

## Synthesis of shape-controlled Ni hourglass nanoparticles with unconventional structure

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Shape-controlled nanoparticles (NPs) used to be synthesized with novel metals like Pt, Pd, Au and Ag using various growth mechanisms. But most of these mechanisms about shaped metallic nanoparticles cannot be successfully accepted into other 3d transition metal species like Fe, Cu, Ni, etc. Because these transition metals are easy to be oxidized so only some of systems could shape-control the metallic nanoparticle successfully. Here, we did study well about synthetic conditions of shape-controlled Ni NPs and observed unique morphology called “Ni hourglass” which involves structural transition of FCC structured nickel to metastable HCP nickel. The unconventional crystalline structure could be stabilized by intensive utilization of hexadecylamine. The dense organic layer on the surface protected the meta-stable crystalline structure.