

Synthesis of shape-controlled Ni HCP hourglass nanoparticles and their shape-dependent catalytic performance

김찬연, 이현주^{1,*}

연세대학교 대학원; ¹연세대학교

(azhyun@yonsei.ac.kr*)

Shape-controlled nanoparticles (NPs) used to be synthesized with novel metals. But most of these mechanisms about shaped metallic nanoparticles cannot be successfully accepted into other 3d transition metal species like iron, copper, nickel, etc. Because these transition metals usually have poor stability for oxidation so they were usually shape-controlled as metal oxides. One of these transition metals, nickel is considered as a promising alternative in various catalytic reactions since its catalytic property and abundance. For that needs, nickel nanoparticles (Ni NPs) had been synthesized and shape-controlled. However there were still lack of understanding about synthetic conditions and their shape-effect. Here, we did study well about shape-controlled Ni NPs and observed unique morphology called "Ni hourglass" which involves structural transition of pure FCC structured nickel to metastable HCP nickel by certain factors. These Ni hourglasses are expected to have abundant defect sites. Thus we will confirm that shape-dependent catalytic performance of nickel using hydrogenation of nitrotoluene.