

INFLUENCE OF INTERFACES ON MAGNETIC HYPERFINE FIELD

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Compacting nanoparticles leads to the formation of a bulk material with a significant fraction of interface. The atomistic short-range order of interfaces is very different from the well known amorphous and crystalline materials. Transmission electron microscopy (TEM), X-ray diffraction studies as well as Mössbauer spectroscopy have been applied to elucidate physical and magnetic properties. The iron-partial phonon density of states (PDOS) was measured showing dramatic differences between the bulk and Materials with significant fraction of interfaces. Molecular dynamics (MD) simulations of the atomic structure of nanomaterials were made and reproduce well the experimental results. The magnetic properties of these materials have been investigated in details. The results show that transition temperature and magnetic moment are different from the well-known materials.