

**SOIL: 10002**

LOCATION COMMENTS: Between Quad IV of LM and TV camera. Surface scoops.  
Redistributed as sample numbers 10084 to 10086.

<b>GENERIC SUBSAMPLES</b>	
(Of 26 only – wt. 750 gm)	
( 424.5 gm)	< 1 mm
( 14.65 gm)	1-2 mm
( 10.96 gm)	2-4 mm
( 7.63 gm)	4-10 mm
( 18.48 gm)	> 1 cm
( gm)	Reserve

<b>MISCELLANEOUS</b>	
<b>Collected mass:</b>	Total est. wt. 5629
<b>Color:</b>	N3 to N4 (med. gray)
<b>Bag no.:</b>	Bulk sample
<b>Container:</b>	Teflon bag; vacuum container (ALSRC). Processed in N2 environment.

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

<b>MATURITY PARAMETERS</b>	
1. $I_s/\text{FeO}$	
2. Agglutinates	

<b>GRAIN SIZE PARAMETERS</b>	
1. $M_z$	52 $\mu\text{m}$ ( $< 1 \text{ mm}$ )
2. $M_d$	60 $\mu\text{m}$

<b>PETROGRAPHY</b> (0.6-3 mm) (Marvin et al. 1971)	
<b>Components</b>	<b>%</b>
Basalt	22.0
Microbreccia	40.0
Glasses:	
Cindery	18.0 (Agglutinates)
Homogeneous	9.0
Ropy	2.0
Norites:	
Anorthosites	8.0
Other	1.0
<b>No. of Particles</b>	<b>135</b>

<b>MAJOR ELEMENTS</b>	
(Agrell et al., 1970)	
	<b>%</b>
$\text{SiO}_2$	42.16
$\text{TiO}_2$	7.75
$\text{Al}_2\text{O}_3$	13.60
$\text{Cr}_2\text{O}_3$	0.30
$\text{FeO}$	15.34
$\text{MnO}$	0.20
$\text{MgO}$	7.76
$\text{CaO}$	11.94
$\text{Na}_2\text{O}$	0.47
$\text{KO}$	0.16
$\text{P}_2\text{O}_5$	0.05
$\text{S}$	0.12

<b>TRACE ELEMENTS</b>			
(Laul & Papike, 1980)			
	<b>ppm</b>		<b>ppm</b>
Sc	60.2	La	15.8
V	70	Ce	43
Co	28.0	Nd	37
Ni	200	Sm	11.4
Ba	170	Eu	1.60
Sr	160	Tb	2.9
Hf	9.00	Dy	17
Ta	1.25	Ho	4.1
Th	1.90	Tm	1.6
U	0.5	Yb	10.0
		Lu	1.39

Ni values are suspect of contamination from the Rh-plated sieves.

**SOIL: 10010**LOCATION COMMENTS: Contingency sample from base of ladder, Quad IV, LM.

GENERIC SUBSAMPLES	
1. ( gm)	< 1 mm
2. ( gm)	1-2 mm
3. ( gm)	2-4 mm
4. ( gm)	4-10 mm
5. ( gm)	> 1 cm
6. ( gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	491 gm
<b>Color:</b>	Med. gray
<b>Bag no.:</b>	Contingency sample bag
<b>Container:</b>	Teflon bag; vacuum container (ALSRC).

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. $I_s/\text{FeO}$	75.0 mature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. $M_z$	
2. $M_d$	

MAJOR ELEMENTS	
(Rhodes & Blanchard, 1981)	
	%
$\text{SiO}_2$	41.5
$\text{TiO}_2$	7.58
$\text{Al}_2\text{O}_3$	13.21
$\text{Cr}_2\text{O}_3$	0.30
$\text{FeO}$	15.83
$\text{MnO}$	0.24
$\text{MgO}$	9.7
$\text{CaO}$	12.05
$\text{Na}_2\text{O}$	0.44
$\text{K}_2\text{O}$	0.14
$\text{P}_2\text{O}_5$	0.11
S	

TRACE ELEMENTS			
(Rhodes & Blanchard, 1981)			
	ppm		ppm
Sc	61	La	14.9
V	47	Ce	46
Co	29	Nd	
Ni	197	Sm	12.1
Ba	205	Eu	1.66
Sr	2.5	Tb	7.82
Hf		Dy	
Ta	1.6	Ho	
Th	1.5	Tm	
U		Yb	9.91
		Lu	1.46

Ni values are suspect of contamination from the Rh-plated sieves.

**SOIL: 10011**

LOCATION COMMENTS: Outside Quad IV of the LM.

<b>GENERIC SUBSAMPLES</b>	
1. ( gm)	< 1 mm
2. ( gm)	1-2 mm
3. ( gm)	2-4 mm
4. ( gm)	4-10 mm
5. ( gm)	> 1 cm
6. ( gm)	Reserve

<b>MISCELLANEOUS</b>	
<b>Collected mass:</b>	82.6 gm
<b>Color:</b>	Gray
<b>Bag no.:</b>	Doc. Sample bag
<b>Container:</b>	Teflon bag; vacuum container (ALSRC).

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

<b>MATURITY PARAMETERS</b>	
1. $I_s/\text{FeO}$	69.0 mature
2. Agglutinates	

<b>GRAIN SIZE PARAMETERS</b>	
1. $M_z$	
2. $M_d$	

<b>MAJOR ELEMENTS</b>	
(Rhodes & Blanchard, 1981)	
	%
SiO <sub>2</sub>	41.5
TiO <sub>2</sub>	7.58
Al <sub>2</sub> O <sub>3</sub>	13.21
Cr <sub>2</sub> O <sub>3</sub>	0.30
FeO	15.83
MnO	0.24
MgO	9.7
CaO	12.05
Na <sub>2</sub> O	0.44
K <sub>2</sub> O	0.14
P <sub>2</sub> O <sub>5</sub>	0.11
S	

<b>TRACE ELEMENTS</b>			
(Rhodes & Blanchard, 1981)			
	ppm		ppm
Sc	61	La	14.9
V	47	Ce	46
Co	29	Nd	
Ni	197	Sm	12.1
Ba	205	Eu	1.66
Sr	2.5	Tb	7.82
Hf		Dy	
Ta	1.6	Ho	
Th	1.5	Tm	
U		Yb	9.91
		Lu	1.46

**SOIL: 10084**

## LOCATION COMMENTS:

GENERIC SUBSAMPLES	
(38,300 gm)	< 1 mm
( gm)	1-2 mm
( gm)	2-4 mm
( gm)	4-10 mm
( gm)	> 1 cm
( gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	38,300 gm
<b>Color:</b>	
<b>Bag no.:</b>	
<b>Container:</b>	ALSC No. 1003

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS		PETROGRAPHY (90-100 $\mu$ m) (Simon et al.,1981 )	
1. $I_s/FeO$	78.0, mature	<b>Components</b>	%
2. Agglutinates		Lithic Fragments	
		Mare Components	
		Mare Basalt	24.0
		Highland Components	
		ANT	0.4
		LMB	0.8
		Feldsp. Basalt	1.1
		RNB/POIK	-
		Fused Soil Component	
		DMB	7.5
		Agglutinates	52.0
		Mineral Fragments	
		Mafic	4.2
		Plagioclase	1.9
		Opaque	1.1
		Glass Fragments	
		Orange/Black	2.7
		Yellow/Green	0.8
		Brown	-
		Clear	1.3
		Miscellaneous	
		Devitrified Glass	1.8
		Others	0.3
		<b>Total</b>	<b>99.9</b>
		<b>No. of Points</b>	<b>625</b>

<b>MAJOR ELEMENTS</b>	
(Laul and Papike, 1980)	
	<b>%</b>
SiO <sub>2</sub>	41.0
TiO <sub>2</sub>	7.3
Al <sub>2</sub> O <sub>3</sub>	12.8
Cr <sub>2</sub> O <sub>3</sub>	0.305
FeO	16.2
MnO	0.220
MgO	9.2
CaO	12.4
Na <sub>2</sub> O	0.38
K <sub>2</sub> O	0.15
P <sub>2</sub> O <sub>5</sub>	
S	

<b>TRACE ELEMENTS</b>			
(Haskins et al., 1970)			
	<b>ppm</b>		<b>ppm</b>
Sc	61.7	La	16.9
V		Ce	47.3
Co	26.8	Nd	41
Ni	200	Sm	13.66
Ba	168	Eu	1.74
Sr		Tb	
Hf		Dy	21.0
Ta	1.4	Ho	4.3-4.6
Th		Tm	
U		Yb	11.35
		Lu	1.69

**SOIL: 10085**

LOCATION COMMENTS:

GENERIC SUBSAMPLES	
1. ( gm)	< 1 mm
2. ( gm)	1-2 mm
3. ( gm)	2-4 mm
4. ( gm)	4-10 mm
5. ( gm)	> 1 cm
6. ( gm)	Reserve

MISCELLANEOUS	
Collected mass:	569.0 gm
Color:	
Bag no.:	
Container:	ALSC No. 1003

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. $I_s/\text{FeO}$	75.0 mature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. $M_z$	
2. $M_d$	

MAJOR ELEMENTS	
	%
$\text{SiO}_2$	
$\text{TiO}_2$	
$\text{Al}_2\text{O}_3$	
$\text{Cr}_2\text{O}_3$	
$\text{FeO}$	
$\text{MnO}$	
$\text{MgO}$	
$\text{CaO}$	
$\text{Na}_2\text{O}$	
$\text{K}_2\text{O}$	
$\text{P}_2\text{O}_5$	
S	

TRACE ELEMENTS			
	ppm		ppm
Sc		La	
V		Ce	
Co		Nd	
Ni		Sm	
Ba		Eu	
Sr		Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	
		Lu	

**SOIL: 10086**

LOCATION COMMENTS:

GENERIC SUBSAMPLES	
1. ( gm)	< 1 mm
2. ( gm)	1-2 mm
3. ( gm)	2-4 mm
4. ( gm)	4-10 mm
5. ( gm)	> 1 cm
6. ( 0 gm)	Reserve

MISCELLANEOUS	
Collected mass:	823.0 gm
Color:	
Bag no.:	
Container:	ALSC No. 1003

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. $I_s/\text{FeO}$	
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. $M_z$	
2. $M_d$	

MAJOR ELEMENTS	
	%
$\text{SiO}_2$	
$\text{TiO}_2$	
$\text{Al}_2\text{O}_3$	
$\text{Cr}_2\text{O}_3$	
FeO	
MnO	
MgO	
CaO	
$\text{Na}_2\text{O}$	
$\text{K}_2\text{O}$	
$\text{P}_2\text{O}_5$	
S	

TRACE ELEMENTS			
	ppm		ppm
Sc		La	
V		Ce	
Co		Nd	
Ni		Sm	
Ba		Eu	
Sr		Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	
		Lu	

**SOIL: 10087**

LOCATION COMMENTS:

GENERIC SUBSAMPLES	
1. ( gm)	< 1 mm
2. ( gm)	1-2 mm
3. ( gm)	2-4 mm
4. ( gm)	4-10 mm
5. ( gm)	> 1 cm
6. (0 gm)	Reserve

MISCELLANEOUS	
Collected mass:	17.4 gm
Color:	
Bag no.:	
Container:	ALSC No. 1003

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. $I_s/\text{FeO}$	
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. $M_z$	
2. $M_d$	

MAJOR ELEMENTS	
	%
$\text{SiO}_2$	
$\text{TiO}_2$	
$\text{Al}_2\text{O}_3$	
$\text{Cr}_2\text{O}_3$	
FeO	
MnO	
MgO	
CaO	
$\text{Na}_2\text{O}$	
$\text{K}_2\text{O}$	
$\text{P}_2\text{O}_5$	
S	

TRACE ELEMENTS			
	ppm		ppm
Sc		La	
V		Ce	
Co		Nd	
Ni		Sm	
Ba		Eu	
Sr		Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	
		Lu	



**SOIL: 12001**

**LOCATION COMMENTS:** Sample from traverse between Surveyor and middle of Crescent Craters. Collected along with rocks. (Near LM)

GENERIC SUBSAMPLES	
( gm)	< 1 mm
( gm)	1-2 mm
( gm)	2-4 mm
( gm)	4-10 mm
( gm)	> 1 cm
( gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	2216 gm
<b>Color:</b>	Med. gray, with brownish hue
<b>Bag no.:</b>	Selected sample box
<b>Container:</b>	Teflon bag; vacuum container (ALSRC). Some handled in N <sub>2</sub> atmosphere.

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. $I_s/FeO$	56.0, submature
2. Agglutinates	
GRAIN SIZE PARAMETERS	
1. $M_z$	60 $\mu m$
2. $M_d$	

<b>PETROGRAPHY</b>	(90-100 $\mu m$ ) (Simon et al., 1981 )
<b>Components</b>	%
Lithic Fragments	
Mare Components	
Mare Basalt	12.9
Highland Components	
ANT	1.0
LMB	0.1
Feldsp. Basalt	0.5
RNB/POIK	2.3
Fused Soil Component	
DMB	9.5
Agglutinates	40.1
Mineral Fragments	
Mafic	18.3
Plagioclase	3.9
Opaque	0.2
Glass Fragments	
Orange/Black	0.5
Yellow/Green	2.8
Brown	1.5
Clear	1.0
Miscellaneous	
Devitrified Glass	5.0
Others	0.5
<b>Total</b>	<b>100.1</b>
<b>No. of Points</b>	<b>823</b>

MAJOR ELEMENTS		TRACE ELEMENTS			
(Laul and Papike, 1980)		(Haskins et al., 1970)			
	%		ppm		ppm
SiO <sub>2</sub>	46.0	Sc	40.2	La	35.6
TiO <sub>2</sub>	2.8	V	110	Ce	85
Al <sub>2</sub> O <sub>3</sub>	12.5	Co	42.5	Nd	57
Cr <sub>2</sub> O <sub>3</sub>	0.410	Ni	190	Sm	17.3
FeO	17.2	Ba	430	Eu	1.85
MnO	0.220	Sr	140	Tb	3.7
MgO	10.4	Hf	11.8	Dy	22.0
CaO	10.9	Ta	1.5	Ho	5.0
Na <sub>2</sub> O	0.48	Th	5.4	Tm	1.8
K <sub>2</sub> O	0.26	U	-	Yb	13.0
P <sub>2</sub> O <sub>5</sub>				Lu	1.85
S					
Ni values are suspect of contamination from Rh-plated Ni sieves					

**SOIL: 21003**

**LOCATION COMMENTS:** Same as 12001. Is a split and coarser fraction of 12001 (>1 cm fragments). The < 1 cm portion is material from the bottom of the SRC. May contain contamination from York mesh in SRC.

GENERIC SUBSAMPLES	
1. ( gm)	< 1 mm
2. ( gm)	1-2 mm
3. ( gm)	2-4 mm
4. ( gm)	4-10 mm
5. ( gm)	> 1 cm
6. ( gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	300.0 gm
<b>Color:</b>	Gray
<b>Bag no.:</b>	Loose material in sample box
<b>Container:</b>	Vacuum container; transferred to N <sub>2</sub> atmosphere.

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	57.0 submature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	
2. M <sub>n</sub>	

<b>Petrography:</b>	(44-74 μm)
(Fron del et al., 1971)	
<b>Components</b>	%
Fine grained intergrowth of glass, mineral grains (agglutinates?)	31.2
Pyroxene and Olivine	43.6
Feldspar	11.6
Opakes	6.6
Angular Glass	4.2
Rounded Glass	2.4
Silica	0.2
<b>Number of grains</b>	<b>500</b>

MAJOR ELEMENTS	
	%
SiO <sub>2</sub>	45.9
TiO <sub>2</sub>	3.6
Al <sub>2</sub> O <sub>3</sub>	14.2
Cr <sub>2</sub> O <sub>3</sub>	0.35
FeO	15.4
MnO	0.22
MgO	9.7
CaO	10.4
Na <sub>2</sub> O	0.43
K <sub>2</sub> O	0.24
P <sub>2</sub> O <sub>5</sub>	
S	

TRACE ELEMENTS			
	ppm		ppm
Sc		La	
V		Ce	
Co		Nd	
Ni		Sm	
Ba		Eu	
Sr		Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	
		Lu	

**SOIL: 12023**

LOCATION COMMENTS: Trench site on east rim of Sharp Crater. Bottom of trench; depth 20 cm.

GENERIC SUBSAMPLES		MISCELLANEOUS	
1. ( gm)	< 1 mm	Collected mass:	407.9 gm
2. ( gm)	1-2 mm	Color:	
3. ( gm)	2-4 mm	Bag no.:	LESC
4. ( gm)	4-10 mm	Container:	Lunar Environmental Sample Container (LESC); stainless steel vacuum container. Stored in vacuum.
5. ( gm)	> 1 cm		
6. ( gm)	Reserve		

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. $I_s/\text{FeO}$	60.0 mature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. $M_z$	
2. $M_d$	

MAJOR ELEMENTS *		TRACE ELEMENTS			
(Woodcock & Pillinger, 1978)		(Warren et al., 1978)			
	%		ppm		ppm
SiO <sub>2</sub>		Sc	35.7	La	33
TiO <sub>2</sub>	2.8	V	-	Ce	88
Al <sub>2</sub> O <sub>3</sub>	13.9	Co	42	Nd	62
Cr <sub>2</sub> O <sub>3</sub>		Ni	220 <sup>+</sup>	Sm	15.5
FeO	15.4	Ba	423	Eu	1.8
MnO	10.08	Sr		Tb	3.4
MgO		Hf	11.6	Dy	-
CaO	11.23	Ta	1.5	Ho	
Na <sub>2</sub> O		Th	6.3	Tm	
K <sub>2</sub> O		U	1.7 <sup>+</sup>	Yb	12.4
P <sub>2</sub> O <sub>5</sub>		Cr	2.58	Lu	1.74
S		Mn	1.58		
* Averaged Data Sets					
* 10-20% uncertainty					

**SOIL: 12024**

LOCATION COMMENTS: Near trench site, east rim of Sharp Crater. Surface sample.

GENERIC SUBSAMPLES	
1. ( gm)	< 1 mm
2. ( gm)	1-2 mm
3. ( gm)	2-4 mm
4. ( gm)	4-10 mm
5. ( gm)	> 1 cm
6. ( gm)	Reserve

MISCELLANEOUS	
Collected mass:	56.5 gm
Color:	
Bag no.:	G.A.S.C.
Container:	G.A.S.C.; vacuum can. Now stored in N <sub>2</sub> atmosphere.

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	30.0 submature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	
2. M <sub>d</sub>	

MAJOR ELEMENTS	
	%
SiO <sub>2</sub>	
TiO <sub>2</sub>	
Al <sub>2</sub> O <sub>3</sub>	
Cr <sub>2</sub> O <sub>3</sub>	
FeO	
MnO	
MgO	
CaO	
Na <sub>2</sub> O	
K <sub>2</sub> O	
P <sub>2</sub> O <sub>5</sub>	
S	

TRACE ELEMENTS			
	ppm		ppm
Sc		La	
V		Ce	
Co		Nd	
Ni		Sm	
Ba		Eu	
Sr		Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	
		Lu	

**SOIL: 12029**

LOCATION COMMENTS: Surveyor III. Located 35 m from the rim, inside the subdued, 185 m diameter Surveyor Crater.

GENERIC SUBSAMPLES		MISCELLANEOUS	
		<b>Collected mass:</b>	6.5 gm
1. ( gm)	< 1 mm	<b>Color:</b>	
2. ( gm)	1-2 mm	<b>Bag no.:</b>	Surveyor III Scoop
3. ( gm)	2-4 mm	<b>Container:</b>	Soil in the soil mechanics trenching device (scoop) from Surveyor III.
4. ( gm)	4-10 mm		
5. ( gm)	> 1 cm		
6. ( gm)	Reserve		

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. $I_s/\text{FeO}$	
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. $M_z$	100 $\mu\text{m}$
2. $M_d$	

MAJOR ELEMENTS	
	%
$\text{SiO}_2$	
$\text{TiO}_2$	
$\text{Al}_2\text{O}_3$	
$\text{Cr}_2\text{O}_3$	
FeO	
MnO	
MgO	
CaO	
$\text{Na}_2\text{O}$	
$\text{K}_2\text{O}$	
$\text{P}_2\text{O}_5$	
S	

TRACE ELEMENTS			
	ppm		ppm
Sc		La	
V		Ce	
Co		Nd	
Ni		Sm	
Ba		Eu	
Sr		Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	
		Lu	

**SOIL: 12030**

LOCATION COMMENTS: Near northeast rim of Head Crater. Collected with two large (4 cm) agglutinate fragments. Exact location not known.

GENERIC SUBSAMPLES	
1. ( gm)	< 1 mm
2. ( gm)	1-2 mm
3. ( gm)	2-4 mm
4. ( gm)	4-10 mm
5. ( gm)	> 1 cm
6. ( gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	75 gm
<b>Color:</b>	Medium Gray
<b>Bag no.:</b>	Bag 1-D
<b>Container:</b>	Teflon Bag; in vacuum container (D-ALSRC). Processed in N <sub>2</sub> environment.

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	14.0 submature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	100 μm
2. M <sub>d</sub>	

PETROGRAPHY		(.25 to 1 mm)
(McKay et al., 1971)		
Components		%
Glazed aggregates (agglutinates)		0.5
Single Crystal		4.0
Glass Fragments		13.0
Igneous Rocks		5.0
Breccia		75.0
Glass Spheres		1.0

MAJOR ELEMENTS	
(Fron del et al., 1971)	
	%
SiO <sub>2</sub>	46.6
TiO <sub>2</sub>	3.6
Al <sub>2</sub> O <sub>3</sub>	14.2
Cr <sub>2</sub> O <sub>3</sub>	0.35
FeO	15.4
MnO	0.22
MgO	9.70
CaO	10.40
Na <sub>2</sub> O	0.43
K <sub>2</sub> O	0.24
P <sub>2</sub> O <sub>5</sub>	
S	

TRACE ELEMENTS			
	ppm		ppm
Sc		La	
V		Ce	
Co		Nd	
Ni		Sm	
Ba		Eu	
Sr		Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	
		Lu	

**SOIL: 12032**

LOCATION COMMENTS: Northwest rim of Bench Crater. Surface sample; soil plus several rocks. Underlying material is light gray.

GENERIC SUBSAMPLES		MISCELLANEOUS	
1. ( gm)	< 1 mm	Collected mass:	310.5 gm
2. ( gm)	1-2 mm	Color:	Medium Dark Gray
3. ( gm)	2-4 mm	Bag no.:	4-D
4. ( gm)	4-10 mm	Container:	Teflon Bag; in vacuum container (D-ALSRC). Processed in N <sub>2</sub> environment.
5. ( gm)	> 1 cm		
6. ( gm)	Reserve		

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS		PETROGRAPHY	
1. I <sub>s</sub> /FeO	12.0 immature	(McKay et al., 1971)	(63 -125 μm)
2. Agglutinates			
GRAIN SIZE PARAMETERS		Components	%
1. M <sub>z</sub>	219 μm	Agglutinates	29
2. M <sub>d</sub>	91 μm	Pyroxenes	15
		Olivine	13
		Feldspar	17
		Glass	23

MAJOR ELEMENTS		TRACE ELEMENTS			
(Fron del et al., 1971)		(Schnetzler & Philpotts, 1971)			
	%		ppm		ppm
SiO <sub>2</sub>	46.5	Sc		La	
TiO <sub>2</sub>	2.9	V		Ce	117
Al <sub>2</sub> O <sub>3</sub>	15.2	Co		Nd	73.0
Cr <sub>2</sub> O <sub>3</sub>	0.26	Ni		Sm	20.7
FeO	14.1	Ba	529	Eu	2.12
MnO	0.2	Sr		Tb	
MgO	9.4	Hf		Dy	28.0
CaO	10.7	Ta		Ho	
Na <sub>2</sub> O	0.59	Th		Tm	
K <sub>2</sub> O	0.36	U		Yb	15.2
P <sub>2</sub> O <sub>5</sub>				Lu	2.24
S					



**SOIL: 12033**

LOCATION COMMENTS: Trench 15 cm deep, about 15 m inside the northwest rim of Head Crater. Bottom of trench described by crew as "cement colored." Lighter than overlying soil.

GENERIC SUBSAMPLES		MISCELLANEOUS	
( gm)	< 1 mm	<b>Collected mass:</b>	450 gm
( gm)	1-2 mm	<b>Color:</b>	Med. Gray
( gm)	2-4 mm	<b>Bag no.:</b>	5-D
( gm)	4-10 mm	<b>Container:</b>	Teflon Bag; Vacuum container (D-ALSRC). Processed in N <sub>2</sub> atmosphere.
( gm)	> 1 cm		
( gm)	Reserve		

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS		PETROGRAPHY (90-100 $\mu$ m) (Simon et al., 1981 )	
1. I <sub>s</sub> /FeO	14.6, immature	<b>Components</b>	%
2. Agglutinates		Lithic Fragments	
		Mare Components	
		Mare Basalt	7.5
		Highland Components	
		ANT	1.3
		LMB	0.3
		Feldsp. Basalt	-
		RNB/POIK	3.7
		Fused Soil Component	
		DMB	11.9
		Agglutinates	17.0
		Mineral Fragments	
		Mafic	26.3
		Plagioclase	9.9
		Opaque	1.3
		Glass Fragments	
		Orange/Black	1.5
		Yellow/Green	0.2
		Brown	7.8
		Clear	-
		Miscellaneous	
		Devitrified Glass	10.8
		Others	0.5
		<b>Total</b>	<b>100</b>
		<b>No. of Points</b>	<b>666</b>

<b>MAJOR ELEMENTS</b>	
(Cuttitta et al., 1971)	
	<b>%</b>
SiO <sub>2</sub>	48.2
TiO <sub>2</sub>	2.33
Al <sub>2</sub> O <sub>3</sub>	15.1
Cr <sub>2</sub> O <sub>3</sub>	0.37
FeO	12.9
MnO	0.18
MgO	8.43
CaO	10.6
Na <sub>2</sub> O	0.87
K <sub>2</sub> O	0.54
P <sub>2</sub> O <sub>5</sub>	0.55
S	

<b>TRACE ELEMENTS</b>			
(Haskins et al., 1971)			
	<b>ppm</b>		<b>ppm</b>
Sc		La	48.5±0.6
V		Ce	127.0±2
Co		Nd	90.0±20
Ni		Sm	21.5±0.2
Ba		Eu	2.31±0.02
Sr		Tb	4.6±0.2
Hf		Dy	31.8±0.2
Ta		Ho	6.1±0.3
Th		Tm	
U		Yb	17.4±0.5
		Lu	2.43±0.03

**SOIL: 12037**

LOCATION COMMENTS: Surface on northwest rim of Bench Crater.

GENERIC SUBSAMPLES		MISCELLANEOUS	
1. ( gm)	< 1 mm	Collected mass:	145.0 gm
2. ( gm)	1-2 mm	Color:	Dark Gray
3. ( gm)	2-4 mm	Bag no:	Bag 8-D
4. ( gm)	4-10 mm	Container:	Teflon Bag; in vacuum container (D-ALSRC). Processed in N <sub>2</sub> environment.
5. ( gm)	> 1 cm		
6. ( gm)	Reserve		

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS		PETROGRAPHY	
1. I <sub>s</sub> /FeO	21.0 immature	(McKay et al., 1971)	(65 to 125 μm)
2. Agglutinates			
GRAIN SIZE PARAMETERS		Components	%
1. M <sub>z</sub>	108 μm	Agglutinates	27
2. M <sub>d</sub>		Pyroxene	45
		Olivine	8
		Feldspar	12
		Glass	9

MAJOR ELEMENTS (<37 μm)		TRACE ELEMENTS			
(Fron del et al., 1971)		(Wakita et al., 1971)			
	%		Ppm		ppm
SiO <sub>2</sub>	44.8	Sc		La	51.3
TiO <sub>2</sub>	3.5	V	160	Ce	136
Al <sub>2</sub> O <sub>3</sub>	15.1	Co		Nd	80
Cr <sub>2</sub> O <sub>3</sub>	0.36	Ni		Sm	23.5
FeO	14.9	Ba		Eu	1.96
MnO	0.25	Sr		Tb	4.6
MgO	10.2	Hf		Dy	28.0
CaO	10.5	Ta		Ho	7.9
Na <sub>2</sub> O	0.65	Th		Tm	2.6
K <sub>2</sub> O	0.38	U		Yb	17.8
P <sub>2</sub> O <sub>5</sub>				Lu	2.43
S					

**SOIL: 12041**

LOCATION COMMENTS: Between Bench and Halo Craters. Surface sample (closer to east rim of Bench Crater about 50 m from the rim).

GENERIC SUBSAMPLES		MISCELLANEOUS	
1. ( gm)	< 1 mm	Collected mass:	19.3 gm
2. ( gm)	1-2 mm	Color:	
3. ( gm)	2-4 mm	Bag no.:	Bag 11-D
4. ( gm)	4-10 mm	Container:	Teflon Bag; in vacuum container (D-ALSRC). Processed in N <sub>2</sub> environment.
5. ( gm)	> 1 cm		
6. ( gm)	Reserve		

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS		PETROGRAPHY (63 to 125 $\mu$ m)	
1. I <sub>s</sub> /FeO	63.0 mature	(McKay et al., 1971)	
2. Agglutinates		Components	%
		Agglutinates	58
		Pyroxene	13
		Olivine	2
		Feldspar	1
		Glass	23

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	62.0 $\mu$ m
2. M <sub>d</sub>	

MAJOR ELEMENTS (<37 $\mu$ m)		TRACE ELEMENTS			
(Fron del et al., 1971)					
	%		ppm		ppm
SiO <sub>2</sub>	46.8	Sc		La	
TiO <sub>2</sub>	2.7	V		Ce	
Al <sub>2</sub> O <sub>3</sub>	15.4	Co		Nd	
Cr <sub>2</sub> O <sub>3</sub>	0.23	Ni		Sm	
FeO	14.2	Ba		Eu	
MnO	0.2	Sr		Tb	
MgO	9.1	Hf		Dy	
CaO	10.9	Ta		Ho	
Na <sub>2</sub> O	0.43	Th		Tm	
K <sub>2</sub> O	0.25	U		Yb	
P <sub>2</sub> O <sub>5</sub>				Lu	
S					

**SOIL: 12042**

LOCATION COMMENTS: In "wrinkled texture" area, approximately 20 m north of Halo Crater.  
Surface sample.

GENERIC SUBSAMPLES	
1. ( gm)	< 1 mm
2. ( gm)	1-2 mm
3. ( gm)	2-4 mm
4. ( gm)	4-10 mm
5. ( gm)	> 1 cm
6. ( gm)	Reserve

MISCELLANEOUS	
Collected mass:	255.0 gm
Color:	Dark Gray (N3)
Bag no.:	Bag 12-D
Container:	Teflon Bag; in vacuum container (D-ALSRC). Processed in N <sub>2</sub> environment.

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	61.0 mature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	88.0 μm
2. M <sub>d</sub>	

PETROGRAPHY	
(Fron del et al., 1971)	(44 to 74 μm)
Components	%
Fine-grained intergrowth of glass and minerals (Agglutinates?)	46.0
Pyroxene and Olivine	34.1
Feldspar	6.3
Opakes	7.7
Angular Glass	4.4
Rounded Glass	0.9
Silica	0.6
<b>No. of Grains</b>	<b>700</b>

MAJOR ELEMENTS	
(Cuttitta et al., 1971)	
	%
SiO <sub>2</sub>	45.7
TiO <sub>2</sub>	2.71
Al <sub>2</sub> O <sub>3</sub>	13.0
Cr <sub>2</sub> O <sub>3</sub>	0.39
FeO	16.2
MnO	0.24
MgO	10.4
CaO	10.6
Na <sub>2</sub> O	0.54
K <sub>2</sub> O	0.25
P <sub>2</sub> O <sub>5</sub>	0.33
S	

TRACE ELEMENTS			
(Haskin et al., 1971)			
	ppm		ppm
Sc		La	36.8
V		Ce	111
Co		Nd	79
Ni		Sm	19.7
Ba		Eu	2.03
Sr		Tb	3.87
Hf		Dy	25.8
Ta		Ho	4.46
Th		Tm	
U		Yb	13.8
		Lu	2.09

**SOIL: 12044**

LOCATION COMMENTS: South rim of Surveyor Crater. Surface sample.

GENERIC SUBSAMPLES		MISCELLANEOUS	
1. ( gm)	< 1 mm	Collected mass:	92.0 gm
2. ( gm)	1-2 mm	Color:	
3. ( gm)	2-4 mm	Bag no.:	14-D
4. ( gm)	4-10 mm	Container:	Teflon Bag; in vacuum container (D-ALSRC). Processed in N <sub>2</sub> environment.
5. ( gm)	> 1 cm		
6. ( gm)	Reserve		

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS		PETROGRAPHY	
1. I <sub>s</sub> /FeO	57.0 submature		(63 -125 $\mu$ m)
2. Agglutinates		(McKay et al., 1971)	
GRAIN SIZE PARAMETERS		Components	%
1. M <sub>z</sub>		Agglutinates	44
2. M <sub>d</sub>		Pyroxenes	23
		Olivine	3
		Feldspar	13
		Glass	17

MAJOR ELEMENTS (<37 $\mu$ m)		TRACE ELEMENTS			
(Fron del et al., 1971)		(Goles et al., 1971)			
	%		ppm		ppm
SiO <sub>2</sub>	46.7	Sc	37.9	La	33.1
TiO <sub>2</sub>	3.6	V		Ce	94
Al <sub>2</sub> O <sub>3</sub>	14.6	Co	45.5	Nd	63
Cr <sub>2</sub> O <sub>3</sub>	0.28	Ni		Sm	20.16.27
FeO	14.2	Ba	380	Eu	2.121.69
MnO	0.21	Sr		Tb	3.79
MgO	9.5	Hf	12.9	Dy	
CaO	10.6	Ta	1.9	Ho	4.2
Na <sub>2</sub> O	0.43	Th	7.4	Tm	
K <sub>2</sub> O	0.24	U		Yb	12.9
P <sub>2</sub> O <sub>5</sub>			2590	Lu	1.81
S					

**SOIL: 12057**

LOCATION COMMENTS: Over large area - misc. chips and soil from tools, bags, and rocks stored with vacuum container.

GENERIC SUBSAMPLES		MISCELLANEOUS	
		<b>Collected mass:</b>	650.0 gm
1. ( gm)	< 1 mm	<b>Color:</b>	
2. ( gm)	1-2 mm	<b>Bag no.:</b>	D-ALSRC, bottom
3. ( gm)	2-4 mm	<b>Container:</b>	Vacuum container (D-ALSRC).
4. ( gm)	4-10 mm		
5. ( gm)	> 1 cm		
6. ( gm)	Reserve		

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS		PETROGRAPHY	
1. $I_s/FeO$	40 submature	(Fron del et al., 1971)	(44 to 74 $\mu m$ )
2. Agglutinates		<b>Components</b>	<b>%</b>
		Fine-grained intergrowth of glass and minerals (Agglutinates?)	41.0
		Pyroxene and Olivine	33.2
		Feldspar	15.4
		Opakes	4.4
		Angular Glass	3.6
		Rounded Glass	2.0
		Silica	0.4
		<b>No. of Grains</b>	<b>500</b>

GRAIN SIZE PARAMETERS	
1. $M_z$	72.0 $\mu m$
2. $M_d$	

MAJOR ELEMENTS (<1 mm)		TRACE ELEMENTS			
(Compston et al., 1971)		(Compston et al., 1971)			
	<b>%</b>		<b>ppm</b>		<b>ppm</b>
$SiO_2$	45.74	Sc		La	33
$TiO_2$	2.91	V	97	Ce	90
$Al_2O_3$	12.13	Co	40	Nd	
$Cr_2O_3$	0.35	Ni	158	Sm	
FeO	17.43	Ba	370	Eu	
MnO	0.23	Sr	142.8	Tb	
MgO	9.90	Hf		Dy	
CaO	10.44	Ta		Ho	
$Na_2O$	0.45	Th	5.8	Tm	
$K_2O$	0.25	U	1.2	Yb	
$P_2O_5$	0.26			Lu	
S	0.07				

**SOIL: 12060**

LOCATION COMMENTS: Between the site of Surveyor III (in Surveyor Crater), North to within 30 m of the rim of the crater. All rocks, soil, and Surveyor equipment collected within the crater.

GENERIC SUBSAMPLES	
1. ( gm)	< 1 mm
2. ( gm)	1-2 mm
3. ( gm)	2-4 mm
4. ( gm)	4-10 mm
5. ( gm)	> 1 cm
6. ( gm)	Reserve

MISCELLANEOUS	
Collected mass:	20.7 gm
Color:	Medium Gray (est.)
Bag no.:	Tote-bag
Container:	Exposed to air during return from Moon and in the crew reception area. Stored in beta-cloth bag in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	24.0 immature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	
2. M <sub>d</sub>	

PETROGRAPHY	
	(44 to 74 μm)
(Fron del et al., 1971)	
<b>Components</b>	<b>%</b>
Fine-grained intergrowth of glass and minerals (Agglutinates?)	29.8
Pyroxene and Olivine	42.4
Feldspar	15.2
Opakes	7.4
Angular Glass	3.4
Rounded Glass	1.4
Silica	0.4
<b>No. of Grains</b>	<b>500</b>

MAJOR ELEMENTS (<37 μm)	
(Fron del et al., 1971)	
	<b>%</b>
SiO <sub>2</sub>	45.3
TiO <sub>2</sub>	4.2
Al <sub>2</sub> O <sub>3</sub>	12.6
Cr <sub>2</sub> O <sub>3</sub>	0.23
FeO	16.9
MnO	0.27
MgO	9.6
CaO	10.5
Na <sub>2</sub> O	0.38
K <sub>2</sub> O	0.25
P <sub>2</sub> O <sub>5</sub>	0.26
S	0.07

TRACE ELEMENTS			
	<b>ppm</b>		<b>ppm</b>
Sc		La	
V		Ce	
Co		Nd	
Ni		Sm	
Ba		Eu	
Sr		Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	
		Lu	



**SOIL: 12070**

LOCATION COMMENTS: Collected from rim of a small crater 15 m northwest of the LM.  
Northwest rim of Surveyor Crater.

GENERIC SUBSAMPLES		MISCELLANEOUS	
		<b>Collected mass:</b>	1102.0 gm
		<b>Color:</b>	
		<b>Bag no.:</b>	Contingency sample bag
		<b>Container:</b>	
1. ( gm)	< 1 mm		
2. ( gm)	1-2 mm		
3. ( gm)	2-4 mm		
4. ( gm)	4-10 mm		
5. ( gm)	> 1 cm		
6. ( gm)	Reserve		

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS		PETROGRAPHY	
1. $I_s/FeO$	47.0 submature	(McKay et al., 1971)	(63 -125 $\mu m$ )
2. Agglutinates			
GRAIN SIZE PARAMETERS		Components	%
1. $M_z$	80 $\mu m$	Agglutinates	45
2. $M_d$		Pyroxenes	23
		Olivine	4
		Feldspar	7
		Glass	22

MAJOR ELEMENTS		TRACE ELEMENTS			
(Cuttitta et al., 1971)		(Haskin et al., 1971)			
	%		ppm		ppm
$SiO_2$	45.7	Sc		La	34.9±0.5
$TiO_2$	2.78	V		Ce	86.3±103
$Al_2O_3$	13.0	Co		Nd	57.0±0.9
$Cr_2O_3$	0.42	Ni		Sm	18.1±0.3
FeO	16.4	Ba		Eu	1.79±0.04
MnO	0.23	Sr		Tb	3.7±0.1
MgO	10.5	Hf		Dy	24.3±3
CaO	10.4	Ta		Ho	4.90±0.05
$Na_2O$	0.48	Th		Tm	
$K_2O$	0.23	U		Yb	12.9±0.4
$P_2O_5$	0.32			Lu	1.9±0.03
S					

**SOIL: 14003 (< 1 mm fraction)**

LOCATION COMMENTS: Collected near the LM, located about 100 m WNW of North Triplet Crater.

GENERIC SUBSAMPLES	
14003 (47.9 gm)	< 1 mm
14002 (42.1 gm)	1-2 mm
14001(31.8 gm)	2-4 mm
14004(33.0 gm)	4-10 mm
14006 to 14012 (23.03 gm)	> 1 cm
( gm)	Reserve

\* 14080 = 1.94 gm; 14081 = 0.84 gm  
14298 = 116.7 gm.

MISCELLANEOUS	
*Collected mass:	1077.83 gm
Color:	
Bag no.:	Contingency sample bag
Container:	Teflon bag within beta-cloth bag. Returned in air. Processed in N <sub>2</sub> environment.

\* Parent 14005

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	66.0, mature
2. Agglutinates	60

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	129 μm (<1 cm): 99 μm (< 1 mm)
2. M <sub>d</sub>	139 μm

PETROGRAPHY	(90-150 μm) (McKay et al., 1972)
Components	%
Agglutinates	60.3
Breccia	
Metamorphosed	20.5
Vitric	3.0
Pale Green	-
Glass Fragment	
Brown	4.3
Colorless	3.0
Glass Droplets	
Brown	0.3
Colorless	0.3
Ropy Glasses	1.0
Clinopyroxene	2.3
Orthopyroxene	1.3
Plagioclase	2.3
Basalt	1.3
<b>Total Number Grains</b>	<b>300</b>

<b>MAJOR ELEMENTS</b>	
(Rose et al., 1972)	
	<b>%</b>
SiO <sub>2</sub>	48.08
TiO <sub>2</sub>	1.77
Al <sub>2</sub> O <sub>3</sub>	17.59
Cr <sub>2</sub> O <sub>3</sub>	0.26
FeO	10.45
MnO	0.14
MgO	9.27
CaO	11.12
Na <sub>2</sub> O	0.65
K <sub>2</sub> O	0.54
P <sub>2</sub> O <sub>5</sub>	0.58
S	

<b>TRACE ELEMENTS</b>			
(Rose et al., 1972)			
	<b>ppm</b>		<b>ppm</b>
Sc	27	La	75
V	58	Ce	
Co	308	Nd	
Ni	430	Sm	
Ba	1000	Eu	
Sr	135	Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U	-	Yb	27
		Lu	

**SOIL: 14141 (<1 mm fraction)**

LOCATION COMMENTS: Station C, near rim of Cone Crater. Surface sample.

GENERIC SUBSAMPLES	
1. 14141(28.5 gm)	< 1 mm
2. 14142(5.35 gm)	1-2 mm
3. 14143(6.73 gm)	2-4 mm
4. 14140(7.43gm)	4-10 mm
5. ( gm)	> 1 cm
6. ( gm)	Reserve

MISCELLANEOUS	
<b>*Collected mass:</b>	56.25 gm
<b>Color:</b>	Dark Gray
<b>Bag no.:</b>	9-N
<b>Container:</b>	Teflon Bag; in vacuum container (ALSRC). Processed in N <sub>2</sub> atmosphere.

\*Parent 14404

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	5.7 immature
2. Agglutinates	5

PETROGRAPHY	(90-150 μm)
(McKay et al., 1972)	
<b>Components</b>	<b>%</b>
Agglutinates	5.2
Breccias	
Recrystallized	49.5
Vitric	7.8
Angular Glass	
Brown	7.6
Colorless	2.6
Pale Green	-
Glass Droplets	
Brown	2.0
Colorless	0.2
Pale Green	-
Ropy Glasses	-
Clinopyroxene	8.0
Orthopyroxene	3.8
Plagioclase	7.6
Olivine	0.4
Opaques	0.4
Basalt	4.2
Anorthosite	1.2
Tachylite	7.0
<b>Total Number Grains</b>	<b>500</b>

MAJOR ELEMENTS		TRACE ELEMENTS			
(Lindstrom et al., 1972)		(Lindstrom et al., 1972)			
	%		ppm		ppm
SiO <sub>2</sub>		Sc	21.5	La	71.4
TiO <sub>2</sub>	0.98 *	V	-	Ce	200
Al <sub>2</sub> O <sub>3</sub>	8.75 *	Co	31.0	Nd	104
Cr <sub>2</sub> O <sub>3</sub>		Ni		Sm	34.7
FeO	7.9 *	Ba	900	Eu	2.82
MnO		Sr		Tb	7.4
MgO		Hf	25.0	Dy	
CaO		Ta	5.7	Ho	
Na <sub>2</sub> O		Th	15.3	Tm	
K <sub>2</sub> O		U		Yb	23.8
P <sub>2</sub> O <sub>5</sub>				Lu	3.35
S					
* Multiply by appropriate conversion to convert to oxide					

**SOIL: 14148 (<1 mm fraction)**

LOCATION COMMENTS: Station G, 30 m northeast of North Triplet Crater. Trench surface sample.

GENERIC SUBSAMPLES		MISCELLANEOUS	
14148(71.65 gm)	< 1 mm	*Collected mass:	85.59 gm
14146(2.82 gm)	1-2 mm -14412	Color:	
14147(1.67 gm)	2-4 mm	Bag no.:	19-N
14145(0.92 gm)	4-10 mm	Container:	Teflon bag; vacuum container (ALSRC). Processed in N <sub>2</sub> atmosphere.
( gm)	> 1 cm		
( gm)	Reserve		

\*Parent of subsamples is 14412

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS		PETROGRAPHY (90-150 µm) (McKay et al., 1972)	
1. I <sub>s</sub> /FeO	74.0, mature	Components	%
2. Agglutinates	50	Agglutinates	50.2
		Breccias	
		Recrystallized	24.2
		Vitric	4.6
		Angular Glass	
		Brown	6.0
		Colorless	2.4
		Pale Green	0.8
		Glass Droplets	
		Brown	1.8
		Colorless	-
		Pale Green	0.2
		Ropy Glasses	0.2
		Clinopyroxene	1.8
		Orthopyroxene	1.4
		Plagioclase	3.0
		Olivine	0.8
		Opakes	0.4
		Anorthosite	-
		Tachylite	-
		Total Number	
		Grains	500

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	77 µm (<1 cm): 60 µm (< 1 mm)
2. M <sub>d</sub>	62 µm

<b>MAJOR ELEMENTS</b>	
(Philpotts et al., 1972)	
	<b>%</b>
SiO <sub>2</sub>	48.5
TiO <sub>2</sub>	1.71
Al <sub>2</sub> O <sub>3</sub>	17.38
Cr <sub>2</sub> O <sub>3</sub>	
FeO	10.55
MnO	0.13
MgO	9.66
CaO	10.40
Na <sub>2</sub> O	0.71
K <sub>2</sub> O	0.53
P <sub>2</sub> O <sub>5</sub>	0.50
S	0.19

<b>TRACE ELEMENTS</b>			
(Lindstrom et al., 1972)			
	<b>ppm</b>		<b>ppm</b>
Sc	21.0	La	64.3
V	44	Ce	176
Co	34.4	Nd	98
Ni		Sm	31.5
Ba		Eu	2.68
Sr		Tb	6.6
Hf	25.7	Dy	
Ta	4.7	Ho	
Th	13.8	Tm	
U	-	Yb	21.7
		Lu	3.18

**SOIL: 14149 (<1 mm fraction)**

LOCATION COMMENTS: Station G, 30 m northeast of North Triplet Crater. Trench surface samples (33 cm below surface).

GENERIC SUBSAMPLES	
14149(88.15 gm)	< 1 mm
14151(11.70 gm)	1-2 mm -14412
14152(11.39 gm)	2-4 mm
14150(11.08 gm)	4-10 mm
( gm)	> 1 cm
( gm)	Reserve

MISCELLANEOUS	
*Collected mass:	232.1 gm
Color:	
Bag no.:	20-N
Container:	Teflon bag; vacuum container (ALSRC). Processed in N <sub>2</sub> atmosphere.

\*Parent 14408 contains rock samples 14073 to 14079

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	53.0, mature
2. Agglutinates	26

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	230 μm (<1 cm): 92 μm (< 1 mm)
2. M <sub>d</sub>	583 μm

PETROGRAPHY	(90-150 μm) (McKay et al., 1972)
Components	%
Agglutinates	26.4
Breccias	
Recrystallized	27.0
Vitric	8.2
Angular Glass	
Brown	1.6
Colorless	2.0
Pale Green	-
Glass Droplets	
Brown	1.6
Colorless	2.0
Pale Green	0.4
Ropy Glasses	-
Clinopyroxene	7.4
Orthopyroxene	3.6
Plagioclase	7.8
Olivine	-
Opakes	0.4
Basalt	0.4
Anorthosite	-
Tachylite	-
<b>Total Number Grains</b>	<b>500</b>



<b>MAJOR ELEMENTS</b>	
(Philpotts et al., 1972)	
	<b>%</b>
SiO <sub>2</sub>	48.0
TiO <sub>2</sub>	1.61
Al <sub>2</sub> O <sub>3</sub>	17.45
Cr <sub>2</sub> O <sub>3</sub>	0.19
FeO	9.95
MnO	0.14
MgO	9.54
CaO	10.54
Na <sub>2</sub> O	0.75
K <sub>2</sub> O	0.58
P <sub>2</sub> O <sub>5</sub>	0.48
S	

<b>TRACE ELEMENTS</b>			
(Lindstrom et al., 1972)			
	<b>ppm</b>		<b>ppm</b>
Sc	21.5	La	65.1
V	-	Ce	177
Co	40.0	Nd	100
Ni		Sm	31.6
Ba		Eu	2.76
Sr		Tb	6.7
Hf	23.0	Dy	
Ta	4.8	Ho	
Th	13.6	Tm	
U	-	Yb	21.7
		Lu	3.08

**SOIL: 14156 (<1 mm fraction)**

LOCATION COMMENTS: Station G, 30 m northeast of North Triplet Crater. From the middle of a 33 cm deep trench.

GENERIC SUBSAMPLES	
14156(138.0 gm)	< 1 mm
14154(5.49 gm)	1-2 mm -14412
14153(3.91 gm)	2-4 mm
14155(3.69 gm)	4-10 mm
* ( gm)	> 1 cm
14409(0.50 gm)	Reserve

\* 14080 = 1.94 gm; 14081 = 0.84 gm

MISCELLANEOUS	
*Collected mass:	162.31 gm
Color:	
Bag no.:	21-N
Container:	Teflon bag; vacuum container (ALSRC). Processed in N <sub>2</sub> atmosphere.

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	68.0, mature
2. Agglutinates	48

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	70 μm (<1 cm): 64 μm (< 1 mm)
2. M <sub>d</sub>	76 μm

PETROGRAPHY	(90-150 μm) (McKay et al., 1972)
Components	%
Agglutinates	47.7
Breccias	
Recrystallized	23.4
Vitric	-
Angular Glass	
Brown	7.8
Colorless	3.2
Pale Green	0.9
Glass Droplets	
Brown	3.2
Colorless	0.4
Pale Green	1.5
Ropy Glasses	0.2
Clinopyroxene	4.3
Orthopyroxene	1.3
Plagioclase	5.4
Olivine	0.2
Opaques	0.4
Basalt	-
Anorthosite	-
Tachylite	-
<b>Total Number Grains</b>	<b>500</b>

<b>MAJOR ELEMENTS</b>	
(Philpotts et al., 1972)	
	<b>%</b>
SiO <sub>2</sub>	48.1
TiO <sub>2</sub>	1.71
Al <sub>2</sub> O <sub>3</sub>	17.15
Cr <sub>2</sub> O <sub>3</sub>	0.19
FeO	10.55
MnO	0.14
MgO	9.55
CaO	10.16
Na <sub>2</sub> O	0.72
K <sub>2</sub> O	0.53
P <sub>2</sub> O <sub>5</sub>	0.49
S	

<b>TRACE ELEMENTS</b>			
(Lindstrom et al., 1972)			
	<b>ppm</b>		<b>ppm</b>
Sc	20.9	La	65.1
V	36	Ce	175
Co	36.2	Nd	-
Ni		Sm	314
Ba		Eu	2.66
Sr		Tb	6.6
Hf	23.2	Dy	
Ta	4.8	Ho	
Th	13.8	Tm	
U	-	Yb	21.5
		Lu	3.05

**SOIL: 14163 (< 1 mm fraction)**

LOCATION COMMENTS: Collected near LM at end of first EVA. Surface sample, with scoop depths of several cm.

GENERIC SUBSAMPLES	
**14163(4444.0 gm)	< 1 mm
14162(288.7 gm)	1-2 mm
14161(197.1 gm)	2-4 mm
14160(196.5 gm)	4-10 mm
( gm)	> 1 cm
( gm)	Reserve

MISCELLANEOUS	
*Collected mass:	7776.3 gm
Color:	
Bag no.:	Bulk sample (weight 2, No. 1028)
Container:	Teflon bag; vacuum container (D-ALSRC). Processed in N <sub>2</sub> atmosphere.

\* This sample is being investigated for weight discrepancies.

\*\*Sample 14422 (<1mm) was also generated from 14163.

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	57.0, submature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	76 μm (<1 cm): 56 μm (< 1 mm)
2. M <sub>d</sub>	65 μm

PETROGRAPHY	(90-150 μm) (Simon et al., 1981)
<b>Components</b>	%
Lithic Fragments	
Mare Component	
Mare Basalt	2.2
Highland Components	
ANT	
LMB	2.9
Feldsp.	0.3
Basalt	0.6
RNB/POIK	10.9
Fused Soil Components	
DMB	19.3
Agglutinate	45.7
Mineral Frag.	
Mafic	2.6
Plagioclase	5.1
Opaque	
Glass Fragments	
Orange/black	-
Yellow/green	2.9
Brown	-
Clear	1.3
Miscellaneous	
Devitrified glass	6.1
Others	-
<b>Total</b>	<b>99.9</b>
<b>No. of points</b>	<b>311</b>

<b>MAJOR ELEMENTS</b>	
(Rose et al., 1972)	
	<b>%</b>
SiO <sub>2</sub>	47.97
TiO <sub>2</sub>	1.77
Al <sub>2</sub> O <sub>3</sub>	17.57
Cr <sub>2</sub> O <sub>3</sub>	0.26
FeO	10.41
MnO	0.14
MgO	9.18
CaO	11.15
Na <sub>2</sub> O	0.68
K <sub>2</sub> O	0.58
P <sub>2</sub> O <sub>5</sub>	0.52
S	

<b>TRACE ELEMENTS</b>			
(Rose et al., 1972)			
	<b>ppm</b>		<b>ppm</b>
Sc	25	La	79
V	57	Ce	
Co	36	Nd	
Ni	400	Sm	
Ba	1100	Eu	
Sr	140	Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	28
		Lu	

**SOIL: 14240**

LOCATION COMMENTS: Station G, 30 m northeast of North Triplet Crater. Filled with soil from the trench bottom.

GENERIC SUBSAMPLES	
1. ( gm)	< 1 mm
2. ( gm)	1-2 mm
3. ( gm)	2-4 mm
4. ( gm)	4-10 mm
5. ( gm)	> 1 cm
6. 14240(168.0 gm)	Reserve
(not sieved)	

MISCELLANEOUS	
Collected mass:	168.0 gm
Color:	
Bag no.:	SESC (2060)
Container:	Special environment sample container (SESC). Retained in vacuum container (ALSRC).

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. $I_s/\text{FeO}$	46.0 submature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. $M_z$	
2. $M_d$	

MAJOR ELEMENTS	
(Rose et al., 1972)	
	%
$\text{SiO}_2$	47.77
$\text{TiO}_2$	1.67
$\text{Al}_2\text{O}_3$	17.99
$\text{Cr}_2\text{O}_3$	0.23
FeO	10.02
MnO	0.14
MgO	9.47
CaO	11.25
$\text{Na}_2\text{O}$	0.70
$\text{K}_2\text{O}$	0.54
$\text{P}_2\text{O}_5$	0.55
S	

TRACE ELEMENTS			
(Rose et al., 1972)			
	ppm		ppm
Sc	28	La	67
V	52	Ce	
Co	33	Nd	
Ni	320	Sm	
Ba	1170	Eu	
Sr	390	Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	23
		Lu	

**SOIL: 14259 (< 1 mm fraction)**

LOCATION COMMENTS: Location vague. Collected at end of EVA-1, somewhere about 100 to 130 m west of the LM (between the LM and Doublet Crater). Surface sample.

GENERIC SUBSAMPLES	
* ( gm)	< 1 mm
14258(64.33 gm)	1-2 mm
14257(13.17 gm)	2-4 mm
14256(13.17 gm)	4-10 mm
( gm)	> 1 cm
( gm)	Reserve

\* 14080 = 1.94 gm; 14081 = 0.84 gm  
14298 = 116.7 gm.

MISCELLANEOUS	
*Collected mass:	2576.78 gm
Color:	
Bag no.:	Comprehensive sample bag (1007)
Container:	Teflon bag; vacuum container (ALSRC). Processed in N <sub>2</sub> atmosphere.

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	85.0, mature
2. Agglutinates	52

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	69 μm (<1 cm): 63 μm (< 1 mm)
2. M <sub>d</sub>	64 μm

PETROGRAPHY	(90-150 μm) (McKay et al.,1972)
Components	%
Agglutinates	51.7
Breccias	
Recrystallized	20.3
Vitric	5.0
Angular Glass	
Brown	6.7
Colorless	3.3
Pale Green	-
Glass Droplets	
Brown	1.3
Colorless	0.6
Pale Green	0.3
Ropy Glasses	0.6
Clinopyroxene	3.7
Orthopyroxene	0.6
Plagioclase	4.7
Olivine	-
Opakes	-
Basalt	1.0
Anorthosite	-
Tachylite	-
Total Number Grains	300

<b>MAJOR ELEMENTS</b>	
(Rose et al., 1972)	
	<b>%</b>
SiO <sub>2</sub>	48.16
TiO <sub>2</sub>	1.73
Al <sub>2</sub> O <sub>3</sub>	17.60
Cr <sub>2</sub> O <sub>3</sub>	0.26
FeO	10.41
MnO	0.14
MgO	9.26
CaO	11.25
Na <sub>2</sub> O	0.61
K <sub>2</sub> O	0.51
P <sub>2</sub> O <sub>5</sub>	0.53
S	

<b>TRACE ELEMENTS</b>			
(Rose et al., 1972)			
	<b>ppm</b>		<b>ppm</b>
Sc	28	La	77
V	62	Ce	
Co	38	Nd	
Ni	440	Sm	
Ba	1100	Eu	
Sr	150	Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U	-	Yb	30
		Lu	



**SOIL: 14260 (<1 mm fraction)**

LOCATION COMMENTS: Location vague. Somewhere between the LM and a point about 100 m west. Surface sample collected along with 25 rocks and "chips."

GENERIC SUBSAMPLES	
1. 14260(282.5 gm)	< 1 mm
2. 14262(9.1 gm)	1-2 mm
3. 14261(8.2 gm)	2-4 mm
4. 14263(16.2 gm)	4-10 mm
5. ( gm)	> 1 cm
6. ( gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	316.0 gm
<b>Color:</b>	
<b>Bag no.:</b>	Comprehensive sample bag (1039)
<b>Container:</b>	Teflon Bag; in vacuum container (ALSRC). Processed in N <sub>2</sub> environment.

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	72.0 mature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	117 μm (<1 cm); 86 μm (<1 mm)
2. M <sub>n</sub>	95 μm

PETROGRAPHY		(<37 μm)
(Finkelman, 1973)		
Components		%
Low-Al Glass		32.0
High-AL Glass		6.0
Pyroxene		29.0
Plagioclase		15.5
Olivine		5.5
K-Rich Phases		2.5
Fe-Metal		0.5
Ilmenite		4.0
Misc.		5.0
<b>No. of Grains Counted</b>		<b>262</b>

MAJOR ELEMENTS	
(Rhodes et al., 1976)	
	%
SiO <sub>2</sub>	47.11
TiO <sub>2</sub>	1.87
Al <sub>2</sub> O <sub>3</sub>	16.97
Cr <sub>2</sub> O <sub>3</sub>	
FeO	11.08
MnO	0.17
MgO	9.42
CaO	10.95
Na <sub>2</sub> O	0.68
K <sub>2</sub> O	0.49
P <sub>2</sub> O <sub>5</sub>	0.47
S	0.12

TRACE ELEMENTS			
(Rhodes et al., 1976)			
	ppm		ppm
Sc	22.8	La	66.5
V		Ce	172
Co	38.1	Nd	
Ni	450	Sm	28.9
Ba		Eu	2.40
Sr		Tb	8.3
Hf	23.8	Dy	
Ta	3.8	Ho	
Th	12.1	Tm	
U		Yb	21.7
Cr	1640	Lu	3.06

**SOIL: 15012**

LOCATION COMMENTS: Station 6, Appennine Front. From the bottom of a trench on the rim of a subdued 10 m diameter crater.

GENERIC SUBSAMPLES		MISCELLANEOUS	
		<b>Collected mass:</b>	312.2 gm
1. ( gm)	< 1 mm	<b>Color:</b>	
2. ( gm)	1-2 mm	<b>Bag no.:</b>	SESC 1
3. ( gm)	2-4 mm	<b>Container:</b>	Special environment sample container (SESC) vacuum container. Returned in vacuum container (ALSRC 2).
4. ( gm)	4-10 mm		
5. ( gm)	> 1 cm		
6. 15012(312.2 gm)	Reserve		

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. $I_s/\text{FeO}$	66.0 mature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. $M_z$	
2. $M_d$	

MAJOR ELEMENTS	
(Christian et al., 1976)	
	%
$\text{SiO}_2$	46.77
$\text{TiO}_2$	1.46
$\text{Al}_2\text{O}_3$	16.75
$\text{Cr}_2\text{O}_3$	0.30
FeO	12.40
MnO	0.17
MgO	10.35
CaO	10.95
$\text{Na}_2\text{O}$	0.45
$\text{K}_2\text{O}$	0.21
$\text{P}_2\text{O}_5$	0.22
S	

TRACE ELEMENTS			
(Laul et al., 1972)			
	ppm		ppm
Sc	28	La	
V	114	Ce	
Co	40	Nd	
Ni		Sm	
Ba		Eu	
Sr		Tb	
Hf	9.9	Dy	
Ta		Ho	
Th	4.9	Tm	
U		Yb	
		Lu	

**SOIL: 15013**

LOCATION COMMENTS: Collected at Station 8, ALSEP site, from the bottom of a 35 cm deep trench.

GENERIC SUBSAMPLES	
1. ( gm)	< 1 mm
2. ( gm)	1-2 mm
3. ( gm)	2-4 mm
4. ( gm)	4-10 mm
5. ( gm)	> 1 cm
6. 15013 (296.2 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	296.2 gm
<b>Color:</b>	Dark gray (field description)
<b>Bag no.:</b>	SESC (no number)
<b>Container:</b>	Vacuum container (special environment sample container) returned in sample collection bag 7 (beta-cloth). Processed in vacuum.

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. $I_s/\text{FeO}$	77.0 mature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. $M_z$	
2. $M_d$	

MAJOR ELEMENTS	
(Christian et al., 1976)	
	%
$\text{SiO}_2$	46.94
$\text{TiO}_2$	1.72
$\text{Al}_2\text{O}_3$	14.46
$\text{Cr}_2\text{O}_3$	0.35
$\text{FeO}$	14.98
$\text{MnO}$	0.21
$\text{MgO}$	10.35
$\text{CaO}$	10.38
$\text{Na}_2\text{O}$	0.44
$\text{K}_2\text{O}$	0.22
$\text{P}_2\text{O}_5$	0.22
S	

TRACE ELEMENTS			
	ppm		ppm
Sc		La	
V		Ce	
Co		Nd	
Ni		Sm	
Ba		Eu	
Sr		Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	
		Lu	

**SOIL: 15014**

LOCATION COMMENTS: "Contaminated" sample, collected under the bell of the LM descent engine. Top soil layer (uppermost 1 or 2 cm).

GENERIC SUBSAMPLES	
1. ( gm)	< 1 mm
2. ( gm)	1-2 mm
3. ( gm)	2-4 mm
4. ( gm)	4-10 mm
5. ( gm)	> 1 cm
6. 15014(333.2 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	333.2 gm
<b>Color:</b>	
<b>Bag no.:</b>	SESC 2
<b>Container:</b>	Vacuum container. Returned in vacuum box (ALSRC 2). Processed in N <sub>2</sub> environment.

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	
2. M <sub>d</sub>	

MAJOR ELEMENTS	
	%
SiO <sub>2</sub>	
TiO <sub>2</sub>	
Al <sub>2</sub> O <sub>3</sub>	
Cr <sub>2</sub> O <sub>3</sub>	
FeO	
MnO	
MgO	
CaO	
Na <sub>2</sub> O	
K <sub>2</sub> O	
P <sub>2</sub> O <sub>5</sub>	
S	

TRACE ELEMENTS			
	ppm		ppm
Sc		La	
V		Ce	
Co		Nd	
Ni		Sm	
Ba		Eu	
Sr		Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	
		Lu	

**SOIL: 15020**

LOCATION COMMENTS: Collected 25 m west of the LM. Surface sample.

GENERIC SUBSAMPLES		
1.	15021(500.2 gm)	< 1 mm
2.	15022(10.0 gm)	1-2 mm
3.	15023(5.0 gm)	2-4 mm
4.	15024(3.6 gm)	4-10 mm
5.	*(78.4 gm)	> 1 cm
6.	15020(88.7 gm)	Reserve

\* Two breccia samples (15025 and 15026) not included in total mass of soil.

MISCELLANEOUS	
<b>Collected mass:</b>	607.5 gm (<1 cm fract.)
<b>Color:</b>	
<b>Bag no.:</b>	Contingency bag
<b>Container:</b>	Teflon bag. Returned in sample collection bag (SCB 4) in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	70.0 mature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	
2. M <sub>d</sub>	82.7 μm

PETROGRAPHY		(90-125 μm) (Basu et al., 1981)	
Components	%	Components	%
Monomineralic		Breccias	14.9
Plagioclase	15.0	Vitric	(12.3)
Pyroxene	3.6	Dark Matrix	11.7
Olivine	9.1	Light Matrix	0.6
Opakes	2.3	Crystalline	(2.6)
Oxides		Poikilitic	
Metal, Sulph.		Melt Matrix	1.0
Silica Phase		Other	1.6
Crystalline		Agglutinate	55.5
Lithics	8.4	Glass	6.1
ANT Suite	(0.3)	Ropy/Clast-Laden	2.3
Anorthosite	0.3	Quench- Crystals	(0.3)
Gabbroic		(Vitrophyres)	
Mare Basalt	(4.5)	Green Glass	0.3
Oliv.-Bearing		Other	
Oliv.-Free	(2.9)	Devitrified (Cryptocry.)	0.3
Microgabbroic	0.3	Crystal/ Clast-Free	(3.2)
Porphyritic, Etc.	2.3	Green	1.0
Ophitic, Etc.	0.3	Yellow	1.3
Intersertal/ Granular		Gray, Colorless	0.6
Other	1.6	Brown, Black, Etc.	0.3
Non-Mare Basalt	(3.6)	Miscellaneous	
Feldspathic			
KREEPy	3.3		
Plag-Phyc	0.3		
Indeterminate			
<b>Total Number Particles</b>			<b>308</b>

<b>MAJOR ELEMENTS</b>	
(Apollo 15 P.E.T., 1972)	
	<b>%</b>
SiO <sub>2</sub>	46.56
TiO <sub>2</sub>	1.75
Al <sub>2</sub> O <sub>3</sub>	13.73
Cr <sub>2</sub> O <sub>3</sub>	
FeO	15.21
MnO	0.20
MgO	10.37
CaO	10.54
Na <sub>2</sub> O	0.41
K <sub>2</sub> O	0.20
P <sub>2</sub> O <sub>5</sub>	0.18
S	0.06

<b>TRACE ELEMENTS</b>			
(Laul et al., 1972)			
	<b>ppm</b>		<b>ppm</b>
Sc	28	La	26
V	114	Ce	73
Co	40	Nd	
Ni		Sm	12.9
Ba	320	Eu	1.4
Sr		Tb	2.3
Hf	9.9	Dy	
Ta	1.2	Ho	
Th	4.9	Tm	
U	1.5	Yb	9.5
Zr	350	Lu	1.3

**SOIL: 15030**

LOCATION COMMENTS: Station 8 (ALSEP site). From the bottom of a 30 m deep trench.

GENERIC SUBSAMPLES	
1. 15031(207.8 gm)	< 1 mm
2. 15032(7.0 gm)	1-2 mm
3. 15033(6.6 gm)	2-4 mm
4. 15034(7.0 gm)	4-10 mm
5. ( gm)	> 1 cm
6. 15030(75.8 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	303.7 gm
<b>Color:</b>	Dark gray
<b>Bag no.:</b>	Doc. bag 252
<b>Container:</b>	Teflon bag (documented bag), in sample collection bag 5 (beta-cloth). Returned in ALSRC (vacuum container). Did not seal properly so was exposed to air. Processed in N <sub>2</sub> environment.

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	68.0 mature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	
2. M <sub>d</sub>	69.3 μm

PETROGRAPHY		(90-125 μm) (Basu et al., 1981)	
Components	%	Components	%
Monomineralic	23.0	Breccias	15.4
Plagioclase	6.1	Vitric	(13.8)
Pyroxene	13.1	Dark Matrix	12.5
Olivine	2.9	Light Matrix	1.3
Opakes	(0.6)	Crystalline	(1.6)
Oxides	0.6	Poikilitic	0.6
Metal, Sulph.		Melt Matrix	1.0
Silica Phase		Other	1.6
Crystalline		Agglutinate	42.3
Lithics	10.9	Glass	8.0
ANT Suite	(0.6)	Ropy/Clast-Laden	2.9
Anorthosite	0.3	Quench- Crystals	(0.3)
Gabbroic	0.3	(Vitrophyres)	
Mare Basalt	(6.7)	Green Glass	
Oliv.-Bearing	0.6	Other	0.3
Oliv.-Free	(4.2)	Devitrified	2.2
Microgabbroic	0.3	(Cryptocry.)	
Porphyritic, Etc.	2.9	Crystal/ Clast-Free	(2.6)
Ophitic, Etc.	1.0	Green	1.0
Intersertal/ Granular	0.3	Yellow	1.0
Other	1.9	Gray, Colorless	1.3
Non-Mare Basalt	(3.6)	Brown, Black, Etc.	0.3
Feldspathic		Miscellaneous	0.3
KREEPy	2.6		
Plag-Phyic			
Indeterminate	1.0		
<b>Total Number Particles</b>			<b>312</b>

<b>MAJOR ELEMENTS</b>	
(Laul et al., 1973)	
	<b>%</b>
SiO <sub>2</sub>	
TiO <sub>2</sub>	1.70
Al <sub>2</sub> O <sub>3</sub>	14.1
Cr <sub>2</sub> O <sub>3</sub>	0.39
FeO	
MnO	0.19
MgO	12.0
CaO	10.20
Na <sub>2</sub> O	0.45
K <sub>2</sub> O	0.23
P <sub>2</sub> O <sub>5</sub>	
S	

<b>TRACE ELEMENTS</b>			
(Laul & Schmitt, 1973)			
	<b>ppm</b>		<b>ppm</b>
Sc	28	La	27
V	120	Ce	75
Co	42	Nd	
Ni		Sm	12.9
Ba	270	Eu	1.3
Sr		Tb	2.4
Hf	9.5	Dy	-
Ta	1.1	Ho	
Th	4.8	Tm	
U	1.6	Yb	8.7
Zr	320	Lu	1.3



**SOIL: 15040**

LOCATION COMMENTS: Station 8 (ALSEP site). From the top (near surface) of the trench. Trench is located 12 m southwest of a 5 m diameter crater.

GENERIC SUBSAMPLES	
1. 15041(269.6 gm)	< 1 mm
2. 15042(5.1 gm)	1-2 mm
3. 15043(2.8 gm)	2-4 mm
4. 15044(1.5 gm)	4-10 mm
5. ( gm)	> 1 cm
6. 15040(113.4 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	392.4 gm
<b>Color:</b>	Dark gray
<b>Bag no.:</b>	Doc. bag 253
<b>Container:</b>	Teflon bag in beta-cloth bag 6. Returned in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	94.0 mature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	
2. M <sub>d</sub>	65.1 μm

PETROGRAPHY:		(90-125 μm) (Basu et al., 1981)	
Components	%	Components	%
Monomineralic	28.1	Breccias	13.4
Plagioclase	4.6	Vitric	(11.4)
Pyroxene	18.9	Dark Matrix	10.7
Olivine	4.6	Light Matrix	0.7
Opakes		Crystalline	(2.0)
Oxides		Poikilitic	0.3
Metal, Sulph.		Melt Matrix	0.7
Silica Phase		Other	1.0
Crystalline		Agglutinate	40.1
Lithics	10.9	Glass	7.8
ANT Suite	(0.3)	Ropy/Clast-Laden	2.0
Anorthosite	0.3	Quench- Crystals	(0.3)
Gabbroic		(Vitrophyres)	
Mare Basalt	(7.3)	Green Glass	
Oliv.-Bearing	2.3	Other	0.3
Oliv.-Free	(4.0)	Devitrified	1.3
Microgabbroic	0.3	(Cryptocry.)	
Porphyritic, Etc.	2.0	Crystal/ Clast-Free	(4.2)
Ophitic, Etc.	2.0	Green	0.3
Intersertal/ Granular		Yellow	2.3
Other	1.0	Gray, Colorless	0.3
Non-Mare Basalt	(3.6)	Brown, Black, Etc.	1.3
Feldspathic		Miscellaneous	
KREEPy	2.0		
Plag-Phyic			
Indeterminate	1.3		
<b>Total Number Particles</b>			<b>307</b>

<b>MAJOR ELEMENTS</b>	
(Laul & Schmitt, 1973)	
	<b>%</b>
SiO <sub>2</sub>	
TiO <sub>2</sub>	1.70
Al <sub>2</sub> O <sub>3</sub>	14.20
Cr <sub>2</sub> O <sub>3</sub>	0.36
FeO	14.30
MnO	0.187
MgO	11.0
CaO	10.60
Na <sub>2</sub> O	0.43
K <sub>2</sub> O	0.21
P <sub>2</sub> O <sub>5</sub>	
S	

<b>TRACE ELEMENTS</b>			
(Laul & Schmitt, 1973)			
	<b>ppm</b>		<b>ppm</b>
Sc	26	La	26
V	170	Ce	68
Co	41	Nd	
Ni		Sm	12.7
Ba	250	Eu	1.3
Sr		Tb	2.2
Hf	9.1	Dy	-
Ta	1.1	Ho	
Th	4.8	Tm	
U	1.6	Yb	8.1
Zr	350	Lu	1.2

**SOIL: 15070**

LOCATION COMMENTS: Station 1, east rim of Elbow Crater. Part of a radial surface sample. Collected 25 m east of the crater rim.

GENERIC SUBSAMPLES	
1. 15071(100.7 gm)	< 1 mm
2. 15072(3.0 gm)	1-2 mm
3. 15073(1.4 gm)	2-4 mm
4. 15074(1.3 gm)	4-10 mm
5. *(1209.8 gm)	> 1 cm
6. 15070(51.3 gm)	Reserve

\*Two large basalt samples (15075 and 15076) returned in same bag as the soil. Not included in total mass of soil.

MISCELLANEOUS	
<b>Collected mass:</b>	157.7 gm
<b>Color:</b>	Light gray (field description)
<b>Bag no.:</b>	Doc. bag 253
<b>Container:</b>	Teflon bag; returned in vacuum (ALSRC No. 1). Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	52.0 submature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	
2. M <sub>d</sub>	100 μm

PETROGRAPHY:		(90-125 μm) (Basu et al., 1981)	
Components	%	Components	%
Monomineralic	39.5	Breccias	8.9
Plagioclase	9.3	Vitric	(8.3)
Pyroxene	23.7	Dark Matrix	8.0
Olivine	4.2	Light Matrix	0.3
Opakes	(1.3)	Crystalline	(0.6)
Oxides	1.3	Poikilitic	0.3
Metal, Sulph.		Melt Matrix	
Silica Phase	1.0	Other	0.3
Crystalline		Agglutinate	34.6
Lithics	10.9	Glass	6.1
ANT Suite	(0.6)	Ropy/Clast-Laden	1.6
Anorthosite	0.6	Quench- Crystals	(0.3)
Gabbroic		(Vitrophyres)	
Mare Basalt	(6.8)	Green Glass	
Oliv.-Bearing	1.3	Other	0.3
Oliv.-Free	(4.2)	Devitrified (Cryptocry.)	1.0
Microgabbroic	1.0		
Porphyritic, Etc.	2.2	Crystal/ Clast-Free	(3.2)
Ophitic, Etc.	1.0	Green	0.6
Intersertal/ Granular		Yellow	1.0
Other	1.3	Gray, Colorless	0.6
Non-Mare Basalt	(1.9)	Brown, Black, Etc.	1.0
Feldspathic		Miscellaneous	
KREEPy	1.9		
Plag-Phyic			
Indeterminate	1.6		
<b>Total Number Particles</b>			<b>312</b>

<b>MAJOR ELEMENTS</b>	
(Duncan et al., 1975)	
	<b>%</b>
SiO <sub>2</sub>	46.95
TiO <sub>2</sub>	1.60
Al <sub>2</sub> O <sub>3</sub>	12.70
Cr <sub>2</sub> O <sub>3</sub>	0.465
FeO	16.29
MnO	0.217
MgO	10.75
CaO	10.49
Na <sub>2</sub> O	0.33
K <sub>2</sub> O	0.092
P <sub>2</sub> O <sub>5</sub>	0.130
S	0.070

<b>TRACE ELEMENTS</b>			
(Morgan et al., 1972)			
	<b>ppm</b>		<b>ppm</b>
Sc		La	
V		Ce	
Co	46.1	Nd	
Ni	170	Sm	
Ba		Eu	
Sr		Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	
Zr		Lu	

**SOIL: 15080**

LOCATION COMMENTS: Station 1, Apennine Front (Elbow Crater). Surface sample, collected 65 m east of the crater rim.

GENERIC SUBSAMPLES		
1.	( gm)	< 1 mm
2.	( gm)	1-2 mm
3.	15083 (1.8 gm)	2-4 mm
4.	15084 (1.1 gm)	4-10 mm
5.*	(695.3 gm)	> 1 cm
6.	15080 (73.5 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	185.3 gm
<b>Color:</b>	
<b>Bag no.:</b>	Doc. bag 158
<b>Container:</b>	Teflon bag; returned in vacuum (ALSRC No. 1). Processed in N <sub>2</sub> .

\*Two basalts, two breccias. Not included in total mass of soil.

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS		
1.	I <sub>s</sub> /FeO	68.0 mature
2.	Agglutinates	

GRAIN SIZE PARAMETERS		
1.	M <sub>z</sub>	
2.	M <sub>d</sub>	

MAJOR ELEMENTS	
(Wanke et al., 1973)	
	%
SiO <sub>2</sub>	48.13
TiO <sub>2</sub>	1.501
Al <sub>2</sub> O <sub>3</sub>	13.85
Cr <sub>2</sub> O <sub>3</sub>	0.44
FeO	16.21
MnO	0.2
MgO	11.14
CaO	11.19
Na <sub>2</sub> O	0.36
K <sub>2</sub> O	0.15
P <sub>2</sub> O <sub>5</sub>	
S	

TRACE ELEMENTS			
(Duncan et al., 1975)			
	ppm		ppm
Sc		La	
V	116	Ce	
Co	46	Nd	
Ni	209	Sm	
Ba	185	Eu	
Sr	120	Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	
		Lu	

**SOIL: 15090**

LOCATION COMMENTS: Station 2, between St. George Crater and Hadley Rille. Surface soil—fillet (soil stacked against a boulder) uphill from boulder.

GENERIC SUBSAMPLES		
1.	15091 (162.9 gm)	< 1 mm
2.	15092 (2.7 gm)	1-2 mm
3.	15093 (0.6 gm)	2-4 mm
4.	(gm)	4-10 mm
5.	* (25.5 gm)	> 1 cm
6.	15090 (39.9 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	205.5 gm
<b>Color:</b>	
<b>Bag no.:</b>	Doc. bag 157
<b>Container:</b>	Teflon bag; returned in vacuum (ALSRC No. 1). Processed in N <sub>2</sub> .

\*One glass-coated breccia. Not included in total mass of soil.

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS		
1.	I <sub>g</sub> /FeO	74.0 mature
2.	Agglutinates	

GRAIN SIZE PARAMETERS		
1.	M <sub>z</sub>	51 μm (< 1 mm)
2.	M <sub>d</sub>	

PETROGRAPHY		(90-125 μm) (Basu et al., 1981)	
Components	%	Components	%
Monomineralic	22.1	Breccias	10.7
Plagioclase	12.0	Vitric	(9.8)
Pyroxene	8.5	Dark Matrix	9.2
Olivine	1.3	Light Matrix	0.6
Opakes	(0.3)	Crystalline	(0.9)
Oxides	0.3	Poikilitic	0.3
Metal, Sulph.		Melt Matrix	
Silica Phase		Other	0.6
Crystalline		Agglutinate	52.8
Lithics	7.8	Glass	5.9
ANT Suite	(3.5)	Ropy/Clast-Laden	1.3
Anorthosite	3.2	Quench- Crystals	(0.3)
Gabbroic	0.3	(Vitrophyres)	
Mare Basalt	(2.4)	Green Glass	(0.3)
Oliv.-Bearing	0.3	Other	
Oliv.-Free	(1.8)	Devitrified (Cryptocry.)	0.9
Microgabbroic			
Porphyritic, Etc.	0.9	Crystal/ Clast-Free	(3.4)
Ophitic, Etc.	0.9	Green	2.2
Intersertal/ Granular		Yellow	0.6
Other		Gray, Colorless	0.6
Non-Mare Basalt	(0.3)	Brown, Black, Etc.	
Feldspathic		Miscellaneous	0.3
KREEPy	1.6		
Plag-Phyic			
Indeterminate	0.3		
<b>Total Number Particles</b>			<b>316</b>

<b>MAJOR ELEMENTS</b>	
(Carran et al., 1972)	
	<b>%</b>
SiO <sub>2</sub>	46.47
TiO <sub>2</sub>	1.31
Al <sub>2</sub> O <sub>3</sub>	17.47
Cr <sub>2</sub> O <sub>3</sub>	0.24
FeO	11.57
MnO	0.17
MgO	10.50
CaO	11.77
Na <sub>2</sub> O	0.41
K <sub>2</sub> O	0.18
P <sub>2</sub> O <sub>5</sub>	0.16
S	

<b>TRACE ELEMENTS</b>			
(Carran et al., 1972)			
	<b>ppm</b>		<b>ppm</b>
Sc	21	La	32
V	80	Ce	
Co	39	Nd	
Ni	365	Sm	
Ba		Eu	
Sr	155	Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	7.7
Zr		Lu	

**SOIL: 15100**

LOCATION COMMENTS: Station 2, St. George Crater. Collected between 2-5 m craters along with comprehensive (rake sample).

GENERIC SUBSAMPLES	
15101 (637.6 gm)	< 1 mm
15102 (12.2 gm)	1-2 mm
15103 (4.1 gm)	2-4 mm
15104 (1.5 gm)	4-10 mm
*15105 (5.6 gm)	> 1 cm
15100 (281.0 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	936.4 gm
<b>Color:</b>	Dark gray (field description)
<b>Bag no.:</b>	Doc. bag 187
<b>Container:</b>	Teflon bag; returned in vacuum (ALSC No. 1). Processed in N <sub>2</sub> .

\*Basalt. Not included in total mass of soil.

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	70.0, mature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	51 μm (<1 mm)
2. M <sub>d</sub>	whole sample = 51.7 μm

PETROGRAPHY (125-250 μm)	
(Heiken and McKay, 1972-unpublished)	
Components	%
Agglutinates	42
Microbreccias:	
Recrystallized	3
Vitric	4
Angular Glass	
Brown	7
Gray	2
Colorless Glass	-
Glass Droplets	
Green	8
Brown	-
Clinopyroxene	10
Orthopyroxene	2
Olivine	2
Plagioclase	12
Orthoclase	1
Basalt	
Equi.	2
Halocryst.	-
Ophitic	-
Anorthosite	4
Opaques	-
<b>Total No. Grains</b>	<b>121</b>



<b>MAJOR ELEMENTS</b>	
(Carron et al., 1972)	
	<b>%</b>
SiO <sub>2</sub>	46.29
TiO <sub>2</sub>	1.31
Al <sub>2</sub> O <sub>3</sub>	17.70
Cr <sub>2</sub> O <sub>3</sub>	0.22
FeO	11.53
MnO	0.16
MgO	10.55
CaO	11.54
Na <sub>2</sub> O	0.41
K <sub>2</sub> O	0.19
P <sub>2</sub> O <sub>5</sub>	0.16
S	

<b>TRACE ELEMENTS</b>			
(Cuttitta et al., 1973)			
	<b>ppm</b>		<b>ppm</b>
Sc	21	La	28
V	94	Ce	
Co	44	Nd	
Ni	295	Sm	
Ba	350	Eu	
Sr	170	Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	9.4
		Lu	

**SOIL: 15200**

LOCATION COMMENTS: Station 2, St. George Crater. Corner of boulder. Collected along with rock chipped off boulder.

GENERIC SUBSAMPLES	
1. 15201 (18.3 gm)	< 1 mm
2. 15202 (0.4 gm)	1-2 mm
3. 15203 (0.2 gm)	2-4 mm
4. 15204 (0.1 gm)	4-10 mm
5. *15205 (92.0 gm)	> 1 cm
6. 15200 (7.7 gm)	Reserve

MISCELLANEOUS	
Collected mass:	26.7 gm
Color:	
Bag no.:	Doc. bag 160
Container:	Teflon bag; returned in vacuum container (ALSC No. #1). Processed in N <sub>2</sub> .

\*Glassy breccia. Not included in total mass of soil.

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	68.0, mature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	56.0 μm
2. M <sub>d</sub>	

MAJOR ELEMENTS	
	%
SiO <sub>2</sub>	
TiO <sub>2</sub>	
Al <sub>2</sub> O <sub>3</sub>	
Cr <sub>2</sub> O <sub>3</sub>	
FeO	
MnO	
MgO	
CaO	
Na <sub>2</sub> O	
K <sub>2</sub> O	
P <sub>2</sub> O <sub>5</sub>	
S	

TRACE ELEMENTS			
	ppm		ppm
Sc		La	
V		Ce	
Co		Nd	
Ni		Sm	
Ba		Eu	
Sr		Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	
		Lu	

**SOIL: 15210**

LOCATION COMMENTS: Station 2, St. George Crater. Fillet sample.

<b>GENERIC SUBSAMPLES</b>	
1. 15211 (163.5 gm)	< 1 mm
2. 15212 (3.6 gm)	1-2 mm
3. 15213 (2.4 gm)	2-4 mm
4. 15214 (0.2 gm)	4-10 mm
5. ( gm)	> 1 cm
6. 15210 (221.2 gm)	Reserve

<b>MISCELLANEOUS</b>	
<b>Collected mass:</b>	390.9 gm
<b>Color:</b>	
<b>Bag no.:</b>	Doc. bag 180
<b>Container:</b>	Teflon bag; returned in vacuum container (ALSRC No. #1). Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

<b>MATURITY PARAMETERS</b>	
1. I <sub>s</sub> /FeO	60.0, mature
2. Agglutinates	

<b>GRAIN SIZE PARAMETERS</b>	
1. M <sub>z</sub>	
2. M <sub>d</sub>	

<b>MAJOR ELEMENTS</b>	
(Cuttitta et al., 1973)	
	%
SiO <sub>2</sub>	46.35
TiO <sub>2</sub>	1.34
Al <sub>2</sub> O <sub>3</sub>	17.73
Cr <sub>2</sub> O <sub>3</sub>	0.23
FeO	11.66
MnO	0.16
MgO	10.48
CaO	11.68
Na <sub>2</sub> O	0.44
K <sub>2</sub> O	0.19
P <sub>2</sub> O <sub>5</sub>	0.19
S	

<b>TRACE ELEMENTS</b>			
(Cuttitta et al., 1973)			
	ppm		ppm
Sc	22	La	
V	80	Ce	
Co	40	Nd	
Ni	325	Sm	
Ba	315	Eu	
Sr	150	Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	7.7
		Lu	

**SOIL: 15220**

LOCATION COMMENTS: Station 2, between St. George Crater. Undisturbed surface soil (reference sample). Collected approximately one meter from a boulder where fillet sample 15210 was collected.

GENERIC SUBSAMPLES		
1.	15221 (290.0 gm)	< 1 mm
2.	15222 (2.4 gm)	1-2 mm
3.	15223 (5.8 gm)	2-4 mm
4.	15224 (7.0 gm)	4-10 mm
5.	( gm)	> 1 cm
6.	15220 (165.5 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	465.7 gm
<b>Color:</b>	465.7 gm
<b>Bag no.:</b>	Doc. bag 181
<b>Container:</b>	Teflon bag; returned in vacuum (ALSRC No. 1). Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS		
1.	I <sub>s</sub> /FeO	63.0 mature
2.	Agglutinates	

GRAIN SIZE PARAMETERS		
1.	M <sub>z</sub>	43 μm (<1 mm)
2.	M <sub>d</sub>	53.4 μm

PETROGRAPHY		(90-125 μm) (Basu et al., 1981)	
Components	%	Components	%
Monomineralic	20.3	Breccias	12.8
Plagioclase	9.5	Vitric	(2.2)
Pyroxene	7.2	Dark Matrix	11.5
Olivine	3.3	Light Matrix	0.7
Opaques	(0.3)	Crystalline	(0.6)
Oxides	0.3	Poikilitic	
Metal, Sulph.		Melt Matrix	0.3
Silica Phase		Other	0.3
Crystalline		Agglutinate	50.0
Lithics	7.9	Glass	8.5
ANT Suite	(2.3)	Ropy/Clast-Laden	2.6
Anorthosite	2.0	Quench- Crystals	0.0
Gabbroic	0.3	(Vitrophyres)	
Mare Basalt	(2.0)	Green Glass	
Oliv.-Bearing	0.7	Other	
Oliv.-Free	(0.3)	Devitrified (Cryptocry.)	0.7
Microgabbroic		Crystal/ Clast-Free	(5.2)
Porphyritic, Etc.		Green	2.0
Ophitic, Etc.	0.3	Yellow	1.3
Intersertal/ Granular		Gray, Colorless	1.6
Other	1.0	Brown, Black, Etc.	0.3
Non-Mare Basalt	(2.3)	Miscellaneous	0.3
Feldspathic			
KREEPy	2.3		
Plag-Phyic			
Indeterminate	1.3		
<b>Total Number Particles</b>			<b>304</b>

<b>MAJOR ELEMENTS</b>	
(Carron et al., 1972)	
	<b>%</b>
SiO <sub>2</sub>	46.56
TiO <sub>2</sub>	1.27
Al <sub>2</sub> O <sub>3</sub>	17.54
Cr <sub>2</sub> O <sub>3</sub>	0.23
FeO	11.32
MnO	0.15
MgO	10.69
CaO	11.87
Na <sub>2</sub> O	0.45
K <sub>2</sub> O	0.19
P <sub>2</sub> O <sub>5</sub>	0.16
S	

<b>TRACE ELEMENTS</b>			
(Cuttitta et al., 1973)			
	<b>ppm</b>		<b>ppm</b>
Sc	20	La	24
V	84	Ce	
Co	44	Nd	
Ni	320	Sm	
Ba	300	Eu	
Sr	160	Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	7.2
Zr		Lu	

**SOIL: 15230**

LOCATION COMMENTS: Station 2, St. George Crater. Soil from under a breccia boulder which was rolled over by the crew.

GENERIC SUBSAMPLES	
1. 15231 (233.9 gm)	< 1 mm
2. 15232 (5.2 gm)	1-2 mm
3. 15233 (3.8 gm)	2-4 mm
4. 15234 (1.8 gm)	4-10 mm
5. ( gm)	> 1 cm
6. 15230 (99.1 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	343.8 gm
<b>Color:</b>	
<b>Bag no.:</b>	Doc. bag 182
<b>Container:</b>	Teflon bag; returned in vacuum (ALSRC No. 1). Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	71.0, mature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	46 μm (<1 mm)
2. M <sub>d</sub>	42.2 μm

PETROGRAPHY	(125-250 μm)
(Heiken and McKay, 1972-unpublished)	
<b>Components</b>	<b>%</b>
Agglutinates	43
Microbreccias:	
Recrystallized	3
Vitric	8
Angular Glass	
Brown	10
Gray	2
Colorless Glass	2
Glass Droplets	
Green	3
Brown	-
Clinopyroxene	8
Orthopyroxene	3
Olivine	1
Plagioclase	7
Orthoclase	2
Basalt	
Equi.	-
Halocryst.	-
Ophitic	5
Anorthosite	1
Opakes	2

<b>MAJOR ELEMENTS</b>	
(Carron et al., 1972)	
	<b>%</b>
SiO <sub>2</sub>	46.40
TiO <sub>2</sub>	1.35
Al <sub>2</sub> O <sub>3</sub>	17.14
Cr <sub>2</sub> O <sub>3</sub>	0.23
FeO	11.53
MnO	0.16
MgO	10.47
CaO	11.88
Na <sub>2</sub> O	0.41
K <sub>2</sub> O	0.19
P <sub>2</sub> O <sub>5</sub>	0.15
S	

<b>TRACE ELEMENTS</b>			
(Cuttitta et al., 1973)			
	<b>ppm</b>		<b>ppm</b>
Sc	22	La	28
V	82	Ce	
Co	42	Nd	
Ni	315	Sm	
Ba	290	Eu	
Sr	155	Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	6.8
		Lu	

**SOIL: 15240**

LOCATION COMMENTS: Station 6, Apennine Front. Floor of a small crater with glass in the center. Sample from center of rim. Crater less than 1 m in diameter.

GENERIC SUBSAMPLES	
15241(197.4 gm)	< 1 mm
15242(18.9 gm)	1-2 mm
15243(31.8 gm)	2-4 mm
15244(32.6 gm)	4-10 mm
*15245(115.5 gm)	> 1 cm
15240(67.1 gm)	Reserve

\*89 pieces of glass coated breccias which may not be representative of the soil. Mass not included in soil total.

MISCELLANEOUS	
Collected mass:	
Color:	
Bag no.:	
Container:	Teflon bag; returned in sample collection bag 3, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	45.0, mature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	
2. M <sub>d</sub>	108 μm

PETROGRAPHY	(125-250 μm)
(Heiken and McKay, 1972-unpublished)	
<b>Components</b>	<b>%</b>
Agglutinates	45
Microbreccias:	
Recrystallized	6
Vitric	1
Angular Glass	
Brown	5
Gray	-
Colorless Glass	1
Glass Droplets	
Green	10
Brown	2
Clinopyroxene	9
Orthopyroxene	3
Olivine	7
Feldspar	9
Orthoclase	
Basalt	
Equi.	2
Halocryst.	-
Ophitic	-
Anorthosite	-
Opakes	
<b>Total Number Grains</b>	<b>100</b>



MAJOR ELEMENTS	
	%
SiO <sub>2</sub>	
TiO <sub>2</sub>	
Al <sub>2</sub> O <sub>3</sub>	
Cr <sub>2</sub> O <sub>3</sub>	
FeO	
MnO	
MgO	
CaO	
Na <sub>2</sub> O	
K <sub>2</sub> O	
P <sub>2</sub> O <sub>5</sub>	
S	

TRACE ELEMENTS			
(Palme et al., 1978)			
	ppm		ppm
Sc	24.7	La	27.2
V		Ce	71.8
Co	39.6	Nd	45
Ni	270	Sm	11.65
Ba	274	Eu	1.43
Sr	140	Tb	2.43
Hf	9.34	Dy	15.6
Ta	1.25	Ho	3.56
Th	3.84	Tm	1.61
U	0.96	Yb	9.23
		Lu	1.26

**SOIL: 15250**

LOCATION COMMENTS: Station 6, Apennine Front. Surface soil, from rim of crater where sample 15240 was collected.

GENERIC SUBSAMPLES	
15251 (380.9 gm)	< 1 mm
15252 (8.3 gm)	1-2 mm
15253 (4.0 gm)	2-4 mm
15254 (1.2 gm)	4-10 mm
( gm)	> 1 cm
15250 (207.0 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	601.4 gm
<b>Color:</b>	Light gray (field description)
<b>Bag no.:</b>	Doc. bag 164
<b>Container:</b>	Teflon bag; returned in sample collection bag 3, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	75.0, mature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	
2. M <sub>d</sub>	56 μm

PETROGRAPHY	(125-250 μm)
(Heiken and McKay, 1972-unpublished)	
<b>Components</b>	<b>%</b>
Agglutinates	54.0
Microbreccias:	
Recrystallized	4.0
Vitric	2.5
Angular Glass	
Brown	5.5
Gray	0.5
Colorless Glass	-
Glass Droplets	
Green	9.5
Brown	3.5
Clinopyroxene	9.5
Orthopyroxene	1.5
Olivine	2.0
Feldspar	2.5
Orthoclase	
Basalt	
Equi.	2.5
Halocryst.	0.5
Ophitic	2.0
Anorthosite	-
Opaques	
<b>Total Number Grains</b>	<b>200</b>

<b>MAJOR ELEMENTS</b>	
(Carron et al., 1972)	
	<b>%</b>
SiO <sub>2</sub>	47.02
TiO <sub>2</sub>	1.49
Al <sub>2</sub> O <sub>3</sub>	16.28
Cr <sub>2</sub> O <sub>3</sub>	0.30
FeO	12.00
MnO	0.16
MgO	10.31
CaO	11.25
Na <sub>2</sub> O	0.54
K <sub>2</sub> O	0.22
P <sub>2</sub> O <sub>5</sub>	0.24
S	

<b>TRACE ELEMENTS</b>			
(Cuttitta et al., 1973)			
	<b>ppm</b>		<b>ppm</b>
Sc	24	La	40
V	85	Ce	
Co	46	Nd	
Ni	405	Sm	
Ba	340	Eu	
Sr	160	Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	11
		Lu	

**SOIL: 15260**

LOCATION COMMENTS: Station 6, Apennine Front. Rim of a subdued, 10 m diameter crater. Soil from bottom of an approximately 10 cm deep trench.

GENERIC SUBSAMPLES	
15261 (416.6 gm)	< 1 mm
15262 (9.1 gm)	1-2 mm
15263 (6.7 gm)	2-4 mm
15264 (5.9 gm)	4-10 mm
( gm)	> 1 cm
15260 (172.2 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	610.5 gm
<b>Color:</b>	
<b>Bag no.:</b>	Doc. bag 166
<b>Container:</b>	Teflon bag; returned in sample collection bag 3, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	77.0, mature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	76.5 μm
2. M <sub>a</sub>	46.3 μm

PETROGRAPHY	(125-250 μm)
(Heiken and McKay, 1972-unpublished)	
<b>Components</b>	<b>%</b>
Agglutinates	50.5
Microbreccias:	
Recrystallized	7.0
Vitric	1.5
Angular Glass	
Brown	5.0
Gray	-
Colorless Glass	0.5
Glass Droplets	
Green	11.5
Brown	2.0
Clinopyroxene	13.0
Orthopyroxene	1.0
Olivine	2.5
Feldspar	-
Orthoclase	
Basalt	
Equi.	-
Halocryst.	1.0
Ophitic	3.0
Anorthosite	0.5
Pyroxenite	0.5
<b>Total Number Grains</b>	<b>200</b>

<b>MAJOR ELEMENTS</b>	
(Brunfelt et al., 1972)	
	<b>%</b>
SiO <sub>2</sub>	
TiO <sub>2</sub>	1.40
Al <sub>2</sub> O <sub>3</sub>	16.1
Cr <sub>2</sub> O <sub>3</sub>	0.36
FeO	12.09
MnO	0.16
MgO	
CaO	11.89
Na <sub>2</sub> O	0.45
K <sub>2</sub> O	
P <sub>2</sub> O <sub>5</sub>	
S	

<b>TRACE ELEMENTS</b>			
(Duncan et al., 1975)			
	<b>ppm</b>		<b>ppm</b>
Sc		La	
V	81	Ce	
Co	42	Nd	
Ni	250	Sm	
Ba	260	Eu	
Sr	136	Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	
		Lu	

**SOIL: 15270**

LOCATION COMMENTS: Station 6, Apennine Front. "Typical" surface soil, collected near the LRV, about 10 m southeast of a 10 m diameter crater.

GENERIC SUBSAMPLES	
1. 15271 (798.3 gm)	< 1 mm
2. 15272 (20.7 gm)	1-2 mm
3. 15273 (13.7 gm)	2-4 mm
4. 15274 (4.4 gm)	4-10 mm
5. ( gm)	> 1 cm
6. 15270 (319.0 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	1156.1 gm
<b>Color:</b>	
<b>Bag no.:</b>	Doc. bag 167
<b>Container:</b>	Teflon bag; returned in sample collection bag 3, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	63.0 mature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	94 μm
2. M <sub>d</sub>	70.4 μm

PETROGRAPHY		(90-125 μm) (Basu et al., 1981)	
Components	%	Components	%
Monomineralic	39.5	Breccias	8.9
Plagioclase	9.3	Vitric	(8.3)
Pyroxene	23.7	Dark Matrix	8.0
Olivine	4.2	Light Matrix	0.3
Opacues	(1.3)	Crystalline	(0.6)
Oxides	1.3	Poikilitic	0.3
Metal, Sulph.		Melt Matrix	0.3
Silica Phase	1.0	Other	0.3
Crystalline		Agglutinate	34.6
Lithics	10.9	Glass	8.5
ANT Suite	(0.6)	Ropy/ Clast-Laden	1.6
Anorthosite	0.6	Quench- Crystals	(0.3)
Gabbroic		(Vitrophyres)	
Mare Basalt	(6.8)	Green Glass	
Oliv.-Bearing	1.3	Other	0.3
Oliv.-Free	(4.2)	Devitrified (Cryptocry.)	1.0
Microgabbroic	1.0		
Porphyritic, Etc.	2.2	Crystal/ Clast-Free	(3.2)
Ophitic, Etc.	1.0	Green	0.6
Intersertal/ Granular		Yellow	1.0
Other	1.3	Gray, Colorless	0.6
Non-Mare Basalt	(1.9)	Brown, Black, Etc.	1.0
Feldspathic		Miscellaneous	
KREEPy	1.9		
Plag-Phyc			
Indeterminate	1.6		
<b>Total Number Particles</b>			<b>312</b>

<b>MAJOR ELEMENTS</b>	
(Apollo 15 P.E.T., 1970)	
	<b>%</b>
SiO <sub>2</sub>	46.70
TiO <sub>2</sub>	1.47
Al <sub>2</sub> O <sub>3</sub>	16.51
Cr <sub>2</sub> O <sub>3</sub>	0.38
FeO	12.15
MnO	0.16
MgO	10.55
CaO	11.29
Na <sub>2</sub> O	0.43
K <sub>2</sub> O	0.21
P <sub>2</sub> O <sub>5</sub>	0.21
S	0.08

<b>TRACE ELEMENTS</b>			
(Duncan et al., 1975)			
	<b>ppm</b>		<b>ppm</b>
Sc		La	
V	80	Ce	
Co	40	Nd	
Ni	231	Sm	
Ba	265	Eu	
Sr	137	Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	
Zr		Lu	

**SOIL: 15290**

LOCATION COMMENTS: Station 6, Apennine Front. Collected 30 m south of a 10 m diameter crater. Surface sample. Collected with a black and white breccia.

GENERIC SUBSAMPLES		
1. 15291	(169.0 gm)	< 1 mm
2. 15292	(5.4 gm)	1-2 mm
3. 15293	(6.7 gm)	2-4 mm
4. 15294	(10.2 gm)	4-10 mm
5. *15295	(947.3 gm)	> 1 cm
6. 15290	(55.0 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	246.3 gm
<b>Color:</b>	
<b>Bag no.:</b>	Doc. bag 188
<b>Container:</b>	Teflon bag; returned in sample collection bag 3, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	63.0, mature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	126.0 μm
2. M <sub>n</sub>	85.4 μm

PETROGRAPHY	(125-250 μm)
(Heiken and McKay, 1972-unpublished)	
<b>Components</b>	<b>%</b>
Agglutinates	16.0
Microbreccias:	
Recrystallized	-
Vitric	32.0
Angular Glass	
Brown	5.0
Gray	-
Colorless Glass	-
Glass Droplets	
Green	3.0
Brown	2.0
Clinopyroxene	12.0
Orthopyroxene	-
Olivine	2.0
Feldspar	12.0
Orthoclase	
Basalt	
Equi.	8.0
Halocryst.	-
Ophitic	-
Anorthosite	4.0
Opakes	
<b>Total Number Grains</b>	<b>150</b>



<b>MAJOR ELEMENTS</b>	
(Carron et al., 1972)	
	<b>%</b>
SiO <sub>2</sub>	47.21
TiO <sub>2</sub>	1.44
Al <sub>2</sub> O <sub>3</sub>	16.40
Cr <sub>2</sub> O <sub>3</sub>	0.29
FeO	11.75
MnO	0.17
MgO	10.25
CaO	11.47
Na <sub>2</sub> O	0.53
K <sub>2</sub> O	0.21
P <sub>2</sub> O <sub>5</sub>	0.25
S	

<b>TRACE ELEMENTS</b>			
(Cuttitta et al., 1975)			
	<b>ppm</b>		<b>ppm</b>
Sc	24	La	42
V	103	Ce	
Co	46	Nd	
Ni	300	Sm	
Ba	350	Eu	
Sr	160	Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	12
		Lu	

**SOIL: 15300**

LOCATION COMMENTS: Station 7, Spur Crater. Soil sample collected to accompany the comprehensive sample.

GENERIC SUBSAMPLES	
1. 15301(810.2 gm)	< 1 mm
2. 15302(23.2 gm)	1-2 mm
3. 15303(12.7 gm)	2-4 mm
4. 15304(7.3 gm)	4-10 mm
5. * (140.1 gm)	> 1 cm
6. 15300(390.7 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	1244.1 gm
<b>Color:</b>	
<b>Bag no.:</b>	Doc. bag 173
<b>Container:</b>	Teflon bag; returned in sample collection bag 3, in air. Processed in N <sub>2</sub> .

\*Not included in total mass of soil. 15305 – aggregate of green glass spherules. 15306 – breccia. 15307 – hollow glass sphere. 15308 - breccia

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	48.0 submature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	
2. M <sub>d</sub>	73.8 μm

PETROGRAPHY		(90-125 μm) (Basu et al., 1981)	
Components	%	Components	%
Monomineralic	13.7	Breccias	9.3
Plagioclase	5.0	Vitric	(7.1)
Pyroxene	6.8	Dark Matrix	5.6
Olivine	1.9	Light Matrix	1.5
Opacues		Crystalline	(2.2)
Oxides		Poikilitic	0.3
Metal, Sulph.		Melt Matrix	
Silica Phase	0.3	Other	1.9
Crystalline		Agglutinate	40.9
Lithics	5.4	Glass	30.0
ANT Suite	(0.9)	Ropy/Clast-Laden	4.0
Anorthosite	0.6	Quench- Crystals	(1.2)
Gabbroic	0.6	(Vitrophyres)	
Mare Basalt	(1.8)	Green Glass	1.2
Oliv.-Bearing	0.6	Other	
Oliv.-Free	(0.9)	Devitrified	2.2
Microgabbroic	0.3	(Cryptocry.)	
Porphyritic, Etc.	0.6	Crystal/	(22.6)
Ophitic, Etc.		Clast-Free	
Intersertal/ Granular		Green	19.5
Other	0.3	Yellow	1.2
Non-Mare Basalt	(1.2)	Gray, Colorless	
Feldspathic		Brown, Black, Etc.	1.9
KREEPy	1.2	Miscellaneous	
Plag-Phyic			
Indeterminate	1.5		
<b>Total Number Particles</b>			<b>323</b>

<b>MAJOR ELEMENTS</b>	
(Apollo 15 P.E.T., 1972)	
	<b>%</b>
SiO <sub>2</sub>	49.91
TiO <sub>2</sub>	1.17
Al <sub>2</sub> O <sub>3</sub>	14.53
Cr <sub>2</sub> O <sub>3</sub>	
FeO	14.05
MnO	0.19
MgO	12.12
CaO	10.70
Na <sub>2</sub> O	0.35
K <sub>2</sub> O	0.16
P <sub>2</sub> O <sub>5</sub>	0.15
S	0.04

<b>TRACE ELEMENTS</b>			
(Duncan et al., 1975)			
	<b>ppm</b>		<b>ppm</b>
Sc		La	
V	97	Ce	
Co	51	Nd	
Ni	234	Sm	
Ba	190	Eu	
Sr	110	Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	
Zr		Lu	

**SOIL: 15310**

LOCATION COMMENTS: Station 7, Spur Crater. Soil in bag with rake sample. Surface soil, collected over an area approximately 1 m<sup>2</sup>. Rim of 100 m subdued crater.

GENERIC SUBSAMPLES	
15311 (295.0 gm)	< 1 mm
15312 (10.1 gm)	1-2 mm
15313 (9.8 gm)	2-4 mm
15314 (8.4 gm)	4-10 mm
* ( gm)	> 1 cm
15310 (140.6 gm)	Reserve

\*Rake sample. 78 fragments of breccia, basalt, and glass. Might bias soil sample with flakes of these rocks.

MISCELLANEOUS	
<b>Collected mass:</b>	463.9 gm
<b>Color:</b>	
<b>Bag no.:</b>	Doc. bag 172
<b>Container:</b>	Teflon bag; returned in sample collection bag 3, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	
2. M <sub>d</sub>	83 μm

PETROGRAPHY	(125-250 μm)
(Heiken and McKay, 1972-unpublished)	
<b>Components</b>	<b>%</b>
Glass Droplets, Clear,	
Pale Green	46.5
Glass Droplets, Yellow-	
Brown	4.5
Glass Fragments	1.0
Agglutinates	9.0
Microbreccia	6.0
Clinopyroxene	7.5
Orthopyroxene	2.5
Feldspar	3.0
Basalt	5.5
Anorthosite	--
Clastic Rock	1.0
Glass Fragments	1.5
Microbreccia	9.0
Olivine	1.0
<b>Grains Counted</b>	<b>200</b>

MAJOR ELEMENTS	
	%
SiO <sub>2</sub>	
TiO <sub>2</sub>	
Al <sub>2</sub> O <sub>3</sub>	
Cr <sub>2</sub> O <sub>3</sub>	
FeO	
MnO	
MgO	
CaO	
Na <sub>2</sub> O	
K <sub>2</sub> O	
P <sub>2</sub> O <sub>5</sub>	
S	

TRACE ELEMENTS			
	ppm		ppm
Sc		La	
V		Ce	
Co		Nd	
Ni		Sm	
Ba		Eu	
Sr		Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	
		Lu	

**SOIL: 15400**

LOCATION COMMENTS: Station 6a, 150 m up slope from the base of the Apennine Front, as determined on the photogeologic map. On a 15 degree slope. Collected with a breccia sample from a fillet.

GENERIC SUBSAMPLES		
1.	15401 (86.4 gm)	< 1 mm
2.	15402 (4.8 gm)	1-2 mm
3.	15403 (6.1 gm)	2-4 mm
4.	15404 (7.9 gm)	4-10 mm
5.	*15405 (513.1 gm)	> 1 cm
6.	15400 (47.5 gm)	Reserve

\*Not included in total mass of soil.

MISCELLANEOUS	
<b>Collected mass:</b>	152.7 gm
<b>Color:</b>	Gray, with greenish hue (field description)
<b>Bag no.:</b>	Doc. bag 168
<b>Container:</b>	Teflon bag; returned in sample collection bag 6, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>g</sub> /FeO	5.6 immature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	.33 (<1 cm); 61 (<1 mm)
2. M <sub>d</sub>	

MAJOR ELEMENTS	
(Taylor et al., 1973)	
	%
SiO <sub>2</sub>	45.35
TiO <sub>2</sub>	0.40
Al <sub>2</sub> O <sub>3</sub>	7.52
Cr <sub>2</sub> O <sub>3</sub>	0.44
FeO	20.1
MnO	0.22
MgO	17.08
CaO	8.42
Na <sub>2</sub> O	0.13
K <sub>2</sub> O	
P <sub>2</sub> O <sub>5</sub>	
S	

TRACE ELEMENTS			
(Masuda et al., 1972)			
	ppm		ppm
Sc		La	19.40
V		Ce	51.0
Co		Nd	
Ni		Sm	31.91
Ba		Eu	1.003
Sr		Tb	
Hf		Dy	12.50
Ta		Ho	
Th		Tm	
U		Yb	6.41
		Lu	0.952

**SOIL: 15410**

LOCATION COMMENTS: Station 6a, 150 m up slope from the base of the Apennine Front, as determined on the photogeologic map. On a 15 degree slope. Collected with a breccia sample from a fillet.

GENERIC SUBSAMPLES	
1. 15411 (103.3 gm)	< 1 mm
2. 15412 (7.1 gm)	1-2 mm
3. 15413 (6.7 gm)	2-4 mm
4. 15414 (4.0 gm)	4-10 mm
5. * (1143.3 gm)	> 1 cm
6. 15410 (56.2 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	152.7 gm
<b>Color:</b>	Gray, with greenish hue (field description)
<b>Bag no.:</b>	Doc. bag 168
<b>Container:</b>	Teflon bag; returned in sample collection bag 6, in air. Processed in N <sub>2</sub> .

\*Three breccia samples (15417 to 15419) not included in mass of soil.

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	43.0 submature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	
2. M <sub>d</sub>	

MAJOR ELEMENTS	
(Willis et al., 1972)	
	%
SiO <sub>2</sub>	46.22
TiO <sub>2</sub>	1.09
Al <sub>2</sub> O <sub>3</sub>	15.08
Cr <sub>2</sub> O <sub>3</sub>	0.37
FeO	13.36
MnO	0.18
MgO	11.74
CaO	10.91
Na <sub>2</sub> O	0.36
K <sub>2</sub> O	0.16
P <sub>2</sub> O <sub>5</sub>	0.17
S	

TRACE ELEMENTS			
(Laul & Schmitt, 1973)			
	ppm		ppm
Sc	23	La	18
V	103	Ce	51
Co	43	Nd	
Ni		Sm	8.4
Ba	180	Eu	1.0
Sr		Tb	1.5
Hf	6.4	Dy	-
Ta	0.75	Ho	
Th	3.0	Tm	
U	0.9	Yb	5.9
		Lu	0.90

**SOIL: 15420**

LOCATION COMMENTS: Station 7, Spur Crater, on the rim. Friable greenish breccia plus soil from around it.

<b>GENERIC SUBSAMPLES</b>	
15421 (254.7 gm)	< 1 mm
15422 (15.9 gm)	1-2 mm
15423 (18.3 gm)	2-4 mm
15424 (19.5 gm)	4-10 mm
*15425 to 15426 (475.8 gm)	> 1 cm
( gm)	Reserve

<b>MISCELLANEOUS</b>	
<b>Collected mass:</b>	308.4 gm
<b>Color:</b>	5GY 5/1 (greenish brown-gray)
<b>Bag no.:</b>	Doc. bag 195
<b>Container:</b>	Teflon bag; returned in sample collection bag 3, in air. Processed in N <sub>2</sub> .

\*Not included in total mass of soil.

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

<b>MATURITY PARAMETERS</b>	
1. I <sub>s</sub> /FeO	
2. Agglutinates	

<b>GRAIN SIZE PARAMETERS</b>	
1. M <sub>z</sub>	96 μm
2. M <sub>n</sub>	

<b>PETROGRAPHY</b>	(125-250 μm)
(Heiken and McKay, 1972-unpublished)	
<b>Components</b>	<b>%</b>
Glass Droplets, Clear, Pale Green	82.0
Glass Droplets, Yellow-Brown	7.3
Glass Fragments	--
Agglutinates	8.4
Microbreccia	0.3
Clinopyroxene	1.3
Orthopyroxene	0.3
Feldspar	0.7
Basalt	--
Anorthosite	--
Clastic Rock	--
Glass Fragments	--
Microbreccia	--
Olivine	--
<b>Grains Counted</b>	<b>200</b>



<b>MAJOR ELEMENTS</b>	
(Apollo 15 P.E.T., 1972)	
	<b>%</b>
SiO <sub>2</sub>	45.18
TiO <sub>2</sub>	1.14
Al <sub>2</sub> O <sub>3</sub>	15.06
Cr <sub>2</sub> O <sub>3</sub>	0.04
FeO	13.72
MnO	0.18
MgO	12.14
CaO	11.11
Na <sub>2</sub> O	0.36
K <sub>2</sub> O	0.11
P <sub>2</sub> O <sub>5</sub>	0.09
S	

<b>TRACE ELEMENTS</b>			
(Taylor et al., 1973)			
	<b>ppm</b>		<b>ppm</b>
Sc	0.07	La	10.2
V		Ce	28.0
Co		Nd	15.0
Ni		Sm	4.3
Ba	121	Eu	0.71
Sr		Tb	0.87
Hf	2.68	Dy	5.7
Ta		Ho	1.39
Th	1.49	Tm	0.59
U		Yb	3.57
		Lu	0.55

**SOIL: 15430**

LOCATION COMMENTS: Station 7, 5 m inside the north rim of Spur Crater. Clod and soil collected as a surface sample.

GENERIC SUBSAMPLES		
1.	15431 (475.7 gm)	< 1 mm
2.	15432 (39.7 gm)	1-2 mm
3.	15433 (31.2 gm)	2-4 mm
4.	15434 (51.6 gm)	4-10 mm
5.	*15435 (206.8 gm)	> 1 cm
6.	( gm)	Reserve

\*Not included in mass of soil.

MISCELLANEOUS	
<b>Collected mass:</b>	598.2 gm
<b>Color:</b>	
<b>Bag no.:</b>	Doc. bag 168
<b>Container:</b>	Teflon bag; returned in sample collection bag 5, in vacuum container which did not seal (therefore exposed to air). Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	39.0 submature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	
2. M <sub>n</sub>	

MAJOR ELEMENTS	
(Rose et al., 1975)	
	%
SiO <sub>2</sub>	46.80
TiO <sub>2</sub>	1.325
Al <sub>2</sub> O <sub>3</sub>	16.35
Cr <sub>2</sub> O <sub>3</sub>	0.30
FeO	11.87
MnO	0.175
MgO	10.89
CaO	11.23
Na <sub>2</sub> O	0.495
K <sub>2</sub> O	0.26
P <sub>2</sub> O <sub>5</sub>	0.24
S	

TRACE ELEMENTS			
(Rose et al., 1975)			
	ppm		ppm
Sc	24.5	La	33.5
V	57.5	Ce	
Co	42	Nd	
Ni	209.5	Sm	
Ba	383.5	Eu	
Sr	123	Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	12
		Lu	

Note: Average of two data sets.

**SOIL: 15470**

LOCATION COMMENTS: Station 4, 30 m south of the rim of 450 m diameter Dune Crater.

GENERIC SUBSAMPLES	
1. 15471 (153.0 gm)	< 1 mm
2. 15472 (6.1 gm)	1-2 mm
3. 15473 (4.5 gm)	2-4 mm
4. 15474 (4.7 gm)	4-10 mm
5. *15474 & 15476 (673.1 gm)	> 1 cm
6. 15470 (82.2 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	250.5 gm
<b>Color:</b>	
<b>Bag no.:</b>	Doc. bag 203
<b>Container:</b>	Teflon bag (documented bag), in sample collection bag 5 (beta-cloth). Returned in ALSRC (vacuum container). Did not seal properly so was exposed to air. Processed in N <sub>2</sub> environment.

\*Two basalt samples. Mass not included in soil sample.

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	34.0 submature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	
2. M <sub>a</sub>	

PETROGRAPHY		(90-125 μm)	
(Basu et al., 1981)			
Components	%	Components	%
Monomineralic	32.7	Breccias	12.2
Plagioclase	9.6	Vitric	(9.9)
Pyroxene	20.8	Dark Matrix	9.2
Olivine	2.0	Light Matrix	0.7
Opakes	(0.3)	Crystalline	(2.3)
Oxides	0.3	Poikilitic	0.7
Metal, Sulph.		Melt Matrix	0.3
Silica Phase		Other	1.3
Crystalline Lithics	12.2	Agglutinate	36.0
ANT Suite	(2.6)	Glass	6.6
Anorthosite	2.6	Ropy/ Clast-Laden	2.3
Gabbroic		Quench- Crystals	(1.0)
Mare Basalt	(7.9)	(Vitrophyres)	
Oliv.-Bearing	3.0	Green Glass	1.0
Oliv.-Free	(2.3)	Other	
Microgabbroic	0.3	Devitrified (Cryptocry.)	0.3
Porphyritic, Etc.	0.7	Crystal/ Clast-Free	(3.0)
Ophitic, Etc.	1.3	Green	1.0
Intersertal/ Granular		Yellow	0.3
Other	2.6	Gray, Colorless	1.0
Non-Mare Basalt	(3.6)	Brown, Black, Etc	0.7
Feldspathic		Miscellaneous	0.3
KREEPy	1.6		
Plag-Phyic			
Indeterminate	1.7		
Total number particles			303

MAJOR ELEMENTS		TRACE ELEMENTS			
(Apollo 15 P.E.T., 1972)		(Duncan et al., 1975)			
	%		ppm		ppm
SiO <sub>2</sub>	46.10	Sc		La	
TiO <sub>2</sub>	1.58	V	128	Ce	
Al <sub>2</sub> O <sub>3</sub>	12.91	Co	46	Nd	
Cr <sub>2</sub> O <sub>3</sub>	0.47	Ni	179	Sm	
FeO	16.24	Ba	165	Eu	
MnO	0.21	Sr	115	Tb	
MgO	11.11	Hf		Dy	
CaO	10.42	Ta		Ho	
Na <sub>2</sub> O	0.32	Th		Tm	
K <sub>2</sub> O	0.12	U		Yb	
P <sub>2</sub> O <sub>5</sub>	0.12	Zr		Lu	
S	0.07				

**SOIL: 15500**

LOCATION COMMENTS: Station 9, Scarp Crater. Surface sample collected 10 m from a 10 m diameter fresh crater. Collected with several breccia samples.

GENERIC SUBSAMPLES	
1. 15501 (103.0 gm)	< 1 mm
2. 15502 (4.4 gm)	1-2 mm
3. 15503 (3.8 gm)	2-4 mm
4. 15504 (4.1 gm)	4-10 mm
5. *15504 to 15508 (1175.6 gm)	> 1 cm
6. 15500(24.8 gm)	Reserve

\*Not included in mass of soil sample.

MISCELLANEOUS	
<b>Collected mass:</b>	140.1 gm
<b>Color:</b>	
<b>Bag no.:</b>	Doc. bag 255
<b>Container:</b>	Teflon bag returned in sample collection bag 5, in air (ALSRC did not seal). Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>g</sub> /FeO	51.0 submature
2. Agglutinates	
GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	
2. M <sub>d</sub>	

PETROGRAPHY:		(90-125 μm)	
(Basu et al., 1981)			
Components	%	Components	%
Monomineralic	19.5	Breccias	15.8
Plagioclase	4.5	Vitric	(13.5)
Pyroxene	12.8	Dark Matrix	12.5
Olivine	2.2	Light Matrix	1.0
Opakes	(0.0)	Crystalline	(2.3)
Oxides		Poikilitic	1.0
Metal, Sulph.		Melt Matrix	1.3
Silica Phase		Other	0.3
Crystalline Lithics	10.5	Agglutinate	42.5
ANT Suite	(1.9)	Glass	11.5
Anorthosite	1.3	Ropy/ Clast-Laden	4.8
Gabbroic	0.6	Quench- Crystals	(1.6)
Mare Basalt	(6.4)	(Vitrophyres)	
Oliv.-Bearing	2.6	Green Glass	1.0
Oliv.-Free	(3.2)	Other	0.6
Microgabbroic	0.3	Devitrified (Cryptocry.)	0.3
Porphyritic, Etc.	1.0	Crystal/ Clast-Free	(4.8)
Ophitic, Etc.	1.9	Green	1.9
Intersertal/ Granular		Yellow	1.6
Other	0.6	Gray, Colorless	1.0
Non-Mare Basalt	(1.6)	Brown, Black, Etc	0.3
Feldspathic		Miscellaneous	0.0
KREEPy	1.6		
Plag-Phyic			
Indeterminate	0.6		
Total number particles			313

<b>MAJOR ELEMENTS</b>	
(Apollo 15 P.E.T., 1972)	
	<b>%</b>
SiO <sub>2</sub>	46.21
TiO <sub>2</sub>	1.81
Al <sub>2</sub> O <sub>3</sub>	12.20
Cr <sub>2</sub> O <sub>3</sub>	0.49
FeO	16.72
MnO	0.22
MgO	10.80
CaO	10.25
Na <sub>2</sub> O	0.37
K <sub>2</sub> O	0.16
P <sub>2</sub> O <sub>5</sub>	0.17
S	0.07

<b>TRACE ELEMENTS</b>			
(Duncan et al., 1975)			
	<b>ppm</b>		<b>ppm</b>
Sc		La	
V	129	Ce	
Co	50	Nd	
Ni	224	Sm	
Ba	220	Eu	
Sr		Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	
Zr		Lu	

**SOIL: 15510**

LOCATION COMMENTS: Station 9, rim of Scarp Crater (from fresh 10 m diameter crater) Rim of crater is very soft; boots sink in 10 cm. Collected a clod and soil.

GENERIC SUBSAMPLES	
15511 (193.1 gm)	< 1 mm
15512 (4.9 gm)	1-2 mm
15513 (4.4 gm)	2-4 mm
15514 (1.1 gm)	4-10 mm
*15515 (144.7 gm)	> 1 cm
15510 (72.3 gm)	Reserve

\*48 pieces. Not included in total mass of soil.

MISCELLANEOUS	
<b>Collected mass:</b>	275.8 gm
<b>Color:</b>	
<b>Bag no.:</b>	Doc. bag 273
<b>Container:</b>	Teflon bag; returned in sample collection bag 7, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. $I_s/\text{FeO}$	
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. $M_z$	
2. $M_d$	56.4 $\mu\text{m}$

PETROGRAPHY		(125-250 μm)
(Heiken and McKay, 1972-unpublished)		
Components	%	
Agglutinate	53	
Clinopyroxene	19.5	
Plagioclase	5.0	
Glass Spheres, Green	4.5	
Glass Spheres, Colorless	3.0	
Basalt, Ophitic	3.5	
Basalt, Hyalocrystalline	2.5	
Microbreccia, Vitric	4.0	
Microbreccia, Recrystallized	1.5	
Glass Fragments, Brown	1.5	
Basalt, Equigranular	1.0	
Anorthosite	--	
Glass Droplets	--	
Grains Counted	200	

<b>MAJOR ELEMENTS</b>	
(Laul & Schmitt, 1973)	
	<b>%</b>
SiO <sub>2</sub>	
TiO <sub>2</sub>	1.90
Al <sub>2</sub> O <sub>3</sub>	12.40
Cr <sub>2</sub> O <sub>3</sub>	0.45
FeO	17.40
MnO	0.22
MgO	12.00
CaO	10.00
Na <sub>2</sub> O	0.37
K <sub>2</sub> O	0.14
P <sub>2</sub> O <sub>5</sub>	
S	

<b>TRACE ELEMENTS</b>			
(Duncan et al., 1975)			
	<b>ppm</b>		<b>ppm</b>
Sc		La	
V	131	Ce	
Co	47	Nd	
Ni	197	Sm	
Ba	210	Eu	
Sr	115	Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	
		Lu	



**SOIL: 15530**

LOCATION COMMENTS: Station 9a, along the east rim of Hadley Rille. About 15 m from the rille rim. From between "outcrops," collected with 4 basalt samples. Surface soil.

GENERIC SUBSAMPLES	
1. 15531 (136.0 gm)	< 1 mm
2. 15532 (6.3 gm)	1-2 mm
3. 15533 (5.4 gm)	2-4 mm
4. 15534 (6.0 gm)	4-10 mm
5. *15534 to 15538 (726.1 gm)	> 1 cm
6. 15530 (138.0 gm)	Reserve

\*Four basalt samples. Not included in mass of soil sample.

MISCELLANEOUS	
Collected mass:	291.7 gm
Color:	
Bag no.:	Doc. bag 275
Container:	Teflon bag returned in sample collection bag 7, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>g</sub> /FeO	27.0, immature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	
2. M <sub>d</sub>	73.6 μm

PETROGRAPHY		(90-125 μm)	
(Basu et al., 1981)			
Components	%	Components	%
Monomineralic	44.6	Breccias	5.8
Plagioclase	8.2	Vitric	(5.2)
Pyroxene	30.1	Dark Matrix	5.2
Olivine	5.6	Light Matrix	
Opakes	(0.7)	Crystalline	(0.6)
Oxides	0.7	Poikilitic	0.3
Metal, Sulph.		Melt Matrix	0.3
Silica Phase		Other	
Crystalline Lithics	20.7	Agglutinate	23.2
ANT Suite	(1.0)	Glass	5.2
Anorthosite	0.3	Ropy/ Clast-Laden	1.6
Gabbroic	0.7	Quench- Crystals	
Mare Basalt	(10.5)	(Vitrophyres)	
Oliv.-Bearing	4.9	Green Glass	
Oliv.-Free	(3.6)	Other	
Microgabbroic	0.3	Devitrified (Cryptocry.)	2.3
Porphyritic, Etc.	2.6	Crystal/ Clast-Free	(1.3)
Ophitic, Etc.	0.7	Green	
Intersertal/ Granular		Yellow	0.3
Other	2.0	Gray, Colorless	0.7
Non-Mare Basalt	(1.0)	Brown, Black, Etc	0.3
Feldspathic		Miscellaneous	0.7
KREEPy	1.0		
Plag-Phyic			
Indeterminate	8.2		
Total number particles			306

<b>MAJOR ELEMENTS</b>	
(Wanke et al., 1973)	
	<b>%</b>
SiO <sub>2</sub>	46.42
TiO <sub>2</sub>	2.169
Al <sub>2</sub> O <sub>3</sub>	9.86
Cr <sub>2</sub> O <sub>3</sub>	0.56
FeO	20.7
MnO	0.25
MgO	11.34
CaO	9.38
Na <sub>2</sub> O	0.31
K <sub>2</sub> O	0.87
P <sub>2</sub> O <sub>5</sub>	
S	

<b>TRACE ELEMENTS</b>			
(Laul et al., 1972)			
	<b>ppm</b>		<b>ppm</b>
Sc	36	La	
V	182	Ce	
Co	50	Nd	
Ni		Sm	
Ba		Eu	
Sr		Tb	
Hf	4.4	Dy	
Ta		Ho	
Th	1.8	Tm	
U		Yb	
Zr		Lu	

**SOIL: 15600**

LOCATION COMMENTS: Station 9a, near Hadley Rille. Comprehensive soil to accompany rake sample. Collected 20 m from the rille rim.

GENERIC SUBSAMPLES	
1. 15601 (802.0 gm)	< 1 mm
2. 15602 (32.9 gm)	1-2 mm
3. 15603 (25.5 gm)	2-4 mm
4. 15604 (21.5 gm)	4-10 mm
5. * (34.8 gm)	> 1 cm
6. 15600 (412.0 gm)	Reserve

\*Not included in mass of soil sample.

MISCELLANEOUS	
<b>Collected mass:</b>	1467.6 gm
<b>Color:</b>	
<b>Bag no.:</b>	Doc. bag 283
<b>Container:</b>	Teflon bag returned in sample collection bag 7, in air (ALSRC did not seal). Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	29.0, immature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	
2. M <sub>d</sub>	77 μm

PETROGRAPHY		(90-125 μm)	
(Basu et al., 1980)			
Components	%	Components	%
Monomineralic	39.7	Breccias	4.9
Plagioclase	7.5	Vitric	(4.6)
Pyroxene	27.2	Dark Matrix	4.3
Olivine	4.3	Light Matrix	0.3
Opakes	(0.7)	Crystalline	(0.3)
Oxides	0.7	Poikilitic	-
Metal, Sulph.		Melt Matrix	-
Silica Phase		Other	0.3
Crystalline Lithics	15.7	Agglutinate	32.1
ANT Suite	(0.3)	Glass	5.2
Anorthosite	-	Ropy/ Clast-Laden	2.0
Gabbroic	0.3	Quench- Crystals	(1.6)
Mare Basalt	(8.6)	(Vitrophyres)	
Oliv.-Bearing	3.6	Green Glass	0.3
Oliv.-Free	(2.7)	Other	1.3
Microgabbroic	0.7	Devitrified (Cryptocry.)	2.3
Porphyritic, Etc.	1.3	Crystal/ Clast-Free	(2.0)
Ophitic, Etc.	0.7	Green	1.0
Intersertal/ Granular	-	Yellow	1.0
Other	2.3	Gray, Colorless	-
Non-Mare Basalt	(0.7)	Brown, Black, Etc	-
Feldspathic	-	Miscellaneous	-
KREEPy	0.7		
Plag-Phyic	-		
Indeterminate	6.2		
Total number particles			305

<b>MAJOR ELEMENTS</b>	
(Apollo 15 P.E.T., 1972)	
	<b>%</b>
SiO <sub>2</sub>	45.05
TiO <sub>2</sub>	1.98
Al <sub>2</sub> O <sub>3</sub>	10.20
Cr <sub>2</sub> O <sub>3</sub>	0.56
FeO	19.79
MnO	0.26
MgO	10.89
CaO	9.87
Na <sub>2</sub> O	0.29
K <sub>2</sub> O	0.10
P <sub>2</sub> O <sub>5</sub>	0.11
S	0.06

<b>TRACE ELEMENTS</b>			
(Brunfelt et al., 1972)			
	<b>ppm</b>		<b>ppm</b>
Sc	35.1	La	11.3
V	200	Ce	29
Co	48.9	Nd	
Ni		Sm	6.3
Ba	135	Eu	1.01
Sr		Tb	1.33
Hf	4.9	Dy	9.7
Ta	0.60	Ho	1.0
Th	1.52	Tm	
U	0.46	Yb	5.2
Zr	170	Lu	0.9
	6.4		

**SOIL: 60050**

LOCATION COMMENTS: Station 10 - ALSEP 170 m south - southwest of LM and 50 m south-southeast of ALSEP control station. Probably ejecta from a 5 m diameter, subdued crater.

GENERIC SUBSAMPLES	
1. 60051 (195.3 gm)	< 1 mm
2. 60052 (11.43 gm)	1-2 mm
3. 60053 (7.41 gm)	2-4 mm
4. 60054 (8.4 gm)	4-10 mm
5. * 60055 to 60059 (57.82 gm)	> 1 cm
6. 60050 (3.27 gm)	Reserve

\* Not included in total mass of soil

MISCELLANEOUS	
<b>Collected mass:</b>	225.8 gm
<b>Color:</b>	5Y 5/1 (Medium Olive Gray)
<b>Bag no.:</b>	Doc. Bag 355
<b>Container:</b>	Teflon bag; returned in unsealed vacuum container, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	57.0 submature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	86 μm (< 1 mm)
2. M <sub>d</sub>	

PETROGRAPHY	(1-2 mm)
(Simkin et al., 1973)	
<b>Components</b>	%
Breccia	40
Agglutinates	9
Glassy	6
Plagioclase	20
Anorthosite	13
Basaltic	12

MAJOR ELEMENTS	
(Simkin et al., 1973)	
	%
SiO <sub>2</sub>	44.8
TiO <sub>2</sub>	0.44
Al <sub>2</sub> O <sub>3</sub>	28.5
Cr <sub>2</sub> O <sub>3</sub>	
FeO	4.5
MnO	0.04
MgO	5.05
CaO	16.2
Na <sub>2</sub> O	0.46
K <sub>2</sub> O	0.14
P <sub>2</sub> O <sub>5</sub>	
S	

TRACE ELEMENTS			
(Korotev, 1982)			
	ppm		ppm
Sc	7.83	La	10.06
V	19	Ce	21.0
Co	21.3	Nd	
Ni	250	Sm	4.88
Ba	108	Eu	1.119
Sr	165	Tb	1.04
Hf	3.89	Dy	
Ta	0.526	Ho	
Th	1.76	Tm	
U	0.46	Yb	3.42
		Lu	0.501

**SOIL: 60500**

LOCATION COMMENTS: Station 10 - ALSEP - Surface (rake) soil. Approximately 100 m southwest of LM.

GENERIC SUBSAMPLES	
1. 60501 (433.8 gm)	< 1 mm
2. 60502 (17.69 gm)	1-2 mm
3. 60503 (9.94 gm)	2-4 mm
4. 60504 (6.63 gm)	4-10 mm
5. ( gm)	> 1 cm
6. 60500 (234.4 gm)	Reserve

MISCELLANEOUS	
Collected mass:	702.46 gm
Color:	
Bag no.:	Doc. Bag 350
Container:	Teflon bag; returned in unsealed vacuum container, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	80.0 mature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	
2. M <sub>d</sub>	

MAJOR ELEMENTS	
(Duncan et al., 1973)	
	%
SiO <sub>2</sub>	45.63
TiO <sub>2</sub>	0.59
Al <sub>2</sub> O <sub>3</sub>	27.14
Cr <sub>2</sub> O <sub>3</sub>	
FeO	5.44
MnO	0.70
MgO	5.52
CaO	15.44
Na <sub>2</sub> O	0.40
K <sub>2</sub> O	0.114
P <sub>2</sub> O <sub>5</sub>	0.14
S	

TRACE ELEMENTS			
(Rose et al., 1975)			
	ppm		ppm
Sc	8.8	La	<10
V	14	Ce	
Co	37	Nd	
Ni	720	Sm	
Ba	143	Eu	
Sr	121	Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	
		Lu	

**SOIL: 60600**

LOCATION COMMENTS: Station 10 - ALSEP. Surface rake soil about 65 m southwest of LM. Lead surface.

GENERIC SUBSAMPLES		
1. 60601	( 330.2 gm)	< 1 mm
2. 60602	(14.93 gm)	1-2 mm
3. 60603	(8.57 gm)	2-4 mm
4. 60604	(3.94 gm)	4-10 mm
5. (    gm)		> 1 cm
6. 60600	(182.6 gm)	Reserve

MISCELLANEOUS	
1. Collected mass:	540.24 gm
2. Color:	N4 (med. dark gray)
3. Bag no.:	Doc. bag 348
4. Container:	Teflon bag; returned in sample collection bag 4; in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I/FeO:	85.0, mature
2. Agglutinates:	

GRAIN SIZE PARAMETERS:	
1. M <sub>z</sub>	
2. M <sub>d</sub>	

PETROGRAPHY (1-2 mm)	
(Taylor et al., 1973)	
Components	%
Agglutinates	12.2
Anorthosite	13.3
Breccia	23.5
Feldspathic Basalt	5.1
Glass	12.2
Light Colored Breccia	1.0
Poikilitic Rock	22.4
Troc. Spinel	10.2

MAJOR ELEMENTS	
(Apollo 16 P.E.T.)	
	%
SiO <sub>2</sub>	45.35
TiO <sub>2</sub>	0.60
Al <sub>2</sub> O <sub>3</sub>	26.75
Cr <sub>2</sub> O <sub>3</sub>	
FeO	5.49
MnO	0.07
MgO	6.27
CaO	15.46
Na <sub>2</sub> O	0.38
K <sub>2</sub> O	0.11
P <sub>2</sub> O <sub>5</sub>	0.13
S	0.07

TRACE ELEMENTS			
(Haskin et al., 1973)			
	ppm		ppm
Sc	9.22	La	12.52
V		Ce	32.6
Co	31.4	Nd	21.1
Ni	-	Sm	3.9
Ba		Eu	1.13
Sr		Tb	1.22
Hf	4.6	Dy	8.02
Ta		Ho	-
Th		Tm	
U		Yb	3.99
		Lu	0.58

**SOIL: 61140**

LOCATION COMMENTS: Station 1, Plum Crater. Located 35 m northeast of Plum Crater (3/4 crater diameter). Part of radial sample. Surface sample.

GENERIC SUBSAMPLES			MISCELLANEOUS
1. 61141	(134.7 gm):	< 1 mm	1. Collected mass: 229.3 gm
2. 61142	(9.43 gm):	1-2 mm	2. Color: 5YR 5/1 (Med. brownish gray)
3. 61143	(5.38 gm):	2-4 mm	3. Bag no.: Doc. bag 363
4. 61144	(5.71 gm):	4-10 mm	4. Container: Teflon bag; returned in unsealed vacuum container (ALSRC #1), in air. Processed in N <sub>2</sub> .
5. ( gm):		> 1 cm	
6. 61140	(74.13 gm):	Reserve	

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>g</sub> /FeO:	56.0, submature
2. Agglutinates:	
GRAIN SIZE PARAMETERS	
1. M <sub>r</sub> :	78 μm (< 1 mm)
2. M <sub>d</sub> :	

MAJOR ELEMENTS		TRACE ELEMENTS			
(Rose et al., 1973)		(Rose et al., 1973)			
	%		ppm		ppm
SiO <sub>2</sub>	45.20	Sc	9.5	La	-
TiO <sub>2</sub>	0.58	V	20	Ce	
Al <sub>2</sub> O <sub>3</sub>	26.40	Co		Nd	
Cr <sub>2</sub> O <sub>3</sub>	0.13	Ni	310	Sm	
FeO	5.29	Ba	120	Eu	
MnO	0.70	Sr	165	Tb	
MgO	6.10	Hf		Dy	
CaO	15.32	Ta		Ho	
Na <sub>2</sub> O	0.52	Th		Tm	
K <sub>2</sub> O	0.14	U		Yb	2.6
P <sub>2</sub> O <sub>5</sub>	0.12			Lu	
S					



**SOIL: 61160**

LOCATION COMMENTS: Surface sample, collected 20 m northeast of the rim of Plum Crater. Loosely compacted, gray soil.

GENERIC SUBSAMPLES			MISCELLANEOUS
1. 61161	(90.0 gm)	< 1 mm	1. Collected mass: 153.67
2. 61162	(5.12 gm)	1-2 mm	2. Color: N7 to 5YR 7/1 (light gray to pinkish gray)
3. 61163	(3.6gm)	2-4 mm	3. Bag no.: Doc. bag 356
4. 61164	(2.16 gm)	4-10 mm	4. Container: Teflon bag; returned in unsealed vacuum container (ALSRC #1), in air. Processed in N <sub>2</sub> .
5. ( gm)		> 1 cm	
6. 61160	(52.79 gm)	Reserve	

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>g</sub> /FeO:	82.0, mature
2. Agglutinates:	36

GRAIN SIZE PARAMETERS:	
1. M <sub>z</sub>	89 μm
2. M <sub>d</sub>	74.3 μm

PETROGRAPHY (90-150 μm)	
(Heiken et al., 1973)	
Components	%
Breccias	
Low-Grade Brown	4.7
Low-Grade Colorless	13.6
Med-Grade	15.0
High-Grade	-
Anorthosite	2
Cataclastic Anorthosite	2.7
Agglutinates	37.0
Feldspar	14.7
Orthopyroxene	1.3
Clinopyroxene	1.3
Glass:	
Colorless	-
Brown	3.1
Maskelynite	0.7
Gray	
Schlieren	0.3
Green	Tr.
Olivine	-
Basalt	0.3
Norite	Tr.
Anorth. Gabbro	0.7
Spinel	-
<b>Total Number Grains</b>	<b>300</b>

MAJOR ELEMENTS	
	%
SiO <sub>2</sub>	44.71
TiO <sub>2</sub>	0.58
Al <sub>2</sub> O <sub>3</sub>	26.26
Cr <sub>2</sub> O <sub>3</sub>	0.98
FeO	5.25
MnO	0.65
MgO	6.35
CaO	16.23
Na <sub>2</sub> O	0.43
K <sub>2</sub> O	0.10
P <sub>2</sub> O <sub>5</sub>	
S	

TRACE ELEMENTS			
	ppm		ppm
Sc	9.4	La	11.9
V		Ce	32
Co	22.2	Nd	
Ni	305	Sm	5.6
Ba		Eu	1.20
Sr		Tb	1.27
Hf	4.2	Dy	
Ta	0.6	Ho	
Th	1.8	Tm	
U		Yb	3.9
		Lu	0.56

**SOIL: 61180**

LOCATION COMMENTS: Surface sample. collected on the northeast rim of Plum Crater, from the rim of a 10 cm diameter crater. Part of a radial sample (second out of the crater rim).

GENERIC SUBSAMPLES		
1. 61181	(156.2 gm)	< 1 mm
2. 61182	(9.43 gm)	1-2 mm
3. 61183	(6.23 gm)	2-4 mm
4. 61184	(6.09 gm)	4-10 mm
5. (    gm):		> 1 cm
6. 61180	(93.4 gm)	Reserve

MISCELLANEOUS	
1. Collected mass:	271.35 gm
2. Color:	5Y 5/1 (med. olive gray)
3. Bag no.:	Doc. bag 369
4. Container:	Teflon bag; returned in unsealed vacuum container (ALSRC #1), in air. Processed in N <sub>2</sub>

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS:	
1. I <sub>s</sub> /FeO:	82.0, mature
2. Agglutinates:	38

GRAIN SIZE PARAMETERS:	
1. M <sub>z</sub> :	94 μm (< 1 cm); 64 μm (< 1 mm)
2. M <sub>g</sub> :	82 μm

PETROGRAPHY: (90-150 μm)	
(Heiken et al., 1973)	
Components	%
Breccias	
Low-Grade Brown	6.3
Low-Grade Colorless	7.3
Med-Grade	12.0
High-Grade	0.3
Anorthosite	2.0
Cataclastic Anorthosite	2.3
Agglutinates	59.6
Feldspar	5.3
Orthopyroxene	0.6
Clinopyroxene	0.3
Glass:	
Colorless	0.6
Brown	-
Maskelynite	1.6
Gray	
Schlieren	
Green	-
Olivine	-
Basalt	0.6
Norite	-
Anorth. Gabbro	0.9
Spinel	-
<b>Total Number Grains</b>	<b>300</b>

MAJOR ELEMENTS		TRACE ELEMENTS			
	%		ppm		ppm
SiO <sub>2</sub>	44.60	Sc	9.26	La	12.43
TiO <sub>2</sub>	0.66	V	21	Ce	33.9
Al <sub>2</sub> O <sub>3</sub>	27.10	Co	31.5	Nd	
Cr <sub>2</sub> O <sub>3</sub>	0.12	Ni	435	Sm	5.92
FeO	5.47	Ba	139	Eu	1.185
MnO		Sr	180	Tb	1.28
MgO	5.78	Hf	4.69	Dy	
CaO	15.56	Ta	0.654	Ho	
Na <sub>2</sub> O	0.51	Th	2.09	Tm	
K <sub>2</sub> O	0.25	U	0.54	Yb	4.17
P <sub>2</sub> O <sub>5</sub>	0.18			Lu	0.593
S					

**SOIL: 61220**

LOCATION COMMENTS: Station 1, trench on rim of Plum Crater. Soil from bottom, probably less than 30 cm deep. (The total depth is not certain.) Is lighter in color than surface.

GENERIC SUBSAMPLES		
1. 61221	(61.0 gm)	< 1 mm
2. 61222	(6.36 gm)	1-2 mm
3. 61223	(9.61 gm)	2-4 mm
4. 61224	(10.58 gm)	4-10 mm
5.* 61225 to 61226	(5.05 gm)	> 1 cm
6. 61220	(191.6 gm)	Reserve

\* Not included in total mass of soil.

MISCELLANEOUS	
1. Collected mass:	279.15 gm
2. Color:	5Y 6/1 (light olive gray)
3. Bag no.:	Doc. bag 357
4. Container:	Teflon bag; returned in unsealed vacuum container (ALSRC #1), in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO:	9.2. immature
2. Agglutinates:	6

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub> :	216 μm (< 1 cm); 68 μm (< 1 mm)
2. M <sub>g</sub> :	234 μm

PETROGRAPHY (90-150 μm)	
(Heiken et al., 1973)	
Components	%
Breccias	
Low-Grade Brown	5.6
Low-Grade Colorless	10.0
Med-Grade	17.3
High-Grade	1.0
Anorthosite	8.3
Cataclastic Anorthosite	5.3
Agglutinates	6.3
Feldspar	17.0
Orthopyroxene	1.6
Clinopyroxene	3.0
Glass:	
Colorless	10.9
Brown	1.3
Maskelynite	7.6
Gray	
Schlieren	
Green	
Olivine	-
Basalt	0.6
Norite	2.0
Anorth. Gabbro	0.3
Spinel	
<b>Total Number Grains</b>	<b>300</b>

<b>MAJOR ELEMENTS</b>	
(Apollo 16 P.E.T., 1973)	
	<b>%</b>
SiO <sub>2</sub>	45.35
TiO <sub>2</sub>	0.49
Al <sub>2</sub> O <sub>3</sub>	28.25
Cr <sub>2</sub> O <sub>3</sub>	
FeO	4.55
MnO	0.06
MgO	5.02
CaO	16.21
Na <sub>2</sub> O	0.42
K <sub>2</sub> O	0.09
P <sub>2</sub> O <sub>5</sub>	0.10
S	0.06

<b>TRACE ELEMENTS</b>			
Haskin et al., 1973)			
	<b>ppm</b>		<b>ppm</b>
Sc	7.0	La	9.1
V		Ce	22.7
Co	17.0	Nd	14.5
Ni	-	Sm	4.35
Ba		Eu	1.28
Sr		Tb	0.90
Hf	3.0	Dy	5.76
Ta		Ho	1.1
Th		Tm	
U		Yb	3.01
		Lu	0.44

**SOIL: 61240**

LOCATION COMMENTS: Top layer from a trench dug on the northeast rim of Plum Crater.

GENERIC SUBSAMPLES		
1. 61241	( 247.1 gm)	
2. 61242	(17.26 gm)	1-2 mm
3. 61243	(13.8 gm)	2-4 mm
4. 61244	(13.25 gm)	4-10 mm
5.* 61245 to 61255	(20.8 gm)	> 1 cm
6. 61240	( 160.8 gm)	Reserve

\* Not included in total mass of soil.

MISCELLANEOUS	
1. Collected mass:	452.2 gm
2. Color:	5Y 4/1 (olive gray)
3. Bag no.:	Doc. bag 352
4. Container:	Teflon bag; returned in unsealed vacuum container (ALSRC #1), in air. Processed in N <sub>2</sub>

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>h</sub> /FeO:	47.0, submature
2. Agglutinates:	27

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub> :	120 μm (< 1 cm); 72 μm (< 1 mm)
2. M <sub>d</sub> :	119 μm

PETROLOGY (90-150 μm) (Heiken et al. 1973)	
Components	%
Breccias	
Low-Grade Brown	9.2
Low-Grade Colorless	18.3
Med-Grade	10.0
High-Grade	-
Anorthosite	3.0
Cataclastic Anorthosite	2.0
Agglutinates	27.1
Feldspar	12.3
Orthopyroxene	2.0
Clinopyroxene	2.0
Glass:	
Colorless	-
Brown	3.3
Maskelynite	7.6
Gray	
Schlieren	0.3
Green	-
Olivine	-
Basalt	2.3
Norite	-
Anorth. Gabbro	0.3
Spinel	-
<b>Total Number Grains</b>	<b>300</b>

<b>MAJOR ELEMENTS</b>	
(Apollo 16 P.E.T., 1973)	
	<b>%</b>
SiO <sub>2</sub>	45.32
TiO <sub>2</sub>	0.57
Al <sub>2</sub> O <sub>3</sub>	27.15
Cr <sub>2</sub> O <sub>3</sub>	
FeO	5.33
MnO	0.07
MgO	5.75
CaO	15.69
Na <sub>2</sub> O	0.55
K <sub>2</sub> O	0.10
P <sub>2</sub> O <sub>5</sub>	0.13
S	0.07

<b>TRACE ELEMENTS</b>			
(Boynton et al., 1976)			
	<b>ppm</b>		<b>ppm</b>
Sc	9.1	La	11.8
V	18	Ce	30
Co	22.8	Nd	
Ni		Sm	5.0
Ba	130	Eu	1.10
Sr		Tb	1.1
Hf	3.3	Dy	5.6
Ta	0.4	Ho	
Th	1.8	Tm	
U	0.55	Yb	3.8
		Lu	0.50



**SOIL: 61280**

LOCATION COMMENTS: Southeast rim of Flag Crater, located in the southwest rim of Plum Crater.  
Sample of fillet around breccia boulder.

GENERIC SUBSAMPLES		
1. 61281	(169.6 gm)	< 1 mm
2. 61282	(10.20 gm)	1-2 mm
3. 61283	(6.74 gm)	2-4 mm
4. 61284	(3.48 gm)	4-10 mm
5.	( gm)	> 1 cm
6. 61280	(68.49 gm)	Reserve

MISCELLANEOUS	
1. Collected mass:	258.5 gm
2. Color:	5Y 5/1 (med. olive gray)
3. Bag no.:	Doc. bag 368
4. Container:	Teflon bag; returned in unsealed vacuum container (ALSRC #1), in air. Processed in N <sub>2</sub>

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO:	69.0, mature
2. Agglutinates:	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub> :	
2. M <sub>d</sub> :	

MAJOR ELEMENTS	
(Rose et al., 1973)	
	%
SiO <sub>2</sub>	44.65
TiO <sub>2</sub>	0.54
Al <sub>2</sub> O <sub>3</sub>	27.12
Cr <sub>2</sub> O <sub>3</sub>	
FeO	5.07
MnO	0.6
MgO	
CaO	16.00
Na <sub>2</sub> O	0.45
K <sub>2</sub> O	0.13
P <sub>2</sub> O <sub>5</sub>	
S	

TRACE ELEMENTS			
(Rose et al., 1973)			
	ppm		ppm
Sc	11.5	La	-
V	27	Ce	
Co	26	Nd	
Ni	440	Sm	
Ba	115	Eu	
Sr	135	Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	3.3
		Lu	

**SOIL: 61500**

LOCATION COMMENTS: Station 1. 20 m east of Flag Crater. Part 2 of a radial sample, about 1/3 crater diameter from Plum Crater. Surface sample.

**GENERIC SUBSAMPLES**

1. 61501	( 466.9 gm)	< 1 mm
2. 61502	(27.43 gm)	1-2 mm
3. 61503	(20.8 gm)	2-4 mm
4. 61504	(12.70 gm)	4-10 mm
5.* 61505	(1.65 gm)	> 1 cm
6. 61500	( 267.8 gm)	Reserve

\* Not included in total mass of soil.

**MISCELLANEOUS**

1. Collected mass:	.749.9 gm
2. Color:	SY 5/2 (olive gray)
3. Bag no.:	Doc. bag 354
4. Container:	Teflon bag; returned in unsealed vacuum container (ALSRC #1), in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL****MATURITY PARAMETERS**

1. I <sub>s</sub> /FeO:	53.0, submature
2. Agglutinates:	

**GRAIN SIZE PARAMETERS**

1. M <sub>z</sub> :	84 μm (< 1 mm)
2. M <sub>d</sub> :	

**MAJOR ELEMENTS**

(Apollo 16 P.E.T., 1973)

	%
SiO <sub>2</sub>	44.66
TiO <sub>2</sub>	0.56
Al <sub>2</sub> O <sub>3</sub>	26.50
Cr <sub>2</sub> O <sub>3</sub>	
FeO	5.31
MnO	0.07
MgO	6.08
CaO	15.33
Na <sub>2</sub> O	0.41
K <sub>2</sub> O	0.11
P <sub>2</sub> O <sub>5</sub>	0.11
S	0.08

**TRACE ELEMENTS**

(Boynton et al., 1975)

	ppm		ppm
Sc	10.0	La	12.1
V		Ce	36
Co	35	Nd	
Ni		Sm	-
Ba	160	Eu	1.22
Sr		Tb	1.2
Hf	4.3	Dy	9.1
Ta	0.56	Ho	
Th	2.2	Tm	
U		Yb	4.2
		Lu	0.69

**SOIL: 62230**

LOCATION COMMENTS: Station 2, southeast rim of Buster Crater. Surface sample, collected with 4 rock samples.

GENERIC SUBSAMPLES			MISCELLANEOUS
1. 62231	(86.74 gm)	< 1 mm	1. Collected mass: 112.12 gm
2. 62232	(6.96 gm)	1-2 mm	2. Color:
3. 62233	(5.32 gm)	2-4 mm	3. Bag no.: Doc. bag 005
4. 62234	(8.46 gm)	4-10 mm	4. Container: Teflon bag; returned in unsealed vacuum (ALSRC #1), in air. Processed in N <sub>2</sub> .
5. 62235 to 62238 (	440.8 gm)	> 1 cm	
6. 62230	(4.64 gm)	Reserve	

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>g</sub> /FeO:	91.0, mature
2. Agglutinates:	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub> :	
2. M <sub>d</sub> :	

MAJOR ELEMENTS		TRACE ELEMENTS			
(Korotev, 1982)		(Korotev, 1982)			
	%		ppm		ppm
SiO <sub>2</sub>		Sc	9.28	La	11.00
TiO <sub>2</sub>		V	22	Ce	29.7
Al <sub>2</sub> O <sub>3</sub>	26.5	Co	35.3	Nd	
Cr <sub>2</sub> O <sub>3</sub>		Ni	485	Sm	5.29
FeO	5.60	Ba	129	Eu	1.129
MnO		Sr	165	Tb	1.13
MgO	6.4	Hf	4.17	Dy	
CaO	14.5	Ta	0.527	Ho	
Na <sub>2</sub> O	0.444	Th	1.98	Tm	
K <sub>2</sub> O		U	0.48	Yb	3.70
P <sub>2</sub> O <sub>5</sub>			731	Lu	0.518
S			566		

**SOIL: 62240**

LOCATION COMMENTS: Station 2, southeast rim of Buster Crater. Collected along with 62230. Surface sample.

**GENERIC SUBSAMPLES**

1. 62241	(243.4 gm)	< 1 mm
2. 62242	(21.74 gm)	1-2 mm
3. 62243	(19.6 gm)	2-4 mm
4. 62244	(16.37 gm)	4-10 mm
5. * 62245 to 62249	(15.75 gm)	> 1 cm
6. 62240	(162.4 gm)	Reserve

\* Not included in total mass of soil.

**MISCELLANEOUS**

1. Collected mass:	463.5 gm
2. Color:	5Y 5/1 (medium olive gray)
3. Bag no.:	Doc. bag 006
4. Container:	Teflon bag; returned in unsealed vacuum container (ALSRC #1), in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL****MATURITY PARAMETERS**

1. I<sub>g</sub>/FeO: 100.0, mature
2. Agglutinates:

**GRAIN SIZE PARAMETERS**

1. M<sub>z</sub>:
2. M<sub>d</sub>:

**MAJOR ELEMENTS**

(Rose et al., 1973)

	%
SiO <sub>2</sub>	44.65
TiO <sub>2</sub>	0.56
Al <sub>2</sub> O <sub>3</sub>	27.00
Cr <sub>2</sub> O <sub>3</sub>	
FeO	5.49
MnO	0.7
MgO	5.84
CaO	15.95
Na <sub>2</sub> O	0.44
K <sub>2</sub> O	0.13
P <sub>2</sub> O <sub>5</sub>	0.10
S	

**TRACE ELEMENTS**

(Boynton et al., 1976)

	ppm		ppm
Sc	9.7	La	12.0
V	21	Ce	32
Co	25.1	Nd	
Ni		Sm	5.4
Ba	130	Eu	1.07
Sr		Tb	1.1
Hf	3.2	Dy	6.5
Ta	0.5	Ho	
Th	1.9	Tm	
U	0.54	Yb	3.6
		Lu	0.49

**SOIL: 62280**

LOCATION COMMENTS: Station 2, 45 m southeast of the rim of Buster Crater. Surface soil collected within a few meters of a 4 m diameter crater.

GENERIC SUBSAMPLES		
1. 62281	(218.5 gm)	< 1 mm
2. 62282	(21.71 gm)	1-2 mm
3. 62283	(13.11 gm)	2-4 mm
4. 62284	(14.3 gm)	4-10 mm
5. * 62285 to 62289	(11.99 gm)	> 1 cm
6. 62280	(143.0 gm)	Reserve

\* Not included in total mass of soil.

MISCELLANEOUS	
1. Collected mass:.	410.6 gm
2. Color:	5Y 6/1 (light olive gray)
3. Bag no.:	Doc. bag 011
4. Container:	Teflon bag; returned in unsealed vacuum container (ALSRC #1), in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>g</sub> /FeO:	76.0, mature
2. Agglutinates:	40

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub> :	134 μm (< 1 cm); 70 μm (< 1 mm)
2. M <sub>d</sub> :	125 μm

PETROGRAPHY		(90-150 μm)
(Heiken et al., 1973)		
Components	%	
Breccias		
Low-Grade Brown	7.0	
Low-Grade Colorless	11.3	
Med-Grade	9.6	
High-Grade	-	
Anorthosite	2.6	
Cataclastic Anorthosite	3.0	
Agglutinates	40.0	
Feldspar	16.0	
Orthopyroxene	0.6	
Clinopyroxene	1.6	
Glass:		
Colorless	4.3	
Brown	0.6	
Maskelynite		
Gray		
Schlieren	1.3	
Green	-	
Olivine	-	
Basalt	0.3	
Norite	1.3	
Anorth. Gabbro	-	
Spinel	-	
<b>Total Number Grains</b>	<b>300</b>	

<b>MAJOR ELEMENTS</b>	
(Laul & Schmitt, 1973)	
	<b>%</b>
SiO <sub>2</sub>	
TiO <sub>2</sub>	0.60
Al <sub>2</sub> O <sub>3</sub>	26.70
Cr <sub>2</sub> O <sub>3</sub>	0.11
FeO	5.50
MnO	0.67
MgO	6.6
CaO	15.90
Na <sub>2</sub> O	0.47
K <sub>2</sub> O	0.12
P <sub>2</sub> O <sub>5</sub>	
S	

<b>TRACE ELEMENTS</b>			
(Boynton et al., 1976)			
	<b>ppm</b>		<b>ppm</b>
Sc	8.9	La	10.6
V	16	Ce	26
Co	19.7	Nd	
Ni		Sm	4.6
Ba	120	Eu	1.15
Sr		Tb	1.00
Hf	2.8	Dy	5.4
Ta	0.4	Ho	
Th	1.6	Tm	
U	0.55	Yb	3.3
		Lu	0.44

**SOIL: 63320**

LOCATION COMMENTS: Station 13, under overhang of "shadow rock," a 5 x 4 m breccia boulder. Was collected as a "shadow" soil.

GENERIC SUBSAMPLES		
1. 63321	(25.67 gm)	< 1 mm
2. 63322	(2.65 gm)	1-2 mm
3. 63323	(2.02 gm)	2-4 mm
4. 63324	(1.14 gm)	4-10 mm
5. (    gm)		> 1 cm
6. 63320	(320.0 gm)	Reserve

MISCELLANEOUS	
1. Collected mass:	351.5 gm
2. Color:	
3. Bag no.:	Doc. bag 426
4. Container:	Teflon bag; returned in sample collection bag 6, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO:	47.0, submature
2. Agglutinates:	33

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub> :	153 μm (< 1 cm); 87 μm (< 1 mm)
2. M <sub>g</sub> :	150 μm

PETROGRAPHY (90-150 μm) (Heiken et al., 1973)	
Components	%
Breccias	
Low-Grade Brown	4.6
Low-Grade Colorless	14.0
Med-Grade	23.3
High-Grade	0.6
Anorthosite	1.6
Cataclastic Anorthosite	9.6
Agglutinates	32.6
Feldspar	9.6
Orthopyroxene	1.6
Clinopyroxene	1.0
Glass:	
Colorless	4.3
Brown	0.3
Maskelynite	-
Gray	
Schlieren	-
Green	-
Olivine	-
Basalt	-
Norite	1.6
Anorth. Gabbro	-
Spinel	-
<b>Total Number Grains</b>	<b>300</b>

<b>MAJOR ELEMENTS</b>	
(Brunfelt et al., 1973)	
	<b>%</b>
SiO <sub>2</sub>	
TiO <sub>2</sub>	0.35
Al <sub>2</sub> O <sub>3</sub>	28.93
Cr <sub>2</sub> O <sub>3</sub>	0.94
FeO	4.67
MnO	0.68
MgO	6.96
CaO	15.67
Na <sub>2</sub> O	0.57
K <sub>2</sub> O	0.77
P <sub>2</sub> O <sub>5</sub>	
S	

<b>TRACE ELEMENTS</b>			
(Boynton et al., 1976)			
	<b>ppm</b>		<b>ppm</b>
Sc	8.2	La	9.3
V	15	Ce	24
Co	19.8	Nd	
Ni		Sm	4.1
Ba	130	Eu	1.21
Sr		Tb	0.78
Hf	3.3	Dy	5.9
Ta	0.5	Ho	
Th	1.3	Tm	
U	0.44	Yb	3.1
		Lu	0.45



**SOIL: 63340**

LOCATION COMMENTS: Station 13, under overhang of "shadow rock," a 5 x 4 m breccia boulder. Was collected as a "shadow" soil.

GENERIC SUBSAMPLES		
1. 63341	(25.88 gm)	< 1 mm
2. 63342	(2.52 gm)	1-2 mm
3. 63343	(2.13 gm)	2-4 mm
4. 63344	(0.96 gm)	4-10 mm
5. (    gm)		> 1 cm
6. 63340	(149.7 gm)	Reserve

MISCELLANEOUS	
1. Collected mass:	181.2 gm
2. Color:	
3. Bag no.:    Doc.    bag	427
4. Container:	Teflon bag; returned in sample collection bag 6, in air. Processed in N <sub>2</sub>

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>g</sub> /FeO:	54.0
2. Agglutinates:	40

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub> :	144 μm (< 1cm);    80 μm (< 1 mm)
2. M <sub>d</sub> :	130 μm

PETROGRAPHY	
	(90-150 μm)
	(Heiken et al., 1973)
Components	%
Breccias	
Low-Grade Brown	5.3
Low-Grade Colorless	14.9
Med-Grade	14.6
High-Grade	0.7
Anorthosite	2.6
Cataclastic Anorthosite	3.3
Agglutinates	40.0
Feldspar	12.6
Orthopyroxene	0.7
Clinopyroxene	1.0
Glass:	
Colorless	1.3
Brown	0.7
Maskelynite	-
Gray	
Schlieren	-
Green	-
Olivine	-
Basalt	1.7
Norite	0.3
Anorth. Gabbro	-
Spinel	-
<b>Total Number Grains</b>	<b>302</b>

MAJOR ELEMENTS		TRACE ELEMENTS			
(Brunfelt et al., 1973)		Krähenbuhl et al., 1973)			
	%		ppm		ppm
SiO <sub>2</sub>		Sc		La	
TiO <sub>2</sub>	0.60	V		Ce	
Al <sub>2</sub> O <sub>3</sub>	29.00	Co		Nd	
Cr <sub>2</sub> O <sub>3</sub>	0.95	Ni		Sm	
FeO	4.53	Ba		Eu	
MnO	0.67	Sr		Tb	
MgO	7.30	Hf		Dy	
CaO	12.45	Ta		Ho	
Na <sub>2</sub> O	0.56	Th		Tm	
K <sub>2</sub> O	0.15	U	398	Yb	
P <sub>2</sub> O <sub>5</sub>				Lu	
S					

**SOIL: 63500**

LOCATION COMMENTS: Station B. "Reference" soil, collected 5 m west, northwest of "shadow rock."  
Rake soil.

GENERIC SUBSAMPLES		
1. 63501	(342.5 gm)	< 1 mm
2. 63502	(25.29 gm)	1-2 mil
3. 63503	(14.53 gm)	2-4 mm
4. 63504	(17.34 gm)	4-10 mm
5.* 63505 to 63515	(19.07 gm)	> 1 cm
6. 63500	(201.8 gm)	Reserve

\* Not included in total mass of soil.

MISCELLANEOUS	
1. Collected mass:	601.5 gm
2. Color:	N6 (med. light gray)
3. Bag no.:	Doc. bag 346
4. Container:	Teflon bag; returned in sample collection bag 4, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO:	46.0, submature
2. Agglutinates:	10

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub> :	110 μm (< 1 cm); 71 μm (< 1 mm)
2. M <sub>g</sub> :	108 μm

PETROGRAPHY (90-150 μm)	
(Heiken et al., 1973)	
Components	%
Breccias	
Low-Grade Brown	7.0
Low-Grade Colorless	16.7
Med-Grade	11.6
High-Grade	1.0
Anorthosite	2.0
Cataclastic Anorthosite	1.0
Agglutinates	44.6
Feldspar	10.3
Orthopyroxene	1.0
Clinopyroxene	1.0
Glass:	
Colorless	1.6
Brown	0.3
Maskelynite	-
Gray	
Schlieren	0.3
Green	-
Olivine	-
Basalt	0.3
Norite	1.3
Anorth. Gabbro	-
Spinel	-
<b>Total Number Grains</b>	<b>300</b>

<b>MAJOR ELEMENTS</b>	
(Bansal et al., 1973)	
	<b>%</b>
SiO <sub>2</sub>	45.02
TiO <sub>2</sub>	0.53
Al <sub>2</sub> O <sub>3</sub>	27.72
Cr <sub>2</sub> O <sub>3</sub>	
FeO	4.72
MnO	0.70
MgO	5.25
CaO	15.87
Na <sub>2</sub> O	0.46
K <sub>2</sub> O	0.9
P <sub>2</sub> O <sub>5</sub>	0.10
S	

<b>TRACE ELEMENTS</b>			
(Wanke et al., 1975)			
	<b>ppm</b>		<b>ppm</b>
Sc	7.43	La	0.99
V		Ce	20
Co	6.19	Nd	-
Ni	-	Sm	0.45
Ba		Eu	1.06
Sr	190	Tb	0.13
Hf	0.56	Dy	0.94
Ta	0.03	Ho	
Th		Tm	
U		Yb	0.68
		Lu	0.10

**SOIL: 64420**

LOCATION COMMENTS: Station 4, near Cinco B Crater, on floor of subdued 15 m crater. From the bottom of a 15 cm deep trench.

GENERIC SUBSAMPLES		
1. 64421	(206.9 gm)	< 1 mm
2. 64422	(6.17 gm)	1-2 mm
3. 64423	(3.76 gm)	2-4 mm
4. 64424	(2.06 gm)	4-10 mm
5.* 64425	(14.62 gm)	> 1 cm
6. 64420	(112.2 gm)	Reserve

\* Not included in total mass of soil.

MISCELLANEOUS	
1. Collected mass:	331.1 gm
2. Color:	5YR 4/1 (brownish gray)
3. Bag no.:	Doc. bag 399
4. Container:	Teflon bag; returned in sample collection bag 3, in air. Processed in N <sub>2</sub>

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO:	83.0, mature
2. Agglutinates:	54

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub> :	78 μm (< 1 mm)
2. M <sub>d</sub> :	

PETROGRAPHY	
(Butler et al., 1973)	(53-74 μm)
Components	%
Olivine	0.6
Pyroxene	1.1
Plagioclase	13.6
Glass	10.6
Rock Fragments	22.9
Agglutinates	52.6

MAJOR ELEMENTS	
(Apollo 16 P.E.T., 1973)	
	%
SiO <sub>2</sub>	44.88
TiO <sub>2</sub>	0.55
Al <sub>2</sub> O <sub>3</sub>	27.60
Cr <sub>2</sub> O <sub>3</sub>	
FeO	5.03
MnO	0.06
MgO	5.35
CaO	15.81
Na <sub>2</sub> O	0.39
K <sub>2</sub> O	0.10
P <sub>2</sub> O <sub>5</sub>	0.13
S	0.07

TRACE ELEMENTS			
(Wanke et al., 1973)			
	ppm		ppm
Sc	7.9	La	12.3
V		Ce	35
Co	25.0	Nd	-
Ni		Sm	5.7
Ba	115	Eu	1.14
Sr		Tb	1.1
Hf	4.0	Dy	6.8
Ta	0.50	Ho	1.6
Th		Tm	
U		Yb	4.0
		Lu	0.57

**SOIL: 64500**

LOCATION COMMENTS: Station 4. In the vicinity of Cinco B Crater, near the rim of a subdued 15 m crater. Rake soil sample. Gray surface underlain by white layer.

GENERIC SUBSAMPLES		
1.	64501 ( 495.7 gm)	< 1 mm
2.	64502 (28.38 gm)	1-2 mm
3.	64503 (24.11 gm)	2-4 ma
4.	64504 (24.15 gm)	4-10 mm
5.*	64505 to 64525 (31.23 gm)	> 1 cm
6.	64500 ( 320.6 gm)	Reserve

\* Not included in total mass of soil.

MISCELLANEOUS	
1.	Collected mass: 892.9 gm
2.	Color: 5Y 5/1 (med. olive gray)
3.	Bag no.: Doc. bag 396
4.	Container: Teflon bag; returned in sample collection bag 1, in air. Processed in N <sub>2</sub>

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1.	I <sub>s</sub> /FeO: 61.0, mature
2.	Agglutinates: 52

GRAIN SIZE PARAMETERS	
1.	M <sub>z</sub> : 104 µm (< 1 cm); 65 µm (< 1 mm)
2.	M <sub>d</sub> : 88 µm

PETROGRAPHY (90-150 µm)	
(Heiken et al., 1973)	
Components	%
Breccias	
Low-Grade Brown	5.3
Low-Grade Colorless	6.6
Med-Grade	5.6
High-Grade	3.6
Anorthosite	2.0
Cataclastic Anorthosite	1.0
Agglutinates	51.6
Feldspar	20.3
Orthopyroxene	0.3
Clinopyroxene	0.3
Glass:	
Colorless	1.6
Brown	1.0
Maskelynite	-
Gray	
Schlieren	0.3
Green	-
Olivine	-
Basalt	-
Norite	0.3
Anorth. Gabbro	-
Spinel	-
<b>Total Number Grains</b>	<b>300</b>

<b>MAJOR ELEMENTS</b>	
(Haskin et al., 1973)	
	<b>%</b>
SiO <sub>2</sub>	
TiO <sub>2</sub>	0.53
Al <sub>2</sub> O <sub>3</sub>	27.4
Cr <sub>2</sub> O <sub>3</sub>	
FeO	4.16
MnO	
MgO	4.27
CaO	16.6
Na <sub>2</sub> O	0.47
K <sub>2</sub> O	0.11
P <sub>2</sub> O <sub>5</sub>	
S	

<b>TRACE ELEMENTS</b>			
(Haskin et al., 1973)			
	<b>ppm</b>		<b>ppm</b>
Sc	10.4	La	11.7
V		Ce	30.3
Co	21.0	Nd	20.3
Ni	290.0	Sm	5.48
Ba		Eu	1.18
Sr		Tb	1.18
Hf	4.7	Dy	7.3
Ta		Ho	1.5
Th		Tm	
U		Yb	3.74
		Lu	0.54

**SOIL: 64800**

LOCATION COMMENTS: Station 4b, slopes of Stone Mountain. Collected as a surface sample on the rim of a 20 m diameter crater.

GENERIC SUBSAMPLES		
1. 64801	(286.8 gm)	< 1 mm
2. 64802	(10.96 gm)	1-2 mm
3. 64803	(8.09 gm)	2-4 mm
4. 64804	(7.89 gm)	4-10 mm
5. (    gm)		> 1 cm
6. 64800	(166.3 gm)	Reserve

MISCELLANEOUS	
1. Collected mass:	480 gm
2. Color:	5YR 4/1 (brownish gray)
3. Bag no.: Doc. bag	400
4. Container:	Teflon bag; returned in sample collection bag 3, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO:	71.0, mature
2. Agglutinates:	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub> :	60 μm (< 1 mm)
2. M <sub>d</sub> :	

PETROGRAPHY	
(53-74 μm)	
(Butler et al., 1973)	
Components	%
Olivine	1.4
Pyroxene	1.4
Plagioclase	12.3
Glass	5.9
Rock Fragments	21.7
Agglutinates	57.4

MAJOR ELEMENTS	
(Taylor et al., 1973)	
	%
SiO <sub>2</sub>	44.90
TiO <sub>2</sub>	0.47
Al <sub>2</sub> O <sub>3</sub>	27.70
Cr <sub>2</sub> O <sub>3</sub>	0.11
FeO	5.01
MnO	
MgO	5.69
CaO	15.70
Na <sub>2</sub> O	0.51
K <sub>2</sub> O	0.22
P <sub>2</sub> O <sub>5</sub>	0.16
S	

TRACE ELEMENTS			
(Taylor et al., 1973)			
	ppm		ppm
Sc	5.6	La	12.8
V	28	Ce	37.1
Co	27	Nd	16.7
Ni		Sm	4.95
Ba	175	Eu	0.99
Sr		Tb	1.01
Hf	3.50	Dy	6.25
Ta		Ho	1.44
Th	2.17	Tm	0.66
U	0.61	Yb	4.00
		Lu	0.62



**SOIL: 64810**

LOCATION COMMENTS: Station 4b, on the slopes of Stone Mountain. Collected as a rake sample on rim of a 20 m diameter crater.

<b>GENERIC SUBSAMPLES</b>	
1. 64811 (174.7 gm)	<1 mm
2. 64812 (9.53 gm)	1-2 mm
3. 64813 (9.1 gm)	2-4 mm
4. 64814 (5.35 gm)	4-10 mm
5.* 64815 to 64837 (111.82 gm)	> 1 cm
6. 64810 (102.14 gm):	Reserve

\* Not included in total mass of soil.

<b>MISCELLANEOUS</b>	
1. Collected mass:	300.8 gm
2. Color:	
3. Bag no.:	Doc. bag 401
4. Container:	Teflon bag; returned in sample collection bag 3, in air. Processed in N <sub>2</sub>

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

<b>MATURITY PARAMETERS</b>	
1. I <sub>g</sub> /FeO:	54.0, submature
2. Agglutinates:	

<b>GRAIN SIZE PARAMETERS</b>	
1. M <sub>z</sub> : 40 μm (< 1mm)	
2. M <sub>d</sub> :	

<b>PETROGRAPHY</b>	(53-74 μm)
(Butler et al., 1973)	
<b>Components</b>	<b>%</b>
Olivine	1.1
Pyroxene	3.2
Plagioclase	23.2
Glass	10.0
Rock Fragments	28.0
Agglutinates	34.3

<b>MAJOR ELEMENTS</b>	
(Simkin et al., 1973)	
	<b>%</b>
SiO <sub>2</sub>	44.6
TiO <sub>2</sub>	0.49
Al <sub>2</sub> O <sub>3</sub>	26.9
Cr <sub>2</sub> O <sub>3</sub>	0.11
FeO	5.59
MnO	0.40
MgO	5.50
CaO	15.5
Na <sub>2</sub> O	0.50
K <sub>2</sub> O	0.19
P <sub>2</sub> O <sub>5</sub>	
S	

<b>TRACE ELEMENTS</b>			
(Korotev, 1982)			
	<b>ppm</b>		<b>ppm</b>
Sc	9.27	La	14.21
V	21	Ce	38.3
Co	35.5	Nd	
Ni	465	Sm	6.82
Ba	159	Eu	1.185
Sr	165	Tb	1.44
Hf	5.67	Dy	
Ta	0.758	Ho	
Th	2.68	Tm	
U	0.70	Yb	4.83
		Lu	0.684

**SOIL: 65500**

LOCATION COMMENTS: Station 5, on the inner rim of a 20 m diameter crater. Rake soil. Gray surface with lighter gray immediately below the surface. Friable aggregates (clods) included in sample.

GENERIC SUBSAMPLES			MISCELLANEOUS	
1.	65501	(150.0 gm)	< 1 mm	1. Collected mass: 618.2 gm
2.	65502	(9.5 gm)	1-2 mm	2. Color:
3.	65503	(23.24 gm)	2-4 mm	3. Bag no.: Doc. bag 333
4.	65504	(22.48 gm)	4-10 mm	4. Container: Teflon bag; returned in vacuum container (ALSRC 2). Processed in N <sub>2</sub>
5.	( )	( gm)	> 1 cm	
6.	65500	( 413.0 gm)	Reserve	

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS		PETROGRAPHY	
1.	I <sub>s</sub> /FeO: 38.0, submature	(Butler et al., 1973)	(53-74 μm)
2.	Agglutinates:	<b>Components</b>	%
		Olivine	1.6
		Pyroxene	3.1
		Plagioclase	11.0
		Glass	8.5
		Rock Fragments	42.5
		Agglutinates	33.5

GRAIN SIZE PARAMETERS	
1.	M <sub>z</sub> : 44 μm (< 1 mm)
2.	M <sub>d</sub> :

MAJOR ELEMENTS		TRACE ELEMENTS			
(Duncan et al., 1973)		(Duncan et al., 1973)			
	%		ppm		ppm
SiO <sub>2</sub>	45.50	Sc		La	
TiO <sub>2</sub>	0.70	V		Ce	
Al <sub>2</sub> O <sub>3</sub>	26.07	Co		Nd	
Cr <sub>2</sub> O <sub>3</sub>		Ni	290	Sm	
FeO	5.96	Ba	175	Eu	
MnO	0.79	Sr	162	Tb	
MgO	6.28	Hf		Dy	
CaO	14.97	Ta		Ho	
Na <sub>2</sub> O	0.44	Th		Tm	
K <sub>2</sub> O	0.15	U		Yb	
P <sub>2</sub> O <sub>5</sub>	0.16			Lu	
S					

**SOIL: 65510**

LOCATION COMMENTS: Station 5, on the inner rim of a 20 m diameter crater. Soil collected with rake sample. Surface sample.

GENERIC SUBSAMPLES			MISCELLANEOUS	
1.	65511	(190.2 gm)	< 1 mm	1. Collected mass: 410.3 gm
2.	65512	(14.68 gm)	1-2 mm	2. Color:
3.	65513	(20.21 gm)	2-4 mm	3. Bag no.: Doc. bag 332
4.	65514	(13.98 gm)	4-10 mm	4. Container: Teflon bag; returned in vacuum container (ALSRC #2). Processed in N <sub>2</sub> .
5.*	65515 to 65588 (178.0 gm)		> 1 cm	
6.	65500	(171.3 gm)	Reserve	

\* Not included in total mass of soil.

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO:	55, submature
2. Agglutinates:	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub> :	
2. M <sub>d</sub> :	

MAJOR ELEMENTS	
(Korotev, 1982)	
	%
SiO <sub>2</sub>	
TiO <sub>2</sub>	
Al <sub>2</sub> O <sub>3</sub>	25.3
Cr <sub>2</sub> O <sub>3</sub>	
FeO	5.82
MnO	
MgO	6.7
CaO	14.2
Na <sub>2</sub> O	0.474
K <sub>2</sub> O	
P <sub>2</sub> O <sub>5</sub>	
S	

TRACE ELEMENTS			
(Korotev, 1982)			
	ppm		ppm
Sc	10.59	La	15.90
V	24	Ce	42.7
Co	26.3	Nd	
Ni	370	Sm	7.56
Ba	172	Eu	1.233
Sr	165	Tb	1.59
Hf	6.15	Dy	
Ta	0.834	Ho	
Th	2.84	Tm	
U	0.74	Yb	5.35
Cr	847	Lu	0.751
Mn	610		

**SOIL: 65700**

LOCATION COMMENTS: Station 5, interior wall of a 20 m diameter crater. Surface soil to accompany rake sample.

**GENERIC SUBSAMPLES**

1. 65701	(171.3 gm)	< 1 mm
2. 65702	(4.89 gm)	1-2 mm
3. 65703	(1.58 gm)	2-4 mm
4. 65704	(1.39 gm)	4-10 mm
5.	( gm)	> 1 cm
6. 65700	(92.3 gm)	Reserve

**MISCELLANEOUS**

1. Collected mass:	271.5 gm
2. Color:	5Y 4/1 (olive gray)
3. Bag no.:	Doc. bag 402
4. Container:	Teflon bag; returned in sample bag 1, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL****MATURITY PARAMETERS**

1. I <sub>s</sub> /FeO:	106.0, mature
2. Agglutinates:	

**GRAIN SIZE PARAMETERS**

1. M <sub>z</sub> :	56 µm (< 1 mm)
2. M <sub>d</sub> :	

**MAJOR ELEMENTS**

(Apollo 16 P.E.T., 1973)

	%
SiO <sub>2</sub>	45.03
TiO <sub>2</sub>	0.64
Al <sub>2</sub> O <sub>3</sub>	26.47
Cr <sub>2</sub> O <sub>3</sub>	
FeO	5.87
MnO	0.08
MgO	6.02
CaO	15.29
Na <sub>2</sub> O	0.41
K <sub>2</sub> O	0.12
P <sub>2</sub> O <sub>5</sub>	0.13
S	0.09

**TRACE ELEMENTS**

(Haskin et al., 1973)

	ppm		ppm
Sc	10.11	La	14.7
V		Ce	38.3
Co	31.7	Nd	25.4
Ni	510.0	Sm	7.01
Ba		Eu	1.27
Sr		Tb	1.46
Hf	5.4	Dy	9.6
Ta		Ho	-
Th		Tm	
U		Yb	5.05
		Lu	0.71

**SOIL: 65900**

LOCATION COMMENTS: Station 5, collected on the interior wall of a 20 m diameter crater, very close to the rim. Surface soil to accompany a rake sample.

GENERIC SUBSAMPLES		
1. 65901	(393.2 gm)	< 1 mm
2. 65902	(14.84 gm)	1-2 mm
3. 65903	(11.40 gm)	2-4 mm
4. 65904	(9.51 gm)	4-10 mm
5.	( gm)	> 1 cm
6. 65900	(233.2 gm)	Reserve

MISCELLANEOUS	
1. Collected mass:	662.15 gm
2. Color:	5Y 4/1 (olive gray)
3. Bag no.:	Doc. bag 406
4. Container:	Teflon bag; returned in sample bag 1, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO:	99.0, mature
2. Agglutinates:	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub> :	71 um (< 1 mm)
2. M <sub>d</sub> :	

PETROGRAPHY	(53-74 um)
(Butler et al., 1973)	
Components	%
Olivine	0.7
Pyroxene	1.8
Plagioclase	10.9
Glass	19.7
Rock Fragments	33.5
Agglutinates	44.4

MAJOR ELEMENTS	
(Laul & Schmitt, 1973)	
	%
SiO <sub>2</sub>	
TiO <sub>2</sub>	0.61
Al <sub>2</sub> O <sub>3</sub>	26.5
Cr <sub>2</sub> O <sub>3</sub>	0.110
FeO	5.8
MnO	0.070
MgO	6.2
CaO	15.0
Na <sub>2</sub> O	0.470
K <sub>2</sub> O	0.11
P <sub>2</sub> O <sub>5</sub>	
S	

TRACE ELEMENTS			
(Laul & Schmitt, 1973)			
	ppm		ppm
Sc	11	La	15.1
V	25	Ce	37
Co	30	Nd	26
Ni		Sm	6.7
Ba	140	Eu	1.22
Sr		Tb	1.4
Hf	4.7	Dy	8.2
Ta	0.62	Ho	
Th	2.5	Tm	
U	0.80	Yb	4.9
		Lu	0.70

**SOIL: 66030**

LOCATION COMMENTS: Station 6, at the base of Stone Mountain. Soil collected with a breccia sample on the rim of a 10 m diameter crater.

GENERIC SUBSAMPLES			MISCELLANEOUS	
1.	66031	(75.6 gm)	< 1 mm	1. Collected mass: 134.6 gm
2.	66032	(2.99 gm)	1-2 mm	2. Color:
3.	66033	(2.16 gm)	2-4 mm	3. Bag no.: Doc. bag 407
4.	66034	(3.36 gm)	4-10 mm	4. Container: Teflon bag; returned in sample collection bag 1, in air.
5.*	66035 to 66037 (219.5 gm)		> 1 cm	Processed in N <sub>2</sub> .
6.	66030	(50.49 gm):	Reserve	

\* Not included in total mass of soil.

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1.	I <sub>g</sub> /FeO: 102.0, mature
2.	Agglutinates:

GRAIN SIZE PARAMETERS	
1.	M <sub>z</sub> : 95 μm (< 1 mm)
2.	M <sub>0</sub> :

MAJOR ELEMENTS	
(Korotev, 1982)	
	%
SiO <sub>2</sub>	
TiO <sub>2</sub>	
Al <sub>2</sub> O <sub>3</sub>	26.7
Cr <sub>2</sub> O <sub>3</sub>	
FeO	5.80
MnO	
MgO	6.8
CaO	14.6
Na <sub>2</sub> O	0.440
K <sub>2</sub> O	
P <sub>2</sub> O <sub>5</sub>	
S	

TRACE ELEMENTS			
(Korotev, 1982)			
	ppm		ppm
Sc	9.95	La	13.65
V	22	Ce	36.8
Co	34.2	Nd	
Ni	480	Sm	6.50
Ba	144	Eu	1.192
Sr	155	Tb	1.37
Hf	5.01	Dy	
Ta	0.685	Ho	
Th	2.49	Tm	
U	0.70	Yb	4.55
Cr	777	Lu	0.642
Mn	582		

**SOIL: 66040**

LOCATION COMMENTS: Station 6, at the base of Stone Mountain. Surface soil collected next to 66030 on the rim of a 10 m diameter crater.

GENERIC SUBSAMPLES			MISCELLANEOUS
1. 66041	(357.4 gm)	< 1 mm	1. Collected mass: 570.2 gm
2. 66042	(19.5 gm)	1-2 mm	2. Color: Gray (field description)
3. 66043	(15.5 gm)	2-4 mm	3. Bag no.: Doc. bag 338
4. 66044	(11.3 gm)	4-10 mm	4. Container: Teflon bag; returned in vacuum container (ALSRC #2). Processed in N <sub>2</sub> .
5. ( )	( gm)	> 1 cm	
6. 66040	(166.5 gm)	Reserve	

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>g</sub> /FeO:	90.0, mature
2. Agglutinates:	39

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub> :	112 μm
2. M <sub>d</sub> :	

PETROGRAPHY	
(53-74 μm)	
(Butler et al., 1973)	
Components	%
Olivine	1.9
Pyroxene	3.5
Plagioclase	12.4
Glass	9.0
Rock Fragments	30.4
Agglutinates	42.8

MAJOR ELEMENTS	
(Apollo 16 P.E.T., 1973)	
	%
SiO <sub>2</sub>	45.07
TiO <sub>2</sub>	0.64
Al <sub>2</sub> O <sub>3</sub>	26.39
Cr <sub>2</sub> O <sub>3</sub>	
FeO	6.08
MnO	0.08
MgO	6.14
CaO	15.29
Na <sub>2</sub> O	0.38
K <sub>2</sub> O	0.12
P <sub>2</sub> O <sub>5</sub>	0.15
S	0.09

TRACE ELEMENTS			
(Rose et al., 1973)			
	ppm		ppm
Sc	10	La	-
V	22	Ce	
Co	21	Nd	
Ni	330	Sm	
Ba	120	Eu	
Sr	145	Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	3.6
		Lu	

**SOIL: 66080**

LOCATION COMMENTS: Station 6, near base of Stone Mountain. Patch of white (light gray) soil or soil aggregate exposed at the surface. Along the west rim of a 10 m diameter crater.

GENERIC SUBSAMPLES		
1.	66081 (177.3 gm)	< 1 mm
2.	66082 (9.85 gm)	1-2 mm
3.	66083 (4.53 gm)	2-4 mm
4.	66084 (3.13 gm)	4-10 mm
5.*	66085 to 66086 (5.69 gm)	> 1 cm
6.	66080 (106.1 gm)	Reserve

\* Not included in total mass of soil.

MISCELLANEOUS	
1.	Collected mass: 300.9 gm
2.	Color: Light gray (field description)
3.	Bag no.: Doc. bag 339
4.	Container: Teflon bag; returned in vacuum container (ALSRC #2). Processed in N <sub>2</sub>

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1.	I <sub>s</sub> /FeO: 80.0, mature
2.	Agglutinates: 53

GRAIN SIZE PARAMETERS:	
1.	M <sub>z</sub> : 76 μm
2.	M <sub>d</sub> :

PETROGRAPHY	
(Butler et al., 1973)	
<b>Components</b>	<b>%</b>
Olivine	1.4
Pyroxene	1.4
Plagioclase	9.7
Glass	4.3
Rock Fragments	28.1
Agglutinates	55.1

MAJOR ELEMENTS	
(Apollo 16 P.E.T., 1973)	
	%
SiO <sub>2</sub>	45.38
TiO <sub>2</sub>	0.67
Al <sub>2</sub> O <sub>3</sub>	26.22
Cr <sub>2</sub> O <sub>3</sub>	
FeO	5.85
MnO	0.08
MgO	6.39
CaO	15.28
Na <sub>2</sub> O	0.39
K <sub>2</sub> O	0.13
P <sub>2</sub> O <sub>5</sub>	0.13
S	0.09

TRACE ELEMENTS			
(Rose et al., 1973)			
	ppm		ppm
Sc	10	La	-
V	19	Ce	
Co	21	Nd	
Ni	348	Sm	
Ba	130	Eu	
Sr	210	Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	4.2
		Lu	



**SOIL: 67460**

LOCATION COMMENTS: Station 11, on the south rim of North Ray Crater. Soil collected from fillet around white breccia boulders several meters in diameter.

<b>GENERIC SUBSAMPLES</b>		
1. 67461	(222.2 gm)	< 1 mm
2. 67462	(17.4 gm)	1-2 mm
3. 67463	(6.24 gm)	2-4 mm
4. 67464	(0.7gm)	4-10 mm
5.	( gm)	> 1 cm
6. 67460	(123.7 gm)	Reserve

<b>MISCELLANEOUS</b>	
1. Collected mass:	370.24 gm
2. Color:	N7 (light gray)
3. Bag no.:	Doc. bag 417
4. Container:	Teflon bag; returned in sample collection bag 6, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

<b>MATURITY PARAMETERS</b>	
1. I <sub>g</sub> /FeO:	25.0, immature
2. Agglutinates:	

<b>GRAIN SIZE PARAMETERS</b>	
1. M <sub>z</sub> :	
2. M <sub>d</sub> :	

<b>PETROGRAPHY</b>	(90-100 μm)
(Simon et al., 1981)	
<b>Components</b>	<b>%</b>
Lithic Fragments	
Mare Component	
Mare Basalt	0.5
Highland Components	
ANT	21.7
LMB	30.7
Feldsp. Basalt	1.6
RNB/POIK	7.9
Fused Soil Component	
DMB	11.1
Agglutinate	8.5
Mineral Frag.	
Mafic	0.5
Plagioclase	12.2
Opaque	1.1
Glass Fragments	
Orange/black	0.5
Yellow/green	-
Brown	-
Clear	-
Miscellaneous	
Devitrified glass	3.4
Others	-
<b>Total</b>	<b>100.1</b>
<b>No. of points</b>	<b>942</b>

<b>MAJOR ELEMENTS</b>	
(Compston et al., 1973)	
	<b>%</b>
SiO <sub>2</sub>	44.77
TiO <sub>2</sub>	0.37
Al <sub>2</sub> O <sub>3</sub>	28.99
Cr <sub>2</sub> O <sub>3</sub>	
FeO	4.35
MnO	0.07
MgO	4.20
CaO	16.85
Na <sub>2</sub> O	0.44
K <sub>2</sub> O	0.06
P <sub>2</sub> O <sub>5</sub>	0.05
S	

<b>TRACE ELEMENTS</b>			
(Boynton et al., 1976)			
	<b>ppm</b>		<b>ppm</b>
Sc	7.8	La	6.7
V	17	Ce	18
Co	13.0	Nd	
Ni		Sm	3.0
Ba	90	Eu	1.10
Sr		Tb	0.59
Hf	1.8	Dy	3.6
Ta	0.3	Ho	
Th	1.0	Tm	
U	-	Yb	2.1
		Lu	0.28

**SOIL: 67480**

LOCATION COMMENTS: Station 11, on the south rim of North Ray Crater. Reference soil to accompany fillet sample 67460. Collected from the surface, about 1 m from the breccia boulders.

GENERIC SUBSAMPLES		
1. 67481	(132.7 gm)	< 1 mm
2. 67482	(14.65 gm)	1-2 mm
3. 67483	(8.37 gm)	2-4 mm
4. 67484	(6.02 gm)	4-10 mm
5.* 67485 to 67495	( gm)	> 1 cm
6.	( gm)	Reserve

\* Not included in total mass of soil.

MISCELLANEOUS	
1. Collected mass:	248.8 gm
2. Color:	N6 to N7 (med. light gray to light gray)
3. Bag no.:	Doc. bag 419
4. Container:	Teflon bag; returned in sample collection bag 6, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>g</sub> /FeO:	31.0, submature
2. Agglutinates:	23

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub> :	178 μm (< 1cm); 110 μm (< 1 mm)
2. M <sub>d</sub> :	272 μm

PETROGRAPHY	(90-150 μm)
(Heiken et al., 1973)	
Components	%
Breccias	
Low-Grade Brown	6.3
Low-Grade Colorless	20.3
Med-Grade	20.0
High-Grade	1.0
Anorthosite	2.6
Cataclastic Anorthosite	7.3
Agglutinates	23.0
Feldspar	15.0
Orthopyroxene	0.3
Clinopyroxene	0.6
Glass:	
Colorless	1.3
Brown	1.0
Maskelynite	-
Gray	
Schlieren	-
Green	-
Olivine	0.3
Basalt	-
Norite	0.3
Anorth. Gabbro	-
Spinel	0.3
<b>Total Number Grains</b>	<b>300</b>

<b>MAJOR ELEMENTS</b>	
(Apollo 16 P.E.T., 1973)	
	<b>%</b>
SiO <sub>2</sub>	44.95
TiO <sub>2</sub>	0.41
Al <sub>2</sub> O <sub>3</sub>	29.01
Cr <sub>2</sub> O <sub>3</sub>	
FeO	4.66
MnO	0.06
MgO	4.20
CaO	16.54
Na <sub>2</sub> O	0.42
K <sub>2</sub> O	0.06
P <sub>2</sub> O <sub>5</sub>	0.13
S	0.03

<b>TRACE ELEMENTS</b>			
(Boynton et al., 1976)			
	<b>ppm</b>		<b>ppm</b>
Sc	7.1	La	7.3
V	14	Ce	18
Co	14.9	Nd	
Ni		Sm	3.3
Ba	90	Eu	1.16
Sr		Tb	0.66
Hf	1.9	Dy	3.9
Ta	0.3	Ho	
Th	1.1	Tm	
U	0.49	Yb	2.4
		Lu	0.32

**SOIL: 67510**

LOCATION COMMENTS: Station 11, on the rim of North Ray Crater. Soil collected with a rake sample, within a few meters of several white breccia boulders, along with samples 67460 and 67480.

GENERIC SUBSAMPLES			MISCELLANEOUS	
1.	67511	(59.5 gm)	< 1 mm	1. Collected mass: 133.6 gm
2.	67512	(14.46 gm)	1-2 mm	2. Color:
3.	67513	(19.39 gm)	2-4 mm	3. Bag no.: Doc. bag 420
4.	67514	(31.03 gm)	4-10 mm	4. Container: Teflon bag; returned in sample collection bag 6, in air. Processed in N <sub>2</sub>
5.*	67515 to 67576 (260.0 gm)		> 1 cm	
6.	67510	(9.22 gm)	Reserve	

\* 32 rocks; not included in total mass of soil.

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1.	I <sub>s</sub> /FeO: 8.8, immature
2.	Agglutinates:

GRAIN SIZE PARAMETERS:	
1.	M <sub>z</sub> : Probably too biased by rake sample
2.	M <sub>q</sub> : Collection held in same bag for a dependable analysis.

MAJOR ELEMENTS	
(Korotev, 1982)	
	%
SiO <sub>2</sub>	
TiO <sub>2</sub>	
Al <sub>2</sub> O <sub>3</sub>	28.6
Cr <sub>2</sub> O <sub>3</sub>	
FeO	4.10
MnO	
MgO	4.0
CaO	15.7
Na <sub>2</sub> O	0.390
K <sub>2</sub> O	
P <sub>2</sub> O <sub>5</sub>	
S	

TRACE ELEMENTS			
(Korotev, 1982)			
	ppm		ppm
Sc	8.18	La	3.42
V	<20	Ce	9.24
Co	7.18	Nd	
Ni	55	Sm	1.71
Ba	45	Eu	0.968
Sr	155	Tb	0.39
Hf	1.24	Dy	
Ta	0.192	Ho	
Th	0.51	Tm	
U	0.158	Yb	1.34
Cr	500	Lu	0.191
Mn	493		

**SOIL: 67600**

LOCATION COMMENTS: Station 11, south rim of North Ray Crater. Soil to accompany rake sample 67610. Within a few meters of a 1 or 2 m diameter white breccia boulder.

GENERIC SUBSAMPLES			MISCELLANEOUS	
1.	67601	(161.8 gm)	< 1 mm	1. Collected mass: 186.2 gm
2.	67602	(13.45 gm)	1-2 mm	2. Color: N6 (med. light gray)
3.	67603	(6.16 gm)	2-4 mm	3. Bag no.: Doc. bag 422
4.	67604	(2.62 gm)	4-10 mm	4. Container: Teflon bag; returned in sample collection bag 6, in air. Processed in N <sub>2</sub> .
5.*	67605	(44.52 gm)	> 1 cm	
6.	67606	(2.17 gm)	Reserve	

\* Not included in total mass of soil.

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS		PETROGRAPHY (90-150 $\mu$ m)	
1.	I <sub>g</sub> /FeO: 45.0, submature	(Heiken et al., 1973)	
2.	Agglutinates: 36	<b>Components</b>	%
		Breccias	
		Low-Grade Brown	4.6
		Low-Grade Colorless	24.0
		Med-Grade	11.3
		High-Grade	0.3
		Anorthosite	2.3
		Cataclastic Anorthosite	1.3
		Agglutinates	36.0
		Feldspar	14.0
		Orthopyroxene	1.3
		Clinopyroxene	1.6
		Glass:	
		Colorless	1.6
		Brown	-
		Maskelynite	
		Gray	
		Schlieren	
		Green	
		Olivine	-
		Basalt	0.6
		Norite	0.6
		Anorth. Gabbro	-
		Spinel	
		<b>Total Number Grains</b>	<b>300</b>

<b>MAJOR ELEMENTS</b>	
(Apollo 16 P.E.T., 1973)	
	<b>%</b>
SiO <sub>2</sub>	45.28
TiO <sub>2</sub>	0.42
Al <sub>2</sub> O <sub>3</sub>	28.93
Cr <sub>2</sub> O <sub>3</sub>	
FeO	4.09
MnO	0.06
MgO	4.75
CaO	16.40
Na <sub>2</sub> O	0.44
K <sub>2</sub> O	0.07
P <sub>2</sub> O <sub>5</sub>	0.06
S	0.04

<b>TRACE ELEMENTS</b>			
(Haskin et al., 1973)			
	<b>ppm</b>		<b>ppm</b>
Sc	6.6	La	6.7
V		Ce	16.5
Co	14.4	Nd	11.1
Ni	180.0	Sm	3.10
Ba		Eu	1.29
Sr		Tb	0.62
Hf	1.99	Dy	4.3
Ta		Ho	0.86
Th		Tm	
U		Yb	2.28
		Lu	0.33

**SOIL: 67700**

LOCATION COMMENTS: Station 11, along the southeast rim of North Ray Crater. Soil collected along with rake sample 67710. Might have been scooped off the top of a very friable white rock. Might not be a typical soil.

**GENERIC SUBSAMPLES**

1. 67701	(235.0 gm)	< 1 mm
2. 67702	(21.69 gm)	1-2 mm
3. 67703	(13.71 gm)	2-4 mm
4. 67704	(7.47 gm)	4-10 mm
5.* 67705 to 67708	(11.92 gm)	> 1 cm
6. 67700	(142.6 gm)	Reserve

\* Not included in total mass of soil.

**MISCELLANEOUS**

1. Collected mass:	420.5 gm
2. Color:	N6 (med. light gray)
3. Bag no.:	Doc. bag 388
4. Container:	Teflon bag; returned in sample collection bag 4, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL****MATURITY PARAMETERS**

1. I <sub>s</sub> /FeO:	39, submature
2. Agglutinates:	16

**GRAIN SIZE PARAMETERS**

1. M <sub>z</sub> :	140 μm (< 1 cm); 92 μm (< 1 mm)
2. M <sub>d</sub> :	160 μm

**PETROGRAPHY**

(90-150 μm)

(Heiken et al., 1973)

**Components****%**

Breccias	
Low-Grade Brown	2.3
Low-Grade Colorless	34.0
Med-Grade	7.3
High-Grade	7.0
Anorthosite	3.3
Cataclastic Anorthosite	Tr.
Agglutinates	15.6
Feldspar	21.0
Orthopyroxene	2.0
Clinopyroxene	2.0
Glass:	
Colorless	2.3
Brown	-
Maskelynite	0.6
Gray	
Schlieren	0.3
Green	-
Olivine	0.3
Basalt	-
Norite	2.0
Anorth. Gabbro	-
Spinel	-
<b>Total Number Grains</b>	<b>300</b>



<b>MAJOR ELEMENTS</b>	
(Compston et al., 1973)	
	<b>%</b>
SiO <sub>2</sub>	44.77
TiO <sub>2</sub>	0.44
Al <sub>2</sub> O <sub>3</sub>	28.48
Cr <sub>2</sub> O <sub>3</sub>	
FeO	4.17
MnO	0.06
MgO	4.92
CaO	16.87
Na <sub>2</sub> O	0.52
K <sub>2</sub> O	0.07
P <sub>2</sub> O <sub>5</sub>	0.08
S	

<b>TRACE ELEMENTS</b>			
(Boynton et al., 1976)			
	<b>ppm</b>		<b>ppm</b>
Sc	6.9	La	7.3
V	27	Ce	18
Co	14.9	Nd	
Ni		Sm	3.3
Ba	90	Eu	1.15
Sr		Tb	0.66
Hf	1.9	Dy	2.4
Ta	0.3	Ho	
Th	1.1	Tm	
U	0.49	Yb	
		Lu	0.32

**SOIL: 67960**

LOCATION COMMENTS: Station 11, southeast rim of North Ray Crater. Is a "reference" soil collected within 10 meters of "House Rock" to accompany soil sample 67940.

**GENERIC SUBSAMPLES**

1. ( gm)	< 1 mil
2. ( gm)	1-2 mm
3. ( gm)	2-4 mm
4. ( gm)	4-10 mm
5. ( gm )	> 1 cm
6. 67960 (12.11 gm):	Reserve

**MISCELLANEOUS**

1. Collected mass: 12.11
2. Color:
3. Bag no.: Doc. bag 391
4. Container: Teflon bag; returned in sample collection bag 4, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL****MATURITY PARAMETERS**

1. I <sub>g</sub> /FeO: 20.0, immature
2. Agglutinates:

**GRAIN SIZE PARAMETERS**

1. M <sub>z</sub> :
2. M <sub>d</sub> :

**MAJOR ELEMENTS**

(Korotev, 1982)

	%
SiO <sub>2</sub>	
TiO <sub>2</sub>	
Al <sub>2</sub> O <sub>3</sub>	
Cr <sub>2</sub> O <sub>3</sub>	
FeO	4.56
MnO	
MgO	
CaO	16.1
Na <sub>2</sub> O	0.527
K <sub>2</sub> O	
P <sub>2</sub> O <sub>5</sub>	
S	

**TRACE ELEMENTS**

(Korotev, 1982)

	ppm		ppm
Sc	7.76	La	10.14
V		Ce	27.6
Co	16.2	Nd	
Ni	215	Sm	4.77
Ba	127	Eu	1.238
Sr	175	Tb	1.04
Hf	3.77	Dy	
Ta	0.532	Ho	
Th	1.88	Tm	
U	0.51	Yb	3.53
	624	Lu	0.519

**SOIL: 68120**

LOCATION COMMENTS: Station 8. Fillet soil, collected around the base of a 1 m breccia boulder.

**GENERIC SUBSAMPLES**

1. 68121	(141.9 gm)	< 1 mm
2. 68122	(10.92 gm)	1-2 mm
3. 68123	(7.36 gm)	2-4 mm
4. 68124	(8.65 gm)	4-10 mm
5.	( gm)	> 1 cm
6. 68120	(90.49 gm)	Reserve

**MISCELLANEOUS**

1. Collected mass:	259.3 gm
2. Color:	
3. Bag no.:	Doc. bag 374
4. Container:	Teflon bag; returned in vacuum container (ALSRC #2). Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL****MATURITY PARAMETERS**

1. I <sub>g</sub> /FeO:	61.0, mature
2. Agglutinates:	

**GRAIN SIZE PARAMETERS**

1. M <sub>z</sub> :	
2. M <sub>d</sub> :	

**MAJOR ELEMENTS**

(Woodcock &amp; Pillinger, 1978)

	%
SiO <sub>2</sub>	
TiO <sub>2</sub>	0.6
Al <sub>2</sub> O <sub>3</sub>	27.6
Cr <sub>2</sub> O <sub>3</sub>	
FeO	5.2
MnO	
MgO	6.0
CaO	17.5
Na <sub>2</sub> O	
K <sub>2</sub> O	
P <sub>2</sub> O <sub>5</sub>	
S	

**TRACE ELEMENTS**

(Fruchter et al., 1974)

	ppm		ppm
Sc	9.8	La	13.1
V		Ce	33.0
Co	30.0	Nd	25
Ni		Sm	6.6
Ba	140	Eu	1.3
Sr		Tb	1.3
Hf	4.4	Dy	
Ta	0.5	Ho	
Th	2.5	Tm	
U		Yb	4.5
		Lu	0.7

**SOIL: 68500**

LOCATION COMMENTS: Station 8, located halfway between two 15 m diameter craters. Soil collected along with rake sample.

**GENERIC SUBSAMPLES**

1. 68501	(521.1 gm)	< 1 mm
2. 68502	(37.8 gm)	1-2 mm
3. 68503	(25.10 gm)	2-4 mm
4. 68504	(17.27 gm)	4-10 mm
5.* 68505	(1.3gm)	> 1 cm
6. 68500	(304.5 gm)	Reserve

\* Not included in total mass of soil.

**MISCELLANEOUS**

1. Collected mass:	905.8 gm
2. Color:	N6 (med. light gray)
3. Bag no.:	Doc. bag 412
4. Container:	Teflon bag; returned in sample collection bag 3, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL****MATURITY PARAMETERS**

1. I <sub>g</sub> /FeO:	85.0. mature
2. Agglutinates:	39

**GRAIN SIZE PARAMETERS**

1. M <sub>z</sub> :	106 μm (< 1 cm); 68 μm (< 1 mm)
2. M <sub>d</sub> :	87 μm

**PETROGRAPHY**

(90-150 μm)

(Heiken et al., 1973)

<b>Components</b>	<b>%</b>
Breccias	
Low-Grade Brown	3.6
Low-Grade Colorless	29.3
Med-Grade	5.6
High-Grade	-
Anorthosite	0.3
Cataclastic Anorthosite	1.6
Agglutinates	38.6
Feldspar	12.3
Orthopyroxene	0.6
Clinopyroxene	1.0
Glass:	
Colorless	4.0
Brown	0.6
Maskelynite	0.3
Gray	
Schlieren	-
Green	-
Olivine	-
Basalt	0.3
Norite	-
Anorth. Gabbro	0.6
Spinel	-
<b>Total Number Grains</b>	<b>300</b>

<b>MAJOR ELEMENTS</b>	
(Bansal et al., 1973)	
	<b>%</b>
SiO <sub>2</sub>	45.18
TiO <sub>2</sub>	0.58
Al <sub>2</sub> O <sub>3</sub>	26.65
Cr <sub>2</sub> O <sub>3</sub>	
FeO	5.48
MnO	0.07
MgO	6.28
CaO	15.35
Na <sub>2</sub> O	0.47
K <sub>2</sub> O	0.11
P <sub>2</sub> O <sub>5</sub>	0.12
S	0.08

<b>TRACE ELEMENTS</b>			
(Korotev, 1981)			
	<b>ppm</b>		<b>ppm</b>
Sc	9.2	La	13.6
V		Ce	35.5
Co	34.7	Nd	
Ni	560	Sm	6.2
Ba		Eu	1.20
Sr		Tb	1.28
Hf	4.5	Dy	
Ta	0.8	Ho	
Th	2.4	Tm	
U		Yb	4.4
		Lu	0.62

**SOIL: 68820**

LOCATION COMMENTS: Station 8, 35 m east of a 15 m diameter crater. Surface soil collected adjacent to a 1 m diameter breccia boulder. Possible "fillet."

GENERIC SUBSAMPLES			MISCELLANEOUS
1. 68821	(123.9 gm)	< 1 mm	1. Collected mass: 220 gm
2. 68822	(7.35 gm)	1-2 mm	2. Color: 5Y 4/1 (olive gray)
3. 68823	(3.52 gm)	2-4 mm	3. Bag no.: Doc. bag 375
4. 68824	(1.5 gm)	4-10 mm	4. Container: Teflon bag; returned in sample collection bag 1, in air.
5. 68825	(8.66 gm)	> 1 cm	
6. 68820	(83.73 gm)	Reserve	

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS		PETROGRAPHY	(63-125 $\mu$ m)
1. $I_s/FeO$ :	84.0. mature	(Apollo 16 P.E.T., 1972)	
2. Agglutinates:	52.0	<b>Components</b>	%
<b>GRAIN SIZE PARAMETERS</b> 1. $M_z$ : 112 $\mu$ m 2. $M_g$ :		Agglutinates	52
		Colorless Glass	
		Fragments	2
		Droplets	1
		Brown Glass	
		Fragments	-
		Droplets	Tr.
		Orthopyroxene	2
		Clinopyroxene	-
		Plagioclase	15
		Breccias:	
		Metaigneous	21
		Vitric	1
		Anorthosite	6
		Basalt	-
		Olivine	-
		Ilmenite	-
		K Feldspar	-
		<b>Total Number Grains</b>	<b>100</b>

<b>MAJOR ELEMENTS</b>	
(Simkin et al., 1973)	
	<b>%</b>
SiO <sub>2</sub>	44.5
TiO <sub>2</sub>	0.5
Al <sub>2</sub> O <sub>3</sub>	26.2
Cr <sub>2</sub> O <sub>3</sub>	
FeO	5.4
MnO	0.12
MgO	6.13
CaO	15.3
Na <sub>2</sub> O	0.48
K <sub>2</sub> O	0.16
P <sub>2</sub> O <sub>5</sub>	
S	

<b>TRACE ELEMENTS</b>			
(Fruchter et al., 1974)			
	<b>ppm</b>		<b>ppm</b>
Sc	9.8	La	13.3
V		Ce	33.2
Co	28.5	Nd	26
Ni		Sm	6.7
Ba	160	Eu	1.2
Sr		Tb	1.2
Hf	4.4	Dy	
Ta	0.5	Ho	
Th	2.5	Tm	
U		Yb	4.9
		Lu	0.7

**SOIL: 68840**

LOCATION COMMENTS: Station 8, approximately 35 m east of a 15 m diameter crater. Surface soil, collected about 6 m north of a 1 m boulder and the "fillet" soil 68820.

<b>GENERIC SUBSAMPLES</b>		
1. 68841	( 266.6 gm)	< 1 mm
2. 68842	(14.36 gm)	1-2 mm
3. 68843	(8.89 gm)	2-4 mm
4. 68844	(5.01 gm)	4-10 mm
5.* 68845 to 68848	(11.45 gm)	> 1 cm
6. 68840	( 154.46 gm)	Reserve

\* Not included in total mass of soil.

<b>MISCELLANEOUS</b>	
1. Collected mass:	449.32 gm
2. Color:	N4-N5 (med. dark gray to med. gray)
3. Bag no.:	Doc. bag 344
4. Container:	Teflon bag; returned in sample collection bag 1, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

<b>MATURITY PARAMETERS</b>	
1. I <sub>s</sub> /FeO:	70.0, mature
2. Agglutinates:	

<b>GRAIN SIZE PARAMETERS</b>	
1. M <sub>z</sub> :	96 μm
2. M <sub>d</sub> :	

<b>PETROGRAPHY</b>	(62.5 to 25 μm)
(Apollo 16 P.E.T., 1973)	
<b>Components</b>	<b>%</b>
Agglutinates	80
Colorless Glass Fragments	2
Colorless Glass Droplets	-
Brown Glass Fragments	2
Brown Glass Droplets	-
Orthopyroxene	-
Clinopyroxene	3
Plagioclase	7
Metamorphosed Breccia	6
Vitric Breccia	Trace
Anorthositic	-
Basalt	Trace
Olivine	-
Ilmenite	-
Potassium Feldspar (?)	-



<b>MAJOR ELEMENTS</b>	
(Apollo 16 P.E.T., 1973)	
	<b>%</b>
SiO <sub>2</sub>	45.08
TiO <sub>2</sub>	0.59
Al <sub>2</sub> O <sub>3</sub>	26.49
Cr <sub>2</sub> O <sub>3</sub>	
FeO	5.65
MnO	0.07
MgO	6.27
CaO	15.30
Na <sub>2</sub> O	0.41
K <sub>2</sub> O	0.11
P <sub>2</sub> O <sub>5</sub>	0.12
S	0.08

<b>TRACE ELEMENTS</b>			
(Rose et al., 1975)			
	<b>ppm</b>		<b>ppm</b>
Sc	9.2	La	14
V	14	Ce	
Co	34	Nd	
Ni	680	Sm	
Ba	120	Eu	
Sr	113	Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	3.8
		Lu	

**SOIL: 69920**

LOCATION COMMENTS: Station 9, 15 km north of a 40 m diameter crater. Collected in shadow of a 0.5 m diameter boulder as part of the surface sample collection. Is the "skim" soil (upper 1 cm).

**GENERIC SUBSAMPLES**

1.	69921	(57.0 gm)	< 1 mm
2.	69922	(2.8 gm)	1-2 mm
3.	69923	(1.7 gm)	2-4 mm
4.	69924	(1.3 gm)	4-10 mm
5.		( gm)	> 1 cm
6.	69920	(0.71 gm)	Reserve

**MISCELLANEOUS**

1.	Collected mass: 59.8 gm
2.	Color: 5Y 5/1 (med. olive gray)
3.	Bag no.: Doc. bag 376
4.	Container: Teflon bag; returned in sample collection bag 3, in air. Processed in N <sub>2</sub>

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL****MATURITY PARAMETERS**

1.	I <sub>g</sub> /FeO: 90.0, mature
2.	Agglutinates:

**GRAIN SIZE PARAMETERS**

1.	M <sub>z</sub> :
2.	M <sub>d</sub> :

**MAJOR ELEMENTS**

(Rose et al., 1973)

	%
SiO <sub>2</sub>	45.20
TiO <sub>2</sub>	0.59
Al <sub>2</sub> O <sub>3</sub>	26.20
Cr <sub>2</sub> O <sub>3</sub>	0.14
FeO	5.54
MnO	0.07
MgO	6.35
CaO	15.35
Na <sub>2</sub> O	0.53
K <sub>2</sub> O	0.14
P <sub>2</sub> O <sub>5</sub>	0.12
S	

**TRACE ELEMENTS**

(Rose et al., 1973)

	ppm		ppm
Sc	10	La	-
V	19	Ce	
Co	21	Nd	
Ni	348	Sm	
Ba	130	Eu	
Sr	210	Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	3.6
		Lu	

**SOIL: 69940**

LOCATION COMMENTS: Station 9, 15 km north of a 40 m diameter crater. Collected along with skim soil 69920 in the shadow of a 0.5 m boulder. Part of surface sample collection. This sample is the "scoop soil" from several cm into the surface.

GENERIC SUBSAMPLES	
1.69941(254.1 gm)	< 1 mm
2.69942(11.85 gm)	1-2 mm
3.69943(8.07 gm)	2-4 mm
4.69944(4.47 gm)	4-10 mm
5.*69945(6.88 gm)	> 1 cm
6.69940(149.4 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	428.5 gm
<b>Color:</b>	N5 to 5YR 2/1 (med. gray to brownish black)
<b>Bag no.:</b>	Doc. bag 377
<b>Container:</b>	Teflon Bag; returned in sample collection bag 3, in air. Processed in N <sub>2</sub> .

\*Not included in total mass of soil.

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	85.0, mature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	62.5 μm (<1 mm)
2. M <sub>d</sub>	

PETROGRAPHY		(.25 to 1 mm)
(Apollo 16 P.E.T., 1972)		
<b>Components</b>		%
Agglutinates		64
Colorless Glass		
Fragments		4
Droplets		-
Brown Glass		
Fragments		6
Droplets		-
Orthopyroxene		1
Clinopyroxene		1
Plagioclase		7
Breccias:		
Metaigneous		7
Vitric		7
Anorthosite		2
Basalt		1
Olivine		-
Ilmenite		-
K Feldspar		-
<b>Total Number Grains</b>		<b>100</b>

MAJOR ELEMENTS		TRACE ELEMENTS			
(Rose et al., 1973)					
	%		ppm		ppm
SiO <sub>2</sub>	44.67	Sc	10.0	La	14.2
TiO <sub>2</sub>	0.63	V		Ce	37.0
Al <sub>2</sub> O <sub>3</sub>	26.30	Co	32.1	Nd	24.0
Cr <sub>2</sub> O <sub>3</sub>	0.13	Ni	470.0	Sm	6.8
FeO	5.76	Ba		Eu	1.28
MnO	0.07	Sr		Tb	1.41
MgO	6.35	Hf	5.3	Dy	9.0
CaO	15.57	Ta		Ho	-
Na <sub>2</sub> O	0.42	Th		Tm	
K <sub>2</sub> O	0.14	U		Yb	4.81
P <sub>2</sub> O <sub>5</sub>	0.12			Lu	0.68
S					

**SOIL: 69960**

LOCATION COMMENTS: Station 9. Soil collected under a 0.5 m boulder after it had been rolled over. Part of "surface sample" suite of samples.

<b>GENERIC SUBSAMPLES</b>	
1.69961(307.9 gm)	< 1 mm
2.69962(13.93 gm)	1-2 mm
3.69963(9.93 gm)	2-4 mm
4.69964(4.8 gm)	4-10 mm
5.*69965(1.11 gm)	> 1 cm
6.69960(131.0 gm)	Reserve

\*Not included in total mass of soil.

<b>MISCELLANEOUS</b>	
<b>Collected mass:</b>	507.6 gm
<b>Color:</b>	N4 to 5YR (med. gray to brownish black)
<b>Bag no.:</b>	Doc. bag 379
<b>Container:</b>	Teflon bag; returned in sample collection bag 3, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

<b>MATURITY PARAMETERS</b>	
1. I <sub>s</sub> /FeO	92.0, mature
2. Agglutinates	

<b>GRAIN SIZE PARAMETERS</b>	
1. M <sub>z</sub>	68 μm (<1 mm)
2. M <sub>d</sub>	

<b>MAJOR ELEMENTS</b>	
(Rose et al., 1973)	
	%
SiO <sub>2</sub>	44.76
TiO <sub>2</sub>	0.60
Al <sub>2</sub> O <sub>3</sub>	26.35
Cr <sub>2</sub> O <sub>3</sub>	0.13
FeO	5.76
MnO	0.07
MgO	6.33
CaO	15.55
Na <sub>2</sub> O	0.41
K <sub>2</sub> O	0.14
P <sub>2</sub> O <sub>5</sub>	0.12
S	

<b>TRACE ELEMENTS</b>			
(Rose et al., 1973)			
	ppm		ppm
Sc	11.8	La	-
V	29	Ce	
Co	47	Nd	
Ni	600	Sm	
Ba	140	Eu	
Sr	135	Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	3.7
		Lu	

**SOIL: 70011**

LOCATION COMMENTS: The fuel products contamination sample was collected under the LM, near the Z footpad. Surface sample, collected from 0-3 cm depth.

GENERIC SUBSAMPLES	
1. ( gm)	< 1 mm
2. ( gm)	1-2 mm
3. ( gm)	2-4 mm
4. ( gm)	4-10 mm
5. ( gm)	> 1 cm
6. 70011(440.7 gm)	Reserve

MISCELLANEOUS	
Collected mass:	440.7 gm
Color:	Med. dark gray (field description)
Bag no.:	SESC
Container:	Collected in a vacuum container on the lunar surface. Vacuum container was returned in sample collection bag 5.

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. $I_s/\text{FeO}$	54.0, submature
2. Agglutinates	37

GRAIN SIZE PARAMETERS	
1. $M_z$	
2. $M_d$	

MAJOR ELEMENTS	
(Rose et al., 1974)	
	%
$\text{SiO}_2$	41.03
$\text{TiO}_2$	8.30
$\text{Al}_2\text{O}_3$	11.98
$\text{Cr}_2\text{O}_3$	0.41
FeO	16.24
MnO	0.23
MgO	10.08
CaO	11.08
$\text{Na}_2\text{O}$	0.31
$\text{K}_2\text{O}$	0.08
$\text{P}_2\text{O}_5$	0.10
S	

TRACE ELEMENTS			
(Wänke et al., 1974)			
	ppm		ppm
Sc	53.1	La	8.03
V		Ce	23.5
Co	31.6	Nd	
Ni		Sm	8.0
Ba	102	Eu	1.67
Sr		Tb	1.9
Hf	6.5	Dy	12.5
Ta	1.2	Ho	2.8
Th		Tm	
U	0.24	Yb	7.04
		Lu	1.02

**SOIL: 70160**

LOCATION COMMENTS: Fillet near the ALSEP central station. Collected at base of a 1.5 m diameter basalt boulder from depth of 0 to 5 cm.

GENERIC SUBSAMPLES		
1.	70161 (197.7 gm)	< 1 mm
2.	70162 (5.14 gm)	1-2 mm
3.	70163 (3.43 gm)	2-4 mm
4.	70164 (1.66 gm)	4-10 mm
5.	*70165 (2.143 gm)	> 1 cm
6.	70160 (106.1 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	316.173gm
<b>Color:</b>	Brownish gray (5YR 4/1)
<b>Bag no.:</b>	Doc. bag 474
<b>Container:</b>	Returned in sample collection bag 1, in vacuum container (SRC-1). Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1.	I <sub>s</sub> /FeO
2.	Agglutinates

GRAIN SIZE PARAMETERS	
1.	M <sub>z</sub> 65.6 μm
2.	M <sub>d</sub> 61.6 μm

PETROGRAPHY	(90-150 μm)
(Heiken and McKay, 1974)	
<b>Components</b>	<b>%</b>
Agglutinates	34.0
Basalt, Equi.	15.0
Basalt, Various	
Breccia:	
Low-Grade-Brown	5.0
Low-Grade-Colorless	-
Med-High Grade	2.0
Anorthosite	-
Cataclastic	
Anorthosite	-
Norite	-
Gabbro	-
Plagioclase	9.0
Clinopyroxene	21.6
Orthopyroxene	-
Olivine	0.3
Ilmenite	5.0
Glass:	
Orange	2.0
"Black"	5.2
Colorless	0.3
Brown	0.6
Gray, "Ropy"	-
Other	-
<b>Total Number Grains</b>	<b>300</b>

<b>MAJOR ELEMENTS</b>	
(Apollo 17 P.E.T., 1973)	
	<b>%</b>
SiO <sub>2</sub>	40.34
TiO <sub>2</sub>	8.99
Al <sub>2</sub> O <sub>3</sub>	11.60
Cr <sub>2</sub> O <sub>3</sub>	0.46
FeO	17.01
MnO	0.23
MgO	9.79
CaO	10.98
Na <sub>2</sub> O	0.32
K <sub>2</sub> O	0.08
P <sub>2</sub> O <sub>5</sub>	0.08
S	0.12

<b>TRACE ELEMENTS</b>			
(Rhodes et al., 1974)			
	<b>ppm</b>		<b>ppm</b>
Sc		La	
V		Ce	
Co		Nd	
Ni	161	Sm	
Ba		Eu	
Sr	168	Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	
		Lu	



**SOIL: 70180**

LOCATION COMMENTS: Located 3 m from deep drill core, near the ALSEP. Surface sample (0 to 5 cm depth).

GENERIC SUBSAMPLES	
1. 70181 (157.1 gm)	< 1 mm
2. 70182 (4.63 gm)	1-2 mm
3. 70183 (3.12 gm)	2-4 mm
4. 70184 (1.68 gm)	4-10 mm
5. *70185 (466.6 gm)	> 1 cm
6. 70180 (93.25 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	259.78 gm
<b>Color:</b>	Dark olive gray (5Y 3/1)
<b>Bag no.:</b>	Doc. bag 475
<b>Container:</b>	Returned in sample container bag 1, in vacuum. Processed in N <sub>2</sub> .

\*Not included in total mass of soil.

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	47.0, submature
2. Agglutinates	56

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	67 μm (<1 cm); 58 μm (<1 mm)
2. M <sub>n</sub>	59 μm

PETROGRAPHY	
(Heiken and McKay, 1974)	
<b>Components</b>	<b>%</b>
Agglutinates	56.0
Basalt, Equi.	14.0
Basalt, Various	
Breccia:	
Low-Grade-Brown	4.6
Low-Grade-Colorless	0.3
Med-High Grade	2.6
Anorthosite	-
Cataclastic	
Anorthosite	0.3
Norite	-
Gabbro	-
Plagioclase	4.3
Clinopyroxene	10.3
Orthopyroxene	0.3
Olivine	-
Ilmenite	2.3
Glass:	
Orange	3.0
"Black"	0.6
Colorless	0.3
Brown	0.6
Gray, "Ropy"	-
Other	-
<b>Total Number Grains</b>	<b>300</b>

<b>MAJOR ELEMENTS</b>	
(Apollo 17 P.E.T., 1973)	
	<b>%</b>
SiO <sub>2</sub>	40.87
TiO <sub>2</sub>	8.11
Al <sub>2</sub> O <sub>3</sub>	12.30
Cr <sub>2</sub> O <sub>3</sub>	0.44
FeO	16.37
MnO	0.24
MgO	9.82
CaO	11.05
Na <sub>2</sub> O	0.35
K <sub>2</sub> O	0.08
P <sub>2</sub> O <sub>5</sub>	0.06
S	0.11

<b>TRACE ELEMENTS</b>			
(Rhodes et al., 1974)			
	<b>ppm</b>		<b>ppm</b>
Sc		La	8.09
V		Ce	24.8
Co		Nd	-
Ni	191	Sm	8.05
Ba	98.3	Eu	1.66
Sr	170	Tb	
Hf		Dy	13.2
Ta		Ho	
Th	-	Tm	
U	0.28	Yb	7.02
		Lu	

**SOIL: 70250**

LOCATION COMMENTS: Collected near the SEP, 180 m at 073° azimuth from LM. Surface sample.

GENERIC SUBSAMPLES	
1. 70251(31.98 gm)	< 1 mm
2. 70252(0.90 gm)	1-2 mm
3. 70253(0.87 gm)	2-4 mm
4. 70254(1.14 gm)	4-10 mm
5. 70256(2.16 gm)	> 1 cm
6. 70250(16.55 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	62.04 gm
<b>Color:</b>	Med. gray (N5)
<b>Bag no.:</b>	Doc. bag 22E
<b>Container:</b>	Returned in sample collection bag B, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>g</sub> /FeO	43.0, submature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	
2. M <sub>n</sub>	

MAJOR ELEMENTS	
	%
SiO <sub>2</sub>	
TiO <sub>2</sub>	
Al <sub>2</sub> O <sub>3</sub>	
Cr <sub>2</sub> O <sub>3</sub>	
FeO	
MnO	
MgO	
CaO	
Na <sub>2</sub> O	
K <sub>2</sub> O	
P <sub>2</sub> O <sub>5</sub>	
S	

TRACE ELEMENTS			
	ppm		ppm
Sc		La	
V		Ce	
Co		Nd	
Ni		Sm	
Ba		Eu	
Sr		Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	
		Lu	

**SOIL: 70270**

LOCATION COMMENTS: Documented rock and soil LRV sample collected near SEP. Very cohesive soil. Very flat, level regolith surface.

GENERIC SUBSAMPLES	
1. 70271(116.1 gm)	< 1 mm
2. 70272(2.97 gm)	1-2 mm
3. 70273(1.46 gm)	2-4 mm
4. 70274(2.33 gm)	4-10 mm
5. *70275(171.4 gm)	> 1 cm
6. 70270(70.46 gm)	Reserve

\*Not included in total mass of soil.

MISCELLANEOUS	
Collected mass:	193.32 gm
Color:	Dark olive gray (5Y 3/1)
Bag no.:	Doc. bag 23E
Container:	Return in sample collection bag 8, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	56.0, submature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	
2. M <sub>d</sub>	

MAJOR ELEMENTS	
	%
SiO <sub>2</sub>	
TiO <sub>2</sub>	
Al <sub>2</sub> O <sub>3</sub>	
Cr <sub>2</sub> O <sub>3</sub>	
FeO	
MnO	
MgO	
CaO	
Na <sub>2</sub> O	
K <sub>2</sub> O	
P <sub>2</sub> O <sub>5</sub>	
S	

TRACE ELEMENTS			
	ppm		ppm
Sc		La	
V		Ce	
Co		Nd	
Ni		Sm	
Ba		Eu	
Sr		Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	
		Lu	

**SOIL: 70311**

LOCATION COMMENTS: LRV sample collected between Station 9 and LM. Rock plus soil. Relatively flat regolith surface. Scooped from upper few centimeters. Station is LRV 12.

GENERIC SUBSAMPLES		
1.	70311 (106.5 gm)	< 1 mm
2.	70312 (4.2 gm)	1-2 mm
3.	70313 (3.21 gm)	2-4 mm
4.	70314 (5.25 gm)	4-10 mm
5.	*70315(148.6 gm)	> 1 cm
6.	70310 (6.82 gm)	Reserve

\*Not included in total mass of soil.

MISCELLANEOUS	
<b>Collected mass:</b>	119.16 gm
<b>Color:</b>	Med. dark gray (N4)
<b>Bag no.:</b>	Doc. bag 54Y
<b>Container:</b>	Returned in sample collection bag 5, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>g</sub> /FeO	39.0, submature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	
2. M <sub>q</sub>	

MAJOR ELEMENTS	
	%
SiO <sub>2</sub>	
TiO <sub>2</sub>	
Al <sub>2</sub> O <sub>3</sub>	
Cr <sub>2</sub> O <sub>3</sub>	
FeO	
MnO	
MgO	
CaO	
Na <sub>2</sub> O	
K <sub>2</sub> O	
P <sub>2</sub> O <sub>5</sub>	
S	

TRACE ELEMENTS			
	ppm		ppm
Sc		La	
V		Ce	
Co		Nd	
Ni		Sm	
Ba		Eu	
Sr		Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	
		Lu	

**SOIL: 70320**

LOCATION COMMENTS: Surface sample at Sherlock Crater, Station LRV 12. LRV is located between Station 9 and LM. Scooped from upper few centimeters. Cohesive soil.

GENERIC SUBSAMPLES	
1. 70321 (141.6 gm)	< 1 mm
2. 70322 (5.42 gm)	1-2 mm
3. 70323 (4.10 gm)	2-4 mm
4. 70324 (4.0 gm)	4-10 mm
5. ( gm)	> 1 cm
6. 70320 (78.24 gm)	Reserve

MISCELLANEOUS	
Collected mass:	233.36 gm
Color:	Olive gray (5Y 4/1)
Bag no.:	Doc. bag 53Y
Container:	Returned in sample collection bag 5, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	42.0, submature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	
2. M <sub>d</sub>	

MAJOR ELEMENTS	
	%
SiO <sub>2</sub>	
TiO <sub>2</sub>	
Al <sub>2</sub> O <sub>3</sub>	
Cr <sub>2</sub> O <sub>3</sub>	
FeO	
MnO	
MgO	
CaO	
Na <sub>2</sub> O	
K <sub>2</sub> O	
P <sub>2</sub> O <sub>5</sub>	
S	

TRACE ELEMENTS			
	ppm		ppm
Sc		La	
V		Ce	
Co		Nd	
Ni		Sm	
Ba		Eu	
Sr		Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	
		Lu	

**SOIL: 71040**

LOCATION COMMENTS: Station 1A, near "Tombstone" rock. Surface soil (0-2 cm depth). Collected in shadow of the boulder.

GENERIC SUBSAMPLES	
1. 71041 (137.8 gm)	< 1 mm
2. 71042 (7.21 gm)	1-2 mm
3. 71043 (6.19 gm)	2-4 mm
4. 71044 (12.84 gm)	4-10 mm
5. *71045 to 71049 (23.617 gm)	> 1 cm
6. 71040 (94.89 gm)	Reserve

\*71075 also derived from this split.

MISCELLANEOUS	
<b>Collected mass:</b>	282.547 gm
<b>Color:</b>	Dark olive gray (5Y 3/1)
<b>Bag no.:</b>	Doc. bag 455
<b>Container:</b>	Returned in sample collection bag 1, in sample return container 1, in vacuum. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	29.0, immature
2. Agglutinates	27.0

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	114 μm (<1 cm); 56 μm (<1 mm)
2. M <sub>d</sub>	75.4 μm

PETROGRAPHY	(90-150 μm)
(Heiken and McKay, 1974)	
<b>Components</b>	<b>%</b>
Agglutinates	27.4
Basalt, Equi.	12.7
Basalt, Various	1.0
Breccia:	
Low-Grade-Brown	1.0
Low-Grade-Colorless	1.0
Med-High Grade	2.5
Anorthosite	-
Cataclastic	
Anorthosite	1.0
Norite	-
Gabbro	-
Plagioclase	12.2
Clinopyroxene	17.3
Orthopyroxene	-
Olivine	0.5
Ilmenite	5.6
Glass:	
Orange	3.6
"Black"	8.1
Colorless	2.0
Brown	4.1
Gray, "Ropy"	-
Other	-
Total Number Grains	197

<b>MAJOR ELEMENTS</b>	
(Apollo 17 P.E.T., 1973)	
	<b>%</b>
SiO <sub>2</sub>	39.74
TiO <sub>2</sub>	9.57
Al <sub>2</sub> O <sub>3</sub>	10.80
Cr <sub>2</sub> O <sub>3</sub>	0.47
FeO	17.73
MnO	0.24
MgO	9.72
CaO	10.72
Na <sub>2</sub> O	0.35
K <sub>2</sub> O	0.08
P <sub>2</sub> O <sub>5</sub>	0.07
S	0.13

<b>TRACE ELEMENTS</b>			
(Rhodes et al., 1974)			
	<b>ppm</b>		<b>ppm</b>
Sc		La	
V		Ce	
Co		Nd	
Ni	117	Sm	
Ba		Eu	
Sr	165	Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	
		Lu	



**SOIL: 71060**

LOCATION COMMENTS: Near "Tombstone" rock, Station 1A. Collected in shadow of the boulder at a depth of 5-6 cm.

GENERIC SUBSAMPLES	
1. 71061(229.2 gm)	< 1 mm
2. 71062(20.74 gm)	1-2 mm
3. 71063(22.79 gm)	2-4 mm
4. 71064(34.35 gm)	4-10 mm
5. *71065 to 71069 (78.235 gm)	> 1 cm
6. 71060(199.4 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	584.715 gm
<b>Color:</b>	Dark olive gray (5Y 3/1)
<b>Bag no.:</b>	Doc. bag 455
<b>Container:</b>	Returned in sample collection bag 1, in sample return container 1, in vacuum. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	29.0, immature
2. Agglutinates	27.0

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	114 μm (<1 cm); 56 μm (<1 mm)
2. M <sub>n</sub>	75.4 μm

PETROGRAPHY	(90-150 μm)
(Heiken and McKay, 1974)	
<b>Components</b>	<b>%</b>
Agglutinates	9.3
Basalt, Equi.	19.6
Basalt, Various	
Breccia:	
Low-Grade-Brown	3.6
Low-Grade-Colorless	0.6
Med-High Grade	1.6
Anorthosite	0.3
Cataclastic	
Anorthosite	-
Norite	-
Gabbro	-
Plagioclase	17.3
Clinopyroxene	21.0
Orthopyroxene	-
Olivine	-
Ilmenite	4.6
Glass:	
Orange	6.3
"Black"	9.6
Colorless	1.3
Brown	4.6
Gray, "Ropy"	-
Other	-
<b>Total Number Grains</b>	<b>300</b>

<b>MAJOR ELEMENTS</b>	
(Apollo 17 P.E.T., 1973)	
	<b>%</b>
SiO <sub>2</sub>	40.09
TiO <sub>2</sub>	9.32
Al <sub>2</sub> O <sub>3</sub>	10.70
Cr <sub>2</sub> O <sub>3</sub>	0.49
FeO	17.85
MnO	0.24
MgO	9.92
CaO	10.59
Na <sub>2</sub> O	0.36
K <sub>2</sub> O	0.08
P <sub>2</sub> O <sub>5</sub>	0.07
S	0.13

<b>TRACE ELEMENTS</b>			
(Korotev, 1976)			
	<b>ppm</b>		<b>ppm</b>
Sc	70.3	La	
V		Ce	
Co	26.3	Nd	
Ni	<50	Sm	
Ba		Eu	
Sr		Tb	
Hf	7.4	Dy	
Ta	1.6	Ho	
Th	0.6	Tm	
U		Yb	
		Lu	

**SOIL: 71130**

LOCATION COMMENTS: Station 1A. Soil collected with 2 basalt chips near a 0.5 m diameter basalt boulder. The boulder is located on the southeast rim of a 10 m blocky crater.

GENERIC SUBSAMPLES	
1. 71131 (86.4 gm)	< 1 mm
2. 71132 (3.99 gm)	1-2 mm
3. 71133 (3.22 gm)	2-4 mm
4. 71134 (0.91 gm)	4-10 mm
5. *71135 to 71136 (62.24 gm)	> 1 cm
6. 71130(49.51 gm)	Reserve

\*Not included in total mass of soil.

MISCELLANEOUS	
Collected mass:	144.03 gm
Color:	Olive gray to olive black (5Y 2/1 – 5Y 4/1)
Bag no.:	Doc. bag 477
Container:	Returned in sample collection bag 1, in sample return container 1, in vacuum. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	33.0, submature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	
2. M <sub>n</sub>	

MAJOR ELEMENTS	
	%
SiO <sub>2</sub>	
TiO <sub>2</sub>	
Al <sub>2</sub> O <sub>3</sub>	
Cr <sub>2</sub> O <sub>3</sub>	
FeO	
MnO	
MgO	
CaO	
Na <sub>2</sub> O	
K <sub>2</sub> O	
P <sub>2</sub> O <sub>5</sub>	
S	

TRACE ELEMENTS			
(Eldridge et al., 1974)			
	ppm		ppm
Sc		La	
V		Ce	
Co		Nd	
Ni		Sm	
Ba		Eu	
Sr		Tb	
Hf		Dy	
Ta		Ho	
Th	0.67	Tm	
U	0.23	Yb	
K	625	Lu	

**SOIL: 71150**

LOCATION COMMENTS: Station 1A. Surface soil scooped up with a basalt fragment near a 0.5 m diameter basalt boulder.

GENERIC SUBSAMPLES	
1. 71151 (57.6 gm)	< 1 mm
2. 71152 (2.60 gm)	1-2 mm
3. 71153 (2.36 gm)	2-4 mm
4. 71154 (1.37 gm)	4-10 mm
5. *71155 to 71157 (26.15 gm)	> 1 cm
6. 71150(1.565 gm)	Reserve

\*Not included in total mass of soil.

MISCELLANEOUS	
Collected mass:	70.816 gm
Color:	Dark olive gray (5Y 3/1)
Bag no.:	Doc. bag 478
Container:	Returned in sample collection bag 1, in sample return container 1, in vacuum. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	34.0, submature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	
2. M <sub>d</sub>	

MAJOR ELEMENTS	
	%
SiO <sub>2</sub>	
TiO <sub>2</sub>	
Al <sub>2</sub> O <sub>3</sub>	
Cr <sub>2</sub> O <sub>3</sub>	
FeO	
MnO	
MgO	
CaO	
Na <sub>2</sub> O	
K <sub>2</sub> O	
P <sub>2</sub> O <sub>5</sub>	
S	

TRACE ELEMENTS			
	ppm		ppm
Sc		La	
V		Ce	
Co		Nd	
Ni		Sm	
Ba		Eu	
Sr		Tb	
Hf		Dy	
Ta		Ho	
Th	0.67	Tm	
U	0.23	Yb	
		Lu	

**SOIL: 71500**

LOCATION COMMENTS: Station 1. Surface sample collected 15 m northeast of a 10m diameter blocky crater. Collected with the rake sample (71520-71597).

GENERIC SUBSAMPLES	
1. 71501 (600.9 gm)	< 1 mm
2. 71502 (22.68 gm)	1-2 mm
3. 71503 (17.58 gm)	2-4 mm
4. 71504 (13.13 gm)	4-10 mm
5. *71505 to 71509 (52.27 gm)	> 1 cm
6. 71500 (359.5 gm)	Reserve

\*71515 also derived from this split.

MISCELLANEOUS	
<b>Collected mass:</b>	1066.06 gm
<b>Color:</b>	Olive gray to olive black (5Y 4/1 – 5Y 2/1)
<b>Bag no.:</b>	Doc. bag 459
<b>Container:</b>	Returned in sample container bag 1, in sample return container 1, in vacuum. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	35.0, submature
2. Agglutinates	35.0

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	83 μm (<1 cm); 65 μm (<1 mm)
2. M <sub>d</sub>	69.3 μm

PETROGRAPHY	
(Heiken and McKay, 1974)	
<b>Components</b>	<b>%</b>
Agglutinates	35.0
Basalt, Equi.	24.6
Basalt, Various	
Breccia:	
Low-Grade-Brown	2.3
Low-Grade-Colorless	0.6
Med-High Grade	2.3
Anorthosite	-
Cataclastic	
Anorthosite	-
Norite	-
Gabbro	-
Plagioclase	5.0
Clinopyroxene	17.3
Orthopyroxene	0.6
Olivine	-
Ilmenite	8.0
Glass:	
Orange	1.3
"Black"	1.3
Colorless	0.6
Brown	0.3
Gray, "Ropy"	-
Other	-
Total Number Grains	300

<b>MAJOR ELEMENTS</b>	
(Apollo 17 P.E.T., 1973)	
	<b>%</b>
SiO <sub>2</sub>	39.82
TiO <sub>2</sub>	9.52
Al <sub>2</sub> O <sub>3</sub>	11.13
Cr <sub>2</sub> O <sub>3</sub>	0.46
FeO	17.41
MnO	0.25
MgO	9.51
CaO	10.85
Na <sub>2</sub> O	0.32
K <sub>2</sub> O	0.07
P <sub>2</sub> O <sub>5</sub>	0.06
S	0.12

<b>TRACE ELEMENTS</b>			
(Korotev, 1976)			
	<b>ppm</b>		<b>ppm</b>
Sc	73.0	La	
V		Ce	
Co	33.1	Nd	
Ni	<90	Sm	
Ba		Eu	
Sr		Tb	
Hf	7.1	Dy	
Ta	1.9	Ho	
Th	0.4	Tm	
U		Yb	
		Lu	

**SOIL: 72130**

LOCATION COMMENTS: LRV 1 sample. Surface scoop collected with large rock sample (72135) between Horatio and Bronte Craters. From a ray emanating from a 10-15 m diameter crater.

GENERIC SUBSAMPLES		
1.	72131 (107.9 gm)	< 1 mm
2.	72132 (8.53 gm)	1-2 mm
3.	72133 (10.95 gm)	2-4 mm
4.	72134 (13.18 gm)	4-10 mm
5.	*72135 (336.9 gm)	> 1 cm
6.	72130 (79.91 gm)	Reserve

\*Not included in total mass of soil.

MISCELLANEOUS	
<b>Collected mass:</b>	220.47 gm
<b>Color:</b>	Dark olive gray (5Y 3/1)
<b>Bag no.:</b>	Doc. bag 26E
<b>Container:</b>	Returned in sample collection bag 8, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	60.0, mature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	
2. M <sub>d</sub>	

MAJOR ELEMENTS	
	%
SiO <sub>2</sub>	
TiO <sub>2</sub>	
Al <sub>2</sub> O <sub>3</sub>	
Cr <sub>2</sub> O <sub>3</sub>	
FeO	
MnO	
MgO	
CaO	
Na <sub>2</sub> O	
K <sub>2</sub> O	
P <sub>2</sub> O <sub>5</sub>	
S	

TRACE ELEMENTS			
	ppm		ppm
Sc		La	
V		Ce	
Co		Nd	
Ni		Sm	
Ba		Eu	
Sr		Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	
		Lu	

**SOIL: 72140**

LOCATION COMMENTS: LRV 2, between Stations 1 and 2 on the “prong” or very faint extension of the white mantle. Surface sample of a very cohesive soil. Ground surface is patterned, “raindrop” texture.

GENERIC SUBSAMPLES	
1. 72141 (225.9 gm)	< 1 mm
2. 72142 (5.32 gm)	1-2 mm
3. 72143 (1.88 gm)	2-4 mm
4. 72144 (2.73 gm)	4-10 mm
5. 72145 (1.25 gm)	> 1 cm
6. 72140 (115.0 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	352.08 gm
<b>Color:</b>	Dark olive gray (5Y 3/1)
<b>Bag no.:</b>	Doc. bag 27E
<b>Container:</b>	Returned in sample collection bag 6, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	81.0, mature
2. Agglutinates	51.0

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	57 μm (<1 cm); 50 μm (<1 mm)
2. M <sub>d</sub>	47.4 μm

PETROGRAPHY	(90-150 μm)
(Heiken and McKay, 1974)	
<b>Components</b>	<b>%</b>
Agglutinates	5.0
Basalt, Equi.	6.6
Basalt, Various	0.6
Breccia:	
Low-Grade-Brown	4.0
Low-Grade-Colorless	4.0
Med-High Grade	1.6
Anorthosite	-
Cataclastic	
Anorthosite	1.3
Norite	0.3
Gabbro	0.3
Plagioclase	9.0
Clinopyroxene	7.0
Orthopyroxene	-
Olivine	-
Ilmenite	0.6
Glass:	
Orange	1.3
“Black”	5.0
Colorless	1.6
Brown	3.9
Gray, “Ropy”	1.3
Other	-
<b>Total Number Grains</b>	<b>300</b>



<b>MAJOR ELEMENTS</b>	
(Rhodes et al., 1974)	
	<b>%</b>
SiO <sub>2</sub>	43.11
TiO <sub>2</sub>	4.37
Al <sub>2</sub> O <sub>3</sub>	16.10
Cr <sub>2</sub> O <sub>3</sub>	0.37
FeO	13.45
MnO	0.19
MgO	10.25
CaO	11.83
Na <sub>2</sub> O	0.40
K <sub>2</sub> O	0.12
P <sub>2</sub> O <sub>5</sub>	0.10
S	0.09

<b>TRACE ELEMENTS</b>			
(Rhodes et al., 1974)			
	<b>ppm</b>		<b>ppm</b>
Sc		La	10.2
V		Ce	28.1
Co		Nd	20.7
Ni	271	Sm	6.70
Ba		Eu	1.35
Sr	156	Tb	
Hf		Dy	9.82
Ta		Ho	
Th	-	Tm	
U	-	Yb	5.28
		Lu	-

**SOIL: 72150**

LOCATION COMMENTS: LRV 3 sample was collected 4.3 km east of the LM, on the way to Station 2 in "dark mantled" material between extensions of the light mantle. Collected with a rock (72155).

GENERIC SUBSAMPLES	
1. ( gm)	< 1 mm
2. ( gm)	1-2 mm
3. ( gm)	2-4 mm
4. ( gm)	4-10 mm
5. *72155 (238.5 gm)	> 1 cm
6. 72150 (53.29 gm)	Reserve

\*Not included in total mass of soil.

MISCELLANEOUS	
<b>Collected mass:</b>	53.29 gm
<b>Color:</b>	Dark brownish gray (5Y 3/1)
<b>Bag no.:</b>	Doc. bag 28E
<b>Container:</b>	Returned in sample collection bag 6, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	82.0, mature
2. Agglutinates	53

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	
2. M <sub>d</sub>	

PETROGRAPHY	(90-150 μm)
(Heiken and McKay, 1974)	
<b>Components</b>	<b>%</b>
Agglutinates	52.6
Basalt, Equi.	8.3
Basalt, Various	1.3
Breccia:	
Low-Grade-Brown	5.3
Low-Grade-Colorless	1.6
Med-High Grade	4.0
Anorthosite	-
Cataclastic	
Anorthosite	0.3
Norite	-
Gabbro	-
Plagioclase	5.3
Clinopyroxene	5.3
Orthopyroxene	-
Olivine	-
Ilmenite	0.6
Glass:	
Orange	3.9
"Black"	5.3
Colorless	1.3
Brown	2.8
Gray, "Ropy"	0.6
Other	0.3
<b>Total Number Grains</b>	<b>300</b>

MAJOR ELEMENTS		TRACE ELEMENTS			
		(Korotev, 1976)			
	%		ppm		ppm
SiO <sub>2</sub>		Sc	44.1	La	
TiO <sub>2</sub>		V		Ce	
Al <sub>2</sub> O <sub>3</sub>		Co	38.8	Nd	
Cr <sub>2</sub> O <sub>3</sub>		Ni	265	Sm	
FeO		Ba		Eu	
MnO		Sr		Tb	
MgO		Hf	5.2	Dy	
CaO		Ta	1.1	Ho	
Na <sub>2</sub> O		Th	1.3	Tm	
K <sub>2</sub> O		U		Yb	
P <sub>2</sub> O <sub>5</sub>				Lu	
S					

**SOIL: 72160**

LOCATION COMMENTS: LRV 3, between SEP and Station 2. From "typical dark-mantled" area.  
Surface sample.

GENERIC SUBSAMPLES	
1. 72161 (162.5 gm)	< 1 mm
2. 72162 (4.018 gm)	1-2 mm
3. 72163 (2.538 gm)	2-4 mm
4. 72164 (0.946 gm)	4-10 mm
5. ( gm)	> 1 cm
6. 72160 (80.0 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	250.002 gm
<b>Color:</b>	Olive gray (5Y 4/1)
<b>Bag no.:</b>	Doc. bag 29E
<b>Container:</b>	Returned in sample collection bag 8, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	87.0, mature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	69 μm
2. M <sub>d</sub>	

PETROGRAPHY	(90-124 μm)
(Basu et al., 1974)	
<b>Components</b>	<b>%</b>
Plagioclase	3.8
Pyroxenes, etc.	2.4
Rocks (basalt?)	2.4
Breccia:	
Vitric, Dark	34.5
Vitric, Light	15.4
Recrystallized	2.0
Glass:	
Spherules	1.0
Irregular	7.5
Agglutinates	31.1

MAJOR ELEMENTS	
(Rhodes et al., 1974)	
	<b>%</b>
SiO <sub>2</sub>	42.12
TiO <sub>2</sub>	5.21
Al <sub>2</sub> O <sub>3</sub>	14.22
Cr <sub>2</sub> O <sub>3</sub>	0.42
FeO	14.86
MnO	0.22
MgO	10.54
CaO	11.17
Na <sub>2</sub> O	0.41
K <sub>2</sub> O	0.11
P <sub>2</sub> O <sub>5</sub>	0.08
S	0.08

TRACE ELEMENTS			
(Rhodes et al., 1974)			
	<b>ppm</b>		<b>ppm</b>
Sc		La	9.71
V		Ce	27.0
Co		Nd	-
Ni	273	Sm	6.94
Ba		Eu	1.42
Sr	150	Tb	
Hf		Dy	10.4
Ta		Ho	
Th	-	Tm	
U	0.41	Yb	5.51
		Lu	-

**SOIL: 72220**

LOCATION COMMENTS: Station 2, uphill from base of South Massif. This soil was collected from a fillet developed under an overhang of a 2 m diameter breccia boulder. Not permanently shadowed; an east-facing overhang. Surface soil (0-2 cm).

GENERIC SUBSAMPLES		
1.	72221 (225.8 gm)	< 1 mm
2.	72222 (11.13 gm)	1-2 mm
3.	72223 (7.92 gm)	2-4 mm
4.	72224 (7.51 gm)	4-10 mm
5.	( gm)	> 1 cm
6.	72220 (136.2 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	388.56 gm
<b>Color:</b>	Olive gray (5Y 4/1)
<b>Bag no.:</b>	Doc. bag 496
<b>Container:</b>	Return in sample collection bag 8, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>g</sub> /FeO	58.0, submature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	
2. M <sub>d</sub>	

MAJOR ELEMENTS	
	%
SiO <sub>2</sub>	
TiO <sub>2</sub>	
Al <sub>2</sub> O <sub>3</sub>	
Cr <sub>2</sub> O <sub>3</sub>	
FeO	
MnO	
MgO	
CaO	
Na <sub>2</sub> O	
K <sub>2</sub> O	
P <sub>2</sub> O <sub>5</sub>	
S	

TRACE ELEMENTS			
(Keith et al., 1974)			
	ppm		ppm
Sc		La	
V		Ce	
Co		Nd	
Ni		Sm	
Ba		Eu	
Sr		Tb	
Hf		Dy	
Ta		Ho	
Th	3.6 ± .4	Tm	
U	0.89 ± .03	Yb	
		Lu	

**SOIL: 72240**

LOCATION COMMENTS: Station 2, lower slopes of the South Massif. Sample of a fillet from the base of a 2 m diameter boulder (within 1 m of the base).

GENERIC SUBSAMPLES		
1.	72241 (186.0 gm)	< 1 mm
2.	72242 (11.20 gm)	1-2 mm
3.	72243 (7.93 gm)	2-4 mm
4.	72244 (3.99 gm)	4-10 mm
5.	( gm)	> 1 cm
6.	72240 (113.3 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	322.42 gm
<b>Color:</b>	Olive gray (5Y 4/1)
<b>Bag no.:</b>	Doc. bag 497
<b>Container:</b>	Return in sample collection bag 8, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	64.0, mature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	
2. M <sub>d</sub>	

MAJOR ELEMENTS	
	%
SiO <sub>2</sub>	
TiO <sub>2</sub>	
Al <sub>2</sub> O <sub>3</sub>	
Cr <sub>2</sub> O <sub>3</sub>	
FeO	
MnO	
MgO	
CaO	
Na <sub>2</sub> O	
K <sub>2</sub> O	0.144
P <sub>2</sub> O <sub>5</sub>	
S	

TRACE ELEMENTS			
(Keith et al., 1974)			
	ppm		ppm
Sc		La	
V		Ce	
Co		Nd	
Ni		Sm	
Ba		Eu	
Sr		Tb	
Hf		Dy	
Ta		Ho	
Th	3.6 ± .5	Tm	
U	0.94 ± .03	Yb	
		Lu	

**SOIL: 72260**

LOCATION COMMENTS: Station 2, located on the lower slopes near the base of the South Massif.  
Skim sample (upper 1 cm) of a fillet near a 2 m diameter boulder.

GENERIC SUBSAMPLES		
1.	72261 (161.9 gm)	< 1 mm
2.	72262 (7.70 gm)	1-2 mm
3.	72263 (4.4gm)	2-4 mm
4.	72264 (4.4 gm)	4-10 mm
5.	( gm)	> 1 cm
6.	72260 (100.60 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	279.0 gm
<b>Color:</b>	Med. gray (field description)
<b>Bag no.:</b>	Doc. bag 498
<b>Container:</b>	Return in sample collection bag 8, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	59.0, submature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	
2. M <sub>d</sub>	

MAJOR ELEMENTS	
	%
SiO <sub>2</sub>	
TiO <sub>2</sub>	
Al <sub>2</sub> O <sub>3</sub>	
Cr <sub>2</sub> O <sub>3</sub>	
FeO	
MnO	
MgO	
CaO	
Na <sub>2</sub> O	
K <sub>2</sub> O	
P <sub>2</sub> O <sub>5</sub>	
S	

TRACE ELEMENTS			
	ppm		ppm
Sc		La	
V		Ce	
Co		Nd	
Ni		Sm	
Ba		Eu	
Sr		Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	
		Lu	

**SOIL: 72320**

LOCATION COMMENTS: Station 2, near base of South Massif. "Shadowed" soil collected about 20 cm under the east-west overhang of a 2 m diameter boulder.

GENERIC SUBSAMPLES		
1.	72321 (77.3 gm)	< 1 mm
2.	72322 (1.38 gm)	1-2 mm
3.	72323 (0.50 gm)	2-4 mm
4.	72324 (0.96 gm)	4-10 mm
5.	( gm)	> 1 cm
6.	72320 (26.17 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	106.31 gm
<b>Color:</b>	Med. gray (N5)
<b>Bag no.:</b>	Doc. bag 500
<b>Container:</b>	Returned in sample collection bag 8, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	73.0, mature
2. Agglutinates	45.0

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	53 μm (<1 cm); 47 μm (<1 mm)
2. M <sub>d</sub>	

PETROGRAPHY	(90-150 μm)
(Heiken and McKay, 1974)	
<u>Components</u>	<u>%</u>
Agglutinates	45.3
Basalt, Equi.	2.3
Basalt, Various	0.7
Breccia:	
Low-Grade-Brown	5.3
Low-Grade-Colorless	7.3
Med-High Grade	15.6
Anorthosite	0.7
Cataclastic	
Anorthosite	1.7
Norite	2.0
Gabbro	-
Plagioclase	9.3
Clinopyroxene	2.7
Orthopyroxene	0.3
Olivine	0.3
Ilmenite	Tr.
Glass:	
Orange	Tr.
"Black"	1.3
Colorless	1.0
Brown	2.0
Gray, "Ropy"	0.7
Other	-
Total Number Grains	300



<b>MAJOR ELEMENTS</b>	
(Rhodes et al., 1974)	
	<b>%</b>
SiO <sub>2</sub>	44.91
TiO <sub>2</sub>	1.56
Al <sub>2</sub> O <sub>3</sub>	20.57
Cr <sub>2</sub> O <sub>3</sub>	
FeO	8.65
MnO	0.13
MgO	9.84
CaO	12.82
Na <sub>2</sub> O	0.47
K <sub>2</sub> O	0.16
P <sub>2</sub> O <sub>5</sub>	0.15
S	0.06

<b>TRACE ELEMENTS</b>			
(Laul et al., 1974)			
	<b>ppm</b>		<b>ppm</b>
Sc	18	La	17.1
V	50	Ce	45
Co	30	Nd	30
Ni	250	Sm	8.3
Ba	190	Eu	1.31
Sr	155	Tb	1.7
Hf	6.2	Dy	11
Ta	0.84	Ho	
Th	2.9	Tm	
U	1.0	Yb	6.1
Z	200	Lu	0.85
Ir	10		
Au	5		

**SOIL: 72430**

LOCATION COMMENTS: Station 2, at base of South Massif. Soil was scooped up when a blue-gray breccia sample chipped from a boulder was picked up.

GENERIC SUBSAMPLES	
1. 72431 (72.00 gm)	< 1 mm
2. 72432 (3.62 gm)	1-2 mm
3. 72433 (2.33 gm)	2-4 mm
4. 72434 (1.47 gm)	4-10 mm
5. *72435 (160.6 gm)	> 1 cm
6. 72430 (1.45 gm)	Reserve

\*Not included in total mass of soil.

MISCELLANEOUS	
Collected mass:	79.42 gm
Color:	Med. olive gray (5Y 5/1)
Bag no.:	Doc. bag 504
Container:	Returned in sample collection bag 8, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	63.0, mature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	
2. M <sub>d</sub>	

MAJOR ELEMENTS	
	%
SiO <sub>2</sub>	
TiO <sub>2</sub>	
Al <sub>2</sub> O <sub>3</sub>	
Cr <sub>2</sub> O <sub>3</sub>	
FeO	
MnO	
MgO	
CaO	
Na <sub>2</sub> O	
K <sub>2</sub> O	
P <sub>2</sub> O <sub>5</sub>	
S	

TRACE ELEMENTS			
	ppm		ppm
Sc		La	
V		Ce	
Co		Nd	
Ni		Sm	
Ba		Eu	
Sr		Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	
		Lu	

**SOIL: 72440**

LOCATION COMMENTS: Station 2, near base of South Massif. Upper 4 cm of soil collected from under a 2-3 m diameter breccia boulder which was rolled over by the crew.

GENERIC SUBSAMPLES	
1. 72441(267.3 gm)	< 1 mm
2. 72442(10.60 gm)	1-2 mm
3. 72443(7.98 gm)	2-4 mm
4. 72444(2.91 gm)	4-10 mm
5. ( gm)	> 1 cm
6. 72440(161.6 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	450.39 gm
<b>Color:</b>	Olive gray (5Y 4/1)
<b>Bag no.:</b>	Doc. bag 505
<b>Container:</b>	Returned in sample collection bag 8, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	68.0, mature
2. Agglutinates	42

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	65 μm (<1 cm); 53 μm (<1 mm)
2. M <sub>d</sub>	50.8 μm

PETROGRAPHY	(90-150 μm)
(Heiken and McKay, 1974)	
Components	%
Agglutinates	41.7
Basalt, Equi.	1.3
Basalt, Various	1.3
Breccia:	
Low-Grade-Brown	9.3
Low-Grade-Colorless	6.3
Med-High Grade	19.3
Anorthosite	1.0
Cataclastic	
Anorthosite	1.3
Norite	0.7
Gabbro	-
Plagioclase	6.7
Clinopyroxene	3.0
Orthopyroxene	3.3
Olivine	0.7
Ilmenite	0.3
Glass:	
Orange	0.3
"Black"	0.3
Colorless	1.3
Brown	1.0
Gray, "Ropy"	0.3
Other	-
<b>Total Number Grains</b>	<b>300</b>

<b>MAJOR ELEMENTS</b>	
(Rhodes et al., 1974)	
	<b>%</b>
SiO <sub>2</sub>	45.03
TiO <sub>2</sub>	1.55
Al <sub>2</sub> O <sub>3</sub>	20.51
Cr <sub>2</sub> O <sub>3</sub>	0.22
FeO	8.85
MnO	0.13
MgO	9.89
CaO	12.83
Na <sub>2</sub> O	0.46
K <sub>2</sub> O	0.17
P <sub>2</sub> O <sub>5</sub>	0.17
S	0.07

<b>TRACE ELEMENTS</b>			
(Laul et al., 1974)			
	<b>ppm</b>		<b>ppm</b>
Sc	18	La	17.8
V	50	Ce	46
Co	30	Nd	30
Ni	270	Sm	8.3
Ba	190	Eu	1.31
Sr	150	Tb	1.7
Hf	6.1	Dy	10
Ta	0.86	Ho	
Th	2.8	Tm	
U	1.0	Yb	6.0
Zr	200	Lu	0.86
Ir	9		
Au	4		

**SOIL: 72460**

LOCATION COMMENTS: Station 2, near base of South Massif. Skim sample (upper 1 cm) of soil collected from under a 2-3 m diameter breccia boulder which was rolled over by the crew.

GENERIC SUBSAMPLES		
1.	72461 (113.7 gm)	< 1 mm
2.	72462 (5.14 gm)	1-2 mm
3.	72463 (3.90 gm)	2-4 mm
4.	72464 (1.76 gm)	4-10 mm
5.	( gm)	> 1 cm
6.	72460 (0.51 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	125.01 gm
<b>Color:</b>	Olive gray (5Y 4/1)
<b>Bag no.:</b>	Doc. bag 506
<b>Container:</b>	Returned in sample collection bag 8, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	71.0, mature
2. Agglutinates	43

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	80 μm (<1 cm); 61 μm (<1 mm)
2. M <sub>d</sub>	59 μm

PETROGRAPHY	(90-150 μm)
(Heiken and McKay, 1974)	
<b>Components</b>	<b>%</b>
Agglutinates	43.0
Basalt, Equi.	2.7
Basalt, Various	0.3
Breccia:	
Low-Grade-Brown	8.3
Low-Grade-Colorless	5.7
Med-High Grade	15.3
Anorthosite	2.0
Cataclastic	
Anorthosite	1.3
Norite	0.3
Gabbro	-
Plagioclase	11.0
Clinopyroxene	3.0
Orthopyroxene	3.0
Olivine	0.3
Ilmenite	0.6
Glass:	
Orange	0.7
"Black"	1.0
Colorless	1.0
Brown	1.3
Gray, "Ropy"	-
Other	-
<b>Total Number Grains</b>	<b>300</b>

<b>MAJOR ELEMENTS</b>	
(Rhodes et al., 1974)	
	<b>%</b>
SiO <sub>2</sub>	44.48
TiO <sub>2</sub>	1.50
Al <sub>2</sub> O <sub>3</sub>	20.87
Cr <sub>2</sub> O <sub>3</sub>	0.21
FeO	8.58
MnO	0.12
MgO	9.69
CaO	12.97
Na <sub>2</sub> O	0.47
K <sub>2</sub> O	0.17
P <sub>2</sub> O <sub>5</sub>	0.16
S	0.06

<b>TRACE ELEMENTS</b>			
(Laul et al., 1974)			
	<b>ppm</b>		<b>ppm</b>
Sc	18	La	17.6
V	50	Ce	45
Co	30	Nd	28
Ni	230	Sm	8.2
Ba	190	Eu	1.32
Sr	145	Tb	1.6
Hf	6.0	Dy	10
Ta	0.80	Ho	
Th	2.8	Tm	
U	1.0	Yb	6.0
Zr	180	Lu	0.86
Ir	12		
Au	5		

**SOIL: 72500**

LOCATION COMMENTS: Station 2, near base of South Massif. Surface soil to accompany rake sample (72530-72559). Sampled to a depth of 4 cm.

GENERIC SUBSAMPLES	
1. 72501(687.2 gm)	< 1 mm
2. 72502(24.13 gm)	1-2 mm
3. 72503(12.94 gm)	2-4 mm
4. 72504(7.96 gm)	4-10 mm
5. 72505(3.09 gm)	> 1 cm
6. 72500(325.5 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	1060.82 gm
<b>Color:</b>	Dark olive gray (5Y 3/1)
<b>Bag no.:</b>	Doc. bag 502
<b>Container:</b>	Returned in sample collection bag 8, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	81.0, mature
2. Agglutinates	48

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	67 μm (<1 cm); 57 μm (<1 mm)
2. M <sub>d</sub>	

PETROGRAPHY	(90-150 μm)
(Heiken and McKay, 1974)	
<b>Components</b>	<b>%</b>
Agglutinates	48.0
Basalt, Equi.	3.3
Basalt, Various	-
Breccia:	
Low-Grade-Brown	8.3
Low-Grade-Colorless	8.7
Med-High Grade	12.6
Anorthosite	0.7
Cataclastic	
Anorthosite	1.7
Norite	0.3
Gabbro	-
Plagioclase	6.3
Clinopyroxene	3.3
Orthopyroxene	2.0
Olivine	0.7
Ilmenite	0.3
Glass:	
Orange	1.0
"Black"	1.0
Colorless	0.7
Brown	0.7
Gray, "Ropy"	-
Other	0.3
<b>Total Number Grains</b>	<b>300</b>

<b>MAJOR ELEMENTS</b>	
(Rhodes et al., 1974)	
	<b>%</b>
SiO <sub>2</sub>	45.12
TiO <sub>2</sub>	1.56
Al <sub>2</sub> O <sub>3</sub>	20.64
Cr <sub>2</sub> O <sub>3</sub>	0.23
FeO	8.77
MnO	0.11
MgO	10.08
CaO	12.86
Na <sub>2</sub> O	0.40
K <sub>2</sub> O	0.16
P <sub>2</sub> O <sub>5</sub>	0.13
S	0.09

<b>TRACE ELEMENTS</b>			
(Laul et al., 1974)			
	<b>ppm</b>		<b>ppm</b>
Sc	18	La	18.0
V	45	Ce	47
Co	31	Nd	30
Ni	250	Sm	8.2
Ba	190	Eu	1.33
Sr	145	Tb	1.7
Hf	6.1	Dy	11
Ta	0.84	Ho	
Th	2.9	Tm	
U	1.0	Yb	6.0
Zr	220	Lu	0.87
Ir	8		
Au	4		



**SOIL: 72700**

LOCATION COMMENTS: Station 2, at base of South Massif. Slightly upslope from Nansen Crater. Soil was collected to accompany rake sample (72730-72738). Surface sample collected from as deep as 5 cm.

GENERIC SUBSAMPLES	
1. 72701(557.3 gm)	< 1 mm
2. 72702(17.7 gm)	1-2 mm
3. 72703(8.05 gm)	2-4 mm
4. 72704(4.76 gm)	4-10 mm
5. 72705(2.39 gm)	> 1 cm
6. 72700(295.2 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	885.40 gm
<b>Color:</b>	Olive gray (5Y 4/1)
<b>Bag no.:</b>	Doc. bag 508
<b>Container:</b>	Returned in sample collection bag 8, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	61.0, mature
2. Agglutinates	43

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	62 μm (<1 cm); 54 μm (<1 mm)
2. M <sub>d</sub>	53.7 μm

PETROGRAPHY	(90-150 μm)
(Heiken and McKay, 1974)	
<b>Components</b>	<b>%</b>
Agglutinates	43.6
Basalt, Equi.	1.7
Basalt, Various	-
Breccia:	
Low-Grade-Brown	12.6
Low-Grade-Colorless	9.7
Med-High Grade	11.7
Anorthosite	1.3
Cataclastic	
Anorthosite	1.0
Norite	0.3
Gabbro	-
Plagioclase	7.7
Clinopyroxene	3.0
Orthopyroxene	0.7
Olivine	1.7
Ilmenite	-
Glass:	
Orange	1.0
"Black"	1.7
Colorless	0.7
Brown	1.3
Gray, "Ropy"	-
Other	-
<b>Total Number Grains</b>	<b>300</b>

<b>MAJOR ELEMENTS</b>	
(Rhodes et al., 1974)	
	<b>%</b>
SiO <sub>2</sub>	45.12
TiO <sub>2</sub>	1.56
Al <sub>2</sub> O <sub>3</sub>	20.64
Cr <sub>2</sub> O <sub>3</sub>	0.23
FeO	8.77
MnO	0.11
MgO	10.08
CaO	12.86
Na <sub>2</sub> O	0.40
K <sub>2</sub> O	0.16
P <sub>2</sub> O <sub>5</sub>	0.13
S	0.09

<b>TRACE ELEMENTS</b>			
(Laul et al., 1974)			
	<b>ppm</b>		<b>ppm</b>
Sc	18	La	18.0
V	45	Ce	47
Co	31	Nd	30
Ni	250	Sm	8.2
Ba	190	Eu	1.33
Sr	145	Tb	1.7
Hf	6.1	Dy	11
Ta	0.84	Ho	
Th	2.9	Tm	
U	1.0	Yb	6.0
Zr	220	Lu	0.87
Ir	8		
Au	4		

**SOIL: 73120**

LOCATION COMMENTS: Station 2A (LRV-4), about 750 m NNE of Station 2 and the base of South Massif on the "light mantle.". Surface sample collected from upper few centimeters.

GENERIC SUBSAMPLES	
1. 73121(179.70 gm)	< 1 mm
2. 73122(5.25 gm)	1-2 mm
3. 73123(2.03 gm)	2-4 mm
4. 73124(0.50 gm)	4-10 mm
5. ( gm)	> 1 cm
6. 73120(100.2 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	287.68 gm
<b>Color:</b>	Olive gray (5Y 4/1)
<b>Bag no.:</b>	Doc. bag 30E
<b>Container:</b>	Returned in sample collection bag 6, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	78.0, mature
2. Agglutinates	42

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	64 μm (<1 cm); 58 μm (<1 mm)
2. M <sub>d</sub>	

PETROGRAPHY	(90-150 μm)
(Heiken and McKay, 1974)	
<b>Components</b>	<b>%</b>
Agglutinates	41.7
Basalt, Equi.	-
Basalt, Various	-
Breccia:	
Low-Grade-Brown	8.7
Low-Grade-Colorless	7.7
Med-High Grade	15.6
Anorthosite	0.3
Cataclastic	
Anorthosite	1.0
Norite	0.3
Gabbro	-
Plagioclase	8.3
Clinopyroxene	4.3
Orthopyroxene	2.3
Olivine	1.0
Ilmenite	2.0
Glass:	
Orange	1.7
"Black"	0.7
Colorless	2.3
Brown	2.0
Gray, "Ropy"	-
Other	-
<b>Total Number Grains</b>	<b>300</b>

<b>MAJOR ELEMENTS</b>	
(Rose et al., 1974)	
	<b>%</b>
SiO <sub>2</sub>	45.56
TiO <sub>2</sub>	1.39
Al <sub>2</sub> O <sub>3</sub>	21.23
Cr <sub>2</sub> O <sub>3</sub>	0.26
FeO	8.45
MnO	0.11
MgO	9.73
CaO	12.82
Na <sub>2</sub> O	0.39
K <sub>2</sub> O	0.17
P <sub>2</sub> O <sub>5</sub>	0.15
S	0.09

<b>TRACE ELEMENTS</b>			
(Laul et al., 1974)			
	<b>ppm</b>		<b>ppm</b>
Sc	17	La	15.6
V	50	Ce	39
Co	31	Nd	27
Ni	280	Sm	7.2
Ba	150	Eu	1.20
Sr		Tb	1.4
Hf	5.0	Dy	10
Ta	0.78	Ho	
Th	2.4	Tm	
U	0.7	Yb	5.3
Zr	200	Lu	0.77
Ir	11		
Au	3		

**SOIL: 73130**

LOCATION COMMENTS: Station 2A, located 750 m NNE of the base of South Massif on "light mantle." Collected as "soil breccia" or friable aggregate in the bottom of a 3 m diameter blocky crater. Apparently it didn't survive transport back to earth as a rock.

GENERIC SUBSAMPLES	
1. 73131(132.3 gm)	< 1 mm
2. 73132(10.38 gm)	1-2 mm
3. 73133(8.58 gm)	2-4 mm
4. 73134(9.61 gm)	4-10 mm
5. ( gm)	> 1 cm
6. 73130(77.20 gm)	Reserve

MISCELLANEOUS	
Collected mass:	238.07 gm
Color:	Med. light gray (N6)
Bag no.:	Doc. bag 31E
Container:	Returned in sample collection bag 8, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	16.0 immature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	
2. M <sub>d</sub>	

MAJOR ELEMENTS	
LSPET, 1973)	
	%
SiO <sub>2</sub>	
TiO <sub>2</sub>	
Al <sub>2</sub> O <sub>3</sub>	
Cr <sub>2</sub> O <sub>3</sub>	
FeO	
MnO	
MgO	
CaO	
Na <sub>2</sub> O	
K <sub>2</sub> O	0.1397
P <sub>2</sub> O <sub>5</sub>	
S	

TRACE ELEMENTS			
(LSPET, 1973)			
	ppm		ppm
Sc	*15	La	
V		Ce	
Co	*119	Nd	
Ni		Sm	
Ba		Eu	
Sr		Tb	
Hf		Dy	
Ta		Ho	
Th	2.24	Tm	
U	0.63	Yb	
		Lu	

\* dpm/kg

**SOIL: 73140**

LOCATION COMMENTS: Station 2A, 750 m NNE of the base of South Massif. Light colored soil collected 15 cm below the regolith surface.

GENERIC SUBSAMPLES	
1. 73141(191.4 gm)	< 1 mm
2. 73142(11.69 gm)	1-2 mm
3. 73143(7.89 gm)	2-4 mm
4. 73144(4.47 gm)	4-10 mm
5. *73145 to 73146 (8.61 gm)	> 1 cm
6. 73140(121.6 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	345.61 gm
<b>Color:</b>	Olive gray (5Y 4/1)
<b>Bag no.:</b>	Doc. bag 40Y
<b>Container:</b>	Returned in sample collection bag 6, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	48.0, submature
2. Agglutinates	32

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	74.8 μm
2. M <sub>d</sub>	62.5 μm

PETROGRAPHY	(90-150 μm)
(Heiken and McKay, 1974)	
<b>Components</b>	<b>%</b>
Agglutinates	32.0
Basalt, Equi.	2.6
Basalt, Various	-
Breccia:	
Low-Grade-Brown	18.3
Low-Grade-Colorless	4.9
Med-High Grade	15.3
Anorthosite	0.3
Cataclastic	
Anorthosite	2.0
Norite	0.3
Gabbro	-
Plagioclase	14.0
Clinopyroxene	4.2
Orthopyroxene	1.0
Olivine	1.0
Ilmenite	0.7
Glass:	
Orange	Tr.
"Black"	0.6
Colorless	0.6
Brown	1.6
Gray, "Ropy"	-
Other	0.3
<b>Total Number Grains</b>	<b>306</b>

<b>MAJOR ELEMENTS</b>	
(Rhodes et al., 1974)	
	<b>%</b>
SiO <sub>2</sub>	45.12
TiO <sub>2</sub>	1.56
Al <sub>2</sub> O <sub>3</sub>	20.64
Cr <sub>2</sub> O <sub>3</sub>	0.23
FeO	8.77
MnO	0.11
MgO	10.08
CaO	12.86
Na <sub>2</sub> O	0.40
K <sub>2</sub> O	0.16
P <sub>2</sub> O <sub>5</sub>	0.13
S	0.09

<b>TRACE ELEMENTS</b>			
(Laul et al., 1974)			
	<b>ppm</b>		<b>ppm</b>
Sc	18	La	18.0
V	45	Ce	47
Co	31	Nd	30
Ni	250	Sm	8.2
Ba	190	Eu	1.33
Sr	145	Tb	1.7
Hf	6.1	Dy	11
Ta	0.84	Ho	
Th	2.9	Tm	
U	1.0	Yb	6.0
Zr	220	Lu	0.87
Ir	8		
Au	4		

**SOIL: 73150**

LOCATION COMMENTS: Station 2A, 750 m NNE of the base of South Massif. Soil collected with blue-gray breccia (73155). Surface sample.

GENERIC SUBSAMPLES	
1. 73151(101.2 gm)	< 1 mm
2. 73152(3.57 gm)	1-2 mm
3. 73153(1.31 gm)	2-4 mm
4. 73154(0.31 gm)	4-10 mm
5. *73155 to 73156 (79.3 gm)	> 1 cm
6. 73150(52.56 gm)	Reserve

\*73155 not included in total mass of sample; 73156  
(3.15 gm) included in total mass of sample.

MISCELLANEOUS	
Collected mass:	162.1 gm
Color:	Olive gray (5Y 4/1)
Bag no.:	Doc. bag 32E
Container:	Returned in sample collection bag 6, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	68.0 mature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	
2. M <sub>d</sub>	

MAJOR ELEMENTS	
	%
SiO <sub>2</sub>	
TiO <sub>2</sub>	
Al <sub>2</sub> O <sub>3</sub>	
Cr <sub>2</sub> O <sub>3</sub>	
FeO	
MnO	
MgO	
CaO	
Na <sub>2</sub> O	
K <sub>2</sub> O	
P <sub>2</sub> O <sub>5</sub>	
S	

TRACE ELEMENTS			
	ppm		ppm
Sc		La	
V		Ce	
Co		Nd	
Ni		Sm	
Ba		Eu	
Sr		Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	
		Lu	



**SOIL: 73210**

LOCATION COMMENTS: Station 3, on the "light mantle" on the rim of a 10 m diameter crater.  
Collected with 4 rocks (73125-73128, 1402.67 gm).

GENERIC SUBSAMPLES		
1.	73211(51.95 gm)	< 1 mm
2.	73212(3.47 gm)	1-2 mm
3.	73213(2.80 gm)	2-4 mm
4.	73214(2.47 gm)	4-10 mm
5.	*72155(2.88 gm)	> 1 cm
6.	73210(37.57 gm)	Reserve

MISCELLANEOUS	
Collected mass:	101.14 gm
Color:	Med. olive gray (N5)
Bag no.:	Doc. bag 527
Container:	Returned in sample collection bag 6, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	39.0 submature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	
2. M <sub>d</sub>	

MAJOR ELEMENTS	
	%
SiO <sub>2</sub>	
TiO <sub>2</sub>	
Al <sub>2</sub> O <sub>3</sub>	
Cr <sub>2</sub> O <sub>3</sub>	
FeO	
MnO	
MgO	
CaO	
Na <sub>2</sub> O	
K <sub>2</sub> O	
P <sub>2</sub> O <sub>5</sub>	
S	

TRACE ELEMENTS			
	ppm		ppm
Sc		La	
V		Ce	
Co		Nd	
Ni		Sm	
Ba		Eu	
Sr		Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	
		Lu	

**SOIL: 73220**

LOCATION COMMENTS: Station 3, on the "light mantle." Skim sample (depth of about 1 cm) of the upper light gray soil. Part of the trench sequence.

GENERIC SUBSAMPLES	
1. 73221(48.11 gm)	< 1 mm
2. 73222(2.71 gm)	1-2 mm
3. 73223(2.61 gm)	2-4 mm
4. 73224(1.65 gm)	4-10 mm
5. 73225(3.66 gm)	> 1 cm
6. 73220(20.8 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	79.54 gm
<b>Color:</b>	Med. olive gray (5Y 5/1)
<b>Bag no.:</b>	Doc. bag 520
<b>Container:</b>	Returned in sample collection bag 6, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	43.0, submature
2. Agglutinates	26

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	95 μm (<1 cm); 64 μm (<1 mm)
2. M <sub>d</sub>	68.4 μm

PETROGRAPHY	(90-150 μm)
(Heiken and McKay, 1974)	
<b>Components</b>	<b>%</b>
Agglutinates	26.3
Basalt, Equi.	3.0
Basalt, Various	1.3
Breccia:	
Low-Grade-Brown	18.3
Low-Grade-Colorless	10.3
Med-High Grade	18.0
Anorthosite	0.3
Cataclastic	
Anorthosite	0.3
Norite	-
Gabbro	-
Plagioclase	11.3
Clinopyroxene	8.0
Orthopyroxene	Tr.
Olivine	1.3
Ilmenite	0.3
Glass:	
Orange	-
"Black"	2.6
Colorless	0.3
Brown	0.6
Gray, "Ropy"	-
Other	-
<b>Total Number Grains</b>	<b>300</b>

<b>MAJOR ELEMENTS</b>	
(Rose et al., 1974)	
	<b>%</b>
SiO <sub>2</sub>	45.20
TiO <sub>2</sub>	1.86
Al <sub>2</sub> O <sub>3</sub>	21.03
Cr <sub>2</sub> O <sub>3</sub>	0.27
FeO	8.85
MnO	0.11
MgO	8.97
CaO	12.86
Na <sub>2</sub> O	0.41
K <sub>2</sub> O	0.16
P <sub>2</sub> O <sub>5</sub>	0.15
S	

<b>TRACE ELEMENTS</b>			
(Rose et al., 1974)			
	<b>ppm</b>		<b>ppm</b>
Sc	15	La	<10
V	40	Ce	
Co	49	Nd	
Ni	250	Sm	
Ba	190	Eu	
Sr	146	Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	4.6
		Lu	

**SOIL: 73240**

LOCATION COMMENTS: Station 3, on the "light mantle." Upper 5 cm of the trench sample sequence. Typical of "light" material a few centimeters below the regolith surface.

GENERIC SUBSAMPLES		
1.	73241(192.7 gm)	< 1 mm
2.	73242(14.94 gm)	1-2 mm
3.	73243(14.38 gm)	2-4 mm
4.	73244(22.25 gm)	4-10 mm
5.	73245(1.6 gm)	> 1 cm
6.	73240(117.7 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	360.57 gm
<b>Color:</b>	Light med. olive gray (N5 to N6)
<b>Bag no.:</b>	Doc. bag 521
<b>Container:</b>	Returned in sample collection bag 6, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	18.0, immature
2. Agglutinates	8

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	127 μm (<1 cm); 51 μm (<1 mm)
2. M <sub>d</sub>	78 μm

PETROGRAPHY	(90-150 μm)
(Heiken and McKay, 1974)	
<b>Components</b>	<b>%</b>
Agglutinates	8.4
Basalt, Equi.)	1.0
Basalt, Various	-
Breccia:	
Low-Grade-Brown	35.8
Low-Grade-Colorless	0.3
Med-High Grade	25.4
Anorthosite	0.3
Cataclastic	
Anorthosite	2.7
Norite	-
Gabbro	-
Plagioclase	11.4
Clinopyroxene	3.3
Orthopyroxene	2.0
Olivine	0.7
Ilmenite	-
Glass:	
Orange	0.3
"Black"	5.7
Colorless	1.0
Brown	-
Gray, "Ropy"	1.0
Other	-
<b>Total Number Grains</b>	<b>299</b>

<b>MAJOR ELEMENTS</b>	
(Rose et al., 1974)	
	<b>%</b>
SiO <sub>2</sub>	44.55
TiO <sub>2</sub>	1.73
Al <sub>2</sub> O <sub>3</sub>	20.20
Cr <sub>2</sub> O <sub>3</sub>	0.25
FeO	8.45
MnO	0.11
MgO	11011
CaO	12.90
Na <sub>2</sub> O	0.46
K <sub>2</sub> O	0.16
P <sub>2</sub> O <sub>5</sub>	0.15
S	

<b>TRACE ELEMENTS</b>			
(Rose et al., 1974)			
	<b>ppm</b>		<b>ppm</b>
Sc	15	La	<10
V	46	Ce	
Co	37	Nd	
Ni	320	Sm	
Ba	160	Eu	
Sr	127	Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	4.6
		Lu	

**SOIL: 73260**

LOCATION COMMENTS: Station 3, on the "light mantle." Medium gray portion of a "marbled zone" about 5-10 cm below the surface. In a sequence of trench samples.

GENERIC SUBSAMPLES	
1. 73261(48.11 gm)	< 1 mm
2. 73262(2.71 gm)	1-2 mm
3. 73263(2.61 gm)	2-4 mm
4. 73264(1.65 gm)	4-10 mm
5. 73265(3.66 gm)	> 1 cm
6. 73260(20.8 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	326.23 gm
<b>Color:</b>	Olive gray (5Y 4/1)
<b>Bag no.:</b>	Doc. bag 522
<b>Container:</b>	Returned in sample collection bag 6, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	45.0, submature
2. Agglutinates	34

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	87 μm (<1 cm); 56 μm (<1 mm)
2. M <sub>d</sub>	56 μm

PETROGRAPHY	(90-150 μm)
(Heiken and McKay, 1974)	
<b>Components</b>	<b>%</b>
Agglutinates	26.3
Basalt, Equi.	3.0
Basalt, Various	1.3
Breccia:	
Low-Grade-Brown	18.3
Low-Grade-Colorless	10.3
Med-High Grade	18.0
Anorthosite	0.3
Cataclastic	
Anorthosite	0.3
Norite	-
Gabbro	-
Plagioclase	11.3
Clinopyroxene	8.0
Orthopyroxene	Tr.
Olivine	1.3
Ilmenite	0.3
Glass:	
Orange	-
"Black"	2.6
Colorless	0.3
Brown	0.6
Gray, "Ropy"	-
Other	-
<b>Total Number Grains</b>	<b>300</b>

<b>MAJOR ELEMENTS</b>	
(Rose et al., 1974)	
	<b>%</b>
SiO <sub>2</sub>	44.71
TiO <sub>2</sub>	1.90
Al <sub>2</sub> O <sub>3</sub>	19.69
Cr <sub>2</sub> O <sub>3</sub>	0.24
FeO	8.86
MnO	0.11
MgO	10.95
CaO	12.90
Na <sub>2</sub> O	0.40
K <sub>2</sub> O	0.16
P <sub>2</sub> O <sub>5</sub>	0.14
S	

<b>TRACE ELEMENTS</b>			
(Rose et al., 1974)			
	<b>ppm</b>		<b>ppm</b>
Sc	17	La	<10
V	46	Ce	
Co	46	Nd	
Ni	450	Sm	
Ba	160	Eu	
Sr	127	Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	5.6
		Lu	

**SOIL: 73280**

LOCATION COMMENTS: Station 3, on the "light mantle" deposits. Light gray fraction of "marbled zone" about 5-10 cm below the regolith surface. Collected as part of the trench sample sequence.

GENERIC SUBSAMPLES	
1. 73281(95.75 gm)	< 1 mm
2. 73282(5.38gm)	1-2 mm
3. 73283(4.74 gm)	2-4 mm
4. 73284(7.14 gm)	4-10 mm
5. 73285(2.58 gm)	> 1 cm
6. 73280(53.54 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	169.13 gm
<b>Color:</b>	Med. gray (N5)
<b>Bag no.:</b>	Doc. bag 523
<b>Container:</b>	Returned in sample collection bag 6, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	34.0, submature
2. Agglutinates	25

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	90 μm (<1 cm); 49 μm (<1 mm)
2. M <sub>d</sub>	61.6 μm

PETROGRAPHY	(90-150 μm)
(Heiken and McKay, 1974)	
<b>Components</b>	<b>%</b>
Agglutinates	24.6
Basalt, Equi.	3.7
Basalt, Varios	
Breccia:	
Low-Grade-Brown	23.7
Low-Grade-Colorless	2.3
Med-High Grade	20.6
Anorthosite	0.3
Cataclastic	
Anorthosite	1.6
Norite	-
Gabbro	-
Plagioclase	9.3
Clinopyroxene	0.3
Orthopyroxene	Tr.
Olivine	0.3
Ilmenite	1.3
Glass:	
Orange	1.3
"Black"	0.3
Colorless	0.6
Brown	2.0
Gray, "Ropy"	0.3
Other	-
<b>Total Number Grains</b>	<b>300</b>



<b>MAJOR ELEMENTS</b>	
(Rose et al., 1974)	
	<b>%</b>
SiO <sub>2</sub>	45.31
TiO <sub>2</sub>	1.76
Al <sub>2</sub> O <sub>3</sub>	20.23
Cr <sub>2</sub> O <sub>3</sub>	0.27
FeO	8.82
MnO	0.11
MgO	9.95
CaO	12.10
Na <sub>2</sub> O	0.41
K <sub>2</sub> O	0.16
P <sub>2</sub> O <sub>5</sub>	0.14
S	

<b>TRACE ELEMENTS</b>			
(Rose et al., 1974)			
	<b>ppm</b>		<b>ppm</b>
Sc	15	La	<10
V	42	Ce	
Co	46	Nd	
Ni	380	Sm	
Ba	160	Eu	
Sr	117	Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	4.8
		Lu	

**SOIL: 74110**

LOCATION COMMENTS: LRV-5, between Station 3 and 4. Collected with a very friable breccia, so is probably not a representative soil sample. Breccia fell apart in transit so is not included in the "soil." Surface sample.

GENERIC SUBSAMPLES		
1.	74111(116.8 gm)	< 1 mm
2.	74112(11.12 gm)	1-2 mm
3.	74113(12.11 gm)	2-4 mm
4.	74114(13.26 gm)	4-10 mm
5.	*74115 to 74119 (37.11 gm)	> 1 cm
6.	74110(92.12 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	282.52 gm
<b>Color:</b>	Light olive gray (5Y 6/1)
<b>Bag no.:</b>	Doc. bag 41Y
<b>Container:</b>	Returned in sample collection bag 8, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	31.0 submature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	
2. M <sub>d</sub>	

MAJOR ELEMENTS	
	%
SiO <sub>2</sub>	
TiO <sub>2</sub>	
Al <sub>2</sub> O <sub>3</sub>	
Cr <sub>2</sub> O <sub>3</sub>	
FeO	
MnO	
MgO	
CaO	
Na <sub>2</sub> O	
K <sub>2</sub> O	
P <sub>2</sub> O <sub>5</sub>	
S	

TRACE ELEMENTS			
	ppm		ppm
Sc		La	
V		Ce	
Co		Nd	
Ni		Sm	
Ba		Eu	
Sr		Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	
		Lu	

**SOIL: 74120**

LOCATION COMMENTS: LRV-6, between Stations 3 and 4. Surface sample from upper few centimeters of regolith. "Light mantle" material.

<b>GENERIC SUBSAMPLES</b>	
1. 74121(252.0 gm)	< 1 mm
2. 74122(6.65 gm)	1-2 mm
3. 74123(2.73 gm)	2-4 mm
4. 74124(0.39 gm)	4-10 mm
5. ( gm)	> 1 cm
6. 74120(124.1 gm)	Reserve

<b>MISCELLANEOUS</b>	
<b>Collected mass:</b>	385.87 gm
<b>Color:</b>	Olive gray (5Y 4/1)
<b>Bag no.:</b>	Doc. bag 42Y
<b>Container:</b>	Returned in sample collection bag 8.

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

<b>MATURITY PARAMETERS</b>	
1. $I_s/\text{FeO}$	88.0, mature
2. Agglutinates	52

<b>GRAIN SIZE PARAMETERS</b>	
1. $M_z$	54 $\mu\text{m}$ (<1 cm); 49 $\mu\text{m}$ (<1 mm)
2. $M_d$	44.0 $\mu\text{m}$

<b>PETROGRAPHY</b>	(90-150 $\mu\text{m}$ )
(Heiken and McKay, 1974)	
<b>Components</b>	<b>%</b>
Agglutinates	51.7
Basalt, Equi.	2.0
Basalt, Various	-
Breccia:	
Low-Grade-Brown	7.0
Low-Grade-Colorless	5.7
Med-High Grade	12.0
Anorthosite	0.7
Cataclastic	
Anorthosite	0.7
Norite	0.7
Gabbro	-
Plagioclase	7.3
Clinopyroxene	3.7
Orthopyroxene	1.0
Olivine	0.3
Ilmenite	0.7
Glass:	
Orange	0.3
"Black"	2.3
Colorless	1.7
Brown	1.8
Gray, "Ropy"	-
Other	0.3
<b>Total Number Grains</b>	<b>300</b>

<b>MAJOR ELEMENTS</b>	
(Duncan et al., 1974)	
	<b>%</b>
SiO <sub>2</sub>	44.51
TiO <sub>2</sub>	2.56
Al <sub>2</sub> O <sub>3</sub>	19.36
Cr <sub>2</sub> O <sub>3</sub>	0.269
FeO	10.24
MnO	0.132
MgO	9.93
CaO	12.44
Na <sub>2</sub> O	0.40
K <sub>2</sub> O	0.134
P <sub>2</sub> O <sub>5</sub>	0.136
S	0.083

<b>TRACE ELEMENTS</b>			
(Philpotts et al., 1974)			
	<b>ppm</b>		<b>ppm</b>
Sc		La	
V		Ce	39.0
Co		Nd	25.6
Ni		Sm	7.55
Ba	167	Eu	1.33
Sr	150	Tb	
Hf		Dy	10.4
Ta		Ho	
Th		Tm	
U		Yb	5.79
		Lu	0.895

**SOIL: 74220**

LOCATION COMMENTS: Station 4, on the rim of 120 m diameter Shorty Crater. From 0.8 m wide band of orange hue, bordered by light gray soil and underlain by a black clastic deposit. From a 6-8 cm deep trench. 74220 has been interpreted by several investigators as a friable clastic rock and not as a soil.

GENERIC SUBSAMPLES		
1.	74221(7.77 gm)	< 1 mm
2.	74222(0.08 gm)	1-2 mm
3.	74223(0.17 gm)	2-4 mm
4.	74224(0.98 gm)	4-10 mm
5.	( gm)	> 1 cm
6.	74220(1171.0 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	1180 gm
<b>Color:</b>	Moderate to pale brown (5Y 4/4)
<b>Bag no.:</b>	Doc. bag 509
<b>Container:</b>	

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS		
1.	$I_s/\text{FeO}$	1.0, immature
2.	Agglutinates	2

GRAIN SIZE PARAMETERS		
1.	$M_z$	41 $\mu\text{m}$ (<1 mm)
2.	$M_d$	38 $\mu\text{m}$

PETROGRAPHY		(90-150 $\mu\text{m}$ )
(Heiken and McKay, 1974)		
Components	%	
	,6	,82
Agglutinates	1.2	2.7
Basalt, Equi.	1.6	2.0
Basalt, Various		
Breccia:		
Low-Grade-Brown	0.3	-
Low-Grade-Colorless	-	1.3
Med-High Grade	-	-
Anorthosite	-	-
Cataclastic		
Anorthosite	-	-
Norite	-	-
Gabbro	-	
Plagioclase	-	1.0
Clinopyroxene	0.3	0.3
Orthopyroxene	-	-
Olivine	-	-
Ilmenite	-	0.3
Glass:		
Orange	66.3	83.6
"Black"	29.3	6.7
Colorless	0.3	-
Brown	-	1.3
Gray, "Ropy"	-	0.7
Other	-	-
<b>Total Number Grains</b>	<b>300</b>	<b>300</b>

<b>MAJOR ELEMENTS</b>	
(Rhodes et al., 1972)	
	<b>%</b>
SiO <sub>2</sub>	38.57
TiO <sub>2</sub>	8.81
Al <sub>2</sub> O <sub>3</sub>	6.32
Cr <sub>2</sub> O <sub>3</sub>	0.75
FeO	22.04
MnO	0.30
MgO	14.44
CaO	7.68
Na <sub>2</sub> O	0.36
K <sub>2</sub> O	0.09
P <sub>2</sub> O <sub>5</sub>	0.04
S	0.07

<b>TRACE ELEMENTS</b>			
(Rhodes et al., 1972)			
	<b>ppm</b>		<b>ppm</b>
Sc		La	6.25
V		Ce	19.0
Co		Nd	17.8
Ni	83	Sm	6.53
Ba	76.4	Eu	1.80
Sr	209	Tb	
Hf		Dy	9.40
Ta		Ho	
Th	-	Tm	
U	0.16	Yb	4.43
		Lu	0.61

**SOIL: 74240**

LOCATION COMMENTS: Station 4, on the rim of Shorty Crater. Gray soil bordering a 1 m wide band of orange soil on the southern edge of a 5-8 cm deep trench.

GENERIC SUBSAMPLES		MISCELLANEOUS	
1.	74241(307.3 gm)	< 1 mm	<b>Collected mass:</b> 1039.978 gm
2.	74242(22.50 gm)	1-2 mm	<b>Color:</b> Gray to med. gray (N5.5 to 5YR 5/1)
3.	74243(27.67 gm)	2-4 mm	<b>Bag no.:</b> Doc. bag 510
4.	74244(21.95 gm)	4-10 mm	<b>Container:</b> Returned in sample container 2, in vacuum. Processed in N <sub>2</sub> .
5.	*74245(116.658 gm)	> 1 cm	
6.	74240(544.9 gm)	Reserve	

\*Samples 74245 to 74249 and 74285 to 74287 derived from this split.

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS		PETROGRAPHY	(90-150 µm)
1.	I <sub>s</sub> /FeO	5.1, immature	(Heiken and McKay, 1974)
2.	Agglutinates	8	
GRAIN SIZE PARAMETERS		Components	%
1.	M <sub>z</sub>	Agglutinates	8.0
		Basalt, Equi.	30.0
2.	M <sub>d</sub>	Basalt, Various	
		Breccia:	
		Low-Grade-Brown	1.6
		Low-Grade-Colorless	13.3
		Med-High Grade	2.0
		Anorthosite	-
		Cataclastic	
		Anorthosite	0.6
		Norite	-
		Gabbro	-
		Plagioclase	4.6
		Clinopyroxene	11.3
		Orthopyroxene	-
		Olivine	-
		Ilmenite	1.3
		Glass:	
		Orange	4.0
		"Black"	-
		Colorless	4.6
		Brown	3.6
		Gray, "Ropy"	14.3
		Other	0.3
		<b>Total Number Grains</b>	<b>300</b>

<b>MAJOR ELEMENTS</b>	
(Apollo 17 P.E.T., 1974)	
	<b>%</b>
SiO <sub>2</sub>	40.78
TiO <sub>2</sub>	8.61
Al <sub>2</sub> O <sub>3</sub>	12.54
Cr <sub>2</sub> O <sub>3</sub>	0.41
FeO	15.84
MnO	0.24
MgO	9.15
CaO	11.36
Na <sub>2</sub> O	0.38
K <sub>2</sub> O	0.12
P <sub>2</sub> O <sub>5</sub>	0.09
S	0.14

<b>TRACE ELEMENTS</b>			
(Rhodes et al., 1974)			
	<b>ppm</b>		<b>ppm</b>
Sc		La	9.95
V		Ce	28.8
Co		Nd	24.0
Ni	80	Sm	8.55
Ba	112	Eu	1.60
Sr	163	Tb	
Hf		Dy	13.7
Ta		Ho	
Th	-	Tm	
U	0.37	Yb	7.45
		Lu	-



**SOIL: 74260**

LOCATION COMMENTS: Station 4, on the rim of 120 m diameter Shorty Crater. Gray soil bordering a 1 m wide band of orange soil on the northern edge of a 5-8 cm deep trench.

GENERIC SUBSAMPLES	
1. 74261(12.44 gm)	< 1 mm
2. 74262(0.75 gm)	1-2 mm
3. 74263(0.57 gm)	2-4 mm
4. 74264(1.74 gm)	4-10 mm
5. ( gm)	> 1 cm
6. 74260(511.20 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	526.7 gm
<b>Color:</b>	Light brownish gray (5YR 6/1)
<b>Bag no.:</b>	Doc. bag 511
<b>Container:</b>	Returned in sample container 2, in vacuum. Processed in N <sub>2</sub> .

\*Samples 74245 to 74249 and 74285 to 74287 derived from this split.

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	5.0, immature
2. Agglutinates	8

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	127 μm (<1 cm); 56 μm (<1 mm)
2. M <sub>d</sub>	88.0 μm

PETROGRAPHY	(90-150 μm)
(Heiken and McKay, 1974)	
<b>Components</b>	<b>%</b>
Agglutinates	7.7
Basalt, Equi.	23.7
Basalt, Various	
Breccia:	
Low-Grade-Brown	17.4
Low-Grade-Colorless	5.4
Med-High Grade	3.3
Anorthosite	-
Cataclastic	
Anorthosite	-
Norite	-
Gabbro	-
Plagioclase	2.7
Clinopyroxene	13.7
Orthopyroxene	-
Olivine	0.3
Ilmenite	2.3
Glass:	
Orange	7.7
"Black"	2.0
Colorless	3.7
Brown	1.7
Gray, "Ropy"	18.1
Other	0.3
<b>Total Number Grains</b>	<b>300</b>

<b>MAJOR ELEMENTS</b>	
(Apollo 17 P.E.T., 1974)	
	<b>%</b>
SiO <sub>2</sub>	41.22
TiO <sub>2</sub>	7.68
Al <sub>2</sub> O <sub>3</sub>	13.25
Cr <sub>2</sub> O <sub>3</sub>	0.41
FeO	15.31
MnO	0.23
MgO	9.47
CaO	11.37
Na <sub>2</sub> O	0.38
K <sub>2</sub> O	0.12
P <sub>2</sub> O <sub>5</sub>	0.09
S	0.12

<b>TRACE ELEMENTS</b>			
(Korotev, 1976)			
	<b>ppm</b>		<b>ppm</b>
Sc	56.3	La	
V		Ce	
Co	49.2	Nd	
Ni	160	Sm	
Ba		Eu	
Sr		Tb	
Hf	6.7	Dy	
Ta	1.1	Ho	
Th	0.7	Tm	
U		Yb	
		Lu	

**SOIL: 75060**

LOCATION COMMENTS: Station 5, on the southwest rim of Camelot Crater. Collected from irregular, 1 cm deep depression on a 3 m wide boulder. Collected 1-2 m from boulder edge. "Skim" sample (1 cm deep).

GENERIC SUBSAMPLES	
1. 75061(157.9 gm)	< 1 mm
2. 75062(8.52 gm)	1-2 mm
3. 75063(6.28 gm)	2-4 mm
4. 75064(11.63 gm)	4-10 mm
5. *75065 to 75066 (2.243 gm)	> 1 cm
6. 75060(0.527 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	186.523 gm
<b>Color:</b>	Brownish gray (5YR 4/1)
<b>Bag no.:</b>	Doc. bag 465
<b>Container:</b>	Returned in sample container 2, in vacuum. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	33.0, submature
2. Agglutinates	24

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	128 μm (<1 cm); 81 μm (<1 mm)
2. M <sub>d</sub>	110.3 μm

PETROGRAPHY	(90-150 μm)
(Heiken and McKay, 1974)	
<b>Components</b>	<b>%</b>
Agglutinates	24.0
Basalt, Equi.	26.6
Basalt, Various	
Breccia:	
Low-Grade-Brown	2.6
Low-Grade-Colorless	2.0
Med-High Grade	0.3
Anorthosite	-
Cataclastic	
Anorthosite	-
Norite	-
Gabbro	-
Plagioclase	4.6
Clinopyroxene	29.6
Orthopyroxene	-
Olivine	0.3
Ilmenite	5.3
Glass:	
Orange	1.0
"Black"	-
Colorless	1.6
Brown	1.6
Gray, "Ropy"	-
Other	-
<b>Total Number Grains</b>	<b>299</b>

<b>MAJOR ELEMENTS</b>	
(Rhodes et al., 1974)	
	<b>%</b>
SiO <sub>2</sub>	39.32
TiO <sub>2</sub>	10.31
Al <sub>2</sub> O <sub>3</sub>	10.42
Cr <sub>2</sub> O <sub>3</sub>	0.48
FeO	18.19
MnO	0.25
MgO	9.53
CaO	10.72
Na <sub>2</sub> O	0.33
K <sub>2</sub> O	0.08
P <sub>2</sub> O <sub>5</sub>	0.06
S	0.13

<b>TRACE ELEMENTS</b>			
(Rhodes et al., 1974)			
	<b>ppm</b>		<b>ppm</b>
Sc		La	7.07
V		Ce	23.6
Co		Nd	23.1
Ni	115	Sm	9.09
Ba	89.5	Eu	1.77
Sr	166	Tb	
Hf		Dy	15.5
Ta		Ho	
Th	-	Tm	
U	0.21	Yb	8.36
		Lu	-

**SOIL: 75080**

LOCATION COMMENTS: Station 5, on the southwest rim of Camelot Crater. Collected as a surface sample (upper 5 cm), less than 1 mm from the basalt boulder where 75060 was collected.

GENERIC SUBSAMPLES	
1. 75081(932.4 gm)	< 1 mm
2. 75082(38.92 gm)	1-2 mm
3. 75083(30.88 gm)	2-4 mm
4. 75084(23.31 gm)	4-10 mm
5. 75085 to 75089 (12.652 gm)	> 1 cm
6. 75080(524.2 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	1562.362 gm
<b>Color:</b>	Dark gray (N3)
<b>Bag no.:</b>	Doc. bag 467
<b>Container:</b>	Returned in sample container 2, in vacuum. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	40.0, submature
2. Agglutinates	35

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	87 μm (<1 cm); 67 μm (<1 mm)
2. M <sub>d</sub>	73.3 μm

PETROGRAPHY	(90-150 μm)
(Heiken and McKay, 1974)	
<b>Components</b>	<b>%</b>
Agglutinates	35.3
Basalt, Equi.	15.7
Basalt, Various	4.0
Breccia:	
Low-Grade-Brown	0.4
Low-Grade-Colorless	0.7
Med-High Grade	2.0
Anorthosite	0.3
Cataclastic	
Anorthosite	-
Norite	-
Gabbro	-
Plagioclase	9.0
Clinopyroxene	20.3
Orthopyroxene	-
Olivine	0.7
Ilmenite	5.7
Glass:	
Orange	0.7
"Black"	3.0
Colorless	1.3
Brown	0.6
Gray, "Ropy"	-
Other	-
<b>Total Number Grains</b>	<b>300</b>

<b>MAJOR ELEMENTS</b>	
(Apollo 17 P.E.T., 1974)	
	<b>%</b>
SiO <sub>2</sub>	40.27
TiO <sub>2</sub>	9.41
Al <sub>2</sub> O <sub>3</sub>	11.31
Cr <sub>2</sub> O <sub>3</sub>	0.46
FeO	17.20
MnO	0.25
MgO	9.59
CaO	10.97
Na <sub>2</sub> O	0.33
K <sub>2</sub> O	0.08
P <sub>2</sub> O <sub>5</sub>	0.07
S	0.12

<b>TRACE ELEMENTS</b>			
(Laul et al., 1974)			
	<b>ppm</b>		<b>ppm</b>
Sc	61	La	7.2
V	100	Ce	30
Co	27	Nd	25
Ni	100	Sm	7.6
Ba	100	Eu	1.70
Sr	160	Tb	2.0
Hf	7.0	Dy	12
Ta	1.3	Ho	
Th	0.6	Tm	
U	-	Yb	7.3
Zr	230	Lu	1.0
Ir	5		
Au	3		

**SOIL: 75110**

LOCATION COMMENTS: LRV-7 sample, from the apex of Victory Crater, on inner slope of crater rim. Scooped from upper few centimeters of regolith.

GENERIC SUBSAMPLES	
1. 75111(235.0 gm)	< 1 mm
2. 75112(10.20 gm)	1-2 mm
3. 75113(6.76 gm)	2-4 mm
4. 75114(6.87 gm)	4-10 mm
5. 75115(2.60 gm)	> 1 cm
6. 75110(122.5 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	383.93 gm
<b>Color:</b>	Dark olive gray (5Y 3/1)
<b>Bag no.:</b>	Doc. bag 43Y
<b>Container:</b>	Returned in sample collection bag 8, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	54.0, submature
2. Agglutinates	52

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	
2. M <sub>d</sub>	

PETROGRAPHY	(90-150 μm)
(Heiken and McKay, 1974)	
<b>Components</b>	<b>%</b>
Agglutinates	52.2
Basalt, Equi.	5.6
Basalt, Various	2.7
Breccia:	
Low-Grade-Brown	2.3
Low-Grade-Colorless	-
Med-High Grade	5.6
Anorthosite	-
Cataclastic	
Anorthosite	0.7
Norite	-
Gabbro	-
Plagioclase	2.0
Clinopyroxene	8.3
Orthopyroxene	-
Olivine	-
Ilmenite	0.7
Glass:	
Orange	5.0
"Black"	11.6
Colorless	1.0
Brown	1.0
Gray, "Ropy"	1.0
Other	0.3
<b>Total Number Grains</b>	<b>300</b>

MAJOR ELEMENTS	
	%
SiO <sub>2</sub>	
TiO <sub>2</sub>	
Al <sub>2</sub> O <sub>3</sub>	
Cr <sub>2</sub> O <sub>3</sub>	
FeO	
MnO	
MgO	
CaO	
Na <sub>2</sub> O	
K <sub>2</sub> O	
P <sub>2</sub> O <sub>5</sub>	
S	

TRACE ELEMENTS			
	ppm		ppm
Sc		La	
V		Ce	
Co		Nd	
Ni		Sm	
Ba		Eu	
Sr		Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	
		Lu	



**SOIL: 75120**

LOCATION COMMENTS: LRV-8, between Victory and Horatio Craters, in an area of "dark mantle."  
Surface sample scooped from upper few centimeters of regolith.

GENERIC SUBSAMPLES		
1.	75121(240.3 gm)	< 1 mm
2.	75122(5.20 gm)	1-2 mm
3.	75123(2.147 gm)	2-4 mm
4.	75124(0.956 gm)	4-10 mm
5.	( gm)	> 1 cm
6.	75120(126.6 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	375.211 gm
<b>Color:</b>	Dark olive gray (5Y 3/1)
<b>Bag no.:</b>	Doc. bag 44Y
<b>Container:</b>	Returned in sample collection bag 8, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS		
1.	I <sub>s</sub> /FeO	67.0, submature
2.	Agglutinates	63

GRAIN SIZE PARAMETERS		
1.	M <sub>z</sub>	
2.	M <sub>d</sub>	

PETROGRAPHY		(90-150 μm)
(Heiken and McKay, 1974)		
<b>Components</b>		<b>%</b>
Agglutinates		63.0
Basalt, Equi.		5.7
Basalt, Vario.		2.3
Breccia:		
Low-Grade-Brown		2.0
Low-Grade-Colorless		0.3
Med-High Grade		3.7
Anorthosite		-
Cataclastic		
Anorthosite		-
Norite		-
Gabbro		-
Plagioclase		4.0
Clinopyroxene		8.7
Orthopyroxene		-
Olivine		-
Ilmenite		0.7
Glass:		
Orange		3.0
"Black"		3.7
Colorless		1.7
Brown		1.0
Gray, "Ropy"		-
Other		0.3
<b>Total Number Grains</b>		<b>301</b>

MAJOR ELEMENTS	
	%
SiO <sub>2</sub>	
TiO <sub>2</sub>	
Al <sub>2</sub> O <sub>3</sub>	
Cr <sub>2</sub> O <sub>3</sub>	
FeO	
MnO	
MgO	
CaO	
Na <sub>2</sub> O	
K <sub>2</sub> O	
P <sub>2</sub> O <sub>5</sub>	
S	

TRACE ELEMENTS			
	ppm		ppm
Sc		La	
V		Ce	
Co		Nd	
Ni		Sm	
Ba		Eu	
Sr		Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	
		Lu	

**SOIL: 76030**

LOCATION COMMENTS: Station 6, approximately 25 m from the large cluster of boulders. Collected as a surface sample along with several breccias and a basalt (placed in separate bags).

GENERIC SUBSAMPLES		
1.	76031(152.6 gm)	< 1 mm
2.	76032(5.71 gm)	1-2 mm
3.	76033(4.58 gm)	2-4 mm
4.	76034(2.01 gm)	4-10 mm
5.	( gm)	> 1 cm
6.	76030(16.06 gm)	Reserve

MISCELLANEOUS	
Collected mass:	180.96 gm
Color:	
Bag no.:	Doc. bag 48Y
Container:	Returned in sample collection bag 5, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	64.0 mature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	
2. M <sub>d</sub>	

MAJOR ELEMENTS	
	%
SiO <sub>2</sub>	
TiO <sub>2</sub>	
Al <sub>2</sub> O <sub>3</sub>	
Cr <sub>2</sub> O <sub>3</sub>	
FeO	
MnO	
MgO	
CaO	
Na <sub>2</sub> O	
K <sub>2</sub> O	
P <sub>2</sub> O <sub>5</sub>	
S	

TRACE ELEMENTS			
	ppm		ppm
Sc		La	
V		Ce	
Co		Nd	
Ni		Sm	
Ba		Eu	
Sr		Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	
		Lu	

**SOIL: 76120**

LOCATION COMMENTS: LRV sample collected halfway between SEP and Station 6. Surface sample scooped from the upper few centimeters. Collected from the "dark mantle."

GENERIC SUBSAMPLES	
1. 76121(188.1 gm)	< 1 mm
2. 76122(4.72 gm)	1-2 mm
3. 76123(2.49 gm)	2-4 mm
4. 76124(1.61 gm)	4-10 mm
5. ( gm)	> 1 cm
6. 76120(107.0 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	303.92 gm
<b>Color:</b>	Dark olive gray (5Y 3/1)
<b>Bag no.:</b>	Doc. bag 46Y
<b>Container:</b>	Returned in sample collection bag 5, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	71.0, mature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	
2. M <sub>d</sub>	

MAJOR ELEMENTS	
	%
SiO <sub>2</sub>	
TiO <sub>2</sub>	
Al <sub>2</sub> O <sub>3</sub>	
Cr <sub>2</sub> O <sub>3</sub>	
FeO	
MnO	
MgO	
CaO	
Na <sub>2</sub> O	
K <sub>2</sub> O	
P <sub>2</sub> O <sub>5</sub>	
S	

TRACE ELEMENTS			
	ppm		ppm
Sc		La	
V		Ce	
Co		Nd	
Ni		Sm	
Ba		Eu	
Sr		Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	
		Lu	

**SOIL: 76130**

LOCATION COMMENTS: LRV-10. at the turning point between SEP and Station 6. Surface sample of soil plus 3 rocks.

GENERIC SUBSAMPLES	
1. 76131(146.1 gm)	< 1 mm
2. 76132(6.79 gm)	1-2 mm
3. 76133(5.21 gm)	2-4 mm
4. 76134 (3.10 gm)	4-10 mm
5. *76135 to 76137 (222.56 gm)	> 1 cm
6. 76120(19.57 gm)	Reserve

\*Not included in total mass of soil.

MISCELLANEOUS	
Collected mass:	180.77 gm
Color:	Med. gray (field description)
Bag no.:	Doc. bag 47Y
Container:	Returned in sample collection bag 5, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	70.0, mature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	
2. M <sub>d</sub>	

MAJOR ELEMENTS	
	%
SiO <sub>2</sub>	
TiO <sub>2</sub>	
Al <sub>2</sub> O <sub>3</sub>	
Cr <sub>2</sub> O <sub>3</sub>	
FeO	
MnO	
MgO	
CaO	
Na <sub>2</sub> O	
K <sub>2</sub> O	
P <sub>2</sub> O <sub>5</sub>	
S	

TRACE ELEMENTS			
	ppm		ppm
Sc		La	
V		Ce	
Co		Nd	
Ni		Sm	
Ba		Eu	
Sr		Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	
		Lu	

**SOIL: 76220**

LOCATION COMMENTS: Station 6, at the base of North Massif. Collected in the boulder track about 10 m upslope from the boulder cluster. Surface sample.

GENERIC SUBSAMPLES	
1. 76221(390.4 gm)	< 1 mm
2. 76222(13.65 gm)	1-2 mm
3. 76223(8.26 gm)	2-4 mm
4. 76224(3.83 gm)	4-10 mm
5. ( gm)	> 1 cm
6. 76220(196.7 gm)	Reserve

\*Not included in total mass of soil.

MISCELLANEOUS	
<b>Collected mass:</b>	612.84 gm
<b>Color:</b>	Med. olive gray
<b>Bag no.:</b>	Doc. bag 534
<b>Container:</b>	Returned in sample collection bag 7, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	66.0, mature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	
2. M <sub>d</sub>	

MAJOR ELEMENTS	
	%
SiO <sub>2</sub>	
TiO <sub>2</sub>	
Al <sub>2</sub> O <sub>3</sub>	
Cr <sub>2</sub> O <sub>3</sub>	
FeO	
MnO	
MgO	
CaO	
Na <sub>2</sub> O	
K <sub>2</sub> O	
P <sub>2</sub> O <sub>5</sub>	
S	

TRACE ELEMENTS			
	ppm		ppm
Sc		La	
V		Ce	
Co		Nd	
Ni		Sm	
Ba		Eu	
Sr		Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	
		Lu	

**SOIL: 76240**

LOCATION COMMENTS: Station 6, at the base of North Massif. "Shadowed" soil, collected 1-2 m beyond the overhang of a 5 x 4 x 3 m boulder. Scooped from a depth of 4-5 cm.

GENERIC SUBSAMPLES	
1. 76241(21.14 gm)	< 1 mm
2. 76242(1.20 gm)	1-2 mm
3. 76243(1.23 gm)	2-4 mm
4. 76244(1.53 gm)	4-10 mm
5. *76245 to 76246 (14.74 gm)	> 1 cm
6. 76240(450.7 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	490.54 gm
<b>Color:</b>	Olive gray (5Y 4/1)
<b>Bag no.:</b>	Doc. bag 312
<b>Container:</b>	Returned in sample collection bag 4, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	56.0, submature
2. Agglutinates	48

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	100 μm (<1 cm); 53 μm (<1 mm)
2. M <sub>d</sub>	64 μm

PETROGRAPHY	(90-150 μm)
(Heiken and McKay, 1974)	
<b>Components</b>	<b>%</b>
Agglutinates	48.0
Basalt, Equi.	2.3
Basalt, Various	1.0
Breccia:	
Low-Grade-Brown	4.7
Low-Grade-Colorless	2.7
Med-High Grade	12.3
Anorthosite	0.3
Cataclastic	
Anorthosite	1.3
Norite	-
Gabbro	-
Plagioclase	12.0
Clinopyroxene	5.0
Orthopyroxene	2.0
Olivine	1.3
Ilmenite	2.0
Glass:	
Orange	0.7
"Black"	2.3
Colorless	0.7
Brown	1.3
Gray, "Ropy"	-
Other	-
<b>Total Number Grains</b>	<b>300</b>

<b>MAJOR ELEMENTS</b>	
(Rhodes et al., 1974)	
	<b>%</b>
SiO <sub>2</sub>	43.2
TiO <sub>2</sub>	3.31
Al <sub>2</sub> O <sub>3</sub>	17.85
Cr <sub>2</sub> O <sub>3</sub>	
FeO	10.92
MnO	0.16
MgO	11.05
CaO	11.97
Na <sub>2</sub> O	0.43
K <sub>2</sub> O	0.12
P <sub>2</sub> O <sub>5</sub>	0.09
S	0.07

<b>TRACE ELEMENTS</b>			
(Baedecker et al., 1974)			
	<b>ppm</b>		<b>ppm</b>
Sc	31	La	
V		Ce	34
Co	37	Nd	
Ni		Sm	
Ba		Eu	1.6
Sr		Tb	1.8
Hf	6.7	Dy	
Ta	0.88	Ho	
Th	2.7	Tm	
U		Yb	4.8
		Lu	



**SOIL: 76260**

LOCATION COMMENTS: Station 6, at the base of North Massif. "Skim" sample (to depth of 2 cm) collected outside the limit (about 1 m) of the boulder overhang where sample 76240 was collected.

GENERIC SUBSAMPLES		
1.	76261(107.7 gm)	< 1 mm
2.	76262(8.55 gm)	1-2 mm
3.	76263(6.57 gm)	2-4 mm
4.	76264(8.76 gm)	4-10 mm
5.	76265(1.75 gm)	> 1 cm
6.	76260(96.6 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	292.93 gm
<b>Color:</b>	Very dark gray (5Y 3/1)
<b>Bag no.:</b>	Doc. bag 313
<b>Container:</b>	Returned in sample collection bag 4, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS		
1.	I <sub>s</sub> /FeO	58.0, submature
2.	Agglutinates	45

GRAIN SIZE PARAMETERS		
1.	M <sub>z</sub>	87 μm (<1 cm); 58 μm (<1 mm)
2.	M <sub>d</sub>	

PETROGRAPHY		(90-150 μm)
(Heiken and McKay, 1974)		
<b>Components</b>		<b>%</b>
Agglutinates		45.3
Basalt, Equi.		3.3
Basalt, Various		1.0
Breccia:		
Low-Grade-Brown		2.3
Low-Grade-Colorless		3.3
Med-High Grade		12.6
Anorthosite		1.0
Cataclastic		
Anorthosite		-
Norite		0.3
Gabbro		-
Plagioclase		10.3
Clinopyroxene		9.3
Orthopyroxene		3.3
Olivine		0.7
Ilmenite		1.0
Glass:		
Orange		0.7
"Black"		1.3
Colorless		2.0
Brown		1.9
Gray, "Ropy"		-
Other		-
<b>Total Number Grains</b>		<b>300</b>

<b>MAJOR ELEMENTS</b>	
(Rhodes et al., 1974)	
	<b>%</b>
SiO <sub>2</sub>	43.64
TiO <sub>2</sub>	3.38
Al <sub>2</sub> O <sub>3</sub>	17.96
Cr <sub>2</sub> O <sub>3</sub>	0.28
FeO	10.93
MnO	0.16
MgO	10.75
CaO	12.11
Na <sub>2</sub> O	0.43
K <sub>2</sub> O	0.12
P <sub>2</sub> O <sub>5</sub>	0.11
S	0.07

<b>TRACE ELEMENTS</b>			
(Baedecker et al., 1974)			
	<b>ppm</b>		<b>ppm</b>
Sc	30	La	
V		Ce	-
Co	32	Nd	
Ni		Sm	
Ba		Eu	1.5
Sr		Tb	-
Hf	5.6	Dy	
Ta	-	Ho	
Th	-	Tm	
U		Yb	-
		Lu	

**SOIL: 76280**

LOCATION COMMENTS: Station 6, at the base of North Massif. "Scooped" sample collected to a depth of 5 cm below the "skim" sample 76260. Located about 1 m outside the boulder overhang where sample 76240 was collected.

GENERIC SUBSAMPLES	
1. 76281(251.8 gm)	< 1 mm
2. 76282(14.27 gm)	1-2 mm
3. 76283(12.71 gm)	2-4 mm
4. 76284(10.69gm)	4-10 mm
5. *76285 to 76286 (33.912 gm)	> 1 cm
6. 76280(153.0 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	446.382 gm
<b>Color:</b>	Olive gray (5Y 4/1)
<b>Bag no.:</b>	Doc. bag 472
<b>Container:</b>	Returned in sample collection bag 4, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	45.0, submature
2. Agglutinates	45

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	86 μm (<1 cm); 53 μm (<1 mm)
2. M <sub>d</sub>	70.8 μm

PETROGRAPHY	(90-150 μm)
(Heiken and McKay, 1974)	
<u>Components</u>	<u>%</u>
Agglutinates	45.3
Basalt, Equi.	5.0
Basalt, Various	1.7
Breccia:	
Low-Grade-Brown	5.3
Low-Grade-Colorless	0.7
Med-High Grade	10.3
Anorthosite	1.0
Cataclastic	
Anorthosite	0.3
Norite	-
Gabbro	-
Plagioclase	10.7
Clinopyroxene	6.3
Orthopyroxene	4.7
Olivine	-
Ilmenite	1.3
Glass:	
Orange	1.3
"Black"	3.7
Colorless	1.7
Brown	-
Gray, "Ropy"	0.3
Other	0.3
<b>Total Number Grains</b>	<b>300</b>

<b>MAJOR ELEMENTS</b>	
(Rhodes et al., 1974)	
	<b>%</b>
SiO <sub>2</sub>	43.56
TiO <sub>2</sub>	3.83
Al <sub>2</sub> O <sub>3</sub>	17.80
Cr <sub>2</sub> O <sub>3</sub>	0.29
FeO	11.26
MnO	0.16
MgO	10.55
CaO	12.18
Na <sub>2</sub> O	0.43
K <sub>2</sub> O	0.11
P <sub>2</sub> O <sub>5</sub>	0.09
S	0.07

<b>TRACE ELEMENTS</b>			
(Rhodes et al., 1974)			
	<b>ppm</b>		<b>ppm</b>
Sc		La	
V		Ce	
Co		Nd	
Ni	169	Sm	
Ba		Eu	
Sr	150	Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	
		Lu	

**SOIL: 76320**

LOCATION COMMENTS: Station 6, at the base of North Massif. Sample of soil on a flat section of the north end of boulder #1 of the boulder cluster.

GENERIC SUBSAMPLES	
1. 76321(502.7 gm)	< 1 mm
2. 76322(23.10 gm)	1-2 mm
3. 76323(15.84 gm)	2-4 mm
4. 76324(11.8 gm)	4-10 mm
5. ( gm)	> 1 cm
6. 76320(260.3 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	813.74 gm
<b>Color:</b>	Olive gray (5Y 4/1)
<b>Bag no.:</b>	Doc. bag 557
<b>Container:</b>	Returned in sample collection bag 7, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	93.0, mature
2. Agglutinates	39

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	69 μm (<1 cm); 53 μm (<1 mm)
2. M <sub>d</sub>	57.8 μm

PETROGRAPHY	(90-150 μm)
(Heiken and McKay, 1974)	
<b>Components</b>	<b>%</b>
Agglutinates	39.1
Basalt, Equi.	2.7
Basalt, Various	-
Breccia:	
Low-Grade-Brown	4.3
Low-Grade-Colorless	-
Med-High Grade	14.4
Anorthosite	-
Cataclastic	
Anorthosite	1.0
Norite	-
Gabbro	-
Plagioclase	15.7
Clinopyroxene	6.7
Orthopyroxene	5.7
Olivine	-
Ilmenite	0.3
Glass:	
Orange	1.3
"Black"	2.3
Colorless	2.3
Brown	4.0
Gray, "Ropy"	-
Other	-
<b>Total Number Grains</b>	<b>299</b>

<b>MAJOR ELEMENTS</b>	
(Rhodes et al., 1974)	
	<b>%</b>
SiO <sub>2</sub>	44.08
TiO <sub>2</sub>	3.00
Al <sub>2</sub> O <sub>3</sub>	18.41
Cr <sub>2</sub> O <sub>3</sub>	0.26
FeO	10.53
MnO	0.15
MgO	10.82
CaO	12.23
Na <sub>2</sub> O	0.46
K <sub>2</sub> O	0.13
P <sub>2</sub> O <sub>5</sub>	0.09
S	0.07

<b>TRACE ELEMENTS</b>			
(Rhodes et al., 1974)			
	<b>ppm</b>		<b>ppm</b>
Sc		La	
V		Ce	
Co		Nd	
Ni	210	Sm	
Ba		Eu	
Sr	151	Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	
		Lu	

**SOIL: 76500**

LOCATION COMMENTS: Station 6, at the base of North Massif. Surface sample collected 25 m west of the boulder cluster near a 10 m diameter crater. Collected as a soil to accompany rake sample (76530 to 76577).

GENERIC SUBSAMPLES		
1.	76501(630.7 gm)	< 1 mm
2.	76502(22.76 gm)	1-2 mm
3.	76503(10.09 gm)	2-4 mm
4.	76504(10.72)	4-10 mm
5.	*76505 to 76506 (7.5 gm)	> 1 cm
6.	76500(345.2 gm)	Reserve

MISCELLANEOUS	
Collected mass:	1019.47 gm
Color:	
Bag no.:	Doc. bag 559
Container:	

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS		
1.	I <sub>g</sub> /FeO	58.0, submature
2.	Agglutinates	47

GRAIN SIZE PARAMETERS		
1.	M <sub>z</sub>	67 μm (<1 cm); 51 μm (<1 mm)
2.	M <sub>d</sub>	53.7 μm

PETROGRAPHY		(90-150 μm)
(Heiken and McKay, 1974)		
Components	%	
Agglutinates	47.2	
Basalt, Equi.	1.7	
Basalt, Vario.	-	
Breccia:		
Low-Grade-Brown	3.8	
Low-Grade-Colorless	-	
Med-High Grade	8.3	
Anorthosite	-	
Cataclastic		
Anorthosite	1.4	
Norite	-	
Gabbro	-	
Plagioclase	17.2	
Clinopyroxene	7.6	
Orthopyroxene	7.9	
Olivine	0.7	
Ilmenite	0.3	
Glass:		
Orange	0.7	
"Black"	0.3	
Colorless	1.4	
Brown	-	
Gray, "Ropy"	-	
Other	-	
Total Number Grains		290

<b>MAJOR ELEMENTS</b>	
(Apollo 17 P.E.T., 1974)	
	<b>%</b>
SiO <sub>2</sub>	43.41
TiO <sub>2</sub>	3.15
Al <sub>2</sub> O <sub>3</sub>	18.63
Cr <sub>2</sub> O <sub>3</sub>	0.26
FeO	10.32
MnO	0.14
MgO	11.08
CaO	12.28
Na <sub>2</sub> O	0.35
K <sub>2</sub> O	0.10
P <sub>2</sub> O <sub>5</sub>	0.08
S	

<b>TRACE ELEMENTS</b>			
(Rhodes et al., 1974)			
	<b>ppm</b>		<b>ppm</b>
Sc		La	8.95
V		Ce	24.3
Co		Nd	17.4
Ni	203	Sm	5.55
Ba		Eu	1.25
Sr	151	Tb	
Hf		Dy	8.18
Ta		Ho	
Th	-	Tm	
U	0.44	Yb	4.53
		Lu	



**SOIL: 77510**

LOCATION COMMENTS: Station 7, at the base of North Massif. Collected as a surface sample with 5 rocks (77515 to 77519, total 556.8 gm) 18 m east of the boulder sampled at Station 7.

GENERIC SUBSAMPLES	
1. 77511(118.1 gm)	< 1 mm
2. 77512(2.45 gm)	1-2 mm
3. 77513(1.19 gm)	2-4 mm
4. 77514(556.8 gm)	4-10 mm
5. *77515 to 77517 (77.57 gm)	> 1 cm
6. 77510(77.57 gm)	Reserve

\*Not included in total mass of soil.

MISCELLANEOUS	
Collected mass:	202.81 gm
Color:	Olive gray (5Y 4/1)
Bag no.:	Doc. bag 540
Container:	Returned in sample collection bag 7, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	80.0 mature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	
2. M <sub>d</sub>	

MAJOR ELEMENTS	
	%
SiO <sub>2</sub>	
TiO <sub>2</sub>	
Al <sub>2</sub> O <sub>3</sub>	
Cr <sub>2</sub> O <sub>3</sub>	
FeO	
MnO	
MgO	
CaO	
Na <sub>2</sub> O	
K <sub>2</sub> O	
P <sub>2</sub> O <sub>5</sub>	
S	

TRACE ELEMENTS			
(Rhodes et al., 1974)			
	ppm		ppm
Sc		La	
V		Ce	
Co		Nd	
Ni	231	Sm	
Ba		Eu	
Sr	153	Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	
		Lu	

**SOIL: 77530**

LOCATION COMMENTS: Station 7, at the base of North Massif. Collected with "selected rocks" (6 rocks, 77535 to 77539 and 77545, total 1121.1 gm, consisting of 2 coarse-grained basalts, 2 green-gray breccias, 1 light-gray breccia, and 1 tan-gray breccia).

GENERIC SUBSAMPLES	
1. 77531(126.6 gm)	< 1 mm
2. 77532(3.13 gm)	1-2 mm
3. 77533(2.51 gm)	2-4 mm
4. 77534(4.46 gm)	4-10 mm
5. ( gm)	> 1 cm
6. 77530(82.76 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	219.46 gm
<b>Color:</b>	Olive gray (5YR 4/1)
<b>Bag no.:</b>	Doc. bag 542
<b>Container:</b>	Returned in sample collection bag 7, in vacuum. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	79.0, mature
2. Agglutinates	54

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	63 μm (<1 cm); 49 μm (<1 mm)
2. M <sub>d</sub>	48 μm

PETROGRAPHY	(90-150 μm)
(Heiken and McKay, 1974)	
<b>Components</b>	<b>%</b>
Agglutinates	54.0
Basalt, Equi.	4.0
Basalt, Various	0.7
Breccia:	
Low-Grade-Brown	5.6
Low-Grade-Colorless	2.3
Med-High Grade	9.7
Anorthosite	0.7
Cataclastic	
Anorthosite	1.0
Norite	-
Gabbro	-
Plagioclase	9.3
Clinopyroxene	3.3
Orthopyroxene	1.0
Olivine	0.7
Ilmenite	1.3
Glass:	
Orange	0.3
"Black"	3.3
Colorless	0.3
Brown	2.0
Gray, "Ropy"	-
Other	-
<b>Total Number Grains</b>	<b>300</b>

<b>MAJOR ELEMENTS</b>	
(Rhodes et al., 1974)	
	<b>%</b>
SiO <sub>2</sub>	43.07
TiO <sub>2</sub>	3.91
Al <sub>2</sub> O <sub>3</sub>	17.16
Cr <sub>2</sub> O <sub>3</sub>	0.3
FeO	11.70
MnO	0.17
MgO	10.19
CaO	11.93
Na <sub>2</sub> O	0.44
K <sub>2</sub> O	0.11
P <sub>2</sub> O <sub>5</sub>	0.08
S	0.08

<b>TRACE ELEMENTS</b>			
(Rhodes et al., 1974)			
	<b>ppm</b>		<b>ppm</b>
Sc		La	9.96
V		Ce	26.7
Co		Nd	19.4
Ni		Sm	6.47
Ba	123	Eu	1.35
Sr	155	Tb	
Hf		Dy	9.55
Ta		Ho	
Th	-	Tm	
U	-	Yb	5.26
		Lu	-

**SOIL: 78120**

LOCATION COMMENTS: LRV-11, on the rim of Slup Crater between Stations 7 and 8. Crew picked up several fragmented aggregates (clods) but none were visible in the returned sample; most probably disaggregated and mixed in transit. Scooped from upper few centimeters.

GENERIC SUBSAMPLES	
1. 78121(121.6 gm)	< 1 mm
2. 78122(4.43 gm)	1-2 mm
3. 78123(2.49 gm)	2-4 mm
4. 78124(5.64 gm)	4-10 mm
5. ( gm)	> 1 cm
6. 78120(75.78 gm)	Reserve

MISCELLANEOUS	
Collected mass:	209.94 gm
Color:	Olive gray (5Y 4/1)
Bag no.:	Doc. bag 50Y
Container:	Returned in sample collection bag 5, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	68.0 mature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	
2. M <sub>d</sub>	

MAJOR ELEMENTS	
	%
SiO <sub>2</sub>	
TiO <sub>2</sub>	
Al <sub>2</sub> O <sub>3</sub>	
Cr <sub>2</sub> O <sub>3</sub>	
FeO	
MnO	
MgO	
CaO	
Na <sub>2</sub> O	
K <sub>2</sub> O	
P <sub>2</sub> O <sub>5</sub>	
S	

TRACE ELEMENTS			
(Phillpotts et al., 1974)			
	ppm		ppm
Sc		La	
V		Ce	25.2
Co		Nd	19.2
Ni		Sm	6.26
Ba	113	Eu	1.39
Sr	154	Tb	
Hf		Dy	9.84
Ta		Ho	
Th		Tm	
U		Yb	5.27
		Lu	0.830

**SOIL: 78220**

LOCATION COMMENTS: Station 8, at base of Sculptured Hills, south of Wessex Cleft. 78220 was collected from the regolith surface under a 2-3 m diameter norite boulder rolled over by the crew.

GENERIC SUBSAMPLES		
1.	78221(227.1 gm)	< 1 mm
2.	78222(5.21 gm)	1-2 mm
3.	78223(2.69 gm)	2-4 mm
4.	78224(1.48 gm)	4-10 mm
5.	( gm)	> 1 cm
6.	78220(108.3 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	344.78 gm
<b>Color:</b>	Dark olive gray (5Y 3/1)
<b>Bag no.:</b>	Doc. bag 545
<b>Container:</b>	Returned in sample collection bag 7, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS		
1.	I <sub>s</sub> /FeO	93.0, mature
2.	Agglutinates	57

GRAIN SIZE PARAMETERS		
1.	M <sub>z</sub>	50 μm (<1 cm); 45 μm (<1 mm)
2.	M <sub>d</sub>	40 μm

PETROGRAPHY	(90-150 μm)
(Heiken and McKay, 1974)	
<b>Components</b>	<b>%</b>
Agglutinates	57.0
Basalt, Equi.	1.0
Basalt, Various	-
Breccia:	
Low-Grade-Brown	6.3
Low-Grade-Colorless	-
Med-High Grade	7.0
Anorthosite	1.3
Cataclastic	
Anorthosite	-
Norite	-
Gabbro	0.3
Plagioclase	5.0
Clinopyroxene	8.9
Orthopyroxene	3.6
Olivine	1.7
Ilmenite	1.0
Glass:	
Orange	0.7
"Black"	3.0
Colorless	1.3
Brown	2.0
Gray, "Ropy"	-
Other	-
<b>Total Number Grains</b>	<b>302</b>

<b>MAJOR ELEMENTS</b>	
(Duncan et al., 1974)	
	<b>%</b>
SiO <sub>2</sub>	43.67
TiO <sub>2</sub>	3.84
Al <sub>2</sub> O <sub>3</sub>	17.13
Cr <sub>2</sub> O <sub>3</sub>	0.320
FeO	11.68
MnO	0.157
MgO	10.55
CaO	11.79
Na <sub>2</sub> O	0.37
K <sub>2</sub> O	0.092
P <sub>2</sub> O <sub>5</sub>	0.080
S	0.088

<b>TRACE ELEMENTS</b>			
(Duncan et al., 1974)			
	<b>ppm</b>		<b>ppm</b>
Sc		La	
V	68	Ce	
Co	34	Nd	
Ni	221	Sm	
Ba	109	Eu	
Sr	147	Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	
		Lu	

**SOIL: 78230**

LOCATION COMMENTS: Station 8, at the base of Sculptured Hills, south of Wessex Cleft. This soil was collected with 3 rock samples (78235 to 78238, coarse- grained norites; total mass of 349.64 gm).

GENERIC SUBSAMPLES	
1. 78231(122.7 gm)	< 1 mm
2. 78232(2.68 gm)	1-2 mm
3. 78233(1.42 gm)	2-4 mm
4. 78234(0.72 gm)	4-10 mm
5. ( gm)	> 1 cm
6. 78220(82.98 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	210.5 gm
<b>Color:</b>	Dark gray (field description)
<b>Bag no.:</b>	Doc. bag 564
<b>Container:</b>	Returned in sample collection bag 4, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	81.0, mature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	
2. M <sub>d</sub>	

MAJOR ELEMENTS	
	%
SiO <sub>2</sub>	
TiO <sub>2</sub>	
Al <sub>2</sub> O <sub>3</sub>	
Cr <sub>2</sub> O <sub>3</sub>	
FeO	
MnO	
MgO	
CaO	
Na <sub>2</sub> O	
K <sub>2</sub> O	
P <sub>2</sub> O <sub>5</sub>	
S	

TRACE ELEMENTS			
	ppm		ppm
Sc		La	
V		Ce	
Co		Nd	
Ni		Sm	
Ba		Eu	
Sr		Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	
		Lu	

**SOIL: 78250**

LOCATION COMMENTS: Station 8, at the base of Sculptured Hills, south of Wessex Cleft. Soil collected along with a chip from a norite boulder (78255; 48.31 gm, coarse-grained norite).

GENERIC SUBSAMPLES	
1. ( gm)	< 1 mm
2. ( gm)	1-2 mm
3. ( gm)	2-4 mm
4. ( gm)	4-10 mm
5. ( gm)	> 1 cm
6. 78250(50.57 gm)	Reserve

MISCELLANEOUS	
Collected mass:	50.57 gm
Color:	
Bag no.:	Doc. bag 546
Container:	

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. $I_s/\text{FeO}$	
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. $M_z$	
2. $M_d$	

MAJOR ELEMENTS	
	%
$\text{SiO}_2$	
$\text{TiO}_2$	
$\text{Al}_2\text{O}_3$	
$\text{Cr}_2\text{O}_3$	
FeO	
MnO	
MgO	
CaO	
$\text{Na}_2\text{O}$	
$\text{K}_2\text{O}$	
$\text{P}_2\text{O}_5$	
S	

TRACE ELEMENTS			
	ppm		ppm
Sc		La	
V		Ce	
Co		Nd	
Ni		Sm	
Ba		Eu	
Sr		Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	
		Lu	



**SOIL: 78420**

LOCATION COMMENTS: Station 8, at base of the Sculptured Hills, south of Wessex Cleft. The bottom layer (10 cm thick) of a 25 cm deep trench

GENERIC SUBSAMPLES	
1. 78421(186.2 gm)	< 1 mm
2. 78422(4.16 gm)	1-2 mm
3. 78423(2.41 gm)	2-4 mm
4. 78424(1.91 gm)	4-10 mm
5. ( gm)	> 1 cm
6. 78420(97.94 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	292.68 gm
<b>Color:</b>	Med. gray (N5)
<b>Bag no.:</b>	Doc. bag 548
<b>Container:</b>	

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. $I_s/\text{FeO}$	
2. Agglutinates	63

GRAIN SIZE PARAMETERS	
1. $M_z$	46 $\mu\text{m}$ (<1 cm); 41 $\mu\text{m}$ (<1 mm)
2. $M_d$	

PETROGRAPHY	(90-150 $\mu\text{m}$ )
(Heiken and McKay, 1974)	
<b>Components</b>	<b>%</b>
Agglutinates	62.6
Basalt, Equi.	5.7
Basalt, Various	
Breccia:	
Low-Grade-Brown	7.0
Low-Grade-Colorless	1.3
Med-High Grade	2.6
Anorthosite	0.3
Cataclastic	
Anorthosite	0.6
Norite	-
Gabbro	-
Plagioclase	7.3
Clinopyroxene	9.0
Orthopyroxene	-
Olivine	0.6
Ilmenite	-
Glass:	
Orange	0.6
"Black"	0.3
Colorless	1.3
Brown	0.6
Gray, "Ropy"	-
Other	-
<b>Total Number Grains</b>	<b>300</b>

<b>MAJOR ELEMENTS</b>	
(Miller et al., 1974)	
	<b>%</b>
SiO <sub>2</sub>	20.9
TiO <sub>2</sub>	2.3
Al <sub>2</sub> O <sub>3</sub>	9.2
Cr <sub>2</sub> O <sub>3</sub>	
FeO	9.5
MnO	0.127
MgO	7.1
CaO	8.4
Na <sub>2</sub> O	0.32
K <sub>2</sub> O	
P <sub>2</sub> O <sub>5</sub>	
S	
O	42.3

<b>TRACE ELEMENTS</b>			
(Baedeker et al., 1974)			
	<b>ppm</b>		<b>ppm</b>
Sc	37	La	
V		Ce	25
Co	36	Nd	
Ni		Sm	1.4
Ba		Eu	
Sr		Tb	1.6
Hf	5.1	Dy	
Ta	0.79	Ho	
Th	1.3	Tm	
U		Yb	5.4
		Lu	

**SOIL: 78440**

LOCATION COMMENTS: Station 8, at the base of Sculptured Hills, south of Wessex Cleft. Soil from walls of 25 cm deep trench, above 78240 (probably from about 5 cm to 15 cm below regolith surface).

GENERIC SUBSAMPLES	
1. 78441(162.8 gm)	< 1 mm
2. 78442(3.78 gm)	1-2 mm
3. 78443(2.44 gm)	2-4 mm
4. 78444(1.19 gm)	4-10 mm
5. ( gm)	> 1 cm
6. 78440(81.38 gm)	Reserve

MISCELLANEOUS	
Collected mass:	251.59 gm
Color:	
Bag no.:	Doc. bag 551
Container:	Returned in sample collection bag 4, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	77.0, mature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	
2. M <sub>d</sub>	

MAJOR ELEMENTS	
(Miller et al., 1974)	
	%
SiO <sub>2</sub>	20.6
TiO <sub>2</sub>	1.9
Al <sub>2</sub> O <sub>3</sub>	9.1
Cr <sub>2</sub> O <sub>3</sub>	
FeO	9.6
MnO	0.131
MgO	6.6
CaO	7.9
Na <sub>2</sub> O	0.36
K <sub>2</sub> O	
P <sub>2</sub> O <sub>5</sub>	
S	
O	42.0

TRACE ELEMENTS			
(Phillipotts et al., 1974)			
	ppm		ppm
Sc		La	24.2
V		Ce	18.6
Co		Nd	6.08
Ni		Sm	1.35
Ba	113	Eu	
Sr	149	Tb	9.18
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	5.17
		Lu	0.806

**SOIL: 78460**

LOCATION COMMENTS: Station 8, at the base of Sculptured Hills, south of Wessex Cleft. Soil from the walls of a 25 cm deep trench from a depth of about 1-5 cm.

GENERIC SUBSAMPLES		
1.	78461(264.5 gm)	< 1 mm
2.	78462(5.328 gm)	1-2 mm
3.	78463(2.787 gm)	2-4 mm
4.	78464(1.303 gm)	4-10 mm
5.	78465(1.039 gm)	> 1 cm
6.	78460(138.1 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	413.057 gm
<b>Color:</b>	Olive black (5Y 2/1)
<b>Bag no.:</b>	Doc. bag 550
<b>Container:</b>	Returned in sample collection bag 7, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS		
1.	I <sub>s</sub> /FeO	83.0, mature
2.	Agglutinates	

GRAIN SIZE PARAMETERS		
1.	M <sub>z</sub>	
2.	M <sub>d</sub>	

MAJOR ELEMENTS	
(Miller et al., 1974)	
	%
SiO <sub>2</sub>	19.9
TiO <sub>2</sub>	2.1
Al <sub>2</sub> O <sub>3</sub>	8.5
Cr <sub>2</sub> O <sub>3</sub>	
FeO	10.0
MnO	0.122
MgO	6.7
CaO	7.9
Na <sub>2</sub> O	0.30
K <sub>2</sub> O	
P <sub>2</sub> O <sub>5</sub>	
S	
O	41.9

TRACE ELEMENTS			
(Phillpotts et al., 1974)			
	ppm		ppm
Sc		La	
V		Ce	23.2
Co		Nd	17.6
Ni		Sm	5.88
Ba	109	Eu	1.31
Sr	149	Tb	
Hf		Dy	8.88
Ta		Ho	
Th		Tm	
U		Yb	4.88
		Lu	0.78

**SOIL: 78480**

LOCATION COMMENTS: Station 8, at the base of Sculptured Hills, south of Wessex Cleft. "Skim" soil collected to a depth of 0.5 to 1 cm, as part of the collection of samples from a 25 cm deep trench.

GENERIC SUBSAMPLES	
1. 78481(173.9 gm)	< 1 mm
2. 78482(2.69 gm)	1-2 mm
3. 78483(1.21 gm)	2-4 mm
4. 78484(0.32 gm)	4-10 mm
5. ( gm)	> 1 cm
6. 78480(89.33 gm)	Reserve

MISCELLANEOUS	
Collected mass:	267.45 gm
Color:	
Bag no.:	Doc. bag 549
Container:	

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. $I_s/FeO$	
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. $M_z$	
2. $M_d$	

MAJOR ELEMENTS	
(Miller et al., 1974)	
	%
SiO <sub>2</sub>	20.2
TiO <sub>2</sub>	1.8
Al <sub>2</sub> O <sub>3</sub>	9.0
Cr <sub>2</sub> O <sub>3</sub>	
FeO	9.3
MnO	0.124
MgO	6.8
CaO	7.6
Na <sub>2</sub> O	0.29
K <sub>2</sub> O	
P <sub>2</sub> O <sub>5</sub>	
S	
O	41.9

TRACE ELEMENTS			
(Phillipotts et al., 1974)			
	ppm		ppm
Sc	36	La	
V		Ce	24
Co	38	Nd	
Ni		Sm	
Ba		Eu	1.4
Sr		Tb	1.7
Hf	5.6	Dy	
Ta	0.68	Ho	
Th	1.6	Tm	
U		Yb	5.3
		Lu	

**SOIL: 78500**

LOCATION COMMENTS: Station 8, at base of Sculptured Hills, south of Wessex Cleft. 78220 was collected from the regolith surface under a 2-3 m diameter norite boulder rolled over by the crew.

GENERIC SUBSAMPLES	
1. 78501(718.7 gm)	< 1 mm
2. 78502(21.38 gm)	1-2 mm
3. 78503(16.14 gm)	2-4 mm
4. 78504(19.16 gm)	4-10 mm
5. * (109.31 gm)	> 1 cm
6. 78500(391.1 gm)	Reserve

\*78506 to 78509 and 78515 to 78518 comprise this split. Not included in total mass of soil.

MISCELLANEOUS	
Collected mass:	1166.48 gm
Color:	
Bag no.:	Doc. bag 566
Container:	

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. $I_s/FeO$	36.0, submature
2. Agglutinates	63

GRAIN SIZE PARAMETERS	
1. $M_z$	46 $\mu m$ (<1 cm); 41 $\mu m$ (<1 mm)
2. $M_d$	31.5 $\mu m$

PETROGRAPHY	(90-150 $\mu m$ )
(Heiken and McKay, 1974)	
<b>Components</b>	<b>%</b>
Agglutinates	35.3
Basalt, Equi.	11.0
Basalt, Various	-
Breccia:	
Low-Grade-Brown	2.3
Low-Grade-Colorless	0.3
Med-High Grade	8.0
Anorthosite	Tr.
Cataclastic	
Anorthosite	2.0
Norite	Tr.
Gabbro	-
Plagioclase	13.3
Clinopyroxene	6.0
Orthopyroxene	7.3
Olivine	-
Ilmenite	3.7
Glass:	
Orange	2.0
"Black"	3.6
Colorless	1.0
Brown	2.3
Gray, "Ropy"	0.3
Other	2.0
<b>Total Number Grains</b>	<b>300</b>

<b>MAJOR ELEMENTS</b>	
(Apollo 17 P.E.T., 1973)	
	<b>%</b>
SiO <sub>2</sub>	42.67
TiO <sub>2</sub>	5.47
Al <sub>2</sub> O <sub>3</sub>	15.73
Cr <sub>2</sub> O <sub>3</sub>	0.37
FeO	13.15
MnO	0.18
MgO	9.91
CaO	11.77
Na <sub>2</sub> O	0.35
K <sub>2</sub> O	0.09
P <sub>2</sub> O <sub>5</sub>	0.05
S	0.10

<b>TRACE ELEMENTS</b>			
(Rhodes et al., 1974)			
	<b>ppm</b>		<b>ppm</b>
Sc		La	8.29
V		Ce	23.3
Co		Nd	18.4
Ni	194	Sm	6.36
Ba		Eu	1.37
Sr	154	Tb	
Hf		Dy	10.2
Ta		Ho	
Th	-	Tm	
U	0.36	Yb	5.54
		Lu	-

**SOIL: 79120**

LOCATION COMMENTS: Station 9, on the southeast rim of Van Serg Crater. Collected adjacent to a broken 0.8 m long boulder at a depth of about 3 cm.

GENERIC SUBSAMPLES	
1. 79121(214.4 gm)	< 1 mm
2. 79122(13.97 gm)	1-2 mm
3. 79123(13.14 gm)	2-4 mm
4. 79124(14.48 gm)	4-10 mm
5. 79125(1.91 gm)	> 1 cm
6. 79120(116.4 gm)	Reserve

MISCELLANEOUS	
Collected mass:	374.3 gm
Color:	Olive gray (5Y 4/1)
Bag no.:	Doc. bag 569
Container:	Returned in sample collection bag 5, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	57.0 submature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	
2. M <sub>d</sub>	

MAJOR ELEMENTS	
	%
SiO <sub>2</sub>	
TiO <sub>2</sub>	
Al <sub>2</sub> O <sub>3</sub>	
Cr <sub>2</sub> O <sub>3</sub>	
FeO	
MnO	
MgO	
CaO	
Na <sub>2</sub> O	
K <sub>2</sub> O	
P <sub>2</sub> O <sub>5</sub>	
S	

TRACE ELEMENTS			
	ppm		ppm
Sc		La	
V		Ce	
Co		Nd	
Ni		Sm	
Ba		Eu	
Sr		Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	
		Lu	



**SOIL: 79220**

LOCATION COMMENTS: Station 9, on the southeast rim of Van Serg Crater. From the top 2 cm (gray) soil in a 17 cm deep trench.

GENERIC SUBSAMPLES	
1. 79221(152.6 gm)	< 1 mm
2. 79222(7.22 gm)	1-2 mm
3. 79223(6.24 gm)	2-4 mm
4. 79224(9.75 gm)	4-10 mm
5. *79225 to 79228 (22.22 gm)	> 1 cm
6. 79220(93.49 gm)	Reserve

MISCELLANEOUS	
<b>Collected mass:</b>	291.52 gm
<b>Color:</b>	Olive gray (5Y 4/1)
<b>Bag no.:</b>	Doc. bag 483
<b>Container:</b>	Returned in sample collection bag 5, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	81.0, mature
2. Agglutinates	44

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	50 μm (<1 cm); 53 μm (<1 mm)
2. M <sub>d</sub>	

PETROGRAPHY	(90-150 μm)
(Heiken and McKay, 1974)	
<b>Components</b>	<b>%</b>
Agglutinates	44.4
Basalt, Equi.	14.4
Basalt, Various	
Breccia:	
Low-Grade-Brown	8.5
Low-Grade-Colorless	1.0
Med-High Grade	1.0
Anorthosite	-
Cataclastic	
Anorthosite	0.3
Norite	-
Gabbro	-
Plagioclase	6.9
Clinopyroxene	6.5
Orthopyroxene	-
Olivine	-
Ilmenite	1.3
Glass:	
Orange	4.2
"Black"	3.3
Colorless	2.3
Brown	2.3
Gray, "Ropy"	3.6
Other	-
<b>Total Number Grains</b>	<b>306</b>

<b>MAJOR ELEMENTS</b>	
(Apollo 17 P.E.T., 1974)	
	<b>%</b>
SiO <sub>2</sub>	41.67
TiO <sub>2</sub>	6.52
Al <sub>2</sub> O <sub>3</sub>	13.57
Cr <sub>2</sub> O <sub>3</sub>	0.42
FeO	15.37
MnO	0.21
MgO	10.22
CaO	11.18
Na <sub>2</sub> O	0.34
K <sub>2</sub> O	0.09
P <sub>2</sub> O <sub>5</sub>	0.06
S	0.12

<b>TRACE ELEMENTS</b>			
(Korotev, 1976)			
	<b>ppm</b>		<b>ppm</b>
Sc		La	7.46
V		Ce	25.6
Co		Nd	
Ni		Sm	6.90
Ba		Eu	1.44
Sr		Tb	1.78
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	6.70
		Lu	0.94

**SOIL: 79240**

LOCATION COMMENTS: Station 9, on the southeast rim of Van Serg Crater. From the 2-7 cm level of a 17 cm deep trench.

GENERIC SUBSAMPLES	
1. 79241(174.3 gm)	< 1 mm
2. 79242(11.32 gm)	1-2 mm
3. 79243(10.46 gm)	2-4 mm
4. 79244(10.85 gm)	4-10 mm
5. 79245(10.11 gm)	> 1 cm
6. 79240(113.3 gm)	Reserve

MISCELLANEOUS	
Collected mass:	330.34 gm
Color:	Med. dark gray (N4)
Bag no.:	Doc. bag 484
Container:	Returned in sample collection bag 5, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	51.0, submature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	
2. M <sub>d</sub>	

MAJOR ELEMENTS	
(Rose et al., 1974)	
	%
SiO <sub>2</sub>	41.73
TiO <sub>2</sub>	6.79
Al <sub>2</sub> O <sub>3</sub>	13.9
Cr <sub>2</sub> O <sub>3</sub>	0.46
FeO	15.64
MnO	0.20
MgO	9.90
CaO	11.08
Na <sub>2</sub> O	0.39
K <sub>2</sub> O	0.90
P <sub>2</sub> O <sub>5</sub>	0.890
S	

TRACE ELEMENTS			
(Rose et al., 1974)			
	ppm		ppm
Sc	56	La	<10
V	81	Ce	
Co		Nd	
Ni	275	Sm	
Ba	117	Eu	
Sr	147	Tb	
Hf		Dy	
Ta		Ho	
Th		Tm	
U		Yb	6.4
		Lu	

**SOIL: 79260**

LOCATION COMMENTS: Station 9, on the southeast rim of Van Serg Crater. From the lowest 10 cm in a 17 cm deep trench.

<b>GENERIC SUBSAMPLES</b>	
1. 79261(187.8 gm)	< 1 mm
2. 79262(11.74 gm)	1-2 mm
3. 79263(11.46 gm)	2-4 mm
4. 79264(15.85 gm)	4-10 mm
5. 79265(2.6 gm)	> 1 cm
6. 79260(118.9 gm)	Reserve

<b>MISCELLANEOUS</b>	
<b>Collected mass:</b>	348.35 gm
<b>Color:</b>	Olive gray to olive black (5Y 4/1 to 5Y 2/1)
<b>Bag no.:</b>	Doc. bag 485
<b>Container:</b>	Returned in sample collection bag 5, in air. Processed in N <sub>2</sub> .

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

<b>MATURITY PARAMETERS</b>	
1. I <sub>g</sub> /FeO	43.0, submature
2. Agglutinates	22

<b>GRAIN SIZE PARAMETERS</b>	
1. M <sub>z</sub>	125 μm (<1 cm); 70 μm (<1 mm)
2. M <sub>d</sub>	

<b>PETROGRAPHY</b>	(90-150 μm)
(Heiken and McKay, 1974)	
<b>Components</b>	<b>%</b>
Agglutinates	22.3
Basalt, Equi.	13.3
Basalt, Vario.	
Breccia:	
Low-Grade-Brown	1.3
Low-Grade-Colorless	0.3
Med-High Grade	8.3
Anorthosite	0.6
Cataclastic	
Anorthosite	0.6
Norite	0.3
Gabbro	-
Plagioclase	12.7
Clinopyroxene	16.6
Orthopyroxene	1.6
Olivine	-
Ilmenite	7.0
Glass:	
Orange	4.0
"Black"	2.6
Colorless	3.2
Brown	2.0
Gray, "Ropy"	1.3
Other	1.6
<b>Total Number Grains</b>	<b>300</b>

<b>MAJOR ELEMENTS</b>	
(Apollo 17 P.E.T., 1979)	
	<b>%</b>
SiO <sub>2</sub>	42.26
TiO <sub>2</sub>	6.09
Al <sub>2</sub> O <sub>3</sub>	14.43
Cr <sub>2</sub> O <sub>3</sub>	0.40
FeO	14.60
MnO	0.20
MgO	9.82
CaO	11.48
Na <sub>2</sub> O	0.35
K <sub>2</sub> O	0.11
P <sub>2</sub> O <sub>5</sub>	0.07
S	0.12

<b>TRACE ELEMENTS</b>			
(Rhodes et al., 1974)			
	<b>ppm</b>		<b>ppm</b>
Sc		La	8.31
V		Ce	22.2
Co		Nd	17.8
Ni	177	Sm	6.18
Ba		Eu	1.39
Sr	154	Tb	
Hf		Dy	10.0
Ta		Ho	
Th	-	Tm	
U	0.32	Yb	5.53
		Lu	0.71

**SOIL: 79510**

LOCATION COMMENTS: Station 9, on the southeast rim of Van Serg Crater. Surface sample collected about 2-3 m east of a boulder and sample 79120.

GENERIC SUBSAMPLES	
1. 79511(179.2gm)	< 1 mm
2. 79512(11.32 gm)	1-2 mm
3. 79513(9.94 gm)	2-4 mm
4. 79514(12.24 gm)	4-10 mm
5. *79515(93.23 gm)	> 1 cm
6. 79510(107.6 gm)	Reserve

MISCELLANEOUS	
Collected mass:	413.53 gm
Color:	Olive gray (5Y 3/1)
Bag no.:	Doc. bag 570
Container:	Returned in sample collection bag 5, in air. Processed in N <sub>2</sub> .

\*Samples 79515 to 79519, 79525 to 79529, and 79535 to 79537 derived from this split.

**SELECTED CHEMICAL AND PHYSICAL PROPERTIES OF SOIL**

MATURITY PARAMETERS	
1. I <sub>s</sub> /FeO	61.0, mature
2. Agglutinates	

GRAIN SIZE PARAMETERS	
1. M <sub>z</sub>	
2. M <sub>d</sub>	

MAJOR ELEMENTS	
(Mason et al., 1974)	
	%
SiO <sub>2</sub>	41.69
TiO <sub>2</sub>	6.13
Al <sub>2</sub> O <sub>3</sub>	13.79
Cr <sub>2</sub> O <sub>3</sub>	0.43
FeO	15.11
MnO	0.27
MgO	10.31
CaO	10.73
Na <sub>2</sub> O	0.2
K <sub>2</sub> O	0.18
P <sub>2</sub> O <sub>5</sub>	0.06
S	-

TRACE ELEMENTS			
(Laul et al., 1974)			
	ppm		ppm
Sc	50	La	8.7
V	85	Ce	29
Co	37	Nd	21
Ni	170	Sm	7.3
Ba	100	Eu	1.52
Sr		Tb	65
Hf	5.6	Dy	10
Ta	0.99	Ho	
Th	-	Tm	
U	-	Yb	5.7
Zr	150	Lu	0.86
Ir	8		
Au	3		