

ADSORPTION DU NICKEL SUR LES OXYDES METALLIQUES

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Abstract : This work studies the nickel anchored on several oxides, in the aim to be used as benzene hydrogenation catalyst. The metal ions, adsorbed on the oxide surface, are reduced under γ radiation in aqueous solution. The radiolytic way has been proven to be a powerful tool for obtaining dispersed nanoparticles in colloidal state, deposited on a solid support or in heterogeneous state. This process makes it possible to control the size of the particles, their localization on the surface or into volume. In the dispersed systems, the surface phenomena play an important role. The adsorption of ions or molecules on the surface of the aggregates can modify their properties and improve their activity. This is why we paid attention to the step of nickel adsorption on the oxides by looking for the optimal condition in order to obtain an electrostatic interaction between the metal ions and the surface of the support, favorable to a homogeneous and durable nickel dispersion. This step was followed by UV-visible spectrophotometry and pHmetry. In the second step, the irradiated samples are characterized by various techniques (MEB, analyzes X and XRD). For the MgO support, Mg₂Ni phases and Ni₂Mg of nanometric size were evidenced. These intermetallic compounds are of first importance in the energy field. The nanoparticles of Ni/ZrO₂ tested in catalysis in the benzene hydrogenation reaction exhibit good catalytic properties. They are more active in decreasing temperature than in increasing ones, indicating an enhancement of the catalytic activity during working.

Keywords : Nanoparticles; NiMg₂; MgNi₂; Ni/Oxide; Catalysts; Radiolysis, Benzene hydrogenation.