

Study on performance of secondary lithium/sulfur battery with various weight ratios of S/FeS composite cathode

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The lithium/sulfur battery consists of composite cathode, polymer electrolyte, and lithium anode. The composite cathode is made of elemental sulfur(or lithium sulfide), carbon black, P(VdF-co-HFP), LiClO₄ and acetone. In the electrolyte of lithium/sulfur batteries, PE separator with mechanical strength is used in order to prevent the transfer discharging products such Li₂S from cathode to the lithium anode. The cell using a dispersant had good cyclability and discharge/charge efficiency.

The cathode based on sulfur was prepared with different ratios of sulfur and iron(II) sulfide for the Li/S batteries. The cathode with the ratio of S:FeS = 8:2 showed the highest specific capacity and good battery performance at room temperature. To understand the effect of the iron on the electrochemical performance, the cells were characterized using FRA, CV, charging and discharging.