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岩浆岩体系氧同位素分馏系数的理论计算

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摘要：

The increment method is applied to calcuation of oxygen isotope fractionation factors for common magmatic rocks by using oxygen isotope indices for known minerals.The results show that there are some differences in the degree of ^{18}O-enrichment for the different types of magmatic rocks,and their sequence of ^{18}O-enrichment is reckoned as follows acid rocks > neutral rocks > basic rocks > ultrabasic rocks.Two sets of internally consistent fractionation factors for phenocryst-lava systems at temperacture above 1000K and for rock-water systems in the temperature range of 0 to 1200℃ are acquired, respectively.The theoretical calibrations are consistent with the data from hydrothermal experiments and empirical estimates.The present results can be used to quantitatively determine the history of water-rock exchange and to serve geological thermometry for various magmatic rocks (especially extrusive rocks containing phenocryst).

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