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# Mordenite as Catalyst Support for Complete Volatile Organic Compounds Oxidation

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**Abstract :** Zeolite mordenite has been investigated as a transition metal support for the preparation of efficient catalysts in the oxidation of volatile organic compounds (VOCs). The highly crystalline mordenite samples were treated with hydrofluoric acid and ammonium fluoride to get hierarchical material with secondary porosity. The obtained supports by this method have a high active surface area, good diffusion properties and prevent the extraction of metal components during catalytic reactions. The active metal phases platinum and copper were loaded by impregnation on both mordenite materials (parent and acid treated counterparts). Monometalic Pt and Cu, and bimetallic Pt/Cu catalysts were obtained. The metal phases were fine dispersed as nanoparticles on the functional porous materials. The catalysts synthesized in this way were investigated in the reaction of complete oxidation of propane and benzene. Platinum, copper and platinum/copper were loaded and there catalytic activity was investigated and compared. All samples are characterized by X-ray diffraction analysis, nitrogen adsorption, scanning electron microscopy (SEM), X-ray photoelectron measurements (XPS) and temperature programed reduction (TPR). The catalytic activity of the samples obtained is investigated in the reaction of complete oxidation of propane and benzene by using of Gas Chromatography (GC). The oxidation of three organic molecules was investigated—methane, propane and benzene. The activity of metal loaded mordenite catalysts for methane oxidation is almost the same for parent and treated mordenite as a support. For bigger molecules as propane and benzene, the activity of catalysts based on treated mordenite is higher than those based on parent zeolite.

**Keywords :** metal loaded catalysts, mordenite, VOCs oxidation, zeolites
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