

Table S1b: Step-degassing Ne analyses of Pit 1 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 $\text{g}^{-1}$ )
OV01-1-4	a	0.1401	400	0.25	2.026 +/- 0.038	20.257 +/- 0.406	218.218 +/- 3.624	9.986 +/- 0.211	109.1 +/- 2.3	102.17 +/- 3.02	71	51	201.1 +/- 4.4
			850	0.25	2.013 +/- 0.035	19.521 +/- 0.416	222.739 +/- 3.530	9.669 +/- 0.208	112.0 +/- 2.3	97.18 +/- 3.07	70	48	
			1100	0.25	0.154 +/- 0.029	0.702 +/- 0.081	13.499 +/- 2.387	4.549 +/- 0.993	88.8 +/- 22.8	1.77 +/- 0.84	35	1	
OV01-1-4	b	0.1361	400	0.25	1.508 +/- 0.040	18.828 +/- 0.479	165.656 +/- 4.507	12.631 +/- 0.318	111.1 +/- 3.4	105.95 +/- 3.64	77	53	200.7 +/- 4.8
			850	0.25	1.814 +/- 0.031	17.862 +/- 0.468	194.687 +/- 4.478	10.047 +/- 0.205	108.5 +/- 2.2	94.79 +/- 3.18	72	47	
			1100	0.25	0.108 +/- 0.022	0.379 +/- 0.076	9.534 +/- 2.182	3.589 +/- 1.026	89.4 +/- 27.4	-	0	0	
OV01-13-16	a	0.1629	400	0.25	2.864 +/- 0.042	25.352 +/- 0.52	302.455 +/- 4.089	8.832 +/- 0.160	107.0 +/- 1.6	103.64 +/- 3.19	67	53	195.5 +/- 4.4
			850	0.25	2.347 +/- 0.033	21.561 +/- 0.478	250.189 +/- 3.555	9.156 +/- 0.182	107.8 +/- 1.7	89.63 +/- 2.91	68	46	
			1100	0.25	0.562 +/- 0.031	2.030 +/- 0.099	51.646 +/- 2.558	3.596 +/- 0.257	92.9 +/- 6.8	2.27 +/- 0.83	18	1	
OV01-13-16	b	0.1278	400	0.25	1.897 +/- 0.044	18.760 +/- 0.495	207.647 +/- 4.684	10.012 +/- 0.226	110.7 +/- 2.6	103.26 +/- 4.02	70	54	190.0 +/- 5.4
			850	0.25	1.710 +/- 0.033	15.297 +/- 0.429	187.201 +/- 4.235	9.125 +/- 0.225	110.7 +/- 2.5	82.81 +/- 3.43	69	44	
			1100	0.25	0.451 +/- 0.020	1.840 +/- 0.089	43.627 +/- 2.293	4.146 +/- 0.257	97.7 +/- 6.5	3.96 +/- 0.84	28	2	
OV01-28-31.5	a	0.1454	400	0.25	2.547 +/- 0.046	19.974 +/- 0.49	264.360 +/- 4.770	7.796 +/- 0.185	104.4 +/- 1.9	85.86 +/- 3.51	63	48	178.2 +/- 4.5
			850	0.25	1.613 +/- 0.036	17.808 +/- 0.373	175.890 +/- 4.453	10.984 +/- 0.269	109.9 +/- 3.2	89.99 +/- 2.68	73	51	
			1100	0.25	0.236 +/- 0.028	1.033 +/- 0.092	22.347 +/- 2.753	4.373 +/- 0.840	95.4 +/- 16.2	2.31 +/- 0.85	33	1	
OV01-28-31.5	b	0.1537	400	0.25	1.217 +/- 0.032	14.512 +/- 0.358	134.263 +/- 4.093	12.095 +/- 0.306	111.3 +/- 3.8	71.24 +/- 2.42	75	40	177.9 +/- 4.2
			850	0.25	1.539 +/- 0.031	20.270 +/- 0.511	171.707 +/- 3.835	13.430 +/- 0.293	112.8 +/- 2.5	102.63 +/- 3.39	78	58	
			1100	0.25	0.347 +/- 0.022	1.638 +/- 0.105	35.714 +/- 2.331	4.797 +/- 0.421	104.0 +/- 8.8	3.99 +/- 0.81	37	2	
OV01-38-41.5	a	0.1703	400	0.25	1.993 +/- 0.042	23.555 +/- 0.44	215.724 +/- 4.762	11.748 +/- 0.243	108.9 +/- 2.7	104.08 +/- 2.70	75	68	152.5 +/- 3.3
			850	0.25	1.042 +/- 0.028	11.032 +/- 0.296	118.274 +/- 3.882	10.529 +/- 0.347	114.3 +/- 4.4	46.84 +/- 1.81	72	31	
			1100	0.25	0.121 +/- 0.028	0.622 +/- 0.082	11.697 +/- 2.807	5.136 +/- 1.345	97.4 +/- 32.2	1.55 +/- 0.68	42	1	
OV01-38-41.5	b	0.146	850	0.25	2.223 +/- 0.036	28.208 +/- 0.562	249.678 +/- 3.819	12.709 +/- 0.199	113.1 +/- 1.8	148.99 +/- 3.87	77	99	150.4 +/- 3.9
			1100	0.25	0.169 +/- 0.022	0.710 +/- 0.078	16.513 +/- 2.852	4.169 +/- 0.700	98.2 +/- 21.0	1.44 +/- 0.69	30	1	
OV01-55-58	a	0.1557	400	0.25	1.386 +/- 0.034	18.018 +/- 0.39	153.168 +/- 3.971	12.917 +/- 0.341	111.1 +/- 3.4	89.71 +/- 2.60	78	67	134.1 +/- 3.2
			850	0.25	1.048 +/- 0.023	9.861 +/- 0.263	111.201 +/- 2.666	9.381 +/- 0.271	106.9 +/- 3.0	43.57 +/- 1.75	69	32	
			1100	0.25	0.068 +/- 0.023	0.332 +/- 0.058	6.122 +/- 2.750	4.918 +/- 1.871	91.4 +/- 51.4	0.85 +/- 0.58	40	1	
OV01-55-58	b	0.1609	850	0.25	2.283 +/- 0.038	29.316 +/- 0.619	252.668 +/- 4.144	12.856 +/- 0.227	111.4 +/- 2.0	140.74 +/- 3.93	77	99	141.8 +/- 4.0
			1100	0.25	0.147 +/- 0.030	0.605 +/- 0.067	13.443 +/- 2.929	4.097 +/- 0.939	92.2 +/- 27.3	1.07 +/- 0.69	28	1	
OV01-65-68	a	0.163	400	0.25	1.471 +/- 0.035	14.749 +/- 0.399	154.330 +/- 4.079	9.966 +/- 0.305	105.5 +/- 3.3	64.03 +/- 2.54	71	51	125.2 +/- 3.4
			850	0.25	1.574 +/- 0.028	14.379 +/- 0.351	170.386 +/- 3.516	9.113 +/- 0.214	109.1 +/- 2.4	59.87 +/- 2.22	68	48	
			1100	0.25	0.147 +/- 0.023	0.638 +/- 0.087	14.217 +/- 2.867	4.335 +/- 0.899	97.6 +/- 24.9	1.25 +/- 0.68	32	1	
OV01-65-68	b	0.1663	850	0.25	2.668 +/- 0.039	29.195 +/- 0.551	292.523 +/- 4.693	10.932 +/- 0.142	110.3 +/- 1.6	128.39 +/- 2.96	73	99	129.5 +/- 3.0
			1100	0.25	0.148 +/- 0.028	0.617 +/- 0.081	12.052 +/- 2.956	4.145 +/- 0.949	82.1 +/- 25.3	1.08 +/- 0.70	29	1	
OV01-68-72l	a	0.1551	400	0.25	3.298 +/- 0.047	15.691 +/- 0.303	342.214 +/- 6.187	4.727 +/- 0.070	104.3 +/- 1.6	37.74 +/- 1.60	37	35	108.7 +/- 3.0
			850	0.25	4.831 +/- 0.062	24.208 +/- 0.476	499.590 +/- 7.062	4.999 +/- 0.068	104.2 +/- 1.0	63.79 +/- 2.26	41	59	
			1100	0.25	1.382 +/- 0.024	5.189 +/- 0.193	139.530 +/- 3.074	3.758 +/- 0.137	102.1 +/- 2.4	7.14 +/- 1.23	21	7	
OV01-68-72l	b	0.1614	850	0.25	8.287 +/- 0.105	39.802 +/- 0.736	867.061 +/- 10.065	4.797 +/- 0.049	105.3 +/- 0.6	94.73 +/- 2.79	38	94	100.7 +/- 3.0
			1100	0.25	1.531 +/- 0.041	5.537 +/- 0.151	147.473 +/- 3.174	3.590 +/- 0.125	96.9 +/- 2.9	6.01 +/- 1.20	18	6	

<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  $^{21}\text{Ne}$  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.