Development of waterborne polyurethane energy storage materials

Does waterborne polyurethane have self-healing properties?
Waterborne polyurethane (WPU) with self-healing propertiesis highly desirable for sustainable development. However,balancing the mechanical and self-healing properties of WPU is challenging. In t...

What are the properties of water borne polyurethanes?
The hard and soft segments in the molecular structure of water-borne polyurethanes determine the hardness and flexibility. Their two-phase structure confers water-borne polyurethanes with excellent low-temperature film-forming properties, leveling, and flexibility, good heat resistance, and stickiness .

What is water borne polyurethane?
Articles from Polymers are provided here courtesy of Multidisciplinary Digital Publishing Institute (MDPI) Water-borne polyurethanes are novel functional polymers that use water as the dispersion medium. When compared with solvent-borne polyurethanes,water-borne polyurethanes are more environmentally friendly and easier to transport and store. ...

How is water borne polyurethane dispersion made?
Subsequently,it is mixed with water containing chain extenders in a specific ratio and then stirred to form a stable water-borne polyurethane dispersion . Hubbard uses the high internal phase ratio continuous emulsification methodto produce water-borne polyurethane foam adsorbents.

Why is continuous production of water borne polyurethane important?
The continuous production of water-borne polyurethane provides improved the automation, stable product performance, scalable production scale, and easy maintenance of the production environment, and it has become an important production process in various enterprises.

Are waterborne polydopamine/polyurethane/phase change material foams suitable for light-to-thermal energy?
Flexible and Inherently Photothermal Waterborne Polydopamine/Polyurethane/Phase Change Material Foams for Light-to-thermal Energy Conversion and Thermal Energy Storage Flexible, nanoparticle-free, industrially adaptable waterborne polyurethane (WPU) foams with light-to-thermal energy conversion and latent heat storage capacity are presented.

Abstract Solid-solid phase change materials (SSPCMs) are considered one of the most promising candidates for thermal energy storage due to their efficient heat storage ...

Nevertheless, during operational usage, waterborne polyurethane materials, akin to other polymeric substances, are susceptible to oxidative aging manifestations like yellowing, cracking, and ...

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In this study, a kind of waterborne polyurethane coating material with excellent water resistance performance has been prepared through the cross-linking of waterborne ...

Water-borne polyurethanes are novel functional polymers that use water as the dispersion medium. When compared with solvent-borne polyurethanes, water-borne polyurethanes are more environmentally friendly and easier ...

The constant increase in fuel prices and greenhouse gas emissions are the main driving forces to search for alternative renewable energy resources. In this respect, the ...

In this study, we aim to develop a novel polyurethane (PUR) with phase changeability and antimicrobial properties for human health-friendly thermal energy storage applications.

Abstract Waterborne polyurethane (WPU) with self-healing properties is highly desirable for sustainable development. However, balancing the mechanical and self-healing properties of WPU is challenging.

This material not only retains the environmentally benign and non-toxic properties of waterborne polyurethane (WPU), but also combines the inherent recyclability and ther-mal energy ...

Waterborne polyurethane (WPU) with self-healing properties is highly desirable for sustainable development. However, balancing the mechanical and self-healing properties of WPU is ...

By incorporating polyethylene glycol-based waterborne polyurethane (PEGWPU), the phase change interval was extended, leakage prevention was achieved, and toughness was enhanced.

The effects of waterborne polyurethane on storage stability, rheological properties, and VOCs release of crumb rubber modified asphalt were investigated in this study.

Flexible, nanoparticle-free, industrially adaptable waterborne polyurethane (WPU) foams with light-to-thermal energy conversion and latent heat storage capacity are presented.

1. Introduction Waterborne polyurethane (WPU), as an important class of polyurethane materials, has been widely applied as adhesive, ink, and coating because of its ...

In the face of ubiquitous corrosion threats, the development of high-performance elastomer protective materials with active self-healing functions is extremely ...

The main raw materials involved in the synthesis of water-borne polyurethanes are diisocyanates or polyisocyanates and polyols (including polyether type, polyester type, and polyolefin type), which are connected ...

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Here, a high strength and high toughness waterborne polyurethane elastomer was developed, where mechanical properties were enhanced via a delayed crystallisation response ...

With the current decreasing fossil resources and increasing carbon dioxide emissions, researchers are increasingly concerned about the development and utilization of ...

Polyurethane (PU) based materials are emerging as asphalt modifiers due to their unique molecular structure, but the production of commonly used PU prepolymers and PU ...

Water-based or waterborne polyurethane matting resins find extensive application in surface coating to diminish gloss, offering a pleasant tactile experience and a matte ...

It is worth noting that the biomass support material--wood flour introduced in the above studies is an inactive material devoid of energy storage capacity, therefore, the energy ...

At present, existing methods for constructing superhydrophobic surfaces involve the use of salinized or fluorinated waterborne polyurethane to reduce the surface energy of the ...

Impregnating phase change materials (PCMs) into cellulose aerogels has been recognized as an effective approach to mitigating the liquid leakage issues because of the superior surface ...

A series of lignin-based biological waterborne polyurethanes (LBWPU) with excellent properties were synthesized by prepolymerization with different contents of sodium lignosulfonate ...

A series of lignin-based biological waterborne polyurethanes (LBWPU) with excellent properties were synthesized by prepolymerization with different contents of sodium ...

Waterborne polyurethane dispersions used in surface coatings have recently gained a lot of interest as the need for more and more alternatives in the case of chemical ...

Water-borne polyurethanes are novel functional polymers that use water as the dispersion medium. When compared with solvent-borne polyurethanes, water-borne polyurethanes are more environmentally ...

Han, S., Ding, Q., Li, J. et al. Mechanically robust and leak-resistant waterborne polyurethane/cellulose nanofibril/polyethylene glycol phase change foams for thermal energy ...

The major aim of the present study is to improve the thermal characteristics of polyurethane foams (PUFs) that have been almost exclusively used for thermal insulation ...

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The C = C bonds in HEMA further enhance application versatility through functional strategies such as dual crosslinking, UV curing, and thermal curing. This innovative ...

Abstract In this study, we aim to develop a novel polyurethane (PUR) with phase changeability and antimicrobial properties for human health-friendly thermal energy storage applications. The study c...