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Interactions of Green Synthesized Indium Oxide (In_2O_3) Nanofluids with Bovine Serum Albumin Protein

KanchanaLatha Chitturi[1], Aparna Yarrama[1]*, Jinsub Park[2], Dayakar Thatikayala[2], Ramchander Merugu[3] and S. Ramkumar[4]

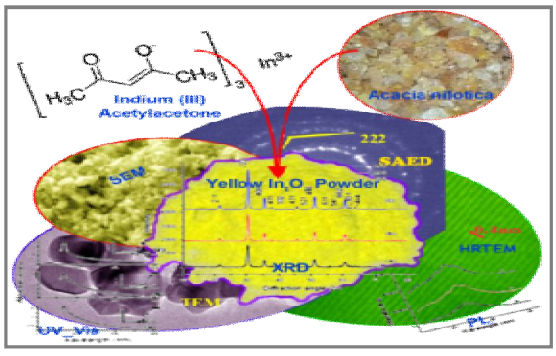
1. Department of Physics, Nampally, Hyderabad-500001, Telangana, **INDIA**
2. Department of Electronic Engineering, Hanyang University, Seoul 133-791, Republic of **KOREA**
3. Department of Bio Chemistry, Mahatma Gandhi University, Nalgonda-508254, Telangana, **INDIA**
4. Department of Physics, BVRIET, Hyderabad-500001, Telangana, **INDIA**

Email: profyaparna@gmail.com

ABSTRACT

A two-step method which is cost-effective and reliable was used to prepare stable Indium oxide nanofluids by dispersing biosynthesized Indium oxide nanoparticles in ethylene glycol base fluid with a surfactant PVP and Albumin Protein. The precursors Indium (III) Acetylacetonate and Gum Acacia were used for obtaining Indium oxide nanoparticles. The obtained stable nanofluids of Indium Oxide were characterized by Spectroscopy and Microscopy for determining the morphology, size and chemical composition. For different volume concentrations of PVP, the thermophysical properties were studied. It was observed that the effect of PVP and Albumin protein has played a major role on magnitude and behavior of thermal conductivity enhanced about 30% and the decrement in viscosity for 5% volume concentration with that of base fluid at the same temperature.

Graphical Abstract



Keywords: Biosynthesis, In_2O_3 nanofluid, PVP, Albumin, Thermophysical properties, TEM, SEM and EDAX.