NOBLE GAS AND CRE AGE MEASUREMENT OF NEW BASALTIC SHERGOTTITE JAH 479

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Introduction: We report the first noble gas measurements and cosmic ray exposure (CRE) ages of recently recovered Basaltic shergottite Jiddat al Harasis 479 (JaH 479) (Oman, 2008 [1]). Mineralogy, petrography, chemistry and oxygen isotopic compositions are reported by [2]. JaH 479 displays similar rare earth element (REE) patterns to basaltic shergottite Zagami [2].

Experimental Procedure: An ~ 120 mg interior chip of JaH 479 was furnace step-heated until melting at 600, 1000, 1800 and 1900 °C steps and the emitted gas analysed for noble gases He, Ne, Ar, Kr and Xe using an MAP 215-50 instrument.

Results and Discussion: *Gas Concentrations:* Total noble gas concentrations for both JaH 479 and Zagami [3] are shown in Table 1. Compared to Zagami, JaH 479 has lower ^{4}He and ^{22}Ne, similar $^{36}Ar_{trapped}$ and higher ^{40}Ar, ^{84}Kr and ^{132}Xe concentrations.

Table 1: Noble gas concentrations (cc/g) of JaH 479 and Zagami.

Noble Gas	JaH 479 (this study)	Zagami [3]
^{4}He	98×10^{-8}	274×10^{-8}
^{22}Ne	0.49×10^{-8}	0.70×10^{-8}
^{40}Ar	3.4×10^{-6}	2.1×10^{-6}
$^{36}Ar_{trapped}$	3.3×10^{-9}	3.4×10^{-9}
^{84}Kr	1.6×10^{-10}	0.61×10^{-10}
^{132}Xe	0.38×10^{-10}	0.21×10^{-10}

Cosmogenic Neon: Previous analyses of basaltic shergottites have reported low $(^{21}Ne/^{22}Ne)_{cosmog}$ ratios of ~ 0.75-0.80, likely resulting from solar-cosmic-ray (SCR) influences [4]. Our analysis of JaH 479 indicates an even lower total $(^{21}Ne/^{22}Ne)_{cosmog}$ ratio of ~ 0.73, which could result from greater SCR contributions.

CRE Ages: CRE ages were calculated after [5,6], using Zagami chemical composition data [7]. We obtain CRE ages of 1.84 Ma, 2.20 Ma and 2.14 Ma for ^{3}He (T_3), ^{21}Ne (T_{21}) and ^{38}Ar (T_{38}) respectively. The CRE age range observed here is not typical of the ejection ages reported in previous analyses of shergottites, where clusters occur at ~ 1, 3, 4-5, and 20 Ma as summarised by [8]. However, a similar range has been observed for olivine-phyric shergottites Y 980459 and RBT 04262, and lherzolitic shergottite NWA 480 [9-11]. These four meteorites may have been ejected from Mars during the same event at ~ 2 Ma.

References: [1] Weisberg, M.K., et al. 2009. *Meteoritics & Planetary Science* 44:429-462. [2] Lorenz. C. A. et al. 2010. This volume. [3] Schwenzer, S. et al. 2007. *Meteoritics and Planetary Science* 42:387-412. [4] Garrison, D.H. et al. *Meteoritics* 30:738-747. [5] Eugster, O., and Michel, T. 1995. *Geochimica et Cosmochimica Acta* 59:177-199. [6] Eugster, O. et al. 1997. *Geochimica et Cosmochimica Acta* 61:2749-2757. [7] Lodders, K. 1998. *Meteoritics and Planetary Science* 33:A183-A190. [8] Eugster, O. et al. 2002. *Meteoritics and Planetary Science* 37:1345-1360. [9] Okazaki, R., and Nagao, K. 2004. *Antartic Meteorite Research* 17:68-83. [10] Nagao, K., and Park, J. 2008. *Meteoritics and Planetary Science* 43:A107. [11] Marty, B. et al. 2001. *Meteoritics and Planetary Science* 36:A122-A123.