

# Electrical Conductivity of Newly Synthesized Copolymer Resin-IV from 2, 4-Dihydroxypropiophenone, 1, 5-Diaminonaphthalene and Formaldehyde

N. C. Das<sup>1</sup> and W. B. Gurnule<sup>2</sup>

Department of Chemistry, Dr. Ambedkar College of Arts, Commerce & Science, Chandrapur, Maharashtra, India<sup>1</sup>

Department of Chemistry, Kamla Nehru Mahavidyalaya, Nagpur, Maharashtra, India<sup>2</sup>

ncd.lec@gmail.com

**Abstract:** The copolymer 2,4-DHP-1,5-DANF-IV has been synthesized by condensation of 2,4-dihydroxypropiophenone, 1,5-diaminonaphthalene with formaldehyde in the presence of 2M hydrochloric acid as a catalyst with 4:2:7 molar ratio of reacting monomers. The copolymer has been characterized by elemental analysis, UV-Visible, FT-I and <sup>1</sup>H-NMR spectra. Electrical conductivity measurement has been carried out to ascertain the semiconducting nature of the copolymer resin. The electrical conductivity of the copolymer has been found to be  $2.05 \times 10^{-10}$  to  $1.15 \times 10^{-8} \text{ ohm}^{-1} \text{ cm}^{-1}$  in the temperature range 313-428 K. The activation energy of electrical conduction has been found to be  $6.48 \times 10^{-20} \text{ J/K}$ . The plots of  $\log \sigma \text{ Vs } 10^3/T$  are found to be linear over a wide range of temperature, which obeyed the Wilson's exponential law  $\sigma = \sigma_0 \exp(-\Delta E/KT)$  and the copolymer can be ranked as semiconductor.

**Keywords:** Copolymer, Synthesis, Characterization, Morphology, Electrical Conductivity

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