

论文

不同温度下钙芒硝矿溶解细观结构显微CT试验研究

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摘要:

对不同溶浸条件下的钙芒硝矿样进行了显微CT扫描实验, 观测钙芒硝某一固定层面的物理细观结构在水溶液溶浸作用下的变化规律与特征, 揭示了溶浸温度与时间对钙芒硝溶解特性的影响。结合钙芒硝溶解的宏观质量变化与细观孔隙率及裂纹演化, 研究了不同温度下的钙芒硝溶解特性。根据实验与理论分析结果, 得到: 钙芒硝矿中Na₂SO₄在未达到其饱和溶解度前, 溶解不断进行, 同时, 存在CaSO₄的溶解与水化结晶两个动态平衡; 溶解和结晶的速度影响钙芒硝孔隙率的变化; 室温溶浸时, 钙芒硝容易碎裂, 35℃时, 钙芒硝溶解相对稳定, 65℃和95℃时, 短时间内溶解速度较高, 随着时间增长, 溶解速度减小, 且95℃溶速低于65℃; 不同温度钙芒硝的溶解-渗透方式不同。

关键词: 钙芒硝; 细观结构; 溶解; 温度时间效应

Experimental study on meso structure of glauberite soaked in water under different temperature

Abstract:

The glauberite soaked under different conditions were scanned by micro CT, focused on the microscopic changes on a fixed lay, and studied the law of glauberite soaked in water affected by temperature and time. This paper combined macroscopic quality changes and microscopic porosity and crack evolution to study the dissolution properties of glauberite under different temperatures. According to the experimental data and theoretical analysis, got conclusion as follows: dissolution of glauberite continues before Na₂SO₄ reaches its saturation solubility, and two dynamic balance—dissolution and hydration of CaSO₄ coexists in the same time. Glauberite porosity is impacted by the speed of dissolution and crystallization. Glauberite easily brokes when dissolved at room temperature, but it is relatively stable at 35, 65 and 95℃, solution velocity is high within short time, but decreases with time increasing, and solution speed at 95℃ is lower than 65℃. The ways of glauberite dissolution penetration are different under different temperature.

Keywords: glauberite; meso structure; dissolution; temperature and time effect

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