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The use of magnesium alloys is increasing in a range of applications, and their popularity is growing wherever lightweight materials are needed. This book provides a comprehensive account of the corrosion of magnesium alloys. It covers not only the corrosion performances and mechanisms of Mg alloys in conventional environments, such as sodium chloride solutions, but also looks at their corrosion behaviours in special media, like engine coolants and simulated body fluids.

Part one covers fundamentals such as the corrosion electrochemistry, activity and passivity of magnesium and its alloys. Part two then considers the metallurgical effect in relation to the corrosion of magnesium alloys, including the role of micro-structure and earth-rare elements, the corrosion behaviour of magnesium-based bulk metallic glasses, and the corrosion of innovative magnesium alloys. Part three goes on to describe environmental influences on the corrosion of magnesium alloys, such as atmospheric corrosion, stress corrosion cracking, creep and fatigue behaviour, and galvanic corrosion. Finally, part four is concerned with various means of protecting magnesium alloys against corrosion through the use of aluminium electrodeposition, conversion and electrophoretic coatings, and anodisation.

With its distinguished editor and team of contributors, this book is an invaluable resource for metallurgists, engineers and designers working with magnesium and its alloys, as well as professionals in the aerospace and automotive industries.