78546

Dark Matrix Breccia
42.66 g, 4.9 x 3.9 x 2.5 cm

INTRODUCTION

Sample 78546 is a coherent soil breccia that was collected as part of a large rake sample at Station 8 (Fig. 1). Warner et al. (1978f) state that 78546 is similar to 78535. Fruland (1983) included 78546 in the suite of soil breccias to be studied by the Regolith Initiative.

PETROGRAPHY

Butler (1973) describes 78546 as moderately coherent, medium grey, matrix-rich breccia with clasts composing less than 5% of the rock. Clasts are predominantly white and consist of plagioclase and mare basalt (Fig. 2).

Warner et al. (1978f) report that 78546 has a relatively high proportion of clasts to matrix. Part of the breccia is intruded by irregular, sometimes vesicular, glass veins. Lithic clasts include a large poikilitic anorthositic norite or gabbro, several mare basalt clasts (mostly fine-grained), and abundant fine-grained breccia clasts. Orange glass and devitrified orange glass spherules are abundant. Minor pale yellow, green, and colorless glass fragments are also reported.

Simon et al. (1990) give the mineralogical mode of 78546 and compare it with other regolith breccias.

MINERAL CHEMISTRY

Warner et al. (1979) have studied the glass compositions in 78546. Shearer et al. (1991) have used the ion microprobe to analyze glass beads in 78546.

WHOLE-ROCK CHEMISTRY

Laul and Schmitt (1975c) and Simon et al. (1990) have reported the chemical composition of 78546 (Table 1 and Fig. 3). This breccia has a high Ti content. The REE content is similar to the Station 8 soil (78501).

Figure 1: Photograph of 78546. Scale is 1 cm. S73-21410.

SURFACE

One side of 78546 had numerous micrometeorite craters (Butler, 1973).

PROCESSING

The largest piece of 78546 retraining weighs 32 g. There are three thin sections of 78546.

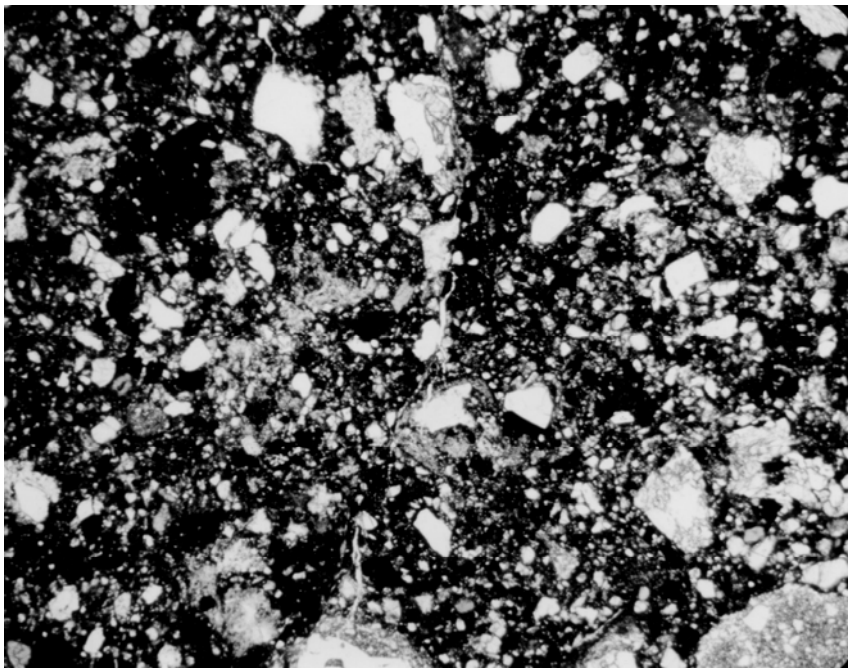

Figure 2: Photomicrograph of thin section 78546,8. Field of view is 3 x4 mm.

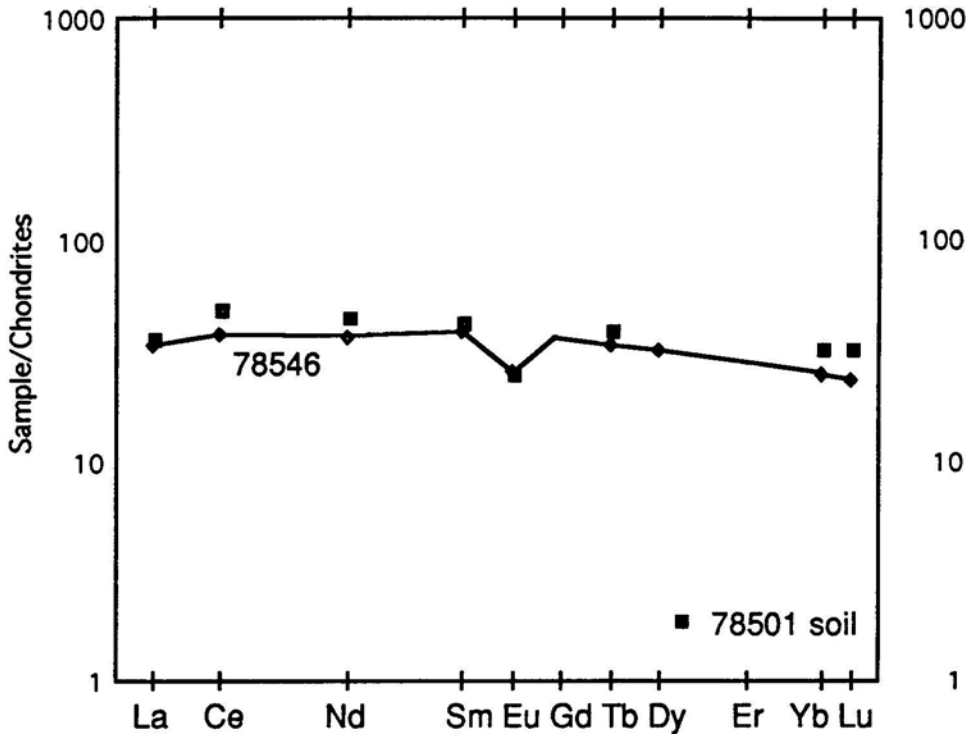

Figure 3: Normalized rare earth element diagram for 78546. Data from Laul and Schmitt (1975c). Data for local soil 78501 are for comparison.

Table 1: Whole-rock chemistry of 78546.
a) Simon et al. (1990); b) Laul and Schmitt (1975c)

Split Technique	,10 (a) INAA	,3 (b) INAA	Split Technique	,10 (a) INAA	,3 (b) INAA
SiO_2 (wt%)	–	–	Cs	0.13	
TiO_2	4.33	4.2	Zn	60	
Al_2O_3	13.9	15.3	Ni	100	150
Cr_2O_3	0.41	0.33	Co	37.1	35.3
FeO	13.6	13.2	Sc	40	31
MnO	0.18	0.16	La	8.62	7.8
MgO	10.6	10	Ce	22.7	22
CaO	11.5	11	Nd	17.8	16
Na_2O	0.47	0.45	Sm	5.8	5.5
K_2O	0.11	0.10	Eu	1.4	1.4
Nb (ppm)			Gd	7.3	
Zr	110	–	Tb	1.3	1.2
Hf	4.7	4.7	Dy	8.6	7.6
Ta	0.76	0.67	Tm	0.71	
U	0.33	–	Yb	4.42	3.9
Th	1.15	0.8	Lu	0.66	0.56
Sr	150		Ge (ppb)		
Rb	10.8		Ir	4.5	6
Ba	110	100	Au	6.0	1