



## Methods of Efficient Lignin Conversion

ID# 2024-034

### HIGHLIGHTS

- Methods for processing Kraft lignin into monomers or alternative liquid fuels.
- Facilitates sustainable production of bio-oil with a high yield under moderate conditions.

### OPPORTUNITY

Lignocellulosic biomass has gained attention as a promising substitute for fossil fuels. However, 95% of industrial lignin is mainly burned for energy recovery or sent to landfills while a mere 5% is employed in the production of various chemicals. Lignin's inherent recalcitrant nature poses significant challenges to the depolymerization process, often complicating the procedure.

University of Alberta researchers developed a method to depolymerize Kraft lignin without a metal catalyst, which resulted in bio-oil yield of 55% from dry lignin. Additionally, the use of nickel-based catalyst enhanced the bio-oil yield and minimized the residual solids post-reaction. The findings indicated a significant enhancement in bio-oil yield, exceeding 60%. Following the depolymerization of lignin, the resulting solid residues were purified to produce biochar. The potential of obtained biochar was evaluated as an effective adsorbent for the heavy metals in water treatment. The results showed that biochar has a considerable potential for lead adsorption.

### COMPETITIVE ADVANTAGE

- Efficient conversion of lignin into valuable products, including biochar and bio-oil, under mild conditions.

### STATUS

- Patent pending

### INVENTORS

- [Aman Ullah](#), Karen Lopez Camas

### MORE INFORMATION

Joanna Preston

Associate Director

Technology Transfer Services, University of Alberta

780.265.1075

[jpreston@ualberta.ca](mailto:jpreston@ualberta.ca)

DISCLAIMER: The contents of this licensing opportunity are provided for informational purposes only, and neither the University of Alberta nor the inventors offer any warranty, written or implied, as to the accuracy of the said contents.