

Flow battery technology rabat

Flow batteries are important energy storage systems that store electrical energy in redox-active chemicals dissolved in circulating media [1]. Redox flow batteries benefit from their large capacity proportional to tank size and stable power output resulting from continuous circulation of electrolyte solutions. Owing to these advantages, flow batteries represent a promising technology for large-scale energy storage. When a redox flow battery is charged and discharged, electrical energy is converted to and from chemical energy, respectively, in a rechargeable manner [2].

The design of the optical flow battery (Fig. 1a) comprises photoexcitation, a flow medium that stores optical energy, and emission gated by an external stimulus such as focused ultrasound (FUS). As a result, an optical flow battery can be considered as a time-delayed photoluminescent system where photoexcitation and FUS-stimulated emission are two separate and independent processes. In this sense, the optical flow battery is akin to a redox flow battery, the latter of which stores electrical energy in redox species with separate and independent recharging and discharging processes.

We next sought to characterize the optical properties of SMSO colloids to satisfy the second requirement for an optical flow battery. Specifically, the strong absorption of SMSO colloids near 365 nm (Fig. 1g, left) and their long luminescence lifetime (Fig. 1h) suggest their ability to store the photoexcitation energy provided by ultraviolet (UV) light. In addition, the mechanoluminescence spectrum of SMSO colloids under FUS exhibited a peak at 470 nm, thus confirming their ability to release the stored optical energy with ultrasound stimuli (Fig. 1g, right).

The lifetime and stability of the optical flow battery. a Time-resolved light emission power and FUS pressure of the optical flow battery. b Peak emission power for the first 10 charge/discharge cycles. c, d Peak emission power, volumetric power capacity (c), and energy extraction efficiency (d) for over 30,000 cycles. The data are represented as mean $\pm$ standard deviation (SD) from 5 independent measurements

These characterizations include TEM, HRTEM, and XRD. TEM and HRTEM images of SMSO colloids were acquired by a Field Electron and Ion Company Tecnai TEM microscope. The XRD pattern of SMSO colloids was collected by a X-ray PANalytical Empyrean diffractometer. The concentration of SMSO colloids was determined by a X-SERIES II Quadrupole inductively coupled plasma mass spectrometer (ICP-MS).

Contact us for free full report

Web: <https://sumthingtasty.co.za/contact-us/>

Email: energystorage2000@gmail.com

WhatsApp: 8613816583346

