

ISOTOPIC SYSTEMATICS OF NEON IN SIEVE FRACTIONS OF DISAGGREGATED ALLENDE METEORITE, D. Heymann, Dept. of Geology, Rice University, Houston, and R. L. Palma, Dept. of Physics, Sam Houston State University, Huntsville, also in Texas, USA.

A fragment of the Allende meteorite weighing about 6 grams was disaggregated by repeated freeze-thawing cycles plus ultrasonic treatments in water. When the disaggregation seemed to be near-complete, the material was washed through sieves with water; the sieve fractions were then washed with acetone and dried in air. The less than 64 micron fraction contained more than 50% of the original mass. Neon was measured mass-spectrometrically in aliquots of the sieve fractions at a NASA-JSC facility. The results are given in Table 1.

Although the gas contents are not strictly inversely proportional to grain size, there are two distinct groups of samples: larger than 354 microns with low Ne contents, and smaller than 354 microns with high Ne contents. A least-square regression fit of the isotopic data yields:

$$\left(\frac{^{20}\text{Ne}}{^{22}\text{Ne}} \right) = 13.05 - 14.14 \left(\frac{^{21}\text{Ne}}{^{22}\text{Ne}} \right)$$

with a standard deviation of intercept of 0.42. Cosmogenic neon is on the regression line, and so is "Neon-B" (see 1). The latter is remarkable, since the overwhelming majority of Ne samples extracted from the Allende meteorite by other investigators are mixes of "cosmogenic Ne" and "Neon-A" (e.g. 2). The mass spectrometer used by us had never before been exposed to "Neon-B". We suspect that the carrier-phases of the ubiquitous "Neon-A" went into suspension during the disaggregation and were lost. Thus could the occurrence of significant amounts of "Neon-B", much of which seemingly surface-correlated, become revealed in our fragment of Allende.

(1) D. C. Black, Geochim. Cosmochim. Acta, v. 36, p. 347 and p. 377 (1972); (2) R. Lewis, B. Srinivasan, and E. Anders, Science, v. 190, p. 251 (1975).

Size (μm)	TABLE 1			
	$^{22}\text{Ne} (\times 10^8, \text{cm}^3/\text{g})$	$^{20}\text{Ne}/^{22}\text{Ne}$	$^{21}\text{Ne}/^{22}\text{Ne}$	$^{22}\text{Ne}/^{22}\text{Ne}$
< 64	8.39	9.85	0.2374	
64 - 105	35.4	11.53	0.0831	
105 - 250	19.59	11.25	0.1312	
250 - 354	14.62	11.23	0.1566	
354 - 500	1.759	1.117	0.890	
500 - 700	3.24	3.144	0.686	
> 700	1.884	1.79	0.794	