

Synthesis and Characterization of Mass Catalysts Based on Cobalt and Molybdenum

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Abstract : The electronic structure of transition metals gives them many catalytic possibilities in many types of reactions, particularly cobalt and molybdenum. It is in this context that this study is part of the synthesis and characterization of mass catalysts based on cobalt and molybdenum $\text{Co}_{1-x}\text{Mo}_x\text{O}_4$ ($X=0$ and $X=0.5$ and $X=1$). The two catalysts were prepared by Co-precipitation using ammonia as a precipitating agent and one by precipitation. The samples obtained were analyzed by numerous physic-chemical analysis techniques: ATG-ATD-DSC, DRX-HT, SEM-EDX, and the elemental composition of the catalysts was verified by SAA as well as the FTIR. The ATG-DSC shows a mass loss for all the catalysts of approximately 8%, corresponding to the loss of water and the decomposition of nitrates. The DRX-HT analysis allows the detection of the two CoMoO_4 phases with diffraction peaks which increase with the increase in temperature. The results of the FTIR analysis made it possible to highlight the vibration modes of the bonds of the structure of the prepared catalysts. The SEM images of the solids show very different textures with almost homogeneous surfaces with a more regular particle size distribution and a more defined grain shape. The EDX analysis showed the presence of the elements Co, Mo, and O in proportions very close to the nominal proportions. Finally, the actual composition, evaluated by SAA, is close to the theoretical composition fixed during the preparation. This testifies to the good conditions for the preparation of the catalysts by the co-precipitation method.

Keywords : catalytic, molybdenum, coprecipitation, cobalt, ammonia

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