

高放废物处置库北山预选区地下水同位素组成特征及其意义

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作者	单位	E-mail
郭永海	核工业北京地质研究院, 北京100029	guoyonghai@163.net
王驹	核工业北京地质研究院, 北京100029	
萧丰	核工业北京地质研究院, 北京100029	
王志明	核工业北京地质研究院, 北京100029	
刘淑芬	核工业北京地质研究院, 北京100029	
苏锐	核工业北京地质研究院, 北京100029	
宗自华	核工业北京地质研究院, 北京100029	

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中文摘要:在高放废物处置库选址中,场地水文地质条件的认识极为重要,因为任何从处置库释放出来的放射性物质都将通过地下水搬运向人类生存环境或生物圈迁移.甘肃北山地区是高放废物处置库的重要预选区之一,位于我国西北甘肃省西北部.为了认识预选区的水文地质条件,从水文地质角度评价其作为高放废物处置库场地的适宜性,在过去的10 a,在该区开展同位素水文地质调查工作.野外调查和氢、氧稳定同位素分析结果表明,研究区地下水主要源自大气降水补给,浅部地下水主要由现代区内降水补给形成,而深部地下水则可能由地质历史降水补给形成;浅部地下水系统具有相对开放性特征,水循环交替能力较强,而深部地下水系统具有相对封闭性特征,水循环交替能力较弱.

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Groundwater Isotope Characteristics of the Pre-selected Site of a High Level Radioactive Waste Repository in the Beishan Area, Gansu Province and Their Implications

Abstract: Knowledge of hydrogeological conditions is of paramount importance in the site selection of a high level radioactive waste repository since any radioactive material released from the repository will be in varying degrees transported to the human environment or biosphere by groundwater. The Beishan area in Gansu Province, one of the important potential sites for China's high level radioactive waste repositories, is located in northwestern Gansu Province. In order to understand the hydrogeological conditions and get to know whether the area is a suitable site for a repository or not, the authors carried out an isotopic hydrogeological investigation and research in the past ten years. According to the field investigation and an analysis of the stable isotopes of hydrogen and oxygen, it is concluded that both shallow groundwater and deep groundwater are of meteoric origin. The shallow groundwater is recharged mainly by modern and local precipitation, and the deep groundwater might originate from infiltration recharge of ancient precipitation. From the tritium data of groundwater in the area, it is also thought that the shallow groundwater system is relatively open and its capability for water circulation is