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EMERGENCY POWER SOURCE WITH LONG STORAGE LIFE AND HIGH RELIABILITY FOR SPACECRAFT

Abstract

Thermal batteries are capable of satisfying the specific requirements for the emergency power of spacecraft. In this study, a thermal battery with novel FeS2@CoS2 composite cathode was provided. Novel binary cathode material was prepared on a large scale and applied to thermal batteries, which significantly improved the discharge performance of the battery. At a current density of 250 mA/cm2, the specific energy of the thermal battery reaches 106 Wh kg-1, while its maximum output capacity reaches 937 As/g. The FeS2@CoS2 cathode delivers a high specific capacity and high thermal stability, which guarantee reliability of the thermal battery. Meanwhile, the non-conductive nature of molten salt at the ambient temperature ensures a long and maintenance-free storage life. This novel thermal battery design method holds great promise for the development and application of highly reliable emergency power source with long storage life for spacecraft during emergency flight.