



The *TranLIVE Spotlight* is a bi-weekly update from the University Transportation Center research collaboration led by the University of Idaho

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### **TRANLIVE RESEARCHERS MAKE PROGRESS REFINING BIO-OILS INTO RENEWABLE FUELS**

MOSCOW, Idaho – Armando McDonald, David McIlroy, Yunglei Han, and Blaise-Alexis Kengne, researchers at the University of Idaho’s National Institute for Advanced Transportation Technology (NIATT), have made significant improvements to the refining process of bio-oil. Bio-oil, which is extracted from decaying plant matter (biomass), can be refined and utilized as an environmentally conscious alternative to contemporary fossil fuels for gasoline, jet fuel, and diesel.

When biomass is converted into bio-oil, it contains anhydro-sugars, alcohols, ketones, aldehydes, carboxylic acids, phenols and water; many of which cause issues in the shelf life and refining process of bio-oil. With this issue in mind, the researchers decided on a two-step refining process. First they developed nickel (Ni), copper (Co), and ruthenium (Ru) based catalysts. Then they treated the oil with hydrogen to further reduce the amount of limiting compounds.

After a series of tests using each of the catalysts, it was found that the nickel based catalysts were best able to successfully convert bio-oil into hydrocarbons while reducing coke formations and the amount of furans, ketones, and aldehydes. Though this proved to be a success, the researchers noted that an increase in nickel loading on the catalysts as well as an increase in hydrogen pressure could further improve conversion yields and minimize coke formation.

The benefits of this research could lead to greater yields in bio-oil production and consequently cheaper, renewable, and environmentally-friendly fuels into the future.

The complete report is available at: [bit.ly/tranlive100614](http://bit.ly/tranlive100614)

#### **ABOUT TRANLIVE UNIVERSITY TRANSPORTATION CENTER**

TranLIVE is the Transportation for Livability by Integrating Vehicles and the Environment a research collaboration lead by the University of Idaho in partnership with Old Dominion University, Syracuse University, Texas Southern University, and Virginia Polytechnic Institute and State University. TranLIVE works to find solutions to transportation challenges that minimize environmental impacts while educating students to enter the transportation workforce and creating and transferring tools and knowledge to practicing transportation professionals. TranLIVE is sponsored by the United States Department of Transportation (USDOT) University Transportation Centers Program. For more information visit: [www.tranliveutc.org](http://www.tranliveutc.org)