

## 水辐解产物对深处置高放废物容器侵蚀模拟研究

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**摘要** 采用 $^{60}\text{Co}$   $\gamma$ -辐射源、人工模拟花岗岩地下水和高温高压实验装置,在模拟深处置条件下(处置深度=1000m,t=190°C,p=20 MPa,pH=7.2),实验研究了花岗岩地下水辐射分解产物对深处置高放废物金属容器材料的氧化侵蚀强度。由实验得出,与无辐射情况相比较,花岗岩地下水吸收140?Gy  $\gamma$ 辐照后,水辐射分解产物对不同金属容器材料的氧化侵蚀强度分别增大:铜材——1.5倍,铝材——2.8倍,熟铁——4.3倍,不锈钢——0.7倍。我国在选用高放废物包装容器金属材料、设计容器型式、规格和设计深地质处置库时,必须充分重视地下水辐射分解效应对各工程屏障产生的破坏作用。

**关键词** [辐射分解](#) [高放废物](#) [深地质处置](#) [废物容器](#) [氧化侵蚀](#)

分类号

## A SIMULATED EXPERIMENTAL STUDY IN CORROSION OF WATER RADIOLYSIS PRODUCTS ON CONTAINER OF HIGH-LEVEL WASTE IN THE CONDITION OF DEEP GEOLOGICAL DISPOSAL

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**Abstract** An experimental study in oxidation corrosion of radiolysis products from irradiated granitic groundwater on metal material of high-level waste container in the simulated condition of deep geological disposal (t=190°C, p=20MPa, pH=7. 2) is done by means of  $^{60}\text{Co}$  gamma irradiation source, artificial simulated granitic groundwater, high temperature and high pressure experimental installation. Contrasting with that in the condition of no irradiation, oxidation corrosion intensity of groundwater radiolysis products on various metal material increases: copper— 1-5times aluminium— 2-8 times, iron— 4-3 times stainless steel— 0.7 time. Damage of groundwater radiolysis products to various engineering barriers of radwaste disposal repository should be pay attention to when our country selects metal material of high-level waste container, designs container style and deep geological disposal repository.

**Key words** [Radiolysis](#) [High-level waste](#) [Deep geological disposal](#) [Waste container](#) [Oxidation corrosion](#)

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