



## News Release

### **Osama Musa, Ashland chief technology officer and expert team of scientists publish six-volume handbook of pyrrolidone and caprolactam based materials**

WILMINGTON, Del., June 8, 2021 – Ashland Global Holdings (NYS:ASH) today announced that Osama Musa, Ph.D., senior vice president and chief technology officer, Ashland and an expert team of scientists have published a six volume book, “The Handbook of Pyrrolidone and Caprolactam Based Materials: Synthesis, Characterization and Industrial Applications.”

Pyrrolidone and caprolactam based materials have very interesting, diverse properties and functionalities that shape everyday life. This handbook details the broad human benefits of the materials within thirty-two chapters, many of which are from the chemist’s viewpoint.

“I am proud of Osama and our talented team of scientists who worked diligently, dedicating personal time to publish a detailed and modern portrait of pyrrolidone and caprolactam based materials for the world today and their future possibilities,” said Guillermo Novo, chairman and chief executive officer, Ashland. “This comprehensive handbook unites the functionality of pyrrolidone and caprolactam based materials with relevant science critical for our customers, consumers and a circular economy.”

“Ashland is truly a specialty materials company,” said Osama Musa, senior vice president and chief technology officer, Ashland. “This handbook emphasizes our capabilities to provide designer materials and innovations, and to customize solutions for complex challenges. It enables readers to appreciate these diverse capabilities and broad ranging applications more fully. The handbook also reinforces Ashland’s ability to adapt to ever-changing technology needs and consumer megatrends as diverse as sustainability to healthy aging and more.”

Volume one presents the chemistry of small lactam-based molecules, uncovering their unique properties. The discussion builds the necessary foundations required for a fundamental understanding of how the molecules enable a myriad of commercially important applications.

The second volume explores the physical chemistry and molecular interactions of pyrrolidone and caprolactam based materials. It reviews homopolymerization, copolymerization, controlled radical polymerization and acrylate based pyrrolidone polymerizations. Pyrrolidone functionalization of natural and synthetic polymers is also discussed and presents a rich and diverse polymer landscape relevant to today’s technical challenges and opportunities. This volume is dedicated to the memory of

Michael A. Tallon, an Ashland scientist who spent several decades working on the study of these materials.

Volume three reviews the physical chemistry and molecular interactions of pyrrolidone and caprolactam based materials ranging from cocrystals and coordination complexes to solution properties, characterization techniques and computational chemistry. State-of-the-art techniques provide insight into the origins of the structure and properties of the materials.

The fourth volume includes detailed discussions of nuclear magnetic resonance and Fourier transform-infrared spectroscopy, thermal and mechanical properties, and imaging techniques as applied to various phenomena involving pyrrolidone and caprolactam materials.

Volumes five and six explore relevant commercial subjects including applications in consumer and industrial end markets such as pharmaceutical, hair care, skin care, oral care, home care, adhesives, digital printing, coatings and more. Safety, toxicology, and antimicrobial topics are also reviewed along with the technical rationale for the nearly ubiquitous nature of these materials.

Published by Wiley, the handbook is now available online by visiting [Handbook of Pyrrolidone and Caprolactam Based Materials: Synthesis, Characterization and Industrial Applications, 6 Volume Set | Wiley](https://www.wiley.com/en-us/Handbook+of+Pyrrolidone+and+Caprolactam+Based+Materials:+Synthesis,+Characterization+and+Industrial+Applications,+6+Volume+Set+|+Wiley)

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A recent interview with Musa about sustainability as part of Ashland's business strategy can be found here

<https://www.wiley.com/network/professionals/sustainability/green-growth-opportunities-sustainability-in-the-chemical-industry-2>

### **About Ashland**

Ashland Global Holdings Inc. (NYSE: ASH) is a premier specialty materials company with a conscious and proactive mindset for sustainability. The company serves customers in a wide range of consumer and industrial markets, including adhesives, architectural coatings, automotive, construction, energy, food and beverage, nutraceuticals, personal care and pharmaceutical. Approximately 4,200 passionate, tenacious solvers – from renowned scientists and research chemists to talented engineers and plant operators – thrive on developing practical, innovative and elegant solutions to complex problems for customers in more than 100 countries. Visit [ashland.com](https://www.ashland.com) and [ashland.com/sustainability](https://www.ashland.com/sustainability) to learn more.

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