

Occurrence Characteristics of Sandstone Pore-fissure Water on the Roof of Jurassic Coal Seam and Dynamic Simulation of Groundwater during Mining

Xuanxuan Li, Guangquan Xu, Ji Fang

*School of Earth and Environment, Anhui University of Science and Technology, Huainan, Anhui,
635196134@qq.com, gqxu67@163.com, 851447157@qq.com*

Abstract There is an abundant coal resource in Jurassic strata in the western area of China, and the distribution and occurrence of sandstone pore-fissure water on the roof of coal seam have its own characteristics, and are affected by diagenesis process and hydrogeological conditions. Meanwhile, in the constantly advancing process of coal mining face, due to the impact of mining roof fractured zone development, sandstone water seepage field of the coal seam roof has dynamic changes, which could lead to mine water disaster. So it has some guiding significance to study the occurrence characteristics and seepage field change for how to prevent and control mine water disaster. Took Bojianghaizi mine in Dongsheng area, Erdos, China as an example, according to the occurrence characteristics on the roof of Cretaceous and Jurassic coal seam before the extraction, and the dynamic characteristics of the groundwater during mining operation, the occurrence regularity and influence factors of the roof sandstone pore-fissure water had been revealed from their formation mechanism. It was pointed out that the Cretaceous and Jurassic strata were in one series of terrestrial sediment, because of the late diagenesis time, the low maturity degree of rock, and the argillaceous and calcareous cementitious filling rock, the pore-fissure of dual media in sandstone aquifer of seam roof had been developed by all kinds of geotechnical activities later. Sandstone pore-fissure water mainly occurred in the strata of sandstone and the conglomerate of lower Cretaceous Zhidan Group, middle Jurassic Zhiluo Formation, and middle-lower Jurassic Yan'an Formation, which aquifer was low water-rich stratum and bad permeability and transmissivity. Through the study of the hydrogeological conditions of aquifers in Jurassic, the hydrogeological conceptual model and mathematical model had been established by Visual Modflow software, and dynamic characteristics of the groundwater flow area under different drainages were studied during the advance process of working face, and the drainage characteristics of pore-fissure water was discussed. The simulation results clearly reflected that water conductivity of the groundwater depression cone within the scope of fissure zone developed faster than the out of the scope. It was because that the permeability changed from small to large which provided an important guidance for the prevention and control of sandstone water disaster within the scope of water conductivity fissure zone.

Keywords occurrence characteristics, sandstone pore-fissured aquifer, dynamic simulation, mining influence