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一种缓冲回填材料的筛选及其特性：西班牙实例

Villar María Victoria1，Astudillo Julio2，Huertas Fernando2

(1. CIEMAT，能源环境与技术研究中心，西班牙 马德里 28040；2. ENRESA，国家放射性废物管理公司S. A.，西班牙 马德里 28043)

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摘要 介绍了西班牙在高放废物深地质处置中用于缓冲回填材料的泥岩的筛选及其特性的研究成果，这项研究在西班牙核废料管理委员会资助下进行，始于20世纪80年代，且在开始阶段主要是开展泥岩沉积层及黏土供应商的筛选工作。黏土这些特性与标准已被国际社会广泛接受，但进一步的研究主要涉及到泥岩的矿物纯度、持水特性、可塑性、低渗透性、较高的膨胀压力和热导性。经初步研究，确定两种膨润土沉积层被选中，并在实验室中对其特性进行了研究，主要包括：热－水－力特性的确定、预加热和温度的影响以及石英添加剂的作用。由于膨润土具有较高的膨胀性以及低渗透性，因而必须对传统的试验技术进行改进，并设计出新的试验设备。最终确定Cortijo de Archidona(Almería)选为西班牙膨润土的供应区，其开采的膨润土已在近期结束的数个研究课题中得到了应用。无论是从矿物学、热学、水力学、力学和地质化学，还是从可变性等方面看来，该区膨润土的特性都是最好的；另外，处置库中膨润土的变化特征在实验室以及现场都已经作了相应的研究。

关键词 放射性废物处置 膨润土屏障 西班牙泥岩 蒙脱土 皂石

分类号

SELECTION AND CHARACTERIZATION OF A REFERENCE SEALING MATERIAL：THE SPANISH CASE

Villar María Victoria1，Astudillo Julio2，Huertas Fernando2

(1. CIEMAT，Research Centre for Energy，Environment and Technology，Madrid 28040，Spain；2. ENRESA，Empresa Nacional de Residuos Radiactivos S.A.，Madrid 28043，Spain)

Abstract

The paper summarises the studies performed in Spain as regards the selection and characterization of clays suitable for sealing and backfilling of radioactive waste repositories. This research began in the 1980s under the auspices of ENRESA，the Spanish agency for nuclear waste management，and started by a survey of apt clay deposits and suppliers. The characterization of the clays and the criteria followed for their further selection were those already accepted by the international community：mineralogical purity，retention properties，plasticity，low permeability，high swelling pressure and thermal conductivity. These initial studies resulted in the selection of two bentonite deposits，whose detailed characterizations were carried out by several laboratories. These included the determination of thermo-hydro-mechanical properties，and of the impact of pre-heating，temperature and addition of quartz on these properties. The high expandability and low permeability of these materials led to the modification of the available experimental techniques and to the design of new equipment. The Cortijo de Archidona deposit(Almería) was finally selected and the bentonite taken there has been the object of various research projects that have ended in this bentonite being one of the best characterised from the mineralogical，thermal，hydraulic，mechanical，geochemical and alterability points of view. Besides，the behaviour of this bentonite under the conditions of a repository has been studied at laboratory and natural scale.

Key words radioactive waste disposal bentonite barrier Spanish clays montmorillonite saponite

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通讯作者