CLUES TO MULTIPLE EXPOSURE HISTORY OF SOME METEORITES

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Based on the studies of ablation and tracks, Bhandari *et al.* (1980) suggested that Seoni and Patora (both H5 chondrites) belong to single stage exposure history. We have measured the elemental and isotopic composition of light noble gases in Seoni and Patora. The measured He-3, Ne-21 and Ar-38 due to cosmic ray spallation in these samples are given in Table 1. Based on the Ne-21 production rates of Nishiizumi *et al.* (1980), we find the exposure ages of Seoni and Patora to be 4.0 m.y. and 8.4 m.y. respectively.

Table 1

Sample	Spallogenic amount (10^{-8}cc/g) ^{3}He	^{21}Ne	^{38}Ar	22/21	3/21
Patora	9.98	1.99	0.204	1.157	5.02
Seoni	5.0	1.18	0.192	1.104	5.05

The average track densities found in several olivine crystals of Seoni and Patora are 1.36×10^5 and 2.6×10^5 tracks cm^{-2} my^{-1}. Using the values of tracks cm^{-2} my^{-1} (TPM) and Ne-22/Ne-21 ratios (Bhandari and Potdar, 1982), the preatmospheric radius of Seoni and Patora are estimated to be 30 cm and 15 cm respectively. These results suggest a single stage exposure for these two meterorites. However, if the data points fall to the left of the size-profiles in the TPM vs. 22/21 neon correlation diagram, it suggests multiple-exposure for those meteorites.

From Xe-128 excesses and Co-60 activity, determined in St. Severin (Marti *et al.*, 1969), Bruderheim (Rao *et al.*, 1968; Fireman, 1966) and Abee (Marti *et al.*, 1966), one finds that the spallation ages and neutron exposure ages (about 25 m.y., 12 m.y. and 8 m.y. respectively) are consistent with each other indicating single stage exposure for these meteorites. However, the meteorites Murchison, Murray and Allende show differences between spallation ages (1.5 m.y., 3.0 m.y. and 5.0 m.y. respectively) and neutron exposure ages (45 m.y., 12 m.y. and 20 m.y. respectively) indicating the possibility of multiple exposure history.

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