

概要

従来のリチウムイオン電池で用いられるリチウムを含む酸化物などの正極材料は、蓄電容量が限られている。そこで、高いエネルギー密度を持つ二次電池を実現するために、硫黄正極が注目されている。硫黄正極の理論蓄電容量は 1,672mAh/g となり、従来の正極の理論容量の 6 倍以上である。しかし、その実用化に向けては、低い電導性、反応中間生成物の溶出など、多くの課題を解決しなければならない。本提案では、これらの課題解決が期待される硫黄/炭素複合電極の調査を行い、材料開発の指針を示した。

Summary

Application of the conventional lithium ion battery (LIB) for energy storage has been limited by its low specific energy density due to the low cathode capacity. As a promising cathode for achieving next-generation batteries with high energy density, sulfur is known to have a theoretical specific capacity as high as 1,672 mAh/g, as much as six times that of electrodes currently in use. However, there still remain many problems to be solved such as the low electrical conductivity, dissolution of the reaction intermediates and the large volume change in charge/discharge. In this proposal, sulfur/carbon composite electrodes developed for lithium-sulfur batteries were reviewed to reveal a direction for electrode material development.