

**MAGNETOCALORIC EFFECT AND SIZE-DEPENDENT STUDY OF THE  
MAGNETIC PROPERTIES OF COBALT FERRITE NANOPARTICLES PREPARED  
BY SOLVOTHERMAL SYNTHESIS**

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Cobalt ferrite (CoFe<sub>2</sub>O<sub>4</sub>) nanoparticles from 2 to 15 nm were synthesized using a solvothermal procedure. In this non-aqueous method, acetophenone was used as solvent and the particle size was controlled by changing the reaction temperature from 120 to 200 °C. Nanoparticles show good crystallinity and uniformity, as determined by x-ray diffraction and transmission electron microscopy.

Magnetic measurements indicate superparamagnetic behaviour. Zero-field-cooling (ZFC) demagnetization experiments at 100 Oe show blocking temperatures ranging from 215 K to more than 325 K. Increasing the applied magnetic field has only a small effect on the blocking temperature and a slight shift was observed to lower temperatures.

Saturation magnetization increases with particle size and a small decrease is observed when increasing the temperature. The Verwey transition is observed at 150K.

The magnetocaloric effect shown by these cobalt ferrite nanoparticles is reasonably high for nanomaterials.