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# Physico-Chemical Characterization and Catalytic Properties of Copper-Doped Alumina-Pillared Montmorillonites

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**Abstract:** Cu-doped alumina-pillared montmorillonite samples have been prepared and characterized with X-ray diffraction (XRD), Brunauer-Emmett-Teller (BET), electron spin resonance (ESR) and inductive coupled plasma atomic emission spectroscopy (ICP AES) techniques. The results show that the catalysts are porous materials with copper species located in the interlayer, present either as isolated Cu<sup>2+</sup> ions anchored at alumina pillars or as patches of amorphous CuO. Catalytic tests with hydroxylation of phenol show that the clay samples possess significant activity for dihydroxybenzene (DHB) formation, comparable with the reference TS-1 catalyst. Experiments with changing the substrate dosing indicate that adsorption and activation of phenol molecules is a necessary condition for the reaction to occur.

**Key Words:** Alumina • Copper • Copper Catalyst • Montmorillonite • Phenol Hydroxylation • Pillared Clay

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