

**ADVANCED POLYMERIC
MEMBRANE TECHNOLOGY
FOR GAS SEPARATION PROCESSES**

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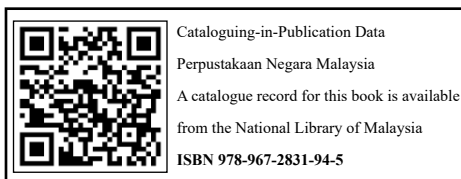
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PREFACE

This book is designed to provide a comprehensive overview of the latest advancements in the field of polymeric membranes for gas separation applications. Gas separation has become a crucial process in various industries, ranging from energy production and environmental protection to food and beverage processing, pharmaceuticals, and more.

Polymeric membranes have emerged as a promising solution for gas separation due to their unique properties, such as high selectivity, ease of fabrication, and cost-effectiveness. Over the past few decades, significant progress has been made in the development of advanced polymeric membrane materials, fabrication techniques, and characterization methods, leading to improved performance and expanded applications in gas separation processes.

This book brings together a collection of reviews authored by leading experts in the field, covering a wide range of topics related to advanced polymeric membrane technology for gas separation. The book also includes discussions on the challenges and future prospects of polymeric membrane technology, providing valuable insights for researchers, engineers, and professionals working in this field.

We hope that this book will inspire readers to explore the fascinating world of advanced polymeric membrane technology and contribute to further advancements in this field. We invite you to dive into the pages of this book and explore the exciting advancements in polymeric membrane technology for gas separation processes.

ACKNOWLEDGEMENT

We would like to express our deepest gratitude and appreciation to all those who have contributed to the creation and development of this book, "Advanced Polymeric Membrane Technology for Gas Separation Processes." Without the unwavering support, expertise, and guidance from the following individuals and organizations, this work would not have been possible.

First and foremost, we extend our heartfelt thanks to our families for their constant encouragement, understanding, and patience throughout the journey of writing this book. Their love and support have been a constant source of motivation. We would also like to acknowledge the contributions of the reviewers and editors who meticulously reviewed and improved the manuscript. Their meticulous attention to detail, insightful comments, and suggestions have significantly enhanced the quality of the book.

Last but not least, we would like to thank our readers, who have shown interest in this book. We hope that the knowledge and insights shared within these pages will prove beneficial in advancing the field and fostering new developments in polymeric membrane technology for gas separation processes. Once again, we express our deepest appreciation to everyone who has contributed to the realization of this book. Your support and involvement have played a crucial role in bringing this work to fruition.

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AUTHOR'S BIODATA



Born on 11 March 1989 in Pontian, Johor, Ir. Ts. Dr. Norazlianie binti Sazali is a highly accomplished professional in gas engineering. She obtained her Bachelor's degree from Universiti Malaysia Pahang (UMP) in 2012, followed by a Master's degree from Universiti Tun Hussein Onn Malaysia (UTHM) in 2015. Driven by her research passion, she pursued a PhD in Gas Engineering from Universiti Teknologi Malaysia (UTM). Currently serving as the Director of UMP Press and a dedicated Senior Lecturer at UMP since 2018, Ir. Ts. Dr. Norazlianie has made significant contributions to the field, particularly in carbon membrane and gas separation research. Her impressive research record includes over 130 indexed articles in WoS/Scopus, with an H-index of 18. Elsevier recognized her exceptional expertise by listing her as one of the Top 2% World Scientists in both 2022 and 2021.



Professor Datuk Ts. Dr. Ahmad Fauzi Ismail, the Founder and First Director of Advanced Membrane Technology Research Centre (AMTEC), excels in diverse areas of membrane research. His expertise lies in the development of polymeric, inorganic, and innovative mixed matrix membranes for water desalination, waste water treatment, gas separation, palm oil refining, removal of emerging contaminants using photocatalytic membranes, haemodialysis membrane

development, and polymer electrolyte membrane for fuel cell applications. In 1997, he earned a PhD in Chemical Engineering from the University of Strathclyde, preceded by an MSc. and BSc. from Universiti Teknologi Malaysia in 1992 and 1989 respectively. He has authored and co-authored over 550 journal articles. His efforts have resulted in the establishment of AMTEC as a recognized Higher Institution Centre of Excellence (HiCoE). Presently, he serves as the Vice Chancellor of Universiti Teknologi Malaysia.



Dr. Wan Norharyati Wan Salleh is a highly accomplished Senior Lecturer as well as a Research Fellow of the esteemed Advanced Membrane Technology Research Center (AMTEC) at Universiti Teknologi Malaysia (UTM). She obtained her B. Eng (Chemical Engineering) and PhD (Gas Engineering) degrees from UTM in 2008 and 2012, respectively. Dr. Wan Norharyati's passion and dedication to her research is evident in her extensive publication record, with numerous scientific papers published in high-impact international refereed journals and academic books. She has authored or co-authored over 200 research papers, which have garnered approximately 4340 citations and resulted in an impressive H-index of 35. Throughout her career, Dr. Wan Norharyati has led 11 research grants and been involved in over 40 research projects. Her expertise lies in membrane science and technology, specifically in the development of composite and photocatalytic membranes for water and wastewater treatment, as well as polymer-based carbon membranes and polymer/inorganic membranes for gas separation