

### **The effect of alkali concentration on the structural and magnetic properties of Mn-ferrite nanoparticles prepared via the co-precipitation method**

**Somayeh Pourbafarani**  
Isfahan University, Iran

Chemistry plays an important role in the development of novel nano-structural materials, and a simple control of solution chemistry can lead to specific changes in crystallite properties. One of the chemical techniques in the synthesis of nanoparticles is co-precipitation. The advantages of using this method are that the structural and morphological properties of nanoparticles can be varied by controlling the chemical and physical parameters of the reaction medium such as the alkali concentration, reaction temperature, molar ratio of salts, ionic strength of aqueous medium, and reaction time. In this

work,  $\text{MnFe}_2\text{O}_4$  nano particles were synthesized using the co-precipitation method under two different NaOH concentration settings as reaction agents at 355 K (82°C). Structural and morphological properties of the nanoparticles were examined using X-ray diffraction and a scanning electron microscope. The decrease of NaOH concentration led to the increase of particle size, more crystallinity and a narrower particle size distribution. The results were evaluated from a chemical point of view and were based on the supersaturation level, which was influenced by alkali concentration. It was concluded that the higher NaOH concentration led to a more rapid nucleation and more random cation distribution. The magnetic properties of the nanoparticles were consistent with the structural and morphological properties of the particles.

s.pourbafarani@chmail.ir