

# Synthesis and Characterisation of Copolymer Resin Derived from 2,2'- Dihydroxybiphenyl, Ethylenediamine and Formaldehyde

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**Abstract**--Synthesis of copolymer resin (2,2'-BPEDF) have been prepared by the condensation of 2,2-dihydroxybiphenyl (BP) and ethylenediamine(ED) with formaldehyde (F) in the presence of acid catalyst and using 1:1:2 molar ratio of reacting monomers. Copolymer resin compositions have been determined on the basis of their elemental analysis and the number average molecular weights of resin were determined by conductometric titration in non-aqueous medium. The UV-visible, FTIR and proton nuclear magnetic resonance (<sup>1</sup>H NMR) spectra were studied to elucidate the structure. The surface features and crystalline behaviour of the ligand and its complexes were analysed by scanning electron microscope (SEM).

**Keywords:** Synthesis, 2,2'-dihydroxybiphenyl, ethylenediamine, formaldehyde, polycondensation, resin, structure, degree of polymerization, characterization.

## I. INTRODUCTION

Synthesis and characterization of polymeric resins deserves to be investigated because of their varied characteristics and beneficial properties. Copolymers resin has been become subjects of interest and are found to be amorphous, crystalline or resinous in nature [1-2]. So far, several copolymers of phenol or 8-Hydroxyquinoline derivatives like o-aminophenol, resorcinol, pyrogallol and phydroxybenzoic acid with formaldehyde have been reported. Extensive studies on the copolymers, reported in the literature, are synthesized by the condensation of a mixture of phenol or hydroxybenzoic acid, various amines and formaldehyde [3-4]. Since last few decades many scientists are working to develop new and easier techniques for synthesis and characterization of copolymer due to its versatile applications in domestic as well as in industrial sector. copolymer found very useful applications as adhesive, high temperature flame resistance, melting temperature control, fibres, coating materials, semiconductor, catalyst, ion exchange resin, flexibility impact modifier for engineering plastic, heat sealing film in car interior, pipelines, electrical resistance textiles, bullet-proof vests biomaterials, light guide panel laptop computers and pharmaceutical uses[5-8].

Thermo analytical and kinetic studies of terpolymer resins derived from 8-hydroxyquinoline-5-sulphonic acid/p-cresol, oxamide/melamine with formaldehyde have been reported by Singru et al. [9-11]. Recently, the groups of Pierre, Serratrice, Bradshaw and Hiratani developed di and tritopic 8-HQ derivatives for the selective extraction or sensitizing of Metal ions [12-14]. Poly (oxinealkaline) polymers have been reported as ion exchangers [15] as well. 2-hydroxy, 4-methoxybenzophenone, 1,5-diaminonaphthalene, formaldehyde by Das [16]. A chelating terpolymer synthesized from anthranilic acid, salicylic acid and formaldehyde by MAR Ahmad and co-workers [17]. The material is often not a single component and hence simple chemical analysis will rarely provide all information required.