The effect of structure directing agents on micro/mesopore structures of aluminosilicates from Indonesian kaolin as deoxygenation catalysts

## ABSTRACT

Indonesian kaolin was successfully transformed into aluminosilicates (ALS) via two-step hydrothermal synthesis using different structure directing agents (SDA). The effects of structure, porosity and catalytic activity of ALS were determined for deoxygenation of bio-oil into green diesel. The first hydrothermal step used silicalite and tetrapropyl ammonium hydroxide (TPAOH) as SDA, followed by the addition of cetyltrimethyl ammonium bromide (CTAB) in the second hydrothermal step to induce mesopores. Silicalite formed ZSM-5 with hierarchical structures meanwhile TPAOH produced ZSM-5 mainly with microporosity. ZSM-5 framework was rapidly formed when using TPAOH preventing the formation of mesostructure in the second crystallization processes. In the absence of SDA, the aluminosilicate was characterized as mesopore volume and surface acidities than ZSM-5, consequently enhancing the conversion and selectivity of deoxygenation reaction towards long-chain (C11-C18) green diesel hydrocarbon.