

Synthesis, characterization and electrical properties of poly(2,5-, 2,3- and 3,5-dichloroaniline)s Part II. Copolymers with aniline

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Abstract

Poly(2,5-dichloroaniline-co-aniline), poly(2,3-dichloroaniline-co-aniline) and poly(3,5-dichloroaniline-co-aniline) have been synthesized by chemical copolymerization of aniline with the dichloroanilines in aqueous 1 M hydrochloric acid using potassium dichromate as oxidizing agent. The copolymers were synthesized at several molar fractions of dichloroaniline in the feed and were characterized by elemental analysis, FT-IR and UV-VIS spectroscopy and by electrochemical method. Moreover, the products were doped with HCl and gaseous iodine. The doping level shows strongly variation with composition of dichloroaniline in the copolymers. Thus, the conductivity can be controlled in a broad range, from 10^{-9} to 10^{-2} S cm⁻¹. The relationship between composition of copolymer and comonomer feed molar ratio shows that the dichloroanilines present different reactivity in the copolymerization with aniline. Conductivities and UV-VIS spectra of products are compared with those of polyaniline and they are shown to be consistent with a diminution in pi-conjugation of copolymers caused by the dihalogenation.

Keywords

Copolymers, Dichloroanilines, Poly(dichloroaniline)s, Poly(dichloroaniline-co-aniline).