

**15529**  
Vesicular Mare Basalt  
1531 grams



*Figure 1: Photo of 15529. Sample is 10 cm across (cube is 1 inch). NASA S87-48191.*

**Introduction**

Lunar sample 15529 is a very vesicular mare basalt (figure 1) that remains unstudied. It was collected from near the edge of Hadley Rille in an area called “The Terrace”. The lunar regolith was thin in this area, with abundant rock samples (basalts) exposed (Swann et al. 1971).

Dirt fills some vesicles, but not all, and the sample has no obvious zap pits.

**Petrography**

Note similarity of 15529 to 15556 and 15016. Vesicles are 30% by volume; average 4 mm, up to 7 mm (Butler

1971). The relatively low silica content indicates that 15529 is probably related to the olivine-normative clan of Apollo 15 basalts. The mineral mode reported in the original catalog seems too high in plagioclase content.

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**Mineralogical Mode for 15529**

	<b>Sample Catalog Butler 1971</b>
Olivine	
Pyroxene	45-55
Plagioclase	45-55
Silica	
Opaques	1

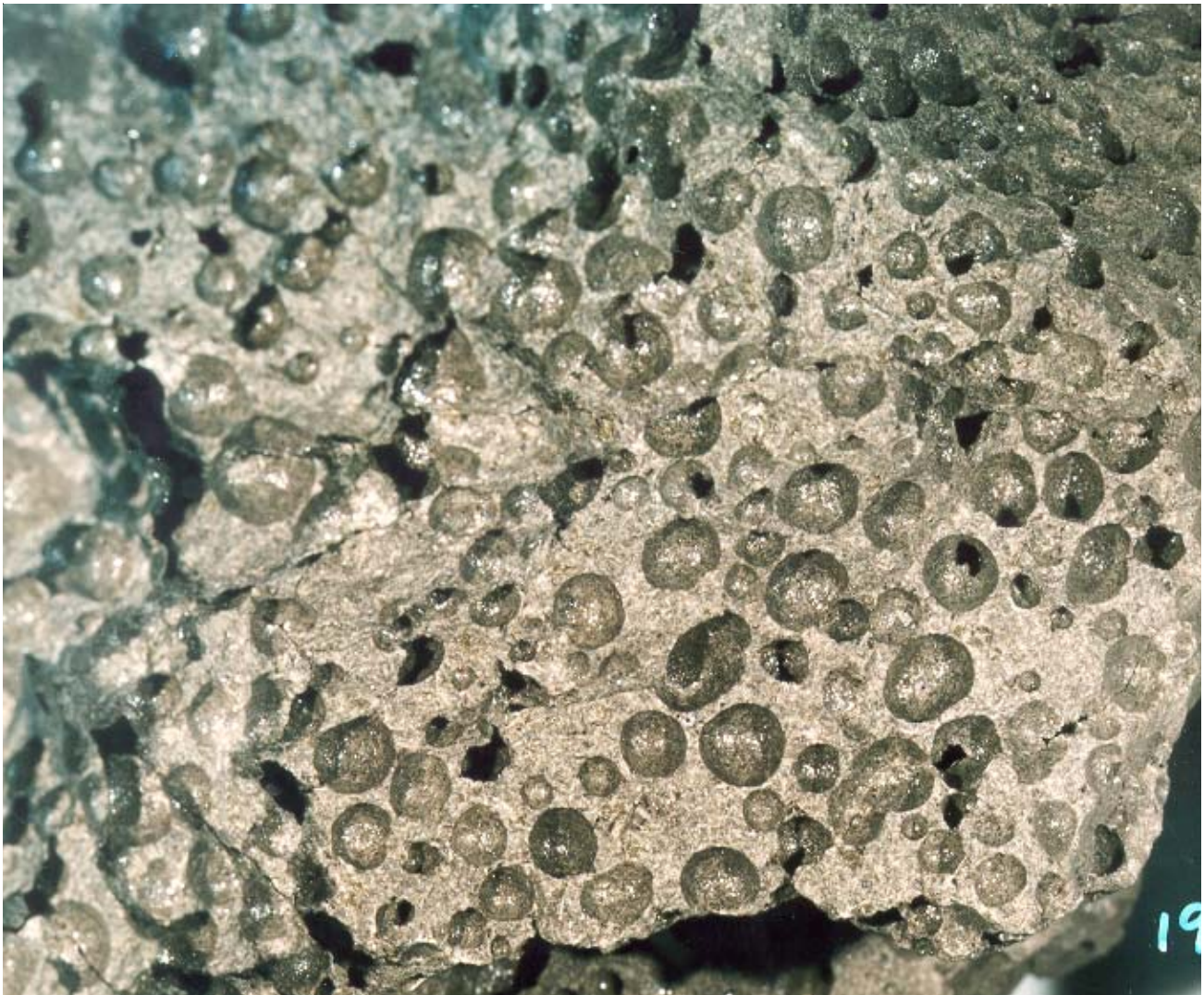


Figure 2: Closeup photo of freshly broken surface of 15529 showing numerous large vesicles. Largest vesicle is 4 mm. NASA S97-16850.

**Chemistry**

Neal (2001) and Ryder and Schuraytz B.C. (2001) reported chemical analyses (table, and figure 4). Rhodes and Blanchard (1983) reported that they had also analyzed 15529, but gave no data.

**Radiogenic age dating**

None

**Other Studies**

Garvin et al. (1982) calculated the gas pressure from the vesicle size and viscosity.

**Processing**

There are only two (small) thin sections.

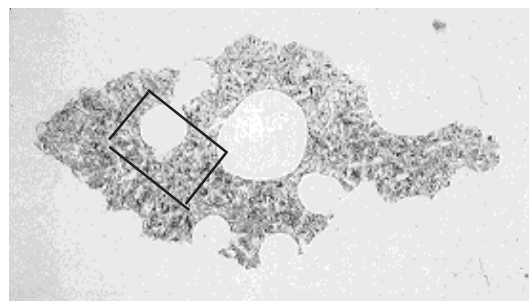
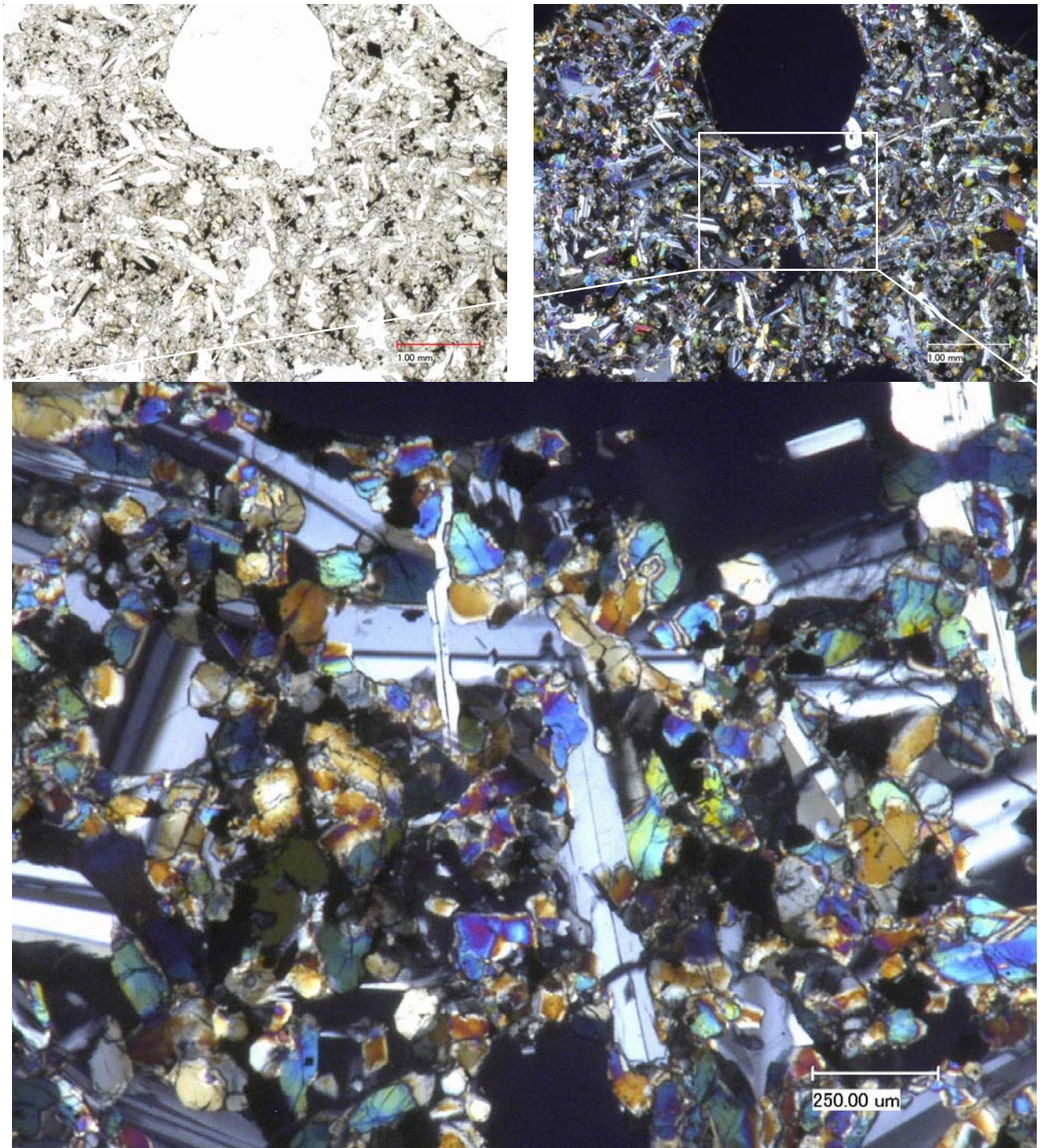


Figure 3: Thin section of 15529,14. Scale about 1 cm.



*Figure 4: Photomicrographs of thin section 15529,14 by C Meyer @ 30 and 150x.*

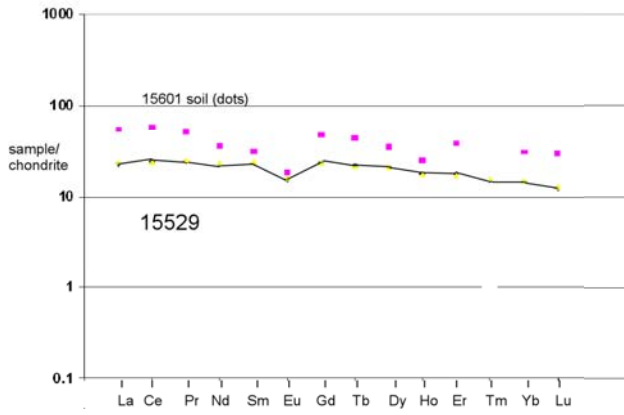


Figure 5: Normalized rare-earth-element diagram for 15529 (data from Neal 2001), compared with 15601 soil.

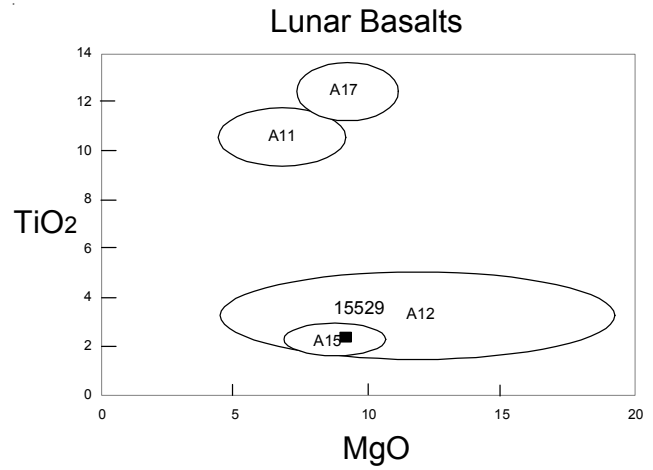


Figure 6: Chemical composition of 15529 compared with that of other lunar basalts.

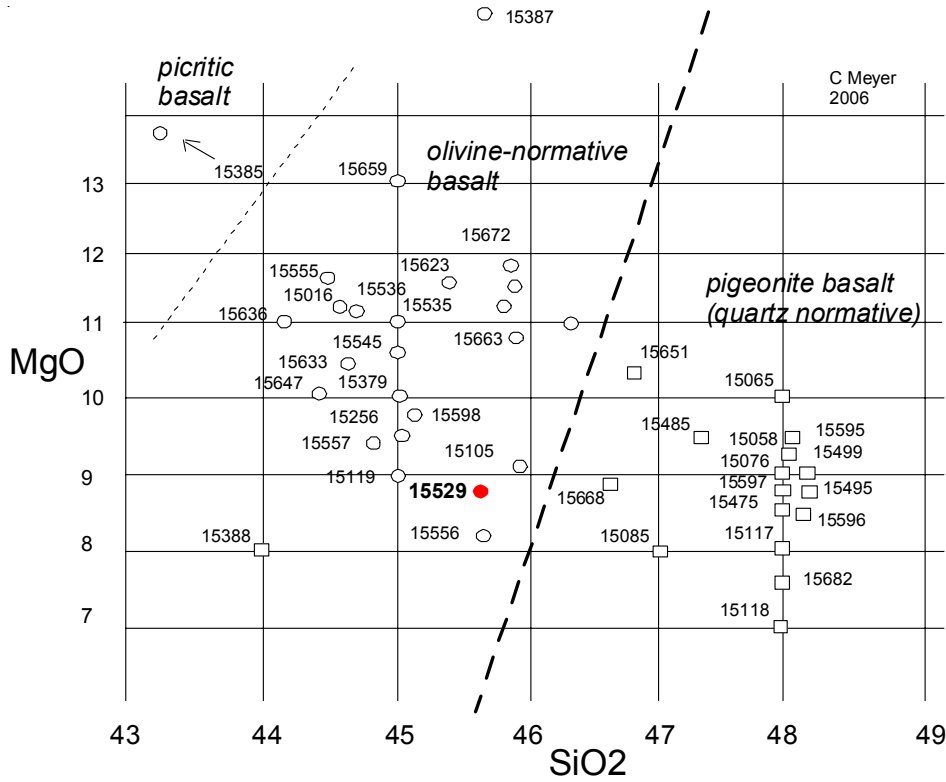
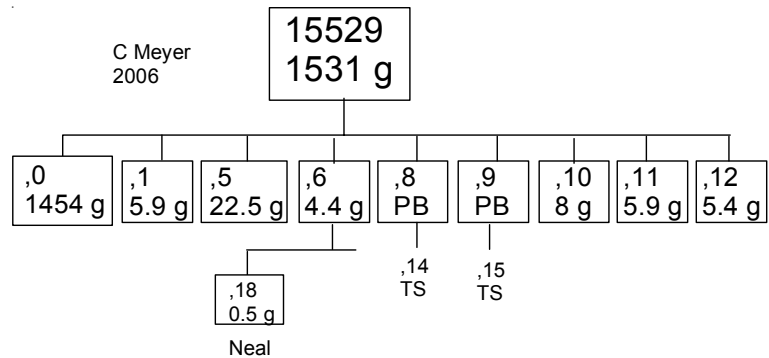


Figure 7: The big picture.



**Table 1. Chemical composition of 15529.**

reference weight	Ryder 2001		Neal 2001	
SiO <sub>2</sub> %	45.7	(a)		
TiO <sub>2</sub>	2.58	(a)		
Al <sub>2</sub> O <sub>3</sub>	9.19	(a)		
FeO	21.84	(a)	21.9	(b)
MnO	0.29	(a)		
MgO	8.91	(a)		
CaO	10.27	(a)		
Na <sub>2</sub> O	0.244	(a)	0.264	(b)
K <sub>2</sub> O	0.044	(a)		
P <sub>2</sub> O <sub>5</sub>	0.068	(a)		
S %				
sum				
Sc ppm			45	(b) 44.3 (c)
V				249 (c)
Cr	4364	(a)	4320	(b) 4168 (c)
Co			48.9	(b) 53 (c)
Ni	44	(a)	55	(b) 53 (c)
Cu	9	(a)	79	(b) 16 (c)
Zn				22 (c)
Ga				3.9 (c)
Ge ppb				
As				
Se				
Rb	2	(a)		0.92 (c)
Sr	101	(a)		103 (c)
Y	28	(a)		29.4 (c)
Zr	89	(a)		100.5 (c)
Nb	10	(a)		6.65 (c)
Mo				0.12 (c)
Ru				
Rh				
Pd ppb				
Ag ppb				
Cd ppb				
In ppb				
Sn ppb				
Sb ppb				
Te ppb				
Cs ppm				0.15 (c)
Ba			57	(b) 55.4 (c)
La			5.1	(b) 5.39 (c)
Ce			15.5	(b) 14.8 (c)
Pr				2.18 (c)
Nd			7	(b) 9.98 (c)
Sm			3.7	(b) 3.42 (c)
Eu			0.91	(b) 0.87 (c)
Gd				4.6 (c)
Tb			0.79	(b) 0.79 (c)
Dy				5.05 (c)
Ho				0.99 (c)
Er				2.83 (c)
Tm				0.36 (c)
Yb			2.27	(b) 2.38 (c)
Lu			0.32	(b) 0.3 (c)
Hf			2.62	(b) 2.63 (c)
Ta			0.4	(b) 0.51 (c)
W ppb				50 (c)
Re ppb				
Os ppb				
Ir ppb				
Pt ppb				
Au ppb				0.07 (c)
Th ppm			0.4	(b) 0.02 (c)
U ppm				

technique: (a) XRF, (b) INAA, (c) ICP-MS

**References for 15529**

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