

Electron Microprobe Dating of Monazite and Its Applications:

Some Examples in South China

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Abstract

Electron microprobe (EMP) monazite age dating has recently been developed to reveal thermal events of the aluminous igneous and metamorphic rocks. Simultaneous analysis of Th, U, Pb and Y on monazite grain is necessary for deriving the apparent age of the analyzed spot, and a series of spot analysis is the basis for constructing the age "isochron". Previously, application has been made by the authors on detrital monazites from the beach sands of W Taiwan (Chen et al., 2006). Age frequency pattern correlates nicely with that obtained from the river mouth sediments of the Minjiang in N Fujian. This indicates that sediments in W Taiwan were mainly deposited through the transportation of this river and the provenance would be most probably the Wuyishan area. Phanerozoic peak ages, 450-430 Ma, 360-350 Ma, and 245 Ma, conform the time of major orogenesis in S China. Two more examples using the EMP monazite age on aluminous granitic bodies in S China are given. One example tackles granitic rocks in Fujian-Jiangxi area. Preliminary results yield Caledonian, Hercynian, Indosinian and Early Yanshanian ages. The other is focused on strongly peraluminous Darongshan granites. Age results, 223 ± 8 Ma for Jiuzhou pluton and 230 ± 15 Ma for Taima pluton, are systematically 6-7 Ma younger than the SHRIMP U-Pb zircon ages (Deng et al., 2004). One explanation is that the EMP monazite age can minimize the influence of inherited cores of the dated mineral. Because the Paleozoic and older granitic rocks in S China are largely strongly peraluminous (Sun, 2006), EMP monazite dating technique would be a potential tool to constrain in-situ age of the P-T-t trajectory for these rocks.

References:

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