

Table 1. Suite 1 Serenitatis impact melt breccia samples. a) Major element composition. b) Normative mineralogy calculated from major element composition.

Sample	SiO <sub>2</sub>	TiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	FeO	MnO	MgO	CaO	NaO	K <sub>2</sub> O	Group
(a) Suite 1										
72435	45.55	1.64	17.77	8.79	0.118	12.19	10.66	0.639	0.235	1B
73155	46.05	1.69	17.86	9.12	0.124	10.88	10.90	0.629	0.290	1B
76015	45.64	1.47	18.50	8.41	0.119	11.92	11.05	0.672	0.270	1A
76215	45.82	1.43	18.31	8.19	0.108	13.02	10.88	0.652	0.230	1A
76295	46.42	1.49	18.21	8.83	0.120	10.45	11.15	0.714	0.340	1B
77075	45.98	1.52	17.86	8.77	0.118	12.95	10.75	0.655	0.240	1B
73217 <sup>a</sup>	52.70	1.48	18.00	8.77	0.120	3.45	11.90	0.775	2.210	1A
Sample	Anorth.	Ilmenite	High-Ca pyx	Low-Ca pyx	Total pyx	Olivine				
(b) Suite 1										
72435	46.01	3.19	6.59	24.93	31.52	12.19				
73155	46.17	3.29	7.5	28.15	35.65	7.56				
76015	47.57	2.85	6.71	22.03	28.74	13.28				
76215	46.97	2.75	6.22	21.83	28.05	15.12				
76295	46.52	2.9	8.17	26.67	34.84	7.4				
77075	45.59	2.92	6.73	22.92	29.65	14.66				
73217 <sup>a</sup>	39.32	2.83	16.85	14.09	30.94	—				

<sup>a</sup>Not part of the Serenitatis melt sheet.

Table 2. Suite 2 samples and overall description. These are Apollo samples collected with clear indications of being involved with some form of impact melt.

Sample	Description	Group
12032,354	Ropy brown glass (possibly from Copernicus impact)	2C3
12033,604	Ropy brown glass (possibly from Copernicus impact)	2C3
15455,261	“Black and white” breccia; sample is from black phase (fine-grained impact melt)	2C1
64455,128	Glass-coated basaltic impact melt (possibly from South Ray Crater formation)	2B
67095,108	Glass-coated basaltic impact melt	2B
67475,219	Glassy/fine-grained impact melt breccia	2C1
67627,13	Vesicular glass (rough)	2C4
67627,17	Vesicular glass (smooth)	2C4
67729,19	Vesicular glass breccia	2C4
67936,29	Glass veins from fine-grained basaltic impact melt	2C2
68815,384	Glassy polymict breccia	2C2
69935,87	Melt breccia (fine-grained portion)	2C3
69935,88	Melt breccia (glassy portion)	2C3
72255,338	Aphanitic clast-rich melt breccia (from matrix)	2C1
76055,78	Aphanitic matrix melt breccia (from matrix)	2A

observed. The exact size distribution is not known, but G. Ryder prepared fine-grained well-mixed samples to eliminate any bias in sample heterogeneity. The quenched glass samples were created from a split of each sample at the Johnson Space Center by fusion of a portion of each crystalline sample on Molybdenum strips in an argon atmosphere. The resulting glass beads were crushed at the RELAB facility to <125 µm particle size. For one crystalline-glass pair (76015), a series of mass fraction mixtures was created, in known abundance increments. Two batches of glass were prepared from the homogenized 76015 sample and

combined in order to have sufficient sample for the suite of mixtures.

The Suite 2 samples were received as rock chips. Spectra for a few were measured in their natural form. To compare spectral features of particulate samples, all were ground to <125 µm powders. For a few samples, size separates were prepared dry then the larger particles were wet sieved with ethanol and a separate <25 µm “wet” sample collected and dried.

The sample spectra were measured in the RELAB BDR spectrometer from 0.3 to 2.6 µm (at a standard viewing geometry of  $i = 0^\circ$  and  $e = 30^\circ$ , 5 nm