

COSMIC-RAY EXPOSURE AGES OF BRACHINITES.

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Introduction: Brachinites are a small group of poorly-understood achondrites that are olivine-dominated. Only a few types of meteorites are dominated by olivine, even though there should be plentiful sources from differentiated chondritic bodies. Though there have been several studies on the petrology and chemistry of the brachinites, there have been only a few that focus on chronology, which may help us to understand more about this group's history and to better define relationships [1,2,3]. Cosmic-ray exposure (CRE) ages measure the interval of time since a meteorite departed from its last (proximate) parent body due to an impact or break-up event. In this work we will report ²¹Ne, ³He, and ³⁸Ar exposure ages of brachinites NWA 6077, NWA 595, NWA 7297, NWA 1500, NWA 4518, and RaS 309.

Methods: It is necessary to make corrections for the trapped (non spallation produced) component of ³⁸Ar to correctly measure its cosmic-ray exposure age. Samples were heated in a multi-step procedure ranging from 400-1300°C and corrections were made at each step for the trapped component of ³⁸Ar. The spallation component represented as little as 0% to as much as 90% of the measured ³⁸Ar. To determine the age, we will use the production rate $P_{38}=1.81[\text{Ca}]+0.098[\text{Fe}+\text{Ni}]+0.38[\text{Ti}+\text{Cr}+\text{Mn}]+2.9[\text{K}]$ in units of 10^{-10} ccSTP/g/Ma, where the wt% of the appropriate element is inserted into the corresponding bracket [4].

References: [1] Nehru C. E. et al. (1983) *10th Proceedings of the Lunar and Planetary Science Conference* B237-244. [2] Day J. M. D. et al. (2012) *Geochimica et Cosmochimica Acta* 81:94-128. [3] Mittlefehldt D. W. et al. (2003), *Meteoritics and Planetary Science* 38:1601-1625. [4] Eugster O. and Michel TH. (1995) *Geochimica et Cosmochimica Acta*, 59:177-199.