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Heterogeneous base catalyzed depolymerization of lignin into aromatic monomers**Richa Km and Paresh L Dhepe**

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Lignin is generated as a major byproduct during bio-ethanol production and is a complex three dimensional amorphous biopolymer having several aromatic rings linked together via various linkages (e.g. C-C bond, C-O-C bonds, etc.). The polyphenolic structure of lignin is ideally suitable for the catalytic transformation of it into lower molecular weight substituted phenols, which can be used as octane enhancers and platform chemicals. This research focuses on the development of heterogeneous base catalyzed method for the depolymerization of lignin (Mw~60,000 Da) at milder reaction conditions ($T \leq 300^\circ\text{C}$) to obtain the intact aromatic monomers. Various solid base catalysts were evaluated for the synthesis of aromatic monomers from depolymerization of lignin. The optimization of reaction conditions such as temperature, concentrations etc. has been done to achieve the maximum yield of aromatic monomers (~51%), by suppressing the formation of degradation products (coke and char) and gas formation. Moreover, catalyst showed a constant recycle activity minimum up to 4th run with 36% of product yields. Various physico-chemical characterizations for both fresh and spent catalyst were described to enlighten its stability. The depolymerization of lignin yields various aromatic monomers such as vanillin, guaiacol, etc., which can be further used as platform chemicals. The yield of aromatic monomers varied strongly depending on the heterogeneous base catalyst used.

Biography

Richa Km has completed her MSc from Chaudhary Charan Singh University, Meerut, India and currently pursuing PhD from CSIR-National Chemical Laboratory, Pune, India in Catalysis and Inorganic Chemistry Division under the guidance of Dr. Paresh L Dhepe. Her research work is focused on the replacement of soluble bases with (insoluble) heterogeneous base catalysts for the depolymerization of lignin, which would allow for easy separation of catalyst from the products and reuse. She has been granted a patent for her work. She also has the experience of working on synthesis of porous structured and amorphous materials.

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