

78527**Granulitic Noritic Breccia****5.16 g, 1.8 x 1.3 x 1.2 cm****INTRODUCTION**

Sample 78527 was collected as part of a large rake sample at Station 8 (Kiel et al., 1974). It is a light-colored, recrystallized norite (Fig. 1)

PETROGRAPHY

Butler (1973) described this sample as a "brecciated, coarse-grained (up to 4 mm) gabbroic rock with a dark glass coating. The plagioclase is probably maskelynite, and the mafic silicate is pale green." In a few places the sample is thinly coated by dark Breccia material, suggesting that it was a clast in a soil breccia.

Nehru et al. (1978) describe 78527 as a recrystallized norite, containing ~52% plagioclase (An₉₄), 45%

orthopyroxene (Wo₃En₇₇Fs₂₀), 2% olivine (FO₇₇), and -0.3% accessories, including minor high-Ca pyroxene (Wo₄₂En₄₈Fs₁₀), armalcolite, ilmenite, rutile, chromite, baddeleyite, zirconolite, zircon, K-feldspar, metal, and troilite. The rock consists of large, seriate, subangular plagioclase (up to 2 mm) and orthopyroxene (up to 0.8 mm) crystals in a fine-grained recrystallized matrix (Fig. 2). Minor olivine occurs as large polygonized grains.

Cushing et al. (1993) include 78527 in their suite of lunar granulites.

MINERAL CHEMISTRY

The compositions of minerals in 78527 are given in Nehru et al. (1978) and Warren et al. (1978f)

(Fig. 3). Metal grains in 78527 are all high in Ni (25-53%) and Co (1.9-2.2%).

WHOLE-ROCK CHEMISTRY

Laul and Schmitt (1975c), Murali et al. (1977a), and Warren et al. (1983) have reported the chemical composition of 78527 (Table 1 and Fig. 4). This composition and the mineral composition are similar to that of pristine lunar norite 78235. Warren (1993) lists it as a potentially pristine lunar sample. However, it has a relatively high Ir content.

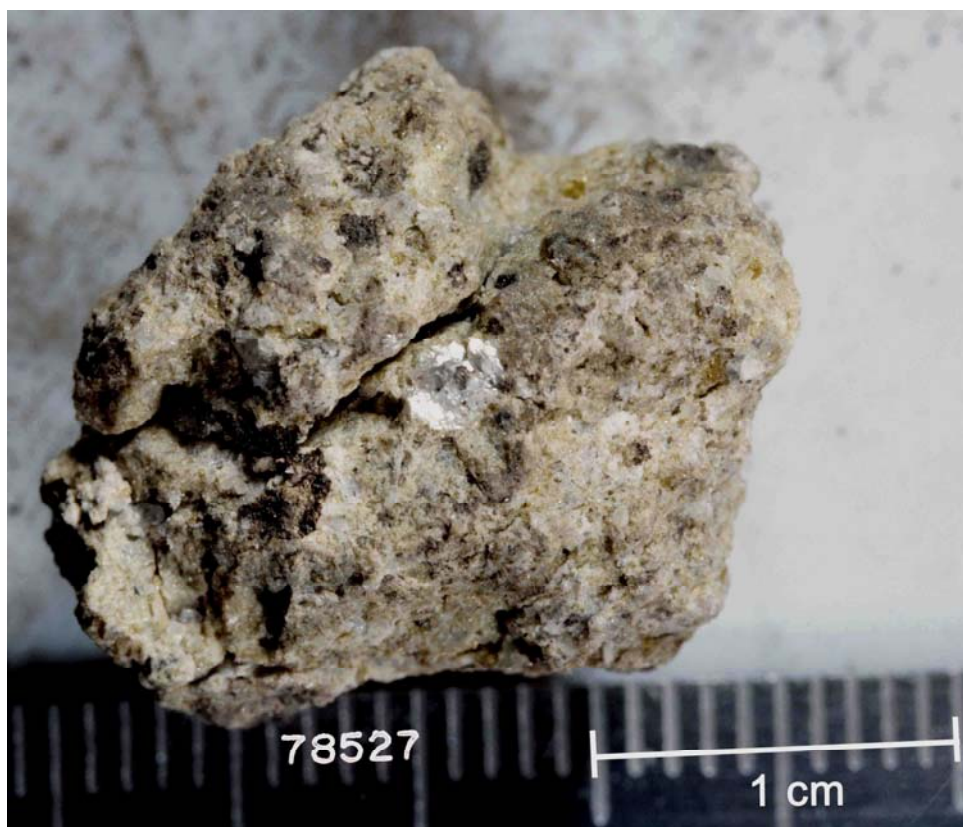


Figure 1: Photograph of 78527. The white spot in the center is an artifact. Scale is 1 cm. S73-21026.

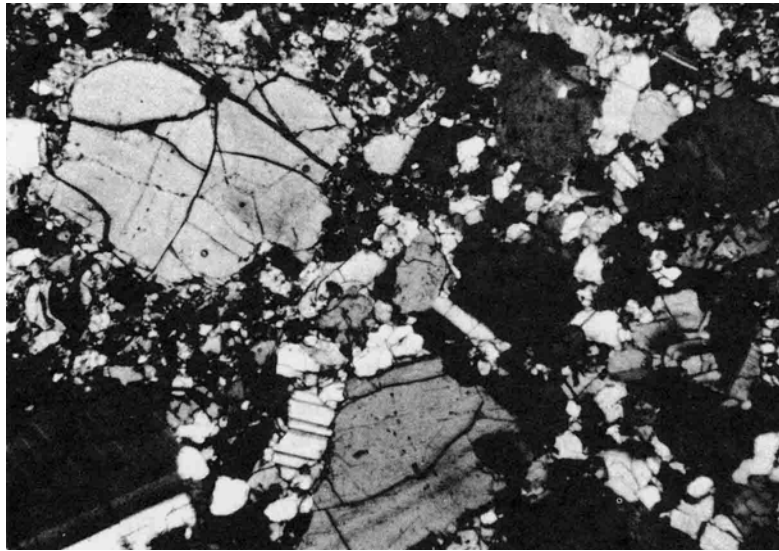


Figure 2: Photomicrograph of thin section 78257. Field of view is 3 x 4 mm. From Warner et al. (1978).

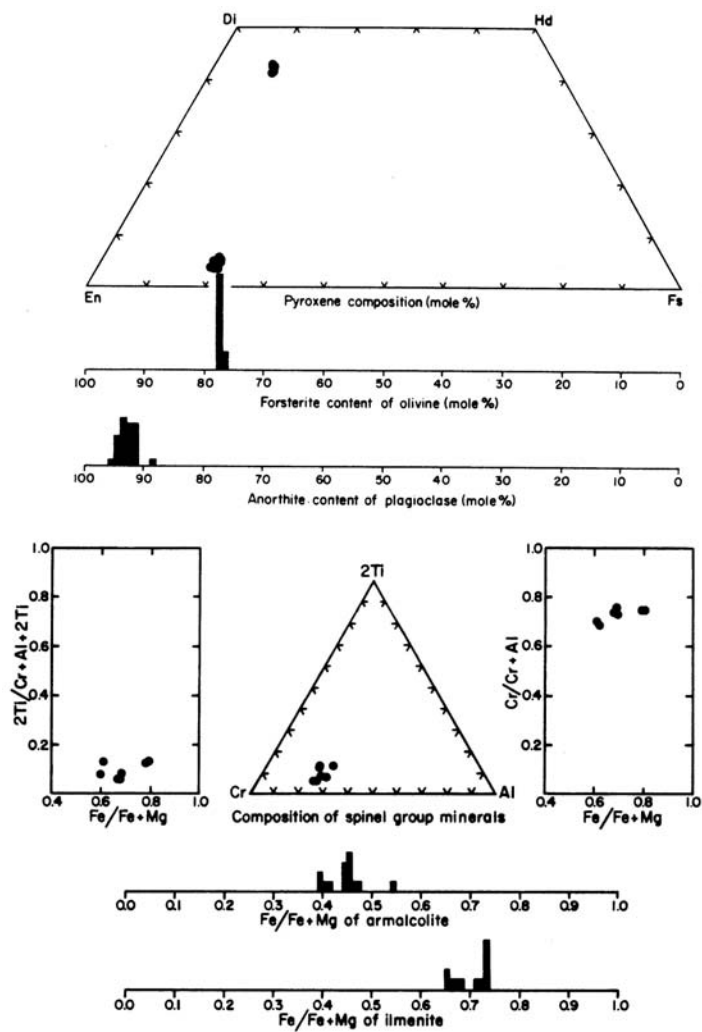


Figure 3: Compositions of minerals in 78527. From Warner et al. (1978).

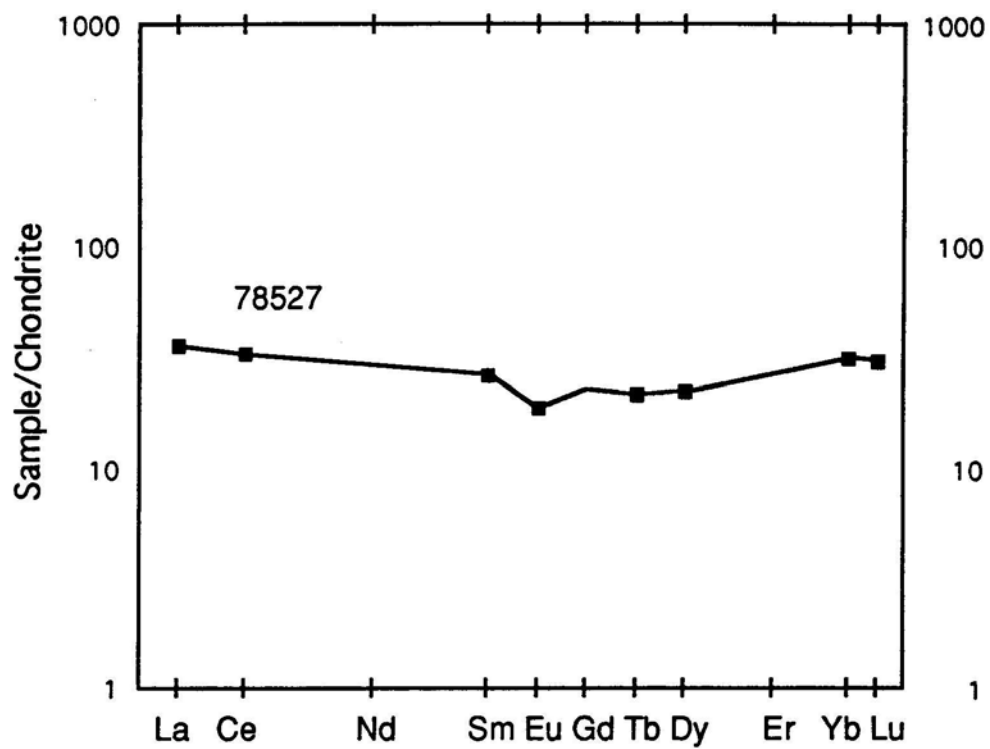


Figure 4: Normalized rare earth element diagram for 78527. Data from Laul and Schmitt (1975).

Table 1: Whole-rock chemistry of 78527.

a) Laul and Schmitt (1975c); b) Murah et al. (1977a); c) Warren et al. (1983)

Split Technique	,2 (a) INAA	,2 (b) INAA	,5 (c) INAA
SiO ₂ (wt%)	–	–	45.37
TiO ₂	0.6	0.38	0.37
Al ₂ O ₃	16.8	13.3	14.93
Cr ₂ O ₃	0.21	0.191	0.215
FeO	7.4	8.3	9.90
MnO	0.09	0.087	0.12
MgO	15	14	19.75
CaO	9.2	7.8	8.12
Na ₂ O	0.42	0.36	0.35
K ₂ O	0.065	0.054	0.07
Nb (ppm)			
Zr	–		<350
Hf	2.9	3.2	2.76
Ta	0.3	0.33	0.33
U	–		0.29
Th	1.4	0.7	1.6
Ba	150	110	140
Ni	120	170	102
Co	31.6	35	47
Sc	9.4	8	9.4
La	8.5	7.9	9.3
Ce	20	(25)	25.5
Nd			14
Sm	3.9	2.9	3.72
Eu	1.07	0.97	0.98
Gd			
Tb	0.8	0.7	0.83
Dy	5.5	4.7	5.7
Er			
Yb	5	3.4	3.76
Lu	0.73	0.59	0.61
Ge (ppb)			86
Ir		6	2.8
Au			0.23