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This comprehensive work explores the advanced technology of redox flow batteries, focusing on key components such as membranes, electrolytes, and various battery systems including zinc hybrid, vanadium, and zinc-bromine hybrids. Edited by Inamuddin and Tariq Altalhi, it provides an in-depth analysis of membrane properties, electrolyte materials, and the operational mechanics of these batteries. The book aims to advance knowledge on energy storage technologies, targeting researchers, engineers, and professionals in the field of sustainable energy solutions.