

## Microscopic properties of superparamagnetic ferrite nanoparticles

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The magnetic properties of five differently sized samples of the spinel ferrite nanoparticles have been investigated by XRD, TEM, magnetization measurements and Mossbauer spectroscopy. At the liquid helium temperature all the samples show long-range antiferromagnetic order in coexistence with short-range magnetic order. The Mossbauer absorption lines broaden increasingly as the temperature approaches the Neel temperature from below, and a strong central peak appears in the spectra. This kind of line broadening may be ascribed to the superparamagnetic effects.