Methodology for 40Ar/39Ar isotopic data from the Wrangell Mountains basin

40Ar/39Ar 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


Summary of 40Ar/39Ar isotopic data from the Wrangell Mountains basin

<table>
<thead>
<tr>
<th>Sample Name</th>
<th>Mineral</th>
<th>Integrated Age (Ma)</th>
<th>Plateau Age (Ma)</th>
<th>Isochron Age (Ma)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAS1-DKOL</td>
<td>whole-rock</td>
<td>89.1 +/- 0.4</td>
<td>none</td>
<td>77.9 +/- 2.1</td>
<td>ragged spectrum, no plateau, error-chron</td>
</tr>
<tr>
<td>MAS1-DKOLI</td>
<td>crystal vitric tuff of upper MacColl Ridge Formation</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>KOT-GCL</td>
<td>hornblende</td>
<td>155 +/- 1.2</td>
<td>152.8 +/- 1.1</td>
<td>86% of release, 5 fractions</td>
<td></td>
</tr>
</tbody>
</table>

MAS1-DKOL - crystal vitric tuff of upper MacColl Ridge Formation
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