

**72161**  
Soil  
250 grams

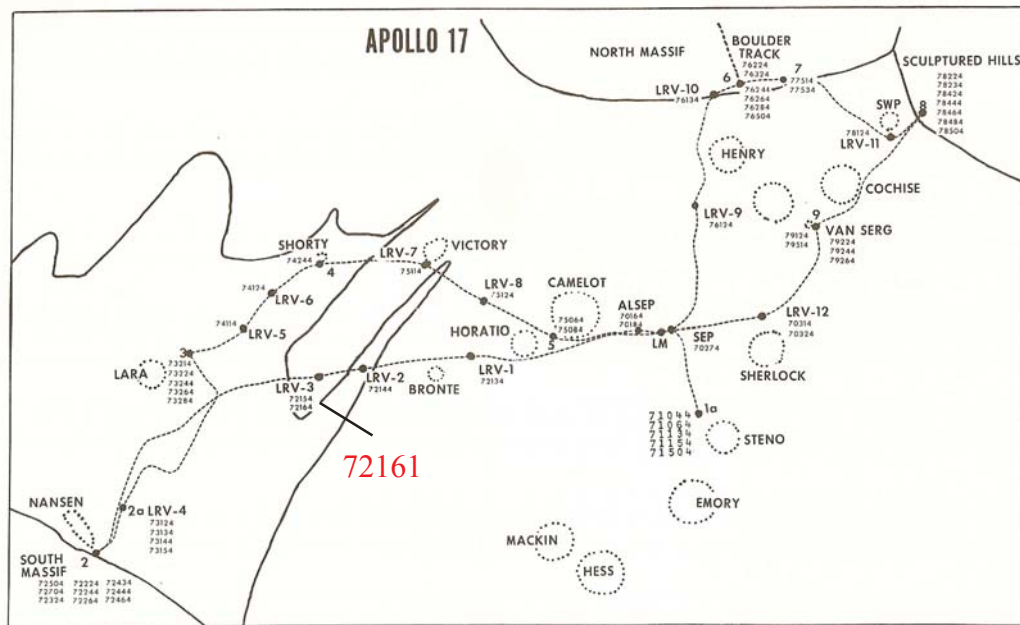


Figure 1: Location of soil sample 72160 at LRV-3 on Apollo 17 map (Meyer 1973). S73-24071

**Introduction**

Soil sample 72160 – 72164 was collected from the mare surface at LRV-3 (figure 1).

**Petrography**

Morris (1978) determined the maturity index ( $I_s/FeO = 87$ ). Basu et al. (1975) performed a detailed study, finding that the agglutinate content (31%) was generally less than expected for a very mature soil.

**Chemistry**

The bulk composition of 72161 is intermediate between mare and highland material (figures 2 and 4).

Moore et al. (1974) determined 200 ppm carbon (figure 3). Basu et al. (1975) studied the distribution of hydrogen and carbon, finding that it was very high in the finest fraction. This is a very mature soil.

**Modal content of soil 72160 (90-124 micron).**

From Basu et al. 1974.

	72161
Agglutinates	31 %
Basalt	2.4
Breccia	51.9
Plagioclase	3.8
Pyroxene	2.4
Glass other	8.5

**Cosmogenic isotopes and exposure ages**

Eldridge et al. (1975) determined the cosmic-ray-induced activity of  $^{22}Na = 190$  dpm/kg,  $^{26}Al = 166$  dpm/kg and  $^{54}Mn = 220$  dpm/kg.

**Other Studies**

Silver (1974) determined the U, Th and Pb isotopes.

Heymann et al. (1974) reported the rare gas content.

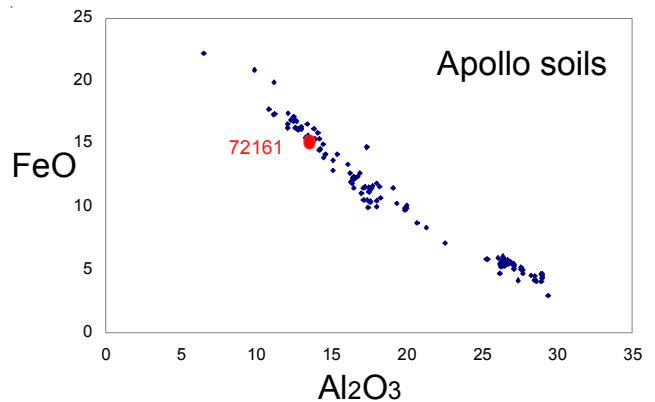


Figure 2: Composition of 72161 compared with other soil samples from Apollo missions.

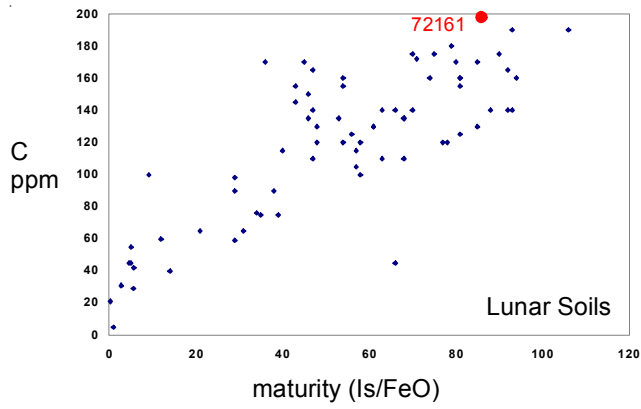


Figure 3: Carbon content and maturity index for soil sample 72161 compared with other Apollo soils samples.

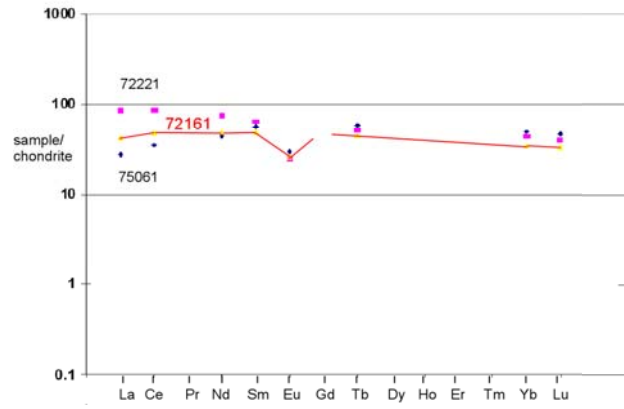
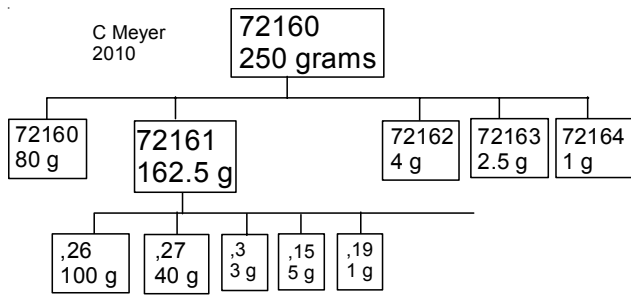


Figure 4: Normalized rare-earth-element diagram for 72161 showing contamination of mare soil with some highland material.



**Table 1. Chemical composition of 72161.**

reference weight	Hubbard74 Wiesmann76	Hubbard74	Korotev92	Philpotts74	Eldridge75	Baedecker74	Miller74
SiO <sub>2</sub> %		42.12 (b)					42.8
TiO <sub>2</sub>		5.21 (b)					4.67
Al <sub>2</sub> O <sub>3</sub>		14.22 (b)					14.4
FeO		14.86 (b)	14.9 (c)			15.2 (a)	15.7
MnO		0.22 (b)				0.22 (a)	0.19
MgO		10.54 (b)					11.4
CaO		11.17 (b)					10.8
Na <sub>2</sub> O		0.41 (b)	0.397 (c)			0.46 (a)	0.47
K <sub>2</sub> O	0.104 (a)	0.11 (b)		0.1 (a)	0.095 (d)		
P <sub>2</sub> O <sub>5</sub>		0.08 (b)					
S %		0.08 (b)					
sum							
Sc ppm			41.2 (c)			41 (a)	
V							
Cr	2668 (a)	2874 (b)	2900 (c)			2700 (a)	
Co			44.7 (c)				
Ni		273 (b)	320 (c)			286 (e)	
Cu							
Zn		58 (b)				53 (e)	
Ga						6.47 (e)	
Ge ppb						446 (e)	
As							
Se							
Rb	2.039 (a)	1.9 (b)		2.01 (a)			
Sr	159 (a)	165 (b)	140 (c)	155 (a)			
Y		55 (b)					
Zr	192 (a)	207 (b)	190 (c)	206 (a)			
Nb		16 (b)					
Mo							
Ru							
Rh							
Pd ppb							
Ag ppb							
Cd ppb						58 (e)	
In ppb						4.6 (e)	
Sn ppb							
Sb ppb							
Te ppb							
Cs ppm							
Ba	114 (a)		119 (c)	115 (a)			
La	9.71 (a)		9.8 (c)				
Ce	27 (a)		28.4 (c)	25.7 (a)		27 (a)	
Pr							
Nd	20.6 (a)		22 (c)	20.5 (a)			
Sm	6.94 (a)		7.12 (c)	6.84 (a)			
Eu	1.42 (a)		1.44 (c)	1.45 (a)		1.5 (a)	
Gd	9.5 (a)			9.13 (a)			
Tb			1.81 (c)			1.9 (a)	
Dy	10.4 (a)			9.99 (a)			
Ho							
Er	6.01 (a)			5.77 (a)			
Tm							
Yb	5.51 (a)		5.61 (c)	5.39 (a)		3.7 (a)	
Lu			0.796 (c)	0.837 (a)			
Hf	6.2 (a)		5.96 (c)			5.8 (a)	
Ta			0.87 (c)			0.83 (a)	
W ppb							
Re ppb							
Os ppb							
Ir ppb			12.5 (c)			10.7 (e)	
Pt ppb							
Au ppb			5.2 (c)			3.7 (e)	
Th ppm			1.41 (c)		1.47 (d)	1.5 (a)	
U ppm	0.41 (a)		0.32 (c)		0.45 (d)		

technique: (a) IDMS, (b) XRF, (c) INAA, (d) radiation count., (e) RNAA

## References for 72161

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