A CHEMICAL STUDY OF APOLLO 15 GLASS-COATED ROCK 15465 AND GREEN GLASS FROM SOIL 15301. W. B. Stroube, Jr., M. Z. Ali and W. D. Ehmann, Department of Chemistry, University of Kentucky, Lexington, Kentucky 40506.

Abundances of twenty elements have been determined by INAA in glass and breccia fractions separated from glass-coated breccia chips 15465,15 and 16. Each subsample was crushed in an agate mortar and samples of breccia and glass were hand-picked under a microscope. The glass fragments ranged from dark green to black in color. Representative splits of approximately 10 mg each were used for the analyses. The breccia and split 1 of the glass from chip 15465,16 were analyzed in one experiment, while split 2 of 15465,16 glass and both the breccia and glass splits of chip 15465,15 were processed in a second experiment with a different set of W-1 and BCR-1 standard rocks for comparison standards. Data for all splits of rock 15465 are presented in Table 1. Estimated analytical error limits are: Fe, Na, Mn, Co, and Sc = 1 - 5%; Al, Mg, Ca, Ti, Cr, Eu, Hf, La, Lu, Sm, Th, V, and Yb = 6 - 10%; Ba and K = 11 - 15%.

Our data indicate that the composition of the glass-coating and the bulk breccia are extremely similar for both subsamples of 15465. Our previously published preliminary data (1) for only one split of breccia and glass from 15465 led us to the opposite conclusion, based on incorrect preliminary data for Cr and Ca. The similarity of the glass-coating and the bulk breccia has also been indicated by oxygen isotope studies (2). Gold (3) has suggested glazing of lunar surface rocks by radiative solar heating. While this mechanism would explain the remarkable similarity of compositions for the bulk breccia and the glass-coating, the large amount of glass present and its penetration into breccia fractures even smaller than 0.1 mm suggest the glass had its origin as a very fluid impact melt derived from source material extremely similar to the breccia it invaded.

The glass from 15465 is compared in Table 1 with our INAA data for emerald green glass spheres extracted from typical Apollo 15 soil 15301. The major element data we obtained for the 15301 glass spheres are in good agreement with other published data on the same material (4) and also with mean compositions reported by Reid *et al*. (5) for green glasses from three Apollo 15 soils. The elemental abundances we report for the glass-coating of 15465 do not closely match either of the two compositional groups of Apollo 15 glasses reported by Delano (6). However, with the exception of K the 15465 coating is closest to the high K group of glasses and is quite different from the ultramafic group of glasses, as represented by our analyses of the green glass spheres from 15301. The ultramafic green glass spheres have been postulated to have an origin by lava fountaining (7) and are clearly not derived from the same source material as the coating on breccia 15465.

Table 1. Elemental abundances in glass and breccia fractions of glass-coated breccia 15465 and green glass spheres from soil 15301.

Element (Splits)	15465,16 Breccia	15465,16 Glass coating (1)	15465,16 Glass coating (2)	15465,15 Breccia	15465,15 Glass coating (1)	15465,15 Glass coating (2)	15465,15 Glass coating (3)	15301,87 Green glass spheres
Fe (%)	7.8	8.9	8.9	9.1	9.2	-	-	16.5
Al	7.96	9.44	-	8.4	8.0	7.9	8.4	4.0
Mg	-	-	-	6.31	6.12	6.05	6.72	9.34
Ca	7.4	7.4	-	8.3	7.26	7.36	8.24	5.6
Ti	0.73	0.67	-	0.59	0.67	0.68	0.84	0.32
Na	0.428	0.36	0.36	0.346	0.328	-	-	0.119
K	-	-	0.21	0.17	0.16	-	-	0.03
Cr	0.17	0.20	0.23	0.22	0.23	-	-	-
Mn	0.132	0.120	-	0.126	0.130	0.123	0.132	0.206
Ba (ppm)	-	-	280.	220.	220.	-	-	-
V	66.	53.	-	69.	71.	77.	78.	86.
Co	31.	40.	40.	39.	39.	-	-	80.
Sc	20.	23.	22.	22.	22.	-	-	35.
La	-	-	27.	23.	23.	-	-	4.5
Sm	-	-	12.	12.	12.	-	-	3.0
Hf	10.8	8.3	-	-	-	-	-	-
Yb	-	-	7.2	6.8	6.8	-	-	6.3
Th	-	6.6	-	-	-	-	-	-
Eu	1.4	1.4	1.3	1.2	1.3	-	-	-
Lu	-	-	-	1.05	1.08	-	-	0.38

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