

14255
Regolith Breccia
22.12 grams

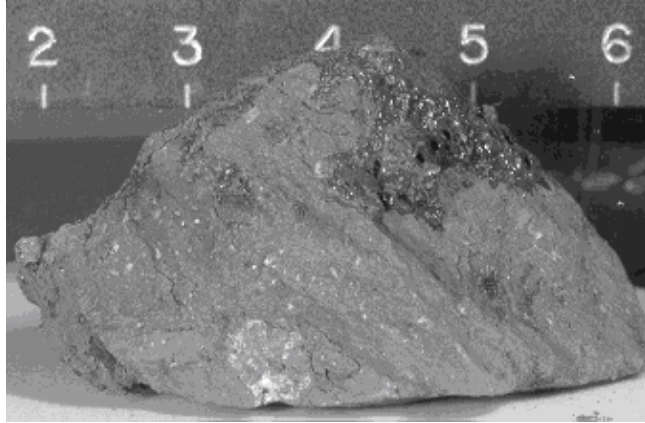


Figure 1: Photo of 14255. Scale in cm. NASA S71-25415.

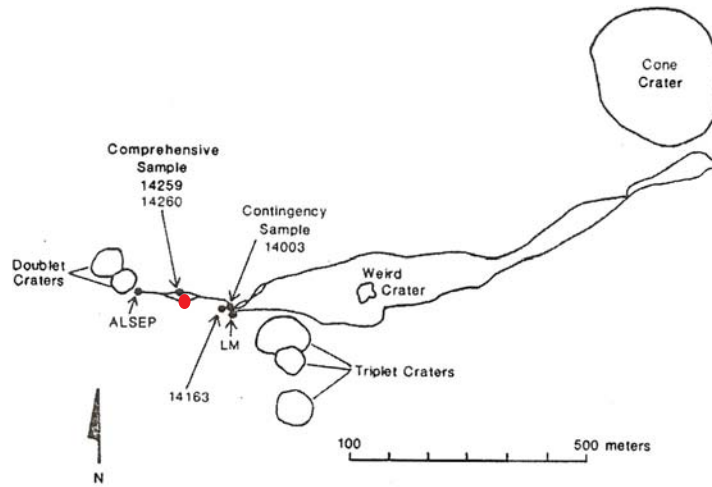


Figure 2: Map of Apollo 14 traverse with location of 14255.

Introduction

14255 is a regolith breccia with glass coat (figure 1). It was collected as part of the “comprehensive sample” taken near the ALSEP station. Compare with 14259 soil.

The Apollo 14 regolith breccias (vitric matrix breccias) are slightly more aluminous than the Fra Mauro breccias (crystalline matrix breccias).

Petrography

Phinney et al. (1975) described the samples from the comprehensive collection. It is a friable fine-grained, glass-matrix breccia with a thin coat of black glass over most of its surface. There are micrometeorite zap pits on all sides.

Fruiland (1983) included 14255 in the compilation of regolith breccias. It was studied by Simon et al. (1989) who reported a high percentage of agglutinates (matrix free). The matrix contains light-brown glass.

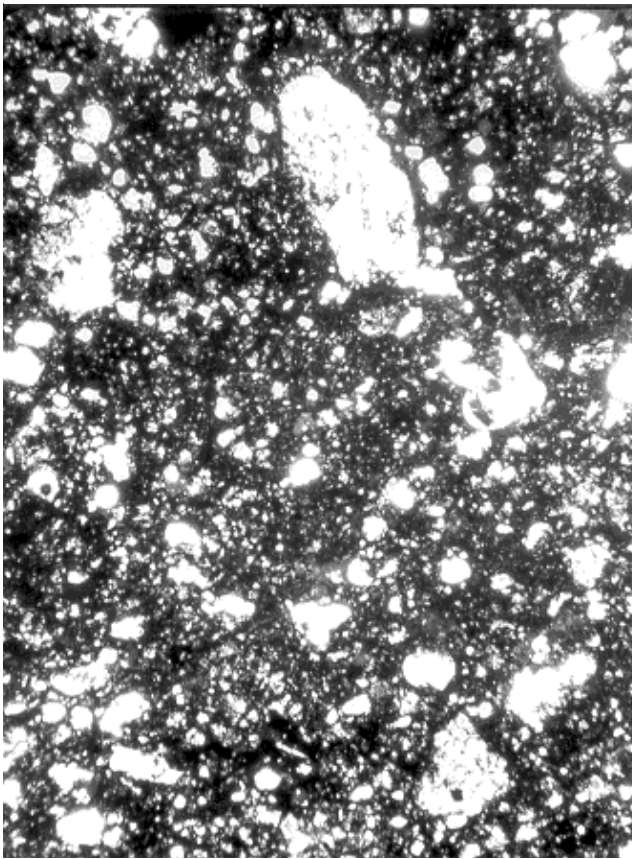


Figure 3: Photomicrograph of thin section 14255,6 (scale unknown).

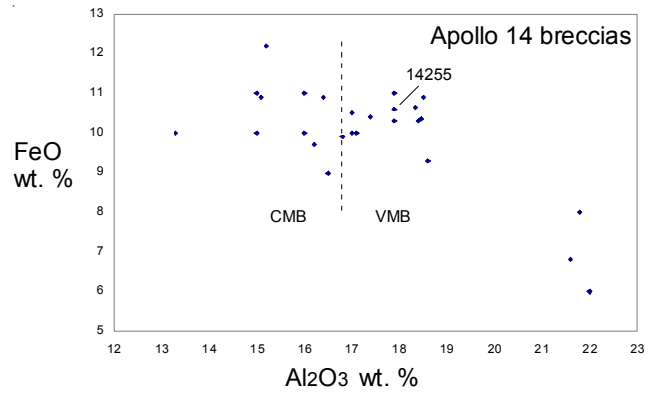


Figure 4: Composition of 14255 compared with other Apollo 14 breccia samples.

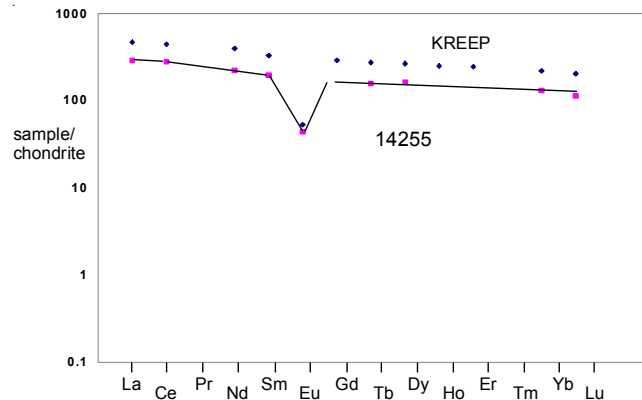


Figure 5: Normalized rare-earth-element diagram for 14255 compared with KREEP.

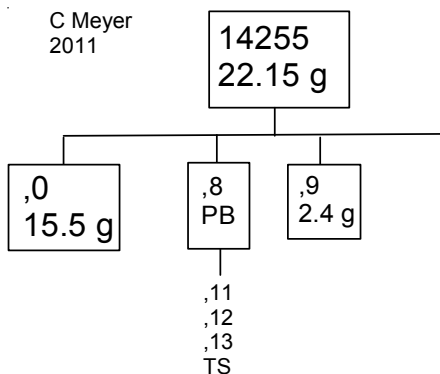
The obvious clast seen in figure 1 has not been studied.

Chemistry

Excellent analyses of 14255 were reported by Simonds et al. (1977) and Simon et al. (1989) (table 1). But the composition is very like the Apollo 14 soil.

Processing

14255 was returned in weigh bag 1007. There are 5 thin sections of 14255.



References for 14255

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Chao E.C.T., Minkin J.A. and Best J.B. (1972) Apollo 14 breccias: General characteristics and classification. *Proc. 3rd Lunar Sci. Conf.* 645-659.

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Phinney W.C., Simonds C.H. and Warner J. (1975) Description, Classification and Inventory of the Comprehensive sample from Apollo 14. *Curator's Catalog*, pp. 46.

Simon S.B., Papike J.J., Shearer C.K., Hughes S.S. and Schmitt R.A. (1989) Petrology of Apollo 14 regolith breccias and ion microprobe studies of glass beads. *Proc. 19th Lunar Planet. Sci. Conf.* 1-17.

Table 1. Chemical composition of 14255.

| reference | Simon89 | Simon89 | Simon77 | Simon77 | Simon77 |
|--------------------------------|---------|---------|---------|-----------|---------|
| weight | 145 mg | | glass | matrix | |
| SiO ₂ % | | | 47.05 | (b) 47.35 | (c) |
| TiO ₂ | 1.62 | (a) | 1.72 | (b) 1.75 | (c) |
| Al ₂ O ₃ | 17.9 | (a) | 17.87 | (b) 17.45 | (c) |
| FeO | 10.6 | (a) | 9.85 | (b) 10.46 | (c) |
| MnO | 0.143 | (a) | | 0.16 | (c) |
| MgO | 9.5 | (a) | 9.4 | (b) 9.48 | (c) |
| CaO | 10.5 | (a) | 11.16 | (b) 11.09 | (c) |
| Na ₂ O | 0.64 | (a) | 0.62 | (b) 0.66 | (c) |
| K ₂ O | 0.51 | (a) | 0.46 | (b) 0.47 | (c) |
| P ₂ O ₅ | | | | 0.45 | (c) |
| S % | | | | 0.09 | (c) |
| sum | | | | | |
| Sc ppm | 22 | (a) | | | |
| V | 36 | (a) | | | |
| Cr | 1320 | (a) | 3070 | (b) | |
| Co | 35 | (a) | | | |
| Ni | 390 | (a) | | | |
| Cu | | | | | |
| Zn | | | | | |
| Ga | | | | | |
| Ge ppb | | | | | |
| As | | | | | |
| Se | | | | | |
| Rb | 19 | (a) | | | |
| Sr | 80 | (a) | | | |
| Y | | | | | |
| Zr | 780 | (a) | | | |
| Nb | | | | | |
| Mo | | | | | |
| Ru | | | | | |
| Rh | | | | | |
| Pd ppb | | | | | |
| Ag ppb | | | | | |
| Cd ppb | | | | | |
| In ppb | | | | | |
| Sn ppb | | | | | |
| Sb ppb | | | | | |
| Te ppb | | | | | |
| Cs ppm | 0.73 | (a) | | | |
| Ba | 850 | (a) | | | |
| La | 68.5 | (a) | | | |
| Ce | 170 | (a) | | | |
| Pr | | | | | |
| Nd | 102 | (a) | | | |
| Sm | 29.3 | (a) | | | |
| Eu | 2.49 | (a) | | | |
| Gd | | | | | |
| Tb | 5.7 | (a) | | | |
| Dy | 40 | (a) | | | |
| Ho | | | | | |
| Er | | | | | |
| Tm | | | | | |
| Yb | 21.4 | (a) | | | |
| Lu | 2.77 | (a) | | | |
| Hf | 20.8 | (a) | | | |
| Ta | 2.9 | (a) | | | |
| W ppb | | | | | |
| Re ppb | | | | | |
| Os ppb | | | | | |
| Ir ppb | 10 | (a) | | | |
| Pt ppb | | | | | |
| Au ppb | 7.5 | (a) | | | |
| Th ppm | 11.6 | (a) | | | |
| U ppm | 3.2 | (a) | | | |

technique: (a) INAA, (b) e. probe, (c) XRF

Simonds C.H., Phinney W.C., Warner J.L., McGee P.E., Geeslin J., Brown R.W. and Rhodes J.M. (1977) Apollo 14 revisited, or breccias aren't so bad after all. *Proc. 8th Lunar Sci. Conf.* 1869-1893.

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