Contribution ID: **1876** Type: **Poster**

Physical Properties of Nano- Scaled silver in Boron Nitride Matrix

Monday 27 October 2025 18:30 (20 minutes)

In this study we transformed the characteristics of silver nanoparticles from non-magnetic to magnetic by enclosing them in a boron nitride matrix, which seprates the silver nanoparticles from each other, making their magnetic moment parallel. The chemical method used to manufacture the silver nanoparticles in boron nitride matrix (Ag NB) was freeze- drying .XRD data revealed that the average size of Ag BN nanoparticles was 6.41 nm, which is similar to the particle size obtained by TEM, 11 nm. We also discovered that Ag BN nanoparticles have ferromagnetic characteristics at 300 K (room temperature) with magnetic parameters such as magnetic saturation ,coercivity and retentivity of Ms=0.0115 emu/g, Hc=0.017 T, and Mr=0.0007 emu/g. In addition to photoluminescence at 430 nm (2.8 eV), in the visible and blue light regions. Our investigation of Ag BN nanoparticles has revealed unexpected magnetization in silver nanoparticles, as ferromagnetic (FM) ordering is normally observed in transition-metal systems generally originates from partially filled d-electron shells. Thus, the mechanism responsible for this observed magnetization remains ambiguous. We utilize first-principles spin-polarized density functional theory to examine the magnetization in Ag nanoclusters. Silver nanoparticles with enhanced magnetic capabilities allow them to be used in a variety of essential applications, including magnetic storage, medical imaging, medication delivery, cancer treatment, and water purification [1,2,3].
Key words: silver, Boron Nitride, Freeze drying,Magnteic properteis ,Nano
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Session Classification: Poster session & Welcome drinks

Track Classification: Condensed Matter Physics