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The negative and positive effects of hot water injection into coal seam on CBM production

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The injection of hot water into coal seam has both negative and positive effects on the production of CBM (Coalbed Methane). In terms of the negative effect, when the water is entering the pore network in coal, the relative saturation and permeability of gas are reduced and lead to the water-lock phenomenon dominated by capillary force, which prevents the migration of CBM. In terms of the positive effect, the adsorbed CBM can be desorbed as the coal seam is heated, which increases the gas pressure, so as to improve the migration power and water displacement capacity of gas. In this study, the evolution law of the water regions and the gas regions distribution with the coal temperature and the two-phase fluid pressures during the hot water injecting into the pore network in coal was analyzed through numerical simulation, and the percolation transformation conditions of water region and gas region was clarified, so that the mechanism of negative and positive effects of hot water injection into coal seam on CBM production can be revealed. In the engineering of enhanced exploitation of CBM by injecting hot water into coal seams, the negative effect of CBM production was transformed into the positive effect by continuously increasing the coal seam temperature.

Participation

In-Person

References

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