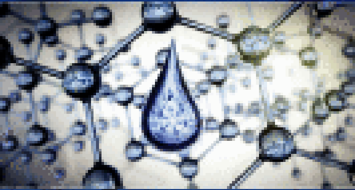
# SYNTHESIS OF METAL-ORGANIC FRAMEWORKS VIA WATER-BASED ROUTES

## A green and sustainable approach



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# Synthesis of Metal-Organic Frameworks via Water-Based Routes

## A Green and Sustainable Approach


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# Dedication

Sir Syed Ahmad Khan for his enormous efforts in promoting modern education and the establishment of Muhammadan Anglo-Oriental College, which later evolved into Aligarh Muslim University.

# Contents

# Preface

This book offers solid, quantitative descriptions and reliable guidelines, reflecting the maturation and demand of the field and the development of metal-organic frame (MOF) works. It summarizes the fundamental approaches and principles to prepare MOF works. The book particularly emphasizes the exciting preparation and applications of zeolitic imidazolate frameworks (ZIFs), isoreticular metal-organic frameworks (IRMOFs), coordination pillared-layer (CPL), and more. This book will be interesting for researchers working in the fields of MOF works, composite materials, material science, applied science, organic chemistry, and environmental chemistry. Additionally, the book will be useful for the scientists working on the preparation of MOF works from water-based systems. Furthermore, it will be equally helpful for the students in the development MOF works as well as graduates in material science, chemical engineering, environmental engineering, organic synthesis, and environmental chemistry. The book will serve as a reference book for industries working on the design and manufacturing process of MOF works.

The introductory chapter begins by covering basic information about MOFs and their applications. In the second chapter, the fundamentals of MOFs are discussed. The third chapter covers the kind and role of linkers for MOFs. Chapters four to eight describe different ways of synthesis of MOFs. Chapter nine provides valuable information about the solubility and thermodynamic stability of MOFs. Chapters 10 to 13 concentrate on the preparation and applications of essential water-based MOFs. Chapter 14 provides information about the applications of MOFs for wastewater treatment. Finally, the last chapter is dedicated to the industrial aspects of water-based MOFs.

Finally, we assure the readers that the information provided in this book can serve as a very important tool for anyone working on the MOF works. We are grateful to all the authors who contributed chapters to this book and who helped to turn our thoughts into reality. Lastly, we are grateful to the Elsevier team for their continuous support at every stage to make it possible to publish on time.

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