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Geological and geochemical characteristics of the Jiling Na-metasomatism uranium deposit, Gansu, China.

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The metasomatite-related uranium deposit hosts the second largest uranium resource repository in all deposit types. It widespread distributes in Australia, Brazil, Russian, and Ukraine, but rarely presents in China. The Na-metasomatism-related uranium deposit in the Jiling area, northwest China was selected to investigate the genesis. The petrology indicates that late-magmatic albitization was followed by chlorite alteration of biotite and feldspar. The major uranium minerals are uraninite and brannerite. A large amount of uranium minerals occur in fractures in the newly formed albite and chlorite, indicating the main mineralization stage occurred later than albitization and chloritization. The geochemistry reveals that the Jiling granitoids belong to A-type granitoids and generated by mingling between the crust- and mantle-derived magmas. The high Th/U ratios (2.76 to 10.63) of the Jiling granitoids can provide uranium for mineralization. Compared to the fresh granitoids, the mineralized granitoids display high Na, U, low K, Si contents, and LREE/HREE ratios. H, O, and C isotope reveal that the CO₂ originated from the mantle, and H₂O in hydrothermal fluid from mixing between magmatic hydrothermal and meteoric water. Pb isotope reveals that the uranium may derive from the host granitoids.

Country or International Organization

China

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