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## Iron-modified mesoporous materials as catalysts for ODS of sulfur compounds

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### ABSTRACT

Fe-modified mesoporous catalysts were used in the ODS of DBT's using H<sub>2</sub>O<sub>2</sub> as oxidant and acetonitrile as solvent. SBA-15, MCM-48, CMK-3 and CMK-1 were used as supports. Iron was incorporated using iron nitrate by wetness impregnation. The catalysts were characterized by XRD, N<sub>2</sub> isotherms, TEM, XPS and ICP. We developed catalysts with high specific surface area, pore volume and narrow mesopore size distribution and highly dispersed Fe-species. The catalysts were tested in the oxidative desulfurization of different sulfur compounds as benzothiophene, dibenzothiophene and 4,6-dimethyl dibenzothiophene. The catalyst prepared using CMK-3 as support was the most active for the ODS reaction. The good activity was related with the high dispersion of the iron oxides, mainly in the magnetite phase. Temperature, hydrogen peroxide and sulfur initial concentration were studied using Fe-CMK-3 in the oxidation of DBT. The optimal operation conditions were determined. Fe-CMK-3 is an active and stable catalyst to be applied in the industrial process of ODS.

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