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甘肃北山预选区岩体力学与渗流特性研究

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摘要 通过现场节理调查、地应力及高压压水试验及室内岩石力学试验, 研究了甘肃北山预选区岩体力学和渗流特性。研究表明: 甘肃北山岩体节理以陡倾角的剪节理为主, 节理倾向分布可用正态函数进行有效地拟合, 而开度分布可用负指数函数进行拟合。甘肃北山岩石均具有高密度、低含水量、低吸水性率和低孔隙率的特性, 岩石致密, 但浅部岩石均匀性较差; 英云闪长岩岩性不均匀, 而300 m以下似斑状二长花岗岩的岩石均匀性较好, 其单轴抗压强度和弹性模量较高。该区最大水平主应力为17.52 MPa, 而最小水平应力为11.12 MPa, 属中等应力区; 岩体的渗透系数为10<sup>-7</sup>~10<sup>-5</sup> cm/s, 属低渗透性岩体。为此, 编制了渗透张量计算和节理三维模拟程序, 可较好地反映岩体的渗透性质和节理的三维分布。

关键词 [高放废物](#) [地质处置](#) [岩体节理](#) [岩体渗流](#) [地应力](#)

分类号

**STUDY ON ROCK MASS MECHANICS AND SEEPAGE CHARACTERISTICS OF CANDIDATE SITE—BEISHAN, GANSU PROVINCE**

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**Abstract**

Rock mass mechanics and seepage characteristics of the high level radioactive waste disposal candidate site—Beishan, Gansu Province, are studied with field joint survey, geostress test, high-pressure hydraulic test and rock mechanic test in laboratory. The study indicates that the most of rock mass joints in Beishan, Gansu Province, are with shear joint with steep angle of inclination. Distribution of joint's inclination direction can be effectively fitted by normal function, and the distribution of joint's aperture can be effectively fitted by negative exponential function. Rock of Beishan, Gansu Province, is of high density, low water content, low permeability, and low porosity. Rock near the ground and tonalite is not uniform, and the granite 300 meters below the ground is uniform with uniaxial compression strength and Young's module. The maximum principal horizontal stress is 17.52 MPa, and the minor principal horizontal stress is 11.12 MPa, which show that it is under a moderate geostress site. The coefficient of permeability of rock mass is about 10<sup>-7</sup>~10<sup>-5</sup> cm/s with a low permeability. Codes of permeability tensor calculation and 3D joint simulation are programmed, where the seepage characteristic and 3D joint distribution can be visualized.

**Key words** [high-level radioactive waste](#) [geological disposal](#) [rock mass joint](#) [seepage in rock mass](#) [geostress](#)

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