

## DAFTAR PUSTAKA

- Abdalrazaq, E.A., Mohammed, H.K., Voronkova, D.K., Joshi, S.K., Saleh, E.A.M., Kareem, A.H., Kumar, A., Alawadi, A., Alslaami, A., and Fathollahi, R., 2024, Palladium anchored to BisPyP@bilayer-SiO<sub>2</sub>@NMP organic-inorganic hybrid as an efficient and recoverable novel nanocatalyst in Suzuki and Stille C-C coupling reactions, *Sci. Rep.*, 14, 1-17.
- Adam, M.S.S., Ullah, F., and Makhlof, M.M., 2020, Hybrid organic-inorganic Cu(II) iminoisonicotine@TiO<sub>2</sub>@Fe<sub>3</sub>O<sub>4</sub> heterostructure as efficient catalyst for cross-couplings, *J. Am. Ceram. Soc.*, 103, 4632-4653.
- Adimule, V., Yallur, B.C., Pai, M.M., Batakurki, S.R., and Nandi, S.S., 2022, Biogenic Synthesis of Magnetic Palladium Nanoparticles Decorated Over Reduced Graphene Oxide Using Piper Betle Petiole Extract (Pd-rGO@Fe<sub>3</sub>O<sub>4</sub> NPs) as Heterogeneous Hybrid Nanocatalyst for Applications in Suzuki-Miyaura Coupling Reactions of Biphenyl, *Top. Catal.*, 1-14.
- Agustiniingsih, D., Nuryono, N., Santosa, S.J., and Kunarti, E.S., 2023, Propylamine Silica-Titania Hybrid Material Modified with Ni(II) as the Catalyst for Benzyl Alcohol to Benzaldehyde Conversion, *Indones. J. Chem.*, 23, 1361-1374.
- Agwa, I.S., Omar, O.M., Tayeh, B.A., and Abdelsalam, B.A., 2020, Effects of using rice straw and cotton stalk ashes on the properties of lightweight self-compacting concrete, *Constr. Build. Mater.*, 235, 1-12.
- Aharipour, N., Nemati, A., and Malek Khachatourian, A., 2022, Green Synthesis of Silica Extracted from Rice Husk Ash, *Adv. Ceram. Prog.*, 8, 15-20.
- Ahmad, J., Arbili, M.M., Alabduljabbar, H., and Deifalla, A.F., 2023, Concrete made with partially substitution corn cob ash: A review, *Case Stud. Constr. Mater.*, 18, 1-18.
- Ajeel, S.A., Sukkar, K.A., and Zedin, N.K., 2021, Evaluation of acid leaching process and calcination temperature on the silica extraction efficiency from the sustainable sources, *J. Phys.: Conf. Ser.*, 1773, 1-8.
- Ajeel, S.A., Sukkar, K.A., and Zedin, N.K., 2020, Extraction of high purity amorphous silica from rice husk by chemical process, *IOP Conf. Ser. Mater. Sci. Eng.*, 881, 1-12.
- Akkoç, M., Buğday, N., Altın, S., Kiraz, N., Yaşar, S., and Özdemir, İ., 2021, N-heterocyclic carbene Pd(II) complex supported on Fe<sub>3</sub>O<sub>4</sub>@SiO<sub>2</sub>: Highly active, reusable and magnetically separable catalyst for Suzuki-Miyaura cross-coupling reactions in aqueous media, *J. Organomet. Chem.*, 943, 1-10.
- Akrami, S., Watanabe, M., Ling, T.H., Ishihara, T., Arita, M., Fuji, M., and Edalati, K., 2021, High-pressure TiO<sub>2</sub>-II polymorph as an active photocatalyst for

CO<sub>2</sub> to CO conversion, *Appl. Catal. B Environ.*, 298, 1–26.

- Al-Otaibi, A.L., 2021, Yttrium Doped Single-Crystalline Orthorhombic Molybdenum Oxide Micro-Belts: Synthesis, Structural, Optical and Photocatalytic Properties, *J. Inorg. Organomet. Polym. Mater.*, 31, 3416–3429.
- Ali, M.E., Rahman, M.M., Sarkar, S.M., and Hamid, S.B.A., 2014, Heterogeneous metal catalysts for oxidation reactions, *J. Nanomater.*, 2014, 1–23.
- Amirmahani, N., Mahmoodi, N.O., Malakootian, M., Pardakhty, A., and Seyedi, N., 2020, Pd nanoparticles supported on Fe<sub>3</sub>O<sub>4</sub>@SiO<sub>2</sub>-Schiff base as an efficient magnetically recoverable nanocatalyst for Suzuki–Miyaura coupling reaction, *Res. Chem. Intermed.*, 46, 4595–4609.
- Ananikov, V.P., 2015, Nickel: The “spirited horse” of transition metal catalysis, *ACS Catal.*, 5, 1964–1971.
- Anggarini, U., Yu, L., Nagasawa, H., Kanezashi, M., and Tsuru, T., 2022, Metal-Induced Aminosilica Rigidity Improves Highly Permeable Microporous Membranes via Different Types of Pendant Precursors, *ACS Appl. Mater. Interfaces*, 14, 42692–42704.
- Aprilia, S., Rosnelly, C.M., Zuhra, Fitriani, F., Haffiz Akbar, E., Raqib, M., Rahmah, K., Amin, A., and Baity, R.A., 2023, Synthesis of amorphous silica from rice husk ash using the sol-gel method: Effect of alkaline and alkaline concentration, *Mater. Today Proc.*, 87, 225–229.
- Askaruly, K., Azat, S., Sartova, Z., Yeleuov, M., Kerimkulova, A., and Bekseitova, K., 2020, Obtaining and Characterization of Amorphous Silica from Rice Husk, *J. Chem. Technol. Metall.*, 55, 88–97.
- Athinarayanan, J., Periasamy, V.S., Alhazmi, M., Alatah, K.A., and Alshatwi, A.A., 2015, Synthesis of biogenic silica nanoparticles from rice husks for biomedical applications, *Ceram. Int.*, 41, 275–281.
- Athinarayanan, J., Periasamy, V.S., Alhazmi, M., and Alshatwi, A.A., 2017, Synthesis and biocompatibility assessment of sugarcane bagasse-derived biogenic silica nanoparticles for biomedical applications, *J. Biomed. Mater. Res. - Part B Appl. Biomater.*, 105, 340–349.
- Babyszko, A., Wanag, A., Sadłowski, M., Kusiak-Nejman, E., and Morawski, A.W., 2022, Synthesis and Characterization of SiO<sub>2</sub>/TiO<sub>2</sub> as Photocatalyst on Methylene Blue Degradation, *Catalysts*, 12, 1–18.
- Bagheri, S., Muhd Julkapli, N., and Bee Abd Hamid, S., 2014, Titanium dioxide as a catalyst support in heterogeneous catalysis, *Sci. World J.*, 2014, 1–21.
- Bakri, A.S., Sahdan, M.Z., Adriyanto, F., Raship, N.A., Said, N.D.M., Abdullah, S.A., and Rahim, M.S., 2017, Effect of annealing temperature of titanium dioxide thin films on structural and electrical properties, *AIP Conf. Proc.*, 1788, 1–8.

- Banda, P.G. and Mucherla, R., 2022, Palladium-Supported Polydopamine-Coated NiFe<sub>2</sub>O<sub>4</sub>@TiO<sub>2</sub>: A Sole Photocatalyst for Suzuki and Sonogashira Coupling Reactions under Sunlight Irradiation, *ACS Omega*, 7, 29356–29368.
- Baran, T., 2018, Ultrasound-accelerated synthesis of biphenyl compounds using novel Pd(0) nanoparticles immobilized on bio-composite, *Ultrason. Sonochem.*, 45, 231–237.
- Basha, S.K.T., Kalla, R.M.N., Varalakshmi, M., Sudhamani, H., Appa, R.M., Chul Hong, S., and Raju, C.N., 2022, Heterogeneous catalyst SiO<sub>2</sub>-LaCl<sub>3</sub>·7H<sub>2</sub>O: characterization and microwave-assisted green synthesis of  $\alpha$ -aminophosphonates and their antimicrobial activity, *Mol. Divers.*, 1–13.
- Beletskaya, I.P. and Cheprakov, A. V., 2004, Copper in cross-coupling reactions: The post-Ullmann chemistry, *Coord. Chem. Rev.*, 248, 2337–2364.
- Bhardwaj, M., Sahi, S., Mahajan, H., Paul, S., and Clark, J.H., 2015, Novel heterogeneous catalyst systems based on Pd(0) nanoparticles onto amine functionalized silica-cellulose substrates [Pd(0)-EDA/SCs]: Synthesis, characterization and catalytic activity toward C–C and C–S coupling reactions in water under limiting basic, *J. Mol. Catal. A Chem.*, 408, 48–59.
- Bhowmik, K., Sengupta, D., Basu, B., and De, G., 2014, Reduced graphene oxide supported Ni nanoparticles: A high performance reusable heterogeneous catalyst for Kumada-Corriu cross-coupling reactions, *RSC Adv.*, 4, 35442–35448.
- Böhme, M. and Frenking, G., 1994, The CuC bond dissociation energy of CuCH<sub>3</sub>. A dramatic failure of the QCISD(T) method, *Chem. Phys. Lett.*, 224, 195–199.
- Bortolotto Teixeira, L., Guzi de Moraes, E., Paolinelli Shinhe, G., Falk, G., and Novaes de Oliveira, A.P., 2021, Obtaining Biogenic Silica from Sugarcane Bagasse and Leaf Ash, *Waste and Biomass Valorization*, 12, 3205–3221.
- Brown, D.G. and Boström, J., 2016, Analysis of Past and Present Synthetic Methodologies on Medicinal Chemistry: Where Have All the New Reactions Gone?, *J. Med. Chem.*, 59, 4443–4458.
- Buah-Kwofie, A., Yeboah, P.O., and Pwamang, J., 2011, Determination of levels of polychlorinated biphenyl in transformers oil from some selected transformers in parts of the Greater Accra Region of Ghana, *Chemosphere*, 82, 103–106.
- Busacca, C.A., Fandrick, D.R., Song, J.J., and Senanayake, C.H., 2012, Applications of Transition Metal Catalysis in Drug Discovery and Development: An Industrial Perspective, John Wiley & Sons Inc., New Jersey.
- Cantoblanco, C. De, 2024, Influence of the Interaction of Nickel and Copper with Ceria on Ethanol Steam Reforming over Ni-Cu-CeO<sub>2</sub> Catalysts, *Catalysts*, 1–17.

- Carvalho, G.C., Marena, G.D., Karnopp, J.C.F., Jorge, J., Sábio, R.M., Martines, M.A.U., Bauab, T.M., and Chorilli, M., 2022, Cetyltrimethylammonium bromide in the synthesis of mesoporous silica nanoparticles: General aspects and in vitro toxicity, *Adv. Colloid Interface Sci.*, 307, 1–14.
- Chakraborty, A., Chakraborty, T., Menendez, M.I., and Chattopadhyay, T., 2019, Surfactant-mediated solubilization of magnetically separable nanocatalysts for the oxidation of alcohols, *ACS Omega*, 4, 11558–11565.
- Chen, P.P., Lucas, E.L., Greene, M.A., Zhang, S.Q., Tollefson, E.J., Erickson, L.W., Taylor, B.L.H., Jarvo, E.R., and Hong, X., 2017, A Unified Explanation for Chemoselectivity and Stereospecificity of Ni-Catalyzed Kumada and Cross-Electrophile Coupling Reactions of Benzylic Ethers: A Combined Computational and Experimental Study, *Physiol. Behav.*, 176, 100–106.
- Chen, Y. and Feng, L., 2020, Silver nanoparticles doped TiO<sub>2</sub> catalyzed Suzuki-coupling of bromoaryl with phenylboronic acid under visible light, *J. Photochem. Photobiol. B Biol.*, 205, 1–10.
- Chernysheva, M. V., Bulatova, M., Ding, X., and Haukka, M., 2020, Influence of Substituents in the Aromatic Ring on the Strength of Halogen Bonding in Iodobenzene Derivatives, *Cryst. Growth Des.*, 20, 7197–7210.
- Cudennec, Y. and Lecerf, A., 2003, The transformation of Cu(OH)<sub>2</sub> into CuO, revisited, *Solid State Sci.*, 5, 1471–1474.
- Cueto-Díaz, E.J., Castro-Muñiz, A., Suárez-García, F., Gálvez-Martínez, S., Torquemada-Vico, M.C., Valles-González, M.P., and Mateo-Martí, E., 2021, Aptes-based silica nanoparticles as a potential modifier for the selective sequestration of CO<sub>2</sub> gas molecules, *Nanomaterials*, 11, 1–19.
- Cui, S., Yu, S., Lin, B., Shen, X., Zhang, X., and Gu, D., 2017, Preparation of amine-modified SiO<sub>2</sub> aerogel from rice husk ash for CO<sub>2</sub> adsorption, *J. Porous Mater.*, 24, 455–461.
- Das, M.K., Bobb, J.A., Ibrahim, A.A., Lin, A., Abouzeid, K.M., and El-Shall, M.S., 2020, Green Synthesis of Oxide-Supported Pd Nanocatalysts by Laser Methods for Room-Temperature Carbon-Carbon Cross-Coupling Reactions, *ACS Appl. Mater. Interfaces*, 12, 23844–23852.
- Deshmukh, P., Bhatt, J., Peshwe, D., and Pathak, S., 2012, Determination of silica activity index and XRD, SEM and EDS studies of amorphous SiO<sub>2</sub> extracted from rice Husk Ash, *Trans. Indian Inst. Met.*, 65, 63–70.
- Dhaneswara, D., Marito, H.S., Fatriansyah, J.F., Sofyan, N., Adhika, D.R., and Suhariadi, I., 2022, Spherical SBA-16 particles synthesized from rice husk ash and corn cob ash for efficient organic dye adsorbent, *J. Clean. Prod.*, 357, 1–9.
- Eskandari, A., Jafarpour, M., Rezaeifard, A., and Salimi, M., 2019, Supramolecular photocatalyst of Palladium (II) Encapsulated within Dendrimer on TiO<sub>2</sub>

- nanoparticles for Photo-induced Suzuki-Miyaura and Sonogashira Cross-Coupling reactions, *Appl. Organomet. Chem.*, 33, 13–18.
- Eslahi, H., Sardarian, A.R., and Esmailpour, M., 2021, Green and sustainable palladium nanomagnetic catalyst stabilized by glucosamine-functionalized Fe<sub>3</sub>O<sub>4</sub>@SiO<sub>2</sub> nanoparticles for Suzuki and Heck reactions, *Appl. Organomet. Chem.*, 35, 1–21.
- Eslami, S., Farhangdoost, B., Shahverdi, H., and Mohammadi, M., 2021, Surface grafting of silica nanoparticles using 3-aminopropyl (triethoxysilane) to improve the CO<sub>2</sub> absorption and enhance the gas consumption during the CO<sub>2</sub> hydrate formation, *Greenh. Gases Sci. Technol.*, 11, 939–953.
- Esmailpour, M., Zahmatkesh, S., Fahimi, N., and Nosratabadi, M., 2018, Palladium nanoparticles immobilized on EDTA-modified Fe<sub>3</sub>O<sub>4</sub>@SiO<sub>2</sub> nanospheres as an efficient and magnetically separable catalyst for Suzuki and Sonogashira cross-coupling reactions, *Appl. Organomet. Chem.*, 32, 1–15.
- Fan, X., Yang, J., Pang, Q., Liu, Z., Zhang, P., and Yang, J.H., 2021, Ultrafine and Highly Dispersed Pd/SiO<sub>2</sub> for Suzuki–Miyaura Cross-coupling Reactions, *Catal. Letters*, 151, 2291–2301.
- Fardhyanti, D.S., Dewi, R., Putri, A., Fianti, O., and Fitriyaningsi, A., 2018, Synthesis of Silica Powder from Sugar Cane Bagasse Ash and Its Application as Adsorbent in Adsorptive-distillation of Ethanol-water Solution, *MATEC Web Conf.*, 2002, 1–6.
- Farid, S.A. and Zaheer, M.M., 2023, Production of new generation and sustainable concrete using Rice Husk Ash (RHA): A review, *Mater. Today Proc.*, 1–10.
- Farrant, W.E., Babafemi, A.J., Kolawole, J.T., and Panda, B., 2022, Influence of Sugarcane Bagasse Ash and Silica Fume on the Mechanical and Durability Properties of Concrete, *Materials (Basel)*, 15, 1–20.
- Feizpour, F., Jafarpour, M., and Rezaeifard, A., 2019, Band Gap Modification of TiO<sub>2</sub> Nanoparticles by Ascorbic Acid-Stabilized Pd Nanoparticles for Photocatalytic Suzuki–Miyaura and Ullmann Coupling Reactions, *Catal. Letters*, 1–16.
- Fernandes, I.J., Calheiro, D., Sánchez, F.A.L., Camacho, A.L.D., De Campos Rocha, T.L.A., Moraes, C.A.M., and De Sousa, V.C., 2017, Characterization of silica produced from rice husk ash: Comparison of purification and processing methods, *Mater. Res.*, 20, 519–525.
- Fernandes, I.J., Moraes, C.A.M., Egea, J.R.J., and Sousa, V.C., 2024, Production and characterization of silica materials from rice husk ash by different combustion processes, *Powder Technol.*, 436, 1–12.
- Fuentes, E.M., Da Costa Faro, A., De Freitas Silva, T., Assaf, J.M., and Rangel, M.D.C., 2011, A comparison between copper and nickel-based catalysts obtained from hydrotalcite-like precursors for WGS, *Catal. Today*, 171,

290–296.

- Gandra, U.R., Reddy, P.S., Salam, A., Gajagouni, S.P., Alfantazi, A., and Mohideen, M.I.H., 2024, TiO<sub>2</sub> supported palladium-bipyridyl complex as an efficient catalyst for Suzuki–Miyaura reaction in aqueous-ethanol, *Sci. Rep.*, 14, 1–9.
- Ghabdian, K., Motavalizadehkakhky, A., Zhiani, R., Heravi, M.M., Allahresani, A., and Zadsirjan, V., 2023, (Fe<sub>3</sub>O<sub>4</sub>@SiO<sub>2</sub>/GO–NH<sub>2</sub>–Co(II) NPs): A Novel and Efficient Nanomagnetic Heterogeneous Cobalt Catalysis in the Sonogashira and Heck–Mizoroki Coupling Reactions, *J. Clust. Sci.*, 34, 3105–3119.
- Ghaedi, H. and Zhao, M., 2022, Review on Template Removal Techniques for Synthesis of Mesoporous Silica Materials, *Energy and Fuels*, 36, 2424–2446.
- Ghorbani-Choghamarani, A., Derakhshan, A.A., Hajjami, M., and Rajabi, L., 2016, Copper-Schiff base alumoxane: A new and reusable mesoporous nano catalyst for Suzuki-Miyaura and Stille C–C cross-coupling reactions, *RSC Adv.*, 6, 94314–94324.
- Ghorbani-Choghamarani, A., Taherinia, Z., and Mohammadi, M., 2021, Facile synthesis of Fe<sub>3</sub>O<sub>4</sub>@GlcA@Ni-MOF composites as environmentally green catalyst in organic reactions, *Environ. Technol. Innov.*, 24, 1–14.
- Habibi, D., Faraji, A.R., Arshadi, M., and Fierro, J.L.G., 2013, Characterization and catalytic activity of a novel Fe nano-catalyst as efficient heterogeneous catalyst for selective oxidation of ethylbenzene, cyclohexene, and benzylalcohol, *J. Mol. Catal. A Chem.*, 372, 90–99.
- Haider, J. Bin, Haque, M.I., Hoque, M., Hossen, M.M., Mottakin, M., Khaleque, M.A., Johir, M.A.H., Zhou, J.L., Ahmed, M.B., and Zargar, M., 2022, Efficient extraction of silica from openly burned rice husk ash as adsorbent for dye removal, *J. Clean. Prod.*, 380, 1–11.
- Hardyanti, I.S., Nurani, I., Hardjono HP, D.S., Apriliani, E., and Wibowo, E.A.P., 2017, Pemanfaatan Silika (SiO<sub>2</sub>) dan Bentonit sebagai Adsorben Logam Berat Fe pada Limbah Batik, *JST*, 3, 37–41.
- Hashim, U., Nadzirah, S., Azizah, N., Azmi, M.S., and Bala, K., 2015, Silanization using APTES in different solvents on titanium dioxide nanoparticles, *Proc. - 2015 2nd Int. Conf. Biomed. Eng. ICoBE 2015*, 30–31.
- Hegde, S., Nizam, A., and Vijayan, A., 2023, Furaldehyde-based magnetic supported palladium nanoparticles as an efficient heterogeneous catalyst for Mizoroki-Heck cross-coupling reaction, *New J. Chem.*, 1121–1129.
- Heravi, M.M., Zadsirjan, V., Hajiabbasi, P., and Hamidi, H., 2019, Advances in Kumada–Tamao–Corriu cross-coupling reaction: an update, *Monatsh. Chem.*, 150, 535–591.
- Hong, K., Sajjadi, M., Suh, J.M., Zhang, K., Nasrollahzadeh, M., Jang, H.W., Varma, R.S., and Shokouhimehr, M., 2020, Palladium Nanoparticles on

- Assorted Nanostructured Supports: Applications for Suzuki, Heck, and Sonogashira Cross-Coupling Reactions, *ACS Appl. Nano Mater.*, 3, 2070–2103.
- Hossain, S.S., Mathur, L., Bhardwaj, A., and Roy, P.K., 2019, A facile route for the preparation of silica foams using rice husk ash, *Int. J. Appl. Ceram. Technol.*, 16, 1069–1077.
- Hosseini-Sarvari, M. and Dehghani, A., 2023, Nickel/TiO<sub>2</sub>-catalyzed Suzuki–Miyaura cross-coupling of arylboronic acids with aryl halides in MeOH/H<sub>2</sub>O, *Monatsh. Chem.*, 154, 397–405.
- Iffland, L., Petuker, A., Gastel, M. Van, and Apfel, U., 2017, Mechanistic Implications for the Ni (I)-Catalyzed Kumada Cross-Coupling Reaction, *Inorganics*, 5, 1–13.
- Irzaman, Cahyani, I.D., Aminullah, Maddu, A., Yulianto, B., and Siregar, U.J., 2020, Biosilica properties from rice husk using Various HCl concentrations and frequency sources, *Egypt. J. Chem.*, 63, 363–371.
- Jamwal, B., Kaur, M., Sharma, H., Khajuria, C., Paul, S., and Clark, J.H., 2019, Diamines as interparticle linkers for silica-titania supported PdCu bimetallic nanoparticles in Chan-Lam and Suzuki cross-coupling reactions, *New J. Chem.*, 43, 4919–4928.
- Jasim, S.A., Ansari, M.J., Majdi, H.S., Oplencia, M.J.C., and Uktamov, K.F., 2022, Nanomagnetic Salamo-based-Pd(0) Complex: an efficient heterogeneous catalyst for Suzuki–Miyaura and Heck cross-coupling reactions in aqueous medium, *J. Mol. Struct.*, 1261, 1–14.
- Kadu, B.S., 2021, Suzuki-Miyaura cross coupling reaction: recent advancements in catalysis and organic synthesis, *Catal. Sci. Technol.*, 11, 1186–1221.
- Kato, T., Yamada, Y., Nishikawa, Y., Otomo, T., Sato, H., and Sato, S., 2021, Origins of peaks of graphitic and pyrrolic nitrogen in N1s X-ray photoelectron spectra of carbon materials: quaternary nitrogen, tertiary amine, or secondary amine?, *J. Mater. Sci.*, 56, 15798–15811.
- Khan, K., Ullah, M.F., Shahzada, K., Amin, M.N., Bibi, T., Wahab, N., and Aljaafari, A., 2020, Effective use of micro-silica extracted from rice husk ash for the production of high-performance and sustainable cement mortar, *Constr. Build. Mater.*, 258, 1–12.
- Khandaka, H., Sharma, K.N., and Joshi, R.K., 2021, Aerobic Cu and amine free Sonogashira and Stille couplings of aryl bromides/chlorides with a magnetically recoverable Fe<sub>3</sub>O<sub>4</sub>@SiO<sub>2</sub> immobilized Pd(II)-thioether containing NHC, *Tetrahedron Lett.*, 67, 1–7.
- Khoury, D. El, 2018, Towards the use of Electrostatic Force Microscopy to study interphases in nanodielectric materials Présentée par Diana EL KHOURY, *L' Univ. Mont Pellier, Thesis*.
- Kiani, F. and Naeimi, H., 2018, Ultrasonic accelerated coupling reaction using

- magnetically recyclable bis (propyl molononitril) Ni complex nanocatalyst: A novel, green and efficient synthesis of biphenyl derivatives, *Ultrason. Sonochem.*, 48, 267–274.
- Kiss, Á., Hell, Z., and Bálint, M., 2010, Nickel/magnesium-lanthanum mixed oxide catalyst in the Kumada-coupling, *Org. Biomol. Chem.*, 8, 331–335.
- Kiss, Á., Németh, J., Fodor, A., and Hell, Z., 2015, Supported metal catalysts in organic syntheses, *Period. Polytech. Chem. Eng.*, 59, 72–81.
- Kocjan, A., Logar, M., and Shen, Z., 2017, The agglomeration, coalescence and sliding of nanoparticles, leading to the rapid sintering of zirconia nanoceramics, *Sci. Rep.*, 7, 1–8.
- Kumar, P., Kumar, P., Khanduri, H., Pathak, S., Pathak, S., Singh, A., Singh, A., Singh, A., Basheed, G.A., Basheed, G.A., Pant, R.P., and Pant, R.P., 2020, Temperature selectivity for single phase hydrothermal synthesis of PEG-400 coated magnetite nanoparticles, *Dalt. Trans.*, 49, 8672–8683.
- Kwan, W.H. and Wong, Y.S., 2020, Acid leached rice husk ash (ARHA) in concrete: A review, *Mater. Sci. Energy Technol.*, 3, 501–507.
- Li, Q. and Zhou, Y., 2023, Brief History, Preparation Method, and Biological Application of Mesoporous Silica Molecular Sieves: A Narrative Review, *Molecules*, 28, 1–17.
- Li, Z., Dong, J., Zhang, H., Zhang, Y., Wang, H., Cui, X., and Wang, Z., 2021, Sonochemical catalysis as a unique strategy for the fabrication of nano-/micro-structured inorganics, *Nanoscale Adv.*, 3, 41–72.
- Limpakomon, S., Kulvanich, P., and Chatchawalsaisin, J., 2019, Effect of polyoxyl 40 hydrogenated castor oil solutions on the wet mass of colloidal silicon dioxide for extrusion/spheronization, *J. Drug Deliv. Sci. Technol.*, 53, 101155.
- Liu, C., Ji, C.L., Qin, Z.X., Hong, X., and Szostak, M., 2019, Synthesis of Biaryls via Decarbonylative Palladium-Catalyzed Suzuki-Miyaura Cross-Coupling of Carboxylic Acids, *iScience*, 19, 749–759.
- Liu, Y., Tourbin, M., Lachaize, S., and Guiraud, P., 2013, Silica nanoparticles separation from water: Aggregation by cetyltrimethylammonium bromide (CTAB), *Chemosphere*, 92, 681–687.
- Lupacchini, M., Mascitti, A., Giachi, G., Tonucci, L., d'Alessandro, N., Martinez, J., and Colacino, E., 2017, Sonochemistry in non-conventional, green solvents or solvent-free reactions, *Tetrahedron*, 73, 609–653.
- Lv, W., Wang, S., Wang, P., Liu, Y., Huang, Z., Li, J., Dong, M., Wang, J., and Fan, W., 2021, Regulation of Al distributions and Cu<sup>2+</sup> locations in SSZ-13 zeolites for NH<sub>3</sub>-SCR of NO by different alkali metal cations, *J. Catal.*, 393, 190–201.
- Ma, X., Zhou, B., Gao, W., Qu, Y., Wang, L., Wang, Z., and Zhu, Y., 2012, A

- recyclable method for production of pure silica from rice hull ash, *Powder Technol.*, 217, 497–501.
- Machado, I. V., dos Santos, J.R.N., Januario, M.A.P., and Corrêa, A.G., 2021, Greener organic synthetic methods: Sonochemistry and heterogeneous catalysis promoted multicomponent reactions, *Ultrason. Sonochem.*, 78, 1–48.
- Mahmud, M.S., Daud, F.D.M., Sarifuddin, N., Zaki, H.H.M., Nordin, N.H., and Mohammad, N.F., 2022, Size reduction via planetary milling and acid leaching effect on rice husk ash-derived nano-silica, *Mater. Today Proc.*, 66, 2786–2790.
- Majoul, N., Aouida, S., Bessaïs, B., and Si, S.-, 2015, Applied Surface Science Progress of porous silicon APTES-functionalization by FTIR investigations, *Appl. Surf. Sci.*, 331, 388–391.
- Maleki, A., Taheri-ledari, R., Ghalavand, R., and Firouzi-haji, R., 2020, Palladium-decorated *o*-phenylenediamine-functionalized Fe<sub>3</sub>O<sub>4</sub>/SiO<sub>2</sub> magnetic nanoparticles : A promising solid-state catalytic system used for Suzuki-Miyaura coupling reactions, *J. Phys. Chem. Solids*, 136, 1–8.
- Malevu, T.D., Mwankemwa, B.S., Motloun, S. V., Tshabalala, K.G., and Ocaya, R.O., 2019, Effect of annealing temperature on nano-crystalline TiO<sub>2</sub> for solar cell applications, *Phys. E Low-Dimensional Syst. Nanostructures*, 106, 127–132.
- Manickam, S., Camilla Boffito, D., Flores, E.M.M., Leveque, J.M., Pflieger, R., Pollet, B.G., and Ashokkumar, M., 2023, Ultrasonics and sonochemistry: Editors' perspective, *Ultrason. Sonochem.*, 99, 1–25.
- Mardjan, M.I.D., Hariadi, M.F., Putri, I.M., Musyarrofah, N.A., Salimah, M., Priatmoko, P., Purwono, B., and Commeiras, L., 2022, Ultrasonic-assisted-synthesis of isoindolin-1-one derivatives, *RSC Adv.*, 19016–19021.
- Martínez, R.F., Cravotto, G., and Cintas, P., 2021, Organic Sonochemistry: A Chemist's Timely Perspective on Mechanisms and Reactivity, *J. Org. Chem.*, 86, 13833–13856.
- Maurya, M.R., Kumar, A., and Costa Pessoa, J., 2011, Vanadium complexes immobilized on solid supports and their use as catalysts for oxidation and functionalization of alkanes and alkenes, *Coord. Chem. Rev.*, 255, 2315–2344.
- Mejía, J.M., Mejía De Gutiérrez, R., and Montes, C., 2016, Rice husk ash and spent diatomaceous earth as a source of silica to fabricate a geopolymeric binary binder, *J. Clean. Prod.*, 118, 133–139.
- Meraz, M.M., Mim, N.J., Mehedi, M.T., Noroozinejad Farsangi, E., Arafin, S.A.K., Shrestha, R.K., and Hussain, M.S., 2023, On the utilization of rice husk ash in high-performance fiber reinforced concrete (HPFRC) to reduce silica fume content, *Constr. Build. Mater.*, 369, 1–24.

- Miranda, A., Martínez, L., and De Beule, P.A.A., 2020, Facile synthesis of an aminopropylsilane layer on Si/SiO<sub>2</sub> substrates using ethanol as APTES solvent, *MethodsX*, 7, 1–11.
- Mishchik, K., 2014, Ultrafast laser-induced modification of optical glasses: a spectroscopy insight into the microscopic mechanisms, *Thesis*.
- Moghadam, H.H., Sobhani, S., and Sansano, J.M., 2020, New Nanomagnetic Heterogeneous Cobalt Catalyst for the Synthesis of Aryl Nitriles and Biaryls, *ACS Omega*, 5, 18619–18627.
- Mondal, P., Bhanja, P., Khatun, R., Bhaumik, A., Das, D., and Manirul Islam, S., 2017, Palladium nanoparticles embedded on mesoporous TiO<sub>2</sub> material (Pd@MTiO<sub>2</sub>) as an efficient heterogeneous catalyst for Suzuki-Coupling reactions in water medium, *J. Colloid Interface Sci.*, 508, 378–386.
- Moon, J., Cho, H., and Song, J., 2012, Synthesis and Conductive Properties of Li<sup>1+</sup><sub>x</sub>Al<sub>x</sub>Ti<sub>2-x</sub>(PO<sub>4</sub>)<sub>3</sub> (x = 0, 0.3, 0.5) by Sol-Gel Method, *Kor. J. Mater. Res.*, 22, 346–351.
- Naddaf, M., Kafa, H., and Ghanem, I., 2020, Extraction and Characterization of Nano-Silica from Olive Stones, *Silicon*, 12, 185–192.
- Nair, P.P., Philip, R.M., and Anilkumar, G., 2021, Nickel catalysts in Sonogashira coupling reactions, *Org. Biomol. Chem.*, 19, 4228–4242.
- Nasseri, F., Nasseri, M.A., Kassaee, M.Z., and Yavari, I., 2023, Synergistic performance of a new bimetallic complex supported on magnetic nanoparticles for Sonogashira and C–N coupling reactions, *Sci. Rep.*, 13, 1–20.
- Nayak, P.P. and Datta, A.K., 2021, Synthesis of SiO<sub>2</sub>-Nanoparticles from Rice Husk Ash and its Comparison with Commercial Amorphous Silica through Material Characterization, *Silicon*, 13, 1209–1214.
- Nayak, P.P., Nandi, S., Bhunia, K., and Datta, A.K., 2023, Modelling the extraction process parameters of amorphous silica-rich rice husk ash using hybrid RSM–BPANN–MOGA optimization technique, *Mater. Chem. Phys.*, 293, 1–17.
- Niakan, M., Masteri-Farahani, M., Karimi, S., and Shekaari, H., 2021, Hydrophilic role of deep eutectic solvents for clean synthesis of biphenyls over a magnetically separable Pd-catalyzed Suzuki-Miyaura coupling reaction, *J. Mol. Liq.*, 324, 1–33.
- Norsuraya, S., Fazlena, H., and Norhasyimi, R., 2016, Sugarcane Bagasse as a Renewable Source of Silica to Synthesize Santa Barbara Amorphous-15 (SBA-15), *Procedia Eng.*, 148, 839–846.
- Nzereogu, P.U., Omah, A.D., Ezema, F.I., Iwuoha, E.I., and Nwanya, A.C., 2023, Silica extraction from rice husk: Comprehensive review and applications, *Hybrid Adv.*, 4, 1–15.

- Ouellette, R.J. and Rawn, J.D., 2014, Haloalkanes and Alcohols Introduction to Nucleophilic Substitution and Elimination Reactions.
- Palcheva, R., Dimitrov, L., Tyuliev, G., Spojakina, A., and Jiratova, K., 2013, TiO<sub>2</sub> nanotubes supported NiW hydrodesulphurization catalysts: Characterization and activity, *Appl. Surf. Sci.*, 265, 309–316.
- Parida, K.M., Mallick, S., Sahoo, P.C., and Rana, S.K., 2010, A facile method for synthesis of amine-functionalized mesoporous zirconia and its catalytic evaluation in Knoevenagel condensation, *Appl. Catal. A Gen.*, 381, 226–232.
- Peltzer, R.M., Eisenstein, O., Nova, A., and Cascella, M., 2017, How Solvent Dynamics Controls the Schlenk Equilibrium of Grignard Reagents: A Computational Study of CH<sub>3</sub>MgCl in Tetrahydrofuran, *J. Phys. Chem. B*, 121, 4226–4237.
- Pharande, P.S., Rashinkar, G.S., and Pore, D.M., 2021, Cellulose Schiff base-supported Pd(II): An efficient heterogeneous catalyst for Suzuki Miyaura cross-coupling, *Res. Chem. Intermed.*, 47, 4457–4476.
- Rachmaniar, S., Nugraha, D.A., Santjojo, D.J.D.H., Tjahjanto, R.T., Mufti, N., and Masruroh, 2024, Prevention of particle agglomeration in sol–gel synthesis of TiO<sub>2</sub> nanoparticles via addition of surfactant, *J. Nanoparticle Res.*, 26, 1–11.
- Rafiee, F., Khavari, P., Payami, Z., and Ansari, N., 2019, Palladium nanoparticles immobilized on the magnetic few layer graphene support as a highly efficient catalyst for ligand free Suzuki cross coupling and homo coupling reactions, *J. Organomet. Chem.*, 883, 78–85.
- Rahimi, L., Mansoori, Y., Nuri, A., Koochi-Zargar, B., and Esquivel, D., 2021, A new Pd(II)-supported catalyst on magnetic SBA-15 for C–C bond formation via the Heck and Hiyama cross-coupling reactions, *Appl. Organomet. Chem.*, 35, 1–18.
- Ramesh, A., Da, C.T., Manigandan, R., Bhargav, P.B., and Nguyen-Le, M.T., 2022, Selectivity oxidation of benzyl alcohol using mesoporous g-C<sub>3</sub>N<sub>4</sub> catalysts prepared by hard template method, *Colloids Interface Sci. Commun.*, 48, 1–6.
- Rana, S., Bishwa Bidita Varadwaj, G., and Jonnalagadda, S.B., 2019, Ni nanoparticle supported reduced graphene oxide as a highly active and durable heterogeneous material for coupling reactions, *Nanoscale Adv.*, 1, 1527–1530.
- Rana, S., Maddila, S., Yalagala, K., and Jonnalagadda, S.B., 2015, Organo functionalized graphene with Pd nanoparticles and its excellent catalytic activity for Suzuki coupling reaction, *Appl. Catal. A Gen.*, 505, 539–547.
- Rangraz, Y., Nemati, F., and Elhampour, A., 2020, A novel magnetically recoverable palladium nanocatalyst containing organoselenium ligand for

- the synthesis of biaryls via Suzuki-Miyaura coupling reaction, *J. Phys. Chem. Solids*, 138, 1–10.
- Rashid, A. Bin, Shishir, S.I., Mahfuz, M.A., Hossain, M.T., and Hoque, M.E., 2023, Silica Aerogel: Synthesis, Characterization, Applications, and Recent Advancements, *Part. Part. Syst. Charact.*, 40, 1–22.
- Ratnani, S., Mahilkar Sonkar, S., and Kumari, R., 2023, Strategies for sustainable organic synthesis, *J. Iran. Chem. Soc.*, 20, 495–508.
- Salman, A.D., Juzsakova, T., Ákos, R., Ibrahim, R.I., Al-Mayyahi, M.A., Mohsen, S., Abdullah, T.A., and Domokos, E., 2021, Synthesis and surface modification of magnetic Fe<sub>3</sub>O<sub>4</sub>@SiO<sub>2</sub> core-shell nanoparticles and its application in uptake of scandium(III) ions from aqueous media, *Environ. Sci. Pollut. Res.*, 28, 28428–28443.
- Sancheti, S. V. and Gogate, P.R., 2018, Intensification of heterogeneously catalyzed Suzuki-Miyaura cross-coupling reaction using ultrasound: Understanding effect of operating parameters, *Ultrason. Sonochem.*, 40, 30–39.
- Santana Costa, J.A. and Paranhos, C.M., 2018, Systematic evaluation of amorphous silica production from rice husk ashes, *J. Clean. Prod.*, 192, 688–697.
- Sarker, M.Z., Rahman, M.M., Minami, H., Suzuki, T., and Ahmad, H., 2022, Amine functional silica-supported bimetallic Cu-Ni nanocatalyst and investigation of some typical reductions of aromatic nitro-substituents, *Colloid Polym. Sci.*, 300, 279–296.
- Sawasdee, V. and Pisutpaisal, N., 2022, Rice Husk Ash Characterization and Utilization as a source of Silica Material, *Chem. Eng. Trans.*, 93, 79–84.
- Sekifuji, R., Chieu, L. Van, Tateda, M., and Takimoto, H., 2021, Solubility and physical composition of rice husk ash silica as a function of calcination temperature and duration, *Int. J. Recycl. Org. Waste Agric.*, 10, 19–27.
- Senger, N.A., Bo, B., Cheng, Q., Keeffe, J.R., Gronert, S., and Wu, W., 2012, The element effect revisited: Factors determining leaving group ability in activated nucleophilic aromatic substitution reactions, *J. Org. Chem.*, 77, 9535–9540.
- September, L.A., Kheswa, N., Seroka, N.S., and Khotseng, L., 2023, Green synthesis of silica and silicon from agricultural residue sugarcane bagasse ash - a mini review, *RSC Adv.*, 13, 1370–1380.
- Setyawan, N., Hoerudin, and Wulanawati, A., 2019, Simple extraction of silica nanoparticles from rice husk using technical grade solvent: Effect of volume and concentration, *IOP Conf. Ser. Earth Environ. Sci.*, 309, 1–9.
- Setyawan, N., Hoerudin, and Yuliani, S., 2021, Synthesis of silica from rice husk by sol-gel method, *IOP Conf. Ser. Earth Environ. Sci.*, 733, 1–7.
- Sharma, H., Mahajan, H., Jamwal, B., and Paul, S., 2018, Cu@Fe<sub>3</sub>O<sub>4</sub>-TiO<sub>2</sub>-L-dopa: A novel and magnetic catalyst for the Chan-Lam cross-coupling reaction in

- ligand free conditions, *Catal. Commun.*, 107, 68–73.
- Sharma, N., Sharma, P., and Parashar, A.K., 2022, Incorporation of Silica Fume and Waste Corn Cob Ash in Cement and Concrete for Sustainable Environment, *Mater. Today Proc.*, 62, 4151–4155.
- Shinde, P.S., Suryawanshi, P.S., Patil, K.K., Belekar, V.M., Sankpal, S.A., Delekar, S.D., and Jadhav, S.A., 2021, A brief overview of recent progress in porous silica as catalyst supports, *J. Compos. Sci.*, 5, 1–17.
- Singh, R.G. and Yadav, G.D., 2024, Synthesis of biphenyl via sustainable Suzuki-Miyaura coupling reaction using mesoporous MCF-supported tin-palladium nanoparticles, *Mol. Catal.*, 553, 1–17.
- Singh, S., Geetha, P., and Ramajayam, R., 2023, Isolation, synthesis and medicinal chemistry of biphenyl analogs – A review, *Results Chem.*, 6, 1–28.
- Škrjanc, A., Jankovič, D., Meden, A., Mazaj, M., Grape, E.S., Gazvoda, M., and Zabukovec Logar, N., 2024, Carbonyl-Supported Coordination in Imidazolates: A Platform for Designing Porous Nickel-Based ZIFs as Heterogeneous Catalysts, *Small*, 20, 1–7.
- Soltani, S.S., Taheri-Ledari, R., Farnia, S.M.F., Maleki, A., and Foroumadi, A., 2020, Synthesis and characterization of a supported Pd complex on volcanic pumice laminates textured by cellulose for facilitating Suzuki-Miyaura cross-coupling reactions, *RSC Adv.*, 10, 23359–23371.
- Steven, S., Restiawaty, E., Pasymi, P., and Bindar, Y., 2021, An appropriate acid leaching sequence in rice husk ash extraction to enhance the produced green silica quality for sustainable industrial silica gel purpose, *J. Taiwan Inst. Chem. Eng.*, 122, 51–57.
- Styring, P., Grindon, C., and Fisher, C.M., 2001, A polymer-supported nickel(II) catalyst for room temperature Tamao-Kumada-Corriu coupling reactions, *Catal. Letters*, 77, 1–7.
- Sukkasem, T., Nuchitprasittichai, A., Junpirom, S., Pulsawat, N., Khumronrith, P., Photongngam, S., and Janphuang, P., 2023, Role of SiO<sub>2</sub> in TiO<sub>2</sub>/SiO<sub>2</sub> photocatalyst for hydrogen peroxide gas generation from air humidity via photocatalysis, *J. Incl. Phenom. Macrocycl. Chem.*, 2, 289–305.
- Suslick, K.S., Eddingsaas, N.C., Flannigan, D.J., Hopkins, S.D., and Xu, H., 2018, The Chemical History of a Bubble, *Acc. Chem. Res.*, 51, 2169–2178.
- Tagliapietra, S., Calcio Gaudino, E., and Cravotto, G., 2014, The use of power ultrasound for organic synthesis in green chemistry, *Power Ultrasonics*, 998–1022.
- Talreja, K., Chauhan, I., Ghosh, A., Majumdar, A., and Butola, B.S., 2017, Functionalization of silica particles to tune the impact resistance of shear thickening fluid treated aramid fabrics, *RSC Adv.*, 7, 49787–49794.
- Tamao, K., Sumitani, K., and Kumada, M., 1972, Selective Carbon-Carbon Bond

Formation by Cross-Coupling of Grignard Reagents with Organic Halides. Catalysis by Nickel-Phosphine Complexes, *J. Am. Chem. Soc.*, 94, 4374–4376.

- Tamoradi, T., Ghadermazi, M., and Ghorbani-Choghamarani, A., 2019, SBA-15@adenine-Pd: a novel and green heterogeneous nanocatalyst in Suzuki and Stille reactions and synthesis of sulfides, *J. Porous Mater.*, 26, 121–131.
- Tang, H., Yang, M., Li, X., Zhou, M.L., Bao, Y.S., Cui, X.Y., Zhao, K., Zhang, Y.Y., and Han, Z.B., 2021, Synthesis of biaryl compounds via Suzuki homocoupling reactions catalyzed by metal organic frameworks encapsulated with palladium nanoparticles, *Inorg. Chem. Commun.*, 123, 1–7.
- Tessema, B., Gonfa, G., Mekuria Hailegiorgis, S., and Venkatesa Prabhu, S., 2023, An Overview of Current and Prognostic Trends on Synthesis, Characterization, and Applications of Biobased Silica, *Adv. Mater. Sci. Eng.*, 2023, 1–23.
- Thapa, S., Shrestha, B., Gurung, S.K., and Giri, R., 2015, Copper-catalysed cross-coupling: An untapped potential, *Org. Biomol. Chem.*, 13, 4816–4827.
- Thomas, J.M., 2009, Handbook Of Heterogeneous Catalysis. 2., completely revised and enlarged Edition. Vol. 1–8. Edited by G. Ertl, H. Knözinger, F. Schüth, and J. Weitkamp., *Angew. Chemie Int. Ed.*, 48, 3390–3391.
- Thomas, P., 2017, Poly Chlorinated biphenyls (PCBs) in Power Transformers - An Indian Scenario, *J. CPRI*, 13, 621–628.
- Tian, Y., Jiao, W., Liu, P., Song, S., Lu, Z., Hirata, A., and Chen, M., 2019, Fast coalescence of metallic glass nanoparticles, *Nat. Commun.*, 10, 1–9.
- U.S. Environmental Protection Agency, 2010, Toxicological Review of Biphenyl, *Rev. Lit. Arts Am.*, 39, 759–786.
- Ulfa, M., Al Afif, H., Saraswati, E.T., and Bahruji, H., 2022, Fast Removal of Methylene Blue via Adsorption-Photodegradation on TiO<sub>2</sub>/SBA-15 Synthesized by Slow Calcination, *Materials*, 15, 1–13.
- Urquhart, L., 2018, Market watch: Top drugs and companies by sales in 2017, *Nat. Rev. Drug Discov.*, 17, 232.
- Usgodaarachchi, L., Thambiliyagodage, C., Wijesekera, R., and Bakker, M.G., 2021, Synthesis of mesoporous silica nanoparticles derived from rice husk and surface-controlled amine functionalization for efficient adsorption of methylene blue from aqueous solution, *Curr. Res. Green Sustain. Chem.*, 4, 100116.
- Vansant, 1995, *The surface chemistry of silica* 1, 59–77.
- Varadwaj, G.B.B., Rana, S., and Parida, K.M., 2013, Amine functionalized K10 montmorillonite: A solid acid-base catalyst for the Knoevenagel condensation reaction, *Dalt. Trans.*, 42, 5122–5129.

- Vásquez-Céspedes, S., Betori, R.C., Cismesia, M.A., Kirsch, J.K., and Yang, Q., 2021, Heterogeneous Catalysis for Cross-Coupling Reactions: An Underutilized Powerful and Sustainable Tool in the Fine Chemical Industry?, *Org. Process Res. Dev.*, 25, 740–753.
- Veisi, H., Ghorbani, M., and Hemmati, S., 2019, Sonochemical in situ immobilization of Pd nanoparticles on green tea extract coated Fe<sub>3</sub>O<sub>4</sub> nanoparticles: An efficient and magnetically recyclable nanocatalyst for synthesis of biphenyl compounds under ultrasound irradiations, *Mater. Sci. Eng. C*, 98, 584–593.
- Veisi, H., Joshani, Z., Karmakar, B., Tamoradi, T., Heravi, M.M., and Gholami, J., 2021, Ultrasound assisted synthesis of Pd NPs decorated chitosan-starch functionalized Fe<sub>3</sub>O<sub>4</sub> nanocomposite catalyst towards Suzuki-Miyaura coupling and reduction of 4-nitrophenol, *Int. J. Biol. Macromol.*, 172, 104–113.
- Velmurugan, P., Shim, J., Lee, K.J., Cho, M., Lim, S.S., Seo, S.K., Cho, K.M., Bang, K.S., and Oh, B.T., 2015, Extraction, characterization, and catalytic potential of amorphous silica from corn cobs by sol-gel method, *J. Ind. Eng. Chem.*, 29, 298–303.
- Viéitez-Calo, S., Morgan, D.J., Golunski, S., Taylor, S.H., and Twigg, M. V., 2021, Structure Sensitivity and Hydration Effects in Pt/TiO<sub>2</sub> and Pt/TiO<sub>2</sub>-SiO<sub>2</sub> Catalysts for NO and Propane Oxidation, *Top. Catal.*, 64, 955–964.
- Vinatoru, M. and Mason, T.J., 2019, Can sonochemistry take place in the absence of cavitation? – A complementary view of how ultrasound can interact with materials, *Ultrason. Sonochem.*, 52, 2–5.
- Wang, J., Ran, Q., Xu, X., Zhu, B., and Zhang, W., 2019, Preparation and Optical Properties of TiO<sub>2</sub>-SiO<sub>2</sub> thin films by Sol-gel Dipping Method, *IOP Conf. Ser. Earth Environ. Sci.*, 310, 2–7.
- Wang, L., Zhang, K., Hu, Z., Duan, W., Cheng, F., and Chen, J., 2014, Porous CuO nanowires as the anode of rechargeable Na-ion batteries, *Nano Res.*, 7, 199–208.
- Wang, P., Zhu, H., Liu, M., Niu, J., Yuan, B., Li, R., and Ma, J., 2014, Stabilizing Pd on the surface of amine-functionalized hollow Fe<sub>3</sub>O<sub>4</sub> spheres: A highly active and recyclable catalyst for Suzuki cross-coupling and hydrogenation reactions, *RSC Adv.*, 4, 28922–28927.
- Wang, X., Lu, Z., Jia, L., and Chen, J., 2016, Physical properties and pyrolysis characteristics of rice husks in different atmosphere, *Results Phys.*, 6, 866–868.
- Wattanasiriwech, S., Wattanasiriwech, D., and Svasti, J., 2010, Production of amorphous silica nanoparticles from rice straw with microbial hydrolysis pretreatment, *J. Non. Cryst. Solids*, 356, 1228–1232.
- Wu, Y., Zhang, Y., Zhou, J., and Gu, D., 2020, Recent progress on functional

- mesoporous materials as catalysts in organic synthesis, *Emergent Mater.*, 3, 247–266.
- Xia, W., 2016, Interactions between metal species and nitrogen-functionalized carbon nanotubes, *Catal. Sci. Technol.*, 6, 630–644.
- Yamada, Y., Tanaka, H., Kubo, S., and Sato, S., 2021, Unveiling bonding states and roles of edges in nitrogen-doped graphene nanoribbon by X-ray photoelectron spectroscopy, *Carbon N. Y.*, 185, 342–367.
- Yi, Z., Dumée, L.F., Garvey, C.J., Feng, C., She, F., Rookes, J.E., Mudie, S., Cahill, D.M., and Kong, L., 2015, A New Insight into Growth Mechanism and Kinetics of Mesoporous Silica Nanoparticles by in Situ Small Angle X-ray Scattering, *Langmuir*, 31, 8478–8487.
- Yousaf, M., Zahoor, A.F., Akhtar, R., Ahmad, M., and Naheed, S., 2020, Development of green methodologies for Heck, Chan–Lam, Stille and Suzuki cross-coupling reactions, *Mol. Divers.*, 24, 821–839.
- Yu, X. and Williams, C.T., 2022, Recent advances in the applications of mesoporous silica in heterogeneous catalysis, *Catal. Sci. Technol.*, 12, 5765–5794.
- Yuvakkumar, R., Elango, V., Rajendran, V., and Kannan, N., 2014, High-purity nano silica powder from rice husk using a simple chemical method, *J. Exp. Nanosci.*, 9, 272–281.
- Zaera, F., 2021, Designing Sites in Heterogeneous Catalysis: Are We Reaching Selectivities Competitive with Those of Homogeneous Catalysts?, *Chem. Rev.*, 8594–8757.
- Zarnegaryan, A. and Elhamifar, D., 2020, An efficient and heterogeneous Pd-containing modified graphene oxide catalyst for preparation of biaryl compounds, *Heliyon*, 6, 1–8.
- Zhang, Y., Gao, Y., and Du, X., 2018, Stability mechanisms of oscillating vapor bubbles in acoustic fields, *Ultrason. Sonochem.*, 40, 808–814.
- Zhang, Y.F. and Shi, Z.J., 2019, Upgrading Cross-Coupling Reactions for Biaryl Syntheses, *Acc. Chem. Res.*, 52, 161–169.
- Zhang, Z., Górski, B., and Leonori, D., 2022, Merging Halogen-Atom Transfer (XAT) and Copper Catalysis for the Modular Suzuki-Miyaura-Type Cross-Coupling of Alkyl Iodides and Organoborons, *J. Am. Chem. Soc.*, 144, 1986–1992.
- Zhao, W., Shen, M., Zhu, Y., Ren, X., and Li, X., 2023, Insights into Synergy of Copper and Acid Sites for Selective Catalytic Reduction of NO with Ammonia over Zeolite Catalysts, *Catalysts*, 13, 1–18.
- Zhao, Y., Huang, Z., Wang, L., Chen, X., Zhang, Y., Yang, X., Pang, D., Kang, J., and Guo, L., 2022, Highly efficient and recyclable amorphous Pd(II)/crystal Pd(0) catalyst for boosting Suzuki reaction in aqueous solution, *Nano Res.*, 15, 1193–1198.



Zhang, J., Kong, L., Chen, Y., Huang, H., Zhang, H., Yao, Y., Xu, Yuxi, Xu, Yan, Wang, S., Ma, X., and Zhao, Y., 2021, Enhanced synergy between Cu<sup>0</sup> and Cu<sup>+</sup> on nickel doped copper catalyst for gaseous acetic acid hydrogenation, *Front. Chem. Sci. Eng.*, 15, 666–678.

Zimbovskiy, D.S., Gavrilov, A.I., and Churagulov, B.R., 2018, Synthesis of copper oxides films via anodic oxidation of copper foil followed by thermal reduction, *IOP Conf. Ser. Mater. Sci. Eng.*, 347, 1–9.