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Role of trioctylphosphine on quantum size effect in Ni nanolattice

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Nickel nanoparticles are of special interest for their attractive potential applications in magnetic resonance imaging, magnetic fluids, catalysts, magnetic recording media, rechargeable batteries, optoelectronics, conducting paints, magnetic hyperthermia and other biomedical applications. When these nanoparticles are dispersed in a liquid medium for example, they tend to agglomerate/ disperse due to van der Waals or other attractive forces. Similarly, what kind of forces they may need to form their own periodic lattice in solid state and how this will influence their overall properties may be intriguing. We have investigated some of these aspects. They revealed that trioctylphosphine is responsible for their nanolattice formation, how the Ni atoms are arranged in these nanoparticles, how their electronic density of states changes, nearest-neighbour atoms are changed with particle size and why their quantum size effect is unique in heat capacity, not in electronic or magnetic properties. Some of these shall be discussed briefly.

Speaker Biography

Okram has completed PhD from Indian Institute of Technology, Bombay (1995), India. He has worked at several research institutes including National Institute of Materials Science, Tsukuba, Japan (1996-98) as STA Fellow before joining at UGC-DAE Consortium for Scientific Research, Indore, India as Scientist D in 2001. He has delivered over 61 invited lectures at various conferences, published over 210 papers that have been cited 985 times and his publication H-index is 16 and has been serving as a reviewer of several reputed journals.

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