10024

Sample 10024 is a subangular, medium light grey, fine grained basalt. This sample originally weighed 68gm, and measured 5 X 4 X 2.5 cm. It was returned in the Contingency Sample Container.

BINOCULAR DESCRIPTION BY: Twedell DATE: 6-8-76

ROCK TYPE: Vesicular basalt SAMPLE: 10024,27 WEIGHT: 20.43 gm

COLOR: Medium light grey DIMENSIONS: 3.2 x 2.4 x 1.3 cm

SHAPE: Angular to Sub-angular

COHERENCE: Intergranular – friable
Fracturing – few, non-penetrative

FABRIC/TEXTURE: Isotropic equigranular

VARIABILITY: Homogeneous.

SURFACE: Surface is granulated; Flat fracture surface on one side (PET)

ZAP PITS: Few on T_1, N_1. None on S_1, W_1, E_1, B_1. Pits are glass lined, up to 1mm in diameter.

CAVITIES: Surface is vuggy on both fresh and exterior surfaces. Vugs cover approximately 25% of rocks surface area. Glass droplets occur inside some of the vugs.

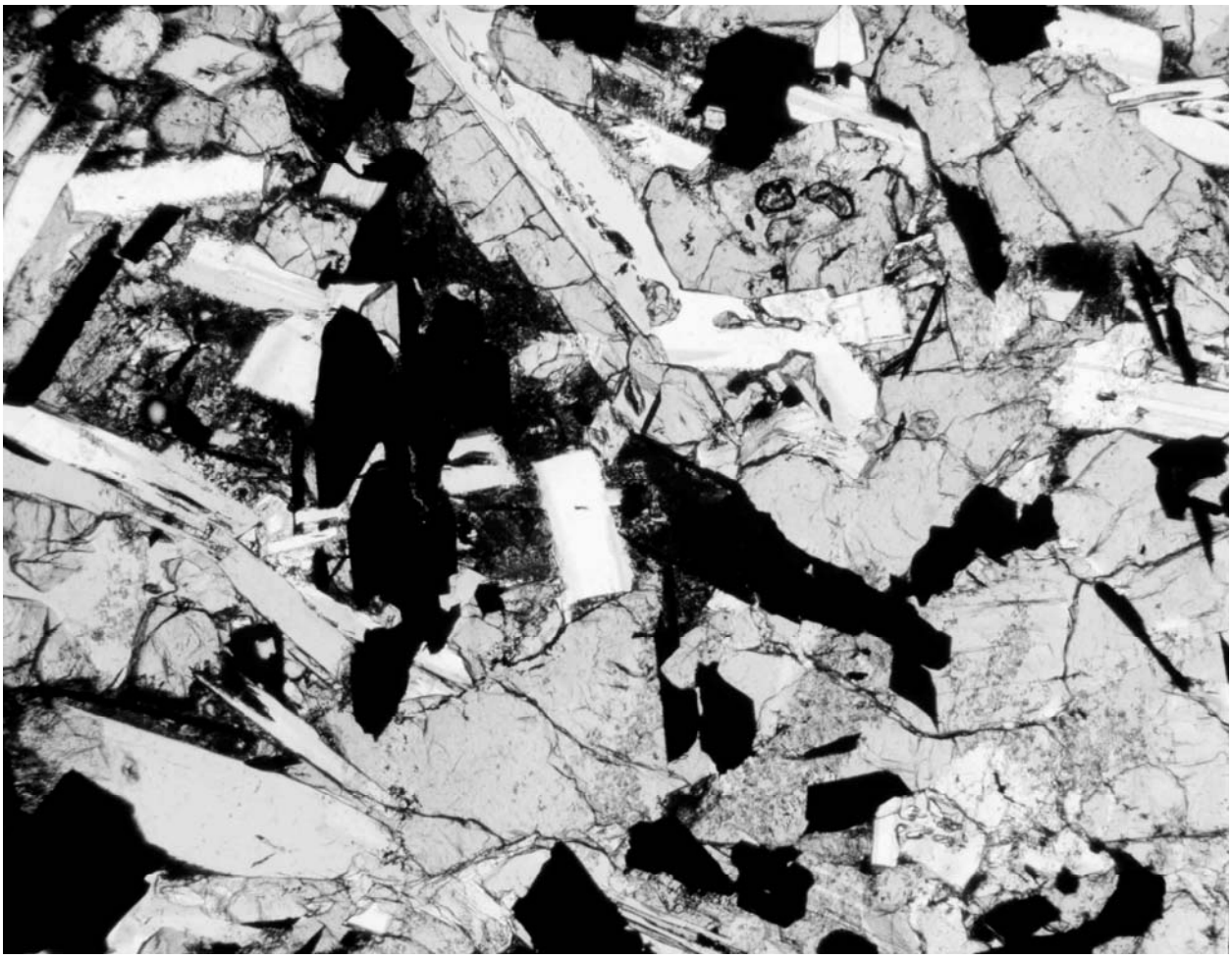
COMPONENT	COLOR	% OF ROCK	SHAPE	SIZE (MM) DOM.	RANGE
Plagioclase	White	30	Angular	.2	.1-.4
Pyroxene	Brown	30	Angular	.3	.1-. 5
$Black_1$	Black	25	Rounded	.3	.1-.5
Ilmenite	Black	15	Angular	.3	<.1-. 3

1) Vitreous appearance, probably glass

SPECIAL FEATURES: There are some dark grey crystals protruding from the vug walls.

10024,0 Original PET Photo (S-69-46030)

10024 (S-75-31693)



SECTION: 10024, 29 Width of Field: 1.39 mm plane light S-76-26262

THIN SECTION DESCRIPTION BY: Walton DATE: 6/8/76

SUMMARY: Fine-grained, intersertal basalt composed of clinopyroxene, plagioclase, and ilmenite with subordinate mesostasis. Few of the crystals in the section show well defined crystal faces and most are somewhat rounded at edges. Several groups of radially clustered, acicular pyroxene-plagioclase intergrowths are also present. Glassy cores are present in some of the crystals as well as a glass-rich mesostasis between adjacent crystalline phases.

Phase	% Section	Shape	Size (mm)
Pyrox	45	Anhedral, irregular	0.1-0.8
Plag	22	Anhedral to acicular	0.2-0.9
Opaq	23	Anhedral to subhedral	0.01-0.4
Meso	10	Irregular	0.01-0.03

COMMENTS:

Pyroxene – The pyroxene forms pale brown anhedral crystals which host the other phases present. Well developed cleavage is found in many crystals, while fracturing is present in all the crystals. No marked zoning, but occasional twinning is present. The crystals make up an almost continuous array with many areas consisting of only polygranular pyroxene. All contacts with the other crystalline phases are sharp and the mesostasis present in the section usually occurs between adjacent pyroxene crystals.

The mesostasis forms dark brown poorly defined irregular masses throughout the section. The boundaries between the crystalline phases and the mesostasis are ill defined and the glassy material appears to have filled interstitial openings in the other phases. Some devitrification has taken place as the masses are very turbid.

Plagioclase – Two major types of plagioclase occur in the rock. The larger anhedral crystals are skeletal, poorly formed and form interstitial masses between the pyroxene crystals. The smaller acicular crystals are lath-like and may have hollow centers filled with a glassy phase. These crystals form intergrowths with acicular pyroxene crystals in more or less fan-shaped manner. Many of the terminations are quite splintery. Small crystals of an apatite-like phase is present associated with the plagioclase. This phase was not identified.

Opaques – The primary opaque phase present in the rock is ilmenite. It forms skeletal crystals which are scattered throughout the section. Few terminations are present on any crystals. Some chromite exsolution is present. Most of the crystals of ilmenite are very eroded and the embayments filled with pyroxene. A few lath-like subhedral crystals are present. These are smaller and far more uncommon than the larger skeletal crystals.

Many masses of troilite with and without iron-nickel inclusions are found scattered throughout the section.

Kushiro and Nakamura (1970) have reported large crystals of cristobalite from this rock. None of the sections examined could confirm their observation. Several small areas of the mesostasis had that appeared to be small silica inclusions but these were not confirmed.

TEXTURE: Nearly equigranular intersertal basalt consisting of a random network of pyroxene that is intergrown with large skeletal crystals of ilmenite. Occurring interstitial to this network are plagioclase

tablets that are intergrown with the edges of the pyroxene, acicular pyroxene-plagioclase intergrowth, small subhedral crystals of ilmenite, and anhedral masses of plagioclase and mesostasis. Contacts are sharp between crystalline phases.

HISTORY AND PRESENT STATUS OF SAMPLES – 10/18/76

10024 was removed from the Contingency Sample bag in PCTL. The sample was split in PCTL and was later re-examined in SSPL.

PRISTINE SAMPLES (ALL PCTL-SSPL)

7	0.01 gm	Less than 1mm fines.
19	7.22 gm	Two large pieces plus small chips and fines. There are no pitted surface.
27	20.427 gm	Piece with one pitted surface.

RETURNED SAMPLES:

17	10.59 gm	Piece with one pitted surface.

CHEMICAL ANALYSES

Element	Number of Analyses	Mean	Units	Range
SiO_2	3	39.61	PCT	1.25
Al_2O_3	4	8.32	PCT	1.75
TiO_2	3	12.54	PCT	1.3
FeO	3	19.26	PCT	1.31
MnO	3	.231	PCT	0.028
MgO	3	7.59	PCT	.981
CaO	3	10.2	PCT	.726
Na_2O	3	.489	PCT	0.06
K_2O	4	.303	PCT	0.059
P_2O_5	1	.2	PCT	0
Rb	5	5.99	PPM	.72
Sr	3	173.7	PPM	17.5
Ba	3	255.0	PPM	140
Sc	1	76.2	PPM	0
V	2	60.5	PPM	47
Cr_2O_3	3	.372	PCT	.065
Co	2	30.2	PPM	3.6
Ni	1	20.04	PPM	0

Element	Number of Analyses	Mean	Units	Range
Cu	1	16.0	PPM	0
Zn	1	14.0	PPM	0
Y	1	168.0	PPM	0
Zr	2	512.5	PPM	275
Nb	1	25.0	PPM	0
Ta	1	2.4	PPM	0
Hf	1	20.0	PPM	0
La	2	31.0	PPM	16
Ce	3	86.87	PPM	32
Pr	1	12.0	PPM	0
Nd	2	60.55	PPM	11.1
Sm	2	21.3	PPM	4.2
Eu	1	2.21	PPM	0
Gd	1	28.6	PPM	0
Dy	1	33.6	PPM	0
Ho	1	8.1	PPM	0
Er	1	19.3	PPM	0
Yb	2	18.1	PPM	0
Lu	1	3.2	PPM	0
Th	1	4.1	PPM	0
U	1	0.67	PPM	0
B	1	0.7	PPM	0
Ga	1	5.0	PPM	0
O	1	38.9	PCT	0
S	1	0.22	PCT	0

Analysts: Compston et al., (1970); Ehmann & Morgan, (1970); Rose et al., (1970); Goles et al., (1970); Gopalon et al., (1970); Philpotts & Schnetzler, (1970); Papanastassiou & Wasserburg, (1971); Hurley & Pinson, (1970).

Age References: Turner (1970); Eberhardt et al., (1971b); Papanastassiou et al., (1971).