

Gas-phase Catalytic Hydrodeoxygenation of Phenolic Compounds Derived from Lignin Pyrolysis for Hydrocarbon Production Using Ni@HZSM-5- γ -Al₂O₃

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Abstract

Statement of the Problem: Biomass, as a raw material for future fuels and chemicals, has been put on the agenda to cope with the crisis caused by the increasing depletion of fossil fuels and environmental pollution. The chemical energy contained in biomass can be directly obtained from burning or indirectly obtained by converting it into liquid or gas fuel. The fuel syngas obtained from the gasification of biomass can be burned to generate heat and can be used in engines or turbines to generate electricity. Liquid fuel obtained from biomass pyrolysis or liquefaction can replace traditional fuel oils used in power generation and thermal energy, as well as in the production of fuels and chemicals. Pyrolysis is considered to be an effective method in various biomass utilization technologies, through which high yields of liquid products can be achieved [4]. However, the bio-oil prepared by the pyrolysis of biomass has high oxygen content and therefore is lacking as a high-quality transportation fuel. Our group worked to identify a catalyst that could more efficiently convert biomass pyrolysis oil into high-quality fuel.

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Biography

Dr. Zhiyu Li has been devoted to the research and development of renewable energy and catalytic conversion of biomass. He received his PhD in Agricultural Bio-Environment and Energy Engineering from South China Agricultural University, under the tutelage of Prof. Enchen Jiang. Currently, Dr. Li is an associate professor at Shandong University of Technology. At the same time, he joined the Qingdao Institute of Bioenergy and Bioprocess Technology, Chinese Academy of Sciences in January 2022 to develop high-value liquid fuels with Professor Li Xuebing. Dr. Zhiyu Li has published nearly 20 SCI papers, one of which has been selected as one of the top 1% ESI highly cited papers in the world (Hydrodeoxygenation of phenols, acids, and ketones as model bio-oil for hydrocarbon fuel over Ni-based catalysts modified by Al, La and Ga).