

# Synthesis, Characterization and Morphology of Organic Copolymer Resin-III Resulting from 1,5-Diaminonaphthalene, 2,4-Dihydroxypropiophenone and Formaldehyde

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**Abstract:** The copolymer 2,4-DHP-1,5-DANF-III has been synthesized from 2,4-dihydroxypropiophenone, 1,5-diaminonaphthalene with formaldehyde by the polycondensation method in the presence of 2M hydrochloric acid as a catalyst with 3:1:5 molar proportion of reactants. The copolymer has been characterized by various physico-chemical and spectral techniques such as elemental analysis, UV-Visible, FT-IR, <sup>1</sup>H-NMR and non-aqueous conductometric titration. Scanning electron microscopy (SEM) has been used to establish the surface morphology. The copolymer has been found to be crystalline as well as amorphous or transition between crystalline and amorphous.

**Keywords:** Copolymer, Synthesis, Characterization, Morphology, Crystalline, Amorphous

## I. INTRODUCTION

The synthesized copolymer showing versatile applications and properties which attracted the attention of scientist and introduces the innovations in polymer science. Copolymers have been changing our life for decades with many applications in the field including waste water treatment, ion-exchanger, medicine, engineering, agriculture, and semiconductor because of their high thermal stability, heat and chemical resistance. Thermogravimetric analysis has been widely used to investigate the decomposition characteristics of polymeric matter. The degradation of polymer under air or inert atmosphere at increasing temperature provides useful information about the nature of the species produced [1-5].

Electrical conductivity study of thermally stable newly synthesized copolymer has reported by Niley and coworker [6]. Gabal et al. have reported the synthesis, characterization and electrical conductivity of polyaniline-Mn<sub>0.8</sub>Zn<sub>0.2</sub>Fe<sub>2</sub>O<sub>4</sub> nano-composites [7]. Gupta has studied the electrical conductance behaviour of copolymer resin-II derived from p-hydroxybenzaldehyde, urea and ethylene glycol [8]. Chinchamalpure and coworker have reported the electrical conductivity of some copolymers and its polychelates [9]. Gurnule and coworkers studied the synthesis, characterization and thermal degradation study of copolymer derived from salicylaldehyde, melamine and formaldehyde [10]. Thermal degradation and electrical conductivity measurement of resin derived from salicylic acid, hexamethylenediamine and formaldehyde has been studied by Dhanraj Masram et al. [11]. Terpolymer 8-hydroxyquinoline, formaldehyde with pyrogallol have been reported by Soumaya Gharbi et al. [12]. Electrical conductivity of salicylidene - anthranilic acid - schiff base formaldehyde resin (R-AASA) was reported by Abbas and coworker [13]. The present investigation deals with study of synthesis and characterization of 2,4-dihydroxypropiophenone, 1,5-diaminonaphthalene with formaldehyde copolymer which has not been reported so far in literature.