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我国高放废物地质处置研究

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摘要 文章提出我国高放废物地质处置拟采用处置库选址和场址评价—特定场址地下实验室—处置库“三部曲”式技术路线。计划目标是于 2030~2040年前后建成我国的高放废物地质处置库。处置对象是玻璃固化块、超铀废物和部分乏燃料,处置库为竖井—坑道型,候选围岩为花岗岩,位于饱和带中。已初步选定甘肃北山地区为重点预选区。该区地处戈壁,地壳稳定,人烟稀少,地质条件和水文地质条件有利。现已试验获取预选区大量深部地质环境参数。确定使用膨润土作为处置库的回填材料,已获得一批放射性核素在花岗岩和膨润土中的吸附、扩散数据,建立了模拟处置库温度、压力和氧化还原条件的实验装置。高放废物地质处置场址评价、放射性核素地球化学行为、回填材料研究和环境评价研究正在深入进行,并与国际原子能机构等进行了卓有成效的合作

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Studies on Geological Disposal of High-level Waste in China

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Abstract China has proposed a preliminary R&D program for the deep geological disposal of high-level waste. The development strategy for high-level waste repository includes 3 stages: siting and site characterization, underground research laboratory for a site-specific, and repository. It is expected that a national geological repository will be built and put into operation between 2030~2040. The deep geological disposal method will be used. The disposed waste will be vitrified high level waste, transuranic waste and some spent fuel from CANDU reactors. The repository concept is shaft-tunnel-silo located in a saturated zone in granite. Because of rare inhabitants, stable crust, and a good geological and hydro-geological condition, the Beishan area, a Gobi desert in Gansu province, is considered as the most potential candidate area for China's geological repository. Bentonite is selected as a sort of backfill for the repository. With in-situ tests, a great number of deep geological data have been obtained. In laboratory, some data of the adsorption and diffusion, related with radioactive-nuclides' migration in granite and bentonite, have also been obtained; some devices have been established to simulate the temperature, pressure, and redox condition of the real repository. Studies on siting evaluation, geochemical behavior of radioactive nuclides, buffer material, and environment impact assessment have also been conducted. Some cooperations with International Atomic Energy Agency have been very successful.

Key words [China](#) [high-level waste](#) [geological disposal](#) [underground research laboratory](#) [site characterization](#)

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