Frontiers in Pharmaceutical, Material, and Environmental Sciences: Innovative Approaches and Applications

Editors

Tahmeena Khan

Qazi Inamur Rahman

Nafees Ahmad

Shahla Tanveer

Department of Chemistry,

Integral University, Lucknow

BOOK RIVERS

WE CREATE READERS

Published by: - Book Rivers

Website: - **https://www.bookrivers.com**

Email: **publish@bookrivers.com**

1st Print Edition - 2026

Title: ***Frontiers in Pharmaceutical, Material, and Environmental Sciences: Innovative Approaches and Applications***

Editors: ***Tahmeena Khan, Qazi Inamur Rahman, Nafees Ahmad, Shahla Tanveer***

ISBN: 978-93-6884-630-7

MRP: 370/-INR

(Printed in India)

PREFACE

This book brings together a collection of research studies that delve into the fields of pharmaceutical science, materials science, and environmental science. The chapters within this volume highlight innovative methods and significant discoveries in these areas. The research presented here explores the development of advanced drug delivery systems, the therapeutic potential of natural products, the removal of environmental pollutants, and the optimization of material properties. By combining experimental techniques with computational modeling, the authors have gained deeper insights into the underlying mechanisms of these processes. We hope this book will serve as a valuable resource for researchers, academics, and industry professionals in these fields. The knowledge and insights provided here will contribute to the advancement of scientific research and the development of sustainable solutions for global challenges.

Editors:

Tahmeena Khan

Qazi Inamur Rahman

Nafees Ahmad

Shahla Tanveer

Contents

Chapter – 7

Influence of Plasticizers on Thermoplastic Starch (TPS) Properties developed from Polystyrene

Suneel[1*], Devendra Pratap Mishra[2]

[1]*Department of Chemistry, Integral University, Lucknow, Uttar Pradesh 226026, India.*

[2] *Department of Applied sciences, Rajkiya engineering college, ambedkar nagar, 224122, U.P., India*

Corresponding email: sunilphd@student.iul.ac.in

Abstract

Starch is a naturally occurring biodegradable polymer belongs to class of polysaccharide. Present hydroxyl group in starch form hydrogen bond with H_2O molecules which makes it semi synthetics biodegradable polymer. The present observation is on polystyrene film and plasticized potato starch (PPS) blend through injection moulding method laboratory scale. Three samples were produced along in 5, 10 and 15% composition of polystyrene and potato starch using modifier like Sorbitol, Glycerol and Urea. Developing approaches toward biodegradable properties in polystyrene were analyzed by chemical treatment, water absorption test, and soil burial test in compost medium in 20, 30, 40 and 60 days interval, which indicates a continuous decrease in weight with increased plasticizers contents and number of days. Variation in mechanical properties like tensile strength, izod impact strength is also measure and compare with reference material.

Keywords: Plasticizer, Thermoplastics, Glycerol, Sorbitol, Urea, Biodegradable