

ChE Publications

2021

1. Wan Mahari, W.A.; Azwar, E.; Foong, S.Y.; Ahmed, A.; Peng, W.; Tabatabaei, M.; Aghbashlo, M.; Park, Y.-K.; Sonne, C.; Lam, S.S. Valorization of municipal wastes using co-pyrolysis for green energy production, energy security, and environmental sustainability: A review. *Chem. Eng. J.* **2021**, *421*, 129749.
2. Ullah, H.; Qureshi, K.S.; Khan, U.; Zaffar, M.; Yang, Y.J.; Rabat, N.E.; Khan, M.I.; Saqib, S.; Mukhtar, A.; Ullah, S.; et al. Self-healing epoxy coating synthesis by embedment of metal 2-methyl imidazole and acetylacetone complexes with microcapsules. *Chemosphere* **2021**, *285*, 131492.
3. Fazal, T.; Rehman, M.S.U.; Javed, F.; Akhtar, M.; Mushtaq, A.; Hafeez, A.; Alaud Din, A.; Iqbal, J.; Rashid, N.; Rehman, F. Integrating bioremediation of textile wastewater with biodiesel production using microalgae (*Chlorella vulgaris*). *Chemosphere* **2021**, *281*, 130758.
4. Abbas, T.; Wadhawan, T.; Khan, A.; McEvoy, J.; Khan, E. Iron turning waste: Low cost and sustainable permeable reactive barrier media for remediating dieldrin, endrin, DDT and lindane in groundwater. *Environ. Pollut.* **2021**, *117825*.
5. Shahid, M.K.; Batool, A.; Kashif, A.; Nawaz, M.H.; Aslam, M.; Iqbal, N.; Choi, Y. Biofuels and biorefineries: Development, application and future perspectives emphasizing the environmental and economic aspects. *J. Environ. Manage.* **2021**, *297*, 113268.
6. Mukhtar, A.; Saqib, S.; Mubashir, M.; Ullah, S.; Inayat, A.; Mahmood, A.; Ibrahim, M.; Show, P.L. Mitigation of CO₂ emissions by transforming to biofuels: Optimization of biofuels production processes. *Renew. Sustain. Energy Rev.* **2021**, *150*, 111487.
7. Ahmad, N.; Wang, X.; Sun, P.; Chen, Y.; Rehman, F.; Xu, J.; Xu, X. Electrochemical CO₂ reduction to CO facilitated by MDEA-based deep eutectic solvent in aqueous solution. *Renew. Energy* **2021**, *177*, 23–33.

8. Asghar, U.; Rafiq, S.; Anwar, A.; Iqbal, T.; Ahmed, A.; Jamil, F.; Khurram, M.S.; Akbar, M.M.; Farooq, A.; Shah, N.S.; et al. Review on the progress in emission control technologies for the abatement of CO₂, SO_x and NO_x from fuel combustion. *J. Environ. Chem. Eng.* **2021**, *9*, 106064.
9. Fazal, T.; Faisal, A.; Mushtaq, A.; Hafeez, A.; Javed, F.; Din, A.A.; Rashid, N.; Aslam, M.; Rehman, M.S.U.; Rehman, F. Macroalgae and coal-based biochar as a sustainable bioresource reuse for treatment of textile wastewater. *Biomass Convers. Biorefinery* **2019**, *1–16*.
10. Zaman, S.U.; Zaman, M.K.U.; Irfan, M.; Rafiq, S.; Irfan, M.; Muhammad, N.; Saif-ur-Rehman; Wajeeh, S.; Naz, G. Biocompatible chicken bone extracted dahlite/hydroxyapatite/collagen filler based polysulfone membrane for dialysis. *Int. J. Artif. Organs* **2021**, *0391398821994119*.
11. Nisar, U. Bin; Khan, M.J.; Imran, M.; Khan, M.R.; Farooq, M.; Ehsan, S.A.; Ahmad, A.; Qazi, H.H.; Rashid, N.; Manzoor, T. Groundwater investigations in the Hattar industrial estate and its vicinity, Haripur district, Pakistan: An integrated approach. *Kuwait J. Sci.* **2021**, *48*.
12. Inayat, A.; Jamil, F.; Raza, M.; Khurram, S.; Ghenai, C.; Al-Muhatseb, A.H. Upgradation of waste cooking oil to biodiesel in the presence of green catalyst derived from date seeds. *Biofuels* **2021**, *12*, 1245–1250.
13. Rahim, A.R.A.; Johari, K.; Shehzad, N.; Saman, N.; Mat, H. Conversion of coconut waste into cost effective adsorbent for Cu (II) and Ni (II) removal from aqueous solutions. *Environ. Eng. Res.* **2020**, *26*, 200250.
14. Wreland Lindström, R. Low-cost Single Chamber MFC Integrated with Novel Lignin-based Carbon Fiber Felt Bioanode for Treatment of Recalcitrant Azo Dye. *Front. Energy Res.* **2021**, *9*, 260.
15. Kanwal, F.; Ahmed, A.; Jamil, F.; Rafiq, S.; Ayub, H.M.; Ghauri, M.; Khurram, M.S.; Munir, S.; Inayat, A.; Abu Bakar, M.S. Co-Combustion of Blends of Coal and Underutilised Biomass Residues for Environmental Friendly Electrical Energy Production. *Sustainability* **2021**, *13*, 4881.
16. Shafiq, I.; Hussain, M.; Shafique, S.; Hamayun, M.H.; Mudassir, M.; Nawaz, Z.; Ahmed, A.; Park, Y.-K. A comprehensive numerical design of firefighting systems for onshore petroleum installations. *Korean J. Chem. Eng.* **2021**, *38*, 1768–1780.
17. Asif, M.; Zafar, M.; Akhter, P.; Hussain, M.; Umer, A.; Razzaq, A.; Kim,

W.-Y. Effect of Urea Addition on Anatase Phase Enrichment and Nitrogen Doping of TiO₂ for Photocatalytic Abatement of Methylene Blue. *Appl. Sci.* **2021**, *11*, 8264.

18. Iqbal, Y.; Malik, A.R.; Iqbal, T.; Aziz, M.H.; Ahmed, F.; Abolaban, F.A.; Ali, S.M.; Ullah, H. Green synthesis of ZnO and Ag-doped ZnO nanoparticles using *Azadirachta indica* leaves: Characterization and their potential antibacterial, antidiabetic, and wound-healing activities. *Mater. Lett.* **2021**, *305*, 130671.
19. Suresh, S.D.; Qasim, A.; Lal, B.; Imran, S.M.; Foo, K.S. Application of Gaussian Process Regression (GPR) in Gas Hydrate Mitigation. *J. Adv. Res. Fluid Mech. Therm. Sci.* **2021**, *88*, 27–37.
20. Sajid, M.S.; Saleem, S.; Jabeen, F.; Fatima, B.; Zulfikar, M.; Ashiq, M.N.; Ressom, H.W.; Pukala, T.L.; Najam-ul-Haq, M. Iminodiacetic acid (IDA)-generated mesoporous nanopolymer: a template to relate surface area, hydrophilicity, and glycopeptides enrichment. *Microchim. Acta* **2021**, *188*, 1–8.
21. Barambu, N.U.; Bilad, M.R.; Laziz, A.M.; Nordin, N.A.H.M.; Bustam, M.A.; Shamsuddin, N.; Khan, A.L. A wavy flow channel system for membrane fouling control in oil/water emulsion filtration. *J. Water Process Eng.* **2021**, *44*, 102340.
22. Ahmed, U.; Hussain, M.A.; Bilal, M.; Zeb, H.; Ahmad, N.; Ahmad, N.; Usman, M. Production of Hydrogen from Low Rank Coal Using Process Integration Framework between Syngas Production Processes: Techno-Economic Analysis. *Chem. Eng. Process. Intensif.* **2021**, *169*, 108639.
23. Osman, A.I.; Qasim, U.; Jamil, F.; Ala'a, H.; Jrai, A.A.; Al-Riyami, M.; Al-Maawali, S.; Al-Haj, L.; Al-Hinai, A.; Al-Abri, M. Bioethanol and biodiesel: Bibliometric mapping, policies and future needs. *Renew. Sustain. Energy Rev.* **2021**, *152*, 111677.
24. Khan, Z.; Javed, F.; Shamair, Z.; Hafeez, A.; Fazal, T.; Aslam, A.; Zimmerman, W.B.; Rehman, F. Current developments in esterification reaction: A review on process and parameters. *J. Ind. Eng. Chem.* **2021**, *103*, 80–101.
25. Saeed, U.; Khan, A.L.; Gilani, M.A.; Bilad, M.R.; Khan, A.U. Supported deep eutectic liquid membranes with highly selective interaction sites for efficient CO₂ separation. *J. Mol. Liq.* **2021**, *342*, 117509.

26. Qasim, U.; Rafiq, S.; Jamil, F.; Ahmed, A.; Ali, T.; Kers, J.; Khurram, M.S.; Hussain, M.; Inayat, A.; Park, Y.-K. Processing of lignocellulose in ionic liquids: A cleaner and sustainable approach. *J. Clean. Prod.* **2021**, *323*, 129189.
27. Nayab, S.S.; Abbas, M.A.; Mushtaq, S.; Khan Niazi, B.; Batool, M.; Shehnaz, G.; Ahmad, N.; Ahmad, N.M. Anti-Foulant Ultrafiltration Polymer Composite Membranes Incorporated with Composite Activated Carbon/Chitosan and Activated Carbon/Thiolated Chitosan with Enhanced Hydrophilicity. *Membranes (Basel)*. **2021**, *11*, 827.
28. Shafiq, I.; Hussain, M.; Shafique, S.; Akhter, P.; Ahmed, A.; Ashraf, R.S.; Ali Khan, M.; Jeon, B.-H.; Park, Y.-K. Systematic Assessment of Visible-Light-Driven Microspherical V₂O₅ Photocatalyst for the Removal of Hazardous Organosulfur Compounds from Diesel. *Nanomaterials* **2021**, *11*, 2908.
29. Wang, P.; Chen, G.; Li, W.; Li, H.; Ju, B.; Hussain, M.; Yang, W.; Wu, G. Microstructural evolution and thermal conductivity of diamond/Al composites during thermal cycling. *Int. J. Miner. Metall. Mater.* **2021**, *28*, 1821–1827.
30. Ishaq, M.; Gilani, M.A.; Bilad, M.R.; Faizan, A.; Raja, A.A.; Afzal, Z.M.; Khan, A.L. Exploring the potential of highly selective alkanolamine containing deep eutectic solvents based supported liquid membranes for CO₂ capture. *J. Mol. Liq.* **2021**, *340*, 117274.
31. Jamil, F.; Al-Riyami, M.; Al-Haj, L.; Al-Muhtaseb, A.H.; Myint, M.T.Z.; Baawain, M.; Al-Abri, M. Waste Balanites aegyptiaca seed oil as a potential source for biodiesel production in the presence of a novel mixed metallic oxide catalyst. *Int. J. Energy Res.* **2021**, *45*, 17189–17202.
32. Hamayun, M.H.; Ramzan, N.; Hussain, M.; Faheem, M. Reply to Variny et al. Comment on “Hamayun et al. Evaluation of Two-Column Air Separation Processes Based on Exergy Analysis. Energies 2020, 13, 6361.” *Energies* **2021**, *14*, 6445.
33. Ahmed, M.F.; Abbas, M.A.; Mahmood, A.; Ahmad, N.M.; Rasheed, H.; Qadir, M.A.; Khan, A.U.; Qiblawey, H.; Zhu, S.; Sadiq, R. Hybrid Beads of Zero Valent Iron Oxide Nanoparticles and Chitosan for Removal of Arsenic in Contaminated Water. *Water* **2021**, *13*, 2876.
34. Ul Hassan, S.; Bilal, B.; Nazir, M.S.; Naqvi, S.A.R.; Ali, Z.; Nadeem, S.;

Muhammad, N.; Palvasha, B.A.; Mohyuddin, A. Recent progress in materials development and biological properties of GTR membranes for periodontal regeneration. *Chem. Biol. Drug Des.* **2021**.

35. Naqvi, S.R.; Tariq, R.; Shahbaz, M.; Naqvi, M.; Amin, A.; Khan, Z.; Mackey, H.; Mckay, G.; Al-Ansari, T. Recent developments on sewage sludge pyrolysis and its kinetics: Resources recovery, thermogravimetric platforms, and innovative prospects. *Comput. Chem. Eng.* **2021**, 107325.
36. Suleman, M.; Zafar, M.; Ahmed, A.; Rashid, M.U.; Hussain, S.; Razzaq, A.; Mohidem, N.A.; Fazal, T.; Haider, B.; Park, Y.-K. Castor Leaves-Based Biochar for Adsorption of Safranin from Textile Wastewater. *Sustain.* **2021**, 13.
37. Zaman, S.U.; Saif-Ur-Rehman; Zaman, M.K.U.; Rafiq, S.; Arshad, A.; Khurram, M.S.; Irfan, M.; Saqib, S.; Muhammad, N.; Irfan, M.; et al. Fabrication and performance evaluation of polymeric membrane using blood compatible hydroxyapatite for artificial kidney application. *Artif. Organs* **2021**.
38. Hafeez, A.; Shezad, N.; Javed, F.; Fazal, T.; ur Rehman, M.S.; Rehman, F. Synergetic effect of packed-bed corona-DBD plasma micro-reactor and photocatalysis for organic pollutant degradation. *Sep. Purif. Technol.* **2021**, 269, 118728.
39. Mukhtar, A.; Ullah, S.; Inayat, A.; Saqib, S.; Mellon, N.B.; Assiri, M.A.; Al-Sehemi, A.G.; Khan Niazi, M.B.; Jahan, Z.; Bustam, M.A.; et al. Synthesis - structure-property relationship of nitrogen-doped porous covalent triazine frameworks for pre-combustion CO₂ capture. *Energy* **2021**, 216, 119230.
40. Saeed, U.; Khan, A.L.; Gilani, M.A.; Bilad, M.R.; Khan, A.U. Supported liquid membranes comprising of choline chloride based deep eutectic solvents for CO₂ capture: Influence of organic acids as hydrogen bond donor. *J. Mol. Liq.* **2021**, 335, 116155.
41. Saghir, M.; Umer, M.A.; Ahmed, A.; Monir, N.B.; Manzoor, U.; Razzaq, A.; Xian, L.; Mohammad, K.; Shahid, M.; Park, Y.-K. Effect of high energy ball milling and low temperature densification of plate-like alumina powder. *Powder Technol.* **2021**, 383, 84–92.
42. Hafeez, A.; Javed, F.; Fazal, T.; Shezad, N.; Amjad, U.-S.; Rehman, M.S. ur; Rehman, F. Intensification of ozone generation and degradation of azo dye in non-thermal hybrid corona-DBD plasma micro-reactor. *Chem. Eng. Process.*

- *Process Intensif.* **2021**, *159*, 108205.

43. Wan Osman, W.N.A.; Mat Nawi, N.I.; Samsuri, S.; Bilad, M.R.; Khan, A.L.; Hunaepi, H.; Jaafar, J.; Lam, M.K. Ultra low-pressure filtration system for energy efficient microalgae filtration. *Heliyon* **2021**, *7*, e07367.
44. Qasim, U.; Osman, A.I.; Al-Muhtaseb, A.H.; Farrell, C.; Al-Abri, M.; Ali, M.; Vo, D.-V.N.; Jamil, F.; Rooney, D.W. Renewable cellulosic nanocomposites for food packaging to avoid fossil fuel plastic pollution: a review. *Environ. Chem. Lett.* **2021**, *19*, 613–641.
45. Inayat, A.; Shahbaz, M.; Khan, Z.; Inayat, M.; Mofijur, M.; Ahmed, S.F.; Ghenai, C.; Ahmad, A.A. Heat integration modeling of hydrogen production from date seeds via steam gasification. *Int. J. Hydrogen Energy* **2021**, *46*, 30592–30605.
46. Asif, S.; Mubashir, M.; Klemeš, J.J.; Saqib, S.; Mukhtar, A.; Bokhari, A.; Lukose, J.; Koyande, A.K.; Chew, K.W.; Show, P.L. Enhanced production of non-edible Xanthium spinosum-based biodiesel using waste biomass under dynamic conditions. *Biomass Convers. Biorefinery* **2021**.
47. Shakeel, U.; Hussain, M.; Sheikh, R.; Ahmed, A.; Nazir, M.S.; Yang, W.; Shezad, N.; Akhter, P.; Park, Y.-K. Development of highly efficient solid acid catalysts supported on mesoporous KIT-6 for esterification of oleic acid. *Korean J. Chem. Eng.* **2021**, *38*, 966–974.
48. Qadeer, M.U.; Ayoub, M.; Komiya, M.; Khan Daulatzai, M.U.; Mukhtar, A.; Saqib, S.; Ullah, S.; Qyyum, M.A.; Asif, S.; Bokhari, A. Review of biodiesel synthesis technologies, current trends, yield influencing factors and economical analysis of supercritical process. *J. Clean. Prod.* **2021**, *309*, 127388.
49. Amjad, U.-S.; Ishaq, M.; Rehman, H. ur; Ahmad, N.; Sherin, L.; Hussain, M.; Mustafa, M. Diesel and gasoline like fuel production with minimum styrene content from catalytic pyrolysis of polystyrene. *Environ. Prog. Sustain. Energy* **2021**, *40*, e13493.
50. Rashid, R.; Shafiq, I.; Akhter, P.; Iqbal, M.J.; Hussain, M. A state-of-the-art review on wastewater treatment techniques: the effectiveness of adsorption method. *Environ. Sci. Pollut. Res.* **2021**, *28*, 9050–9066.
51. Muazzam, R.; Hafeez, A.; Uroos, M.; Saeed, M.; Rehman, F.; Muhammad, N. Plasma-based ozonolysis of lignin waste materials for the production of

value-added chemicals. *Biomass Convers. Biorefinery* **2021**.

52. Ansarinab, H.; Hajabdollahi, H.; Fatimah, M. Life cycle assessment (LCA) of a novel geothermal-based multigeneration system using LNG cold energy-integration of Kalina cycle, stirling engine, desalination unit and magnetic refrigeration system. *Energy* **2021**, *231*, 120888.
53. Shafiq, I.; Shafique, S.; Akhter, P.; Ishaq, M.; Yang, W.; Hussain, M. Recent breakthroughs in deep aerobic oxidative desulfurization of petroleum refinery products. *J. Clean. Prod.* **2021**, *294*, 125731.
54. Riaz, F.; Qyyum, M.A.; Bokhari, A.; Klemeš, J.J.; Usman, M.; Asim, M.; Awan, M.R.; Imran, M.; Lee, M. Design and Energy Analysis of a Solar Desiccant Evaporative Cooling System with Built-In Daily Energy Storage. *Energies* **2021**, *14*.
55. Hafeez, A.; Shamair, Z.; Shezad, N.; Javed, F.; Fazal, T.; Rehman, S. ur; Bazmi, A.A.; Rehman, F. Solar powered decentralized water systems: A cleaner solution of the industrial wastewater treatment and clean drinking water supply challenges. *J. Clean. Prod.* **2021**, *289*, 125717.
56. Siraj, Z.; Maafa, I.M.; Shafiq, I.; Shezad, N.; Akhter, P.; Yang, W.; Hussain, M. KIT-6 induced mesostructured TiO₂ for photocatalytic degradation of methyl blue. *Environ. Sci. Pollut. Res.* **2021**.
57. Amen, R.; Hameed, J.; Albashar, G.; Kamran, H.W.; Hassan Shah, M.U.; Zaman, M.K.U.; Mukhtar, A.; Saqib, S.; Ch, S.I.; Ibrahim, M.; et al. Modelling the higher heating value of municipal solid waste for assessment of waste-to-energy potential: A sustainable case study. *J. Clean. Prod.* **2021**, *287*, 125575.
58. Shafiq, I.; Hussain, M.; Rashid, R.; Shafique, S.; Akhter, P.; Yang, W.; Ahmed, A.; Nawaz, Z.; Park, Y.-K. Development of hierarchically porous LaVO₄ for efficient visible-light-driven photocatalytic desulfurization of diesel. *Chem. Eng. J.* **2021**, *420*, 130529.
59. Mushtaq, R.; Abbas, M.A.; Mushtaq, S.; Ahmad, N.M.; Khan, N.A.; Khan, A.U.; Hong, W.; Sadiq, R.; Jiang, Z. Antifouling and Flux Enhancement of Reverse Osmosis Membrane by Grafting Poly (3-Sulfopropyl Methacrylate) Brushes. *Membr.* **2021**, *11*.
60. Shafiq, I.; Hussain, M.; Shafique, S.; Rashid, R.; Akhter, P.; Ahmed, A.; Jeon, J.-K.; Park, Y.-K. Oxidative desulfurization of refinery diesel pool

fractions using LaVO₄ photocatalyst. *J. Ind. Eng. Chem.* **2021**, *98*, 283–288.

61. Babar, M.; Mubashir, M.; Mukhtar, A.; Saqib, S.; Ullah, S.; Bustam, M.A.; Show, P.L. Sustainable functionalized metal-organic framework NH₂-MIL-101(Al) for CO₂ separation under cryogenic conditions. *Environ. Pollut.* **2021**, *279*, 116924.
62. Al-Mawali, K.S.; Osman, A.I.; Al-Muhtaseb, A.H.; Mehta, N.; Jamil, F.; Mjalli, F.; Vakili-Nezhaad, G.R.; Rooney, D.W. Life cycle assessment of biodiesel production utilising waste date seed oil and a novel magnetic catalyst: A circular bioeconomy approach. *Renew. Energy* **2021**, *170*, 832–846.
63. Al-Shidi, H.K.; Sulaiman, H.; Al-Reasi, H.A.; Jamil, F.; Aslam, M. Human and ecological risk assessment of heavy metals in different particle sizes of road dust in Muscat, Oman. *Environ. Sci. Pollut. Res.* **2021**, *28*, 33980–33993.
64. Ahmed, A.; Hidayat, S.; Abu Bakar, M.S.; Azad, A.K.; Sukri, R.S.; Phusunti, N. Thermochemical characterisation of Acacia auriculiformis tree parts via proximate, ultimate, TGA, DTG, calorific value and FTIR spectroscopy analyses to evaluate their potential as a biofuel resource. *Biofuels* **2021**, *12*, 9–20.
65. Javed, F.; Shamair, Z.; Hafeez, A.; Fazal, T.; Aslam, R.; Akram, S.; Rashid, N.; Zimmerman, W.B.; Rehman, F. Conversion of poultry-fat waste to a sustainable feedstock for biodiesel production via microbubble injection of reagent vapor. *J. Clean. Prod.* **2021**, *311*, 127525.
66. Farooq, A.; Moogi, S.; Jang, S.-H.; Ahmed, A.; Kim, Y.-M.; Reddy Kannapu, H.P.; Valizadeh, S.; Jung, S.-C.; Lam, S.S.; Rhee, G.H.; et al. Biohydrogen synthesis from catalytic steam gasification of furniture waste using nickel catalysts supported on modified CeO₂. *Int. J. Hydrogen Energy* **2021**, *46*, 16603–16611.
67. Faisal, A.; Javed, F.; Hassan, M.; Gorji, M.R.; Akram, S.; Rashid, N.; Rehman, F. Experimental and mathematical nonlinear rheological characterization of chicken fat oil-a sustainable feedstock for biodiesel. *Biomass Convers. Biorefinery* **2021**.
68. Hidayat, S.; Bakar, M.S.A.; Ahmed, A.; Iryani, D.A.; Hussain, M.; Jamil, F.; Park, Y.-K. Comprehensive kinetic study of Imperata Cylindrica pyrolysis via Asym2sig deconvolution and combined kinetics. *J. Anal. Appl. Pyrolysis*

2021, **156**, 105133.

69. Naas, T.T.; Hossain, S.; Aslam, M.; Rahman, A.; Hoque, A.S.M.; Kim, K.-Y.; Islam, S.M.R. Kinematic Measurements of Novel Chaotic Micromixers to Enhance Mixing Performances at Low Reynolds Numbers: Comparative Study. *Micromachines* **2021**, *12*.
70. Tahir, K.; Miran, W.; Jang, J.; Shahzad, A.; Moztahida, M.; Kim, B.; Lim, S.-R.; Lee, D.S. Carbamazepine biodegradation and volatile fatty acids production by selectively enriched sulfate-reducing bacteria and fermentative acidogenic bacteria. *J. Chem. Technol. Biotechnol.* **2021**, *96*, 592–602.
71. Saulat, H.; Khan, M.M.; Aslam, M.; Chawla, M.; Rafiq, S.; Zafar, F.; Khan, M.M.; Bokhari, A.; Jamil, F.; Bhutto, A.W.; et al. Wind speed pattern data and wind energy potential in Pakistan: current status, challenging platforms and innovative prospects. *Environ. Sci. Pollut. Res.* **2021**, *28*, 34051–34073.
72. Saqib, S.; Rafiq, S.; Muhammad, N.; Khan, A.L.; Mukhtar, A.; Ullah, S.; Nawaz, M.H.; Jamil, F.; Zhang, C.; Ashokkumar, V. Sustainable mixed matrix membranes containing porphyrin and polysulfone polymer for acid gas separations. *J. Hazard. Mater.* **2021**, *411*, 125155.
73. Haider, S.; Liaquat, A.; Awan, M.S.; Ul-Haq, N.; ul Haq, A. Electrical and magnetic properties of BiFeO₃ nanoparticles substituted with high concentrations of cobalt. *J. Aust. Ceram. Soc.* **2021**, *57*, 643–650.
74. Ullah, S.; Al-Sehemi, A.G.; Mubashir, M.; Mukhtar, A.; Saqib, S.; Bustam, M.A.; Cheng, C.K.; Ibrahim, M.; Show, P.L. Adsorption behavior of mercury over hydrated lime: Experimental investigation and adsorption process characteristic study. *Chemosphere* **2021**, *271*, 129504.
75. Saeed, U.; Khan, A.L.; Gilani, M.A.; Aslam, M.; Khan, A.U. CO₂ separation by supported liquid membranes synthesized with natural deep eutectic solvents. *Environ. Sci. Pollut. Res.* **2021**, *28*, 33994–34008.
76. Al-Muhtaseb, A.H.; Osman, A.I.; Murphin Kumar, P.S.; Jamil, F.; Al-Haj, L.; Al Nabhani, A.; Kyaw, H.H.; Myint, M.T.Z.; Mehta, N.; Rooney, D.W. Circular economy approach of enhanced bifunctional catalytic system of CaO/CeO₂ for biodiesel production from waste loquat seed oil with life cycle assessment study. *Energy Convers. Manag.* **2021**, *236*, 114040.
77. Asif, F.; Hamayun, M.H.; Hussain, M.; Hussain, A.; Maafa, I.M.; Park, Y.-K. Performance Analysis of the Perhydro-Dibenzyl-Toluene Dehydrogenation

System—A Simulation Study. *Sustain.* **2021**, *13*.

78. Shazali, E.R.H.; Morni, N.A.H.; Bakar, M.S.A.; Ahmed, A.; Azad, A.K.; Phusunti, N.; Park, Y.-K. Characterisation and Co-pyrolytic Degradation of the Sawdust and Waste Tyre Blends to Study the Effect of Temperature on the Yield of the Products. *Appl. Chem. Eng.* **2021**, *32*, 205–213.
79. Batool, M.; Shafeeq, A.; Haider, B.; Ahmad, N.M. TiO₂ Nanoparticle Filler-Based Mixed-Matrix PES/CA Nanofiltration Membranes for Enhanced Desalination. *Membr.* **2021**, *11*.
80. Zaman, S.U.; Saif-ur-Rehman; Zaman, M.K.U.; Arshad, A.; Rafiq, S.; Muhammad, N.; Saqib, S.; Jamal, M.; Wajeeh, S.; Imtiaz, S.; et al. Biocompatibility performance evaluation of high flux hydrophilic CO₃Ap/HAP/PSF composite membranes for hemodialysis application. *Artif. Organs* **2021**, *45*, E265–E279.
81. Mehmood, T.; Gaurav, G.K.; Cheng, L.; Klemeš, J.J.; Usman, M.; Bokhari, A.; Lu, J. A review on plant-microbial interactions, functions, mechanisms and emerging trends in bioretention system to improve multi-contaminated stormwater treatment. *J. Environ. Manage.* **2021**, *294*, 113108.
82. Khan, A.S.; Ibrahim, T.H.; Rashid, Z.; Khamis, M.I.; Nancarrow, P.; Jabbar, N.A. COSMO-RS based screening of ionic liquids for extraction of phenolic compounds from aqueous media. *J. Mol. Liq.* **2021**, *328*, 115387.
83. Ahmed, A.; Bakar, M.S.A.; Razzaq, A.; Hidayat, S.; Jamil, F.; Amin, M.N.; Sukri, R.S.; Shah, N.S.; Park, Y.-K. Characterization and Thermal Behavior Study of Biomass from Invasive Acacia mangium Species in Brunei Preceding Thermochemical Conversion. *Sustain.* **2021**, *13*.
84. Suhail, F.; Batool, M.; Shah, A.T.; Tabassum, S.; Khan, A.L.; Gilani, M.A. Highly CO₂ selective mixed matrix membranes of polysulfone based on hetaryl modified SBA-16 particles. *Sep. Purif. Technol.* **2021**, *258*, 117999.
85. Nazir, M.S.; Palvasha, B.A.; Tahir, Z.; Ali, Z.; Akhtar, M.N.; Azam, K.; Abdullah, M. An Overview on Eco-Friendly Polymer Composites for Heavy Metal Ion Remediation. *Curr. Anal. Chem.* **2021**, *17*, 737–753.
86. Hamza, M.; Ayoub, M.; Shamsuddin, R. Bin; Mukhtar, A.; Saqib, S.; Zahid, I.; Ameen, M.; Ullah, S.; Al-Sehemi, A.G.; Ibrahim, M. A review on the waste biomass derived catalysts for biodiesel production. *Environ. Technol. Innov.* **2021**, *21*, 101200.

87. Arif, S.; Saqib, H.; Mubashir, M.; Malik, S.I.; Mukhtar, A.; Saqib, S.; Ullah, S.; Show, P.L. Comparison of Nigella sativa and Trachyspermum ammi via experimental investigation and biotechnological potential. *Chem. Eng. Process. - Process Intensif.* **2021**, *161*, 108313.
88. Tariq, A.; Ahmad, N.M.; Abbas, M.A.; Shakir, M.F.; Khaliq, Z.; Rafiq, S.; Ali, Z.; Elaissari, A. Reactive Extrusion of Maleic-Anhydride-Grafted Polypropylene by Torque Rheometer and Its Application as Compatibilizer. *Polym.* **2021**, *13*.
89. Abdullah, A.; Ahmed, A.; Akhter, P.; Razzaq, A.; Hussain, M.; Hossain, N.; Abu Bakar, M.S.; Khurram, S.; Majeed, K.; Park, Y.-K. Potential for sustainable utilisation of agricultural residues for bioenergy production in Pakistan: An overview. *J. Clean. Prod.* **2021**, *287*, 125047.
90. Rashid, R.; Shafiq, I.; Iqbal, M.J.; Shabir, M.; Akhter, P.; Hamayun, M.H.; Ahmed, A.; Hussain, M. Synergistic effect of NS co-doped TiO₂ adsorbent for removal of cationic dyes. *J. Environ. Chem. Eng.* **2021**, *9*, 105480.
91. Inayat, A.; Khan, Z.; Aslam, M.; Shahbaz, M.; Ahmad, M.M.; Abdul Mutalib, M.I.; Yusup, S. Integrated adsorption steam gasification for enhanced hydrogen production from palm waste at bench scale plant. *Int. J. Hydrogen Energy* **2021**, *46*, 30581–30591.
92. Jamil, F.; Murphin Kumar, P.S.; Al-Haj, L.; Tay Zar Myint, M.; Al-Muhtaseb, A.H. Heterogeneous carbon-based catalyst modified by alkaline earth metal oxides for biodiesel production: Parametric and kinetic study. *Energy Convers. Manag. X* **2021**, *10*, 100047.
93. Niazi, F.K.; Umer, M.A.; Ahmed, A.; Hafeez, M.A.; Khan, Z.; Butt, M.S.; Razzaq, A.; Luo, X.; Park, Y.-K. Nanoporous Alumina Membranes for Sugar Industry: An Investigation of Sintering Parameters Influence on Ultrafiltration Performance. *Sustain.* **2021**, *13*.
94. Tawfik, A.; Nasr, M.; Galal, A.; El-Qelish, M.; Yu, Z.; Hassan, M.A.; Salah, H.A.; Hasanin, M.S.; Meng, F.; Bokhari, A.; et al. Fermentation-based nanoparticle systems for sustainable conversion of black-liquor into biohydrogen. *J. Clean. Prod.* **2021**, *309*, 127349.
95. Ismail, I.; Kurnia, K.A.; Samsuri, S.; Bilad, M.R.; Marbelia, L.; Ismail, N.M.; Khan, A.L.; Budiman, A.; Susilawati, S. Energy efficient harvesting of Spirulina sp. from the growth medium using a tilted panel membrane filtration. *Bioresour. Technol.* **2021**, *15*, 100697.

96. Hafeez, A.; Shezad, N.; Javed, F.; Fazal, T.; Saif ur Rehman, M.; Rehman, F. Developing multiplexed plasma micro-reactor for ozone intensification and wastewater treatment. *Chem. Eng. Process. - Process Intensif.* **2021**, *162*, 108337.
97. Hussain, A.; Qyyum, M.A.; Minh, L.Q.; Riaz, A.; Haider, J.; Naqvi, M.; Naqvi, S.R.; Lee, M. Methoxy-methylheptane as a cleaner fuel additive: An energy- and cost-efficient enhancement for separation and purification units. *Energy Sci. Eng.* **2021**, *n/a*.
98. Babar, M.; Mukhtar, A.; Mubashir, M.; Saqib, S.; Ullah, S.; Quddusi, A.H.A.; Bustam, M.A.; Show, P.L. Development of a novel switched packed bed process for cryogenic CO₂ capture from natural gas. *Process Saf. Environ. Prot.* **2021**, *147*, 878–887.
99. Ishaq, M.; Gilani, M.A.; Ahmad, F.; Afzal, Z.M.; Arshad, I.; Bilad, M.R.; Ayub, K.; Khan, A.L. Theoretical and experimental investigation of CO₂ capture through choline chloride based supported deep eutectic liquid membranes. *J. Mol. Liq.* **2021**, *335*, 116234.
100. Waqas, S.; Bilad, M.R.; Huda, N.; Harun, N.Y.; Md Nordin, N.A.; Shamsuddin, N.; Wibisono, Y.; Khan, A.L.; Roslan, J. Membrane Filtration as Post-Treatment of Rotating Biological Contactor for Wastewater Treatment. *Sustain.* **2021**, *13*.
101. Qaiser, M.; Asghar, A.B.; Jaffery, M.H.; Javaid, M.Y.; Khurram, M.S. FLOW CONTROL OF HYDROGEN FUEL IN PEM FUEL CELL USING SOFT COMPUTING TECHNIQUES. *J. Ovonic Res.* **2021**, *17*.
102. Shakoor, A.; Khan, A.L.; Akhter, P.; Aslam, M.; Bilad, M.R.; Maafa, I. M.; Moustakas, K.; Nizami, A.-S.; Hussain, M. CO₂ from waste to resource by developing novel mixed matrix membranes. *Environ. Sci. Pollut. Res.* **2021**, *28*, 12397–12405.
103. Asif, S.; Klemeš, J.J.; Mukhtar, A.; Chuah, L.F.; Saqib, S.; Bokhari, A. Intensification of Biodiesel Synthesis in a Cavitation System from Xanthium Spinosum Oil. *Chem. Eng. Trans.* **2021**, *86*, 151–156.
104. Ahmad, M.S.; Klemeš, J.J.; Alhumade, H.; Elkamel, A.; Mahmood, A.; Shen, B.; Ibrahim, M.; Mukhtar, A.; Saqib, S.; Asif, S.; et al. Thermo-kinetic study to elucidate the bioenergy potential of Maple Leaf Waste (MLW) by pyrolysis, TGA and kinetic modelling. *Fuel* **2021**, *293*, 120349.

105. Ansarinab, H.; Hajabdollahi, H.; Fatimah, M. Conceptual design of LNG regasification process using liquid air energy storage (LAES) and LNG production process using magnetic refrigeration system. *Sustain. Energy Technol. Assessments* **2021**, *46*, 101239.
106. Akhtar, A.; Andleeb, A.; Waris, T.S.; Bazzar, M.; Moradi, A.-R.; Awan, N.R.; Yar, M. Neurodegenerative diseases and effective drug delivery: A review of challenges and novel therapeutics. *J. Control. Release* **2021**, *330*, 1152–1167.
107. Qyyum, M.A.; Ahmed, F.; Nawaz, A.; He, T.; Lee, M. Teaching-learning self-study approach for optimal retrofitting of dual mixed refrigerant LNG process: Energy and exergy perspective. *Appl. Energy* **2021**, *298*, 117187.
108. Inayat, A.; Jamil, F.; Ghenai, C.; Kamil, M.; Bokhari, A.; Waris, A.; Rafiq, S.; Khurram, S. Biodiesel synthesis from neem oil using neem seeds residue as sustainable catalyst support. *Biomass Convers. Biorefinery* **2021**.
109. Hossain, S.; Tayeb, N.T.; Islam, F.; Kaseem, M.; Bui, P.D.H.; Bhuiya, M.M.K.; Aslam, M.; Kim, K.-Y. Enhancement of Mixing Performance of Two-Layer Crossing Micromixer through Surrogate-Based Optimization. *Micromachines* **2021**, *12*.
110. Hameed, Z.; Aslam, M.; Khan, Z.; Maqsood, K.; Atabani, A.E.; Ghauri, M.; Khurram, M.S.; Rehan, M.; Nizami, A.-S. Gasification of municipal solid waste blends with biomass for energy production and resources recovery: Current status, hybrid technologies and innovative prospects. *Renew. Sustain. Energy Rev.* **2021**, *136*, 110375.
111. Shafiq, I.; Shafique, S.; Akhter, P.; Abbas, G.; Qurashi, A.; Hussain, M. Efficient catalyst development for deep aerobic photocatalytic oxidative desulfurization: recent advances, confines, and outlooks. *Catal. Rev.* **2021**, *1*–46.
112. Tahir, K.; Miran, W.; Jang, J.; Maile, N.; Shahzad, A.; Moztahida, M.; Ghani, A.A.; Kim, B.; Jeon, H.; Lim, S.-R.; et al. Nickel ferrite/MXene-coated carbon felt anodes for enhanced microbial fuel cell performance. *Chemosphere* **2021**, *268*, 128784.
113. Qyyum, M.A.; Naquash, A.; Ali, W.; Haider, J.; Noon, A.A.; Rehan, M.; Nizami, A.-S.; Yasin, M.; Lee, M. Process Systems Engineering Evaluation of Prospective Working Fluids for Organic Rankine Cycles Facilitated by Biogas Combustion Flue Gases. *Front. Energy Res.* **2021**, *9*, 135.

114. Arora, A.S.; Nawaz, A.; Qyyum, M.A.; Ismail, S.; Aslam, M.; Tawfik, A.; Yun, C.M.; Lee, M. Energy saving anammox technology-based nitrogen removal and bioenergy recovery from wastewater: Inhibition mechanisms, state-of-the-art control strategies, and prospects. *Renew. Sustain. Energy Rev.* **2021**, *135*, 110126.
115. Malik, S.; Iqbal, A.; Imran, A.; Usman, M.; Nadeem, M.; Asif, S.; Bokhari, A. Impact of economic capabilities and population agglomeration on PM2.5 emission: empirical evidence from sub-Saharan African countries. *Environ. Sci. Pollut. Res.* **2021**, *28*, 34017–34026.
116. El Darra, N.; Xie, F.; Kamble, P.; Khan, Z.; Watson, I. Decontamination of Escherichia coli on dried onion flakes and black pepper using Infra-red, ultraviolet and ozone hurdle technologies. *Heliyon* **2021**, *7*, e07259.
117. Ahmed, U.; Zahid, U.; Onaizi, S.A.; Abdul Jameel, A.G.; Ahmad, N.; Ahmad, N.; AlMohamadi, H. Co-Production of Hydrogen and Methanol Using Fuel Mix Systems: Technical and Economic Assessment. *Appl. Sci.* **2021**, *11*.
118. Anjum, F.; Khan, I.M.; Kim, J.; Aslam, M.; Blandin, G.; Heran, M.; Lesage, G. Trends and progress in AnMBR for domestic wastewater treatment and their impacts on process efficiency and membrane fouling. *Environ. Technol. Innov.* **2021**, *21*, 101204.
119. Kim, H.-J.; Jeon, J.-W.; Hwang, S.-M.; Chu, K.-I.; Cha, Y.-H.; Kwak, Y.-D.; Kim, Y.-H.; Choi, S.-D.; Aslam, M.; Kim, C.-G. Long-term nationwide assessment of polychlorinated dibenzo-p-dioxins/dibenzofurans and dioxin-like polychlorinated biphenyls ambient air concentrations for ten years in South Korea. *Chemosphere* **2021**, *263*, 127903.