

Mesozoic sedimentary basin development on the allochthonous Wrangellia composite terrane, Wrangell Mountains basin, Alaska: A long-term record of terrane migration and arc construction” by Jeffrey M. Trop, Kenneth D. Ridgway, Jeffrey D. Manuszak, and Paul Layer

Methodology for $^{40}\text{Ar}/^{39}\text{Ar}$ isotopic data from the Wrangell Mountains basin

$^{40}\text{Ar}/^{39}\text{Ar}$ analyses were performed by Jeff Drake and Paul Layer at the University of Alaska. Samples were crushed and then washed in deionized water, dried, and sieved. Whole-rock chips or mineral separates were selected for analysis. The samples were wrapped in aluminum foil and arranged in two levels, labeled top and bottom, in aluminum cans of 2.5 cm diameter and 4.5 cm height. Samples of hornblende MMhb1 (Samson and Alexander 1987) with an assumed age of 513.9 Ma (Lanphere et al. 1990) were included on each level with each set of unknowns to monitor the neutron flux. The samples were sent to the uranium enriched research reactor at McMaster University in Hamilton, Ontario, Canada, and irradiated for 70 mWh in position 5c. Upon their return from the reactor, the samples and monitors were analyzed at the Geophysical Institute using a laser heating system connected to a VG3600 mass spectrometer. The samples and monitors measured on this system were loaded into 2 mm diameter holes in a copper tray that was then loaded into an ultra-high vacuum extraction line. The monitors were fused using a 6 watt rated argon-ion laser (capable of 9 watt output), and the samples were step-heated (York et al. 1981; Layer et al. 1987) using laser powers between 100 milliwatts and 9 watts. The argon isotopes measured were corrected for system blank, mass discrimination, and calcium, potassium, and chlorine interference reactions following the procedures outlined in McDougall and Harrison (1988). The weighted mean of the results obtained on the monitor samples was used in calculations. All ages quoted to the ± 1 sigma level and calculated using the standards of Steiger and Jaeger (1977).

References Cited

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Summary of $^{40}\text{Ar}/^{39}\text{Ar}$ isotopic data from the Wrangell Mountains basin

Sample Name	Mineral	Integrated Age (Ma)	Plateau Age (Ma)	Isochron Age (Ma)	Comments
MAS1-DKOL	whole-rock	89.1 +/- 0.4	none	77.9 +/- 2.1	ragged spectrum, no plateau, error-chron
MAS1-DKOL	whole-rock	88.4 +/- 0.4	none	79.4 +/- 0.7	excess argon, lower Ca/K, 60% of release, 6 fractions, fractions give good isochron with initial 40/36 of 412.0 +/- 6.5
KOT-GCL	hornblende	155 +/- 1.2	152.8 +/- 1.1	none	86% of release, 5 fractions

MAS1-DKOLI - crystal vitric tuff of upper MacColl Ridge Formatin

KOT-GCL - granite clast of Kotsina Conglomerate

All Ar-Ar analyses performed by Jeff Drake and Paul Layer at University of Alaska - Fairbanks

Sample descriptions, primary isotopic data, and methodology presented in Appendix B