Origin of the 160Ma granitic rocks in the Barcroft Pluton, Sierra nevada, Western America

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Geochemistry of the granitoids is significant for understanding the crustal growth on the earth. It is still controversial whether the characteristics originate from the distinctive composition of source,differences of P and T condition at the formation, differences of crystallization condition, because the granitoids are quite coarse-grained and highly fractionated. In this study, we present spot analysis of rare earth elements of relict igneous zircon, because the REE patterns of zircon reflects the melt composition which the zircon was crystallized. Moreover, we estimated the primary magma of Phanerozoic granitoids in the Barcroft Batholith to examine the source, pressure and temperature path which Sierra nevada granitoids went through.

As a result, the data of spot analysis indicate the primary magma of 160Ma granitic rocks in the Sierra nevada Batholith went through garnet-free condition which relatively low pressure and high temperature. It is consistent with the theory which Sierra necada batholith was generated at the same time which the mid-ocean-ridge was subducted in the west coast of north America.