1999 GSA Annual Meeting -- Denver, Colorado

Abstract 51452

EARLY PROTEROZOIC 208PB/232TH IN SITU ION PROBE DATING OF MONAZITE FROM ARCHEAN METAMORPHIC SUITES, TOBACCO ROOT MOUNTAINS, MT

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Key words: Archean, Montana, Ionprobe, Age, Monazite

In Session 71 Precambrian Geology (Posters) Tuesday, Tuesday, October 26, 1999 AM in Room: Poster Hall at 08:00 AM for .

Abstract: The Precambrian rocks in the Tobacco Root Mountains have been separated by **Brady** et al. (1994) into three suites: the Indian Creek Metamorphic Suite (ICMS), Pony Middle Mountain Metamorphic Suite (PMMMS), and Spuhler Peak Metamorphic Suite (SPMS). The ICMS and PMMMS are meta supracrustal rocks with substantial volumes of meta-igneous rocks (Burger et al., 1996). The SPMS contains primarily mafic volcanic rocks and is possibly Archean ocean crust. Metamorphosed mafic dikes and sills (MMDS) that intruded the ICMS and the PMMMS but not the SPMS, indicate juxtaposition of the SPMS with the other two suites after intrusion of the dikes at ~2100 Ma (Burger et al., 1999).

Calculated Ps & Ts from MMDS, SPMS, PMMMS, and ICMS rocks indicates all experienced similar Ps &Ts of 7-9 kb and 650-750°C (Burger et al., 1998; Cheney et al., 1996, 1998). The SPMS and ICMS have evolved in a similar manner (Cheney et al. 1998). Both have undergone initial metamorphism at P >10 kb that was followed by differential re-equilibration on a clockwise P-T path to ~6 kb or by reheating at lower P.

Preliminary 208Pb/232Th dates of monazites from 3 SPMS, 1 PMMMS and 3 ICMS rocks have been obtained from the UCLA ion probe. In each sample of aluminous gneiss, 1 to 4 ages were obtained from 1 to 4 monazite grains. Although the absolute ages are subject to change with standard calibration, the relative ages, excepting one SPMS sample (1560±10), are all similar. The average ages of the six samples vary from 1620±26 to 1775±26 Ma. Some of the grains are age zoned with the up to ~100 Ma older grain cores. No systematic difference in age or age zoning have yet been detected in rocks from different suites. Monazites in the matrix are similar in age to those that occur as inclusions in garnet and kyanite. Thus, the monazites in these rocks, as well as the peak metamorphic minerals either grew or re-equilibrated during early Proterozoic Hi P metamorphism.These results are consistent with a sequence of early Proterozoic (1770 Ma) events that significantly overprinted an Archean terrane as developed by Burger et al. (1999).

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