

Metal-incorporated ordered mesoporous alumina supported Ni catalysts for partial oxidation of methane

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Ordered mesoporous alumina (OMA) can serve as a support for catalytic partial oxidation of methane (CPOM) due to their thermal stability and high specific surface area. This study deals with the comparison of CPOM performance using OMA and Ni-doped-OMA supported catalysts. All the OMA supports were prepared using evaporation induced self-assembly (EISA) method. In doing so, 3 wt% of metal was incorporated by impregnation of metal precursor solution. We have prepared a pristine OMA or metal-incorporated OMAs by doping and both of impregnation and doping techniques to compare the extent of deactivation. The investigation of surface characteristics of OMA supports and morphology of incorporated metal nanocrystals was conducted through Brunauer-Emmett-Teller (BET), small-angle X-ray scattering (SAXS), wide-angle X-ray scattering (WAXS) and transmission electron microscopy (TEM). The effluent synthesis gas was analyzed by gas chromatography (GC).