

15364 ANORTHOSITIC (MONOMICT?) BRECCIA ST. 7 1.5 g

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**INTRODUCTION:** 15364 is a plagioclase-rich, fine-grained fragmental breccia (Fig. 1). It lacks mare, KREEP, green glass, or other breccia clasts and appears to have a restricted olivine-bearing feldspathic highlands provenance. It has some mineral features distinct from ferroan anorthosites.

15364 macroscopically appears to have about 10% mafics, and to be coated in gray dust. No distinct zap pits were seen, but the corners were slightly rounded. It was collected as part of the rake sample from the north-east rim of Spur Crater.

**PETROLOGY:** 15364 was described by Steele et al. (1977), and mineral chemical data were given in Steele et al. (1972a, b), Hansen et al. (1979), and Smith et al. (1980a, b). The sample lacks glass, and consists of 20% lithic clasts and 80% mineral clasts, which are dominantly plagioclase (Fig. 2a). The lithic clasts are crystalline, generally poikilitic varieties in which the olivine encloses plagioclases (Figs. 2b-d). Overall the plagioclases are calcic ( $An_{97-95}$ ) and low in Fe (<0.15%); olivine is  $\sim Fo_{70}$ ; and pyroxene is  $\sim En_{75}Wo_3$ . Steele et al. (1977) described the clast shown in Figure 2b (their clast A). It has euhedral, chemically unzoned plagioclase enclosed poikilitically in olivine. The olivine is  $Fo_{72}$  with 0.10% CaO, pyroxene is  $En_{73}Wo_4$ , and the plagioclase is  $An_{97}$ . Chromite is also present. Discrepancies between these analyses and later ones (below) occur. Precise analyses of the Al, P, Ca, Ti, Cr, and Mn in four olivine grains were made by Smith et al. (1980a). The Ti in the olivines is higher than in ferroan anorthosites (Smith et al., 1980a, b, label the sample as ,2 but the thin section is ,1). Hansen et al. (1979) analyzed plagioclases in the clast, with the microprobe, for MgO (0.046%), FeO (0.057%), and K<sub>2</sub>O (0.040%), with a mol % Ab of 5.2%. The K<sub>2</sub>O contents are at the low end of the Mg-suite, but the high end of the ferroan anorthositic suite. The orthopyroxene is reported as  $Mg_{76}$ . The plagioclases were also analyzed by Smith et al. (1980b) with the ion probe, for Li (7.3 ppm), Mg (355 ppm), K (550 ppm), Ti (100 ppm), Sr (275 ppm), and Ba (80 ppm), with mol % Ab of 5.9%. The Ba is higher than in ferroan anorthosite plagioclase. The chromite is Ti-rich. Steele et al. (1977) also found a clast B to be similar to clast A except that it contained no euhedral plagioclase.

**PROCESSING AND SUBDIVISIONS:** Only a small chip ,1 was removed from ,0, for thin sections ,1; ,7; and ,14. ,0 (1.22 g) was temporarily allocated for a magnetic study.



Figure 1. Pre-split view of 15364. S-71-49611

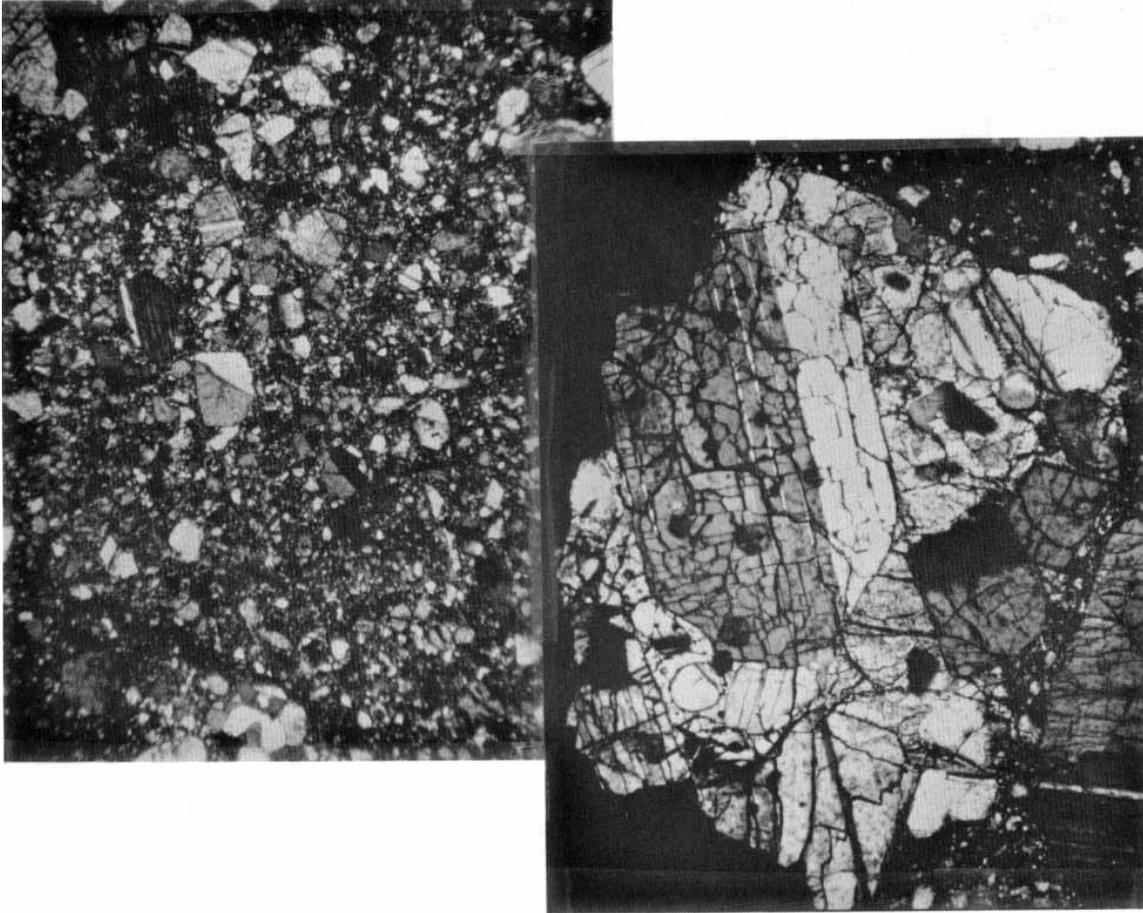
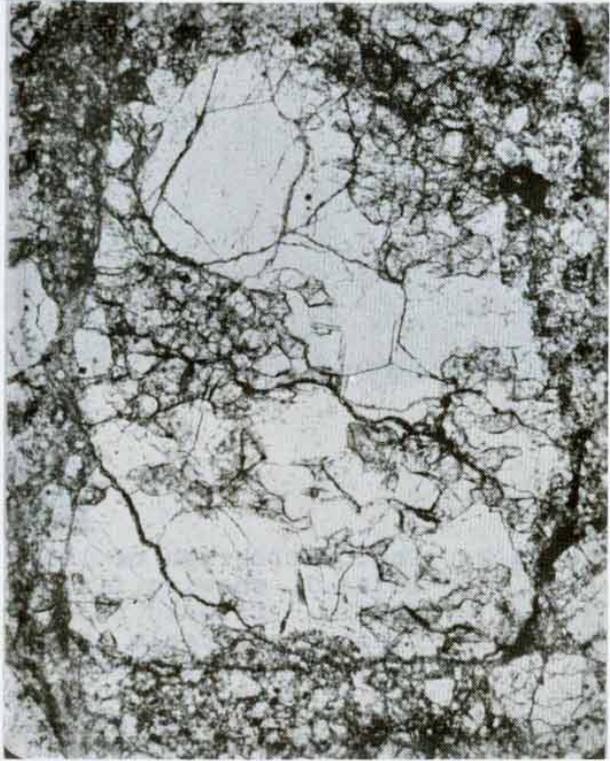


Figure 2. Photomicrograph of 15364.

- a) general matrix view of 15364,7, showing fine grain-size and brecciated nature. Crossed polarizers, width about 2 mm.
- b) Clast A of Steele et al. (1972) in 15364,1, showing euhedral plagioclase. Crossed polarizers, width about 600 microns.
- c) polygonal plagioclase-olivine clast in 15364,7. Crossed polarizers, width about 300 microns.
- d) poikilitic olivine-plagioclase clast in 15364,1. Transmitted light, width about 600 microns



**Fig. 2c**



**Fig. 2d**