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The Influence of Negative Pressure in High-Position Tunnel on Gas Grainage Effect

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Extended Abstract

Based on the simulation results of the airflow field and gas distribution when high-position tunnel is used to extract the gas in goaf, air leakage between the working face and the goaf, gas distribution in goaf and upper corner, gas quantity drained out by high-position tunnel are analyzed under the different extraction negative pressure *P* in high-position tunnel. The conclusions are demonstrated as follows:

(1) With the increase of negative extraction pressure *P*, the scope of air leakage from working face to goaf along with working face changes slightly if *P* is less than 5kPa, and the scope of air leakage increases gradually when *P* is higher than 5kPa. Air leaks from the whole length of the working face into goaf if *P* is over 17kPa.

(2) With the rise of negative extraction pressure *P*, volume of air leakage from working face to goaf basically doesn't change if P is lower than 7kPa, and it increases linearly if *P* is higher than 7kPa. With the rise of negative extraction pressure *P*, volume of air leakage from goaf to working face reduces linearly if *P* is lower than 7kPa, and it's reduction amplitude decreases gradually if *P* is higher than 7kPa.

(3) Gas concentration reduces slightly at air inlet side of goaf, it reduces rapidly at air return side of goaf, and gas concentration at upper corner reduces with the rise of negative extraction pressure *P*, Gas accumulation problem at upper corner can be solved if *P* rises to 3kPa.

(4) Gas concentration in high-position tunnel reduces and the pure methane quantity increases with the rise of negative pressure *P*. When the negative pressure is higher than 17kPa, all gas emitted into goaf is drained out through high-position tunnel.

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