Preparation of Conducting Polyester/Polypyrrole Composites and Their Electrical Properties

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Electrically conducting polyester/polypyrrole(PPy) composite films and fibers have been prepared by polymerizing pyrrole vapor in polyester matrix containing ferric chloride as an oxidizing agent.

After polymerization of pyrrole for one hour, the electrical conductivities of composites reach as high as 10^{-3} - 10^{-2} S/cm, depending on the preparation conditions such as polymerization time, polymerization temperature, and the concentration of the oxidant.

The characterization of the composite films was investigated by FT-IR spectra, X-ray diffration curves, and scanning electron micrographs.

The stability of conductivity to ambient air exposure is excellent, that is, there occurs little change in conductivity on exposing the composites to ambient air for one month.

The thermal stability of composite films under nitrogen gas is studied

by ageing, and the rate constant of the degradation of electrical conductivity suggested the conductivity loss of one order of magnitude loss per every 5 years.