

Synthesis, characterization and fluorescence spectral studies of poly (diphenylamine-aminophenol) copolymers using a reactive surfactant

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Poly (*para*-diphenylamine-co-*ortho*-aminophenol) copolymers have been synthesized through oxidative polymerization with sodium dodecylsulphate as the emulsifying agent. The synthesized copolymer has been characterized using UV-Visible spectroscopy, FT-IR, XRD, SEM and TG-DTA and DSC. The UV-Vis shows the peak at 273 nm due to the $\pi \rightarrow \pi^*$ transition which is related to the extent of conjugation between the adjacent phenylene rings in the polymeric chain. A broad peak that shows in the area of 3850 cm^{-1} is due to hydrogen-bonded $-\text{OH}$ and $-\text{NH}_2$ groups. Two main peaks between 1564 and 1484 cm^{-1} refer to the ring stretching vibrations of the quinoid and benzenoid rings, respectively. The XRD studies confirm the polymer has semicrystalline nature. The SEM analysis of the copolymer exhibits cluster like arrangement on the rough surfaces and wide dispersion, without any regularity in shape. The TGA illustrate there exists three stages of weight loss. The polymer is found to be thermally stable till 518°C with the residual mass of 0.48%. The fluorescence spectroscopy data shows that synchronous scanning for both excitation and emission peaks at 399 nm.

Keywords: Diphenylamine, Aminophenol, Copolymer, TGA, Fluorescence