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## Reversible Semiconductor – Metal Transition study in nano-FePt system

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Highly crystalline nano-spherical Fe-Pt systems were produced by 248 nm laser irradiation of liquid precursor at different laser fluence ranging from 100 – 375 mJ/cm<sup>2</sup>. The influence of laser intensity on the particle size, iron composition and vibrational properties was systematically investigated. The study reveals that the larger particles have higher iron content. The prepared precursor solution through Fe (III) acetylacetonate and Pt (II) acetylacetonate underwent a deep photolysis to polycrystalline of nano Fe-Pt alloys. Fe (II) and Pt (I) acetylacetonate decompose into Fe<sub>0</sub> and Pt<sub>0</sub> nanoparticles (NPs). The material is shown to contain only iron and platinum by EDS. We have observed hysteric loop in structural phase transition of Fe<sub>60</sub>Pt<sub>40</sub> NPs. The material shows high resistance ( 2,700 Ohms) at lower temperatures and low resistance ( 2,200 Ohms) at higher temperatures. Pan theory was used to exemplify the phase transition.

**Level (Hons, MSc, <br> &nbsp; PhD, other)?**

PhD

**Consider for a student <br> &nbsp; award (Yes / No)?**

Yes

**Would you like to <br> submit a short paper <br> for the Conference <br> Proceedings (Yes / No)?**

Yes

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