

Ar-Ar AGES OF BRACHINITE AND BRACHINITE-LIKE ACHONDRITES.

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Introduction: Brachinites are a small group of poorly-understood achondrites that are olivine-dominated. Though there should be plentiful sources of olivine from differentiated chondritic bodies, only a few types are dominated by olivine. The majority of studies on brachinites have focused on petrology and bulk chemistry, with little focus on chronology [1,2,3]. We report the first data of the study of Ar-Ar dating to understand the thermal history of a suite of brachinites. Brachinite/brachinite-like achondrites studied so far include North West Africa (NWA) 1500, North West Africa 595, and North West Africa 6077.

Results: The argon ages of NWA 595 and NWA 1500 are very sensitive to corrections for terrestrial contamination and trapped argon, making it difficult to report any age with confidence. NWA 6077 is not sensitive to these corrections and the apparent age spectrum (Fig. 1) is very disturbed, with no indication of ages older than 2.5 Ga. The summed age is ~620 Ma.

Discussion: Although there is no defined plateau for NWA 6077, we can say it experienced resetting no more than ~600 Ma. The lowest ages may indicate an event at ~200 Ma. This sample is officially an ungrouped achondrite but it is considered to be a brachinite-like achondrite in some studies [2,4]. Additional studies will be performed on splits of the same sample to improve the data of each of these samples, as well as other brachinites (NWA 7297, NWA 4518, and Ramlat as Sahmah 309). In addition to argon thermochronology, future work includes cosmic-ray exposure (CRE) studies to correlate thermal ages with possible exposure age clusters [5]. Correlating this data will help to better constrain the relationships among these achondrites.

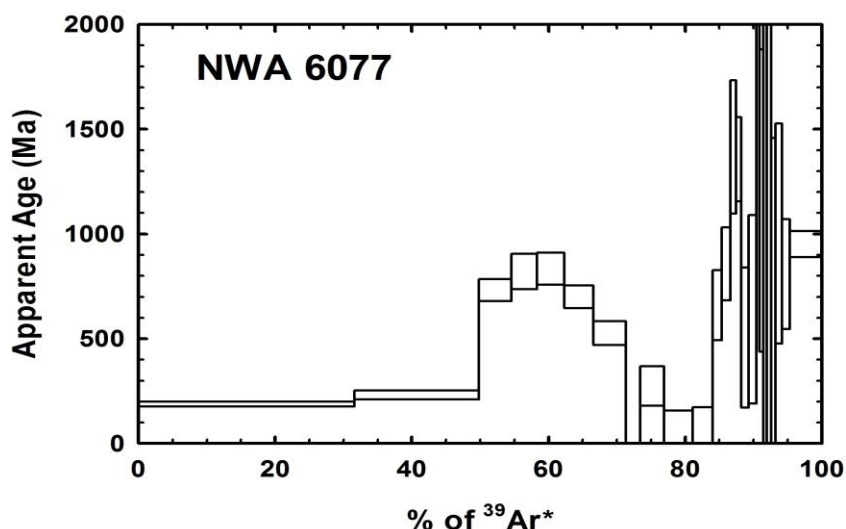


Fig. 1. The apparent age spectra of NWA 6077 shows complete resetting with no sign of its formation age. The summed age is ~600 Ma, interpreted as the maximum time of resetting.

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