

Advanced Materials 2020- Effect of milling on the Structural, magnetic and catalytic properties of zinc ferrite synthesized by microwave combustion method

Mohamed Housam Mahmoud

Jouf University, Saudi Arabia

Abstract

Zinc ferrite nano-crystals were successfully synthesized from its stoichiometric metal nitrates and glycine mixtures, using a microwave assisted combustion method. The as prepared sample was subjected to high energy ball milling for different periods of time. Structural and magnetic properties have been investigated by VSM and Mössbauer spectroscopy. Results revealed that the as-prepared sample is a monophasic zinc ferrite possesses high crystallinity. A minor of α -Fe₂O₃ phase is detected after milling. The room temperature Mössbauer spectra of the samples are representing the coexistence of both ferrimagnetic ordering and superparamagnetic phases. The data obtained indicate that the Isomer shift falls to the Fe³⁺ range. The highest average magnetic hyperfine field B_{hf} was found where the inversion parameter is maxima. The saturation magnetization value of the as prepared ZnFe₂O₄ is 47 emu/g was observed and its value decreases to 29 emu/g after 330 min of mill.

Biography:

Mohamed Housam Mahmoud is an associate Professor, Physics department, Faculty of Science and Arts, Jouf University, Saudi Arabia. Assiut University, Egypt.

Field of research: Condensed matter, Nanoscience, Magnetism and magnetic material.

Speaker Publications:

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