code has been also implemented and tested. Calculations of Ni and Co nanowires up to 30000 magnetic moments in the periodic unit cell have been carried out. Finally, the physical meaning and properties of the calculated magnetostatic dipolar anisotropy energies of Fe thin layers and Ni and Co nanowires are also discussed.

NANO-201

Stability of self-assembled Cobalt nanoparticles under extreme conditions

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Under specific conditions, magnetic metallic nanoparticles (NPs) are self-assembled in organized structures, called supracrystals [1]. This self-organization process takes place thanks to particle small size dispersion as well as the use of an adapted coating agent preventing coalescence and oxidation. Supracrystals possess a high potential in various fields, including electronics, charge transport and information storage. Nevertheless, their thermodynamic properties have been little studied, particularly under pressure. The present work aims at establishing the temperature-pressure phase diagram of supracrystals constituted of Co NPs hold together by lauric acid chains.

To this purpose, two experimental techniques were employed in combination with resistive heated membrane diamond anvil cell (mDAC) for the generation of the high pressures (0-20 GPa) and moderate temperatures (0-200 °C). Low wavenumber Raman scattering was used in order to determine both spherical and quadrupole vibrational modes of individual Co NPs [2]. In addition, a picosecond acoustics setup [3] was used to detect the collective vibrations of supracrystal, and their variations with P and T parameters. Physical properties of lauric acid was studied separately in order to identify its contribution to the properties of the supracrystals.


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Development of a selective hydrogen leak sensor based on Pd incorporated ZnO nanowires on ITO substrate by spray pyrolysis method

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A novel room temperature hydrogen sensor based on Pd decorated ZnO nanowires were fabricated on ITO glass substrate by spray pyrolysis method [1]. The effect of Pd dopant concentration on the structural, optical and