

Oxidation behavior study of elemental mercury using transition metal oxide

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Elemental mercury oxidation over several transition metal-based oxide catalysts prepared from layered double hydroxide (LDH) precursor was studied. Precursor of catalysts was synthesized by co-precipitation of Mg, Al and transition metal (Fe, Ni, Cu, Zn) salts with NaOH and Na₂CO₃. Mixed oxide catalysts were produced after static air thermal treatment of LDH at 723K overnight. As an oxidant of reaction, HCl was used.

All oxidation tests were performed after the adsorption of elemental mercury on catalysts was completed. MgAl-oxide, used as a base material, didn't adsorb and oxidize elemental mercury. In short term test, when 10ppm HCl was added to the reaction, oxidation percent was in the order of ZnMgAl-oxide < NiMgAl-oxide < MgAlFe-oxide < FeMgAl-oxide < CuMgAl-oxide.