

The chemical composition and valence state of elementals in the sample were studied by XPS. For comparison, the XPS measurement of the commercial rutile  $\text{TiO}_2$  was also performed, as displayed in Fig. 1 a-d. It is noted that the peak intensity of C element in the XPS spectra after Cl - doping become stronger, owing to the residual n-butanol. During the ...

2.2.3 Thermal energy storage. Titanium holds porous properties and a good ability to stay stable when impregnated in some chemical. Therefore, titania is extensively used in thermal energy storage applications. ... Kili<sup>#231</sup>; F, Menlik T, S<sup>#246</sup>zen A. Effect of titanium dioxide/water nanofluid use on thermal performance of the flat plate solar collector.

Aqueous aluminum-ion batteries (AIBs) have great potential as devices for future large-scale energy storage systems due to the cost efficiency, environmentally friendly nature, and impressive theoretical energy density of Al. However, currently, available materials used as anodes for aqueous AIBs are scarce. In this study, a novel sol-gel method was used to ...

$\text{TiO}_2$  is one of the most investigated materials due to its abundance, lack of toxicity, high faradaic capacitance, and high chemical and physical stability; however, its potential use in energy storage devices is constrained by its high internal resistance and weak van der Waals interaction between the particles. Carbon nanotubes are especially well suited for ...

One-dimensional nanomaterials with hollow structures could provide large space for ion storage and charge accumulation. Herein,  $\text{TiO}_2/\text{MoSe}_2$ -Carbon nanotube composite (NT) materials were designed and fabricated by the template method and the chelation coordination reaction. The stability and conductivity were improved by the presence of titanium and hollow ...

Thermal energy storage (TES) is an effective solution to overcome the fluctuation and intermittence of solar energy and improve solar energy utilization by storing and reusing large amounts of thermal energy mainly based on phase-change materials (PCMs) [6, 7]. PCMs, which possess advantages of high energy-storage capacity and constant operation temperature [8, ...

1. Introduction. The depletion of fossil fuel supplies and the rise in their harmful environmental repercussions are two issues that humanity is facing [1] Hydrogen can be used as a fuel due to its unique characteristics, such as cleaner combustion and a high energy content can be created from renewable resources and is non-polluting, making it green energy [2, ...

Solar energy is not only a green alternative to fossil energy but also a candidate for future mainstream energy sources. To improve the efficiency and application range of solar energy, we investigated tris

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(1-chloro-2-propyl) phosphate (TCPP) modified titanium dioxide nanotubes (TNTs) doped phase change material microcapsules (p-t-MPCMs) to enhance the ...

The nano-titanium dioxide array tube can be reversibly implanted with the small-radius space effect of  $\text{Al}^{3+}$ . A detailed description is given in this work to clarify the aluminum storage mechanism in titanium dioxide array tubes. Electrochemical studies revealed that the titanium dioxide array tube has a discharge capacity of  $75 \text{ mAh g}^{-1}$ .

Titanium dioxide, also known as titanium(IV) oxide or titania / t a ? ' t e ? n i ? /, is the inorganic compound derived from titanium with the chemical formula  $\text{TiO}_2$ . When used as a pigment, it is called titanium white, Pigment White 6 (PW6), or CI 77891. [4] It is a white solid that is insoluble in water, although mineral forms can appear black. As a pigment, it has a wide range of ...

The popularity of intelligent electronic products demands suitable smart electrodes with high specific capacitance, superior durability, and intrinsic safety. Herein, a bifunctional titanium dioxide ( $\text{TiO}_2$ ) electrode with electrochromic energy storage in the Zn-ion aqueous electrolyte was demonstrated. The color of the electrode can be changed according ...

Although these core-shell arrays electrodes exhibit enhanced optical modulation and energy storage properties, titanium dioxide and zinc oxide have little contribute to the electrochromic and area capacity of the electrodes. Show abstract. Electrochromic-supercapacitors (ESCs) have shown great perspective in multifunctional smart devices due ...

In this study, a molten salt, i.e., sodium nitrate ( $\text{NaNO}_3$ ), that melts at  $308 \text{ }^\circ\text{C}$  is microencapsulated with titanium dioxide ( $\text{TiO}_2$ ) shells via water-limited surfactant-free sol-gel processes for high-temperature and high-density thermal energy storage. The effects of the catalyst and precursor concentrations are examined to determine the optimal conditions for the ...

In situ production of titanium dioxide nanoparticles in molten salt phase for thermal energy storage and heat-transfer fluid applications. ... such as VP1 Therminol, has a temperature range of  $13\text{--}395 \text{ }^\circ\text{C}$ . Energy storage either direct or indirect is a viable option for this technology and is implemented in many CSP plants (Price et al. 2002; ...

Smart windows based on electrochromic (EC) material can alter optical properties (reflectivity, absorptivity, transmittance) persistently and reversibly under external voltage stimuli, which is a promising energy-saving technology [1], [2]. Pseudocapacitors (PCs) are deemed as an energy storage means due to their high power density, long cycle life and fast ...

Microencapsulated paraffin with titanium dioxide ( $\text{TiO}_2$ ) shells as shape-stabilized thermal energy storage materials in buildings were prepared through a sol-gel process. In the core-shell structure, the paraffin was used as the phase change material (PCM), and the  $\text{TiO}_2$  prepared from tetra-n-butyl titanate (TNBT) acted as



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the shell material.

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