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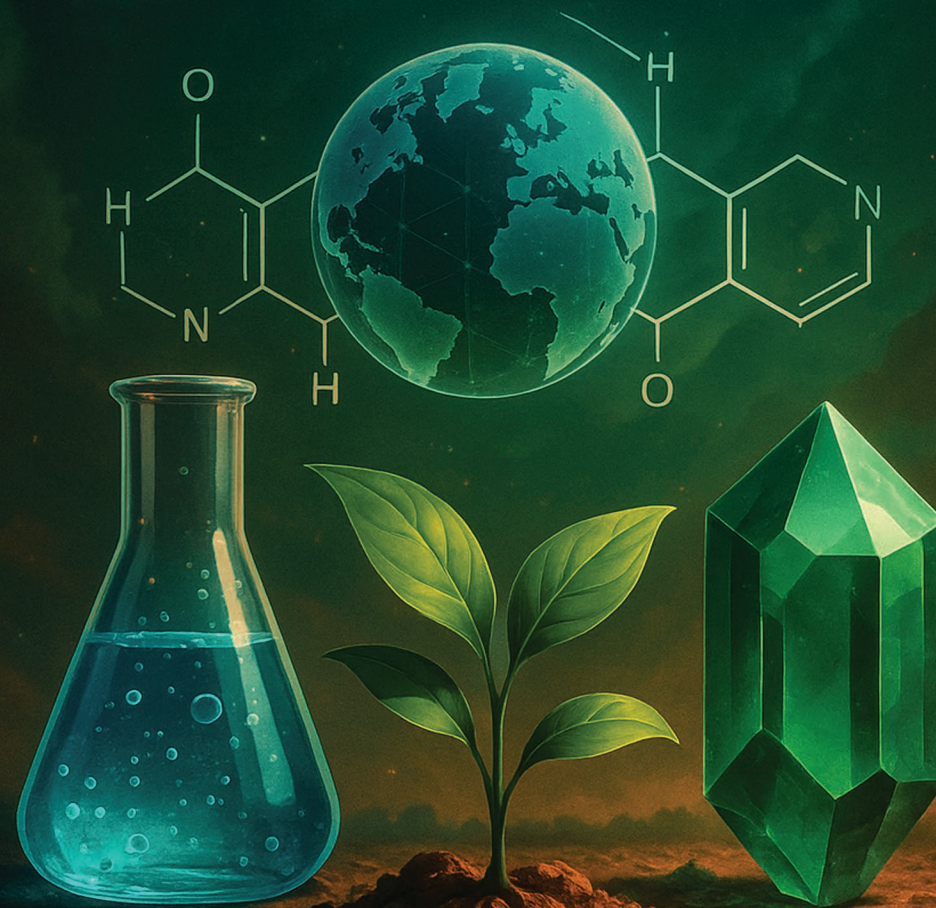
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Perspectives of Medicinal, Material and Environmental Chemistry

PERSPECTIVES OF MEDICINAL, MATERIAL AND ENVIRONMENTAL CHEMISTRY



Editors:
Dr. Saimah Khan
Dr. Naseem Ahmad
Dr. Firoz Hassan



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Perspectives of Medicinal, Material and Environmental Chemistry

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Published by: - Book Rivers

Website: - <https://www.bookrivers.com>

Email: publish@bookrivers.com

1st Print Edition - 2026

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Title: Perspectives of Medicinal, Material and Environmental Chemistry

Editors: Dr. Saimah Khan, Dr. Naseem Ahmad, Dr. Firoz Hassan

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ISBN: 978-93-6884-556-0

MRP: 400 /-INR

(Printed in India)

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CHAPTER – 7

Development of a Zinc-Based Metal-Organic Framework for Efficient Photocatalytic Degradation of Rhodamine B Dye

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Abstract

In this study, we report the synthesis of a zinc-based metal-organic framework (MOF) incorporating terephthalaldehyde as a linker, aimed at the efficient removal of Rhodamine B dye from aqueous solutions. The synthesized MOF, denoted as Zn-Tereph-MOF, was prepared via a solvothermal method, which involved the reaction of zinc nitrate hexahydrate with terephthalaldehyde in a mixed solvent system. Characterization of Zn-Tereph-MOF was performed using techniques such as X-ray diffraction (XRD). The results confirmed the successful formation of the porous framework structure. Photocatalytic studies revealed that Zn-Tereph-MOF exhibits a remarkable capacity for Rhodamine B uptake, attributed to the synergy between the high surface area, favorable pore size, and the interaction between the dye molecules and the framework. These findings highlight the potential of Zn-Tereph-MOF as an effective adsorbent for the removal of organic dyes from wastewater, contributing to environmental remediation efforts.

Introduction

The growing concern over environmental pollution, particularly from industrial effluents containing harmful organic dyes, has

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