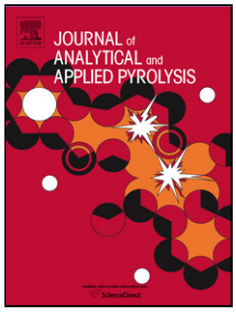
Accepted Manuscript



Title: Stability of crude bio-oil and its water-extracted fractions

Authors: Shoujie Ren, X. Philip Ye

PII: S0165-2370(18)30052-4
DOI: https://doi.org/10.1016/j.jaap.2018.03.005
Reference: JAAP 4279

To appear in: *J. Anal. Appl. Pyrolysis*

Received date: 16-1-2018
Revised date: 22-2-2018
Accepted date: 4-3-2018

Please cite this article as: Shoujie Ren, X.Philip Ye, Stability of crude bio-oil and its water-extracted fractions, Journal of Analytical and Applied Pyrolysis https://doi.org/10.1016/j.jaap.2018.03.005

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ACCEPTED MANUSCRIPT

Stability of crude bio-oil and its water-extracted fractions

Shoujie Ren[1] and X. Philip Ye[1*]

[1]Biosystems Engineering & Soil Science, University of Tennessee, Knoxville, TN, 37996. U.S.A.

*Corresponding author: Phone: +1-(865)-974-7129. E-mail: xye2@utk.edu

Highlights

- Fractionated crude bio-oil into organic/aqueous phases for efficient utilization
- Evaluated physicochemical changes of crude bio-oil vs. its fractions during aging
- Aqueous phase is more stable than crude bio-oil and organic phase
- Higher temperature accelerates aging toward higher acidity

Abstract: Fractionation of crude bio-oil into an organic phase and an aqueous phase by simply adding water and research strategies targeted at producing hydrogen, fuels, or other value-added chemicals from the fractions have been proposed. However, the stability of the bio-oil fractions has not been comprehensively investigated. The objective of this study was to comparatively investigate the stability of crude bio-oil and its two fractions by evaluating their physicochemical properties during long-term storage at room temperature and accelerated aging at 40 °C and 60 °C. Comparing with crude bio-oil, the resulted aqueous phase is more stable; for the organic phase, the stability is also improved in terms of the changes in viscosity and average molecular weight, but not in terms of the increasing water content and total acid number. In overview for all the crude bio-oil and its two fractions, the water content, viscosity, total acid number, and average molecular weight increased with the increase of aging time and temperature; except for acetic acid and propionic acid, which slightly increased in content at all aging conditions, all the other 13 measured chemical contents decreased with the increasing aging time and temperature,

Download English Version:

https://daneshyari.com/en/article/7606308

Download Persian Version:

https://daneshyari.com/article/7606308

Daneshyari.com