

Special Presentation

Bob Tracy

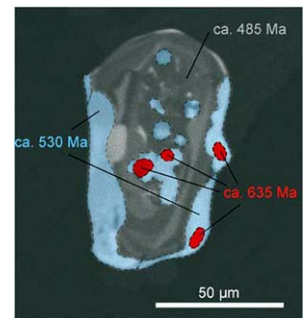
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Monazite in Extreme Environments: Constraining the Dependability of Monazite Geochronology in Thermally and Mechanically Extreme Conditions

Abstract

The accessory mineral monazite (cerium phosphate with REEs, Th and U) commonly occurs in metamorphic and felsic igneous rocks and has become a very useful dating tool, both for isotopic (U-Pb) dating using mass spectrometry and chemical dating using the electron microprobe. Because of its unique thermochronologic properties, monazite tends to record multiple thermal events that can be resolved down to 20-30 Ma, and thus can provide data that constrains complex tectonic histories in orogenic belts, including thermal and deformational pulses and intrusive episodes. Monazite is assumed to have a closure temperature of >750 °C which implies that at T higher than this, an age recorded in it can be completely reset. Similarly, it can be assumed that extreme ductile shear stress that induces extreme grain size reduction in moderate to high-T mylonites may also produce significant age resetting. Studies constraining the degree of recrystallization and age resetting in UHT (>1000 °C) and ultramylonite examples indicate complex behavior that bears upon interpretation of both isotopic and chemical ages determined from monazite.



Day: Monday, March 7, 2005

Room: E207 Howe-Russell

Time: 9:30-10:30 am