

PRELIMINARY MODAL PETROLOGY OF APOLLO 16 DOUBLE DRIVE TUBE CORE 64001. Abhijit Basu, Dept. Geol., Indiana U., Bloomington, IN 47405, David S. McKay, NASA-JSC, Houston, TX 77058, and Georgeann Nace, Lockheed Inc., Houston, TX 77058.

We report on the preliminary modal petrologic data on the 90-150 μm size fraction of samples from six levels of the lower half of the Apollo 16 double drive tube core at station 4. We have used a revised version of a classification that we had proposed earlier for submillimeter particles in Apollo 16 soils [1], a version that we have used in our recent lunar highland studies [2,3]. The data (Table 1) are, however, preliminary in nature and will be refined in near future.

The data show that, like other South Ray province soils, these soils are also mature and in an AML diagram (fig. 1) generally plot towards the mature end of the mixing line established for the core 64002 [3]. The samples are also relatively rich in plagioclase indicating dominantly anorthositic source rocks. This shows up very well as a plagioclase-rich cluster in a metamorphosed breccia-plagioclase-poikilitic rock diagram (fig. 2) which otherwise shows trends of mixing in all Apollo 16 soils [4]. The above, together with the presence of many fresh looking basaltic textured breccias (fragments of dimict breccias?), suggest that this part of the core represents Cayley Plain materials. In this regard there is no difference between the lower part of the core (64001) and the upper part (64002). However, one major petrologic difference between the two parts of the core is that the lower part is relatively homogeneous. This is apparent from the plots below.

REFERENCES. [1] Basu, A. and McKay D. S. (1981) Workshop on Apollo 16, 36. LPI, Houston. [2] Houck, K. J. (1982) PLPSC 13, A197. [3] Houck, K. J. (1982) PLPSC 13, A210. [4] McKay, D. S. et al. (1977), PLSC 8, 2929.

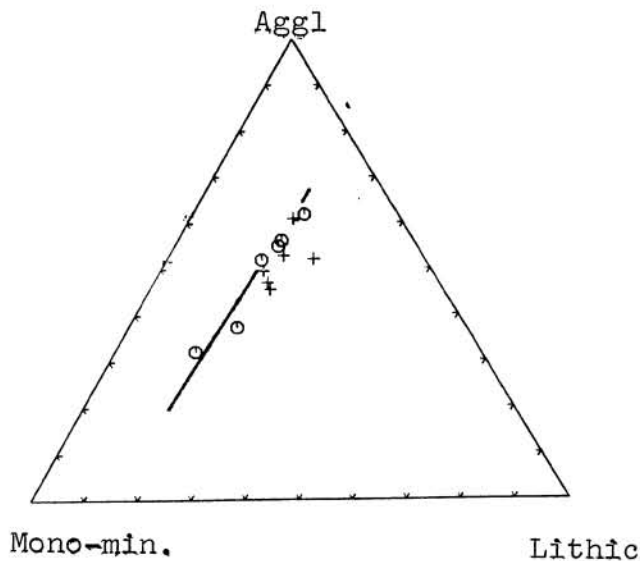


Figure 1

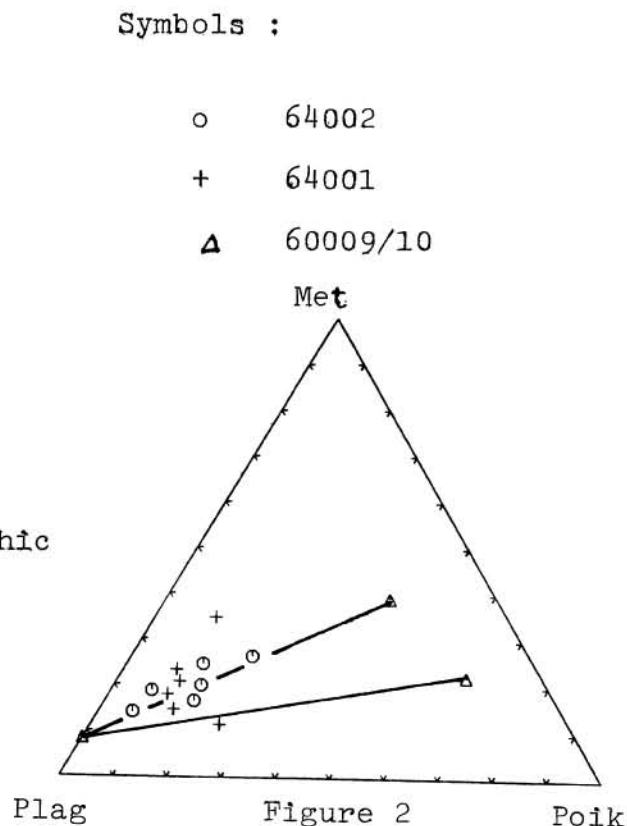


Figure 2

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Table 1. Modal data of six samples from the double drive tube core 64001

	370	371	372	373	374	375
<i>Monomineralic</i>	25.3	19.5	24.7	24.0	15.7	16.8
Plagioclase	21.8	18.3	19.9	21.5	15.0	14.0
Pyroxene	3.2	1.2	4.2	0.9	0.7	2.2
Olivine	0.3			1.3		
Opaques, Oxides, etc.				0.3		0.3
SiO ₂ Phases						0.3
<i>Crystalline Lithics</i>	1.2	1.5	0.9	0.6	0.6	0.3
Anorth., Nor., Troct.	(0.6)	(0.9)	(0.3)	(0.3)		
Anorthositic						
Noritic-troctolitic	0.6	0.9	0.3	0.3		
Mare Basalt		0.6	0.6	0.3	0.3	0.3
KREEP Basalt	0.6				0.3	
Indeterminate/Other						
<i>Breccias</i>	25.5	31.0	34.0	29.4	28.1	33.1
Fragmental/Vitric Matrix	(9.7)	(16.3)	(17.5)	(15.2)	(13.4)	(11.0)
Regolithic Vitric Matrix	(8.8)	(13.9)	(14.7)	(13.9)	(11.1)	(7.6)
Porous	4.1	4.0	8.0	6.0	2.6	2.5
Compact	4.7	9.9	6.7	7.9	8.5	5.1
Feldspathic Vitric Matrix	(0.6)	(1.5)	(2.5)	(0.0)	(1.3)	(2.8)
Porous	0.6	0.3	0.3		0.3	0.3
Compact		1.2	2.2		1.0	2.5
Fragmental Matrix	(0.3)	(0.9)	(0.3)	(1.3)	(1.0)	(0.6)
Unshocked clasts >50%						0.3
Shocked clasts >50%	0.3	0.9	0.3	1.3	1.0	0.3
Crystalline Matrix	(15.8)	(14.7)	(16.5)	(14.2)	(14.7)	(22.1)
Poikilitic	(3.2)	(2.8)	(7.3)	(4.1)	(2.6)	(2.9)
Equant Plagioclase	1.6	2.2	3.8	1.6	1.3	1.3
Acicular Plagioclase	1.6	0.6	3.5	2.5	1.3	1.6
Basaltic-Textured	(5.0)	(7.3)	(5.7)	(5.7)	(7.5)	(10.2)
Variolitic		0.9	0.6	0.3	0.7	
Subophitic	0.9	2.2	3.5	1.3	2.9	4.8
Interganular	2.8	1.5	1.3	1.3	1.0	1.6
Intersertal	1.3	1.5	0.3	2.8	2.9	3.8
Porphyritic						
Other/Indeterminate		1.2			0.3	
Granulitic	3.5	4.3	2.9	3.8	3.9	4.5
Other/Indeterminate	4.1	0.3	0.6	0.6	0.7	4.5
<i>Agglutinates</i>	37.7	40.2	35.3	38.2	48.4	42.7
<i>Glass</i>	10.0	7.0	4.4	7.1	6.5	7.0
Clast Laden/Ropy	0.9	1.2	1.6	2.2	2.3	1.0
Vitrophyric/Quench Crystal	6.3	1.2	0.6	0.6		0.6
Cryptocrystalline	1.3	1.5	0.6	0.9	1.3	2.5
Clast and Crystal Free	(1.5)	(3.1)	(1.6)	(3.4)	(2.9)	(2.9)
Green	0.3	0.3				
Yellow	0.3	0.6	0.3	0.3	1.0	1.3
Colorless/Gray, etc.	0.9	2.2	1.3	2.5	1.6	1.6
Black/Orange, etc.				0.6	0.3	
<i>Miscellaneous</i>	0.0	0.3	0.3	0.6	0.3	0.0
n	316	323	312	317	306	314