

Synthesis of Bimetallic Fe/Cu Nanoparticles with Different Copper Loading Ratios

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Abstract : Nanotechnology has multiple and enormous advantages for all application. Therefore, this research is carried out to synthesize and characterize bimetallic iron with copper nano-particles. After synthesizing nano zero valent iron by reduction of ferric chloride by sodium borohydride under nitrogen purging environment, bimetallic iron with copper nanoparticles are synthesized by varying different loads of copper chloride. Due to different standard potential (E₀) values of copper and iron, copper is coupled with iron at (Cu to Fe ratio of 1:5, 1:6.7, 1:10, 1:20). It is found that the resulted bimetallic Fe/Cu nanoparticles are composing phases of iron and copper. According to the diffraction patterns indicating the state of chemical combination of the bimetallic nanoparticles, the particles are well-combined and crystalline sizes are less than 1000 Å (or 100 nm). Specifically, particle sizes of synthesized bimetallic Fe/Cu nanoparticles are ranging from 44.583 nm to 85.149 nm.

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