

## Crystallographic and Magnetic Properties of Iron Oxide Nanoparticles for Applications in Biomedicine

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Magnetic nanoparticles have been investigated for use as biomedical purposes for several years. For biomedical applications the use of particles that present superparamagnetic behavior at room temperature is preferred [1-4]. To control the magnetic materials by magnetic field is essential locate particle to the suitable destination on feeding by injection. In order to use them properly, the particles should be nano size. However there are many difficulties in applications, because there is lack of identifications in nano magnetic properties. In our studies, structural and magnetic properties of iron oxide nanoparticles were investigated by XRD, VSM, TEM, and Mössbauer spectroscopy. At 13 K, hyperfine fields of  $\gamma\text{-Fe}_2\text{O}_3$  were 516 kOe and 490 kOe, that of  $\text{Fe}_3\text{O}_4$  were 517 kOe and 482 kOe. The saturation magnetizations were 21.42 emu/g and 39.42 emu/g. The particle size of powders is 5~19 nm.

**Key words :** Iron oxide, Mössbauer, Applications in Biomedicine, Nanoparticles