The methanol synthesis from glycerol in a one-step over basic oxide catalysts
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Abstract: Crude glycerol, obtained as a by-product from biodiesel production, is recently over-supplied due to limited world demand. As a result, utilization of the glycerol can be realized by converting glycerol to value-added chemicals, such as methanol. In this work, glycerol was catalytically converted to methanol in a one-step using 16 mm diameter of the fixed-bed reactor with basic oxide catalysts; CaO and MgO. Reliance of methanol yield on operating parameters and types of catalyst were investigated. Our results showed that both (CaO and MgO) provided catalytic activities in converting glycerol mainly to methanol. By-products, observed from the operation, included ethanol, propanol, ethanolal, 2,3-butanedione, acetol, ethylene glycol, CO and CO₂. The catalytic conversion of glycerol was varied in range of 70 – 100% with the maximum methanol selectivity of 40 %. In addition, performances of the metal oxide catalyst were observed to be enhanced after doping CeO₂ on the CaO and MgO.

Keywords: Glycerol; Methanol; Basic oxide catalyst; One-step; Fixed bed reactor