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A novel photocatalytically active mesoporous metal-free PPy grafted MWCNT nanocomposite

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Abstract

A new mesoporous metal-free functionalized multi-walled carbon nanotube (f-MWCNT) covalently grafted polypyrrole (PPy) nanocomposite has been synthesized via chemical oxidative polymerization method keeping different weight ratio of f-MWCNT (1-4). Various instrumentation techniques such as UV-DRS, FT-IR, XRD, Raman, TGA, BET and TEM were used to characterize the as-prepared nanocomposite. The successfully constructed photocatalytically active mesoporous metal-free PPy grafted MWCNT nanocomposite was employed for the decontamination of nitrobenzene (NB). Among all the catalysts, f-MWCNT-PPy (3) is found to be efficient due to a large specific surface area and high pore volume by which 99.9% reduction has been achieved within 60 min. The obtained mesoporous, covalently grafted and synergistic f-MWCNT-PPy can be used as an efficient and recyclable photocatalyst

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