TRAPPED NEON IN THE MARTIAN METEORITE SAU 005.

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Introduction: Neon data for martian meteorites apparently show a two-component mixture of cosmogenic Ne and a trapped component [1]. But the $^{20}Ne/^{22}Ne$ of this trapped end-member is not well constrained. Viking missions were unable to measure the neon isotopic ratios, while data from martian meteorites point to all possible values ranging from 'planetary' to 'solar'. The dominance of cosmogenic neon and presence of terrestrial contamination are two major problems, which may be minimized by using stepped heating data on selected phases.

Trapped $^{20}Ne/^{22}Ne$ in SaU 005: We have analyzed various samples of SaU 005 (the martian meteorite from Oman) for their nitrogen and noble gases as part of an ongoing study of martian meteorites [2]. The stepped temperature neon data for these samples provide a chance to investigate the nature of the trapped neon in martian meteorites. On a neon three-isotope plot (Fig. 1) they define a trend that passes through the cosmogenic Ne and a trapped end-member apparently different from Air.

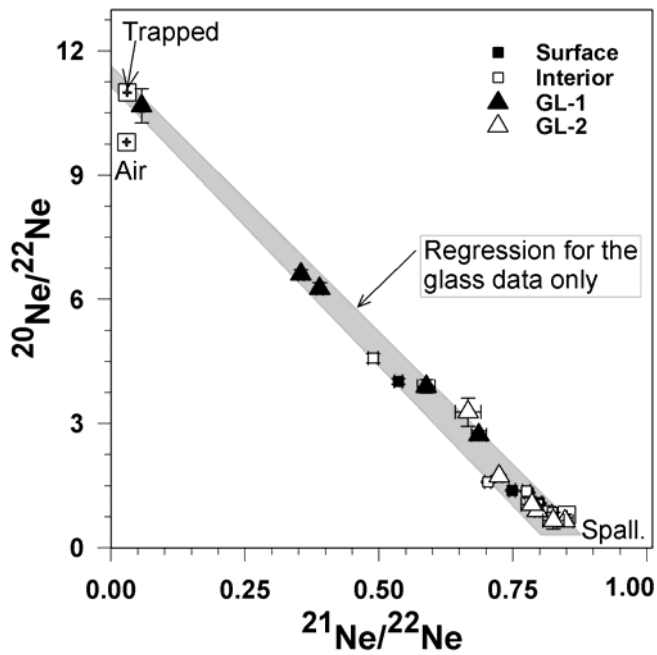

FIG. 1. Plot between $^{21}Ne/^{22}Ne$ and $^{20}Ne/^{22}Ne$ for the stepped heating data from SaU 005. Shaded region represents the uncertainties in the regression parameters obtained from the glass (GL) data.

A linear regression [3] on the stepped heating data for the glass (GL- 1 and 2) samples yields an intercept of 11.3 ± 0.2 and slope of –13.0 ± 0.3, while the corresponding values obtained for the bulk data do not distinguish the trapped component from Air. This may be explained by the presence of larger air contamination (in the form of secondary phases) and/or possible Na-spallation [4]. Using a $^{21}Ne/^{22}Ne$ ratio of 0.03, we derive a trapped $^{20}Ne/^{22}Ne$ of 11.0 ± 0.3 from the glass data.

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