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Crystallographic and Morphological Properties of Mn-Zn Spinel Ferrite Nanoparticles

Manganese ferrite and zinc ferrite nanoparticles were successfully synthesized using the autocombustion method, which offers advantages such as low synthesis temperature, rapid reaction and uniform composition. The structural characteristics of the prepared samples were analyzed by X-ray diffraction (XRD). The XRD results confirmed the formation of a single-phase cubic spinel ferrite structure with good crystallinity. The surface morphology were studied by field emission scanning electron microscopy (FESEM). The FESEM images revealed fine particles with relatively uniform distribution along with slight agglomeration, which can be attributed to magnetic interactions between particles. The results demonstrate that the autocombustion method is an effective route for the synthesis of manganese and zinc ferrites nanoparticles with well define structural and morphological properties, making them suitable for potential applications in magnetic and electronic devices.

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