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Title of MRP "**Studies on the Effect of Iodine Dopping on Electrical Properties of Co-ordination Polymers and their Applications"**

SUMMARY OF THE MINOR RESCARCH PROJECT

During the first year of the tenure of the Minor research project survey of literature, purchasing of glass ware and basic instruments for synthesis of ligand s and coordination polymers have been done. The terpolymer of Salicylicacid, biuret and trioxane(1:1:2) has been synthesized. The coordination polymers of Vo (II), Cr (III) and Cu (II) with terpolymer SBT 1:1:2 have been prepared. After that iodine doped coordination polymers have been prepared. A qualitative doping was carried out by exposing powdered coordination polymers to iodine vapours .After 24 hours material was removed and pelletalised using some pressure. Average diameter and thickness of the pellets were measured by travelling microscope.

In the second year of Minor research project Electrical conductivity of coordination polymers and doped coordination polymers has been measured.

Electrical conductivity of coordination polymers of SBT 1:1:2

The results of electrical conductivity of coordination polymers of SBT 1:1:2 are given in tables' 1-3.From the above results following conclusions can be drawn.

1. The coordination polymers of SBT1:1:2 at room temperature have electrical conductivity in the range of1.48×10^{-12} to1.47×10^{-14}(ohm cm)$^{-1.}$

2. The electrical conductivity of coordination polymers at room temperature declines in the order Cu (II)> Cr (III)> and Vo (II).

3. Thermal activation energies of electrical conduction of these polymers lie in the range 0.091-0.296 eV .

4. The plots of log σ versus 10^3/T is found to be linear over a wide range of temperature, which indicates semiconducting nature of polychelates.

Electrical conductivity of Iodine doped coordination polymers of SBT1:1:2

The results of electrical conductivity of iodine doped coordination polymers are given in tables 1-3.The following conclusions can be drawn.

1.The electrical conductivity of iodine doped coordination polymers of SBT 1:1:2 lies in the range of($1.90x10^{-10)}$ to$1.75x10^{-11}$(ohm cm)$^{-1}$ at room temperature.

2.At room temperature the electrical conductivity of Iodinated coordination polymers decreases in the order,Vo(II) >Cr(III) >and Cu(II).

3.The activation energies of iodine doped coordination polymers of SBT 1:1:2 decline in the order Cr(III)> Vo(II)> Cu(II).

4. The plots of log σ versus 10^3/T are found to be linear in the wide range of temperature. Therefore, it can be concluded that iodinated polymer can also act as a good semiconductor.

By comparing the results of electrical conductivity of iodine doped and without iodine doped coordination polymers, it can be seen that the electrical conductivity increases significantly due to iodine dopping.The increase in electrical conductivity due to iodine dopping can be interpreted in terms of oxidation of the metal chelate ring by iodine which leads to creation of some holes in polymer domain and hence increases conductivity.

By comparing the activation energies of coordinated polymers of SBT1:1:2 and iodinated polymers of SBT1:1:2, it can be concluded that there is a large decrease in activation energies of iodine doped polymers of SBT.Since activation energy is a direct measure of band gap of semiconductors, the decrease in activation energy after iodination of polymers indicates decrease in band gap. Thus large increase in conductivity in iodinated polymers may be attributed to decrease in band gap. The band gap and conductivity is important to decide their application in electronic industry and power sources.