

Chemical Properties of Biocrude Oil from the Hydrothermal Liquefaction of Spirulina Algae, Swine Manure, and Digested Anaerobic Sludge

In an era of water and fuel insecurity, it is important to develop methods to both conserve water and produce fuels from non-petroleum sources. Innovative use of wastewater is part of the solution. Researchers have discovered that it is possible to convert biomass in wastewater to high-value liquid fuels using hydrothermal liquefaction (HTL). Initial biomass chemistry can affect the quality of HTL products, so it is important to test feedstocks prior to large-scale conversion. A group of researchers, including ISTC's Dr. B.K. Sharma and John Scott, did just that.

They focused on three feedstocks likely to be present in wastewater streams: Spirulina algae, swine manure, and anaerobically digested sludge. The three sources varied substantially in biocrude yields, with sludge yielding 9.4% of the original weight and Spirulina yielding 32.6%. Heating values were similar for all product oils, but, when oils were analyzed more closely, it turned out that their chemistry differed quite a bit depending on the feedstock. Molecular weight, boiling point distribution, and long branched aliphatic content were different for the three feedstocks, underlining the importance of HTL feedstock composition and the need to better understand biocrude chemistry when considering bio-oil uses.

Waste Utilization

[Advancing Use of Recycled Material in Asphalt](#)

[Beneficial Use of Plastic Wastes](#)

[Biochar](#)

[Bio-oils and Biolubricants](#)

[Approaches to the Comparison of Oil Extraction Methods for Algae](#)

[Antioxidants from Wood-derived Pyrolyzates \(Bio-oils\)](#)

[Oils and Antioxidants in Beans](#)

[Complete Utilization of Coffee Grounds](#)

[Chemical Properties of Biocrude Oil from the Hydrothermal Liquefaction of Spirulina Algae, Swine Manure, and Digested Anaerobic Sludge](#)

[Gear Oil](#)

[Heat-bodied Oils make Good Industrial Lubricants](#)

[Milkweed Seed Fatty Acids](#)

[Low Value Natural Oils to Biolubricants and Biofuels](#)

[Predicting Products from Algae](#)

[Upgrading Bio-crude Oils](#)

[Waste to Bio-oils](#)

[Novel Catalyst for Breaking Down Lignin](#)

[Biobinders](#)

[Clean Coal](#)

[Liquid Rubber Modifier in Asphalt Binders](#)

[Mud to Parks](#)

[Nano-CarboScavengers](#)

[Solar PV](#)

[Read about older waste utilization projects](#)

- B.K. Sharma
- John Scott

Publications

[Chemical properties of biocrude oil from the hydrothermal liquefaction of Spirulina algae, swine manure, and digested anaerobic sludge](#)



One Hazelwood Drive, MC-676
Champaign, IL 61820
p: 217-333-8940
[Email us](#)

Home of Illinois' State Scientific Surveys

Illinois Natural History Survey
Illinois State Archaeological Survey
Illinois State Geological Survey
Illinois State Water Survey
Illinois Sustainable Technology Center



Email the [Web Administrator](#) with questions or comments. For permissions information, [contact the Illinois Sustainable Technology Center](#).
©2020 University of Illinois Board of Trustees. All rights reserved.

[Privacy statement](#) | [Intranet](#) | [Admin](#)