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## ASSESSMENT MODEL OF STRATA PERMEABILITY CHANGE DUE TO UNDERGROUND LONGWALL MINING

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## Abstract

The coal gas is a potential risk for the safety production in coalmines. The practical experiences in coalmine show that the gas may suffer massive desorption and migration after coal seam mining and deformation of overlying strata. Therefore, gas extraction in mines focuses on mining ground pressure relief gas extraction. In this paper, the study is carried out on gas permeability and migration pathway based on movements of overlying strata over the working face and the spatial location of the coal gas enrichment area. 3D prediction models for overlying strata subsidence of the working face are developed to analyze the movement and deformation law of overlying strata. The concept of "total strain" is introduced to describe the fracture development of overlying strata. The relationship between "total strain" and porosity and permeability are further established. The distribution law of the mining permeability change under final subsidence of overlying strata is analyzed to scientifically reveal the permeability change and migration pathway of gas. The accurate "annular" location of the gas enrichment area in overlying strata is identified. The developed model provides important theoretical guidance for designing parameters of optimized gas drainage system and to improve efficiency extraction of coal seam gas.

Key words: mining subsidence, subsurface strata deformation, permeability, porosity, total strain

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