70311 and 70321

Mare Soil

119 and 233 grams

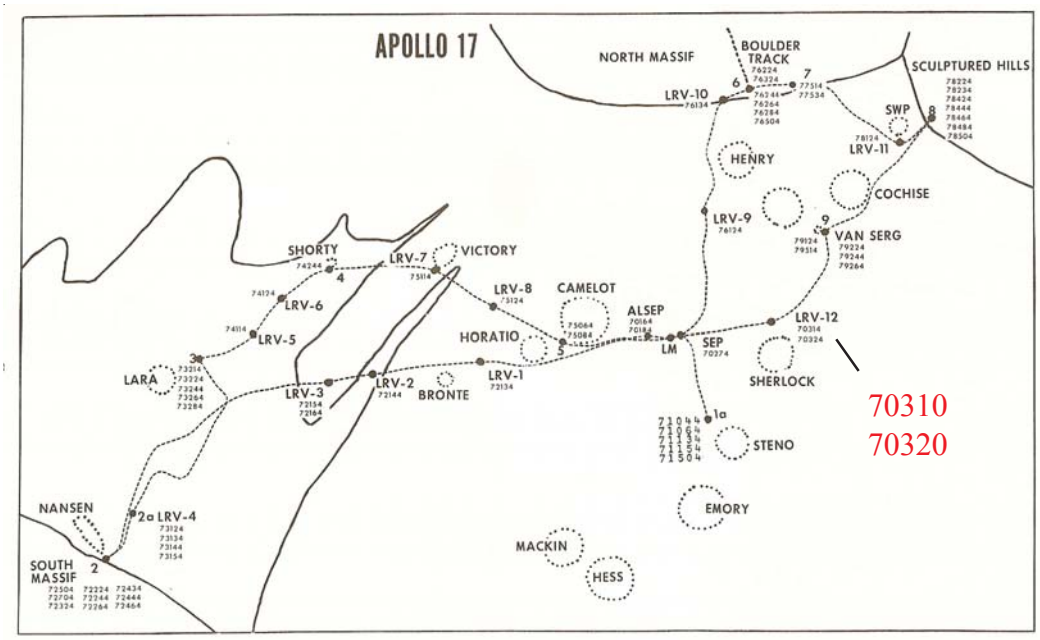


Figure 1: Location of soil samples 70310 and 70320 at LRV-12 on Apollo 17 map (Meyer 1973). S73-24071

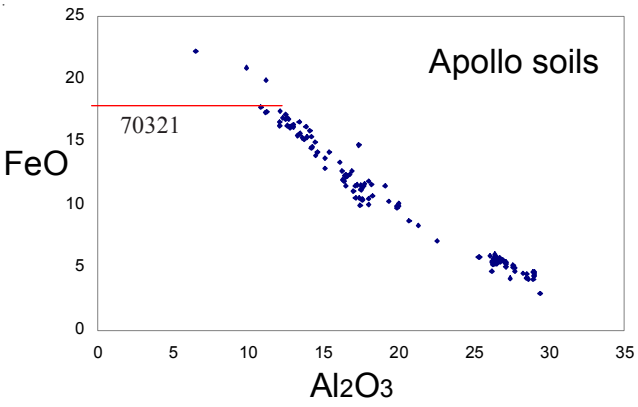


Figure 2: FeO content of 70311 and 70321 compared with other lunar soils.

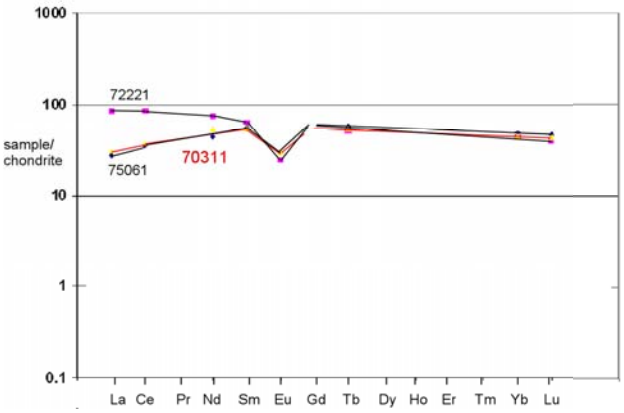


Figure 3: Normalized rare-earth-element diagram for 70311 compared with mare and highland soils at Apollo 17.

Introduction

Soil samples 70311 and 70321 were collected at LRV-12 near the Sherlock Crater (figure 1). 70311 was returned in the bag with 70315 (a coarse basalt), while 70321 appears to be a true soil sample.

Petrography

Morris (1978) determined the maturity index (I_s/FeO) of 70311 and 70321 as 39 and 42, respectively. Meyer (19730 found the coarse-fine fraction was mostly basalt.

Chemistry

Korotev (1992) found both soils had the same chemical composition (Table 1, figures 2 and 3). These soils are very iron–rich and composed of basalt fragments and materials derived from basalts.

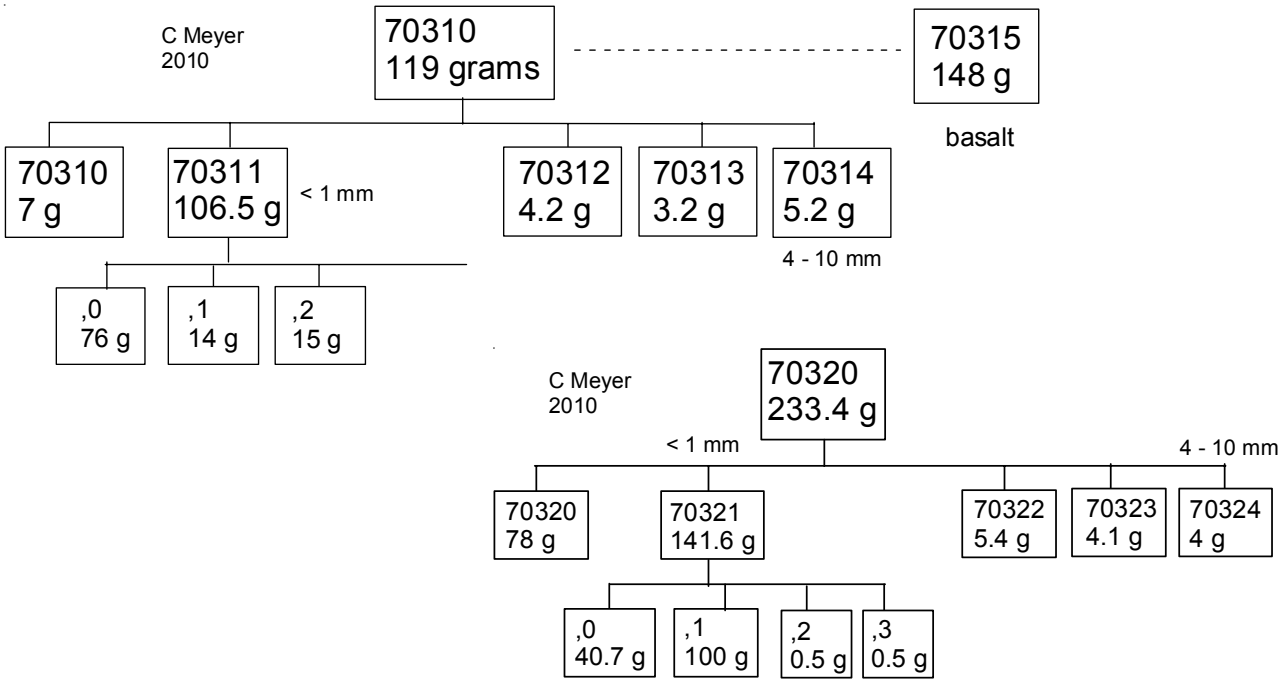
Table 1. Composition of 70311 and 70321.

	70311		70321			
reference	Korotev92		Korotev92		Eldridge75	
weight						
SiO2 %						
TiO2						
Al2O3						
FeO	17.5	(a)	17.1	(a)		
MnO						
MgO						
CaO						
Na2O	0.374	(a)	0.377	(a)		
K2O					0.0714	(b)
P2O5						
S %						
sum						
Sc ppm	65.7	(a)	66.8	(a)		
V						
Cr	3160	(a)	3140	(a)		
Co	33.9	(a)	28.4	(a)		
Ni	160	(a)	90	(a)		
Cu						
Zn						
Ga						
Ge ppb						
As						
Se						
Rb						
Sr	190		160	(a)		
Y						
Zr	260	(a)	280	(a)		
Nb						
Mo						
Ru						
Rh						
Pd ppb						
Ag ppb						
Cd ppb						
In ppb						
Sn ppb						
Sb ppb						
Te ppb						
Cs ppm						
Ba	110	(a)	80	(a)		
La	7.17	(a)	7.14	(a)		
Ce	22.2	(a)	22.5	(a)		
Pr						
Nd	24	(a)	22	(a)		
Sm	8.02	(a)	7.89	(a)		
Eu	1.63	(a)	1.68	(a)		
Gd						
Tb	1.95	(a)	1.99	(a)		
Dy						
Ho						
Er						
Tm						
Yb	7.26	(a)	7.38	(a)		
Lu	1.05	(a)	1.03	(a)		
Hf	7.27	(a)	7.2	(a)		
Ta	1.36	(a)	1.2	(a)		
W ppb						
Re ppb						
Os ppb						
Ir ppb	<8	(a)	6	(a)		
Pt ppb						
Au ppb	<9	(a)	< 8	(a)		
Th ppm	0.69	(a)	0.67	(a)	0.73	(b)
U ppm	< 0.5	(a)	0.2	(a)	0.26	(b)

technique: (a) INAA, (b) radiation count.

Cosmogenic isotopes and exposure ages

Eldridge et al. (1975) determined the cosmic-ray-induced activity of ^{22}Na = 130 dpm/kg, ^{26}Al = 114 dpm/kg and ^{54}Mn = 195 dpm/kg.



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