

Ionic conductivity in oxide heterostructures: the role of interfaces

REVIEW ARTICLE

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Abstract Rapidly growing attention is being directed to the investigation of ionic conductivity in oxide film heterostructures. The main reason for this interest arises from interfacial phenomena in these heterostructures and their applications. Recent results revealed that heterophase interfaces have faster ionic conduction pathways than the bulk or homophase interfaces. This finding can open attractive opportunities in the field of micro-ionic devices. The influence of the interfaces on the conduction properties of heterostructures is becoming increasingly important with the miniaturization of solid-state devices, which leads to an enhanced interface density at the expense of the bulk. This review aims to describe the main evidence of interfacial phenomena in ion-conducting film heterostructures, highlighting the fundamental and technological relevance and offering guidelines to understanding the interface conduction mechanisms in these structures.

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