

Vanadium flow battery for energy storage: challenge and prospective

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Renewable energies from sources like solar and wind are among the central topics of our times with the issues of energy shortage and environment pollution. However, the random nature of these intermittent renewable sources (change with synoptic conditions, day and night alternation, etc.) makes it quite challenging for its use and dispatch through the grid. One effective solution is to connect the power station and the grid with electrical energy storage devices.

Vanadium redox flow battery (VFB) as one kind of energy storage techniques is rather suitable for this application due to its features like long life time, active thermal management as well as the independence of energy and power ratings. Dalian Institute of Chemical and Physics (DICP) has devoted to VFB research for more than 10 years from materials to system integration, where the VFB stacks with power rating from 5 W to 22 kW were successfully developed. To further accelerate its commercialization, a spin-off company (Rongke power Co.Ltd) was established in 2008, where VFB demonstrations in different application fields were carried out.



Figure 1. Key materials development in DICP

In this presentation, the development of VFB in DICP will be introduced, including materials design, preparation and upscale process. Different systems with different power rates and capacities in different application fields will be summarized and discussed in detail.

References:

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