

Hydrochemical Characteristics and Risk Assessment of Groundwater in South China Uranium Mining Area

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A large number of radioactive elements have been released by mining and led to water contamination[1]. The shallow groundwater around a uranium tailings reservoir in south China was selected as research subject, the content characteristics and distribution characteristics of uranium, radium and fluoride in the surrounding river system of the uranium tailings area were studied. The results show that the shallow groundwater are mainly HCO₃-Cl-Ca-Na type; the average concentration of fluoride was 1.82 mg/L, the average radioactivity specific activity of ²³⁸U and ²²⁶Ra was 2.38 mg/L and 5.68×10⁻³ Bq/L respectively. 85.7% of the fluoride in the shallow groundwater exceeded the standard limit[2]. Uranium and radium contributed to the total effective dose of 0.961 mSv, approximately one order of magnitude higher than reference level[3]. The groundwater in study area is unsafe for drinking as its content of fluoride and radioactivity seriously exceeded the corresponding standard.

[1] Denton *et al.* (2016), CHEM GEOL, **434**:12-27. [2] MEP, DT/Z 0290-2015 (2015), 1-12.[3] WHO. Guidelines for drinking water quality (2011), 371-373..