Porous solar container in coal matrix

The predominant method for preventing salt deposition in solar interfacial evaporation systems is through convective diffusion, which allows for the backflow of salt ions, thus preventing ...

For example, the porous structures do not need to be capable of absorbing solar irradiation and they are not suffering such severe thermal shocks if the solar irradiation is interrupted.

A porous support may be able to hold a large amount of a liquid PCM if the support has many pores. Formation of a porous support material with hollow particles encircled by two ...

Although it has been well known that heat transfer occurs with coalbed methane desorption in porous coal matrix, little is understood about the coupling interaction between the heat transfer and mass ...

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This multifunctional membrane synergistically integrates photothermal evaporation and photocatalytic CO2 reduction, leveraging the porous structure and narrow bandgap (1.37 eV) of CAL-T to enhance ...

In general, reticulated porous materials, such as metal foams and porous ceramics, are commonly used as the porous medium for the burner due to their special characteristics of open, ...

Ignoring the inelastic deformation of the coal matrix, the effect of pyrolysis temperature on the elastic deformation of the coal matrix is discussed. Research on matrix compressibility is ...

In thermochemically reactive materials that store solar heat at high temperatures, the porous structure can be tuned across multiple length-scales, enhancing the simultaneous absorption ...

Numerical modeling has been increasingly adopted to predict transport phenomena in porous media under a wide range of conditions, providing a deep understanding of the underlying ...

Solar-interfacial evaporation has shown great potential for desalination using green energy. However, salt accumulation and long-term stability of the evaporators are urgent problems. ...

Adsorption-induced deformation has long been underappreciated in gas transport studies of microporous coal, yet it strongly influences pore configurations and diffusive pathways. ...

The physical reason is perhaps due to the basic topological complexity inherent to porous coal matrix and the

strong adsorption efect of coal on methane molecules. C 2015 Author(s).

Abstract Accurate description of gas transport in porous coal matrix is one critical issue for coalbed methane production. However, the adequacy of existing Fickian diffusion-based models for gas ...

The permeability of coal is an important parameter in mine methane control and coal bed methane exploitation because it determines the practicability of methane extraction. We developed a new coal ...

Various solar energy solutions are available today, such as solar collectors, PV panels, solar ponds, solar chimneys, solar stills and Trombe walls. The current article aims to study the ...

The matrix backbone for the evaporator is consists of made up of cross-linked polyvinyl alcohol (PVA) and carboxymethyl cellulose (CMC) bilayers. The porous structure of NSC-PVA/8CMC ...

According to the principle of minimum capacity, the surface of the coal matrix reduces its surface free energy through gas adsorption. To investigate the competitive influence of gas ...

Rashidi et al. [100] investigated the applications of porous materials in solar energy systems in a review article. Applications of porous materials in solar chimneys, collectors, heat ...

Phase-change heat storage technology contributes to balancing supply and demand, thereby enhancing overall system efficiency and stability. However, phase change materials may leak ...

In previous works, researchers present various ways to enhance the rate of discharging. There are few papers about the influence of porous media on heat storage units. So, the ...

Diffusion is an important process in coalbed methane migration. In addition to diffusion coefficient, the size and shape of coal particles also have influences on methane adsorption and ...

During thermal expansion, the pore volume of the coal is filled, and the surface of the coal matrix becomes smoother. As indicated by the data in Table 3, both pore volume and surface ...

Based on this, we have developed a simple and cost-effective method to construct a hydrogel evaporator with a porous structure. The method involves in readily available and ...

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