

### Petrography and Cosmic-ray Exposure History of Alatage Mountain 001 L-Chondrite Shower

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To date more than 100 meteorites with a total mass of more than 100 kg have been collected from Alatage Mountain in Gobi desert, Hami, Xinjiang province, China. Among these meteorites, Alatage Mountain 001 (AM 001) to Alatage Mountain 041 have already been approved as official names [1]. Recent information indicates that the L5 Alatage Mountain chondrites represent a large chondrite shower.

Of the 41 meteorites, 11 were selected for petrographic studies and measurements of light noble gases. The petrographic studies were performed at the Institute of Geochemistry, Chinese Academy of Sciences. All AM meteorites are ordinary heavily shocked chondrites with shock stages S5 or higher. AM 037 is a shock melt rock. All studied chondrites are of type 5. We also report the cosmic-ray exposure (CRE) ages of 11 AM meteorites (see Table 1). The noble gas concentrations were measured at the University of Bern.

Table 1. Cosmic-ray exposure ages (Ma) based on <sup>3</sup>He, <sup>21</sup>Ne, and <sup>38</sup>Ar for the studied Alatage Mountain meteorites.

Meteorite	Type	Mass (mg)	T <sub>3</sub> (Ma)	T <sub>21</sub> (Ma)	T <sub>38</sub> (Ma)	Adopted age (Ma)
AM 006	L5	81.25	6.3±1.9	6.3±1.9	7.0±2.1	6.5±0.4
AM 014	L5	56.38	6.7±2.0	7.2±2.2	11.5±3.5	8.5±2.6
AM 021	L5	60.05	6.6±2.0	6.6±2.1	11.6±3.5	8.3±2.8
AM 024	L5	68.89	8.0±2.4	7.8±2.3	6.8±2.1	7.5±0.7
AM 029	L5	76.00	7.1±2.1	7.2±2.2	7.3±2.2	7.2±0.1
AM 033	L5	74.28	6.5±1.9	6.8±2.0	7.5±2.3	6.9±0.5
AM 034	L5	65.00	7.8±2.3	8.3±2.5	9.0±2.7	8.3±0.6
AM 036	L5	48.57	7.6±2.3	8.5±2.6	8.4±2.5	8.2±0.5
AM 037	L-melt	75.00	7.3±2.2	8.0±2.5	7.4±2.2	7.5±0.4
AM 039	L5	62.56	6.2±1.9	6.3±1.9	7.2±2.2	6.6±0.5
AM 040	L5	58.15	7.5±2.3	8.0±2.4	8.2±2.5	7.9±0.3

The uncertainties of adopted ages are the standard deviations of T<sub>1</sub>, T<sub>21</sub>, and T<sub>38</sub>.

Among the measured samples AM 006 has the shortest CRE age of 6.5±0.4 Ma and AM 014 has the longest CRE age of 8.5±2.6 Ma. Most of the CRE ages agree within the experimental uncertainties, thereby confirming that the samples are paired. We therefore give the average CRE age for the AM samples of 7.6±0.7 Ma.

**Reference:** [1] Ruzicka A. et al., 2017. *Meteoritics & Planetary Science* 46:1014.

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