

HANDBOOK OF PYRROLIDONE AND CAPROLACTAM BASED MATERIALS

Synthesis, Characterization and Industrial Applications

Edited by *Osama M. Musa*

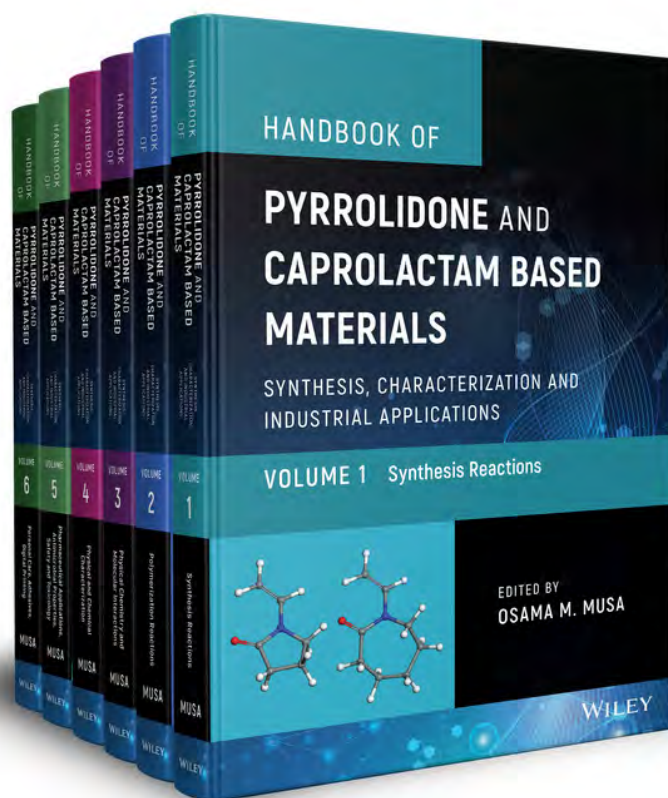
Chemistry/ Industrial Chemistry

Brings together, for the first time, a comprehensive review of all aspects of pyrrolidone- and caprolactam-based materials

This comprehensive, six-volume set describes the broad technical universe of γ - and ϵ -lactams, reviewing in-depth the chemistry of the small lactam-based molecules, uncovering their unique properties and showing how they have enabled a myriad of commercially important applications. From synthesis, through production and into applications, this extensive work targets significant and recent trends in γ - and ϵ -lactam science and technology and addresses all key aspects of pyrrolidone- and caprolactam-based materials to produce a definitive overview of the field.

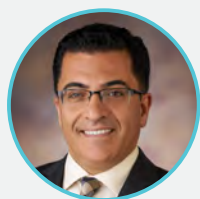
Handbook of Pyrrolidone and Caprolactam Based Materials: Synthesis, Characterization and Industrial Applications provides a detailed and modern portrait of the impact of pyrrolidone- and caprolactam-based materials on the world, as well as potential future possibilities.

Handbook of Pyrrolidone and Caprolactam Based Materials will appeal to industrial scientists and engineers interested in polymer development and manufacturing. It will also benefit academic researchers working in the fields of chemistry, materials science, and chemical and process engineering.



6 Volumes | Print Set ISBN 9781119468738
Hardcover | 2,592 pages | May 2021 | List price US\$1,000
Online ISBN 9781119468769

ABOUT THE EDITOR



Osama M. Musa, PhD, is Senior Vice President and Chief Technology Officer for Ashland Global Holdings. He is known as a strategic R&D leader with a broad experience in the specialty chemicals business sector. During his tenure at Ashland, he has led Research and Development efforts across all business segments and technical platforms, including consumer markets focused on pharmaceutical, nutraceutical, personal care, home care, nutrition and agricultural as well as industrial markets focused on coatings, adhesives, and performance additives for energy, construction, and lithium ion battery markets. He disposes of a wide-ranging network, cooperating with partners both in the industry and in academia.

 Please contact your local Wiley sales representative to place your orders or for any queries.

WILEY

HANDBOOK OF PYRROLIDONE AND CAPROLACTAM BASED MATERIALS

Synthesis, Characterization and Industrial Applications

Edited by *Osama M. Musa*

TABLE OF CONTENTS

VOLUME 1 Synthesis Reactions

- Chapter 1
Introduction to Pyrrolidone and Caprolactam
H. Keith Chenault
- Chapter 2
Synthesis of Pyrrolidones and Caprolactams by Intramolecular Cyclization of Linear Precursors
Samuel D. Arthur and H. Keith Chenault
- Chapter 3
Synthesis of Pyrrolidones and Caprolactams by Ring Modification or Multi-Component Ring-Forming Reaction
H. Keith Chenault
- Chapter 4
Synthesis and Manufacturing of N-Vinyl Pyrrolidone and N-Vinyl Caprolactam
David K. Hood
- Chapter 5
Transformations of N-Vinyl Pyrrolidone and N-Vinyl Caprolactam in Organic Chemistry
Fan Wu and Osama M. Musa

VOLUME 2 Polymerization Reactions

- Chapter 6
Conventional Free Radical Polymerization of N-Vinyl Pyrrolidone Homopolymers
Michael A. Tallon and Osama M. Musa
- Chapter 7
Conventional Free Radical Polymerization of N-Vinyl Caprolactam Homopolymers
Michael A. Tallon and Osama M. Musa
- Chapter 8
Polymerization of N-vinyl Lactam with (Meth)acrylate Based Comonomers
Michael Tallon and Osama M. Musa
- Chapter 9
Polymerization of N-vinyl Lactam with Reactive Monomers.
Michael A. Tallon and Osama M. Musa
- Chapter 10
Synthesis of N-vinyl lactam Copolymers by Controlled Radical Polymerizations
Zheng Li, Sounak Sarkar, Yejia Li, Michael A. Tallon, and Osama M. Musa
- Chapter 11
Pyrrolidone Monomers with Acrylate Functionality and their Polymers
Alan Fernyhough, David Petty, Victoria J. Cunningham, Steven P. Armes and Osama M. Musa
- Chapter 12
Pyrrolidone and Caprolactam Functionalized Natural and Synthetic Polymers
Kelly A. Brush and Osama M. Musa

VOLUME 3 Physical Chemistry and Molecular Interactions

- Chapter 13
Hydration Behaviour of Polylactam Clathrate Hydrate Inhibitors and their Small-Molecule Model Compounds
Luke I. Chambers, Amy V. Hall, Osama M. Musa and Jonathan W. Steed
- Chapter 14
Cocrystals, Coamorphous Phases and Coordination Complexes of γ - and ϵ - Lactams
Amy V. Hall, Luke I. Chambers, Osama M. Musa and Jonathan W. Steed
- Chapter 15
Physicochemical, Solution, and Colloidal Properties of Pyrrolidone and Caprolactam-based Polymers
Roger L. McMullen, Raymond B. Clark, Seher Ozkan and Laurence Senak
- Chapter 16
Dilute Solution Properties and Characterization of N-Vinyl Pyrrolidone Based Polymers
Laurence Senak and Roger L. McMullen
- Chapter 17
Computational Chemistry of Pyrrolidone and Caprolactam Based Materials
Solomon H. Jacobson and Osama M. Musa

VOLUME 4 Physical and Chemical Characterization

- Chapter 18
Nuclear Magnetic Resonance Spectroscopic and Infrared Spectroscopic Characterization of Poly(N-Vinyl Pyrrolidone) and Poly(N-Vinyl Caprolactam) Polymers
Raymond B. Clark and Roger L. McMullen
- Chapter 19
Rheological Characterization of N-Vinyl Pyrrolidone and N-Vinyl Caprolactam-based Polymers
Seher Ozkan and Roger L. McMullen
- Chapter 20
Thermal and Mechanical Analysis of N-Vinyl Pyrrolidone and N-Vinyl Caprolactam-based Polymers
Valencia S. Johnson and Roger L. McMullen
- Chapter 21
Classical and Advanced Imaging for the Characterization of Pyrrolidone and Caprolactam-based Materials
Germain Puccetti
- Chapter 22
Atomic Force Microscopy, Transmission Electron Microscopy, Scanning Electron Microscopy, and Fourier Transform-Infrared Spectroscopic Imaging as Tools to Study Various Phenomena Involving Poly(vinylpyrrolidone)
Roger L. McMullen

VOLUME 5 Pharmaceutical Applications, Antimicrobial Properties, Safety and Toxicology

- Chapter 23
Pyrrolidone and Caprolactam Based Materials in Active Pharmaceutical Ingredient (API) Applications
David K. Hood, Srinivasan Ananthraman and Osama M. Musa
- Chapter 24
Development, Application, and Future Trends of Pyrrolidone and Caprolactam-based Materials in the Pharmaceutical Industry
David K. Hood, Srinivasan Ananthraman and Osama M. Musa
- Chapter 25
Antimicrobial Properties and Applications of Pyrrolidone and Caprolactam-based Materials
Karen Winkowski and Yevgeniy Turovskiy
- Chapter 26
Safety and Toxicology of Caprolactams and Caprolactam-based Polymers
Sang-Tae Kim, Anthony Schatz and Christopher Choi
- Chapter 27
Safety and Toxicology of Pyrrolidones and Pyrrolidone-based Polymers
Sang-Tae Kim, Anthony Schatz and Christopher Choi

VOLUME 6 Personal Care, Adhesives and Digital Printing

- Chapter 28
Personal and Home Care Applications of Pyrrolidone- and Caprolactam-based Materials
Raymond Rigoletto and Roger L. McMullen
- Chapter 29
Pyrrolidone Chemistry in Skin Care, Transdermal Delivery, and Wound Care
Roger L. McMullen
- Chapter 30
Polyvinylpyrrolidone Applications in Oral Care
Petros Gebreselassie
- Chapter 31
Pyrrolidone and Caprolactam-based Materials in Adhesion Related Applications
David K. Hood, Srinivasan Ananthraman and Osama M. Musa
- Chapter 32
Application of Pyrrolidone and Caprolactam Based Materials in the Digital Age
David K. Hood