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Fe-based catalysts for the catalytic conversion wood syngas to liquid hydrocarbons

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B lignocellulosic biomass-derived fuels, including gasoline, diesel, jet fuel, mixed alcohols etc.) produced from renewable resources or mitigate global warming, and can minimize the fossil fuel burning and CO_2 production. Biomass to liquid fuels (BTL) technology that produces useful and high-value biofuels is regarded as a promising alternative to traditional fossil fuel. Iron-based catalysts are efficient FTS catalysts. In our work, a continuous process includes Fe-based catalyst preparation, the gasification of wood, the cleaning of syngas, and Fischer–Tropsch (FT) synthesis was developed and evaluated to demonstrate biomass-to-liquid (BTL) fuel technology. Both of the Fe-based catalyst and the reactant syngas were prepared from wood chips. Oak-tree wood chips were used as the feedstock for gasification process, and they were first gasified to syngas over a commercial pilot plant downdraft gasifier. The raw wood syngas contains about 47% N_2 , 21% CO, 18% H_2 , 12% CO_2 , 2% CH_4 and trace amounts of impurities. A purification reaction system was designed to remove the impurities in the syngas. The excellent catalytic performance was obtained for the wood syngas upgrading reaction.

Biography

Jian LIU has completed his Ph.D from China University of Petroleum-Beijing and postdoctoral studies from Mississippi State University. His research field includes catalysis and biofuels. He was awarded as "New Century Excellent Talents in China" and "Excellent Dissertation Nominee Prize in China" etc. He has published more than 50 papers in reputed journals such as *Angewandte Chemie International Edition* and serving as an editorial board member of *Journal of Petrolium & Environmental Biotechnology*.

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