Photocatalytic degradation of Methylene Blue using PANi/Ceria nanocomposite under visible light irradiation

J. Vidya*, P. Balamurugan

PG and Research Department of Physics, Government Arts College for Men, Nandanam, Chennai – 35, India,
Tel. +91-960-028-6100, email: vidhi.js@gmail.com (J. Vidya), Tel. +91-944-405-6803, email: sibibalamurugan@gmail.com (P. Balamurugan)

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In situ oxidative polymerization technique has been used to synthesize PANi (polyaniline) and PANi/Ceria nanocomposite. The structural, morphology, optical and thermal properties of the samples were characterized by FT-IR, XRD, FE-SEM, UV-visible and TGA studies. PANi and PANi/Ceria nanocomposite exhibited good morphology of nanofibers with an average length of about 200–250 nm and 50–100 nm respectively. The optical and thermal analyses confirm the interaction between PANi and ceria. The band gap of the samples was calculated using Tauc plot and, the band gap of PANi and PANi/Ceria nanocomposite were 2.98 and 2.7eV respectively. The surface area analysis shows that the PANi/Ceria nanocomposite has high surface area than pure PANi and it has 56% degradation ability of methylene blue dye within 150 min under visible light irradiation.

Keywords: PANi; Cerium nitrate; Nanofibers; Photodegradation; Visible light; Methylene blue; Photocatalyst

*Corresponding author.

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