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Photoluminescent studies of 2, 2'-dihydroxybiphenyl, ethylenediamine - formaldehyde copolymer

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Abstract. Polymer resin-II (2,2'-DBPEDF) synthesized by the condensation polymerization of 2,2'-dihydroxybiphenyl (DBP), ethylenediamine (ED) and formaldehyde (F) in acidic medium with molar ratio 2:1:3 of monomer and refluxing in oil bath at 120^{0}C for 5 hr. Synthesized copolymer as a ligand is combined with metal particles such as Ni^{2+}, Cu^{2+} and Zn^{2+} ions is in 2:1 molar proportion to get metal complex. The reaction has been finished with refluxed at 60^{0}C for three hour. Composition and structure of organic polymer resin-II have been determined by elemental analysis and molecular weight determination by non-aqueous conductometric titration. The UV-visible, FTIR, proton nuclear magnetic resonance and surface feature and crystalline behaviour of ligand and its complexes were analysed by SEM. Newly synthesized copolymer with metal complexes with copper and zinc metal may be used as supporting material for luminescence 2,2'-DBPEDF-Cu show higher photoluminescence than 2,2'-DBPEDF-Zn.

Keywords. Synthesis, condensation, ethylenediamine, photoluminescence, copolymer, metal-complex.

1. Introduction

Impressive interest has been appeared in the synthesis and investigation of coordination complex polymers containing N, S and O donor atoms on polymeric interface. In recent years, polymeric compounds have a lot of consideration and significance, because of fundamental significance in industries. The polymer can be utilized as dyes, surface covering, retardants, adhesives, antibacterial, semiconductors, ion exchanger, rectifiers, battery-powered, glow, and so forth. Electrical conductivity and thermal studies of polymers is aid for polymer scientist because of pertinence at raised temperature next to challenges that need to confront attributable to appropriate electrical conductivity, warm soundness and low processability. In association with similar numerous collaborators attempted to modify the warm strength by changing the monomer arrangement in polymer union [1-4]. The most recent examination progress in fluorescent polymers is centred around the arrangement and photoluminescence of fluorescent polymers with new engineering different strategies for plan and amalgamation of fluorescent materials have additionally been created. Organic polymer which shows fluorescence can be combined by polymerization of starting monomers, utilizing fluorescent mixes as initiator fluorescent mixes as chain move specialist's material holding between fluorescent gatherings and copolymers and polymerization of nonfluorescent monomers [5].

Photoluminescent supra molecular architecture has recently attracted much interest because of their potential applications in photoelectronic devices or as fluorescence sensors and probes. Polymers have started to find use in making LEDs, liquid crystals and as sensors for metal ion warfare agents, bacteria and biomolecules. Most of the photoluminescent materials are pi-conjugated semiconducting materials much interest is being shown in the synthesis and exploration of the structure-property relationship of pi conjugated polymers due to vital importance in electrical industries. Coordination mixes are entrancing class of particles that have wide applications in numerous fields, for example, light producing diodes (LEDs), follow metal investigation, metal flagging, plan of optical gadgets and sensor atoms [6]. As compared to blue, green and red luminescent complexes most stable luminescent complex is blue which is useful for electroluminescent displays [7]. LECs, supra molecular assemblies, solar energy conversion scheme [8], biological probing and oxygen sensing [9- 10]. Luminescent coordination polymers are as of now accepting a lot of consideration because of their expected applications in different fields, for example, natural light radiating diodes [11].