

Efficient Production of 2,5-Dimethylfuran from 5-methylfurfural via a novel liquid hydrogen source system

Shao-Hui Hsu (徐韶徽), Pei-en Wu (吳霽恩), Kevin C.-W. Wu (吳嘉文)*

Department of Chemical Engineering, National Taiwan University, Taiwan 10617, Taiwan

*Email: kevinwu@ntu.edu.tw

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Biofuel is one of the sustainable alternative energy sources that could replace petroleum, natural gas, coal, and nuclear energy. Plant wastes containing large amounts of cellulose could firstly be converted to glucose, fructose then 5-methylfurfural (MFAD). Then, furan-based biofuels such as 2,5-dimethylfuran (DMF) could be produced from MFAD. DMF is a promising biofuel because of its energy density (29.3 MJ/L) and high research octane number (101.3) which is comparatively better than ethanol. However, DMF production requires extreme conditions such as high temperature and pressure. A novel DMF production method, which is performed directly in the solvent with sodium borohydride via a bifunctional heterogeneous catalyst, is reported at normal temperature and pressure (N.T.P). Moreover, the reaction time is much shorter than the traditional synthesis of DMF. Hence, production cost and time could be greatly reduced to benefit the synthesis industry.

Keywords: Heterogeneous catalysts; Biofuels; 2,5-Dimethylfuran; Hydrogenolysis reaction; Bifunctional catalysts.

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