

Effect of annealing temperature on structural, optical and catalytic properties of Cu-Zn ferrite nanoparticles

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(Received: 06/06/2015, in revised form: 21/09/2015)

Abstract: In this research, $\text{Cu}_{0.5}\text{Zn}_{0.5}\text{Fe}_2\text{O}_4$ nanoparticles were prepared by citrateprecursormethod and under air-ambient annealing at 200, 400, 600°C. The structural features of samples were investigated by X-ray powder diffraction and FT-IR spectroscopy. The structural characterization of compounds, using X'Pert package and Fullprof program, is evidence for formation of a cubic structure (Fd-3m space group) with no presence of impurity phase that is emphasized by FT-IR data. Calculated values of crystallite size and unit cell parameter show a minimum for the sample annealed at temperature 200°C. Band gap energies of samples have been estimated using absorption coefficient. under similar reaction conditions, the catalytic results show that the sample annealed at temperature 200°C is the best catalyst for the CO and C_2H_6 oxidation due to smaller crystallite size.

Keywords: Cu-Zn ferrite; air ambient; nano-Catalyst; CO and C_2H_6 Oxidation

متن فارسی اصل مقاله از صفحه ۲۹۷ تا ۳۰۸ در این شماره به چاپ رسیده است.

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