Catalytic hydrodeoxygenation of eugenol over supported calcium carbonate catalysts

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Fast pyrolysis is one of the promising processes to valorize lignocellulosic biomass to obtain liquid products known as bio-oil. Its high oxygen content, however, limits the complete replacement of fossil fuels. Therefore, processes to stabilize the oil and remove the oxygen content are required to upgrade bio-oils to obtain hydrocarbon fuels. The hydrodeoxygenation (HDO) is one of the promising methods to upgrade bio-oil. During the HDO, oxygen in the bio-oil feed is converted to water and alcohols. In this study, we investigated the HDO of eugenol, a frequently observed component in the pyrolysis oil derived from lignin, over bifunctional catalysts composed of metal nanoparticles and basic CaCO3. The catalytic HDO of eugenol in n-hexadecane as a solvent was studied in a high pressure batch reactor at 250 °C and 40 bar H2. The roles of basic CaCO3 along with metal nanoparticles on the HDO activity were studied.