

Table S1e: Step-degassing Ne analyses of Pit 6 samples.

Sample name	Aliquot	Aliquot weight (g)	Heating temperature (deg C)	Heating time (hr)	Total $^{20}\text{Ne}$ released <sup>1</sup> ( $10^6$ atoms)	Total $^{21}\text{Ne}$ released <sup>2</sup> ( $10^6$ atoms)	Total $^{22}\text{Ne}$ released <sup>3</sup> ( $10^6$ atoms)	$^{21}\text{Ne} / ^{20}\text{Ne}^4$ ( $10^3$ )	$^{22}\text{Ne} / ^{20}\text{Ne}^4$ ( $10^3$ )	Cosmogenic $^{21}\text{Ne}^5$ This heating step ( $10^6$ atoms $\text{g}^{-1}$ )	Cosmogenic $^{21}\text{Ne}$ as % of $^{21}\text{Ne}$ released in this heating step	Percent of total cosmogenic $^{21}\text{Ne}$ released in this step	Total cosmogenic $^{21}\text{Ne}$ ( $10^6$ atoms $\text{g}^{-1}$ )
OV06-1-3	a	0.145	400	0.25	1.857 +/- 0.038	18.339 +/- 0.476	196.130 +/- 4.378	9.886 +/- 0.204	107.2 +/- 2.5	89.03 +/- 3.19	70	39	225.6 +/- 5.0
			850	0.25	1.572 +/- 0.034	23.505 +/- 0.534	177.849 +/- 4.122	14.971 +/- 0.290	114.2 +/- 2.5	130.51 +/- 3.76	81	58	
			1100	0.25	0.512 +/- 0.023	2.389 +/- 0.119	52.901 +/- 2.544	4.700 +/- 0.289	104.3 +/- 6.4	6.06 +/- 0.95	37	3	
OV06-1-3	b	0.1596	400	0.25	1.854 +/- 0.038	21.432 +/- 0.448	207.868 +/- 5.118	11.538 +/- 0.228	112.5 +/- 2.8	100.28 +/- 2.91	75	43	233.1 +/- 4.7
			850	0.25	1.642 +/- 0.033	24.926 +/- 0.563	191.000 +/- 4.652	15.172 +/- 0.255	117.1 +/- 2.6	126.21 +/- 3.59	81	54	
			1100	0.25	0.522 +/- 0.019	2.597 +/- 0.143	55.050 +/- 2.548	5.026 +/- 0.317	106.5 +/- 6.1	6.62 +/- 0.96	41	3	
OV06-3-5	a	0.1474	400	0.25	1.710 +/- 0.039	16.180 +/- 0.41	180.384 +/- 4.684	9.470 +/- 0.209	106.8 +/- 2.8	75.72 +/- 2.90	69	53	142.3 +/- 3.8
			850	0.25	1.934 +/- 0.037	14.801 +/- 0.373	210.300 +/- 4.679	7.663 +/- 0.154	109.7 +/- 2.1	61.94 +/- 2.35	62	44	
			1100	0.25	0.668 +/- 0.023	2.640 +/- 0.099	68.561 +/- 2.640	3.976 +/- 0.171	103.5 +/- 4.7	4.63 +/- 0.79	26	3	
OV06-3-5	b	0.1612	400	0.25	1.808 +/- 0.045	18.533 +/- 0.471	197.992 +/- 4.620	10.208 +/- 0.276	110.2 +/- 3.0	82.08 +/- 3.05	71	56	145.8 +/- 4.4
			850	0.25	2.570 +/- 0.077	17.126 +/- 0.418	276.227 +/- 5.018	6.687 +/- 0.203	108.3 +/- 3.0	59.29 +/- 2.96	56	41	
			1100	0.25	0.665 +/- 0.023	2.681 +/- 0.135	70.498 +/- 2.416	4.079 +/- 0.236	107.2 +/- 5.0	4.45 +/- 0.94	27	3	
OV06-24-28	a	0.1569	400	0.25	0.667 +/- 0.029	11.177 +/- 0.319	75.352 +/- 3.532	16.779 +/- 0.759	114.5 +/- 6.8	58.88 +/- 2.11	83	67	87.7 +/- 2.7
			850	0.25	0.736 +/- 0.025	6.422 +/- 0.221	76.673 +/- 3.054	8.741 +/- 0.367	105.1 +/- 5.0	27.16 +/- 1.49	66	31	
			1100	0.25	0.065 +/- 0.023	0.458 +/- 0.067	6.722 +/- 2.148	7.099 +/- 2.715	104.4 +/- 49.7	1.70 +/- 0.61	58	2	
OV06-24-28	b	0.1708	400	0.25	2.180 +/- 0.102	17.306 +/- 0.508	226.515 +/- 3.572	8.052 +/- 0.397	105.1 +/- 5.1	63.79 +/- 3.47	63	76	84.2 +/- 3.7
			850	0.25	0.663 +/- 0.028	5.229 +/- 0.167	68.282 +/- 4.321	7.958 +/- 0.387	103.6 +/- 7.7	19.21 +/- 1.10	63	23	
			1100	0.25	0.089 +/- 0.029	0.460 +/- 0.07	8.952 +/- 2.292	5.214 +/- 1.884	100.4 +/- 41.7	1.15 +/- 0.66	43	1	
OV06-42-48	a	0.1501	400	0.25	0.434 +/- 0.027	8.800 +/- 0.236	49.855 +/- 3.073	20.309 +/- 1.272	116.4 +/- 9.8	50.26 +/- 1.67	86	76	66.0 +/- 2.1
			850	0.25	0.481 +/- 0.019	3.620 +/- 0.143	51.259 +/- 2.787	7.514 +/- 0.382	107.1 +/- 6.9	14.68 +/- 1.03	61	22	
			1100	0.25	0.033 +/- 0.020	0.249 +/- 0.069	2.846 +/- 2.051	7.719 +/- 5.172	88.4 +/- 83.5	1.02 +/- 0.61	61	2	
OV06-42-48	b	0.1559	400	0.25	1.459 +/- 0.033	11.590 +/- 0.37	149.677 +/- 3.511	8.055 +/- 0.239	103.7 +/- 3.2	46.81 +/- 2.46	63	71	65.9 +/- 2.8
			850	0.25	0.523 +/- 0.024	4.299 +/- 0.144	58.355 +/- 4.180	8.316 +/- 0.438	112.1 +/- 9.3	17.71 +/- 1.04	64	27	
			1100	0.25	0.134 +/- 0.026	0.613 +/- 0.069	13.357 +/- 2.635	4.629 +/- 1.032	99.8 +/- 27.5	1.39 +/- 0.67	35	2	
OV06-66-78	a	0.1459	400	0.25	0.882 +/- 0.029	5.452 +/- 0.184	89.373 +/- 3.387	6.213 +/- 0.248	102.6 +/- 4.6	19.56 +/- 1.40	52	44	44.5 +/- 2.2
			850	0.25	1.536 +/- 0.033	8.180 +/- 0.252	160.219 +/- 3.592	5.322 +/- 0.154	105.0 +/- 2.3	24.97 +/- 1.71	45	56	
			1100	0.25	0.181 +/- 0.019	0.638 +/- 0.089	19.295 +/- 2.034	3.557 +/- 0.613	107.8 +/- 15.8	0.00 +/- 0.00	0	0	
OV06-66-78	b	0.1563	400	0.25	1.069 +/- 0.040	6.709 +/- 0.199	107.518 +/- 3.989	6.250 +/- 0.261	101.2 +/- 4.9	22.77 +/- 1.49	53	46	49.7 +/- 2.6
			850	0.25	1.808 +/- 0.038	9.366 +/- 0.315	179.858 +/- 4.269	5.200 +/- 0.166	100.2 +/- 2.4	26.01 +/- 2.01	43	52	
			1100	0.25	0.180 +/- 0.022	0.670 +/- 0.095	16.890 +/- 2.324	3.772 +/- 0.710	95.0 +/- 17.6	0.89 +/- 0.75	21	2	

<sup>1</sup> Computed by comparison to  $^{20}\text{Ne}$  signal in air pipettes. 1-sigma uncertainty includes measurement uncertainty of  $^{20}\text{Ne}$  signal in this analysis and the reproducibility of the air pipette signal

<sup>2</sup> Computed by comparison to  $^{21}\text{Ne}$  signal in air pipettes. 1-sigma uncertainty includes measurement uncertainty of  $^{21}\text{Ne}$  signal in this analysis and the reproducibility of the air pipette signal

<sup>3</sup> Computed by comparison to  $^{22}\text{Ne}$  signal in air pipettes. 1-sigma uncertainty includes measurement uncertainty of  $^{22}\text{Ne}$  signal in this analysis and the reproducibility of the air pipette signal

<sup>4</sup> Isotope ratio measured internally during each analysis; does not involve normalization to the Ne isotope signals in the air pipettes.

<sup>5</sup> Computed by comparison of  $^{20}\text{Ne}$  or  $^{22}\text{Ne}$  signal to air pipettes, whichever is more precise. Assumes that Ne in sample is a binary mixture of atmospheric and cosmogenic Ne.