

### Activity and Structure of Ni<sub>2</sub>P/SiO<sub>2</sub> Catalyst for Hydrodeoxygenation of Bio-oil

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This study focused on the hydrodeoxygenation(HDO) of guaiacol over Ni<sub>2</sub>P catalysts with different reaction temperature and pressure. The Ni<sub>2</sub>P catalysts showed a good and stable activity with a guaiacol conversion over 90% at 523–573K and 1 or 8atm, and LHSV of 2.0 h<sup>-1</sup>. The major products were cyclohexane, benzene, anisole and phenol. Two different reaction pathways were confirmed; direct deoxygenation was dominant to give benzene at 1 atm and prehydrogenation followed by deoxygenation was preferred to give cyclohexane at 8 atm. The XAFS analysis revealed that the active site of Ni<sub>2</sub>P catalysts is slightly bound by oxygen during the reaction.