

Direct synthesis of dimethylether (DME) from syngas using copper supported ordered mesoporous alumina: Effects of confinement effect of copper

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Dimethylether (DME), which has similar physical properties with LPG, is one of the attractive alternative fuels because of its lower emission of air-pollutants than that of the traditional diesel fuel. The direct synthesis of DME from syngas was investigated on the hybrid catalysts containing copper crystallites supported on the ordered mesoporous alumina. The mesoporous alumina was synthesized by EISA (Evaporation Induced Self Assembly), and it was annealed at different temperatures to change the physicochemical and acidic properties. The active copper was loaded at a fixed 10wt% by incipient wetness impregnation method. The ordered mesoporous structures enhanced catalytic stability by confining copper crystallites in the mesopores of alumina. H<sub>2</sub>-TPR, XRD, NH<sub>3</sub>-TPD, N<sub>2</sub>-physisorption, N<sub>2</sub>O titration, XPS, and XAFS were applied to characterize the catalytic properties before and after reaction.