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Theoretical equation of gas desorption of particle coal under the non-uniform pressure condition and its analytical solution ☆

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Abstract

Based on the second Fick's law, the theoretical equation of gas desorption of particle coal under the non-uniform pressure condition was developed in this paper. The analytical solution of the theoretical equation and the method of gas desorption quantity of particle coal under non-uniform pressure condition were obtained.

Highlights

► The theoretical equation of gas desorption of particle coal under the non-uniform pressure condition was developed. ► The solution of the theoretical equation and the gas desorption of particle coal under non-uniform pressure were obtained. ► The desorption rate related to the initial concentration, diffusion coefficient, dimensions and external pressure variation.

Keywords

Particle coal; The theoretical equation of gas desorption; The non-uniform pressure condition; Analytical solution
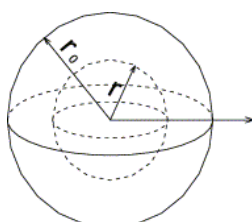
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Fig. 1. The coordinate for gas diffusion through coal particle.

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The First International Symposium on Mine Safety Science and Engineering (ISMSSE2011) will be held in Beijing on October 26 – 29, 2011. The symposium is authorized by the State Administration of Work Safety

and is sponsored by China Academy of Safety Science Technology (CASST), China University of Mining Technology (Beijing) (CUMTB), Datong Coal Mine Group, McGill University (Canada) and University of Wollongong (Australia) with participation from several other universities from round the world, research institutes, professional associations and large enterprises. The topics will focus on mines safety field: theory on mine safety science and engineering technology, coal mine safety science; engineering technology, metal and nonmetal mines safety science; engineering technology, petroleum and natural gas exploitation safety science; engineering technology, mine safety management and safety standardization science; technology, occupational health and safety in mine, emergent rescue engineering technology in mine, etc.

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