

Synthesis and Thermal Behavior of Metallic Cobalt Micro and Nanostructures

Marlene González Montiel¹, P. Santiago-Jacinto², J. A. I. Díaz Góngora¹, E. Reguera¹, Geonel Rodríguez-Gattorno^{1,3,*}

(Received 5 Jan 2011; accepted 9 Mar 2011; published online 7 April 2011.)

Abstract: In this contribution, a comparative study of metallic cobalt micro and nanoparticles obtained in solution by four different chemical routes is reported. Classic routes such as borohydride reduction in aqueous media and the so-called polyol methodology were used to obtain the cobalt nanostructures to be studied. Using CTAB as surfactant, cobalt hollow nanostructures were obtained. The use of strong reducing agents, like sodium borohydride, favors the formation of quasi-monodispersed nanoparticles of about 2 nm size but accompanied with impurities; for hydrazine (a mild reducer), nanoparticles of larger size are obtained which organize in spherical microagglomerates. Valuable information on the particles thermal stability and on nature of the species anchored at their surface was obtained from thermogravimetric curves. The samples to be studied were characterized from UV-vis, IR, X-ray diffraction, and electron microscopy images (scanning and transmission).