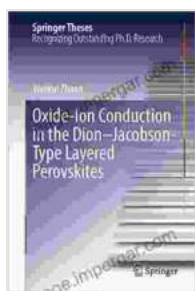


# Oxide Ion Conduction in the Dion Jacobson Type Layered Perovskites

In the realm of materials science, the exploration of materials with exceptional ionic conductivity has garnered immense attention due to their potential applications in various energy conversion and storage technologies. Among these materials, Dion Jacobson layered perovskites have emerged as promising candidates for oxide ion conduction, paving the way for groundbreaking advancements in solid-state electrolytes, fuel cells, and other electrochemical devices.

## Delving into the Structural Uniqueness of Dion Jacobson Perovskites

Dion Jacobson layered perovskites possess a distinct structural arrangement characterized by alternating layers of perovskite-like blocks and alkali metal ions. This unique architecture provides a highly anisotropic pathway for oxide ion transport, enabling efficient conduction along the layers. The presence of large alkali metal ions, such as potassium or rubidium, creates spacious interstitial sites within the perovskite layers, facilitating the migration of oxide ions.



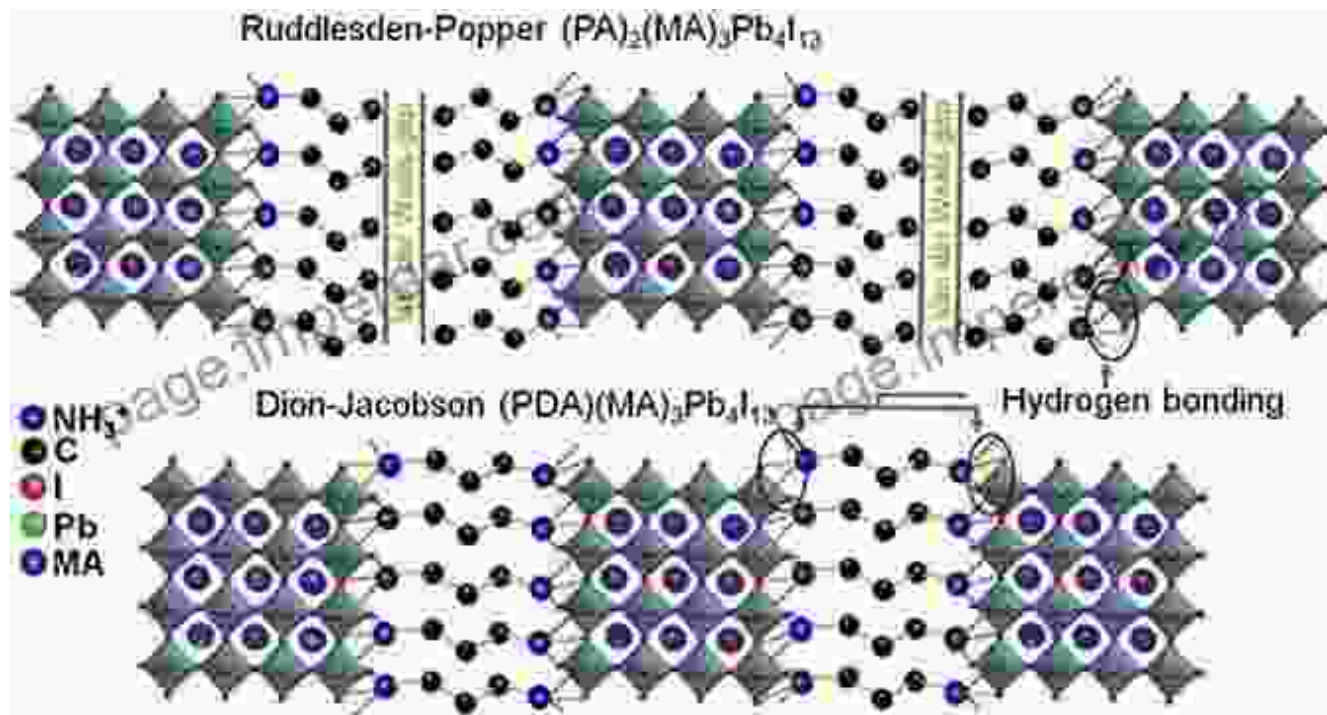
## Oxide-Ion Conduction in the Dion–Jacobson-Type Layered Perovskites (Springer Theses) by Wenrui Zhang

★★★★☆ 4.4 out of 5

Language : English  
File size : 38329 KB  
Text-to-Speech : Enabled  
Screen Reader : Supported  
Enhanced typesetting : Enabled  
Print length : 212 pages

FREE

DOWNLOAD E-BOOK



## Unveiling the Mechanisms of Oxide Ion Conduction

The remarkable oxide ion conductivity observed in Dion Jacobson layered perovskites stems from a delicate interplay of structural factors and defect chemistry. The presence of oxygen vacancies within the perovskite layers creates mobile oxide ions that can hop from one vacant site to the next. This hopping mechanism is further enhanced by the low activation energy for oxygen ion migration, which allows for facile movement of ions even at low temperatures.

## Exploring the Influence of Composition and Phase Transitions

The composition and phase behavior of Dion Jacobson layered perovskites significantly influence their ionic conductivity. By varying the alkali metal ion and the composition of the perovskite layers, researchers can tailor the

material's properties to meet specific application requirements. Phase transitions, such as those induced by temperature or pressure, can also impact the conductivity by altering the crystal structure and defect chemistry.

## **Applications in Solid-State Electrolytes and Beyond**

The exceptional oxide ion conductivity of Dion Jacobson layered perovskites has opened up a vast array of potential applications, particularly in the realm of solid-state electrolytes. These materials are poised to revolutionize energy storage technologies by enabling the development of high-power batteries and supercapacitors with enhanced safety and durability. Additionally, their use in fuel cells and oxygen separation membranes holds great promise for clean energy generation and environmental sustainability.

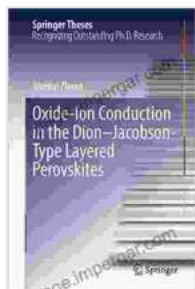
## **The Essential Guide for Researchers and Industry Professionals**

For researchers and industry professionals seeking to delve deeper into the intricacies of oxide ion conduction in Dion Jacobson layered perovskites, this comprehensive guide offers an invaluable resource. The book provides a thorough overview of the fundamental principles, structural characteristics, and electrochemical properties of these fascinating materials. It also explores the latest advancements and emerging applications, empowering readers to harness the full potential of these materials in their own research and development endeavors.

With its in-depth analysis, up-to-date information, and practical insights, this book is an indispensable tool for anyone involved in the development and application of oxide ion conductors. By unlocking the secrets of Dion Jacobson layered perovskites, we can pave the way for transformative

advancements in energy storage, fuel cells, and other electrochemical technologies.

The discovery and exploration of Dion Jacobson layered perovskites have ignited a surge of excitement in the field of materials science. Their exceptional oxide ion conductivity, coupled with their tunable properties and wide-ranging applications, make them prime candidates for revolutionizing energy conversion and storage technologies. This comprehensive guide provides a roadmap for researchers and industry professionals alike to fully comprehend and harness the potential of these remarkable materials.



## Oxide-Ion Conduction in the Dion–Jacobson-Type Layered Perovskites (Springer Theses) by Wenrui Zhang

★★★★☆ 4.4 out of 5

Language : English  
File size : 38329 KB  
Text-to-Speech : Enabled  
Screen Reader : Supported  
Enhanced typesetting : Enabled  
Print length : 212 pages





## "Flesh Wounds" by Richard Glover: A Provocative Exploration of Trauma, Identity, and the Human Body

In his thought-provoking and deeply moving book "Flesh Wounds," Richard Glover embarks on an unflinching exploration of the profound impact trauma can have...



## Trial Techniques and Trials: Essential Knowledge for Legal Professionals

Navigating the complexities of trial law requires a deep understanding of courtroom procedures, effective trial strategies, and the ability to...