

The amazing effects and role of PVP on the crystallinity, phase composition and morphology of nickel ferrite nanoparticles prepared by thermal treatment method

Abstract

Nickel ferrite nanocrystals were prepared from an aqueous solution containing metal nitrates and various concentrations of poly(vinylpyrrolidone) followed by calcination temperature. X-ray diffraction (XRD) analysis was performed to determine the degree of crystallinity of the ferrite nanoparticles. By transmission electron microscopy, the morphology and average particle size of the nickel ferrite nanoparticles were evaluated which had good agreement with the XRD results. Fourier transform infrared spectroscopy suggested the presence of metal oxide bands in all samples as well as the effective elimination of organic constituents after calcinations. Measurements of the extent of magnetization of the nickel ferrite nanoparticles synthesized in different concentrations were obtained at room temperature using a vibrating sample magnetometer.

Keyword: Nanostructures; X-ray diffraction; Infrared spectroscopy; Magnetic properties