



From the journal:

Journal of Materials Chemistry C

Exploring CoFe₂O₄/TiO₂ NCs for High-Efficiency UV-Driven Organic Dye Degradation



[K. M. Gopalakrishnan](#), [R. Ragul](#), [Vallarasu K](#), [R. Anitha](#) and [Vijayalakshmi Viswanathan](#)

Abstract

CoFe₂O₄, TiO₂ Nanoparticles (NPs), and CoFe₂O₄/TiO₂ nanocomposites (NCs) were successfully synthesized and evaluated for their photocatalytic efficiency in the degradation of methylene blue (MB) dye under irradiation of Ultraviolet light. X-ray diffraction (XRD) analysis confirmed the spinel structure of CoFe₂O₄ and the anatase phase of TiO₂. The CoFe₂O₄/TiO₂ composite exhibited the existence of both CoFe₂O₄ and TiO₂ phases without any additional peaks, indicating a successful integration of the two materials. According to morphological study, spherical NPs had an average particle size of approximately 50 nm for CoFe₂O₄, TiO₂, and the CoFe₂O₄/TiO₂ composite. Spectra of UV-Vis absorption of the CoFe₂O₄/TiO₂ nanocomposite displayed a notable redshift compared to pure TiO₂ and CoFe₂O₄ NPs. Photocatalytic degradation tests conducted over 120 minutes beneath UV light demonstrated that the CoFe₂O₄/TiO₂ composite exhibited significantly increased the activity of photocatalysis compared to CoFe₂O₄ and TiO₂. Additionally, the CoFe₂O₄/TiO₂ nanocomposite showed excellent stability and reusability, retaining a efficiency of deterioration of of 96.96% after five cycles.

[About](#)[Cited by](#)[Related](#)

This content is free to download. Please choose one of the options below to gain access.

Log in

Using your FREE account

[Register for a FREE account](#)

Other ways to access this content

Log in

Using your institution credentials

Sign in

With your membership or subscriber account

Article information

<https://doi.org/10.1039/D4TC05022C>

Article type

Paper

Submitted

27 Nov 2024

Accepted

20 Mar 2025

First published

22 Mar 2025

Citation

J. Mater. Chem. C, 2025, Accepted Manuscript

BibTex



Go

Permissions

[Request permissions](#)

Social activity

Tweet

Share

Search articles by author

- ☐ K. M. Gopalakrishnan
- ☐ R. Ragul
- ☐ Vallarasu K
- ☐ R. Anitha
- ☐ Vijayalakshmi Viswanathan

Go

Spotlight

Advertisements

» Journals, books & databases



Home

About us

Membership & professional community

Campaigning & outreach

Journals, books & databases

Teaching & learning

News & events

Locations & contacts

Careers

Awards & funding

Advertise

Help & legal

Privacy policy

Terms & conditions



© Royal Society of Chemistry 2025

Registered charity number: 207890

This website collects cookies to deliver a better user experience. See how this site uses [Cookies](#).