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## 沁水盆地北部煤层气富集区CSAMT勘探试验研究

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Research of the CSAMT exploration mode and experiment for the coalbed methane enrichment region in the north Qinshui basin

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摘要

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摘要 在分析沁水盆地北部煤层气富集与地下水和地质构造之间的关系基础上, 采用大地电磁法探测地下水分布以及有利和不利煤层气富集影响因素、间接探测煤层气相对富集区; 根据煤层气富集地质模型设计了地球物理模型, 利用有限单元法开展典型薄层模型正演模拟, 讨论了探测方法的可行性; 选择山西沁水盆地北部煤层气勘探区开展可控源音频大地电磁探测技术试验, 结合已有地质、钻井及测井资料完成了试验资料的处理与解释; 试验结果表明, 利用可控源音频大地电磁法能有效获得地层电性结构, 推断含水、富水区, 结合煤层气有利富集地质条件和影响因素, 可以实现间接预测煤层气的有利富集区。

关键词 煤层气, CSAMT, 勘探模式, 沁水盆地

Abstract: On the basis of the analysis of the relationship between the coalbed methane (CBM) enrichment region and groundwater and geological structure in the north Qinshui basin, the magnetotelluric method was employed to detect underground water distribution as well as the favorable and unfavorable geological factors which pose impact on coalbed methane enrichment, and indirect detection of the CBM relative enrichment region. According to the CBM enrichment geological model and designed the geophysical model, using the finite element method to carry out the forward modeling, this work discussed the feasibility of the detection mode, based on which we selected the north Qinshui basin CBM exploration area to carry out the controlled source audio magnetotelluric (CSAMT) technological experiment. Coupled with the geological, drilling and logging data, we have completed the experiment data processing and interpretation. The results show that the use of CSAMT method can effectively obtain electrical structure of strata, infer water content, and water-rich areas. Combining with the favorable enrichment CBM geological conditions and influencing factors, it is possible to achieve indirect prediction of the favorable CBM enrichment region.

Keywords Coalbed methane, CSAMT, Exploration mode, Qinshui basin

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