

Solar Energy South Africa

Advantages of chemical energy storage fire extinguishing system



Overview

Can gas fire extinguishing agents reduce the temperature of battery?

Gas fire-extinguishing agents such as Halons, HFC-227ea, CO₂ and Novec 1230 are beneficial to integrity protection of battery system during the fire extinguishing process. However, gas fire-extinguishing agents could not effectively reduce the temperature of battery.

What is the mechanism of fire-extinguishing agent?

The mechanism of fire-extinguishing agent is mainly divided into isolation, smothering, cooling and chemical suppression. However, the fire triangle of battery is difficult to destroy, as the three elements of fire triangle can be provided by the battery itself. In addition, LIB fire is a complex fire with the characteristics discussed above.

What makes a good fire extinguishing system?

An ideal fire extinguishing system should have excellent fire extinguishing and cooling effects, which can quickly extinguish open flames and reduce battery system temperature. Specifically, extinguishing systems whose aim it to prevent module-to-module, and beyond, propagation.

How effective are fire extinguishing agents?

The results have shown that the most effective agents are water and foam, which can extinguish the fire and drastically reduce the temperature of the cell within 20 s. Cui et al. conducted full-scale fire experiments to evaluate the fire extinguishing efficiency of foam, as shown in Figure 13.

Do fire extinguishing agents have a good cooling capacity?

Clearly, water-based fire-extinguishing agents exhibit excellent cooling capacity [55, 78]. In addition, Suitable additives such as F-500 can improve the cooling capacity of pure water. Solid fire-extinguishing agents and gaseous fire-extinguishing agents possess poor cooling capacity.

Are water based fire extinguishing agents effective?

Finally, their effectiveness in suppressing the fire were summarized. Water-based fire-extinguishing agents possess high cooling capacity and excellent anti-reflash performance for the fire. We believe this review could shed light on developing an efficient fire-extinguishing agent particularly designed for LIBs.

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