

BKCS

Bulletin of the Korean Chemical Society

2023-2024

BKCS TOC Book



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Editor-in-Chief, BKCS

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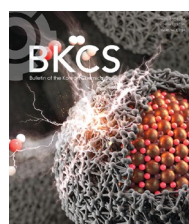


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Analytical Chemistry & Electrochemistry (AC)

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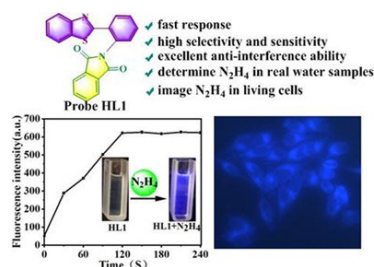
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C Benzothiazole-based fluorescent probe for N_2H_4

Hanlin Wang, Jiexun Huang, Weidong Huang, Longyuan Yang



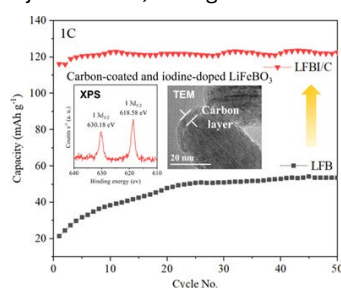
A benzothiazole-based fluorescence enhancement probe HL1 was highly sensitive and selective to N_2H_4 , and it could be applied to detect N_2H_4 content in real water samples and image N_2H_4 in living HeLa cells.

Bull. Korean Chem. Soc. **2023**, *44*, 67-72.

<https://doi.org/10.1002/bkcs.12632>

A Electrochemical and spectroscopic studies on carbon-coated and iodine-doped $LiFeBO_3$ as a cathode material for lithium-ion batteries

Yujin Jeong, Rajeev Kumar, Youngil Lee



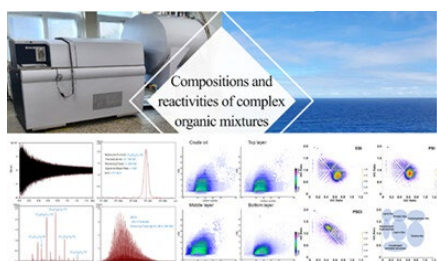
For the first time, a synthesis of iodine doped and carbon coated $LiFeBO_3$ cathode material was attempted. Carbon-coated $LiFeBO_{2.995}O_{10.01}$ (116.19 mAh g⁻¹) has a higher specific discharge capacity than the initial capacity of $LiFeBO_3$ (21.33 mAh g⁻¹) at 1 C rate. This improved capacity is also reflected in the rate performance up to 10 C rate.

Bull. Korean Chem. Soc. **2023**, *44*, 298-303.

<https://doi.org/10.1002/bkcs.12663>

P Characterization of petroleum-related natural organic matter by ultrahigh-resolution mass spectrometry

Thamina Acter, Seulgidaun Lee, Nizam Uddin, Kamarum Monira Mow, Sunghwan Kim



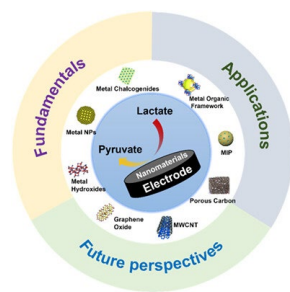
This account reviews recent progress in method development and application of ultrahigh resolution MS to find the chemicals in the natural organic mixture at the molecular level. Due to their extreme heterogeneity and complexity, understanding compositions and reactivity of the mixtures has been scarce. However, there has been significant progress recently thanks to analytical method development.

Bull. Korean Chem. Soc. **2023**, *44*, 332-347.

<https://doi.org/10.1002/bkcs.12662>

R A review on the recent advancements in nanomaterials for nonenzymatic lactate sensing

Khatun A. Jannath, Md Mobarok Karim, Heru Agung Saputra, Kyeong-Deok Seo, Kwang Bok Kim, Yoon-Bo Shim



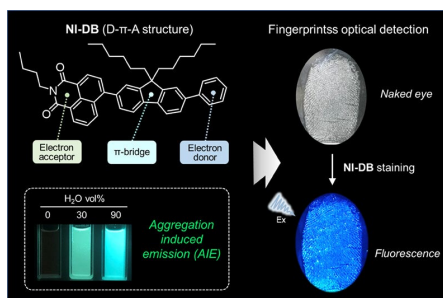
This review summarizes recent trends in the development and applications of electrochemical nonenzymatic lactate sensors based on nanostructured materials including metal and metal oxide nanoparticles, metal-organic frameworks, and molecularly imprinted polymers and carbons. In addition, the analytical performance such as dynamic range, sensitivity, detection limit, and so forth is also highlighted. Detection challenges and future perspective are briefly discussed for development of the lactate sensors toward miniaturization and commercialization purpose.

Bull. Korean Chem. Soc. **2023**, *44*, 407-419.

<https://doi.org/10.1002/bkcs.12678>

C A rational design of AIE-active fluorophore for the fingerprint optical detection

Le Yu, Yunjie Xu, Jungryun Kim, Jieun Lee, Jong Seung Kim



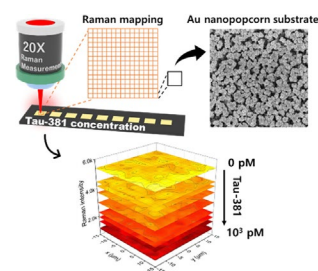
Herein, a novel AIE-active fluorophore (NI-DB) with electron donor- π bridge-electron acceptor (D- π -A) structure based on the 1,8-naphthalimide was developed. Significantly, after fingerprints fixed by cyanoacrylate glue fuming, NI-DB is capable of detecting and imaging latent fingerprints (LFPs) via its intrinsic fluorescence emission. Accordingly, such an AIE-active fluorophore is expected to be an ideal material that would reach the reliable optical detection and imaging of LFPs.

Bull. Korean Chem. Soc. **2023**, *44*, 516-522.

<https://doi.org/10.1002/bkcs.12681>

A Nanoplasmonic assay platforms for reproducible SERS detection of Alzheimer's disease biomarker

Hajun Dang, Younju Joung, Chaehyeon Jeong, Chang Su Jeon, Sung Hyun Pyun, Sung-Gyu Park, Jaebum Choo



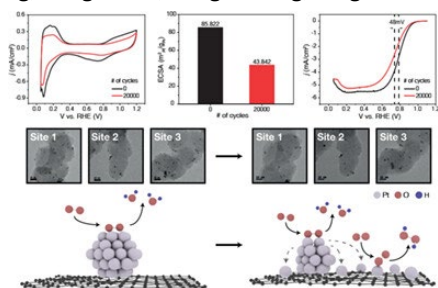
Immunoassays were performed for tau-381 protein, which is one of the important biomarkers of Alzheimer's disease, to evaluate the reproducibility and sensitivity of the nanopopcorn-substrate-based SERS assay platform. The proposed substrate is useful for the high-sensitivity detection of disease biomarkers with very low cut-off values.

Bull. Korean Chem. Soc. **2023**, *44*, 441-448.

<https://doi.org/10.1002/bkcs.12679>

C Multiple-length scale investigation of Pt/C degradation by identical-location transmission electron microscopy

Jimin Kwag, Sungin Kim, Sungsu Kang, Jungwon Park



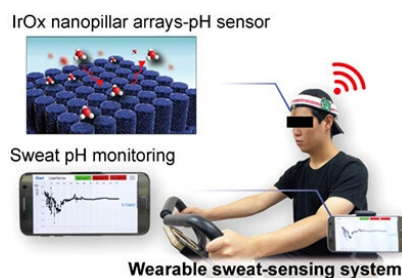
The degradation process of Pt/C was studied using identical-location transmission electron microscopy at multiple-length scales. Various morphological changes in individual Pt nanoparticles were quantitatively analyzed. The formation of Pt single atoms on the carbon support was observed and its effect on the oxygen reduction reaction pathway was studied using rotating ring-disk electrode tests.

Bull. Korean Chem. Soc. **2023**, *44*, 488-494.

<https://doi.org/10.1002/bkcs.12690>

A Preparation of nanopillar array electrode of iridium oxide for high performance of pH sensor and its real-time sweat monitoring

Eun Seop Yoon, Hong Jun Park, Min Sik Kil, Jueun Kim, Kyoung G. Lee, Bong Gill Choi



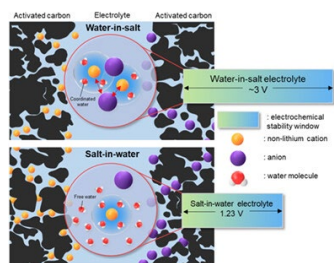
A flexible iridium oxide-based nanopillar array pH sensor is fabricated using soft-lithography and electrochemical deposition steps, resulting in high sensitivity, a fast response time, good repeatability, and selectivity. A wearable sweat-sensing system is designed by integrating the pH sensor with a wireless electronic module, demonstrating real-time monitoring of pH dynamics in the sweat of a volunteer during an indoor cycling exercise.

Bull. Korean Chem. Soc. **2023**, *44*, 528-535.

<https://doi.org/10.1002/bkcs.12689>

R Beyond conventional aqueous electrolytes: Recent developments in Li-free “water-in-salt” electrolytes for supercapacitors

Jongyeon Kim, Subin Lee, Dongwook Lee, Seung Joon Yoo



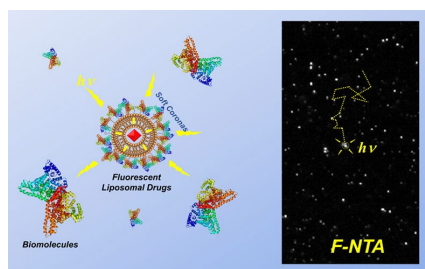
The “Water-in-salt” electrolyte (WiSE) is a promising class of electrolyte because of its unique physicochemical properties. This review highlights the recent progress of WiSE and its application to supercapacitors (SCs). Our discussion is primarily focused on operating mechanisms of non-Lithium based WiSE and how they affect performance. Current challenges and perspectives are also discussed.

Bull. Korean Chem. Soc. **2023**, *44*, 468-482.

<https://doi.org/10.1002/bkcs.12688>

A Probing emergence of biomolecular coronas around drug-loaded liposomal nanoparticles in the solution by using nanoparticle tracking analysis

Ji Yeon Jeong, Heeju Joung, Gwi Ju Jang, Sang Yun Han



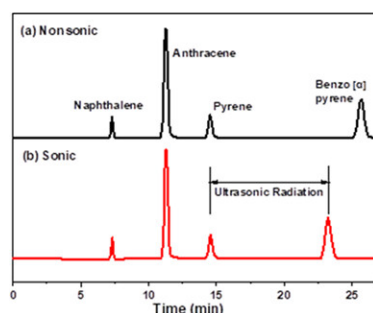
Nanoparticle tracking analysis in the fluorescence (F-NTA) is demonstrated to selectively monitor the formation of natural biomolecular coronas around drug-loaded liposomes, which does not necessitate the isolation of liposomes from the complex native environment. In contrast to previous studies that were limited to hard coronas, the results also uncovered intriguing time-evolving changes occurring in soft coronas.

Bull. Korean Chem. Soc. **2023**, *44*, 551-557.

<https://doi.org/10.1002/bkcs.12692>

A Use of ultrasound in gradient elution of Polycyclic Aromatic Hydrocarbon mixtures by HPLC

Young Han Jeong, Danbi Eun, Nguyen Van Kien, David Jin Han Seog, Jae Jeong Ryoo



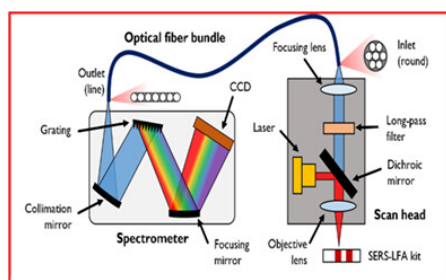
Sono-gradient elution

Bull. Korean Chem. Soc. **2023**, *44*, 613-618.

<https://doi.org/10.1002/bkcs.12700>

P Toward rapid and sensitive point-of-care diagnosis with surface-enhanced Raman scattering-based optofluidic systems

Younju Joung, Sohyun Park, Binnam Kang, Jaebum Choo



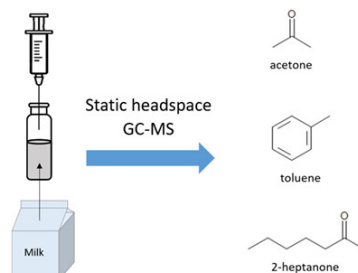
We developed an optofluidic system with surface-enhanced Raman scattering (SERS) and a microfluidic device to diagnose various diseases. This account will introduce a SERS-based optofluidic system that utilizes fluidic devices to quickly and accurately diagnose diseases in the field. We will also highlight the challenges that need to be addressed to use this system in clinical settings.

Bull. Korean Chem. Soc. **2023**, *44*, 718-727.

<https://doi.org/10.1002/bkcs.12718>

A Static headspace gas chromatography–mass spectrometry for volatile organic compounds in bovine milk samples

Dokyung Kwon, Eunbi Lee, Huu-Quang Nguyen, Hanbyeol Jang, Jeongkwon Kim

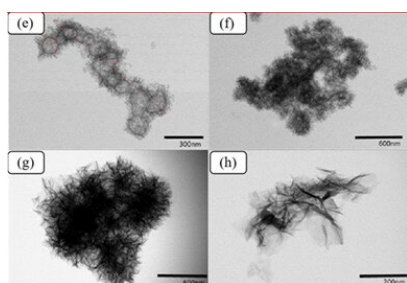


Bull. Korean Chem. Soc. **2023**, *44*, 728-735.

<https://doi.org/10.1002/bkcs.12712>

A Characteristics and electrochemical performances of nickel@nano-silicon/carbon nanofibers composites as anode materials for lithium secondary batteries

Jin-Yeong Choi, Ruye Cong, Angelica Martino, Jiyun Jeon, Hochun Lee, Jaehee Park, Hyun-Ho Park, Chang-Seop Lee



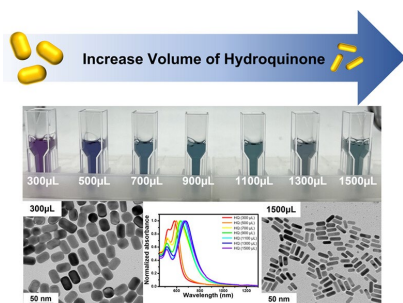
TEM images of transition metal coated Si nanoparticles with 0.01 M $\text{Ni}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$ solution (e,f) and 0.1 M $\text{Ni}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$ solution (g,h).

Bull. Korean Chem. Soc. **2023**, *44*, 852-864.

<https://doi.org/10.1002/bkcs.12759>

C Synthesis of ultra-small gold nanorods: Effect of reducing agent on reaction rate control

Sunghoon Yoo, Goeun Youn, Hyunseung Lee, Jae-Sung Kwon, Youngbok Lee, Seunghyun Lee



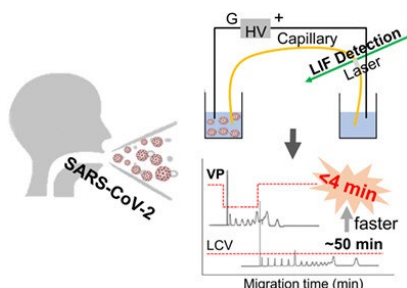
Gold nanorods have attracted attention in nanomedical applications, such as photothermal therapy, photoacoustic imaging, and drug delivery. Herein, we controlled the growth rate of the gold nanorods by adjusting the volume of hydroquinone used as the reducing agent. As a result, we synthesized ultra-small gold nanorods of $16.3 (\pm 2.24) \times 5.85 (\pm 0.54)$ nm in length and diameter.

Bull. Korean Chem. Soc. **2023**, *44*, 648-652.

<https://doi.org/10.1002/bkcs.12706>

C Fast and highly sensitive screening of PCR products of severe acute respiratory syndrome coronavirus 2 by voltage-programmed capillary gel electrophoretic separation

Changuk An, Heesun Park, Su Kang Kim, Seong Ho Kang



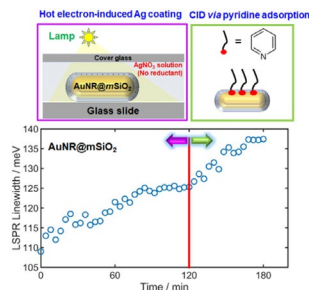
The polymerase chain reaction (PCR) products of SARS-CoV-2 virus was screened within 4 min with pM detection limits by voltage-programmed capillary gel electrophoresis with laser-induced fluorescence detection, which was at least 7.5-fold faster than previous SARS-CoV-2 diagnostic methods based on real-time reverse transcriptase-PCR.

Bull. Korean Chem. Soc. **2023**, *44*, 848-851.

<https://doi.org/10.1002/bkcs.12768>

C Chemical interface damping in single gold nanorods coated with silver via hot electron-mediated photoreduction

Seong Eun Heo, Ji Won Ha



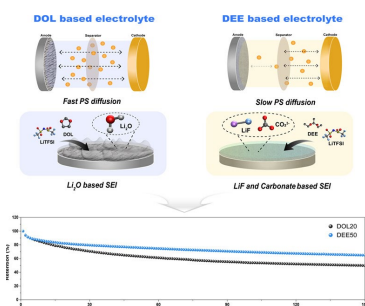
This study contributes to a better understanding of two key aspects: the hot electron-mediated silver (Ag) coating process and the chemical interface damping effect caused by the chemisorption of pyridine in single Ag-coated AuNRs@mSiO₂.

Bull. Korean Chem. Soc. **2023**, *44*, 916-920.

<https://doi.org/10.1002/bkcs.12771>

A 1,1-Diethoxyethane as an interfacial-stabilizing solvent for lithium-sulfur batteries

Juhwi Park, Tae-Hyun Kim, Taeun Yim



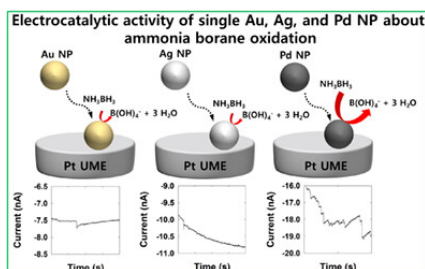
The DEE is proposed as a surface-stabilizing cosolvent for lithium-sulfur batteries (LSBs). The electrochemical reduction of DEE affords organic/inorganic-based solid-electrolyte interphases at the Li anode by participating in the electrochemical reactions. The DEE protects the Li anode and inhibits the dissolution of polysulfide, leading to improved cycling retention of LSBs.

Bull. Korean Chem. Soc. **2024**, *45*, 74-80.

<https://doi.org/10.1002/bkcs.12796>

A Investigation of electrocatalytic activity of palladium nanoparticle for ammonia borane oxidation via single-entity electrochemistry

Seungyoung Park, Ki Jun Kim, Seong Jung Kwon



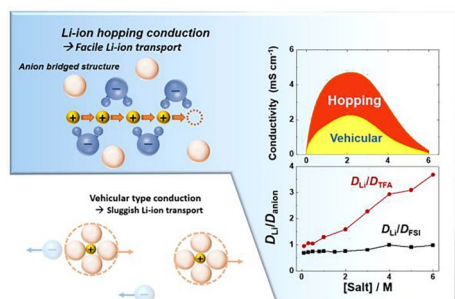
The electrocatalytic behavior of Au, Ag, and Pd nanoparticles (NPs) about ammonia borane (AB) oxidation was investigated at a single level. By analyzing with transient current signal of each NPs based on single-entity electrochemistry measurements, the Pd NP was appropriate for applying an electrocatalyst for AB oxidation when the Pt electrode was used as a support electrode in alkaline conditions.

Bull. Korean Chem. Soc. **2024**, *45*, 81-88.

<https://doi.org/10.1002/bkcs.12797>

A Li-ion hopping conduction enabled by associative Li-salt in acetonitrile solutions

Bonhyeop Koo, Hyejin Lee, Kisung Park, Sunwook Hwang, Hochun Lee



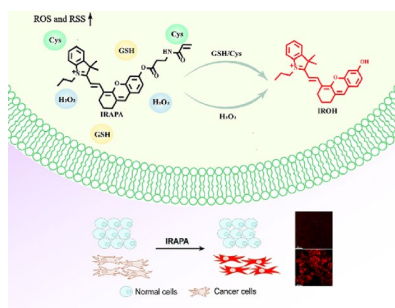
This study demonstrates Li-ion hopping conduction in monodentate acetonitrile (AN) electrolytes via anion-bridged structures with highly associative Li-salt (LiTFA). PFG-NMR confirms Li-ion hopping by illustrating the rapid mobility of Li-ions in comparison to the anion within LiTFA-AN. Raman and DRS analysis reveals that Li-ion hopping occurs due to the predominance of associated ion species in LiTFA-AN.

Bull. Korean Chem. Soc. **2024**, *45*, 92-100.

<https://doi.org/10.1002/bkcs.12802>

A A biothiols and H₂O₂ responsive fluorescence probe for selective cancer imaging

Nan Yin, Guixin Qin, Yuting Wang, Jiali Tang, Xin Yao, Qingling Xu



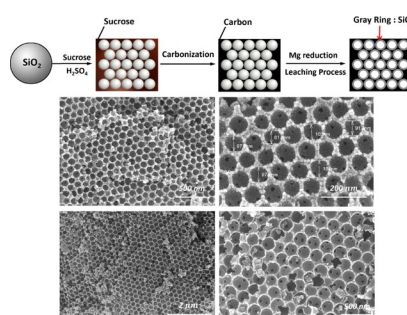
A novel NIR fluorescent probe IRAPA response toward H₂O₂, glutathione and cysteine has been developed and applied for distinguishing cancer from normal cells/tissues.

Bull. Korean Chem. Soc. **2024**, *45*, 252-258.

<https://doi.org/10.1002/bkcs.12811>

C Facile synthesis process for preparing silicon carbide with unique honeycomb structure

Quynh Thi Nguyen, Quy Son Luu, Jiwon Kim, Uyen Thi Do, Yeeun Park, Jihyun Kim, Youngbok Lee



Bull. Korean Chem. Soc. **2024**, *45*, 238-242.

<https://doi.org/10.1002/bkcs.12817>

A Method development for gas chromatography-tandem mass spectrometry analysis of trace level polycyclicaromatic hydrocarbons, alkyl polycyclicaromatic hydrocarbons, polychlorinated biphenyls, and organochlorinepesticides in pine needle specimen

David Chung, Tae Kyung Kim, Ki Wan Park, Seo Yeong Choi, Yun-Suk Oh, Ho-Sang Shin

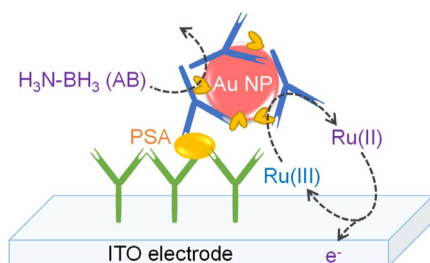


Bull. Korean Chem. Soc. **2024**, *45*, 259-272.

<https://doi.org/10.1002/bkcs.12812>

A Au nanoparticle-catalyzed electron transfer from ammonia-borane to Ru(NH₃)₆³⁺ for sensitive biosensing

Seonhwa Park, Aman Bhatia, Ponnusamy Nandhakumar, Jihyeon Kim, Haesik Yang



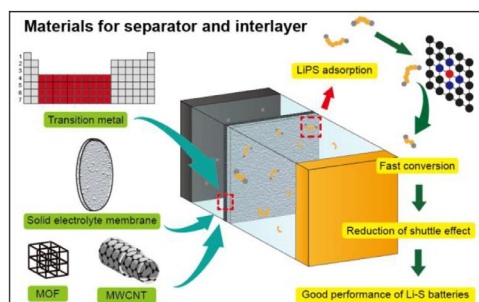
Au nanoparticle (NP)-catalyzed electron transfer (ET) from ammonia-borane to Ru(NH₃)₆³⁺ is efficient for high signal amplification. The small, highly charged Ru(NH₃)₆³⁺ undergoes rapid ET, has high water solubility, and effectively penetrates bio/organic layers on Au NPs. Applying Au NP-catalyzed ET to prostate-specific antigen detection achieved a low detection limit of 10 pg/mL.

Bull. Korean Chem. Soc. **2024**, *45*, 366-372.

<https://doi.org/10.1002/bkcs.12831>

R Recent interlayer and separator design approaches for high-performance Li-S batteries

Hyo-Yeol Choi, Si-Hwan Lee, Hyuk-Joon Yu, Seung-Ho Yu

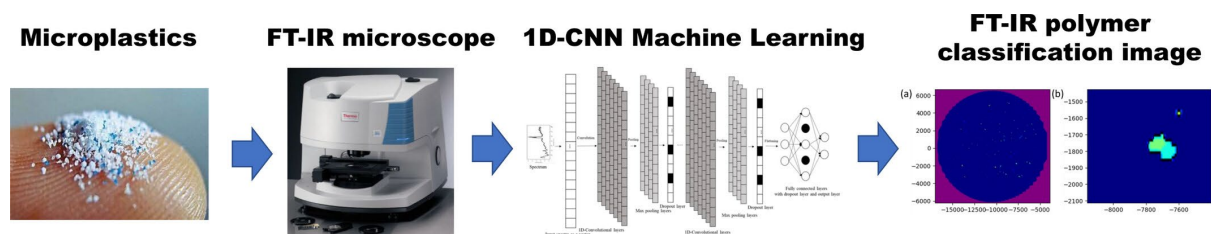


In Li-S batteries, interlayers and separators inevitably encounter lithium polysulfides (LiPS). Moreover, the shuttle effect of LiPS is very lethal in Li-S batteries. This review focuses on recent interlayer and separator design approaches to high-performance Li-S batteries by mitigating the problems in Li-S batteries.

Bull. Korean Chem. Soc. 2024, 45, 382-397.

<https://doi.org/10.1002/bkcs.12833>**A** Development of a machine-learning model for microplastic analysis in an FT-IR microscopy image

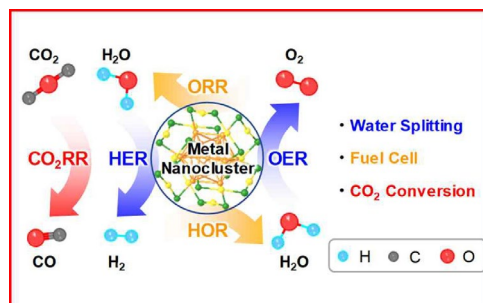
Eunwoo Choi, Yejin Choi, Hyoyoung Lee, Jae-Woo Kim, Han Bin Oh



Bull. Korean Chem. Soc. 2024, 45, 472-481.

<https://doi.org/10.1002/bkcs.12835>**R** Atomically precise metal nanoclusters for energy conversion

Hoeun Seong, Dongil Lee

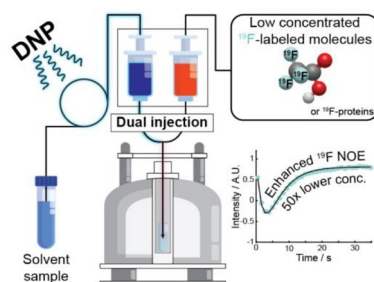


This review examines the performances of atomically precise metal nanoclusters as the electrocatalysts of energy conversion reactions, namely water splitting, fuel cell, and CO₂ conversion reactions, focusing on the strategies used to promote catalytic activity and discussing the future perspectives and resolution of the remaining challenges.

Bull. Korean Chem. Soc. 2024, 45, 435-450.

<https://doi.org/10.1002/bkcs.12842>**A** NOE analysis using dual injection DNP-NMR for studies of solvent-solute interactions at low concentrations

Jihyun Kim



Bull. Korean Chem. Soc. 2024, 45, 560-566.

<https://doi.org/10.1002/bkcs.12852>

R Droplet microfluidics for single-molecule and single-cell analysis in research, diagnosis, and therapy

Joel Sanchez Barea, Dong-Ku Kang

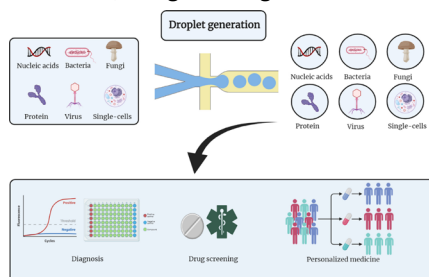


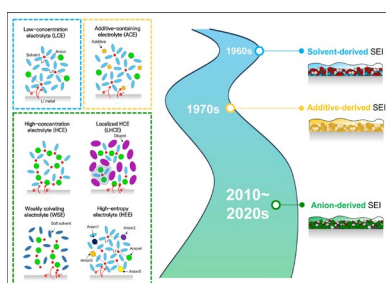
Table of contents droplet microfluidics for molecular and single-cell analysis. Droplet microfluidics can be applied to the analysis of numerous types of samples and lead to more accurate diagnoses and therapies.

Bull. Korean Chem. Soc. **2024**, *45*, 495-502.

<https://doi.org/10.1002/bkcs.12848>

R Modulation of Li⁺ microenvironment in liquid electrolyte for interface design of Li-metal anodes

Minhong Lim, Jiwon Lee, Soyeon Lee, Seungsoo Park, Hongkyung Lee



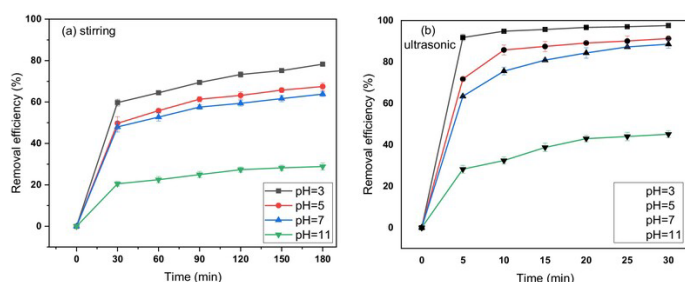
Li metal batteries suffer from the issue of dendrite formation, closely associated with electrolytes, which form the solid-electrolyte interphase (SEI). This review explored historical advancements in electrolytes, ranging from low-concentration to high-concentration and high-entropy formulations, aimed at reinforcing the SEI with anion-derived components to suppress the Li dendrite.

Bull. Korean Chem. Soc. **2024**, *45*, 648-663.

<https://doi.org/10.1002/bkcs.12884>

A Removal of Acid Orange 7 dye using Makgeolli lees with ultrasonic assistance

Nguyen Van Kien, Sunghwan Kim, Jae Jeong Ryoo



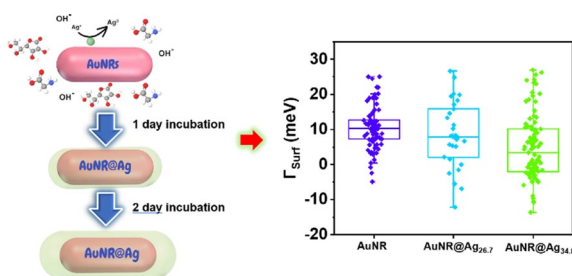
Effect of initial pH on the adsorption of AO7 on Makgeolli lees.

Bull. Korean Chem. Soc. **2024**, *45*, 770-777.

<https://doi.org/10.1002/bkcs.12892>

C Elucidating plasmon damping in silver-coated gold nanorods: Single particle analysis and damping adjustment

Rafifah Hana Raihana Syam, Ji Won Ha



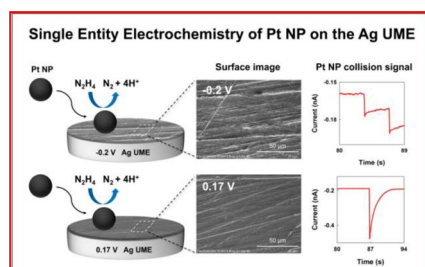
We examined the structural heterogeneity of the Ag shell and the effect of Ag content on the LSPR properties of single AuNRs@Ag. Moreover, this study enhances the understanding of plasmon damping resulting from the interaction at the Ag and Au interface.

Bull. Korean Chem. Soc. **2024**, *45*, 764-769.

<https://doi.org/10.1002/bkcs.12894>

A Enhanced signal to noise ratio of single entity electrochemistry signal of platinum nanoparticles using passive silver ultramicroelectrode

Seongkyeong Yoon, Jaedo Na, Sun Gyu Moon, Heewon Kim, Ki Jun Kim, Seong Jung Kwon



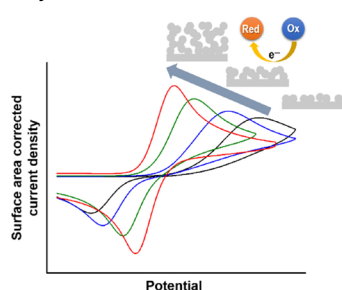
For the first time, single-entity electrochemistry of Pt NPs was observed using an Ag UME. Two characteristic current responses, staircases and blips, were seen during NP collisions, depending on the applied potential. At 0.13 and 0.17 V, Ag UME forms a delicate oxide layer, stabilizing background current. This improves the S/N ratio, offering an advantage over other UMEs like Au, C, Ni, and Hg.

Bull. Korean Chem. Soc. **2024**, *45*, 911-919.

<https://doi.org/10.1002/bkcs.12905>

A Enhanced electrocatalytic activity by nanoconfinement effects at nanoporous indium tin oxide electrodes

Minjee Seo, Je Hyun Bae



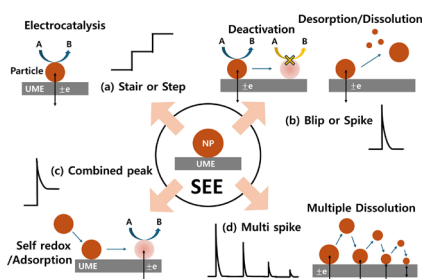
Nanostructured indium tin oxide electrodes with differing nanoporous layer thickness were fabricated to observe the electrokinetics of ferric/ferrous redox reaction and oxygen reduction reaction. This way, we analyzed the contribution of nanoconfinement effects toward the enhanced electrocatalysis in nanoporous structures.

Bull. Korean Chem. Soc. **2024**, *45*, 993-999.

<https://doi.org/10.1002/bkcs.12912>

R Signal shape analysis in single-entity electrochemistry: Understanding electrochemical reaction dynamics

Huichang Park, Jaedo Na, Yujin Han, Dain Heo, Seongkyeong Yoon, Sunwoo Geum, Seong Jung Kwon



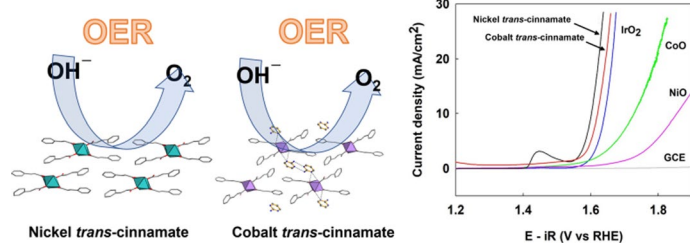
This review categorizes the signal shapes observed in single-entity electrochemistry (SEE). Signals such as staircase, spike, and combined peak responses provide insights into processes such as electrocatalysis, deactivation, and adsorption. This analysis helps to interpret electrochemical reaction dynamics at the single-entity level.

Bull. Korean Chem. Soc. **2024**, *45*, 949-965.

<https://doi.org/10.1002/bkcs.12911>

A Comparison of oxygen evolution reaction performance for Ni and Co using isostructural trans-cinnamate complexes

Hyewon Shin, Sunwoo Geum, Jimin Lee, Minkyun Shin, Kang Min Ok, Seong Jung Kwon, Junghwan Do



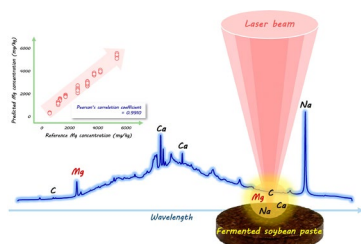
Isostructural nickel and cobalt trans-cinnamate complexes were synthesized via a hydrothermal method. Both complexes demonstrated superior OER catalytic performance compared to IrO₂, with the Ni complex showing particularly strong activity. These excellent characteristics were attributed to the electron delocalization of the metal centers via interactions with π - π delocalized organic ligands.

Bull. Korean Chem. Soc. **2024**, *45*, 920-928.

<https://doi.org/10.1002/bkcs.12910>

A Feasibility of low-power low-resolution laser-induced breakdown spectroscopy for quantification of Mg in fermented soybean pastes

Hyemin Jung, Yujin Oh, Minji Kwon, Hanbeom Choi, Hyang Kim, Sandeep Kumar, Song-Hee Han, Hojin Kim, Haejin Kim, Sang-Ho Nam, Yonghoon Lee



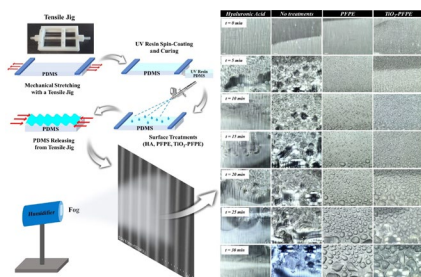
This study utilizes a cost-effective laser-induced breakdown spectroscopy (LIBS) instrument to analyze magnesium (Mg) in fermented soybean pastes, showing the feasibility of using real products as calibration standards supported by other methods. The compact, low-cost LIBS instrument offers an alternative for quantitative mineral analysis and raw material identification, correlating Mg concentrations with the types of salts used.

Bull. Korean Chem. Soc. **2024**, *45*, 1021-1030.

<https://doi.org/10.1002/bkcs.12917>

C Fog collection using hydrophobic and hydrophilic treatments on wrinkle-based multilayered surfaces

Yongseong Kim, Huihwa Kim, Hyun-ju Choi



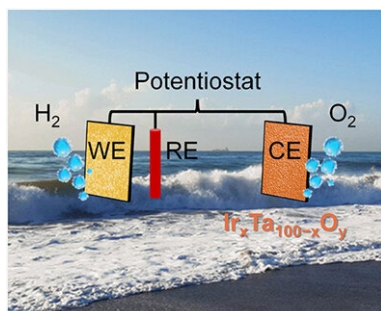
This study demonstrates that regions facing severe water shortages due to climate change can significantly benefit from fog collection as a crucial water resource. Wrinkle-based hydrophilic-hydrophobic surface structures show considerable potential for improving fog-collection efficiency.

Bull. Korean Chem. Soc. **2024**, *45*, 987-992.

<https://doi.org/10.1002/bkcs.12916>

C Fabrication of $\text{Ir}_x\text{Ta}_{100-x}\text{O}_y$ as counter electrodes in saline water

Na Yeon Lee, Han Seo Im, Sumin Lee, Hyun Joo Lee, Hyun Seung Choi, Sung Yul Lim



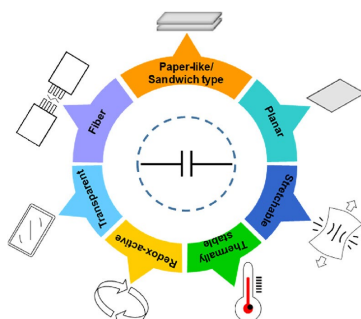
$\text{Ir}_x\text{Ta}_{100-x}\text{O}_y$ -coated electrodes were fabricated by dip coating and thermal treatment. This electrode was used as a counter electrode (CE) to evaluate activities of electrocatalysts toward hydrogen evolution reaction (HER) in simulated seawater. Constant activities for Pt-based electrodes in HER were observed implying the reliability of the $\text{Ir}_x\text{Ta}_{100-x}\text{O}_y$ as CE to prevent from deceptive measurements of HER performance.

Bull. Korean Chem. Soc. **2023**, *44*, 45-49.

<https://doi.org/10.1002/bkcs.12634>

R Flexible supercapacitors toward wearable energy storage devices

Vedi Kuyil Azhagan Muniraj, Madhusudana Koratikere Srinivasa, Hyun Deog Yoo



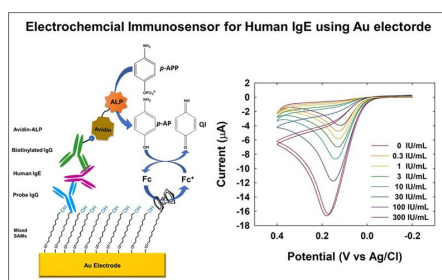
This paper reviews flexible supercapacitors for wearable and flexible electronic devices. Especially, we focus on the chemical processes for fabrication with lower cost, various shapes, and special functionalities such as stretchability, transparency, and thermal stability. We also discuss future perspectives on the strategies toward improved energy and power densities.

Bull. Korean Chem. Soc. **2023**, *44*, 125-136.

<https://doi.org/10.1002/bkcs.12651>

A Immunosensor for human IgE detection using electrochemical redox cycling with ferrocene-mixed self-assembled monolayers modified Au electrode

Ki Jun Kim, Yesol Song, Seungyoung Park, Seung Jun Oh, Seong Jung Kwon



An electrochemical immunosensor for human immunoglobulin E using redox cycling with enzyme reaction was fabricated. As using an Au electrode, redox mediator anchored alkane-thiolates were directly modified. By this, steps for electrode modification are diminished. Based on this, reproducibility, and analytical properties were improved comparing with immunosensor.

Bull. Korean Chem. Soc. **2023**, *44*, 141-146.

<https://doi.org/10.1002/bkcs.12641>

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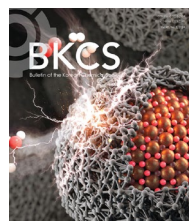
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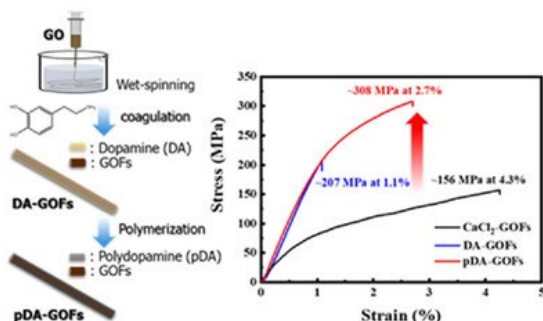


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A Dopamine-assisted wet spinning and mechanical reinforcement of graphene oxide fibers

Hyuntae Hwang, Dongwoo Kang, Young Jin Park, Hyeon Suk Shin

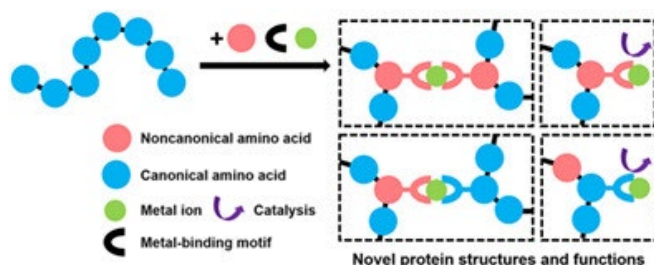


The wet spinning of graphene oxide fibers (GOFs) was performed using dopamine as a coagulation agent and successive polymerization of dopamine inside the fibers. The polymerized DA-GOFs exhibit enhanced mechanical properties with a 97% higher tensile strength than that of the fibers coagulated with CaCl₂.

Bull. Korean Chem. Soc. 2023, 44, 55-59

<https://doi.org/10.1002/bkcs.12636>**R The expanded landscape of metalloproteins by genetic incorporation of noncanonical amino acids**

Jaehee Lee, Minwoo Yang, Woon Ju Song

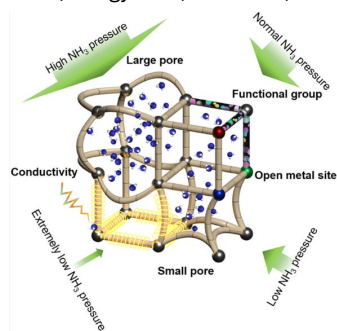


Noncanonical amino acids became a versatile chemical toolbox for creating coordinate covalent bonds between proteins and metal ions or fine-tuning pre-existing inorganic reactivities of metallocofactors. Thus, artificial metalloproteins and metalloenzymes have been built by genetically incorporating noncanonical amino acids, resulting in novel protein structures and functions.

Bull. Korean Chem. Soc. 2023, 44, 23-34.

<https://doi.org/10.1002/bkcs.12635>**R Metal-organic frameworks for NH₃ adsorption by different NH₃ operating pressures**

Cheongwon Bae, Mingyu Gu, Yuri Jeon, Duckjong Kim, Juyeong Kim

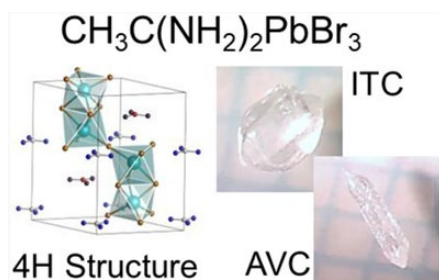


Metal-organic frameworks (MOFs) have emerged as promising NH₃ adsorbents, which would be customizable for different NH₃ pressures due to great structural tunability. We introduce up-to-date reports with MOFs as NH₃ adsorbents and classify them by the NH₃ pressure, from high in adsorption heat pumps to extremely low in daily life sensing.

Bull. Korean Chem. Soc. 2023, 44, 112-124.

<https://doi.org/10.1002/bkcs.12640>**A Acetamidinium bromoplumbate CH₃C(NH₂)₂PbBr₃ with 4H BaRuO₃ structure**

Hyun-Jong Lee, Eunji Lee, Ji-Hyun Cha, Duk-Young Jung



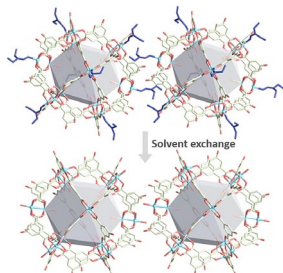
Air stable (ACA)PbBr₃ single crystals were successfully synthesized from acetamidinium bromide and lead bromide, and the crystal structure was determined as 4H BaRuO₃ structure. Millimeter-sized (ACA)PbBr₃ colorless crystals were prepared in the liquid medium. The 4H structure of (ACA)PbBr₃ results from the large ACA size with a tolerance factor which induces a rare connection manner of lead bromide octahedron building blocks.

Bull. Korean Chem. Soc. 2023, 44, 230-235.

<https://doi.org/10.1002/bkcs.12660>

C Solvent-mediated single-crystal-to-single-crystal transformation of metal–organic cage self-assembly

Byeongchan Lee, Dohyun Moon, Jinhee Park



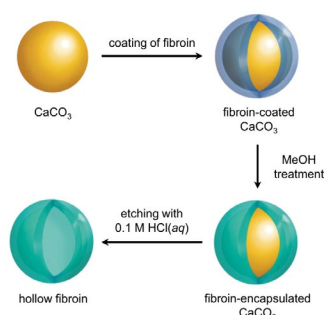
This study demonstrated the unprecedented single-crystal-to-single-crystal transformation of cuboctahedral metal–organic polyhedra using solvent exchange with a weakly coordinating solvent, in this case, chloroform. The strengthened interaction between the cages increases the robustness of the crystals during the solvent removal and thus the porosities.

Bull. Korean Chem. Soc. **2023**, *44*, 55-59.

<https://doi.org/10.1002/bkcs.12637>

A Synthesis of hollow fibroin using calcium carbonate as a template

Byeongho Park, Siva Kumar Ramesh, Seog Woo Rhee, Jinkwon Kim



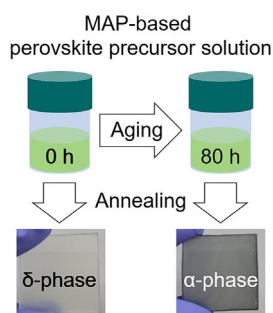
A stable hollow fibroin was successfully synthesized using CaCO_3 as a template.

Bull. Korean Chem. Soc. **2023**, *44*, 274-279.

<https://doi.org/10.1002/bkcs.12659>

A Importance of precursor complexation for green solvent-processed perovskite crystals

Na-Yeon Jo, Hui-Seon Kim

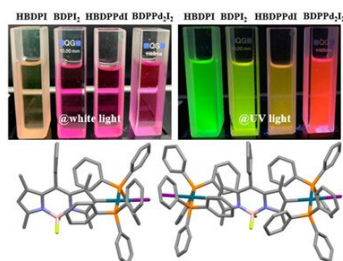


Bull. Korean Chem. Soc. **2023**, *44*, 304-309.

<https://doi.org/10.1002/bkcs.12665>

C Synthesis, crystal structure, and photophysical properties of mononuclear and dinuclear palladium BODIPY chromophores

Gajendra Gupta, Junseong Lee, Chang Yeon Lee



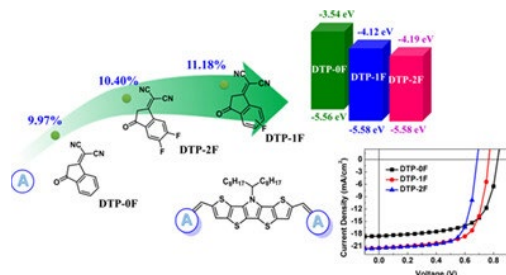
Synthesis and photophysical properties of two new palladium-centered BODIPY complexes are presented.

Bull. Korean Chem. Soc. **2023**, *44*, 390-394.

<https://doi.org/10.1002/bkcs.12673>

A Rational design of the S,N-heteroacene-based nonfullerene by introducing the fluorine atom for efficient high-performance organic solar cells

Sora Oh, Mufarah Amjad, Taek Ahn, Sang Kyu Lee



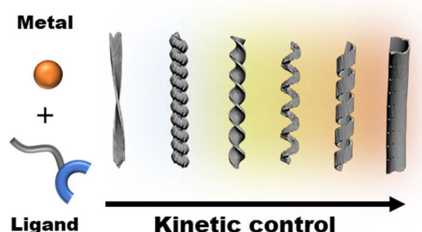
We design and synthesize three fused-ring electron acceptors based on ladder-type pentacyclic heteroacenes with different number of fluorine substitutions. Under this photovoltaic experiment, we can optimize effective donor and acceptor miscibility as well as photovoltaic performances.

Bull. Korean Chem. Soc. **2023**, *44*, 399-406.

<https://doi.org/10.1002/bkcs.12674>

R Kinetically controlled chiral metal-coordinated supramolecular polymerization accompanying helical inversion or morphological transformation

Seol A. Lim, Sung Ho Jung, Jong Hwa Jung



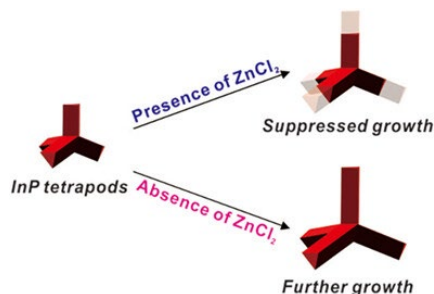
In this account article, we describe the recent progress in the unique characteristics of metal-coordinated supramolecular structures with a controlled helicity based on coordination geometry and dynamic intermolecular binding events.

Bull. Korean Chem. Soc. **2023**, *44*, 322-331.

<https://doi.org/10.1002/bkcs.12670>

C Synthesis of single-crystalline InP tetrapod nanocrystals via addition of ZnCl₂

Sunghu Kim, Seongmin Park, Meeree Kim, Sohee Jeong



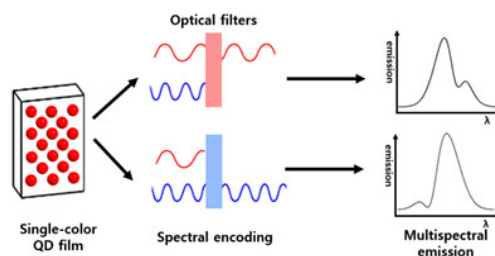
We synthesized indium phosphide (InP) tetrapod NCs with the addition of ZnCl₂ and shelling with ZnSe. Consequently, photoluminescence was dramatically enhanced with tetrapodal geometry. Interestingly, we observed suppression of growing arm length and narrower arm length distribution in InP tetrapods with the addition of ZnCl₂. This study offers a great platform to study the role of ZnCl₂ and exciton behavior in tetrapod NCs.

Bull. Korean Chem. Soc. **2023**, *44*, 483-487.

<https://doi.org/10.1002/bkcs.12684>

C Multiplexing near-infrared quantum dot fluorescence through vibrational and electronic transition signatures

Hyunjung Lee, Sunbin Yang, Junhwa Lee, Sungjee Kim, Sanghwa Jeong

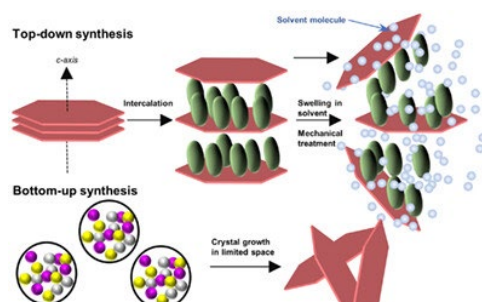


Bull. Korean Chem. Soc. **2023**, *44*, 384-389.

<https://doi.org/10.1002/bkcs.12676>

R Recent advances in the synthesis of layered double hydroxides nanosheets

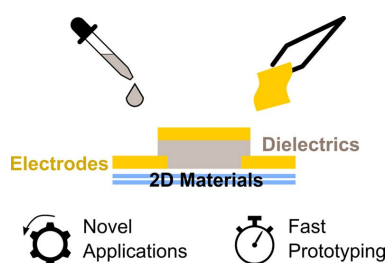
Jing Xie, Zubair Khalid, Jae-Min Oh



Nanosheets of layered double hydroxides (LDH) can be either prepared by top-down exfoliation or bottom-up synthesis under restricted crystal growth condition. For exfoliation, swelling with solvent species can be facilitated with an appropriate intercalation; bottom-up synthesis utilized confined reaction spaces to limit the layer stacking along c-axis.

Bull. Korean Chem. Soc. **2023**, *44*, 100-111.<https://doi.org/10.1002/bkcs.12649>**R** Novel electrodes and gate dielectrics for field-effect transistors based on two-dimensional materials

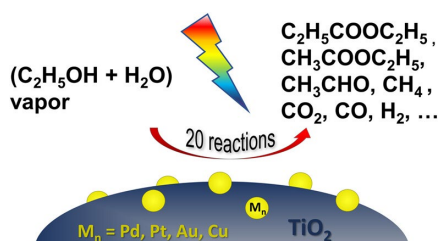
Intek Song



This review provides recent progress on novel methods to prepare electrodes and gate dielectrics for 2D material field-effect transistors.

Bull. Korean Chem. Soc. **2023**, *44*, 495-506.<https://doi.org/10.1002/bkcs.12686>**C** Map of 20 reactions that take place during vapor–solid phase photocatalytic dehydrogenation of ethanol on metal-loaded TiO₂

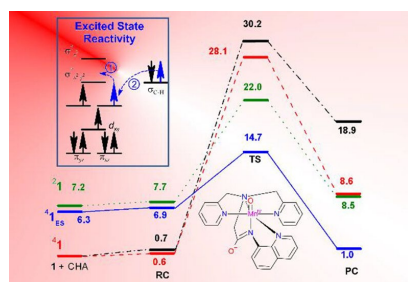
Agni Raj Koirala, Nguyen Huu Thanh, Erdenechimeg Shaariikhuu, Thi Xuyen Nguyen, Muhammad Sarwar Hossain, Kyung Byung Yoon



Twenty reactions that take place during vapor–solid photochemical dehydrogenation of ethanol on metal-doped TiO_2 and the map on how they are interconnected are reported. It gives insights into photocatalytic and thermocatalytic dehydrogenation of ethanol and others and helps to develop eco-friendly processes for the dehydrogenation and oxidative coupling of other alcohols into various products.

Bull. Korean Chem. Soc. **2023**, *44*, 358-362.<https://doi.org/10.1002/bkcs.12685>**C** Calculating the excited state reactivity of a manganese(IV)-oxo species with a negatively charged ligand

Maggie Ng, Kyung-Bin Cho

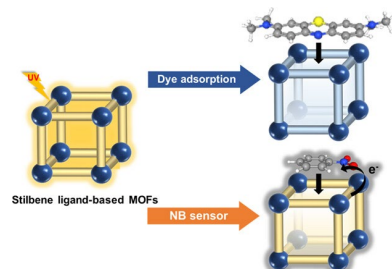


A $Mn^{IV}O$ species with negatively charged ligand was investigated in order to determine if it employs excited state reactivity (ESR) during a C–H activation reaction. It is found that it indeed utilizes ESR, but the charge seems to be less important than the rigidity of the ligand.

Bull. Korean Chem. Soc. **2023**, *44*, 546-550.<https://doi.org/10.1002/bkcs.12695>

A Stilbene ligand-based metal–organic frameworks for efficient dye adsorption and nitrobenzene detection

Jiyun Kim, Chanju Na, Younghu Son, Mani Prabu, Minyoung Yoon



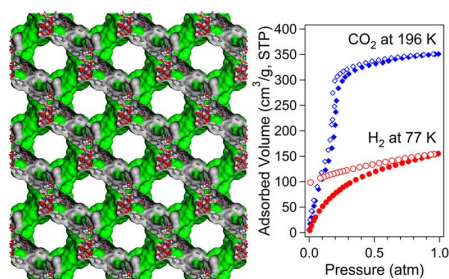
The stilbene ligand-based metal–organic frameworks (MOFs) were used for dye adsorption and nitrobenzene sensing. Despite the low adsorption capacity, the MOFs showed unique selectivity in dye adsorption. In addition, the MOFs also show fluorescence-based sensing ability toward organic analytes. Depending on the structure of MOFs, the MOF shows different selectivity and sensitivity as a sensor.

Bull. Korean Chem. Soc. **2023**, *44*, 507-515.

<https://doi.org/10.1002/bkcs.12683>

A Gas sorption properties of a new Zn-BTB metal–organic framework with permanent porosity

In-Hwan Choi, Ja-Min Gu, Hyun-Chul Kim, Youngmee Kim, Seong Huh



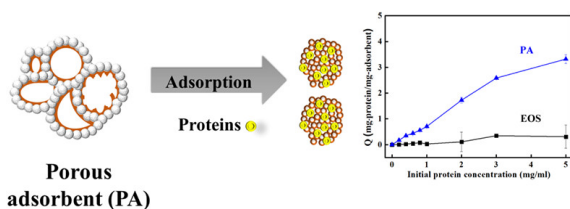
A new three-dimensional Zn-BTB metal–organic framework (MOF) with ant net is prepared and structurally characterized by x-ray crystallography. The Zn-BTB contains a new type of secondary building unit that is distinctly different from that of MOF-177 and Zn-BTB-ant. The permanently porous Zn-BTB MOF contains well-defined cylindrical channels, and it can efficiently sorb carbon dioxide and hydrogen gases at low temperature.

Bull. Korean Chem. Soc. **2023**, *44*, 780-787.

<https://doi.org/10.1002/bkcs.12707>

A Development of porous calcite structure from industrial waste for efficient adsorbent for protein

Zubair Khalid, Jae-Min Oh



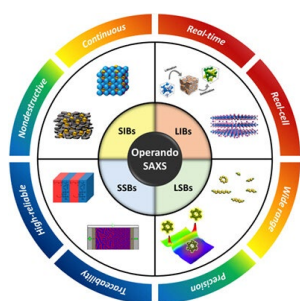
Porous adsorbent (PA) was prepared from electric arc furnace oxidizing slag (EOS) that composed of silica and metal oxide nanoparticles. EOS is treated with acid to dissolve the metal oxide and resulted in porous silica. To grow calcite on the surface of, it is titrated with base having carbonate. The surface changed from silica to porous calcite showed by shifting the curve toward positive region. PA was applied for albumin adsorption and resulted into high adsorption capacity of 3 mg-protein/mg-adsorbent.

Bull. Korean Chem. Soc. **2023**, *44*, 565-571.

<https://doi.org/10.1002/bkcs.12697>

R Operando small-angle x-ray scattering for battery research

Jaeik Lee, Hyeonji Park, Hansol Kim, Taeyeob Kim, Minshi Jin, Taewhan Kim, Ji Man Kim



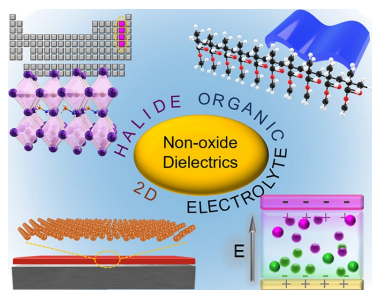
Operando small-angle x-ray scattering (SAXS) for battery research is briefly reviewed, to help in understanding the complex behaviors of nano-scaled electrochemical components such as electrodes and electrolytes in secondary batteries, where this advanced analysis method is expected to play a key role in providing useful information for the design and synthesis of prospective materials in energy-storage fields.

Bull. Korean Chem. Soc. **2023**, *44*, 452-467.

<https://doi.org/10.1002/bkcs.12687>

R Emerging nonoxide dielectrics for next-generation electronics

Ga Hye Kim, Seung Beom Shin, Myung-Gil Kim

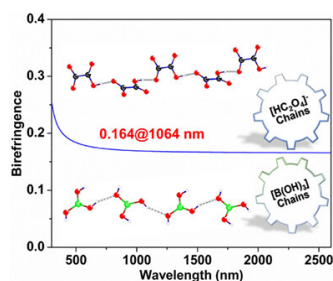


To meet the demands of next-generation electronic devices, which require flexibility, stretchability, low-temperature processability, large-area applicability, ultrathin films, and operation at extremely low voltages, it is essential to study nonoxide dielectric materials. This paper introduces the research trends in nonoxide dielectrics, classified into categories such as organic materials, self-assembled mono/multilayers, electrolytes, two-dimensional (2D) materials, and metal halides.

Bull. Korean Chem. Soc. 2023, 44, 806-817.

<https://doi.org/10.1002/bkcs.12764>**A** $\text{KHC}_2\text{O}_4 \cdot \text{B}(\text{OH})_3$: A nonlinear optical crystal with large birefringence in the short-wavelength ultraviolet region

Yang Li, Jihyun Lee, Kang Min Ok

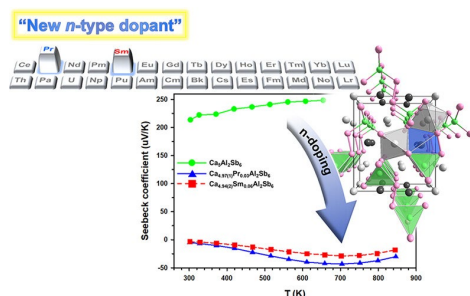


$\text{KHC}_2\text{O}_4 \cdot \text{B}(\text{OH})_3$ exhibits a large birefringence (0.164@1064 nm), short UV cutoff edge (254 nm), and moderate SHG response ($0.3 \times \text{KDP}$) attributed to the infinite $[\text{HC}_2\text{O}_4]^-$ and $[\text{B}(\text{OH})_3]$ chains.

Bull. Korean Chem. Soc. 2023, 44, 788-793.

<https://doi.org/10.1002/bkcs.12720>**A** Novel n-type Zintl phase thermoelectric materials: The $\text{Ca}_{5-x}\text{RE}_x\text{Al}_2\text{Sb}_6$ (RE = Pr, Sm) system

Junsu Lee, Naeun Seo, Seongbeom Yeon, Tae-Soo You

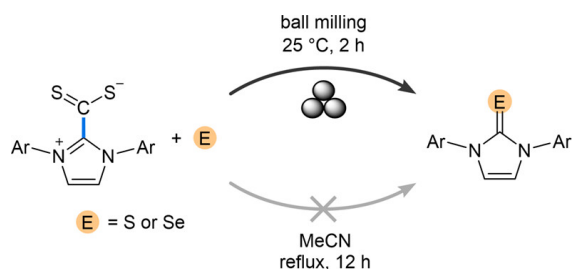


Two novel Zintl phases of $\text{Ca}_{4.97(1)}\text{Pr}_{0.03}\text{Al}_2\text{Sb}_6$ and $\text{Ca}_{4.94(2)}\text{Sm}_{0.06}\text{Al}_2\text{Sb}_6$ were successfully synthesized with some addition of Pr^{3+} and Sm^{3+} -dopants in the $\text{Ca}_{5-x}\text{RE}_x\text{Al}_2\text{Sb}_6$ (RE = rare-earth metals) system, and electrical transport property measurements proved that these compounds were indeed the n-type thermoelectric materials having electrons as primary charge carriers.

Bull. Korean Chem. Soc. 2023, 44, 705-712.

<https://doi.org/10.1002/bkcs.12763>**C** Mechanochemical activation of NHC- CS_2 adducts for the generation of N-heterocyclic carbenes

Subin Park, Youngsuk Kim



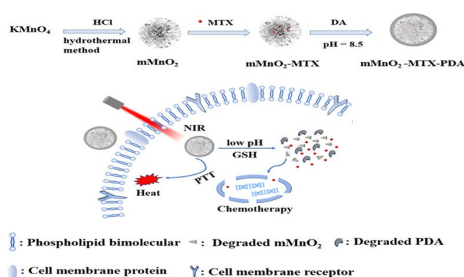
We present a practical and efficient mechanochemical method for generating free carbenes from NHC- CS_2 adducts. Thermal activation of NHC- CS_2 adducts is impractical due to the high activation energy, but ball milling enabled the activation of NHC- CS_2 even at room temperature, highlighting the potential of mechanochemistry as a powerful synthetic tool.

Bull. Korean Chem. Soc. 2023, 44, 1004-1007.

<https://doi.org/10.1002/bkcs.12782>

A A biodegradable drug-controlled delivery system based on mesoporous manganese dioxide and poly(dopamine)

Miaomiao Li, Wenrong Cai, Lihua Jiang, Junyao Li, Shan Li, Tongtong Tang, Yong Kong



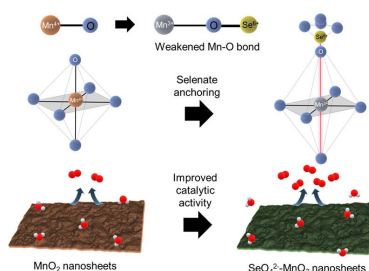
Synthesis of $m\text{MnO}_2$ -MTX-PDA and pH, GSH, and NIR light triggered delivery of MTX.

Bull. Korean Chem. Soc. **2023**, *44*, 1040-1048.

<https://doi.org/10.1002/bkcs.12788>

A Optimization of oxygen evolution electrocatalytic activity of metal oxide nanosheet via surface modification

Haslinda Binti Mohd Sidek, Jihyeong Lee, Xiaoyan Jin, Seong-Ju Hwang



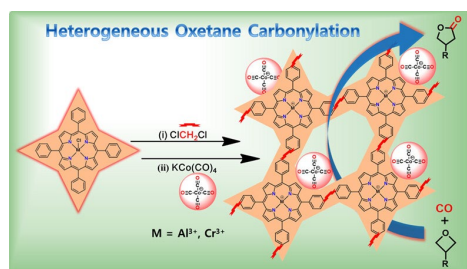
The surface modification of metal oxide nanosheet via the anchoring of highly oxidized nanoclusters provides a powerful way to optimize the electrocatalyst performance via the fine-tuning of chemical bonding character. The bond competition between adjacent Se^{6+} -O and Mn-O bonds is found to be quite effective in stabilizing Mn^{3+} species and thus promoting the reaction kinetics for oxygen evolution.

Bull. Korean Chem. Soc. **2023**, *44*, 962-968.

<https://doi.org/10.1002/bkcs.12790>

A Carbonylative ring expansion of oxetane into γ -butyrolactone using bimetallic cobaltate catalysts: Insight into the deactivation mechanism

Vinothkumar Ganesan, Sungho Yoon



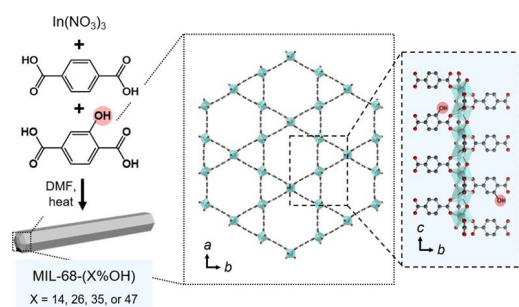
We have achieved a facile and atom-economic synthesis of biologically impressive γ -butyrolactones through carbonylative ring expansion of oxetanes, employing a heterogenized bimetallic Lewis acid-base catalyst. These catalysts demonstrate excellent activity and selectivity, while the validation of the β -hydrogen elimination hypothesis provides insights into the catalyst deactivation route. Our findings pave the way for efficient and sustainable synthesis of γ -butyrolactones, unlocking their immense biological potential.

Bull. Korean Chem. Soc. **2023**, *44*, 1049-1055.

<https://doi.org/10.1002/bkcs.12789>

A Enhanced early-stage adsorption of chemical warfare agent simulant by MIL-68-(X%OH)

Gihyun Lee, Sojin Oh, Moonhyun Oh



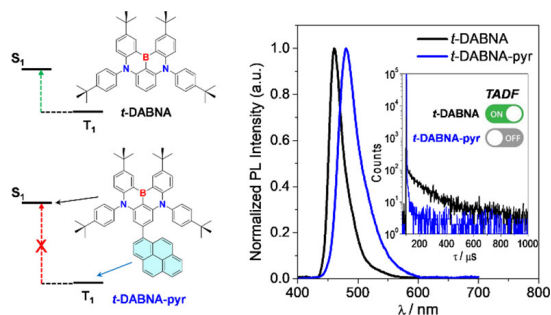
Metal-organic framework-based adsorbents are developed for the effective capture of chemical warfare agent (CWA) simulant, especially in the early stage of its exposure. The incorporation of dangling OH groups into an MIL-68 framework leads to a remarkable enhancement for CWA simulant adsorption at early-stage exposure to its vapor.

Bull. Korean Chem. Soc. **2024**, *45*, 67-73.

<https://doi.org/10.1002/bkcs.12794>

A Boron- and nitrogen-embedded blue multi-resonance emitters with low triplet energy

Hanif Mubarak, Taehwan Lee, Jaehoon Jung, Min Hyung Lee

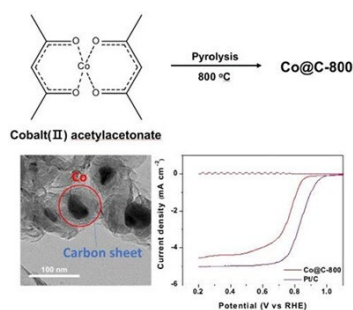


Boron- and nitrogen-embedded multi-resonance emitters, appended with a polycyclic aromatic hydrocarbon (PAH) group, have been prepared. The presence of the PAH unit enlarges the singlet-triplet gap of the emitter by reducing the energy of the triplet state localized at the PAH unit. As a result, t-DABNA-pyr exhibits an intense narrowband sky-blue emission that lacks thermally activated delayed fluorescence characteristics.

Bull. Korean Chem. Soc. 2024, 45, 16-22.

<https://doi.org/10.1002/bkcs.12793>**A** One pot production of Co core/carbon shell materials and their electrocatalytic properties

Yunseok Shin, Sungjin Park

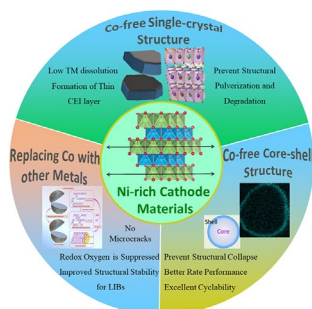


Core-shell materials containing carbon shells surrounding Co particles are prepared one-pot process and show excellent electrocatalytic oxygen reduction reaction performance and stability.

Bull. Korean Chem. Soc. 2024, 45, 23-31.

<https://doi.org/10.1002/bkcs.12798>**R** Recent progress in Co-free, Ni-rich cathode materials for lithium-ion batteries

Sk. Khaja Hussain, Jin Ho Bang

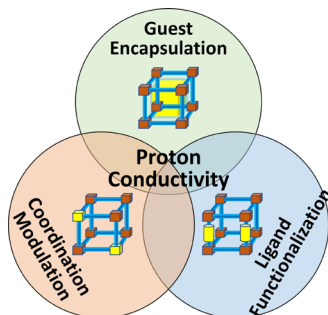


This article discusses recent advances, innovative design approaches, and prospects for the development of Co-free, Ni-rich cathode materials for Li-ion battery applications.

Bull. Korean Chem. Soc. 2024, 45, 4-15.

<https://doi.org/10.1002/bkcs.12799>**R** Post-synthetic modifications in metal-organic frameworks for high proton conductivity

Amitosh Sharma, Seonghwan Lee, Jaewoong Lim, Myoung Soo Lah



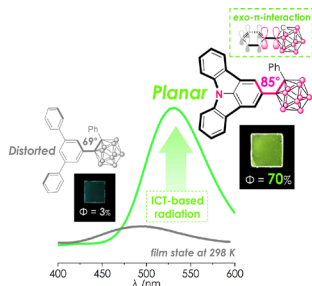
MOFs have attracted research as proton conductors for fuel cells. Our review summarizes key methods for achieving superprotonic conductivity in MOFs, categorizing them into: guest molecule encapsulation, metal-coordination site modulation, and ligand functionalization. We highlight the role of each strategy and explore future MOF developments.

Bull. Korean Chem. Soc. 2024, 45, 145-156.

<https://doi.org/10.1002/bkcs.12801>

A A geometric key for enhancing the radiative efficiency of ortho-carboranyl luminophores: Indolocarbazole- and m-terphenyl-ortho-carboranes

Mingi Kim, Kanghee Cho, Yung Ju Seo, Junhyeok Choi, Namkyun Kim, Ilsup Shin, Kang Mun Lee



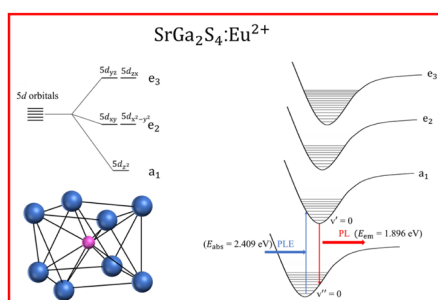
The significant difference between the solid-state intramolecular-charge-transfer-based radiative efficiencies between indolocarbazole- and m-terphenyl-appended o-carboranyl luminophores verifies that the geometric feature of π -conjugated aromatic groups significantly influences radiative decay processes.

Bull. Korean Chem. Soc. **2024**, *45*, 101-109.

<https://doi.org/10.1002/bkcs.12804>

P Photoluminescence properties of Eu²⁺-activated thiogallate phosphors

Young-Sik Cho, Moon-Su Bok, Young-Duk Huh



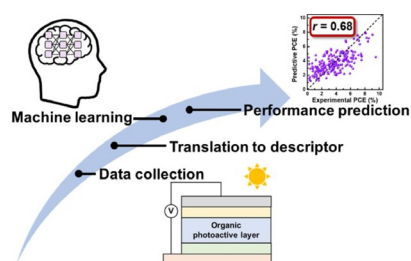
This work analyzes the crystal structural properties and photoluminescence properties of six Eu²⁺-activated thiogallates: CaGa₂S₄:Eu²⁺, SrGa₂S₄:Eu²⁺, EuGa₂S₄, BaGa₂S₄:Eu²⁺, Sr₂Ga₂S₅:Eu²⁺, and Eu₂Ga₂S₅.

Bull. Korean Chem. Soc. **2024**, *45*, 157-164.

<https://doi.org/10.1002/bkcs.12805>

A Molecular structural descriptor-assisted machine learning for organic photovoltaics with perylene diimide acceptors

Gyu-Hee Kim, Keonho Yoon, Chihyung Lee, Minwoo Nam, Doo-Hyun Ko



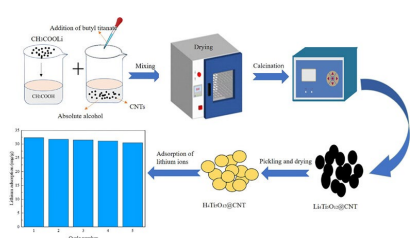
Machine learning (ML) was introduced to accelerate the discovery process of materials for high-efficiency organic photovoltaics (OPVs). Our descriptor was designed to translate the molecular structures of potential materials into a concise matrix. Our ML models, trained with a descriptor, accurately predicted the performance of OPVs using only the molecular structure information of the materials.

Bull. Korean Chem. Soc. **2024**, *45*, 125-130.

<https://doi.org/10.1002/bkcs.12810>

A Synthesis and adsorption properties of H₄Ti₅O₁₂@CNT ion sieves

Yuyu Gao, Jin Chen, Suihong Chu, Bo Yang, Lu Zheng, Min Liu



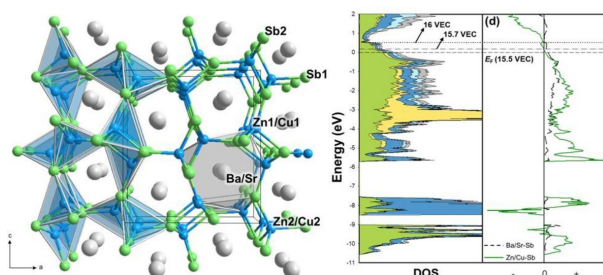
In this study, H₄Ti₅O₁₂@CNT composite nanotubes with an encapsulated structure were prepared for use as ion sieves by combining pretreated CNTs as a template and carbon source, C₁₆H₃₆O₄Ti as a titanium source, and CH₃COOLi as a lithium source; roasting them together at different temperatures; and then washing them with hydrochloric acid to remove the lithium. Roasting and acid washing to remove the lithium were performed at different temperatures and the sample roasted at 700 °C showed the best adsorption performance. Characterization of the specific surface area, scanning electron microscopy, and transmission electron microscopy showed that the structure of the ion sieves was relatively stable and acid washing did not affect their structural integrity. In the first adsorption cycle, the saturation adsorption capacity of the ion sieves was 32.32 mg/g. After five adsorption-desorption cycles, it remained at 30.68 mg/g, exhibiting a reduction of only 5.1%. Therefore, the ion sieves had excellent cycling stability.

Bull. Korean Chem. Soc. **2023**, *44*, 943-951.

<https://doi.org/10.1002/bkcs.12775>

C Effect of co-substitution on complex thermoelectric compounds: The Zintl phase $Ba_{1-x}Sr_xZn_{2-y}Cu_ySb_2$ system

Jiwon Jeong, Daewon Shim, Myung-Ho Choi, Kang Min Ok, Tae-Soo You



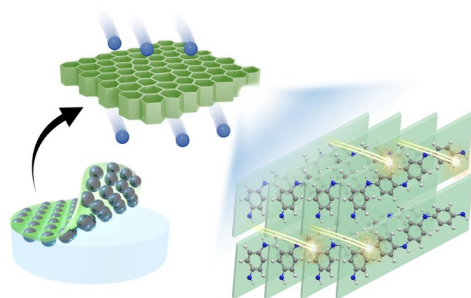
Three complex Zintl phase compounds belonging to the $Ba_{1-x}Sr_xZn_{2-y}Cu_ySb_2$ system were successfully synthesized with the co-substitution of Sr and Cu for Ba and Zn, and DFT calculations indicated that the p-type Cu substitution strengthened the structural stability and enhanced the carrier concentration.

Bull. Korean Chem. Soc. **2024**, *45*, 165-170.

<https://doi.org/10.1002/bkcs.12806>

R Porous pathways: Exploring the future of conducting polymers

Hyeonseong Ham, Geunhong Sim, Woongsik Choi, Moon Jeong Park



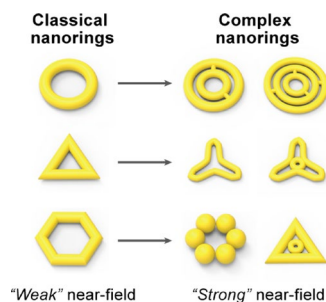
Extensive research has focused on nanostructured conducting polymers (CPs), employing diverse synthetic methods. Introducing porous morphologies in two-dimensional CPs enhances their functionality, facilitating efficient mass/charge transport. The development of self-supporting, two-dimensional porous CPs holds promise for next-gen energy storage and flexible electronics, pushing the boundaries of materials science.

Bull. Korean Chem. Soc. **2024**, *45*, 200-213.

<https://doi.org/10.1002/bkcs.12814>

P Wet-chemical synthesis of two-dimensional complex nanorings for near-field focusing

Insub Jung, Sungwoo Lee, Soohyun Lee, Sungho Park



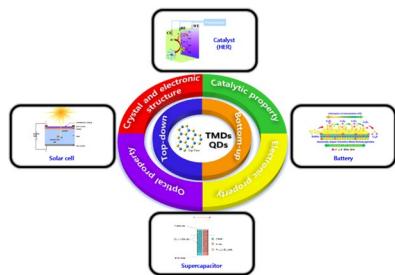
Plasmonic nanorings have gained significant interest because of their unique shape-related optical properties. However, a classical simple ring architecture has shown limitations on low electromagnetic field enhancement. Utilizing rationally designed synthesis methods, a diverse set of complex-shape plasmonic nanorings can be realized, along with strong improvement in near-field focusing.

Bull. Korean Chem. Soc. **2024**, *45*, 228-237.

<https://doi.org/10.1002/bkcs.12815>

R Transition metal dichalcogenide quantum dots: Synthesis, properties, and applications for electrochemistry, energy storage, and solar cells

Hoon Ju Lee, Weiguang Yang, Hyeon Suk Shin



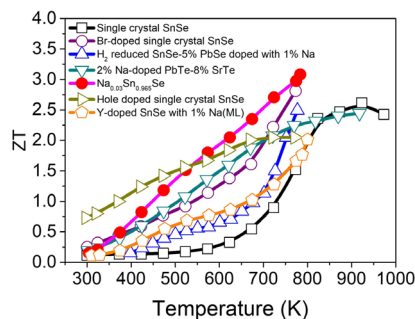
In this article, we briefly review the various popular synthesis methods of transition metal dichalcogenides (TMDs) quantum dots (QDs). We summarize the optical, electronic, and catalytic properties of TMD QDs. Furthermore, recent progress on electrochemistry, energy storage, and solar cell applications of TMD QDs is summarized in detail. Finally, we summarize current research bottlenecks of TMD QDs and discuss potential avenues for future research.

Bull. Korean Chem. Soc. **2024**, *45*, 214-227.

<https://doi.org/10.1002/bkcs.12816>

R SnSe: The rise of the ultrahigh thermoelectric performance material

Taeshik Kim, Hyungseok Lee, In Chung

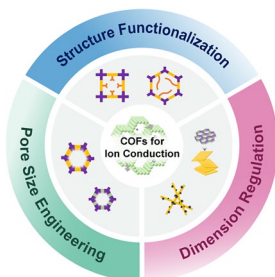


This short review introduces the emergence of a new class of high-performance thermoelectric material SnSe. This simple binary compound exhibits unprecedented thermoelectric properties mainly attributed to its unique crystal structure. The resulting electronic and phonon structures are highly favorable for thermoelectric materials. The new synthesis method finally revealed its intrinsic physical properties for the first time. The resultantly obtained, record-high thermoelectric figure of merit 3.1 has not been achieved so far from any bulk material systems, showing the paradigm change in thermoelectric technology. This achievement also highlights the importance of high-level inorganic synthesis and discovery of new materials.

Bull. Korean Chem. Soc. 2024, 45, 186-199.

<https://doi.org/10.1002/bkcs.12821>**R From structure to function: Harnessing the ionic conductivity of covalent organic frameworks**

Cong-Xue Liu, Soomin Hwang, Hyerin Woo, Eunsung Lee, Sarah S. Park

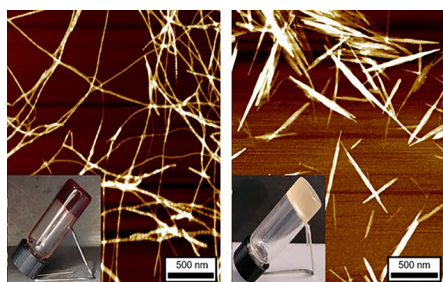


COFs have drawn considerable research attention as ion conductors in energy storage applications. Our review outlines various approaches to achieve improved ionic conductivity in COFs, classified them into three categories: structural functionalization, pore size engineering, and dimensional regulation. We emphasize the significance of each strategy and its contribution to enhancing the ionic conductivity of COFs.

Bull. Korean Chem. Soc. 2024, 45, 296-307.

<https://doi.org/10.1002/bkcs.12823>**C Metal-triggered supramolecular hydrogels based on bipyridine ligand possessing hydrazine moieties with metal ions**

Kayeong Go, Sehee Kim, MinHye Kim, Heekyoung Choi, Sung Ho Jung, Jong Hwa Jung

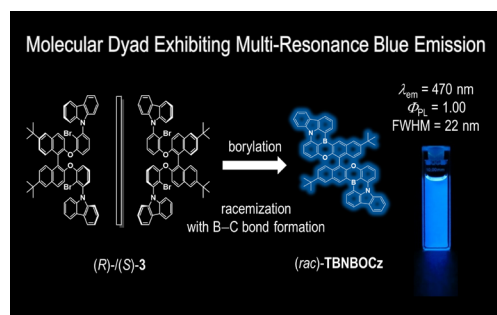


Bipyridine-based gelator 1 having two D-alanine units was prepared, and the metallosupramolecular hydrogel was formed in the presence of $\text{Co}(\text{NO}_3)_2$ and AgNO_3 . The atomic force microscopy (AFM) image of 1 with $\text{Co}(\text{NO}_3)_2$ revealed well-defined helical fibers. In contrast, the AFM image of 1 with AgNO_3 showed shorter linear fiber structures.

Bull. Korean Chem. Soc. 2024, 45, 243-246.

<https://doi.org/10.1002/bkcs.12818>**A Molecular dyad exhibiting strong multi-resonance blue fluorescence**

Byung Hak Jhun, Youngmin You



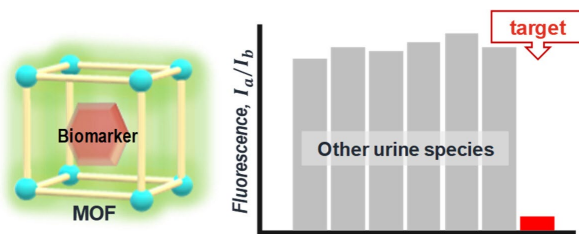
Axially chiral molecular dyads of multi-resonance-fluorescent azaoxaborin exhibit strong blue fluorescence, but the dyads are chiroptically inactive due to racemization in the borylation step.

Bull. Korean Chem. Soc. 2024, 45, 322-330.

<https://doi.org/10.1002/bkcs.12824>

R Metal-organic frameworks as a fluorescent probe for detection of pathogenic biomarkers in human urine

Seyeon Jeong, Hoi Ri Moon



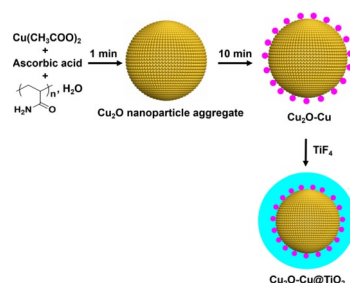
This review introduces the recent progress in various applications of metal-organic frameworks (MOFs) as fluorescence probes for detecting diseases in human urinary samples. The host-guest interactions between MOFs and analytes change the emission properties of MOFs, showcasing the identification of specific biomarkers. Highly tunable and controllable MOFs can be the ideal platform for designing luminescent probes for diagnostic markers in human urine with high selectivity and low detection limits.

Bull. Korean Chem. Soc. **2024**, *45*, 308-316.

<https://doi.org/10.1002/bkcs.12827>

A Photocatalytic degradation of 4-nitrophenol by using multicomponent Cu₂O-Cu@TiO₂ nanoparticle aggregates

Jianwei Jiang, Seokyeong Moon, Sungho Yoon, Lianhai Piao



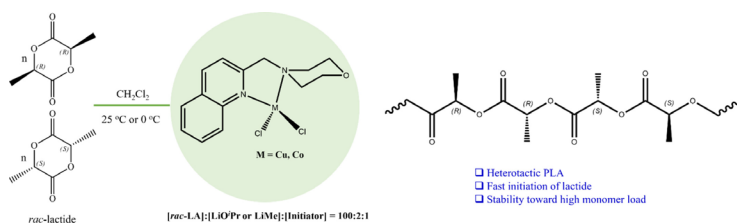
Three-component nanomaterials composed of Cu₂O, Cu, and TiO₂ were prepared using above procedures, and applied in the photocatalytic degradation reaction of 4-nitrophenol under a simulated solar light. We found that it exhibited greater activity than the Cu₂O-Cu nanoparticles aggregates (NPAs), commercial TiO₂, and Cu₂O@TiO₂ NPAs.

Bull. Korean Chem. Soc. **2024**, *45*, 373-377.

<https://doi.org/10.1002/bkcs.12822>

C Highly active cobalt(II) and copper(II) complexes supported by aminomethylquinoline mediating stereoselective ring-opening polymerization of rac-lactide

Jaegyeong Lee, Saira Nayab, Ameet Kumar, Dongil Kim, Hyewon Jung, Sang-Ho Lee, Daeheum Cho, Hyosun Lee



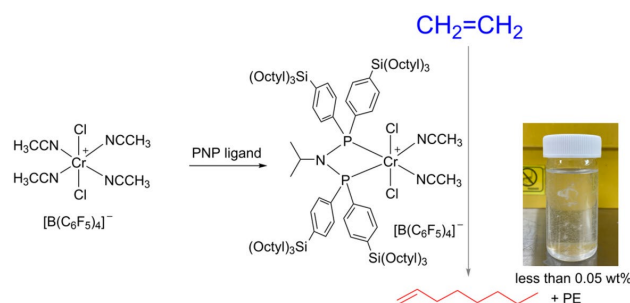
Cobalt(II) and copper(II) catalytic system for ring opening polymerization of rac-LA with quantitative initiation with [LiMe] and [LiOPr] groups by an in situ activation strategy for stereoselective poly(lactide) synthesis. The cobalt(II)/LiMe initiating system produced PLA with high heterotactic enchainment (Pr = 0.92) with 98% conversion at 0 °C.

Bull. Korean Chem. Soc. **2024**, *45*, 317-321.

<https://doi.org/10.1002/bkcs.12828>

A Preparation of chromium complexes for ethylene tetramerization catalyst

Jun Hyeong Park, Ju Yong Park, Jun Won Baek, Yeong Hyun Seo, Mi Ryu Lee, Junseong Lee, Bun Yeoul Lee

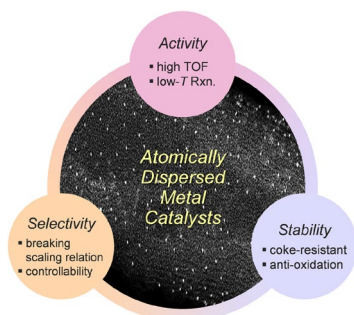


Bull. Korean Chem. Soc. **2024**, *45*, 331-340.

<https://doi.org/10.1002/bkcs.12826>

P Rise of atomically dispersed metal catalysts: Are they a new class of catalysts?

Jae Hyung Kim, Sang Hoon Joo



This account presents the historical background underpinning the emergence of atomically dispersed metal catalysts and highlights selected examples illustrating their unusual catalytic reactivities, which are hard to be realized with homogeneous or heterogeneous catalysts.

Bull. Korean Chem. Soc. **2024**, *45*, 350-358.

<https://doi.org/10.1002/bkcs.12830>

A Theoretical analysis on the formation and nitric oxide release of N-heterocyclic carbene nitric oxide radicals

Junbeom Park, Hayoung Song, Yong Ho Lee, Eunsung Lee



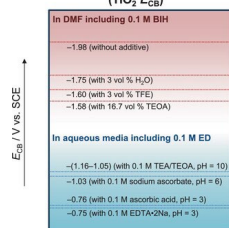
Bull. Korean Chem. Soc. **2024**, *45*, 404-411.

<https://doi.org/10.1002/bkcs.12837>

A Spectroelectrochemical determination of the conduction band level of mesoporous titanium dioxide semiconductor in diverse reaction media

Sunghan Choi, Chongoh Kim, Daehan Lee, Seungmin Jeon, Ho-Jin Son

The conduction band energetics of TiO₂ (TiO₂ E_{CB})



Key factors that govern the TiO₂ E_{CB}

- Proton concentration in aprotic organic solvent media
- pH value in aqueous solvent media
- H⁺ donating/accepting ability of added electron donor

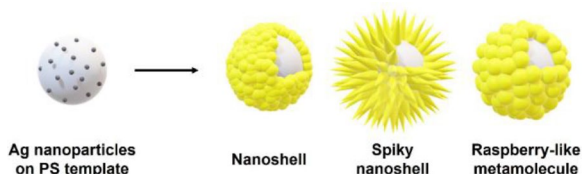
This study emphasizes the crucial role of proton additives and electron donors in influencing the conduction band energetics (E_{CB}) of mesoporous TiO₂ electrodes and aims to determine the extent to which the TiO₂ E_{CB} can shift as a result of the adsorption and intercalation of protons on its surface. The findings obtained herein contribute to the comprehension of the energetic efficiency of TiO₂-mediated photocatalytic systems in various solvent environments.

Bull. Korean Chem. Soc. **2024**, *45*, 412-419.

<https://doi.org/10.1002/bkcs.12839>

P Gold nanoshells with varying morphologies through templated surfactant-assisted seed-growth method

Sunghye Lee, Soyun Lee, Soojin Hwang, So-Jung Park



The synthetic approach reviewed in this paper offers an alternative strategy to typical self-assembly methods for controlled assembly of metal nanoparticles. This method, based on templated seed-mediated metal growth, produces various types of metal nanoshells such as continuous or spiky nanoshells, as well as raspberry-like metamolecules with unique optical properties, including strong and distance-independent SERS, heterogeneity-driven quadrupole-enhanced SERS, and strong magnetic resonances with broad extinction spectra. This account discusses the factors that control the morphology and optical properties and suggests future directions in this field.

Bull. Korean Chem. Soc. **2024**, *45*, 486-494.

<https://doi.org/10.1002/bkcs.12845>

A Organometallic ruthenium complexes derived from anthracene and pyrene chromophores: Synthesis and photophysical properties

Gajendra Gupta, Yena Choe, Suhyun Kim, Junseong Lee, Jiwon Bang, Chang Yeon Lee



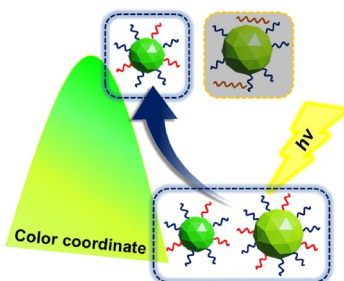
Synthesis and excellent photocatalytic properties of new ruthenium-based anthracene and pyrene complexes are presented.

Bull. Korean Chem. Soc. **2024**, *45*, 398-403.

<https://doi.org/10.1002/bkcs.12841>

C Narrowing the photoluminescence bandwidth of InP-based colloidal quantum dots through photon-triggered isolation

Hyekyeong Kwon, Byeong-Seo Cheong, Jiwon Bang



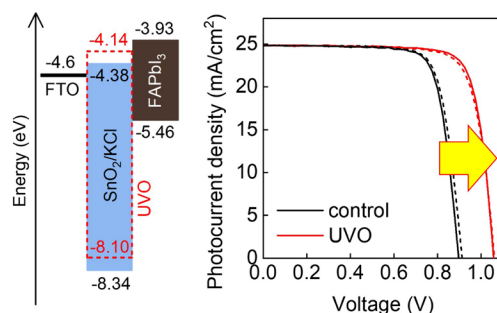
Thiol-functionalized quantum dots enable light-triggered ligand detachment. Selectively removing the light-activated quantum dots from a colloidal solution in an ensemble facilitates the isolation of quantum dots with a nearly monodispersed optical band gap distribution, resulting in narrowed and blueshifted emissions.

Bull. Korean Chem. Soc. **2024**, *45*, 530-534.

<https://doi.org/10.1002/bkcs.12847>

A Effect of UV-ozone treatment for KCl interlayer in perovskite solar cells

Na-Yeon Jo, Yun-Kyeong Hong, Sanghee Yang, Hui-Seon Kim

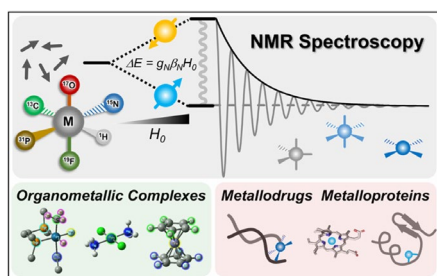


Bull. Korean Chem. Soc. **2024**, *45*, 570-575.

<https://doi.org/10.1002/bkcs.12851>

R NMR spectroscopic investigations of transition metal complexes in organometallic and bioinorganic chemistry

Jeongcheol Shin, Mi Hee Lim, Jiyeon Han



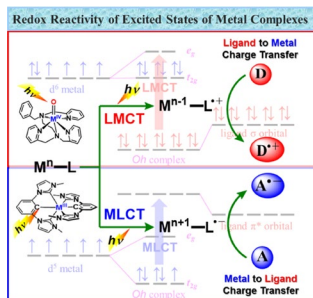
This review covers the applications of nuclear magnetic resonance (NMR) spectroscopy in analyzing transition metal complexes in organometallic and bioinorganic chemistry, with some examples. Enhancing our grasp of NMR spectroscopy coupled with coordination chemistry will enable chemists to decipher the geometric and electronic properties of transition metal complexes.

Bull. Korean Chem. Soc. **2024**, *45*, 593-613.

<https://doi.org/10.1002/bkcs.12853>

R Redox reactivity of LMCT and MLCT excited states of Earth-abundant metal complexes

Wonwoo Nam, Yong-Min Lee, Shunichi Fukuzumi



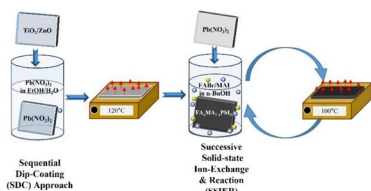
This review focuses on redox reactivity of metal-to-ligand charge transfer (MLCT) and ligand-to-metal charge transfer (LMCT) excited states of earth-abundant metal complexes, such as iron, manganese, cobalt and chromium complexes, together with the lifetimes and redox potentials of the MLCT and LMCT excited states, which are different depending on metals, ligands and Lewis acids bound to ligands.

Bull. Korean Chem. Soc. **2024**, *45*, 503-519.

<https://doi.org/10.1002/bkcs.12850>

A Sequential-dip-coating processed mixed organic and inorganic perovskite film from halide-free lead precursor for efficient perovskite solar cells

Zobia Irshad, Muhammad Adnan, Ho-Joong Kim, Jae Kwan Lee



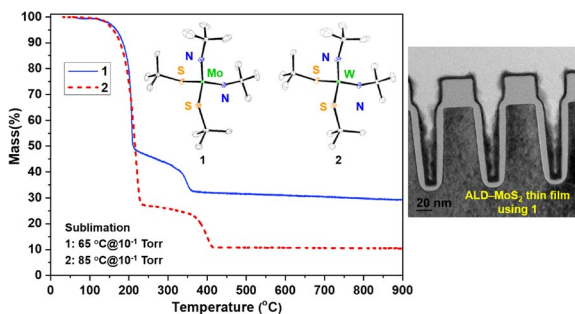
The development of $\text{FA}_{1-x}\text{MA}_{1-y}\text{Pb}_{1-z}\text{Br}_x$ perovskite films through an all-sequential-dip-coated (SDC) deposition method marks a significant advancement in the field of perovskite solar cells (PrSCs). This novel approach utilizes an aqueous non-halide lead precursor, promoting an environmentally friendly and cost-effective alternative to traditional methods. The strategic modulation of FABr concentration in the precursor solution enables precise control over the bromine content within the perovskite crystal lattice, enhancing surface coverage and crystallinity. Such improvements are crucial for achieving high device performance and stability. The SDC method not only demonstrates increased efficiency due to the use of benign solvents but also shows promise for scaling up to large-area PrSC devices, overcoming limitations associated with conventional spin-casting techniques. This innovative synthesis strategy could potentially lead to more sustainable and scalable production of high-performance PrSCs, contributing to the advancement of solar energy technology.

Bull. Korean Chem. Soc. **2024**, *45*, 631-638.

<https://doi.org/10.1002/bkcs.12882>

A Synthesis and characterization of Mo and W compounds for disulfide materials

Sunyoung Shin, Seongmin Yeo, So Jeong Yeo, Taek-Mo Chung, Chang Gyoung Kim, Bo Keun Park



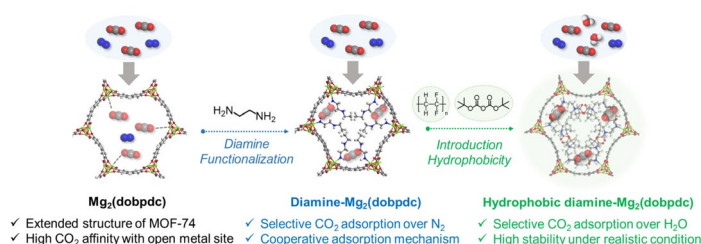
Imido/thiolate compounds **1** (Mo) and **2** (W) have distorted tetrahedral geometries. The TGA of **1** and **2** exhibited a two-step weight loss, and the residue of **1** was assumed to be MoS_2 ; however, **2** was well-vaporized before decomposition. The compounds were sufficiently vaporized to be used for the thin film deposition of metal chalcogenides. Atomic layer deposition confirmed that **1** effectively formed a MoS_2 thin film between 250 and 350 °C.

Bull. Korean Chem. Soc. **2024**, *45*, 576-583.

<https://doi.org/10.1002/bkcs.12880>

P Post-synthetic modifications of MOF-74 type frameworks for enhancing CO_2 capture and moisture stability

Jintu Francis Kurisingal, Jong Hyeak Choe, Hyojin Kim, Jeongwon Youn, Gayoung Cheon, Chang Seop Hong



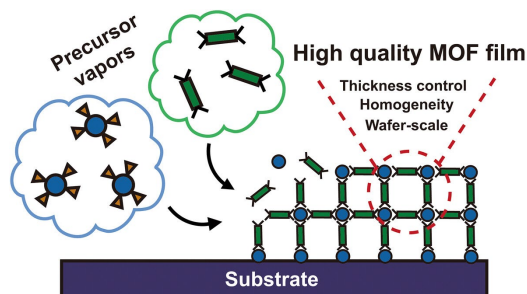
Diamine-modified MOF-74 type frameworks show impressive CO_2 capacities, but struggle with stability in humid conditions, affecting recyclability. To overcome this, exploring the incorporation of diamines onto open metal sites, followed by post-synthetic functionalization with hydrophobic moieties to enhance water stability and overall performance.

Bull. Korean Chem. Soc. **2024**, *45*, 675-688.

<https://doi.org/10.1002/bkcs.12885>

R Vapor-phase synthesis of MOF films

Myeonggeun Choe, Hyeonwoo Lee, Hee Cheul Choi



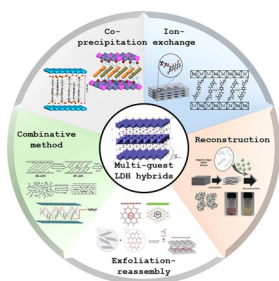
This review highlights two leading vapor-phase synthesis techniques for metal-organic framework (MOF) thin films: molecular layer deposition (MLD) and chemical vapor deposition (CVD).

Bull. Korean Chem. Soc. **2024**, *45*, 584-592.

<https://doi.org/10.1002/bkcs.12854>

R Supramolecular chemistry for the incorporation of multi-guest molecules into two-dimensional metal hydroxide hosts

Taeho Kim, Jin Kuen Park, Jae-Min Oh



The immobilization of multi-guest in the interlayer space of LDH has been widely studied for their synergetic performances via guest-guest interaction. In this review, we have summarized the supramolecular chemistry providing rationales to control guest-guest interaction and to select an appropriate synthetic method. This study will provide strategies to enhance properties of materials that are useful for a variety of applications.

Bull. Korean Chem. Soc. **2024**, *45*, 724-737.

<https://doi.org/10.1002/bkcs.12895>

A A novel thiourea-based fluorescent turn-on sensor for rapidly detecting hypochlorite through a desulfurization reaction

Boeun Choi, Soyeon Kim, Cheal Kim



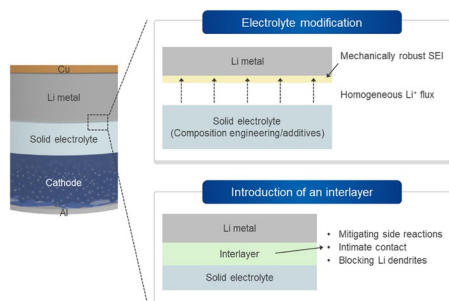
A novel thiourea-based fluorescent turn-on sensor 1-(9-ethyl-9H-carbazol-3-yl)-3-(naphthalen-1-yl)thiourea was developed for recognizing ClO^- with a significantly fast response time (< 1 s) through a desulfurization reaction. The response mechanism of 1-(9-ethyl-9H-carbazol-3-yl)-3-(naphthalen-1-yl)thiourea to ClO^- was demonstrated through ^1H NMR titration, ESI mass, and density functional theory calculations.

Bull. Korean Chem. Soc. **2024**, *45*, 795-801.

<https://doi.org/10.1002/bkcs.12897>

R Interfacial challenges and recent advances of solid-state lithium metal batteries

Wooyoung Jeong, Jonghyeok Yun, Jong-Won Lee



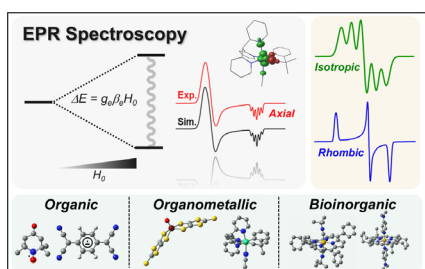
This study reviews various solid electrolytes with high Li^+ conductivity and their interfacial issues in solid-state lithium metal batteries. Furthermore, recent advances in strategies to stabilize the interface between the lithium anode and solid electrolytes are also provided, in terms of the electrolyte modification and introduction of an interlayer.

Bull. Korean Chem. Soc. **2024**, *45*, 806-820.

<https://doi.org/10.1002/bkcs.12900>

R EPR spectroscopy: A versatile tool for exploring transition metal complexes in organometallic and bioinorganic chemistry

Minyoung Ju, Jin Kim, Jeongcheol Shin



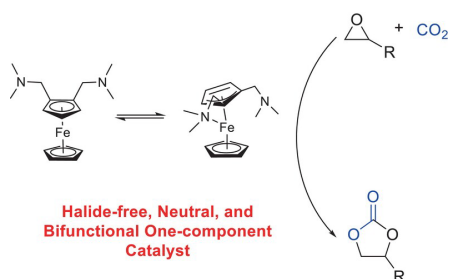
This review discusses electron paramagnetic resonance (EPR) spectroscopic methods for characterization of transition metal complexes. EPR spectroscopy provides valuable insights into the geometric, electronic, and magnetic properties of paramagnetic molecules, reinforcing the blind spot of nuclear magnetic resonance spectroscopy-based structural analysis.

Bull. Korean Chem. Soc. **2024**, *45*, 835-862.

<https://doi.org/10.1002/bkcs.12899>

A Synthesis and computational studies for halide-free, neutral, and bifunctional one-component ferrocene-based catalysts for the coupling of carbon dioxide and epoxides

Jieun Lee, Wooram Lee, Yoseph Kim, Mujin Choi, Seol Ryu, Joonkyung Jang, Youngjo Kim



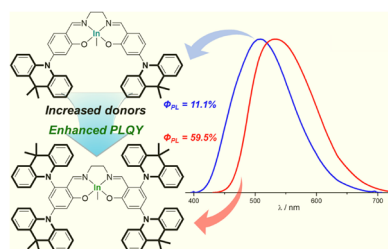
Enhanced catalytic activity for the coupling reaction of CO₂ and epoxides via introduction of two dimethylamino groups into the same cyclopentadienyl ligand.

Bull. Korean Chem. Soc. **2024**, *45*, 821-827.

<https://doi.org/10.1002/bkcs.12901>

A Photophysical properties of 9,9-dimethyl-9,10-dihydroacridine-functionalized salen–indium complexes: Effects of structural rigidity and number of donor substituents

Yoseph Kim, Ji Hye Lee, Jaehoon Kim, Yeonsu Kim, Hyeonkwon Moon, Hyonseok Hwang, Junseong Lee, Jun Hui Park, Youngjo Kim, Myung Hwan Park



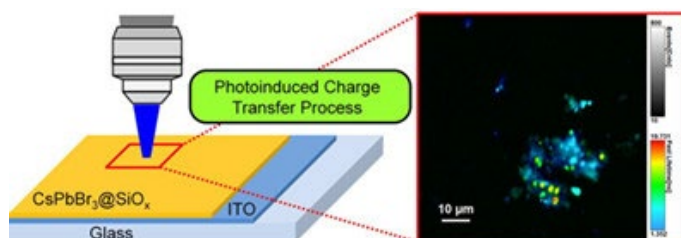
4-DMAC- and 4,6-di-DMAC-functionalized salen–indium complexes were prepared to elucidate the effect of the substituents number and structural rigidity on photophysical properties. Among them, 4,6-di-DMAC-substituted salen–In complex exhibited strong green emission with the PLQY of 59.5% in a PMMA film.

Bull. Korean Chem. Soc. **2024**, *45*, 940-948.

<https://doi.org/10.1002/bkcs.12918>

A Effect of the surroundings on the photophysical properties of CsPbBr₃ perovskite quantum dots embedded in SiO_x matrices

Soo Jeong Lee, You Jeong Lee, Sumi Seo, Hyeonyeong Jo, Donghoon Han, Seog Joon Yoon



We present the impact of the surroundings on the material/photophysical properties of CsPbBr₃@SiO_x perovskite quantum dots (PQDs) and statistically observed the photoinduced charge transfer from PQDs to transparent electrodes.

Bull. Korean Chem. Soc. **2023**, *44*, 147-152

<https://doi.org/10.1002/bkcs.12628>

R Galvanic replacement reaction to prepare catalytic materials

Yongju Hong, Sandhya Venkateshalu, Sangyeon Jeong, Gracita M. Tomboc, Jinhyoung Jo, Jongsik Park, Kwangyeol Lee




Recent advances in galvanic replacement reaction beyond the monometallic templates have been addressed, showcasing fine compositional and morphological control with diverse types of GRR templates. A comprehensive list of applicational studies on GRR-based nanoparticles is also provided.

Bull. Korean Chem. Soc. **2023**, *44*, 4-22.

<https://doi.org/10.1002/bkcs.12638>

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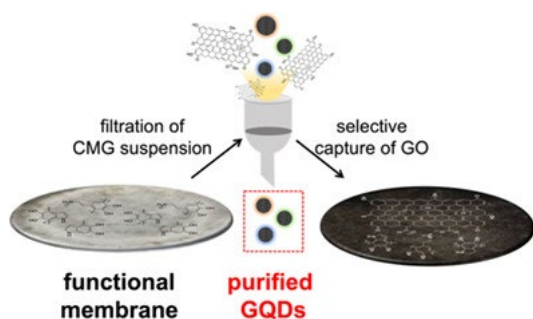
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A Facile production of graphene quantum dots using a molecular adhesive membrane filter

Yuejin Kim, Kyoung-Ik Min, Sanghwa Jeong, Kyueui Lee

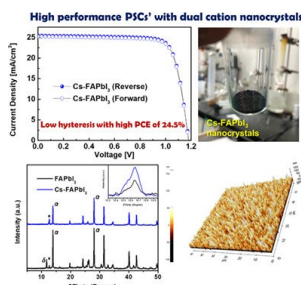


Facile method to produce graphene quantum dots (GQDs) from the chemically modified graphene (CMG) suspension that is produced by Hummer's method is reported. The membrane filter embedded with mussel-inspired polydopamine nanoparticles selectively captured graphene oxide from the CMG suspension, resulting in a successful GQD separation.

Bull. Korean Chem. Soc. 2023, 44, 147-152.

<https://doi.org/10.1002/bkcs.12644>**A Stable dual cations perovskite nanocrystals as absorbers for perovskite solar cells with efficiencies exceeding 24%**

Zhiqing Xie, Ho-Yeol Park, Hyerin Kim, Jeonghyeon Park, Donghyun Song, Jieun Lee, Lakshman Chetan, Sung-Ho Jin

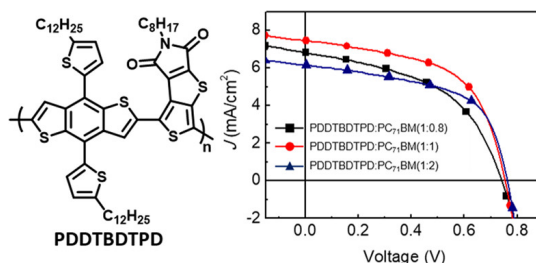


Dual cation pure perovskite nanocrystals Cs-FAPbI3 were synthesized by a simple and effective one-step solution process under air ambient conditions, and high-quality perovskite films with larger grain sizes achieved a power conversion efficiency of 24.5% and long-term stability for perovskite solar cells.

Bull. Korean Chem. Soc. 2023, 44, 658-664.

<https://doi.org/10.1002/bkcs.12703>**A A low-bandgap polymer bearing the N-octyl-2,7-dithia-5-azacyclopenta[α]pentalene-4,6-dione electron-withdrawing unit**

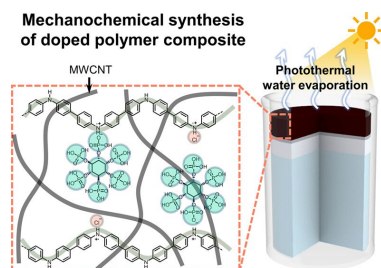
Ji Eun Lee, Pyeongkang Ahn, Seul Lee, Yun-Hi Kim, Soon-Ki Kwon, BongSoo Kim



Bull. Korean Chem. Soc. 2023, 44, 665-670.

<https://doi.org/10.1002/bkcs.12710>**C Mechanochemical synthesis and interfacial engineering of photothermal polymer composites for solar-driven water evaporation**

Jihyo Kim, Dongjun Lee, Wansu Cho, Beomjoo Yang, Jongwon Jung, Chiyoung Park



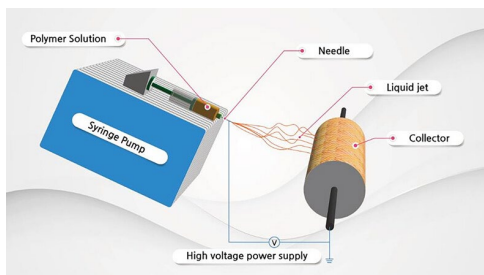
This paper reports the mechanochemical synthesis of a hydrophilic polymer, polydiphenylamine (PD), and its carbon nanotube composites (DD-PD/CNT) for the solar-driven evaporation of water. By adding dopants during polymerization under mechanical force, the hydrophilicity of the polymers was enhanced and the temperature of the polymer surface under light irradiation also increased (97.6 °C). Owing to the enhanced hydrophilicity and photothermal effect, the coated membrane exhibited a very high water evaporation rate (1.41 kg m⁻² h⁻¹) under sunlight irradiation.

Bull. Korean Chem. Soc. 2023, 44, 653-657.

<https://doi.org/10.1002/bkcs.12709>

A Manufacture of electrospun porous PLA fiber-type film coated with CMC and its anti-adhesion efficiency in white mice

Sangmun Choi, Kyu Jin Chung, Youngjung Kim, Daeik Kim, Sun Jin Hwang, Su Ho Bae, Keon Sang Ryo



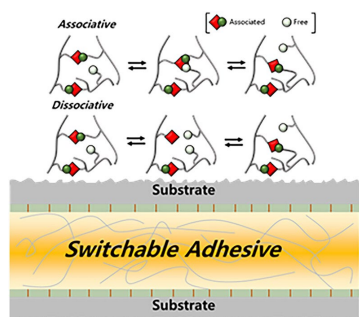
The electrospun polylactide (PLA) anti-adhesion fiber-type film coated with carboxymethylcellulose (CMC) was manufactured and evaluated for its usability through animal experiments. The PLA anti-adhesion film developed in this study is an adhesion preventive film of a double composite structure with both hydrophobicity and hydrophilicity.

Bull. Korean Chem. Soc. **2023**, *44*, 794-801.

<https://doi.org/10.1002/bkcs.12719>

R Covalent adaptive polymer networks for switchable adhesives

Hwi Hyun Moon, Inhwan Cha, Hend A. Hegazy, Kyung-su Kim, Changsik Song



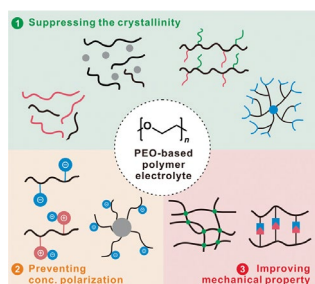
In this review, we describe the adhesion mechanisms and their relation to molecular behaviors. Subsequently, we focus on dynamic covalent chemistry (DCC) employable in switchable adhesives.

Bull. Korean Chem. Soc. **2023**, *44*, 750-767.

<https://doi.org/10.1002/bkcs.12722>

R Recent progress in poly(ethylene oxide)-based solid-state electrolytes for lithium-ion batteries

Jiyoung Lee, Byeong-Su Kim



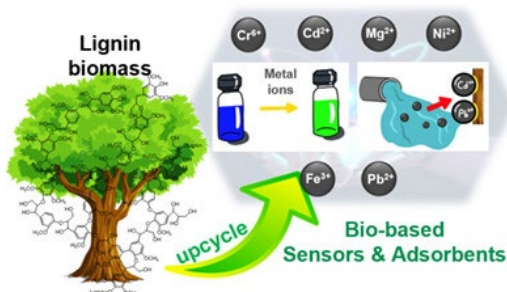
This review summarizes the latest research trends in poly(ethylene oxide) (PEO)-based solid-state polymer electrolytes for application in lithium-ion batteries. Especially, we focus on the strategies to address inherent challenges of PEO. The remaining challenges and future prospects are also presented.

Bull. Korean Chem. Soc. **2023**, *44*, 831-840

<https://doi.org/10.1002/bkcs.12767>

R Lignin-based materials for the detection and adsorption of metal ions

Sumin Lee, Byungjin Koo



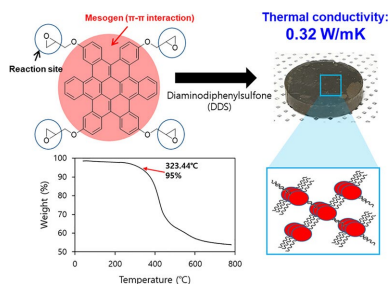
While lignin is the second most abundant wood biomass produced from paper-making industries, only 2% of them is valorized. Through chemical modification or blending, we can upcycle lignin for metal ion sensors and heavy metal adsorbents.

Bull. Korean Chem. Soc. **2023**, *44*, 818-826.

<https://doi.org/10.1002/bkcs.12761>

A Synthesis and characterization of a contorted hexabenzocoronene epoxy toward high thermal stability and thermal conductivity

Minsung Kang, Dohee Lee, Hyeon Woo Kim, Seokhoon Ahn



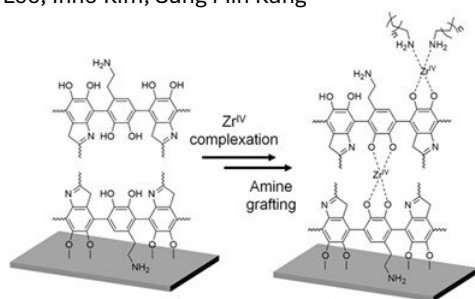
Epoxy groups were introduced to contorted hexabenzocoronene (HBC) structure for high heat resistance and thermal conductivity. The HBC epoxy was cured by diaminophenylsulfone at 170°C for 2 h. The T_d (5 wt%) and thermal conductivity of the cured HBC epoxy were 323.44°C and 0.32 W/mK, respectively. Such high thermal stability and conductivity are originated from pi-pi stacking of HBC mesogens.

Bull. Korean Chem. Soc. **2023**, *44*, 558-564.

<https://doi.org/10.1002/bkcs.12694>

A Zr^{IV} complexation for stability enhancement of polydopamine coatings and rapid grafting of amine compounds

Arisu Lee, Inho Kim, Sung Min Kang



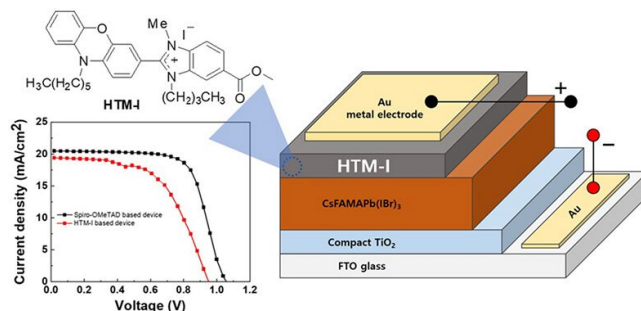
Zr^{IV} coordination chemistry was used to enhance the stability of polydopamine coatings. The polydopamine coating with Zr^{IV} remained stable even when subjected to strong alkaline conditions and ethylenediaminetetraacetic acid (EDTA) treatment. The polydopamine/Zr^{IV} complex coating also demonstrated efficient incorporation of amine compounds.

Bull. Korean Chem. Soc. **2023**, *44*, 939-942.

<https://doi.org/10.1002/bkcs.12774>

C Phenoxazine-benzimidazolium ionic hole transport material for perovskite solar cells

Jong Chan Shin, Moonhoe Kim, Minjae Lee, JungYup Yang

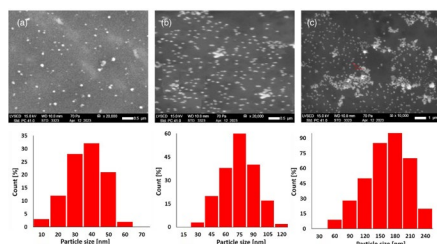


Bull. Korean Chem. Soc. **2023**, *44*, 827-830.

<https://doi.org/10.1002/bkcs.12770>

A Physicochemical characteristics of a nanocomposite film based on purified sodium carboxymethylcellulose and selenium nanoparticles

Khaydar Ergashovich Yunusov, Fozil Mamaraim Ugli Turakulov, Abdushkur Abdukhalilovich Sarymsakov, Sherzod Abdullaevich Yuldoshov, Sayyora Sharafovna Rashidova, Jiang Guohua



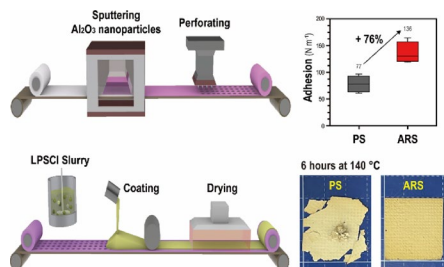
The nanocomposite film was obtained from purified sodium carboxymethylcellulose with degree of substitution 0.97 and degree of polymerization 810 and selenium nanoparticles (SeNPs) with different sizes. The atomic force microscopy and SEM results showed that the SeNPs were spherical with sizes 5–65, 30–120, and 60–240 nm in the structure of Na-CMC nanocomposite films. The nanoparticle size distribution was insignificantly unchanged over the probed holding period of 28 days, which confirmed the high stability of the SeNPs synthesized in the Na-CMC solutions.

Bull. Korean Chem. Soc. **2024**, *45*, 273-283.

<https://doi.org/10.1002/bkcs.12813>

A Surface modification of perforated separator for more robust and thinner all-solid-state electrolyte membrane

Dohwan Kim, Seungyeop Choi, Cheol Bak, Youngjoon Roh, Cyril Bubu Dzakupasu, Yong Min Lee



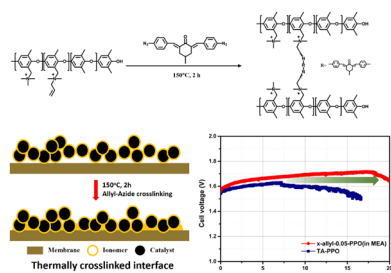
We propose a strategy for designing thin and robust solid electrolyte (SE) membranes with introducing adhesion-reinforced separator (ARS) as a supporting frame. The ARS-based SE membranes exhibit excellent thermal stability and high adhesion with SE composite. From a high ionic conductance made by thin thickness of 35 μm , the ARS-based SE membrane exhibits high-capacity and stable cycling in NCM || Li cells.

Bull. Korean Chem. Soc. **2024**, *45*, 341-349.

<https://doi.org/10.1002/bkcs.12829>

A Enhancing the durability of anion exchange membrane water electrolysis cells via interfacial membrane-ionomer crosslinking

Yerim Lee, Wooseok Lee, Tae-Hyun Kim



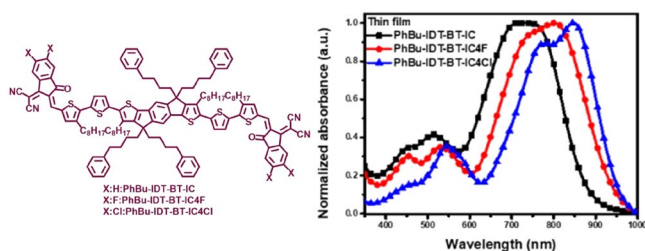
Enhance adhesion between membrane and catalyst-ionomer layer via crosslinking at the interface within the MEA improved the durability of the AEM-based water electrolysis.

Bull. Korean Chem. Soc. **2024**, *45*, 620-630.

<https://doi.org/10.1002/bkcs.12881>

A Novel low-band gap non-fullerene acceptors based on IDIC core as potential photovoltaic materials

Radhiha Ravindran, Inchan Kim, Yun-Hi Kim, Soon-Ki Kwon



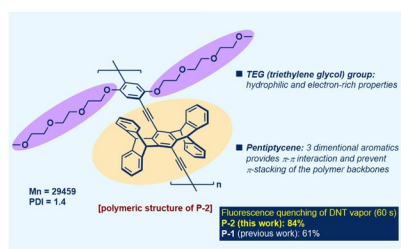
Low-band gap (LBG) polymers with absorption maximum exceeding 845 nm and onset of absorption ~ 960 nm have been designed and synthesized. The optical and thermal properties of these LBGs have been found to be influenced when the hydrogen atoms were substituted with either fluorine or chlorine atoms. The wide absorption both in the visible and in the near infrared regions makes these polymers as potential candidates for photovoltaic applications.

Bull. Korean Chem. Soc. **2024**, *45*, 788-794.

<https://doi.org/10.1002/bkcs.12891>

A Moisture-resistant nitroaromatic explosive gas sensor based on hydrophilic pentiptycene polymer

Gyeongsoo Kim, Sun Bu Lee, Jaeyoung Heo, Tae Eun An, Gang Min Lee, Junggong Kim, Keunyoung Kim, Jongman Lee, Han Yong Bae, Changsik Song



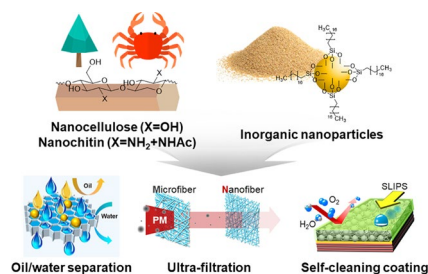
Detecting nitroaromatic explosives is crucial for public safety. Sensors utilizing fluorescence quenching are promising, but moist interference is problematic. We compare two pentiptycene-based polymers, P-1 and P-2, to detect explosives in humid atmospheres. A conjugated polymer P-2, incorporating triethylene glycol groups, exhibited better hydrophilicity and maintained over 90% sensitivity, outperforming P-1. Hence, P-2 has proved to be a better moisture-tolerant explosive sensor.

Bull. Korean Chem. Soc. **2024**, *45*, 828-834.

<https://doi.org/10.1002/bkcs.12902>

R Recent advances in utilizing surface-features of naturally derived nanocellulose and nanochitin for self-cleaning and purifying applications

Donggyu Lee, Jun Mo Koo, Yumi Cho, Jinsik Kim, Soyeon Kim, Dongyeop X. Oh, Hyeonyeol Jeon, Jeyoung Park



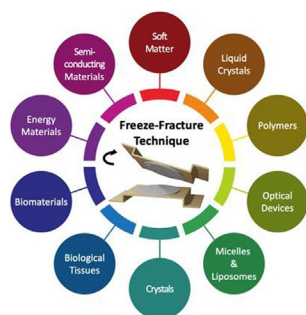
This review delves into the innovative use of naturally derived nanocellulose and nanochitin for self-cleaning and purification applications. Highlighting their chemical modifiability and integration with inorganic nanoparticles, it explores their potential in sustainable solutions for oil/water separation, ultrafiltration, and eco-friendly coatings, while addressing challenges in scalability.

Bull. Korean Chem. Soc. **2024**, *45*, 880-895.

<https://doi.org/10.1002/bkcs.12906>

R Electron microscopy analysis of soft materials with freeze-fracture techniques

Wantae Kim, Dong Ki Yoon



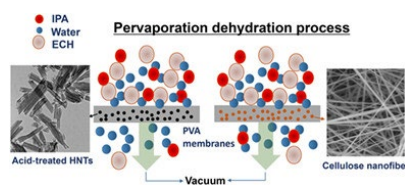
Conventional electron microscopy has limitations such as electrical conductivity, deterioration and damage of samples, and medium conditions. Freeze-fracture technique is a pre-processing process for electron microscopy that rapidly freezes a sample and then splits it to reveal its internal structure, and then makes a metal replica.

Bull. Korean Chem. Soc. **2023**, *44*, 153-162.

<https://doi.org/10.1002/bkcs.12647>

A Cellulose nanofiber and halloysite nanotubes embedded polyvinyl alcohol membranes for pervaporation dehydration of epichlorohydrin–isopropanol–water ternary feed mixture

Shivshanakar Chaudhari, SangJun Yeo, HyeonTae Shin, UiSeo Kim, Sewook Jo, Kie Yong Cho, MinYoung Shon, SeungEun Nam, YouIn Park



In dehydration of few studied industrially important azeotropic epichlorohydrin (ECH)–isopropanol (IPA)–water mixture, to reduce the energy intensiveness of the system, the pervaporation approach was intended. Therefore, two different types of membranes systems namely PVA-TEOS (halloysite nanotubes [HNTs]) and PVA-Glu (cellulose nanofiber [CNF]), were employed and their performance was compared. Among, two different membrane system PVA-TEOS (HNTs) delivered superior performance than PVA-Glu (CNF) membrane. Hydrophilicity improvement and crystallinity reduction with CNF (PVA-Glu) and HNTs (PVA-TEOS) fillers addition were resulted in the overall flux increment. Different dimensions of fillers deviate the overall pervaporation output from membranes. PVA-Glu (5%, w/w CNF) and PVA-TEOS (4%, w/w CNF) were optimal membranes found to be robust with giving stable performance in long-term operation.

Bull. Korean Chem. Soc. **2023**, *44*, 265-273.

<https://doi.org/10.1002/bkcs.12653>

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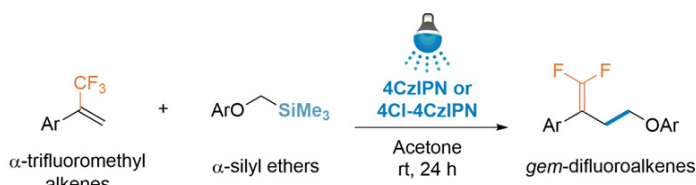


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C Synthesis of gem-difluoroalkenes via photoredox-catalyzed defluoroaryloxymethylation of α -trifluoromethyl alkenes

Shafrizal Rasyid Atriardi, Jae-Young Kim, Yulia Anita, Sang Kook Woo



■ Easily preparable ■ Metal-free photocatalyst ■ Mild condition ■ Up to 95% yield

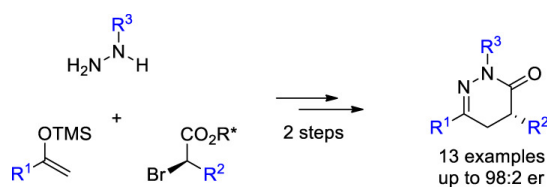
gem-difluoroalkenes are privileged structural motifs because their geometric and electronic properties are similar to those of aldehydes, ketones, and esters. A novel method for the synthesis of gem-difluoroalkenes via visible-light photoredox-catalyzed defluoroaryloxymethylation of α -trifluoromethyl alkenes using α -silyl ethers as aryloxymethyl radical precursors was developed.

Bull. Korean Chem. Soc. **2023**, *44*, 50-53.

<https://doi.org/10.1002/bkcs.12633>

A Asymmetric preparation of 2,4,6-trisubstituted dihydropyridazinones

Min Ji Park, Seo Yun Kim, Ha Rim Lee, Yong Sun Park



R¹ = Ph, *p*-CH₃-Ph, *p*-Cl-Ph, 2-Naph
R² = Ph, *p*-Cl-Ph, *p*-Br-Ph
R³ = H, CH₃, PhCH₂, Ph

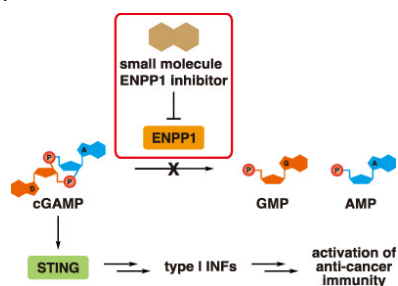
Highly enantioenriched 2,4,6-trisubstituted dihydropyridazinones are prepared by a modular three-component synthetic strategy.

Bull. Korean Chem. Soc. **2023**, *44*, 73-78.

<https://doi.org/10.1002/bkcs.12630>

R Small molecule ectonucleotide pyrophosphatase/phosphodiesterase 1 inhibitors in cancer immunotherapy for harnessing innate immunity

Junwon Choi



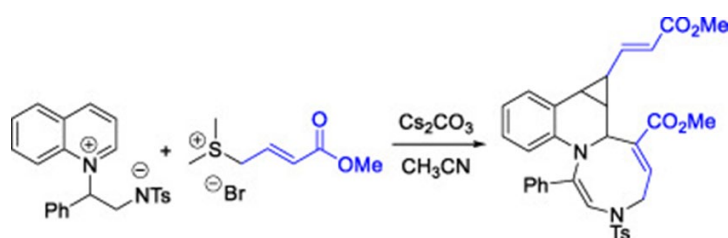
Ectonucleotide pyrophosphatase/phosphodiesterase 1 (ENPP1) inhibitor promotes anticancer innate immune responses via the activation of the stimulator of interferon genes signaling pathway. This review highlights the role of ENPP1 in the modulation of anticancer immunity and the recent progress in the discovery of small molecule ENPP1 inhibitors for cancer immunotherapy.

Bull. Korean Chem. Soc. **2023**, *44*, 88-99.

<https://doi.org/10.1002/bkcs.12646>

C Cascade cycloadditions of N-aromatic zwitterions and allylic sulfonium ylides: Dual roles of the allylic sulfonium ylide in the cascade reaction

Hyundug Jen, Eun Jeong Yoo



We describe the cascade reactions of N-aromatic zwitterions and allylic sulfonium ylides to furnish fused N-heterocyclic compounds. Unprecedentedly, molecules of the allylic sulfonium ylide react with the corresponding zwitterion as C1- and C3 synthons in the same reaction.

Bull. Korean Chem. Soc. **2023**, *44*, 137-140.

<https://doi.org/10.1002/bkcs.12648>

C Various synthetic approaches for [6,7,m]-tricyclic compounds containing an oxygen-bridged skeleton

Juyeon Kang, Chang Ho Oh



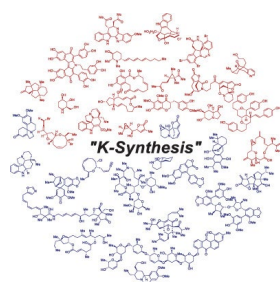
We report the synthesis of [6,7,m]-tricyclic compounds containing an oxygen-bridged skeleton. Six types of oxacyclic compounds were synthesized with two approaches using iodine or oxygen. In addition, oxacyclic compound was obtained from 1,7-enyne carbonyl through Au-catalyzed cyclization. The synthesis of oxacyclic compounds extends to the building block of diterpene alkaloids.

Bull. Korean Chem. Soc. **2023**, *44*, 163-167.

<https://doi.org/10.1002/bkcs.12642>

R "K-synthesis": Recent advancements in natural product synthesis enabled by unique methods and strategies development in Korea

Sunkyu Han



This review summarizes recent advancements (mostly after 2010) in natural product synthesis by researchers in Korea.

Representative achievements in natural product synthesis from Korea are presented with an emphasis on unique methods and strategies that are utilized into the synthetic approaches.

Bull. Korean Chem. Soc. **2023**, *44*, 172-201.

<https://doi.org/10.1002/bkcs.12654>

C Scaffold hopping strategy to derive 4-hydroxy-1-alkyl-2-oxo-1,2-dihydrothieno[2,3-b:4,5-b']dipyridine-3-carboxylglycine derivatives as a novel hypoxia-inducible factor prolyl hydroxylase domain inhibitor for the potential treatment of chronic kidney disease anemia

Ga Young Park, Cheoul-Hong Park, Sang Kwang Lee, Chun Young Im, Soong-Hyun Kim, Hee Jong Hwang, Jieon Lee, Taeho Lee, Yong Rae Hong, Minsoo Song

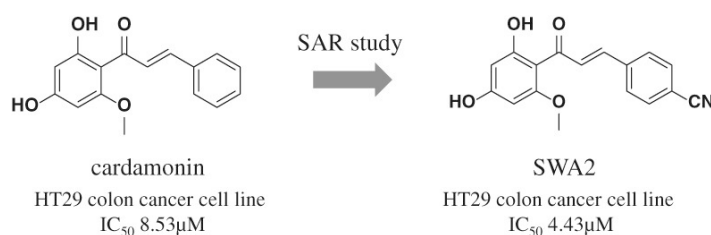


Bull. Korean Chem. Soc. **2023**, *44*, 202-207.

<https://doi.org/10.1002/bkcs.12652>

C Synthesis and evaluation of cardamonin derivatives as antiproliferative agents to human cancer cells

Baskar Selvaraj, Sang Hyuk Lee, Nguyen Qui Ngoc Sang, Heesu Lee, Jae Wook Lee

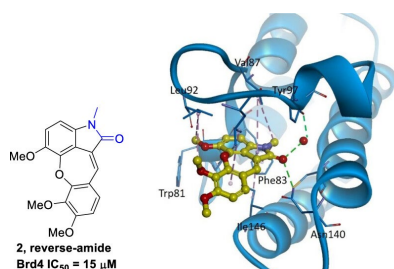


Bull. Korean Chem. Soc. **2023**, *44*, 208-212.

<https://doi.org/10.1002/bkcs.12658>

A Synthesis and biological evaluation of benzoxepinoindol-1-one analogs as Brd4 bromodomain inhibitors

Goni Jung, Joo-Youn Lee, Chi Hoon Park, Eunyoung Yoon, Jung-Nyoung Heo



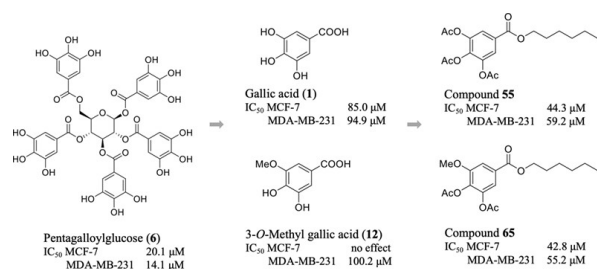
A novel series of benzo[6,7]oxepino[4,3,2-cd]indol-1(2H)-one derivatives were synthesized via a one-pot aldol condensation and SNAr reaction by coupling indolin-2-ones with 2-fluorobenzaldehydes. In addition, molecular docking studies of the designed Compound 2 revealed strong hydrogen bonds in the hot binding pocket of Brd4. All compounds were evaluated for their enzymatic activity in Brd4 bromodomain inhibition.

Bull. Korean Chem. Soc. **2023**, *44*, 213-221.

<https://doi.org/10.1002/bkcs.12656>

A Structure–activity relationship of gallic acid from *Paeonia lactiflora* and its synthetic analogs against human breast cancer cells

Goo Yoon, Jung-Hyun Shim, Hyun Jung Kim, Su-Nam Kim, Min-Suk Bae, Seung-Sik Cho, Eunae Kim



Among the identified compounds of *Paeonia lactiflora* roots, pentagalloylglucose (6) having five gallic acids (GAs) (1) showed cytotoxicity against human breast cancer cells MCF-7 and MDA-MB-231 in vitro with IC₅₀ values of 20.1 and 14.4 μM, respectively. Through structure–activity relationship of GA derivatives, we figured out that three hydroxy groups were important for its cytotoxicity. In addition, drug efficacy was confirmed by increasing its lipid affinity through the synthesis of various ester derivatives of GA.

Bull. Korean Chem. Soc. **2023**, *44*, 222-229.

<https://doi.org/10.1002/bkcs.12657>

P Recent progress on photodynamic therapy and photothermal therapy

Heejeong Kim, Mengyao Yang, Nahyun Kwon, Moonyeon Cho, Jingjing Han, Rui Wang, Sujie Qi, Haidong Li, Van-Nghia Nguyen, Xingshu Li, Hong-Bo Cheng, Juyoung Yoon



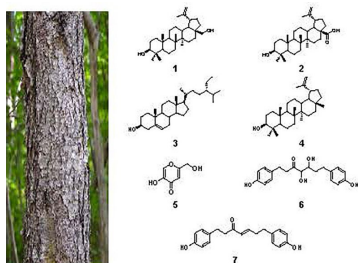
Photodynamic therapy (PDT) and photothermal therapy (PTT) have attracted considerable interest as noninvasive treatment methods. Recent contributions to PDT and PTT are covered, emphasizing the development of new organic photosensitizers.

Bull. Korean Chem. Soc. **2023**, *44*, 236-255.

<https://doi.org/10.1002/bkcs.12655>

A Chemical constituents from *Betula schmidtii* and their free radical scavenging, tyrosinase inhibitory, and neuroprotective activities

Da-Hye Wang, Eun-Hie Koh, Kyung Ae Lee, Ha Sook Chung



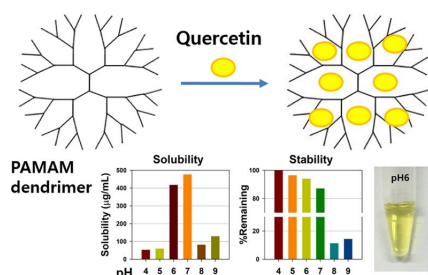
Natural products have long been used as traditional medicine with high pharmaceutical effects. Therefore, extensive research is required to increase its therapeutic efficacies. This study performed the identification of antioxidant, anti-tyrosinase, and cognitive enhancing active components from the inner bark of *Betula schmidtii*, through activity-monitored fractionation and isolation method.

Bull. Korean Chem. Soc. **2023**, *44*, 256-264.

<https://doi.org/10.1002/bkcs.12650>

A The importance of pH for the formation of stable and active quercetin–polyamidoamine dendrimer complex

Hong Taek Kim, Miri Yoo, Eun-Ju Yang, Kyung-Sik Song, Eun Ji Park, Dong Hee Na



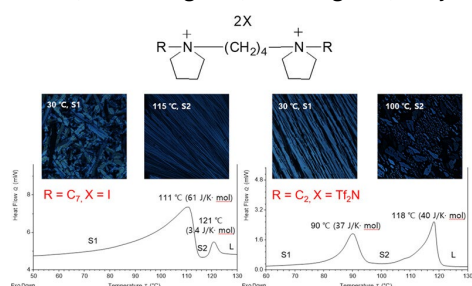
Quercetin–polyamidoamine complex optimized at pH 6 exhibits good water-solubility and stability, strong antioxidant activity, and neuroprotective activity.

Bull. Korean Chem. Soc. **2023**, *44*, 363-369.

<https://doi.org/10.1002/bkcs.12669>

A New organic ionic plastic crystals based on pyrrolidinium dication for a solid-phase electrolyte

Jong Chan Shin, Tae Young Kim, Hwi Jung Kim, U Hyeok Choi, Ho Seok Park, Minjae Lee



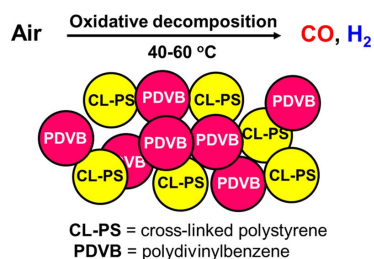
Newly synthesized bis-pyrrolidinium salts with different Br^- , I^- , PF_6^- , and Tf_2N^- anions are fully characterized for future applications of an electrolyte component of electrochemical devices. These bis-pyrrolidinium salts have a plastic crystal phase following unique solid–solid phase transitions, morphology changes, and low fusion entropy values. They are electrochemically stable up to 4.3 V.

Bull. Korean Chem. Soc. **2023**, *44*, 310-321.

<https://doi.org/10.1002/bkcs.12668>

C Cross-linked polystyrene and polydivinylbenzene release significant amounts of carbon monoxide and hydrogen at ambient temperature

Nguyen Huu Thanh, Erdenechimeg Shaariikhuu, Thi Xuyen Nguyen, Muhammad Sarwar Hossain, Eunju Lee Tae, Guda Dinneswara Reddy, Kyung Byung Yoon



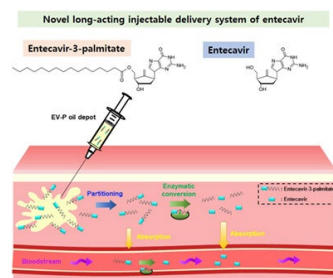
The widely used cross-linked polystyrene and polydivinylbenzene readily release significant amounts of carbon monoxide (CO) and hydrogen (H_2) under ambient conditions, which self-accelerates with time, indicating that the storage rooms for the polymers and their composites should be well ventilated to prevent inhalation of CO by the workers and H_2 -induced potential hazards.

Bull. Korean Chem. Soc. **2023**, *44*, 353-357.

<https://doi.org/10.1002/bkcs.12645>

A Exploration of lipidic prodrug-loaded oil depot system for intramuscular prolonged delivery of entecavir

Min Young Jeong, Myoung Jin Ho, Min-Koo Choi, Young Taek Han, Yong Seok Choi, Myung Joo Kang



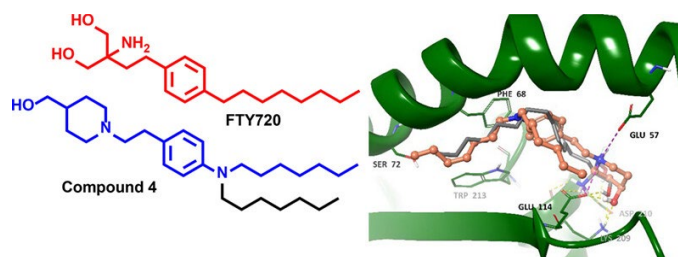
A long-acting delivery system of entecavir (EV) was designed by synthesizing lipidic ester prodrug of EV (entecavir-3-palmitate, EV-P) and formulating into oil depot (OD) system. EV-P OD offered a protracted pharmacokinetic profile following intramuscular injection in rats, with elimination half-life of 7 days. The novel system can be an alternative for prolonged delivery of the antiviral agent.

Bull. Korean Chem. Soc. **2023**, *44*, 605-612.

<https://doi.org/10.1002/bkcs.12699>

C Synthesis and biological investigation of protein phosphatase 2A-activating compounds with dimeric tail as non-small cell lung cancer cell death agents

Su Bin Kim, Taeho Lee, Yoon Sin Oh, Eun-Young Park, Dong Jae Baek



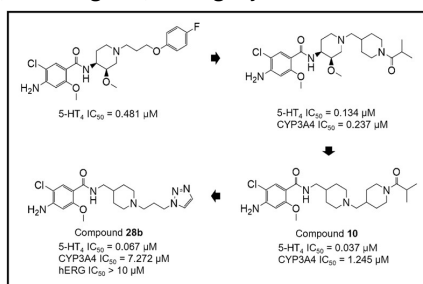
FTY720 analogs were synthesized by introducing a dimeric aliphatic tail into the FTY720 backbone, and their biological activities were investigated. Compound 4 showed more cytotoxicity against lung cancer cell line A549 than RB005 (SK1 inhibitor), and showed a similar level of cytotoxicity to FTY720. Compound 4 induced PP2A activation, which is one of the anticancer mechanisms of FTY720, and showed PP2A docking results similar to those of FTY720.

Bull. Korean Chem. Soc. **2023**, *44*, 293-297.

<https://doi.org/10.1002/bkcs.12661>

A Discovery of novel 4-methylpiperidinyl benzamide derivatives as 5-HT₄ receptor agonist for the treatment of gastrointestinal disorders

Sunho Choi, Min Jung Lee, Kwang-Hyun Ahn



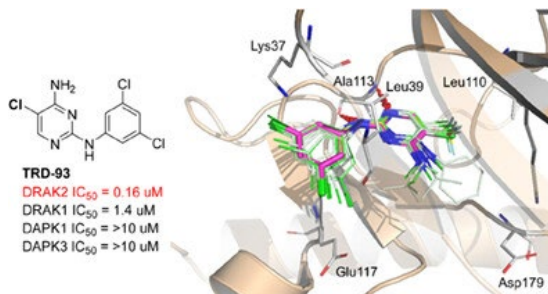
Novel series of 4-methylpiperidinyl benzamide derivatives were synthesized and evaluated. Among them, Compound **28b** showed potent 5-HT₄ receptor-binding affinity. Moreover, Compound **28b** had safety profiles without inhibiting CYP3A4 and blocking hERG. It also showed improved efficacies in animal models as a prokinetic agent.

Bull. Korean Chem. Soc. **2023**, *44*, 370-379.

<https://doi.org/10.1002/bkcs.12667>

C Discovery of TRD-93 as a novel DRAK2 inhibitor

Sangjun Park, Seungmin Kye, Myoung Eun Jung, Chong Hak Chae, Kyung-Min Yang, Seong-Jin Kim, Gildon Choi, Kwangho Lee

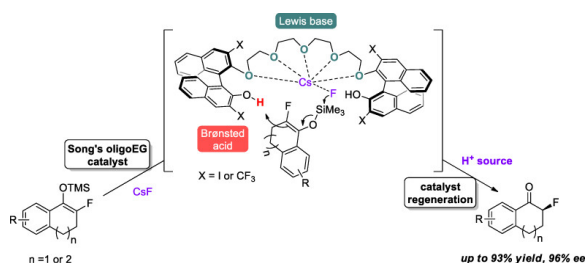


Bull. Korean Chem. Soc. **2023**, *44*, 395-398.

<https://doi.org/10.1002/bkcs.12680>

C Enantioselective protonation of monofluorinated silyl enol ethers by cooperative cation-binding catalysis

Min-Jung Jung, Sushovan Paladhi, Choong Eui Song



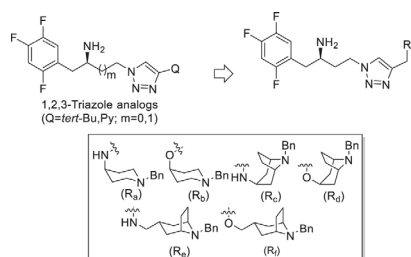
Herein, we report highly enantioselective organocatalytic protonation of a range of monofluorinated silyl enol ethers of cyclic ketones by using Song's chiral oligoethylene glycols as cation-binding catalysts in the presence of CsF and a proton source, producing chiral α -secondary α -fluoro cyclic ketones in excellent yields, with up to 96% ee. This protocol was also successfully extended to the synthesis of chiral α -cho and α -bromo cyclic ketones.

Bull. Korean Chem. Soc. **2023**, *44*, 420-424.

<https://doi.org/10.1002/bkcs.12675>

C 1,2,3-Triazole analogs with bulky and conformationally rigid substructures: Synthesis and in vitro evaluation as DPP-4 inhibitors

Duy-Viet Vo, Jongkook Lee, Haeil Park



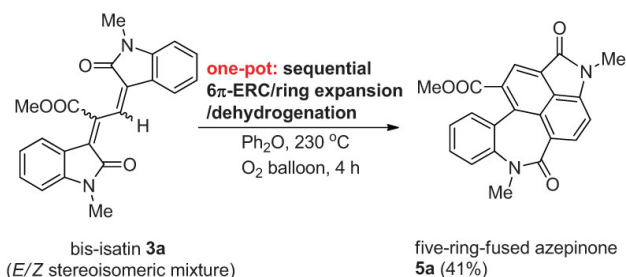
Through our previous structure–activity relationship studies (Gundetti et al. and Vo et al.), we observed that the bioactivities of 1,2,3-triazole analogs increased in relation to the size of the C4-alkyl substituent ($H < CH_3 < \text{tert-Bu}$). Based on these results, we predicted that the larger space between the C4 substituent of the 1,2,3-triazole and several key amino acid residues at the pocket of the enzyme would aid in improving the binding affinity. To decipher the role of bulky conformationally rigid C4-alkyl substituent in the activity of 1,2,3-triazole, we designed 1,2,3-triazole analogs with bulky and conformationally rigid substructures at the C4 position.

Bull. Korean Chem. Soc. **2023**, *44*, 425-428.

<https://doi.org/10.1002/bkcs.12677>

A Synthesis of five-ring-fused azebinone derivatives from bis-isatins via sequential 6 π -electrocyclic ring closure, ring expansion, and dehydrogenation process

Sangku Lee, Junseong Lee, Jae Nyoung Kim



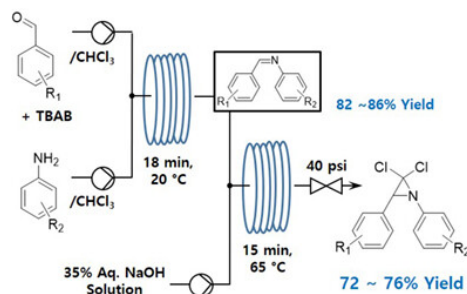
Serendipitous synthesis of five-ring-fused azebinone derivatives from bis-isatins via sequential 6 π -electrocyclic ring closure, ring expansion, and dehydrogenation process is described.

Bull. Korean Chem. Soc. **2023**, *44*, 429-431.

<https://doi.org/10.1002/bkcs.12672>

A Continuous flow system for biphasic synthesis of gem-dichloroaziridine derivatives

Yea Seul Jang, Kook Hee Kang, Seula Yun, Chan Pil Park



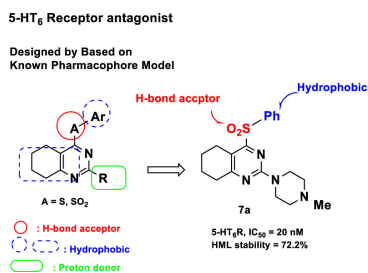
gem-Dichloroaziridines are essential building blocks in the synthesis of biologically and pharmacologically active compounds. We developed a continuous flow biphasic system to overcome the limitation of conventional batch systems. This process is advantageous in protecting the researcher from irritating odors and harmful reactants and intermediates.

Bull. Korean Chem. Soc. **2023**, *44*, 437-440.

<https://doi.org/10.1002/bkcs.12671>

A Synthesis and structure activity relationship studies of 2-amino-4-arylsulfonyl-5,6,7,8-tetrahydroquinazolines as 5-HT₆ receptor antagonists

Young Sun Shim, Yeyong Lee, Hyun Jung Wang, Jinsung Tae, Jonghyun Park, Hyunah Choo, Hyewhon Rhim, Ghilsoo Nam



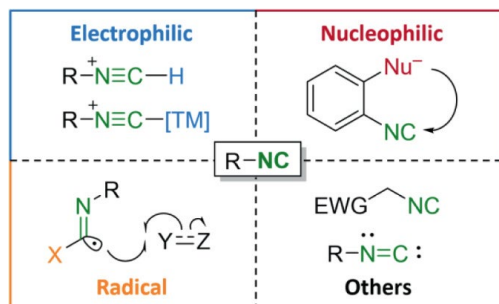
A series of 4-arylthio- or 4-arylsulfonyl-substituted 2-cyclicaminio-5,6,7,8-tetrahydroquinazolines was synthesized and evaluated for 5-HT₆R antagonistic effects in vitro. The lead compound, **7a**, showed the most potent 5-HT₆ receptor inhibitory activity in vitro and good metabolic stability without CYP liability.

Bull. Korean Chem. Soc. **2023**, *44*, 572-577.

<https://doi.org/10.1002/bkcs.12696>

R Organic transformations of isocyanides classified by their activation strategies

Jungwon Kim, Soon Hyeok Hong



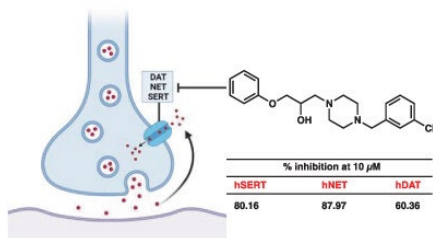
Organic transformations utilizing the reactivity of isocyanides are reviewed, classified by their activation modes. The unique electronic structure of isocyanide allows extensive reactions with electrophiles, nucleophiles, and radicals. The main focus is on recently developed examples, and core activation strategies for the reactions of isocyanides are discussed with the proposed classifications.

Bull. Korean Chem. Soc. **2023**, *44*, 578-595.

<https://doi.org/10.1002/bkcs.12698>

C Identification of 1-phenoxy-3-(piperazin-1-yl)propan-2-ol derivatives as novel triple reuptake inhibitors

Md. Ashrafuzzaman, Su Hyun Ji, Hyomin Ahn, Hwan Won Chung, Daeun Choi, Ju Jin Park, Minji Go, Jung In Pyo, Azam Sharif Mohammed Shafioul, Duck-Hyung Lee, Sung-Gil Chi, Chiman Song, Chan Seong Cheong, Seo-Jung Han



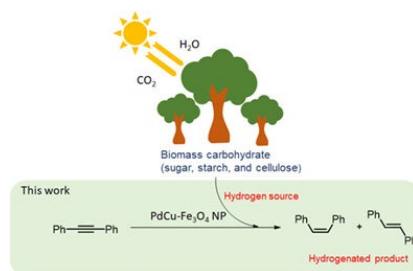
Novel 1-phenoxy-3-(piperazin-1-yl)propan-2-ol derivatives exhibited potent inhibitory activities against serotonin, norepinephrine, and dopamine transporters (SERT, NET, and DAT, respectively) simultaneously and thus, 1-phenoxy-3-(piperazin-1-yl)propan-2-ol derivatives possessed potential as triple reuptake inhibitors. Compound 19 possessed the most potent combination of SERT, NET, and DAT inhibitory activity with inhibition values greater than 60% for all three monoamine transporters.

Bull. Korean Chem. Soc. **2023**, *44*, 596-599.

<https://doi.org/10.1002/bkcs.12693>

C Catalytic semi-hydrogenation through hydrogen transfer from carbohydrates as a sustainable hydrogen source over bimetallic PdCuFe₃O₄ nanoparticles

Jin Hee Cho, Youngdae Won, Byeong Moon Kim

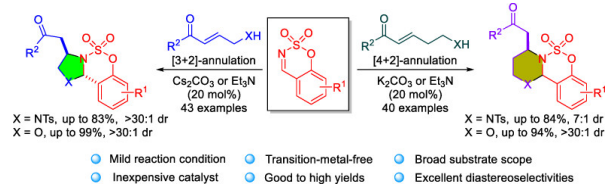


Bull. Korean Chem. Soc. **2023**, *44*, 600-604.

<https://doi.org/10.1002/bkcs.12701>

A Base-catalyzed [3 + 2]/[4 + 2]-annulations of cyclic N-sulfinimines with γ - and δ -sulfonamido/hydroxy- α,β -unsaturated carbonyls: Stereoselective synthesis of imidazolidines, oxazolidines, hexahydropyrimidines, and 1,3-oxazinan

Yoseop Kim, Seung Yeon Kim, Sung-Gon Kim



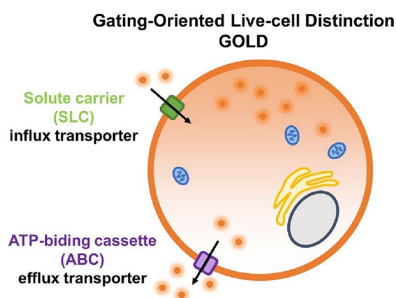
A mild and facile synthetic method for imidazolidine and oxazoline derivatives via the [3 + 2]-annulation of cyclic N-sulfinimines has been established. The reactions between cyclic N-sulfinimines and γ -sulfonamido/ γ -hydroxy- α,β -unsaturated ketones afforded a wide range of imidazolidine and oxazoline derivatives with excellent diastereoselectivities in the presence of Cs₂CO₃ or Et₃N as a catalyst. In addition, the synthetic methodologies for the construction of hexahydropyrimidines and 1,3-oxazinanines have been established through the [4 + 2] annulation between cyclic N-sulfinimines and δ -sulfonamido/ δ -hydroxy- α,β -unsaturated ketones.

Bull. Korean Chem. Soc. **2023**, *44*, 619-628.

<https://doi.org/10.1002/bkcs.12702>

R Chemical probes based on GOLD: The discovery and elucidation of mechanism

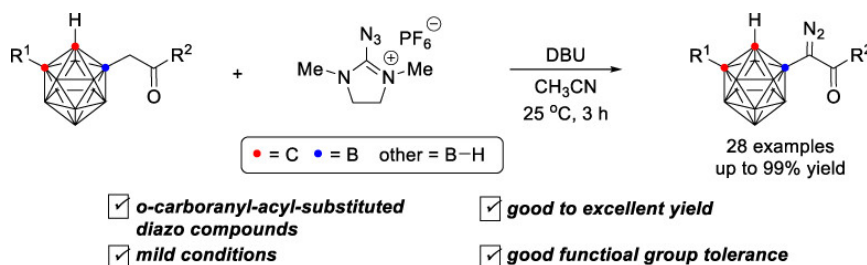
Larissa Miasiro Ciaramicoli, Young-Tae Chang



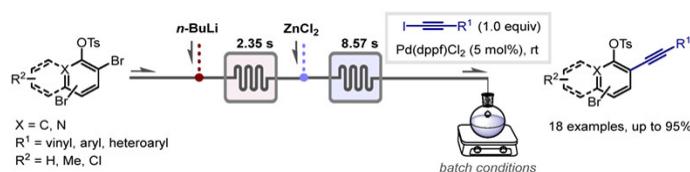
Gating-oriented live-cell distinction mechanism describes the movement of fluorescent probes through cellular membranes and organelles compartments for the selective staining of cell types. Solute carrier transporters are responsible for the uptake of probes, while ATP-binding cassette transporters are most likely to export fluorescent probes out of the cellular space, decreasing the fluorescence intensity of dyes.

Bull. Korean Chem. Soc. **2023**, *44*, 679-692.<https://doi.org/10.1002/bkcs.12713>**A** Synthesis of *o*-carboranyl-acyl-substituted diazo compounds from B(4)-aclylmethyl carboranes and 2-azido-1,3-dimethylimidazolium hexafluorophosphate

Chanyoung Maeng, Gi Hoon Ko, Kyungsup Lee, Hee Chan Noh, Dae Su Park, Phil Ho Lee

*Bull. Korean Chem. Soc.* **2023**, *44*, 693-699.<https://doi.org/10.1002/bkcs.12708>**C** Integrated continuous-flow/batch protocol for *ortho*-selective alkynylation of (hetero)aryl tosylates

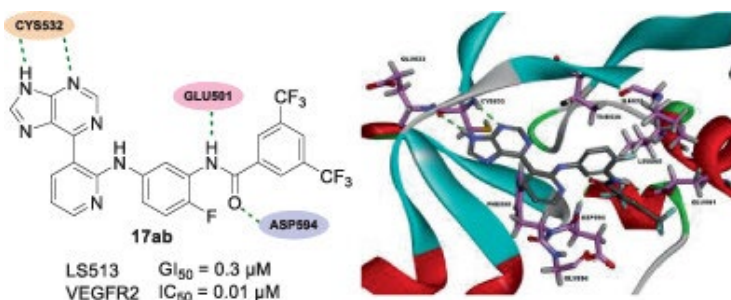
Eun-Hae Ju, Min-Jung Lee, Jiwoo Song, Yong-Ju Kwon, Won-Suk Kim



Regioselective Negishi alkynylation of polyhalo-substituted (hetero)aryl tosylates was achieved using an integrated continuous-flow/batch protocol. The use of continuous-flow chemistry enabled *ortho*-selective zincation of (hetero)aryl tosylates with excellent regioselectivity. The synthetic utility of this method was validated by the synthesis of benzofuran and pyridofuran derivatives via Cu-catalyzed tandem detosylation-5-endo-dig-cyclization.

Bull. Korean Chem. Soc. **2023**, *44*, 772-776.<https://doi.org/10.1002/bkcs.12717>**C** Discovery of dual inhibitors of pan-RAF and VEGFR2

Eun Sun Park, Jihye Choi, Sung Pyo Hong, Ho-Seok Kwon, Jinho Kim, Soon Kil Ahn

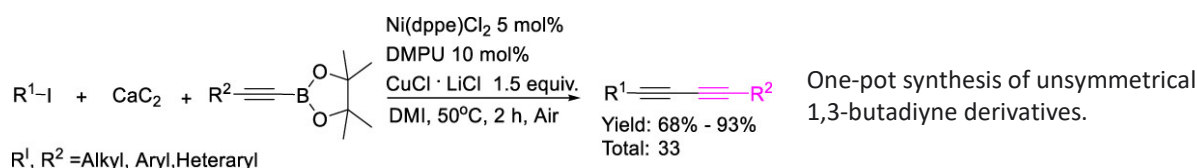


A series of amide derivatives was designed, synthesized, and biologically evaluated as dual inhibitors of pan-RAF and vascular endothelial growth factor receptor 2 (VEGFR2), among which compounds 15h, 16h, and 17ab were identified to be the most potent.

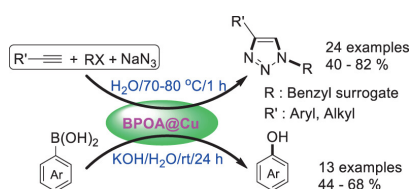
Bull. Korean Chem. Soc. **2023**, *44*, 841-847.<https://doi.org/10.1002/bkcs.12721>

A One-pot synthesis of unsymmetrical 1,3-butadiyne derivatives

Zhikai Zhao

*Bull. Korean Chem. Soc.* **2023**, *44*, 865-870.<https://doi.org/10.1002/bkcs.12762>**A Bis(2-pyridinyl)-oxalamide copper complexes: Scope and limitation in CuAAC and oxidative hydroxylation of arylboronic acids**

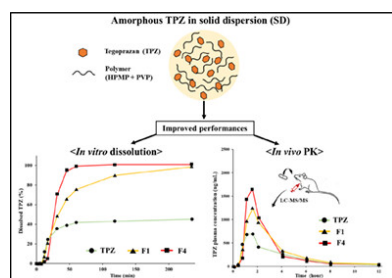
Soo-Jin Choi, Yong-Hyun Ahn, Seung-Hoi Kim



A versatile catalytic platform was developed and characterized, consisting of pyridine-containing oxalamide and copper(II) salt. The platform was characterized using FT-IR, TGA, EDS, and SEM technologies. Its applicability was evaluated in a one-pot three-component system composed of terminal alkynes, benzyl surrogates, and sodium azide for the CuAAC reaction in an aqueous environment, yielding the corresponding 1,4-disubstituted-1,2,3-triazole derivatives. Additionally, the same platform was utilized to explore the transformation of arylboronic acids to the corresponding phenols via ipso-hydroxylation under aqueous basic conditions. During the study, some limitations were observed, such as recyclability and relatively low performance, which could potentially restrict the applicability of the catalytic platform.

Bull. Korean Chem. Soc. **2023**, *44*, 871-879.<https://doi.org/10.1002/bkcs.12760>**A Polymeric solid dispersion enhances the equilibrium solubility and oral bioavailability of tegoprazan**

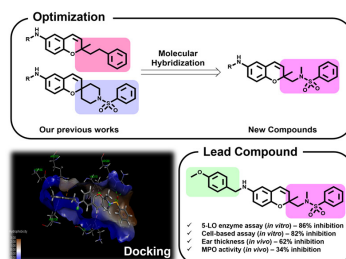
Yong-Hoon Won, Ji-Hyun Yang, Sun Ho Hong, Yoon Tae Goo, Sangkil Lee, Young Wook Choi



Tegoprazan (TPZ) is a potential potassium competitive acid blocker that directly inhibits H^+/K^+ -ATPase. In this study, TPZ was formulated as a solid dispersion with two candidate polymers, PVP and HPMC. Differential calorimetry and powder x-ray diffraction measurements have shown that the crystallinity of TPZ has disappeared, resulting in increased in vitro equilibrium solubility and dissolution of TPZ compared to TPZ raw materials and simple physical mixtures of TPZ with polymers. In addition, bioavailability of TPZ was significantly improved compared to TPZ raw materials. As a result, the solid dispersion of TPZ prepared with PVP and HPMC used as carriers showed the potential to improve the pharmacological effect of TPZ.

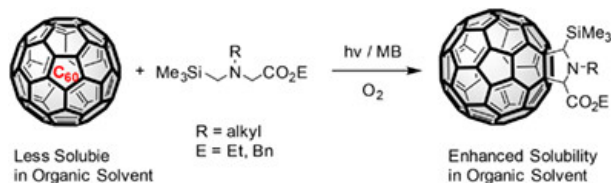
Bull. Korean Chem. Soc. **2023**, *44*, 880-887.<https://doi.org/10.1002/bkcs.12766>**A Development for a new 5-lipoxygenase inhibitors of N-((6-(substituted-amino)-2-methyl-2H-chromen-2-yl)methyl)-N-methyl benzenesulfonamide derivatives**

Young-Chang Kim, Aizhan Abdildinova, Ye Jin Shin, Dong Kyun Han, Jong Yeon Hwang, Hyaee Gyeong Cheon, Young-Dae Gong

*Bull. Korean Chem. Soc.* **2023**, *44*, 98-102.<https://doi.org/10.1002/bkcs.12772>

C Synthesis and solubility properties of amine-functionalized fulleropyrrolidines in organic solvents

Suk Hyun Lim, Dae Won Cho



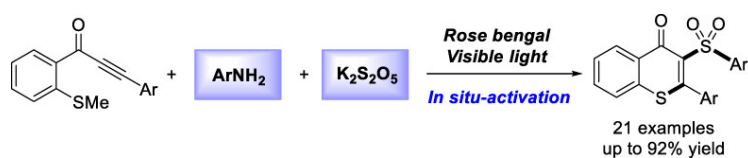
A variety of pyrrolidine-ring fused fullerenes, fulleropyrrolidines, have been prepared by 1,3-dipolar cycloaddition reactions of azomethine ylides to fullerene surface and then their solubility properties in several solvents such as toluene, CHCl_3 , CH_2Cl_2 , and tetrahydrofuran (THF). The solubilities of prepared fulleropyrrolidines in organic solvents were much higher than that of fullerene C_{60} itself and in addition, the extent of solubility can be varied by incorporating organic moieties into fullerene C_{60} .

Bull. Korean Chem. Soc. **2023**, *44*, 911-915.

<https://doi.org/10.1002/bkcs.12769>

C Visible-light-mediated synthesis of 3-arylsulfonylated thioflavones using an in situ activation strategy

Sangcheol Na, Anna Lee



- One-pot, three-component reactions
- Visible light-mediated reactions
- Inexpensive SO_2 source: $\text{K}_2\text{S}_2\text{O}_5$
- In situ-generated aryl diazonium salts

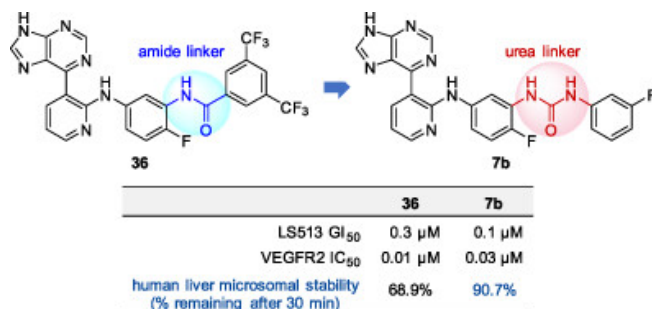
A visible-light-mediated one-pot, three-component synthesis of 3-arylsulfonylated thioflavones was developed using an in situ-activation strategy. This method allows for the efficient formation of 3-arylsulfonylated thioflavones by reacting aryl amines and methylthiolated alkynones, utilizing potassium metabisulfite as an inexpensive sulfur dioxide source.

Bull. Korean Chem. Soc. **2023**, *44*, 921-925.

<https://doi.org/10.1002/bkcs.12778>

C Improvement of the metabolic stability of pan-RAF/VEGFR2 dual inhibitors

Santanu Maiti, Jeong Hee Kwon, Sung Pyo Hong, Ho-Seok Kwon, Jinho Kim, Soon Kil Ahn



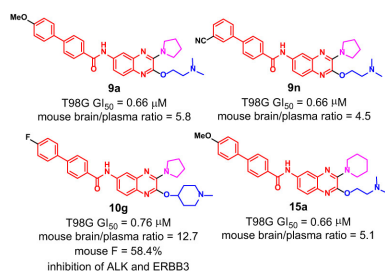
Several urea and guanidine derivatives were designed and synthesized to increase metabolic stability and solubility, and compounds 7b showed comparable inhibitory activities to our previously reported compound 36 while demonstrating improved metabolic stability.

Bull. Korean Chem. Soc. **2023**, *44*, 926-931.

<https://doi.org/10.1002/bkcs.12779>

A Identification and preliminary structure-activity relationship of brain-penetrant quinoxaline-based compounds with in vitro anti-glioblastoma activity

Seohyeon Ahn, Eun Hye Kim, Chaemi Lee, Yoon Chae Nam, Joo-Youn Lee, Jin Sook Song, Seong Hwan Kim, Moon-Kook Jeon



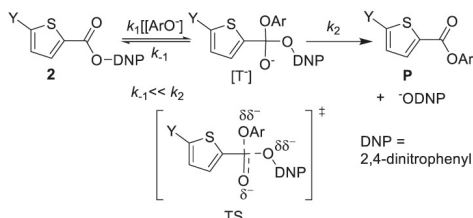
We identified four quinoxaline-based compounds exhibiting sub-micromolar GI_{50} values by screening a CNS-oriented compound collection for glioblastoma T98G cell growth inhibition and subsequent structure-activity relationship studies. The promising features of the four compounds as CNS drug leads were shown by the mouse brain/plasma ratios.

Bull. Korean Chem. Soc. **2023**, *44*, 932-938.

<https://doi.org/10.1002/bkcs.12773>

A Reactions of 2,4-dinitrophenyl 5-substituted-2-thiophenecarboxylate promoted by 4-ZC₆H₄O⁻/4-ZC₆H₄OH in 20 mol% DMSO(aq). Effects of leaving group and nucleophile on the acyl transfer reactions

Sang Yong Pyun, Kyu Cheol Paik, Man So Han, Seung Taek Hong, Bong Rae Cho

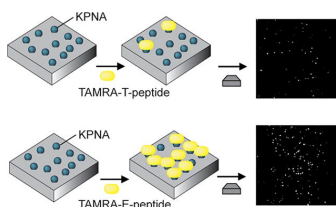


Bull. Korean Chem. Soc. **2023**, *44*, 952-957.

<https://doi.org/10.1002/bkcs.12780>

C Determination of binding affinities between nuclear localization signal peptides of irradiated EGFR and KPNA using single-molecule pull-down assay and development of assay system for inhibitor screening

Jiwon Oh, Namwuk Park, Seung Wook Ham



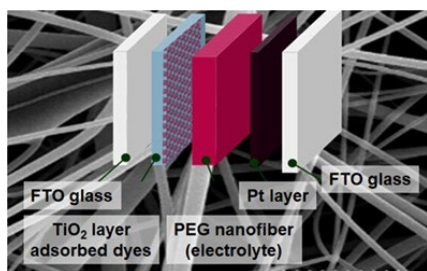
Irradiation activated epidermal growth factor receptor (EGFR) in the nucleus can result in tumor progression and resistance as well as weak sensitization of radio-therapy. Therefore, it is obvious that an inhibitor of EGFR transport into the nucleus needs to be developed as a clinically targeted molecule during radiation-therapy. In this study, we measured the binding affinities of nuclear localization signal (NLS) peptides with (karyopherin alpha [KPNA]) by using a single-molecule pull-down assay. The results revealed stronger binding between KPNA and NLS peptide of radiation activated EGFR. In addition, we found that the stable bio isostere peptide (E-peptide) acts as a pT-peptide and the fluorescence labeled peptide can be the substrate for searching the inhibitors by fluorescence anisotropy measurement. In irradiation therapy, radiation is the cause of many detrimental side effects. Therefore, these results can apply for the development of a small molecule that can ameliorate the side effects during irradiation therapy.

Bull. Korean Chem. Soc. **2023**, *44*, 768-771.

<https://doi.org/10.1002/bkcs.12714>

A Investigation of the photovoltaic effect in dye-sensitized solar cells based on poly(ethylene glycol)-nanofiber electrolytes

Mi-Ra Kim, Sung Soo Park, Jeonghye Han, Thanh Chung Pham, Minkyung Kang, Songyi Lee



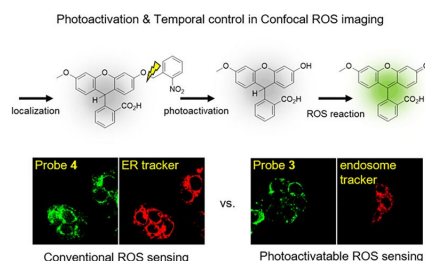
This article describes the preparation poly(ethylene glycol) (PEG) nanofibers as polymer electrolytes for dye-sensitized solar cells (DSSCs) and their applications in dye-sensitized solar cells.

Bull. Korean Chem. Soc. **2023**, *44*, 1008-1014.

<https://doi.org/10.1002/bkcs.12781>

A Mono o-nitrobenzyl dihydrofluorescein as a photoactivatable ROS sensor for oxidative stress in live cells

Hye-Ryeong Jo, Seo Jin Kim, Yingyu Zheng, Seok-Hyun Cho, Sang un Nam, Seungwon Moon, Chulhun Kang, Tae Woo Kim

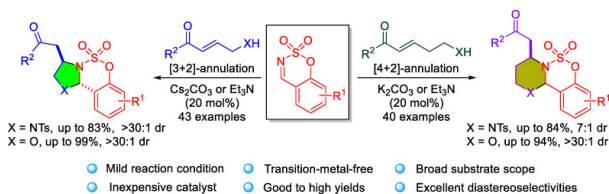


Bull. Korean Chem. Soc. **2023**, *44*, 1015-1024.

<https://doi.org/10.1002/bkcs.12784>

A Base-catalyzed [3 + 2]/[4 + 2]-annulations of cyclic N-sulfinimes with γ - and δ -sulfonamido/hydroxy- α,β -unsaturated carbonyls: Stereoselective synthesis of imidazolidines, oxazolidines, hexahydropyrimidines, and 1,3-oxazinanes

Yoseop Kim, Seung Yeon Kim, Sung-Gon Kim



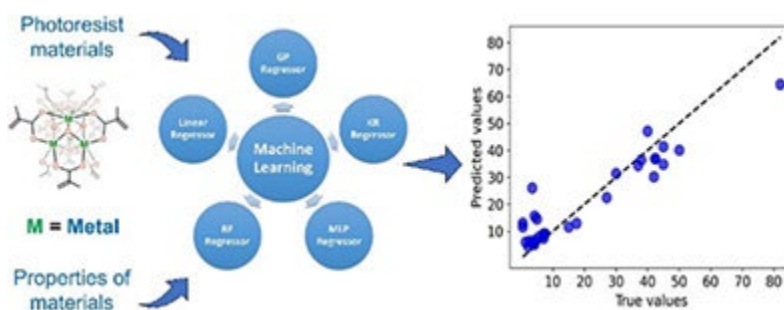
A mild and facile synthetic method for imidazolidine and oxazoline derivatives via the [3 + 2]-annulation of cyclic N-sulfinimes has been established. The reactions between cyclic N-sulfinimes and γ -sulfonamido/ γ -hydroxy- α,β -unsaturated ketones afforded a wide range of imidazolidine and oxazoline derivatives with excellent diastereoselectivities in the presence of Cs_2CO_3 or Et_3N as a catalyst. In addition, the synthetic methodologies for the construction of hexahydropyrimidines and 1,3-oxazinanes have been established through the [4 + 2] annulation between cyclic N-sulfinimes and δ -sulfonamido/ δ -hydroxy- α,β -unsaturated ketones.

Bull. Korean Chem. Soc. 2023, 44, 619-628.

<https://doi.org/10.1002/bkcs.12702>

A Predicting photoresist sensitivity using machine learning

Balaji G. Ghule, Minkyong Kim, Ji-Hyun Jang

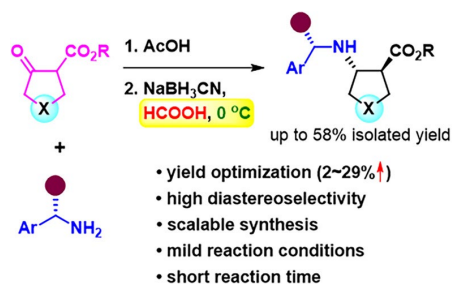


Bull. Korean Chem. Soc. 2023, 44, 900-910.

<https://doi.org/10.1002/bkcs.12776>

A Optimized stereoselective and scalable synthesis of five-membered cyclic trans- β -amino acid building blocks via reductive amination

Jungwoo Hong, Wonchul Lee, Hee-Seung Lee



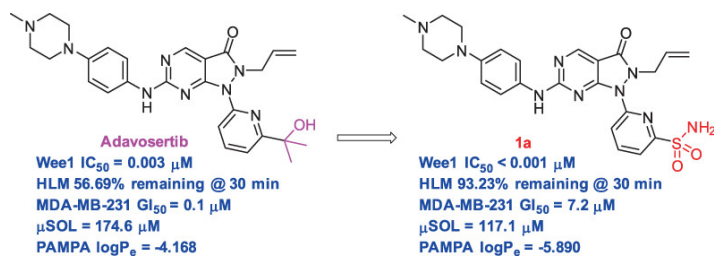
An optimized protocol for the stereoselective synthesis of five-membered cyclic β -amino acids, both alicyclic and heterocyclic, is presented. Incorporating an auxiliary acid during reductive amination achieves rapid, diastereoselective reduction under benign conditions. This approach showcases a marked improvement in isolated yields, coupled with the viability for upscaling.

Bull. Korean Chem. Soc. 2023, 44, 1034-1039.

<https://doi.org/10.1002/bkcs.12786>

A Synthesis and biological evaluation of (2-aminosulfonylpyridin-6-yl)pyrazolopyrimidinone derivatives as Wee1 inhibitors for cancer treatment

Yeon Ju Kim, Myoung Eun Jung, Ju Yeong Lee, Yun-Han Lee, Gildon Choi, Moon-Kook Jeon



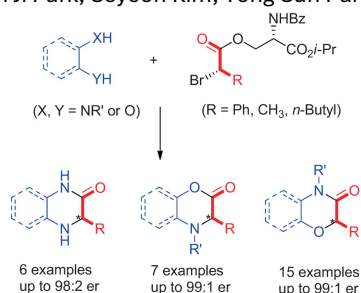
A novel target compound **1a**, with an aminosulfonyl group instead of the 2-hydroxypropan-2-yl moiety in adavosertib was synthesized and showed improved Wee1 enzyme inhibitory activity and metabolic stability. However, it exhibited inferior cellular activities in MDA-MB-231 cell growth inhibition and Wee1 substrate phosphorylation inhibition compared to adavosertib, which may be attributed to its low permeability.

Bull. Korean Chem. Soc. 2024, 45, 60-66.

<https://doi.org/10.1002/bkcs.12791>

A A facile route for highly enantioenriched six-membered 1,4-N,N- and N,O-heterocycles from L-serinate-derived α -bromoacetates

So Jeong Lee, Min Ji Park, Seyeon Kim, Yong Sun Park



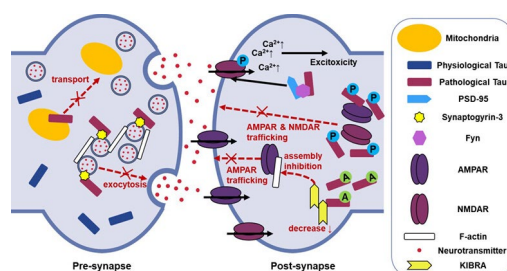
Highly enantioenriched dihydroquinoxalinones, dihydrobenzoxazinones, morpholinones, and piperazinones are prepared by [4 + 2] heteroannulation of 1,4-heteroatomic binucleophiles with 1,2-bielectrophilic α -bromoacetate derived from L-serinate.

Bull. Korean Chem. Soc. **2023**, *44*, 1025-1033.

<https://doi.org/10.1002/bkcs.12787>

R Insights to develop tau-directed therapeutics to protect the synaptic integrity for tauopathies

Eunji Cha, Hak Joong Kim, Sang Min Lim

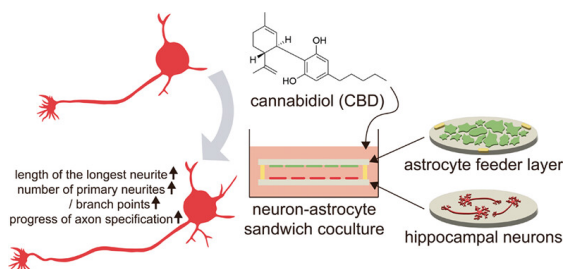


Bull. Korean Chem. Soc. **2024**, *45*, 45-54.

<https://doi.org/10.1002/bkcs.12792>

C Promoting effects of cannabidiol on neurite growth and neuronal development in neuron-astrocyte sandwich coculture

Jungnam Kim, Hyunwoo Choi, Seoin Yang, Insung S. Choi



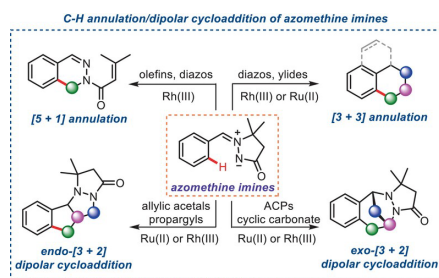
Cannabidiol promotes the early development of primary hippocampal neurons in a neuron-astrocyte sandwich coculture system, such as increases in the longest-neurite length, the number of primary neurites, and the number of branch points.

Bull. Korean Chem. Soc. **2024**, *45*, 55-59.

<https://doi.org/10.1002/bkcs.12795>

R Tandem annulation and dipolar cycloaddition of azomethine imines in catalytic C(sp²)-H functionalization

Neeraj Kumar Mishra, Amitava Rakshit, Kyeongwon Moon, Pargat Singh, In Su Kim



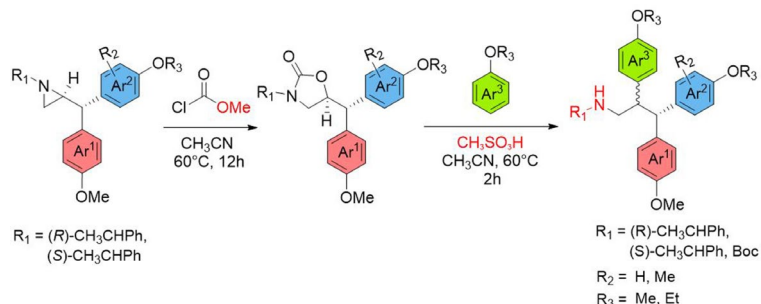
In this review, we have summarized recent progress on the catalytic C-H functionalization and intramolecular cyclization of azomethine imines with a range of coupling partners, such as olefins, alkynes, diazo compounds, ylides, allylic acetals, propargyl compounds, ACPs, and cyclic carbonates. Two representative strategies, annulative cyclization and dipolar cycloaddition, were illustrated.

Bull. Korean Chem. Soc. **2024**, *45*, 131-144.

<https://doi.org/10.1002/bkcs.12809>

C Synthesis of diverse aryl-substituted amino propanes

Seyeon Yoo, Sojeong Yi, Hyun-Joon Ha

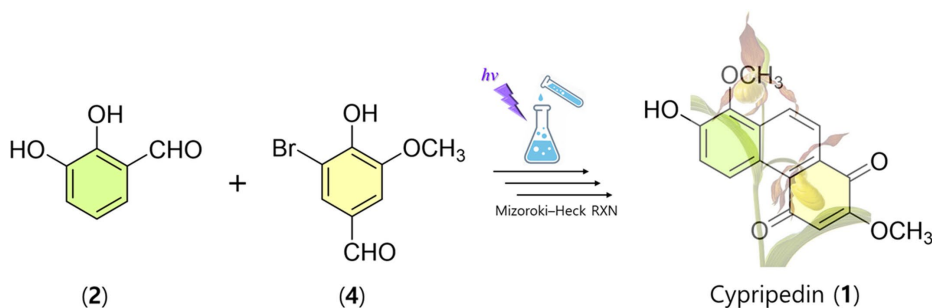


Bull. Korean Chem. Soc. **2024**, *45*, 247-251.

<https://doi.org/10.1002/bkcs.12820>

C Total synthesis of cypripedin

Hyun Jung Kim, Bok Yun Kang, Jung-Hyun Shim, Seung-Sik Cho, Eunae Kim, Goo Yoon

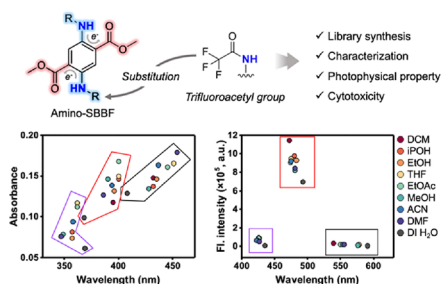


Bull. Korean Chem. Soc. **2024**, *45*, 359-361.

<https://doi.org/10.1002/bkcs.12832>

C Trifluoroacetyl-effect on amino-single benzene-based fluorophores: Synthesis, optical properties, and cytotoxicity

Ji Hye Jin, Dopil Kim, Jisoo Kang, Sangho Lee, Jong Min An, Min Kim, Dokyoung Kim



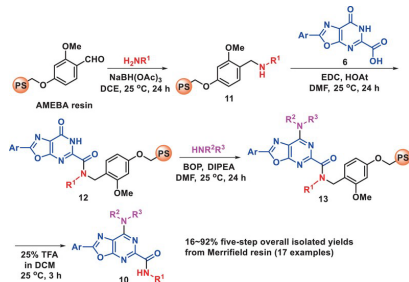
We disclosed a new library based on amino-single benzene-based fluorophore (SBBF) with substituting trifluoroacetyl moiety. The synthesis, optical properties in various organic/aqueous solvents, and evaluated cell viability were systematically conducted.

Bull. Korean Chem. Soc. **2024**, *45*, 451-455.

<https://doi.org/10.1002/bkcs.12836>

A Solid-phase synthetic method for N-alkyl-7-alkylamino-2-aryloxazolo[5,4-d]pyrimidine-5-carboxamide derivatives

Min Ju Cho, Hye Won Yang, Moon-Kook Jeon



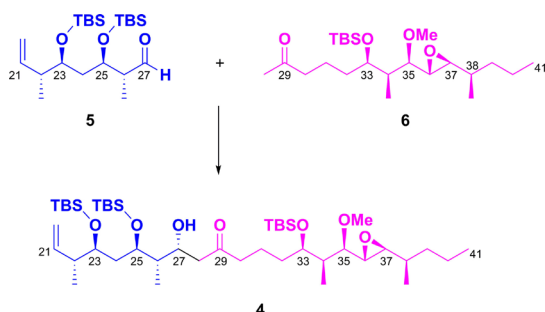
Loading of template compounds **6** onto aminated AMEBA resins **11**, a subset of BOP-mediated direct amination reactions, and final cleavage from the solid support afforded 17 target compounds **10** in 16%–92% five-step overall isolated yields from Merrifield resin.

Bull. Korean Chem. Soc. **2024**, *45*, 460-471.

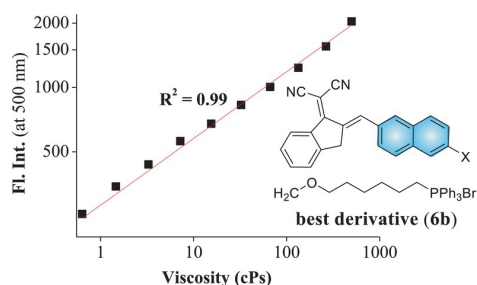
<https://doi.org/10.1002/bkcs.12834>

C Synthesis of C₂₁-C₄₁ fragment of the reported structure of Neaumycin B

Eun Gyeong Choi, Eun Bi Kim, Duck Hyung Lee

Stereoselective synthesis of the C₂₁-C₄₁ fragment **4**.*Bull. Korean Chem. Soc.* **2024**, *45*, 362-365.<https://doi.org/10.1002/bkcs.12825>**C** Systematic derivatives of 1-(dicyanomethylene)indan and their photophysical properties as potential viscosity sensors

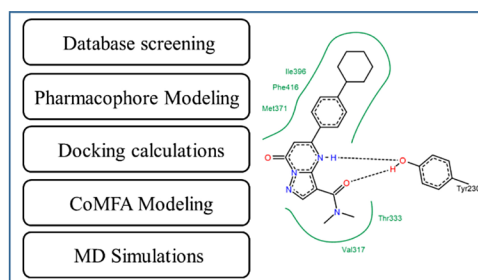
Tae-Ho Roh, Min-Sung Ko, Pradeep P. Desale, Dong-Gyu Cho



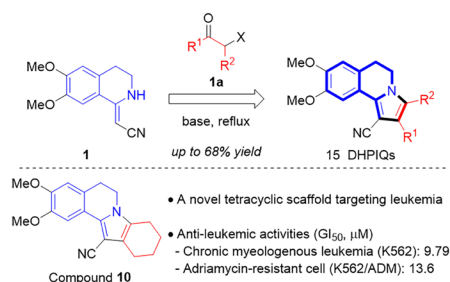
This research demonstrates creating a viscosity sensor from 1-(dicyanomethylene)indan as a new skeleton. Salt-capped derivatives show notable linearity ($R^2 = 0.99$) between fluorescence intensity and viscosity, with reversible changes at two temperatures, a crucial trait.

Bull. Korean Chem. Soc. **2024**, *45*, 456-459.<https://doi.org/10.1002/bkcs.12838>**A** Computational basis of TEAD-3 protein noncovalent inhibition: 3D-QSAR modeling and molecular dynamics simulation

Bitra Kaviani, Marzieh Ghani Dehkordi, Hamed Haghshenas

*Bull. Korean Chem. Soc.* **2024**, *45*, 535-550.<https://doi.org/10.1002/bkcs.12843>**A** A single-step synthesis of 5,6-dihydropyrrolo[2,1-a]isoquinolines and evaluation of their anti-leukemic activity

Hoyeong Park, Santosh Shivanand Raikar, Min Jeong Ahn, Seong Hwan Kim, Pilho Kim

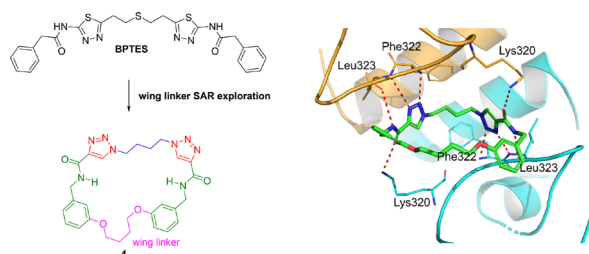


Pharmaceutically intriguing 5,6-dihydro-pyrrolo[2,1-a]isoquinolines (DHPIQs) were prepared by a single-step metal-free method from cyanomethylene-THIQ (**1**) and α -halo-ketones or aldehydes (**1a**) in moderate yields, and their preliminary biological activities were evaluated against leukemic K562 and adriamycin-resistant K562/ADM, resulting in compound **10** active in the both cell lines.

Bull. Korean Chem. Soc. **2024**, *45*, 551-559.<https://doi.org/10.1002/bkcs.12846>

A Novel allosteric glutaminase inhibitors with macrocyclic structure activity relationship analysis (part 2)

Eun Ji Lee, Jiyoung Jang, Rajath Cyriac, Mi Ran Yun, Yeongju Kwon, Myoung Eun Jung, Gildon Choi, Chong Hak Chae, Byoung Chul Cho, Kwangho Lee



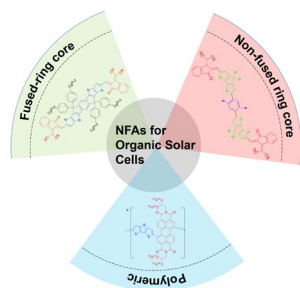
Medicinal chemistry strategy and binding pose of novel macrocyclic glutaminase inhibitor 4 in the allosteric site of glutaminase.

Bull. Korean Chem. Soc. **2024**, *45*, 639-644.

<https://doi.org/10.1002/bkcs.12883>

R Advancements in non-fullerene acceptors for organic solar cells: Brief review of research trends

Minsoo Lee, Eunhye Hwang, Taehyo Kim, Tae-Hyuk Kwon



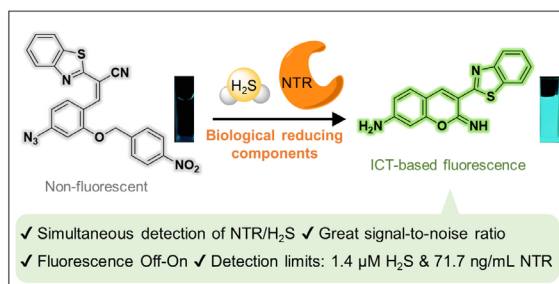
Non-fullerene acceptors (NFAs) have spurred rapid advancements in organic solar cells (OSCs) due to their strong light absorption, tunable energy levels, and improved charge transport, effectively overcoming the limitations of OSCs using fullerene-based acceptors. This review covers the latest research trends, prospects, and challenges for high-performance NFA-based OSCs toward commercialization.

Bull. Korean Chem. Soc. **2024**, *45*, 664-674.

<https://doi.org/10.1002/bkcs.12888>

C Off-On fluorescent benzothiazole-fused coumarin for sensitive detection of nitroreductases and hydrogen sulfide

Song Yi Yoo, Na Yoon Kim, Min Hee Lee



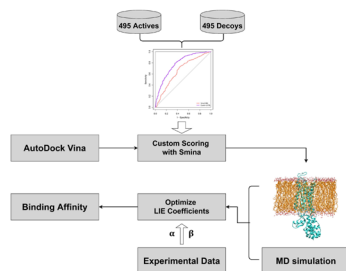
Hydrogen sulfide (H₂S) and nitroreductases (NTR) are crucial biological reductants often overexpressed in cancer cells or bacterial environments. We designed dual detection probe, which transforms into benzothiazole-fused coumarin and exhibits high fluorescence only when both NTR and H₂S are overexpressed, offering a potential tool for simultaneous detection.

Bull. Korean Chem. Soc. **2024**, *45*, 699-705.

<https://doi.org/10.1002/bkcs.12889>

A A time-efficient computational binding affinity estimation protocol with utilization of limited experimental data: A case study for adenosine receptor

Ilkwon Cho, Sunghyun Moon, Kwang-Hwi Cho



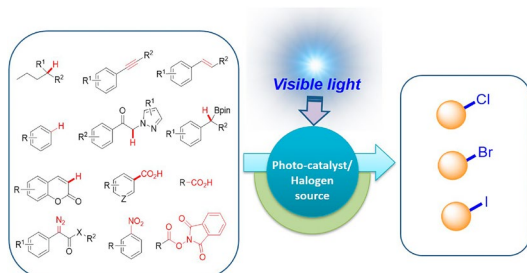
A new binding affinity estimation protocol that utilizes molecular docking with limited experimental data and estimates binding affinity using molecular dynamics simulation has been proposed. A custom scoring function was employed during docking to identify an improved initial binding pose, and the linear interaction energy method with an optimized coefficient was used for binding affinity estimation.

Bull. Korean Chem. Soc. **2024**, *45*, 778-787.

<https://doi.org/10.1002/bkcs.12890>

R Recent progress in visible light-driven halogenation: Chlorination, bromination, and iodination

Anh Thu Nguyen, Houng Kang, Truong Giang Luu, Sung-Eun Suh, Hee-Kwon Kim



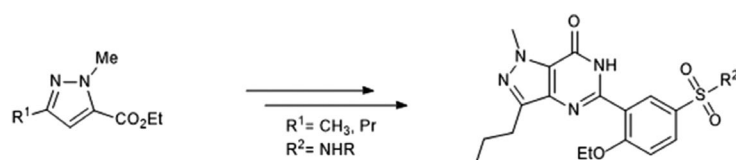
Halogenations have been widely used in chemistry due to a lot of application. This review focus on recent development of visible light-mediated halogenation process including chlorination, bromination, and iodination.

Bull. Korean Chem. Soc. **2024**, *45*, 738-758.

<https://doi.org/10.1002/bkcs.12896>

C Synthesis of sildenafil and its derivatives bearing pyrazolo-pyrimidinones scaffold

Seung Su Lee, Chang Ho Oh



Sildenafil & derivatives

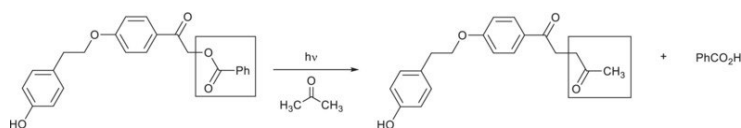
We report the synthesis of pyrazolo-pyrimidinones as sildenafil and its derivatives. Four types of compounds were synthesized with a simplified and efficient synthetic route. The use of readily available starting materials highlights the practicality of this method. In addition, this approach facilitates further exploration and applications in medicinal chemistry and drug development.

Bull. Korean Chem. Soc. **2024**, *45*, 759-763.

<https://doi.org/10.1002/bkcs.12893>

C Photochemical coupling reaction of phenacyl benzoate with acetone to form 1,4-dicarbonyl compound enabled by charge transfer

Ho Suk Shin, Bong Ser Park



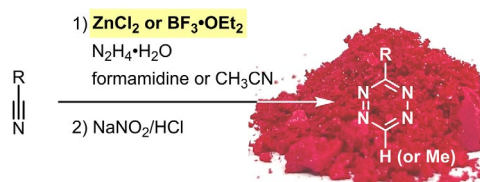
An unprecedented photoinduced coupling reaction to give a 1,4-dicarbonyl compound is observed in the photolysis of phenacyl benzoates in acetone.

Bull. Korean Chem. Soc. **2024**, *45*, 863-866.

<https://doi.org/10.1002/bkcs.12898>

A Cost-effective synthesis of unsymmetric tetrazines

Jiwon Hwang, Byeongjip Yoon, Sung-Eun Suh



- Inexpensive catalysts
- One-pot process
- 30 Tetrazines
- Up to 65% isolated yield
- Multigram scale example

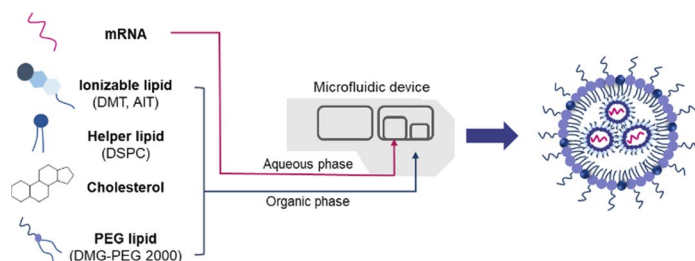
1,2,4,5-Tetrazines, key for synthesizing (hetero)aromatics, enable bioorthogonal ligation without biological interference. Existing synthesis methods are costly and hazardous. This study introduces safer, cheaper alternatives using zinc chloride or boron trifluoride diethyl etherate, enhancing safety, and reducing costs.

Bull. Korean Chem. Soc. **2024**, *45*, 867-872.

<https://doi.org/10.1002/bkcs.12903>

A Study of functional lipid nanoparticles for mRNA delivery using new ionizable tocopherol derivatives

Minyoung Choi, Onesun Jung, Eunjung Lee, Joon Sig Choi



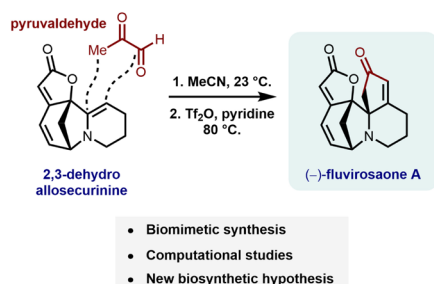
In this study, tocopherol-derived ionizable lipids were synthesized to produce functional lipid nanoparticles for mRNA delivery. Lipid nanoparticles using newly developed ionizable tocopherol derivatives have potential as biocompatible and effective mRNA delivery vehicles.

Bull. Korean Chem. Soc. **2024**, *45*, 929-936.

<https://doi.org/10.1002/bkcs.12909>

C Biomimetic synthesis of fluvirosaone A

Gyumin Kang, Sunky Han



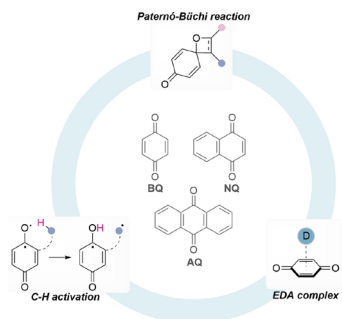
This communication presents the biomimetic synthesis of fluvirosaone A, a pentacyclic high-oxidation state securine alkaloid. Drawing from both experimental and computational studies, we propose a new biosynthetic pathway for fluvirosaone A, identifying pyruvaldehyde as the source of the three additional carbons integrated into the securine framework.

Bull. Korean Chem. Soc. **2024**, *45*, 876-879.

<https://doi.org/10.1002/bkcs.12907>

R Visible light induced reactions of quinones

Jihoon Jang, Gayeon Lee, Eun Jin Cho



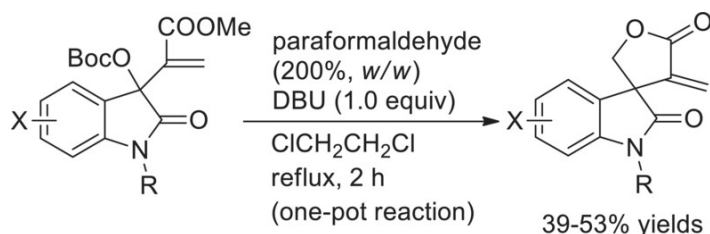
This review covers the visible light induced reactions of quinones, focusing on three key types: Paternò-Büchi reactions, CH activation processes, and the formation of electron donor-acceptor complexes.

Bull. Korean Chem. Soc. **2024**, *45*, 966-976.

<https://doi.org/10.1002/bkcs.12913>

A One-pot synthesis of spirooxindoles bearing α -methylene- γ -butyrolactone moiety from Morita-Baylis-Hillman carbonates of isatins and paraformaldehyde

Junseong Lee, Jae Nyong Kim



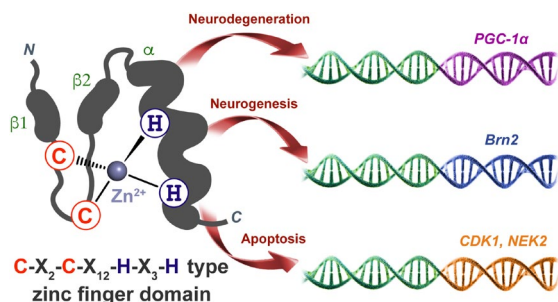
Spirooxindole **3a**, bearing α -methylene- γ -butyrolactone moiety, has been synthesized in a one-pot reaction from the Boc carbonate of Morita-Baylis-Hillman adduct of N-methylisatin and paraformaldehyde in the presence of 1,8-diazabicyclo[5.4.0]undec-7-ene in refluxing 1,2-dichloroethane in moderate yield (52%).

Bull. Korean Chem. Soc. **2024**, *45*, 1015-1020.

<https://doi.org/10.1002/bkcs.12915>

R Regulation of classical zinc fingers for neuronal signaling in the central nervous system

Yunha Hwang, Soyeon Park, Hyunyoung Kim, Yerim Park, Hyun Goo Kang, Dong-Heon Lee, Seung Jae Lee



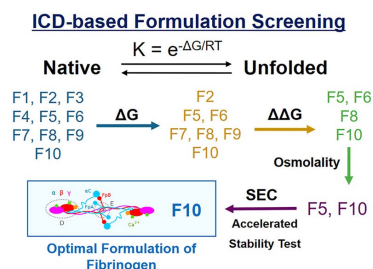
The classical C-X₂-C-X₁₂-H-X₃-H type zinc finger domains, detected in the brain, are associated with neurodegenerative disease, long- and short-term memory, neuronal differentiation and development, and other physiological processes.

Bull. Korean Chem. Soc. **2024**, *45*, 977-986.

<https://doi.org/10.1002/bkcs.12920>

C Application of isothermal chemical denaturation to early-stage formulation development of fibrinogen

Jae Woon Son, Jong Mun Son, Ki Ho Hur, Wonhwa Lee, Im-Sook Song, Dong Hee Na



Automated, high-throughput isothermal chemical denaturation-based formulation study is highly useful for early-stage formulation development of fibrinogen.

Bull. Korean Chem. Soc. **2023**, *44*, 348-352.

<https://doi.org/10.1002/bkcs.12664>

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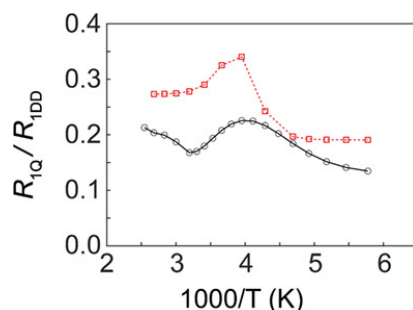
Prof. Kyungwon Kwak
Korea UniversityProf. Jaehoon Jung
University of Ulsan

Physical Chemistry (PC)

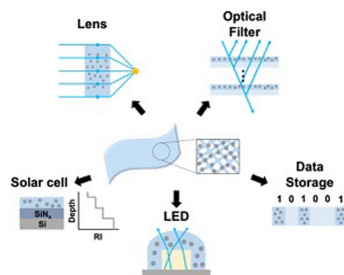
Towards BKCS Impact
Factor of more than 5Prof. Wonwoo Nam
Editor-in-Chief, BKCSWILEY-vch WILEY-vch WILEY-vch WILEY-vch WILEY-vch WILEY-vch WILEY-vch WILEY-vch WILEY-vch WILEY-vch WILEY-vch WILEY-vch 
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A An NMR relaxation study of magnesium borohydride in solid

Chul Kim

*Bull. Korean Chem. Soc.* **2023**, *44*, 79-84.<https://doi.org/10.1002/bkcs.12631>**R** Zirconia nanocomposites and their applications as transparent advanced optical materials with high refractive index

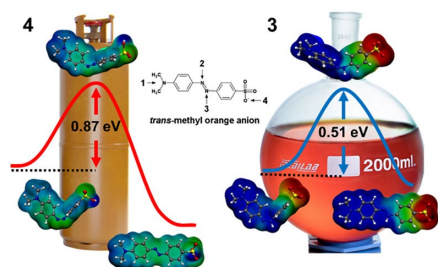
Deunchan Lee, Hanjun Cho, Ilsun Yoon



ZrO₂ nanocomposites can be introduced as advanced optical materials for high-performance photovoltaic and display devices due to their advantage in light manipulation, high refractive index, and excellent transmittance in the visible light region. This review introduces optical theory, fabrication methods, and practical applications of ZrO₂ nanocomposites.

Bull. Korean Chem. Soc. **2023**, *44*, 284-292.<https://doi.org/10.1002/bkcs.12666>**A** Effects of the protonation and the polar solvation on the molecular properties of methyl orange: A density functional theory study

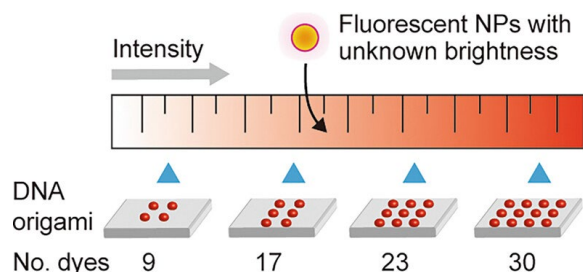
Kanghyeon You, O-Pil Kwon, Dongwook Kim



density functional theory (DFT) study was carried out to unveil the effect of the protonation and the solvation on the molecular properties of methyl orange (MO) anion. In the gas phase, the sulfonate is the strongest proton acceptor and shows the least energy barrier for the cis-to-trans isomerization, while the protonation at azo N atom is the most stable in both the equilibrium and transition states in the aqueous solution.

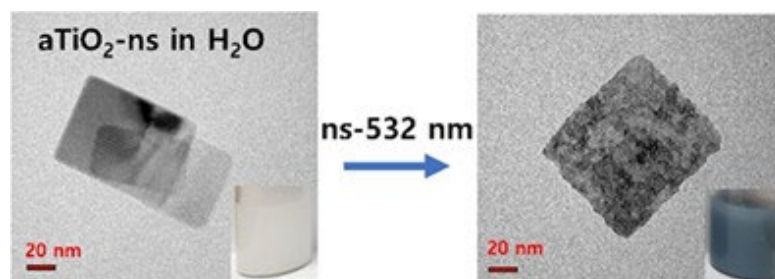
Bull. Korean Chem. Soc. **2023**, *44*, 523-527.<https://doi.org/10.1002/bkcs.12682>**A** Quantitative evaluation of brightness of fluorescent nanoparticles using DNA origami standards

Mina Lee, Sihwa Joo, Tae Geol Lee

*Bull. Korean Chem. Soc.* **2023**, *44*, 536-541.<https://doi.org/10.1002/bkcs.12691>

A Understanding the pulsed laser-induced modification processes of TiO₂ nanomaterials in aqueous solution

Hee Jun An, Nkenku Carl, Youngdong Yoo, Hyuk Kang, Yu Kwon Kim

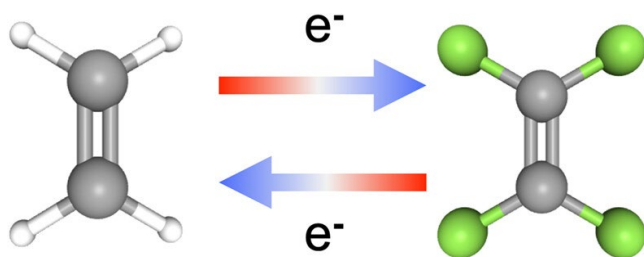


Bull. Korean Chem. Soc. **2023**, *44*, 634-644.

<https://doi.org/10.1002/bkcs.12705>

A Constrained density functional theory calculations for estimation of forward and backward intermolecular charge transfer energy

Junseok Kim, Hyungjun Kim



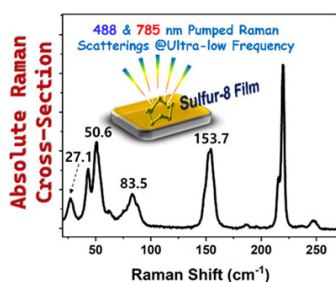
This article describes forward and backward intermolecular charge transfer (CT). Density functionals with a high fraction of Hartree-Fock exchange, which is necessary to reproduce high-level ab initio calculations shows unreasonable reversal between two CT states. The physical origin of such weird behavior is analyzed. Constrained density functional theory calculations using M06-HF functional are suggested to provide accurate energies and correct orders.

Bull. Korean Chem. Soc. **2023**, *44*, 671-678.

<https://doi.org/10.1002/bkcs.12711>

A Determination of the absolute Raman cross-sections of α -S₈ film at ultralow frequencies pumped by 488 and 785 nm lasers

Mingyeong Shin, Jinsun Park, Keunhong Jeong, Myeongkee Park



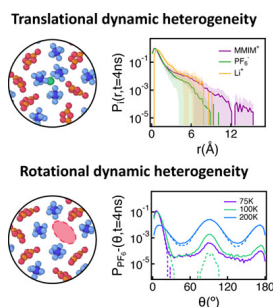
The absolute ultralow frequency Raman cross-sections of α -S₈ film were determined using a custom-built Raman spectrometer with 488 and 785 nm pump lasers. Our results can serve as quantitative Raman standards for solid thin film samples.

Bull. Korean Chem. Soc. **2023**, *44*, 629-633.

<https://doi.org/10.1002/bkcs.12704>

R Simulation studies on the dynamic heterogeneity of organic ionic plastic crystals

Hyungshick Park, Chung Bin Park, Bong June Sung



Dynamic heterogeneity is a key to understanding how organic ionic plastic crystals (OIPCs) can show high conductivity even in solid states. This review article summarizes recent simulation studies on OIPCs. We show that various types of defects can facilitate translational/rotational heterogeneous dynamics in OIPCs. In addition, the effect of polarizability, which is often ignored, on rotational dynamics is investigated.

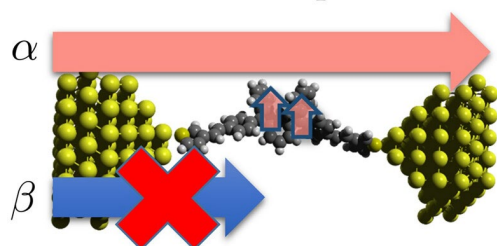
Bull. Korean Chem. Soc. **2023**, *44*, 736-749.

<https://doi.org/10.1002/bkcs.12715>

A Carbon-based organic radical spin filters

Daeheum Cho

Carbon-based spin filter



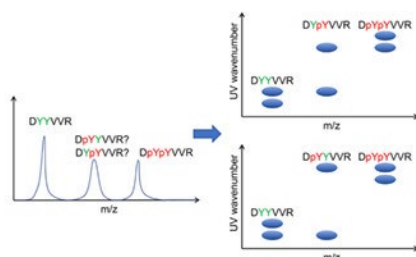
Single-molecule magnetic junctions serve as an highly efficient spin filter. A spin-polarized current could be generated and, moreover, the spin-filtering efficiency could be tuned by the control of the magnetic interactions. The use of a tunable organic magnetic molecular junction system is an appealing approach for regulating spin-polarized currents in spintronic devices.

Bull. Korean Chem. Soc. **2023**, *44*, 700-704.

<https://doi.org/10.1002/bkcs.12716>

C Ultraviolet photodissociation spectra of singly protonated hexapeptides DYYVVR, DYFVVR, and DFYVVR at room temperature

Hyo Nam Jeon, Jang Han Kwon, Hyuk Kang



Phosphorylation site of adjacent tyrosine residues can be located by 2D UV-MS at room temperature.

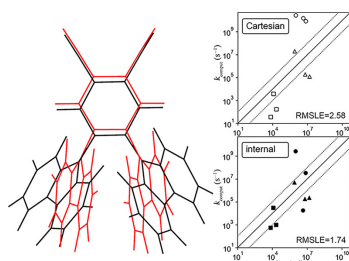
Phosphorylation site of adjacent tyrosine residues can be located by two-dimensional ultraviolet-mass spectrometry (2D UV-MS) at room temperature.

Bull. Korean Chem. Soc. **2023**, *44*, 777-779.

<https://doi.org/10.1002/bkcs.12765>

P Effect of choosing coordinate systems on computationally predicting nonradiative transition rates of flexible thermally activated delayed fluorescence molecules

Byeong Ki Min, Donggeon Kim, Dongwook Kim, Young Min Rhee



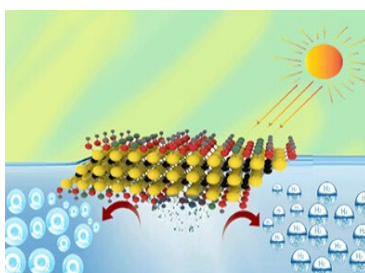
Predicting transition rates is important to assess the efficiency of the optoelectronic device. As these rates can be predicted within the harmonic oscillator approximation, problems can arise when transitions involve large geometrical distortion. In this account, we predict and evaluate nonradiative transition rates of well-known thermally activated delayed fluorescence molecules using both Cartesian and internal coordinates.

Bull. Korean Chem. Soc. **2023**, *44*, 989-1003.

<https://doi.org/10.1002/bkcs.12785>

R Two-dimensional Ti_3C_2 MXene for photocatalytic hydrogen production: A review

B. Shalini Reghunath, Sruthi Rajasekaran, Sandra Mathew, Dephan Pinheiro, Sunaja Devi K. R, Sieon Jung, Theerthagiri Jayaraman, Myong Yong Choi

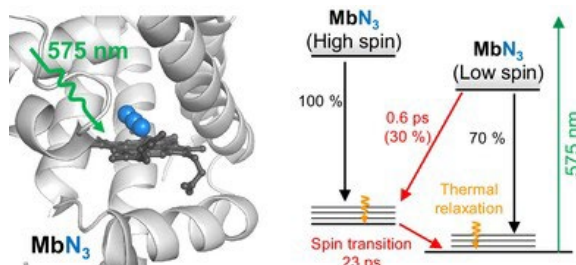


Bull. Korean Chem. Soc. **2023**, *44*, 969-988.

<https://doi.org/10.1002/bkcs.12783>

A Photoexcitation dynamics of azide ion bound ferric myoglobin probed by femtosecond infrared spectroscopy

Seongchul Park, Jooyoung Kim, Manho Lim

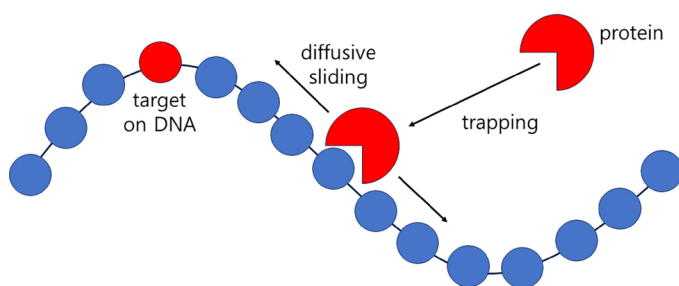


Bull. Korean Chem. Soc. **2024**, *45*, 171-177.

<https://doi.org/10.1002/bkcs.12803>

A Dimensionality reduction in diffusion–reaction systems

Kihyun Park, Taejun Kim, Hyojoon Kim



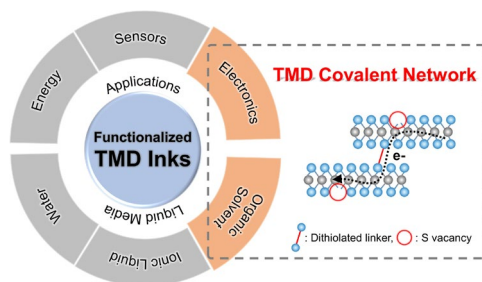
One example of dimensionality reduction is protein-DNA binding which can be greatly facilitated when the protein nonspecifically binds to a random site on the DNA and then slides diffusively along the DNA.

Bull. Korean Chem. Soc. **2024**, *45*, 178-182.

<https://doi.org/10.1002/bkcs.12808>

P Functionalized 2D transition metal dichalcogenide inks via liquid-phase exfoliation for practical applications

Yeonsu Jeong, Paolo Samorì

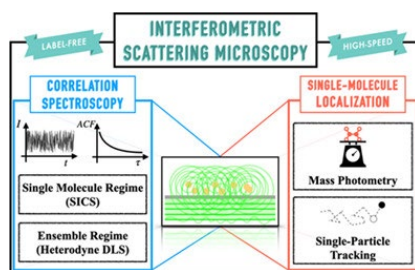


Bull. Korean Chem. Soc. **2024**, *45*, 110-124.

<https://doi.org/10.1002/bkcs.12807>

R Upgrading interferometric scattering microscopy with ensemble statistical analysis

Minsu Lee, Seok-Cheol Hong, Minhaeng Cho



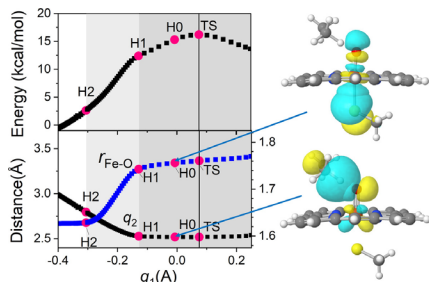
Interferometric scattering (iSCAT) microscopy is a high-speed imaging and tracking technique operating at 1000 FPS, capable of label-free imaging. It has demonstrated its versatility in measuring the mass and 3D positions of nanoparticles and biomolecules, as well as visualizing nanoscale events in complex cellular environments. However, quantifying iSCAT signals has proven challenging due to error-prone post-processing and a lack of statistical reliability in defining iSCAT contrast. To address these issues, this perspective introduces an alternative approach using correlation spectroscopy and ensemble statistical analysis. Correlation spectroscopy offers a more robust framework for signal analysis, while ensemble statistical analysis involves studying a higher density of scatterers, potentially providing more accurate information from fluctuating iSCAT signals. This perspective seeks to improve the accuracy and reliability of iSCAT microscopy, particularly in understanding dynamic processes at the nanoscale.

Bull. Korean Chem. Soc. **2024**, *45*, 32-44.

<https://doi.org/10.1002/bkcs.12800>

A A theoretical study for the linear free energy relationship of CH bond activation and the role of the axial ligand in cytochrome P450 model complexes

Soobin Kwon, Yun-Cheol Choi, Yongho Kim



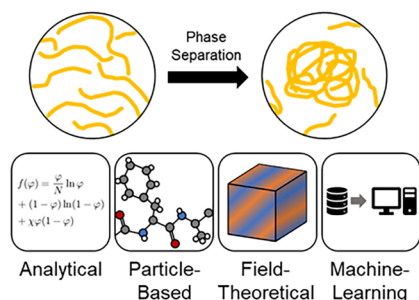
The Fe-O bond utilize $\sigma_{\text{Fe-O}}^*$ and $\pi_{\text{Fe-O}}^*$ orbitals to accept electrons from axial ligands and the C-H bond, respectively. These two orbitals independently but cooperatively increase the Fe-O bond length for C-H bond activation, however, there is no direct orbital interaction between axial ligands and the C-H bond, hindering a clear correlation between reactivity and axial ligand electron donation.

Bull. Korean Chem. Soc. **2024**, *45*, 284-292.

<https://doi.org/10.1002/bkcs.12819>

R Biomolecular phase separation through theoretical and computational microscope

Rajeev Kumar, Da-Hyun Koo, Yu-Gon Eom, Jeong-Mo Choi



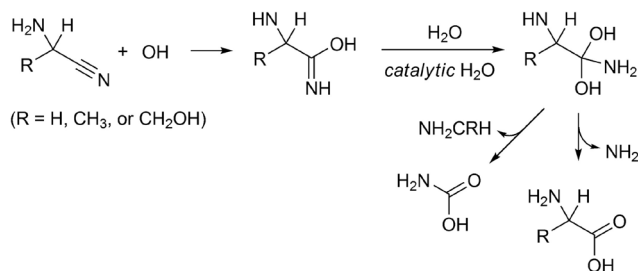
This review covers computational methods to simulate biomolecular phase separation: analytical methods, particle-based simulations, field-theoretic methods, and machine-learning methods.

Bull. Korean Chem. Soc. **2024**, *45*, 420-434.

<https://doi.org/10.1002/bkcs.12840>

C Mechanisms of interstellar synthesis of glycine, alanine, and serine from aminonitriles, OH, and H₂O

Joong Chul Choe



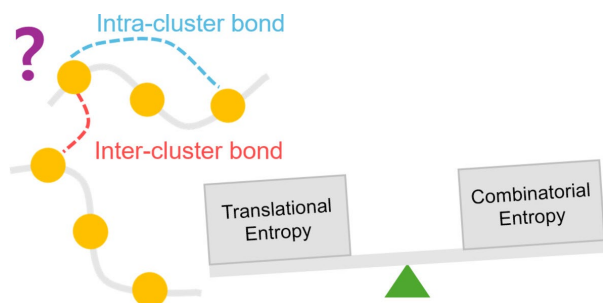
Barrierless pathways for the formation of glycine, alanine, and serine from aminonitriles, OH, and H₂O with catalytic H₂O were obtained using CBS-QB3 calculation, suggesting possible occurrence of the thermal reactions in interstellar ices.

Bull. Korean Chem. Soc. **2024**, *45*, 520-525.

<https://doi.org/10.1002/bkcs.12844>

C Combinatorial entropy determines the early stages of nucleation

Da-Hyun Koo, Ho Jun Park, Jeong-Mo Choi



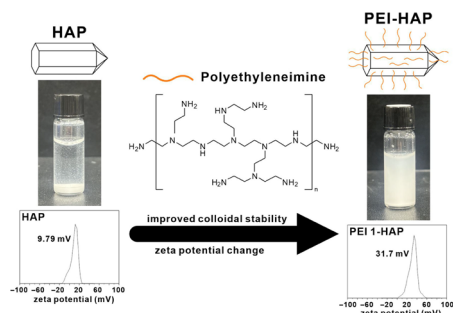
This research highlights the pivotal role of combinatorial entropy in the early stages of percolation dynamics, employing graph-theoretic simulations. It provides novel insights into nucleation behavior, with implications spanning material design to biological systems.

Bull. Korean Chem. Soc. **2024**, *45*, 526-529.

<https://doi.org/10.1002/bkcs.12849>

A Polyethyleneimine incorporated hydroxyapatite for improved colloidal stability

Hyebin Choi, Jaun An, Keunyoung Lee, Ki-Young Kwon



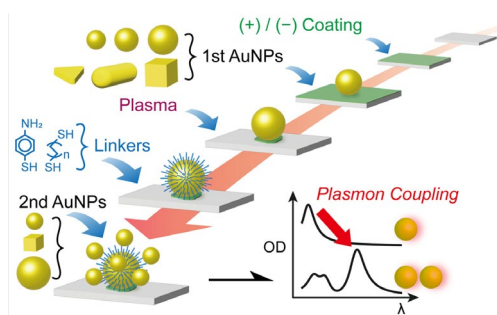
The PEI incorporated hydroxyapatite (PEI-HAP) was prepared by hydrothermal synthesis at 200 °C using a mixture of HAP synthesized at room temperature and PEI solutions. As the amount of PEI increases, zeta potential value become more positive and the colloidal stability of the sample improved. It was attributed to the presence of amines on the surface of HAP preventing the aggregation of HAP.

Bull. Korean Chem. Soc. **2024**, *45*, 614-619.

<https://doi.org/10.1002/bkcs.12855>

P Controlled assembly of gold nanoparticles: Methods and plasmon coupling properties

Sangwoon Yoon



The newly developed controlled assembly method allows us to prepare gold nanoparticle assemblies consisting of various nanoparticle shapes, sizes, and gap distances. Such nanoassemblies reveal the relationship between the plasmon coupling and the nanogap structural parameters.

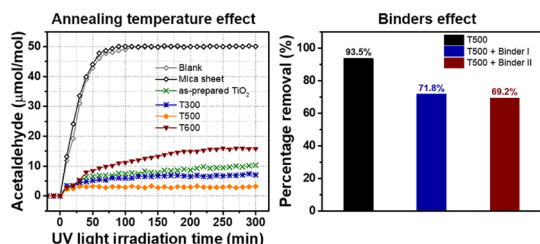
Bull. Korean Chem. Soc. **2024**, *45*, 689-698.

<https://doi.org/10.1002/bkcs.12886>

A TiO₂ for efficient photocatalytic decomposition of acetaldehyde: An investigation of the effects of annealing temperature, humidity, and binder

Yong-Sog Kwon, Kyu-Chul Jung, Shufang Zhao, Yujing Ji, Shahid Saqlain, Young Dok Kim

Removal of acetaldehyde using a TiO₂ photocatalyst



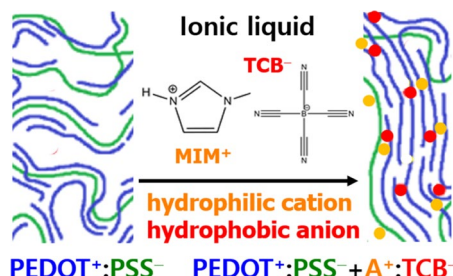
This work demonstrates that annealing temperature can remarkably influence the physico-chemical properties of TiO₂ photocatalysts which eventually affect their photocatalytic performance for environmental applications. Humidity and binders may have significant impact on the photocatalytic removal efficiency as well as on the extent of total oxidation of VOCs like acetaldehyde.

Bull. Korean Chem. Soc. **2024**, *45*, 706-719.

<https://doi.org/10.1002/bkcs.12887>

P Stretchable conducting polymer PEDOT:PSS treated with hard-cation-soft-anion ionic liquid designed from molecular modeling

Yves Lansac, Changwon Choi, Yun Hee Jang



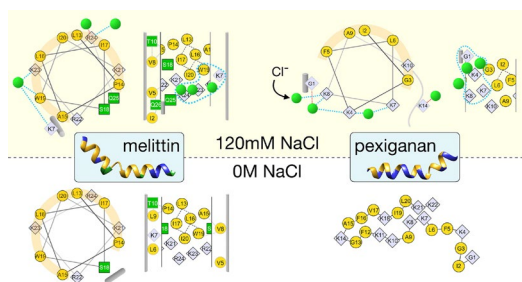
Ion exchange between PEDOT:PSS and ionic liquid (IL) leads to PEDOT:PSS separation and PEDOT self-assembly into fibular conductive pathways. IL composition dramatically affects the PEDOT:PSS separation and the π - π stacking in PEDOT domains. IL with soft (hydrophobic) anion and hard (hydrophilic) cation is proposed for efficient PEDOT:PSS treatment.

Bull. Korean Chem. Soc. **2024**, *45*, 896-905.

<https://doi.org/10.1002/bkcs.12908>

A Unraveling the role of counter ions in shaping the structures of helical peptides in aqueous phase

Jeseong Yoon, Youngbeom Jo, Seokmin Shin



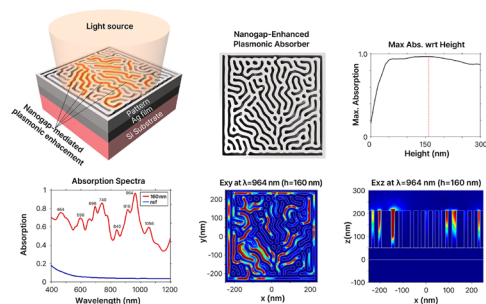
We conducted molecular dynamics simulations to investigate how counter ions influence the structural characteristics of a peptide in solution. By utilizing an extended form of helical projection, we distinctly characterized structural traits and elucidate the underlying principles of structure formation, which are often challenging to discern in conventional approaches.

Bull. Korean Chem. Soc. **2024**, *45*, 1000-1014.

<https://doi.org/10.1002/bkcs.12914>

C Broadband plasmonic response of silver nanomaze-based nanogap-enhanced absorber

Kinam Jung, Yongtaek Lee



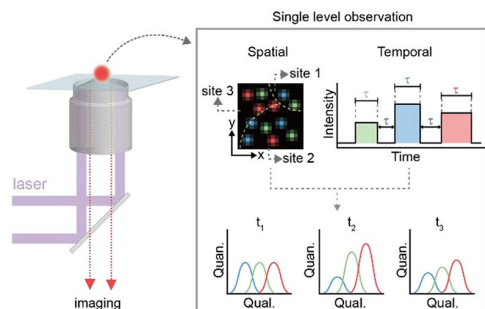
A novel nanogap-enhanced plasmonic absorber is designed using the Gray–Scott algorithm, featuring a complex nanomaze pattern. Finite-difference time-domain simulations reveal broadband absorption and multiple resonance features. The structure exhibits unique electric field distributions, demonstrating effective light trapping across a wide wavelength range and promising significant advancements in nanophotonics.

Bull. Korean Chem. Soc. **2024**, *45*, 906-910.

<https://doi.org/10.1002/bkcs.12904>

R Observation of reactions in single molecules/nanoparticles using light microscopy

Yongdeok Ahn, Minsoo Park, Daeha Seo



This review summarizes experimental methods for observing reactions at the single-molecule level and their advantages and discusses relevant studies. These experiments revealed information not observed using ensemble averaging regarding the chemical processes. This review can provide insights into research methodologies for investigating unresolved problems in chemistry.

Bull. Korean Chem. Soc. **2023**, *44*, 35-44.

<https://doi.org/10.1002/bkcs.12639>

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