盐岩地下储库气体泄漏量的计算方法

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CALCULATION METHOD FOR GAS LEAKAGE MASS FROM UNDERGROUND GAS STORA CAVERNS IN SALT ROCK

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摘要 为分析评估盐岩储气库泄漏事故灾害，借鉴现有输气管道气体泄漏率计算模型和压力容器泄压模型，提出一种适合于盐岩储库气体泄漏量的计算方法，与典型试验对比验证所提出计算方法的有效性；并以金坛盐岩地下储库为例，分析得到泄漏孔径、运营压力、井管长度对气体泄漏率的如下影响规律：气体泄漏率随着注采井套管破裂孔径的增大而逐渐增大，随着盐岩储气库运营压力的增大而线性增加，并随着井管管长的增大而逐渐减小。另外，应用所提出的模型对盐岩储库的气体泄漏速率和泄漏质量随时间的变化进行评估。

关键词： 岩石力学　 盐岩储气库　 气体泄漏　 泄压模型　 计算方法

Abstract： To analyze and evaluate the hazard of the leakage accident from underground gas storage caverns in salt rock，a prediction method for the gas leakage mass is firstly established on base of the existing models for calculating gas release rate of gas transmission pipelines and pressure drop of vessels. The analytical results were then validated by comparison with the existing test data. Furthermore，the factors influencing on the gas leakage rate of the underground gas storage cavern in salt rock were discussed. The results indicate that the release rate decreases with increase of the length，and increases with increases of the operating pressure as well as the pipeline diameter. Finally，the gas leakage rate and mass varying with time were evaluated by the proposed method.

Keywords： mechanics　 gas storage cavern in salt rock　 gas leakage　 pressure drop model　 calculation method

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