

What factors affect adsorption capacity and gas-bearing capacity of shale?

All of these factors will affect the adsorption capacity and gas-bearing capacity of shale, especially the competitive adsorption mechanism and influence of water and  $N_2$ , and require further attention and research.

Can hydraulic fracturing provide underground energy storage in shale formations?

In this study, we propose a new underground energy storage technology based on hydraulic fracturing in shale formations (As shown in ). This patented technology utilizes underground artificial fractures created by hydraulic fracturing to store potential energy.

Why is shale gas important to China?

Under the broad prospect of green and low-carbon energy, shale gas will make a crucial contribution to meeting clean energy demand, which is particularly significant for China's energy supply and transformation.

What controls the gas content of shale?

The gas content of shale is controlled by a combination of its geological properties (OM abundance, kerogen type, thermal maturity, mineral composition, diagenesis), pore fluid properties (water,  $CH_4$ , non-hydrocarbon gases), and geological conditions (temperature, pressure, preservation conditions).

What factors affect shale gas exploration potential?

Among many factors affecting shale gas exploration potential, the gas-bearing properties of shale (quantity, storage state, composition) and their controlling factors are the essential research attracting wide attention in the academic community.

Why is shale less adsorption capacity than gas-solid?

Since the interaction intensity of gas-liquid is much lower than the force of gas-solid, it would also reduce the adsorption capacity of shale to  $CH_4$  (Li et al., 2016a; Hu et al., 2018c) (Fig. 5 b). With the increase of moisture content, the accessible pores are decomposed into many invalid pores by water molecules.

categorized in three main areas: (1) shale gas flow and recovery, (2) shale gas adsorption and phase behaviors, and (3) shale reservoir/rock characterization and mechanics. Table 1 lists ...

When using existing hydraulic fractures of depleted shale oil and gas wells, the existence of the proppant bank accumulated at the bottom of the fracture reduces effective fracture height, thus ...

In this part A of the review paper, we aim to provide a concise and complete review on characterizing the fluid transport processes in unconventional reservoirs. We will examine ...

In order to explore the microscopic storage mechanism of shale gas in water-bearing pores and its influencing

factors, this article first establishes a molecular dynamics model for methane in ...

The formation, storage and seepage characteristics of shale gas reservoirs are significantly different from those of conventional oil and gas reservoirs, and their in-depth study ...

Shale gas from unconventional resources will contribute to meeting the energy demand during the transition to a net-zero carbon economy. In this minireview, the current status of understanding methane adsorption on ...

Three essential factors, including the final injection pressure, total organic carbon (TOC), and accessible porosity, could be used to screen a potential targeted shale reservoir and maximize ...

o Demonstrated great potential of transforming depleted shale oil and gas wells into energy storage wells. A R T I C L E I N F O A B S T R A C T Keywords: Hydraulic fracturing Energy storage Renewable energy Long duration storage ...

The results suggest that a target shale reservoir with a high gas storage capacity either for methane storage or CO<sub>2</sub> sequestration could depend on three essential factors: the final equilibrium pressure, TOC, and accessible porosity. TOC ...

CO<sub>2</sub> injection has aroused great interest in developing shale gas reservoirs because it can achieve enhancing gas recovery (EGR). However, only some studies have studied the storage ...

Overall, An XGBoost model with optimal input features is developed in this work, which exhibits both good performance in gas adsorption prediction and good potential for the ...

Marcellus shale has 171 Gt of theoretically maximum CO<sub>2</sub> storage, ... CO<sub>2</sub> storage in Shale gas reservoirs are one of the most viable storage solution due to their proven ...

Estimating the effectiveness of hydraulic fracturing in the context of the increase in the shale gas demand is of great significance for enhancing shale gas production, which aims to substantially reduce fossil ...

Advancements in horizontal well-pad drilling (multiple wellbores extending from a single wellhead) and hydraulic fracturing allowed economical extraction of hydrocarbons from ...

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