

Magnetic properties of Heusler nanoparticles encapsulated inside carbon nanotubes

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Magnetic properties of nanoscale systems may differ largely from the magnetism in the respective bulk phase and can lead to the emergence of interesting physical properties. Furthermore, Heusler compounds constitute a family of materials with a broad range of physical properties - among them different types of magnetism and materials with high spin polarisation [1]. Here we present results of investigations of thermomagnetic properties of Heusler nanoparticles prepared inside multi-walled carbon nanotubes via a wet-chemical approach [2]. Our study shows, that the coercive field of the Heusler nanocrystals is greatly enhanced and depends on the mean diameter of the Heusler nanocrystals, while the saturation magnetic moment known from the bulk phase is preserved.

References:

- [1] T. Graf et al., Prog. Solid State Ch., 2011, 39 (1), pp 1-50
- [2] M. Gellesch et al., Cryst. Growth Des., 2013, 13 (7), pp 2707–2710