

**Assessment of biocrude from hydrothermal liquefaction of microalgae for further refining process**

\_\_\_\_\_ <sup>1,</sup>                    <sup>1,</sup>                    <sup>1,2,</sup>                    <sup>1,2,\*</sup>  
<sup>1</sup>KAIST; <sup>2</sup>Advanced Biomass R&D Center  
(jwyang@kaist.ac.kr\*)

Hydrothermal liquefaction (HTL) was applied to convert *N. oceanica* and *Golenkinia* sp. into biocrude. High HTL temperature significantly increased biocrude yield, and the effect was more pronounced in *Golenkinia* sp., which has low lipid content. We measured elemental composition and maltene (hexane-solubles) concentration of the biocrude for quality assessment. In biocrude refining process, heteroatom (O, N, and S) is the main cause of catalyst poisoning, and asphaltene (hexane-insolubles) physically deactivates catalysts by coking. Although temperature dependent behavior of heteroatom levels was similar in both microalgae, effective hydrogen-carbon ratio ( $H/C_{eff}$ ) was governed by the maltene concentration, which was greatly affected by the lipid content of microalgae and HTL temperature. Our findings showed that low temperature is optimal for high-lipid strains, and high temperature is optimal for low-lipid strains in the view point of energy-efficient production of biofuel.