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Study of Dielectric and Photocatalytic activity of Composite of Polythiophene with Photosubstituted Complex of Potassium Hexacyanoferrate(III)

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ABSTRACT

The synthesis of composite of Polythiophene with $[Fe(TEMED)(H_2O)(CN)_3].H_2O$ photoadduct was achieved via in-situ oxidative chemical polymerisation method using $FeCl_3$ as oxidant. The as synthesised composite and photoadduct was investigated by UV-Vis, FTIR, XRD and SEM characterization techniques, which indicate successful synthesis of composite. From dielectric study, the magnitude of dielectric constant was found to be 4.4×10^6 at 100 Hz and ac-conductivity of the synthesized composite was found to be 4.5×10^9 S/m at 10^4 Hz. The photocatalytic activity of the synthesised composite was also investigated against Rhodamine B (RhB) dye and was found to degrade 60% of the dye in two hours. Thus the nanocomposite synthesised can be used as a photocatalytic material for water purification.

Keywords: Dielectric study, Dye degradation, photocatalytic activity, Rhodamine B