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Photocatalytic activity of ZnO-rGO-HDPE nanocomposite for degradation of organic pollutants in water

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Wastewater treatment technologies have been employed to remove pollutants in water streams due to the threats that those pollutants pose to human health, animals, and the environment (Khaki et al., 2017). Currently, nanotechnology offers practical solutions to the problems associated with the production of drinking water and with the protection of natural water from being contaminated (Kumar et al., 2020), (Ahmed et al., 2019), (Singh et al., 2018). This study focused on the synthesis of heterogeneous photocatalysis nanocomposite materials that can be used to convert organic dye pollutants in wastewater into non-toxic wastes. Deposition of ZnO on rGO was done by assisted microwave process and incorporation of ZnO/rGO was done by melt-mixing extrusion method. The nanocomposites were characterized using elemental, microscopy, thermal, and photocatalytic analysis by XRD, XPS, FTIR, EDS, DSC, TEM, SEM, and Raman methods. The photocatalytic activity was done by placing nanocomposite into methylene blue solution and measuring UV absorption with time.

Recent Publications

1. Sagadevan S, Lett JA, Weldegebrieal GK, Garg S, Oh W-C, Hamizi NA, et al. Enhanced Photocatalytic Activity of rGO-CuO Nanocomposites for the Degradation of Organic Pollutants. Catalysts [Internet] 2021;11(8):1008

2. Nisar, Asif & Saeed, Muhammad & Muneer, & Usman, Muhammad & Khan, Dr-Iltaf. (2022). Synthesis and characterization of ZnO decorated reduced graphene oxide (ZnO-rGO) and evaluation of its photocatalytic activity toward photodegradation of methylene blue. Environmental Science and Pollution Research. 29. 10.1007/s11356-021-13520-6.s

Biography

Itumeleng Daisy Makgato completed her MTech in Chemistry at the age of 32 years from Tshwane University of Technology, South Africa. She is a Forensic Analyst in the South African Police Service for 10 years. She completed a level 6 Certificate in Pharmaceutical & Medical Device Operations at Innopharma Education and has gained knowledge of Pharma Science, Facilities & Utilities Management, QC & GMP, and Medical Device Operations & Manufacturing Process Tech. She also has a Basic Data Science certificate from Regenesys Business School.

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