

## Local magnetic structure of cobalt nanoparticles on the basis of Co-59 nuclear magnetic resonance data

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**Keywords:** *nanocomposites, nanoparticles, cobalt, NMR, spin-echo.*

### Abstract

A local magnetic structure of cobalt nanoparticles has been studied using Co-59 nuclear magnetic resonance in zero magnetic field.

Nuclear magnetic resonance spectra were obtained for the nanocrystalline cobalt (without matrix) with particles (crystallites) of 12-15 nm size. Comparison of the spectra with that of the bulk sample of cobalt has shown that the cobalt nanoparticles can be described by a "core-shell" type of structure, where the core of the nanoparticle acts as a magnetic domain, and the magnetic moments of the layers near the surface are slanted or disordered. It has been shown that the high-frequency peak of the nuclear magnetic resonance spectra (225.5-226 MHz) is related to the surface layers of nanoparticles, and the peak at the frequency of 220 MHz - to the core of the nanoparticle.