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青海木里冻土区水合物稳定带的特征研究——模拟与钻探结果对比

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Study on the characteristics of gas hydrate stability zone in the Muli permafrost, Qinghai—comparison between the modeling and drilling results

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摘要

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摘要 基于青海木里冻土区的气体组成、钻孔泥浆的温度测量数据等对该区水合物稳定带的顶底深度进行了模拟计算,并将计算结果与钻探揭示的水合物产出深度进行了对比。模拟计算的水合物顶深在148.8~122.7 m间,底深在324.6~354.8 m间,水合物厚度在175.8~232.2 m间,钻探揭示水合物及其异常产出在133~396 m间层段,两者具有可比性,彼此结果基本一致,显示模拟手段可以很好地服务于水合物稳定带顶底深度的预测。气体组成、冻土深度、冻土层内地温梯度、冻土层下地温梯度等是影响木里冻土区水合物稳定带顶底深度的主要敏感因素。

关键词: 水合物稳定带 模拟 冻土 木里 青海

Abstract: Based on gas composition and temperature measurements in the course of field drilling, the upper and lower depths of gas hydrate stability zone are calculated by modeling in the Muli permafrost, Qinghai, then the modeling results are compared with the drilling results. The modeling results show that the upper depth of gas hydrate stability zone is 148.8~122.7 m and the lower depth of gas hydrate stability zone is 324.6~354.8 m, with the thickness of gas hydrate stability zone of 175.8~232.2 m; the drilling results indicate that gas hydrate and its related indications occur at the interval of 133~396 m. These two types of results are comparable and thus are basically accordant, suggesting that the modeling can serve as a prediction of the upper and lower depths of gas hydrate stability zone. Gas composition, depth of permafrost, thermal gradients above and below the base of permafrost are sensitive factors affecting the upper and lower depths of gas hydrate stability zone in the Muli permafrost.

Keywords: Gas hydrate stability zone Modeling Permafrost Muli Qinghai

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