

How important is the concentration of PVP for crystallization?

The duration of crystallization extends with increment of mass fraction of PVP. The duration approaches double the value with the mass fraction of PVP at 3.0 wt.%. The results suggest that the importance of controlling the concentration of PVP to achieve both desirable nucleation performance and high crystallization growth rate.

Why do PVP polymers have a stable adhesion?

While the carbonyl groups and the pyrrolidone rings that exist in the PVP structure lead to a stable adhesion when used as a host matrix. The combination of these attractive features of PVP and PVA polymers can be achieved by blending them with an appropriate ratio.

Can PVP/PVA blend be used in advanced optoelectronics?

The PL of the PVP/PVA blend is tailored to emit spectra in the visible spectrum region; cyan, blue and green colours. The obtained findings of designing the optical and photoluminescent properties of PVP/PVA blend reveal their effective role in advanced optoelectronic. The authors report no declarations of interest.

The superior electrochemical energy storage of SnO₂/CuO/FeO/RGO/PVP electrode led it to be used as a cathode for the fabrication of asymmetric hybrid supercapacitor. The device further enhanced the energy density of 41.7 Wh/kg while retaining the power density of 956 W/kg at 1.2 A/g in two electrode setup. Therefore, this work shows the ...

The functional properties of polyvinyl pyrrolidone/polyvinyl alcohol (PVP/PVA) blend incorporated with non-stoichiometric tin sulphide (SnS) have been explored for ...

Read the latest articles of Journal of Energy Storage at ScienceDirect, Elsevier's leading platform of peer-reviewed scholarly literature. Skip to ... Biogenic-ecofriendly synthesized SnO₂/CuO/FeO/PVP/RGO nanocomposite for enhancing energy density performance of hybrid supercapacitors. Umm E. Ruman, Arif Khan, Hafiz Muhammad Fahad ...

The booming wearable/portable electronic devices industry has stimulated the progress of supporting flexible energy storage devices. Excellent performance of flexible devices not only requires the component units of each device to maintain the original performance under external forces, but also demands the overall device to be flexible in response to external ...

The increasing energy demand produced by technology progressing is a problem we are facing as a society. In this perspective, energy storage devices have made great progress in this field because of their fast charging and discharging process, high power density, and good life cycle. Moreover, with the rapid development of modern wearable and portable ...

UV-vis spectra of the PTMA, PVP and PTMA/PVP blends in chloroform at a solution concentration of 15 mg mL⁻¹; (a), (b) AFM phase and height images of PTMA/PVP blends in the range of 20 mm \times 20 mm; ...

For energy storage applications, a material that has high dielectric permittivity, low loss factor, strong thermal resistance, easy processability, and low cost are highly desirable.

To maintain the significant development of the ecological society, proper attention on Bi_{0.5}Na_{0.5}TiO₃ (BNT) based perovskites has been directed toward the analysis of electrical energy storage in past decades. This article aims to provide a comprehensive analysis of lead-free BNT based materials for piezoelectric detectors, sensors, shape memory alloys and ...

The PVP/PVA polymeric blend is qualified for advanced applications like energy storage devices and nanoelectronics [Citation 5]. Naggar et al. explored the effect of Sn_{0.75}M_{0.25}S₂ (M: metal) nanoparticles (NPs) on the structural and optical properties of PVA/PVP blend [...

Their electrochemical energy storage performance is tested by program-controlled battery tester and electrochemical workstation after being assembled into button cells. The research results show that with the introduction of PVP, the particle size of the obtained material becomes smaller, the particle size distribution is more uniform, and the ...

The FTIR absorption spectra of the host blend and the blend/Li₄Ti₅O₁₂ NPs films are presented in Fig. 3 and Table 2 shows the positions of absorption bands of the host and their characteristics vibrational modes [15, [17], [18], [19], 25, 28]. The main vibrational bands of the spectrum of pure blend combine the characteristic bands of virgin PVP and PEO, which ...

As a promising electrode material in electrochemical energy storage, the tin monosulfide (SnS) exhibits high theoretical specific capacity (782 mAh g⁻¹), excellent chemical stability, and low cost [7]. Moreover, the large layer spacing (4.33 Å) and orthorhombic cells of SnS are conducive to Li⁺ / Na⁺ deintercalation and migration [8]. However, the intrinsic volume ...

This study not only demonstrates that 2D MOFs can serve as excellent energy storage materials, but also confirms that morphology plays a significant impact on material ...

batteries and energy storage > PVP K series. pvp k-series chemistry: PVP polymers and VP derivatives INCI/chemical name: PVP SDS Link > Polyvinylpyrrolidone is a hygroscopic, amorphous polymer supplied as a white, free-flowing powder or a clear aqueous solution. Available in several molecular weight grades, they are characterized by K-value ...

At the same time, polyvinylpyrrolidone (PVP) is introduced to control the crystal morphology and particle size, thus a NCM622 material with excellent electrochemical energy storage performance has been prepared

by the PVP modified liquid-phase assisted solid-state method in this paper.

To solve these issues and realize flexible sodium ion-based energy storage devices, researchers have electrospun many types of flexible nanofibers with active materials ...

Proton conducting polymer blend electrolytes based on cornstarch and polyvinyl pyrrolidone (PVP) with ammonium bromide (NH_4Br) were prepared by the technique of solution casting. Enhancement of amorphous nature by the addition of NH_4Br has confirmed by XRD. In FTIR, by the addition of NH_4Br salt in the optimized blend system, there occurs a change like ...

Seasonal storage of solar thermal energy through supercooled phase change materials (PCM) offers a promising solution for decarbonizing space and water heating in winter. Despite the high energy ...

DOI: 10.1016/j.ceramint.2023.02.204 Corpus ID: 257194930; Structural, morphological, optical, electrical and dielectric features based on nanoceramic $\text{Li}_4\text{Ti}_5\text{O}_{12}$ filler reinforced PEO/PVP blend for optoelectronic and energy storage devices

Advanced multifunctional composite materials have been a significant force in the advancement of efficient solar-thermal energy conversion and storage, which is critical to address current energy shortage problems. In this study, novel phase change material (PCM) composite fiber films, composed of Py-CH (one novel pyrene-based aggregation-induced ...

The Journal of Energy Storage focusses on all aspects of energy storage, in particular systems integration, electric grid integration, modelling and analysis, novel energy storage technologies, sizing and management strategies, business models for operation of storage systems and energy storage developments worldwide.

Moreover, PVP-VS 4 is more resistant to self-discharge than the support VS 4. In addition, we designed PVP- MnO_x composites and PVP-induced co-engineering provides new and original opportunities to develop a range of efficient intercalation materials for the next energy storage technology.

The new type of polymer blend-nanoparticle nanocomposites of (PVA-PEG-PVP) with zirconium oxide nanoparticles for energy storage and release application and gamma shielding application has been investigated. The D.C electrical properties of (PVA-PEG-PVP- ZrO_2) nanocomposites with different concentrations zirconium oxide ...

The new type of polymer blend-nanoparticle nanocomposites of (PVA-PEG-PVP) with zirconium oxide nanoparticles for energy storage and release application and gamma shielding application has ...

In recent years, with ever-growing energy demand and increasing threat from pollution, the pursuit of sustainable energy alternatives is driving the development of high-performance energy storage devices [1,2,3,4,5]. Zinc-ion hybrid supercapacitors (ZHSs) have both the battery-like energy density and the

supercapacitor-like power density, and show the ...

Lithium ion batteries, supercapacitors, solar cells, and fuel cells are established as advanced devices for electrochemical energy storage and conversion [1][2][3][4][5][6].

A facile methodology is developed for one-step fabrication of silver/polyvinylpyrrolidone nanowire (AgPNW) hydrogel and high-quality robust ultralight AgPNW aerogel (AgPNWA) on a large scale and provides important insights into designing a facile 3D assembly of nanomaterials, and thermal energy storage materials with high performance and ...

Polyvinylpyrrolidone (PVP)-enabled significant suppression of supercooling of erythritol for medium-temperature thermal energy storage. ... The supercooling effect is deemed to be a crucial issue for thermal energy storage using phase change materials (PCMs). The exploration of promising additives plays a decisive role in effective suppression ...

Energy storage devices encompass a range of technologies, with batteries and supercapacitors being notable examples [2]. Comprising two electrodes separated by an electrolyte, batteries have been the subject of numerous recent studies focusing on electrode materials for energy storage devices. ... The energy gap of the PVP/NaAlg nanocomposite ...

Proton conducting polymer blend electrolytes based on cornstarch and polyvinyl pyrrolidone (PVP) with ammonium bromide (NH₄Br) were prepared by the technique of solution casting.

The ESW for PEO-PVP-NaPF₆ SPEs with dispersed InAs NWs was found to be 4.10 V (at 40 °C) as shown in Fig. 5a, which is sufficient for applications in high-performance energy storage devices ...

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