Mineral characteristics of Tungsten-bearing granite in the Jiangnan orogenic belt: A case study of the Qingyang pluton

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South China is the most important tungsten-concentrated zone in China and even in the world, famous for the Nanling Tungsten ore belt. A series of Tungsten deposits, related with the late Yangshanian granites, have been recently discovered in the Jiangnan orogen, northeastern Qinzhou-Hangzhou metallogenic belt. The Qingyang composite granite is one of a tungsten-bearing granites in the east of Jiangnan orogenic belt. It crops out over an area of approximatedly 750 km^2. The Baizhangya tungsten-molybdenum deposit was found near this pluton. New LA-ICPMS zircon U-Pb dating suggests that the crystallization age of the Qingyang body is 145.5±0.5Ma. The Qingyang pluton has zircon, apatite, fluorite, titanite, rutile, ilmeite, limonite, anatase and magnetite. The main rock-forming minerals including amphibole, biotite, plagioclase were analysed chemical compositions. The biotite is characterized by high MgO and low FeO contents with high Mg/(Mg+Fe) ratios (0.58-0.61), plotted in the crust-mantle zone. The oxygen fugacity calculated by biotite compositions is above Ni-NiO (NNO). The amphiboles are magnesiohornblende. The pressure of the granite estimated by Al-in-hornblende barometer is 1.79~2.50kbar. An amphibole-plagioclase thermometry and a semiquantitative hornblende thermometer yield a forming temperature of ~714ºC. The plagioclase is oligoclase (An~29.5%). The mineral characteristics of Qingyang pluton are differenct from the Nanling tungsten-bearing S-type granites. The Jiangnan tungsten ore belt is NE-trending and distinct from the Nanling belt in terms of metallogenic age, tungsten-bearing granite type etc. and require further study.

Molecular simulation study of rectorite

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Rectorite is a special kind of clay mineral, consisting of illite layer and smectite layer in a regular order [1]. Rectorite and organo-intercalated rectorite can be applied in many fields. In this study, we use molecular simulations to investigate the interlayer properties of pristine and organo-rectorites. First, we use grand canonical monte carlo and molecular dynamics methods to investigate the hydration properties of rectorite with the comparison with montmorillonite. The results indicate that rectorite shows a similar swelling pattern as montmorillonite but a different interlayer cation distribution [2]. Second, we employ classical molecular dynamic simulations to study the microscopic interlayer properties of $HDTMA^+$-intercalated rectorites with and without water at different $HDTMA^+$ loading levels [4]. According to our simulations of organo rectorite, we find that as the loading level changes, different configurations of $HDTMA^+$ occur. And water addition leads little influence on the mobility of Na^+, but decreases the mobility of alkyl chains. Also we observe the behavious of anions in system exceeding 1 CEC.

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DOI:10.1180/minmag.2013.077.5.26