

Ionic Conductivity of Complex Compounds

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Abstract: Complex compounds show energy-related functions such as decomposition for hydrogen storage, neutron blocking and reducing agent for chemical synthesis. It also show interesting property as another novel energy-related function, lithium fast-ionic conduction was recently reported. This finding suggests that complex hydrides are potential candidates for solid-state electrolytes in lithium-ion batteries. This chapter presents the recent progress in the development of lithium fast-ionic conductors of complex hydrides. First, the fast-ionic conduction in LiBH_4 as a result of clarifying the mechanism of microwave absorption is presented, and then the conceptual development of complex hydrides as a new type of solid-state lithium fast-ionic conductors in LiBH_4 , LiNH_2 , and LiAlH_4 -based complex hydrides is discussed. Last, the potential prospects of this study from both practical and fundamental standing points are described: utilization of complex hydrides as solid electrolytes for batteries, formation of ionic liquids by complex hydrides, and similarity between complex hydrides.

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