Missouri State
UNIVERSITY

DEPARTMENT OF CHEMISTRY

Fall 2019 Seminars

In Silico Investigation for the Conversion of Biodiesel to Gasoline

Arkanil Roy
Chemistry Department, Missouri State Univeristy, Springfield, MO

Wednesday November 20, 2019 at 3.35p in Glass Hall 346

Petroleum products are very important in the modern world, and their excessive use has led to a lot of toxic emissions and greenhouse gases leading to global warming. Biodiesel is an eco-friendly source to petroleum like products. They can be produced using a carbon neutral method, hence making it more attractive.

Biodiesel mainly contains fatty acid methyl esters (FAMEs), which are formed by transesterification of fats and oils (triglycerides), in presence of methanol. FAMEs emit less CO2 and NOx, are easy to produce, have biodegradable characteristics and are nontoxic in nature. But, FAMEs also release more SOx, gel at low temperatures and are more expensive to produce. Pyrolysis of FAMEs address these problems. Pyrolysis breaks down FAMEs into smaller molecules that are conventional petroleum products and fine chemicals.

Pyrolysis of methyl oleate will be simulated, as it is the most common source of biodiesel in Europe. The ultimate goal is to optimize pyrolysis conditions for the desired product distribution and then engineer FAMEs for optimal pyrolysis outcome.

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Fall 2019 Seminars

Synthesis and characterization of novel organoantimony(V) cyanoximates

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Wednesday November 20, 2019 at 4.00p in Glass Hall 346

The requirement of new antimicrobial treatments have become an urgent field in the last two decades. Some pathogens are now resistant to common antibiotics such as penicillin, cephalosporin, and carbapenems. Methicillin resistant *Staphylococcus Aureus* (MRSA) leads the resistant microbes, which corresponds to high death rates associated with its' victims. To antagonize this deadly microbe, new organoantimony(V) cyanoximates were synthesized to promote a new mechanism for antimicrobial treatment without assistance of antibiotics.. The combination of organoantimony and cyanoximes was derived from previous knowledge of medical practice with antimony. Antimony has been proven to be beneficial in various medical applications due to low toxicity in the body. In previous literature, silver(I) cyanoximes were tested for antimicrobial activity by *in vivo* cell culture studies resulting in antimicrobial activity. Through the combination of these two factors, new organoantimony(V) cyanoximates will be synthesized, characterized with FT-IR, FT-Raman, NMR, X-ray crystallography, CHN elemental analysis, variable temperature UV-vis, and tested for antimicrobial activity.

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