

# Limiting the application of sodium-sulfur batteries

Are sodium-sulfur batteries suitable for energy storage?

This paper presents a review of the state of technology of sodium-sulfur batteries suitable for application in energy storage requirements such as load leveling; emergency power supplies and uninterruptible power supply. The review focuses on the progress, prospects and challenges of sodium-sulfur batteries operating at high temperature (~ 300 °C).

What is a room temperature sodium-sulfur (Na-S) battery?

1. Introduction Room temperature sodium-sulfur (Na-S) batteries with sodium metal anode and sulfur as cathode has great potential for application in the next generation of energy storage batteries due to their high energy density (1230 Wh kg<sup>-1</sup>), low cost, and non-toxicity, , , .

Can sodium-sulfur batteries operate at high temperature?

The review focuses on the progress, prospects and challenges of sodium-sulfur batteries operating at high temperature (~ 300 °C). This paper also includes the recent development and progress of room temperature sodium-sulfur batteries. 1. Introduction

How to obtain a room temperature sodium-sulfur battery with stable cycle performance?

In summary, in order to obtain a room temperature sodium-sulfur battery with stable cycle performance and long life, the most important task of the separator is to guide the migration of Na<sup>+</sup> and inhibit the shuttle of polysulfides. Sodium polysulfide dissolved in the electrolyte must pass through the separator to reach the anode.

What are sodium sulfur batteries?

Sodium sulfur (NaS) batteries are a type of molten salt electrical energy storage device. Currently the third most installed type of energy storage system in the world with a total of 316 MW worldwide, there are an additional 606 MW (or 3636 MWh) worth of projects in planning. They are named for their constituents: Sodium (Na) and Sulfur (S).

How much weight can a sodium sulfur battery hold?

The components cooperate with each other, and the room temperature sodium-sulfur battery using the cathode has a specific weight capacity of 737 Wh kg<sup>-1</sup> after two cycles, and the capacity remains at 660 Wh kg<sup>-1</sup> after 50 cycles, with excellent cycle and rate performance.

Room-temperature sodium-sulfur batteries are emerging as a promising next-generation energy storage system. The efficient suppression of the shuttle effect is crucial to improve the battery cycling stability. A comprehensive review targets the underlying mechanisms of shuttling behavior.



