SUSTAINABLE CHEMISTRY:

THE FUTURE OF OUR ENVIRONMENT

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Sustainable Chemistry: The Future of Our Environment

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Sustainable Chemistry: The Future of Our Environment

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Preface

In recent decades, the urgency to adopt sustainable practices in every field of science has become more pronounced, and chemistry is no exception. Sustainable Chemistry: The Future of Our Environment is born out of this growing necessity to realign chemical processes, materials, and innovations with principles that support ecological balance and resource efficiency.

This book aims to bridge the gap between conventional chemistry and sustainable development by presenting theoretical foundations, practical applications, and real-world case studies. It provides a roadmap for how green chemistry can transform industries, safeguard natural ecosystems, and promote circular economies.

The intention behind this book is not only to inform but to inspire action. Whether you are a student, researcher, policymaker, or industry professional, I hope this book encourages critical thinking and proactive engagement in solving environmental challenges through chemistry.

Acknowledgement

I would like to express my sincere gratitude to all those who contributed to the successful completion of this book, Sustainable Chemistry: The Future of Our Environment. This work is the result of collaborative efforts, insightful discussions, and unwavering support from scholars, researchers, and professionals dedicated to environmental sustainability.

My deepest thanks go to the contributors and reviewers whose expertise helped shape the content and ensure academic integrity. I am also grateful to the academic institutions and research bodies whose studies and publications provided valuable references and inspiration for this book.

Special thanks to our publishing team for their commitment to producing a book that upholds both quality and accessibility. Finally, I extend my appreciation to the readers and students of sustainability and chemistry, whose curiosity and passion continue to drive meaningful change for a healthier planet.

About the Authors

Dr. Manisha Sharma is currently serving as Professor and Head at the Institute of Applied Sciences, Mangalayatan University, Aligarh. She holds a Ph.D. in Chemistry from Devi Ahilya Vishwavidyalaya, Indore (2006) With over 17 years of extensive experience in teaching and research, she has made significant contributions in the fields of heterocyclic organic synthesis, antimicrobial screening, QSAR modelling, and electrochemistry and kinetics. Dr. Sharma has authored more than 20 research papers published in reputed national and international journals, and has presented 29 research papers at various academic conferences and seminars. She has also contributed to academic literature through the publication of several books and book chapters.

Prof. Dinesh Kumar Sharma is a Professor of Chemistry and the Controller of Examinations at Mangalayatan University, Aligarh, U.P., India. He earned his M.Sc. and Ph.D. in Chemistry from Dr. Bhim Rao Ambedkar University, Agra. With over 18 years of experience in teaching, research, and administration, he has published over 30 research papers in national and international journals and holds 25 patents both in India and abroad. He is a Life Member of several professional societies and has received numerous awards for his excellence in academic and research contributions.

Prof. Dr. Ravi Kant, FRSC (UK), FICS, FLS (UK), is currently serving as Professor of Chemistry and Dean of Research & Development at Mangalayatan University (NAAC A+), Aligarh, India. His research interests span bioorganometallics, material science, and metallo-pharmaceutical chemistry. He holds the position of Honorary Advisor/Principal Scientist in various research laboratories and R&D institutions. His accolades include the Rashtriya Shiksha Gaurav Puraskar-2015, Young Scientist Award-2018, and Best Faculty Award-2017. Dr. Kant is a fellow of several prestigious scientific organizations including the Royal Society of Chemistry London, Linnean Society of London, Indian Science Congress Association, Uttar Pradesh Academy of Sciences, and Indian Chemical Society. He has supervised 13 Ph.D. scholars, with 07 still working under his guidance, and has authored more than 100 highly cited publications.

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ABOUT THE BOOK

Sustainable Chemistry: The Future of Our Environment is a comprehensive academic resource that explores the principles, innovations, and applications of green and sustainable chemistry in the context of environmental conservation and sustainable development.

This book delves into:

- Core principles of green chemistry.
- Eco-friendly synthesis and materials.
- Waste minimization and pollution prevention.
- Renewable energy integration in chemical processes.
- Regulatory frameworks and sustainable industry practices.
- Case studies on real-world sustainable chemistry innovations.

Designed for university students, researchers, and professionals in chemistry, environmental science, and chemical engineering, this book serves both as a foundational textbook and a forward-looking guide. It supports readers in understanding how chemistry can be leveraged to build a sustainable future—one that harmonizes scientific advancement with ecological responsibility.

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