NOBLE GAS STUDIES OF SAYH AL UHAYMIR 150 MARTIAN METEORITE.

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Introduction: Sayh al Uhaymir 150 (SaU 150), weighing 107.7 g, was found in Al Ghaba, Oman by Rainer and Sven Bartoschewitz, 2002 [1]. For it was classified as a basaltic shergottite and discovered in the same area with SaU 005/008/051/060 and 094, SaU 150 may be paired with them [1]. In this work, we report concentrations and isotopic ratios of noble gases of SaU 150 by stepwise heating method. K-Ar gas retention age and the cosmic-ray exposure age were calculated.

Experimental Method: A 0.0402 g of SaU 150 was analyzed by using a mass spectrometric system (modified-VG5400/MS-II). Noble gases in SaU 150 were extracted at different temperatures of 400, 600, 800, 1000, 1300 and 1750 °C. Then, the gases were purified by using Ti, Zr getters. Four fractions of noble gases (He-Ne, Ar, Kr, and Xe) were measured separately; He and Ar were measured by using the Daly-multiplier system, and most of Ne and Kr, Xe by an ion-counting system.

Result and discussion: The concentrations of the cosmogenic nuclides ^{3}He, ^{21}Ne, and ^{38}Ar (10^{-9}cm^{3}STP/g) are 21.8, 3.63, and 0.599, respectively. K-Ar ages and cosmic-ray exposure ages of SaU 150 and reported data of SaU 005/060 are given in Table 1. The ejection age of SaU 150 shows typical ejection age as basaltic shergottites summarized in [2]. K-Ar age is estimated by using ^{40}Ar concentrations (□1000ºC) and the average K concentrations of 183ppm for SaU meteorite [3]. The obtained ages are about 0.69~1.01 b.y., which are representative data for basaltic shergottites. The data also show the pairing between SaU 150 and SaU 005/060, not only for the Mars ejection age, but also for the pattern of the noble gas concentrations during the stepwise heating.

From the $(^{40}Ar)/(^{36}Ar)_t$ and $^{129}Xe/^{132}Xe$ ratios of SaU150, higher temperature data show the trapped Martian atmosphere components (Ar: 1383±305 at 1300°C, Xe: 1.314±0.064 at 1750°C). While those lower value of $^{129}Xe/^{132}Xe$ ratios (under 1000°C) observed from both SaU 150 and SaU 005/060 can be explained as terrestrial contamination due to desert weathering [5,6].

TABLE 1. The cosmic-ray exposure ages and K-Ar ages.

Meteorite	T_3	T_{21}	T_{38}	K-Ar age (□1000ºC)
	Ma			Ga (K=183ppm [3])
SaU 150	1.31	1.28	0.66	0.69±0.08
SaU 005[4]	1.27	0.83	0.87	1.01±0.11
SaU 060[4]	1.27	1.12	0.79	0.50±0.06

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