Title	Preparation of Activated Carbon/TiO_2 Nanohybrids for Photodegradation of Reactive Red-35 Dye Using Sunlight
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Published Journal Name	Photochem
Type of Publication	Journal
Volume	1 Issue 1
Publisher	MDPI
Publication Date	May, 2021
ISSN	2673-7256
DOI	https://doi.org/10.3390/photochem1010006
URL	https://www.mdpi.com/2673-7256/1/1/6
Other Related Info.	Page 54 - 66

Abstract

Activated carbon/titanium dioxide (AC/TiO_2) nanohybrids were synthesized by a hydrothermal technique using various weight percent of commercial AC and were characterized by X-ray diffraction (XRD), field emission scanning electron microscopy (FESEM), Fourier transform infrared (FTIR) and thermogravimetric analysis (TGA). The synthesized nanohybrids were applied to photodegradation of Reactive Red-35 (RR-35) dye in aqueous solution using sunlight. Due to the synergistic effect of adsorption and photodegradation activity, AC/TiO_2 nanohybrids were more efficient in treating the aqueous dye solution than that of AC and TiO_2. The maximum (95%) RR-35 dye removal from the water was obtained with 20 wt% AC/TiO_2 within 30 min at natural pH of 5.6. The possible photodegradation mechanism of RR-35 dye with AC/TiO_2 was discussed from the scavenger test. Moreover, AC/TiO_2 was found to be suitable for long-term repeated applications through recyclability experiments. Therefore, AC/TiO_2 nanohybrid is a promising photocatalyst for treating azo dyes especially RR-35 from water.