

Abstract :

The main purpose of this study is to investigate the direct hydrothermal liquefaction of oil mill wastewater (OMWW). Experiments were carried out at different temperatures (240–300 °C), water contents (58–88 wt.%) and reaction times (15–45 min). Results show that the highest bio-oil yield was about 58 wt.%, resulting in a higher heating value of 38 MJ/kg. This was conducted at the following optimal conditions:

water content 88 wt.%, a temperature of 280 °C, and 30 min as reaction time. To put bio-oil into wide application, the various physical and chemical characteristics were determined. A detailed chemical composition analysis of bio-oil was performed by gas chromatography–mass spectrometry (GC–MS) coupled with a flame ionization detector (FID). The dominant compounds were identified by using NIST library. Analyses show that the bio-oil contains mainly oleic acid, hexadecanoic acid, fatty acid methyl ester, fatty acid ethyl ester, amino acid derived compounds and phenolic compounds.