

Synthesis, characterization and electrical properties of poly[bis-(2-aminophenyl)disulfide] and poly[bis(2-aminophenyl)diselenide]

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Abstract

Polybis(2-aminophenyl)diselenide and polybis(2-aminophenyl)disulfide were chemically synthesized by oxidation of the monomers with ammonium persulphate in 0.5 M H₂SO₄ and 1 M HCl media, at variable polymerization times. Synthesis of polybis(2-aminophenyl)diselenide for 4.5 h afforded a product with the spectroscopic properties (FT-IR and UV-Vis) similar to those of poly emeraldine. On the other hand, the synthesis of polybis(2-aminophenyl)disulfide with these spectroscopic properties was not so straight forward and, consequently, conditions such as medium, oxidizing agent, temperature, concentration of monomer and oxidizing agent, and polymerization time had to be thoroughly surveyed. Both emeraldine dichalcogenide polymers proved to be insoluble in common organic solvents, but they dissolve well in concentrated sulphuric acid, yielding blue solutions and PANI-like spectra. They get doped by iodine vapor, but very little doping is obtained in acid aqueous media. Their conductivities attained those of semiconduction.

Keywords

Poly[bis-(2-aminophenyl)disulfide], Poly[bis(2-aminophenyl) diselenide], Polydichalcogenides, Doping, Conductivity.