



MSE SEMINAR

Materials Science and Engineering
Michigan Technological University

Wednesday, April 23, 2014

9:00 am – 10:00 am

Room 610, M&M Building



Catalytic Ethanolysis of Kraft Lignin with a Mo-based Catalyst in Supercritical Ethanol

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Abstract

We report the complete ethanolysis of Kraft lignin over an α -MoCl_{1-x}/AC catalyst in pure ethanol at 280°C to give high-valued chemicals of lower molecular weight. A maximum overall yield of 1.64 g/g lignin of the 25 most abundant liquid products (LP25) has achieved. The LP25 consists of C₆ to C₁₀ esters, alcohols, arenes, phenols and benzyl alcohols with an overall heating values of 36.5 MJ/kg. No oligomers and char are formed during this process. With our catalyst, ethanol is the only effective solvent for the reaction. Supercritical ethanol on its own degrades Kraft lignin into a mixture of small molecules and molecular fragments of intermediate size with molecular weight in the range 700 – 1400, differing in steps of 58 units, which is the weight of the branched chain linkage C₃H₆O in lignin. Hydrogen is found have a negative effect on the formation of the low molecular weight products. A predominance of the C₆ alcohols and C₈ esters, accounting for 82 wt% of the LP25, is observed.

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