



## Lignin isolation during recycling of waste wood in an urban locale

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### ABSTRACT

Waste wood (WW) was used as feed stock in an ethanol organosolv treatment to isolate lignin. The effects of treatment conditions (temperature, concentration of sulfuric acid and reaction time) on lignin yield were investigated using response surface methodology (RSM). Lignin yield was positively influenced by temperature and concentration of sulfuric acid but not by reaction time. The maximum lignin yield (12.46 g/100 g of dry wood with 44.25 % recovery) was achieved at 178.2°C and 2.32 % H<sub>2</sub>SO<sub>4</sub>. Gel permeation chromatography showed that the isolated WW-lignin had low molecular weights. From the Fourier-transform infrared spectroscopy and proton nuclear magnetic resonance spectra, WEB-lignin was estimated to have more guaiacyl (G) units than syringyl (S) units, showing high purity. The ethanol organosolv treatment offers the possibility of using isolated WW as an untapped source of lignin.

*Keywords:* Waste wood; Lignin; Ethanol organosolv; Characterization

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