

Evaluation of pH condition in deep granitic rocks by using carbon isotopes of carbonate minerals

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Isotopic studies have been conducted to estimate pH conditions in granite at the Tono area. The calcite precipitations on the fracture surface are classified into three groups, based on carbon isotope compositions. 1) At the depths from 100 m to -100 m sea level: precipitation from groundwater within the last 50,000 years. 2) At the depths greater than -300 m sea level: precipitation from the solution with different carbon isotope ratio from present groundwater in the past more than 50,000 years. 3) At the depths from -100 m to -300 m sea level: mixture of newly calcite partly precipitated within the last 50,000 years and relatively old calcite. These data suggest the possibility that pH condition and the conductive fractures can be estimated by carbon isotope compositions of the calcite.