10044

Sample 10044 is an angular to sub-angular, grey and white, cristobalite basalt. This sample originally weighed 247gm. and measured 7X4X3 cm. It was returned in ALSRC#1003 (Bulk Sample container).

BINOCULAR DESCRIPTION BY: Twedell DATE: 9-18-75

ROCK TYPE: Cristobalite Basalt SAMPLE: 10044,59 WEIGHT: 25 gm

COLOR: Grey & White DIMENSIONS: 4 x 3.5 x 1.5 cm

SHAPE: Angular to sub-angular; rounded but rough on surface texture (PET).

COHERENCE: Intergranular – friable
Fracturing – absent; some elongate openings or fractures—look like semi-healed fractures. Width of fractures variable, in some places almost vuggy (PET).

FABRIC/TEXTURE: Isotropic; structures-many open circles, irregular, not straight, some are discontinuous, definite lines of weakness (PET)/Equigranular; Granular-Holocrystalline (PET).

VARIABILITY: Homogeneous

SURFACE: Irregular.

ZAP PITS: None observed

CAVITIES: Approximately 5% surface coverage, <2mm in diameter.

COMPONENT	COLOR	% OF ROCK	SHAPE	SIZE (MM) DOM.	RANGE
Pyroxene	Pink to Red	35	Anhedral	0.5	1
Plagioclase	White	45	Anhedral to laths	0.5	1
Opaques	Black	20	Rounded to subrounded	0.5	1

10044,0 Original PET Photo S-69-45539

10044,54 (S-75-31692)

SECTION: 10044,55 Width of Field: 2.72 mm plane light s -76-26295

THIN SECTION DESCRIPTION BY: Walton DATE: 9/18/75

SUMMARY: Medium-grained subophitic basalt composed of clinopyroxene, plagioclase, ilmenite with subordinate cristobalite, pyroxferroite and mesostasis. Large anhedral crystals of clinopyroxene host the other phases present. Many of the pyroxene crystals exhibit polygranularity.

Many of the plagioclase, ilmenite and cristobalite crystals show parallel facial development. The ilmenite occurs in rather large skeletal crystals associated with chromian ulvospinel, troilite and iron-nickel metal.

Phase	% Section	Shape	Size (mm)
Pyrox	47	Subhedral to anhedral	0.4-1.4
Plag	34	Blocky to tabular	0.1-0.9
Cris	3	Subhedral to anhedral	0.2-1.2
Opaq	12	Skeletal to anhedral	0.08-0.9
Meso	4	----------	----------

COMMENTS:

Pyroxene – At least two types of pyroxene occur in this section. One is pinkish in color with poor cleavage pattern while the other is reddish and has a well developed cleavage pattern. All crystals have wavy extinctions and are more or less polygranular. Occasional small masses of pyroxferroite also occur with the pyroxene. Chao et al., (1970) reported the new mineral pyroxferroite from 10044.

Plagioclase forms tabular crystals which show sharp twin planes. The crystals are somewhat grouped into radiating groups.

Cristobalite occurs as interstitial void fillings between the plagioclase and pyroxene crystals.

The major opaque phase in the section is ilmenite. The crystals are moderately large and only occasional small shards are encountered. The crystals are very skeletal. Troilite and troilite with iron-nickel inclusions form small masses in the section. Several crystals of chromian ulvospinel also occur in the section.

The mesostasis consists of a brownish glass-rich phase which fills interstitial voids in the silicate network. The glass is very turbid.

Bailey et al. (1970) have reported modal analyses for 10044,74; 10044,41; and 10044,44,1 which is in agreement with the above analysis. They also reported finding apatite and K-feldspar with possible olivine and rutile in their sections, but none were observed in this section.

Cameron (1970) reported on yttrium-zirconium silicate in 10044,50.

Fuch (1970) has reported apatite in 10044,48.

TEXTURE: Nearly equigranular subophitic with large scattered crystals of ilmenite. Little to no indication of shock is present. All crystals are fresh and in sharp contact with each other.

Selected References: Agrell et al., (1970), Albee and Chodos (1970), Bailey et al., (1970), Cameron (1970), Smith, J.V. et al., (1970).

HISTORY AND PRESENT STATUS OF SAMPLES – 10/13/76

10044 was removed from the Bulk Sample Container (ALSRC #1003) and processed in the Bio-Prep Lab. A chip was sent to PCTL for splitting and PET description and analysis. A portion was sent to the Bio-Pool for biological analyses. The rock was sawed in SPL. The remaining pristine samples were re-examined in SSPL.

PRISTINE SAMPLES

14	16.07 gm	Fines. PCTL-SPL-SSPL
15	39.65 gm	Three large chips plus small chips and fines. PCTL-SPL-SSPL
54	48.0 gm	Chip with one sawed surface. Was display sample kept in a nearly hermetic display container for 4 ½ years. PCTL-SPL-Display-SSPL
59	24.14 gm	Representative chip with no pitted or sawn surface. PCTL-SPL-SSPL

RETURNED SAMPLES:

36	11.121 gm	Chip.

CHEMICAL ANALYSES

Element	Number of Analyses	Mean	Units	Range
SiO_2	6	43.19	PCT	5.13
Al_2O_3	6	10.72	PCT	2.45
TiO_2	8	9.10	PCT	4.09
FeO	9	15.76	PCT	19.36
MnO	9	0.266	PCT	0.056
MgO	5	6.11	PCT	.886
CaO	7	11.49	PCT	5.59
Na_2O	9	.472	PCT	0.079
K_2O	8	.116	PCT	0.066
P_2O_5	3	.063	PCT	0.04
Li	3	11.77	PPM	4.5
Rb	5	1.75	PPM	4.49
Cs	1	0.034	PPM	0
Sr	3	186.7	PPM	94
Ba	7	149.1	PPM	163
Sc	6	95.7	PPM	12.3
V	3	45.5	PPM	34
Cr_2O_3	8	0.213	PCT	0.063
Co	6	12.72	PPM	4.5
Ni	2	5.50	PPM	2.99
Cu	3	5.73	PPM	5.0
Zn	1	3.0	PPM	0
Y	2	163.5	PPM	33
Zr	4	501.5	PPM	414

Element	Number of Analyses	Mean	Units	Range
Nb	1	21	PPM	0
Mo	1	0.03	PPM	0
Ag	1	0.2	PPM	0
Ta	4	2.12	PPM	1.2
W	1	0.24	PPM	0
Hf	5	13.86	PPM	4.5
Au	1	0.02	PPM	0
Hg	1	0.001	PPM	0
La	5	11.41	PPM	4.65
Ce	4	52.4	PPM	48.4
Nd	1	50	PPM	4.65
Sn	4	16.07	PPM	7.3
Eu	4	2.76	PPM	0.36
Gd	1	24.0	PPM	0
Tb	3	4.91	PPM	0.61
Dy	2	26.05	PPM	3.1
Ho	1	5.67	PPM	0
Yb	6	13.58	PPM	6.5
Lu	5	1.89	PPM	0.85
Th	2	0.99	PPM	0.02
U	2	0.24	PPM	0.08
B	1	1.2	PPM	0
Ga	1	5.1	PPM	0
Ln	1	0.003	PPM	0
C	1	102.0	PPM	0
Ge	1	1.0	PPM	0
N	1	98.0	PPM	0
As	1	0.05	PPM	0
O	1	41.5	PCT	0
S	2	0.12	PCT	0.12
Se	1	0.23	PPM	0
F	2	142.5	PPM	119
Cl	1	14.7	PPM	0
Br	1	0.19	PPM	0
I	1	0.48	PPM	0

Analysts: Agrell et al., (1970); Engel & Engel, (1970); Goles et al., (1970); Wakita et al., (1970); Wanke et al., (1970); Dymek et al., (1975); Turekian & Kharkar, (1970); Kharkar & Turekian, (1971); Engel et al., (1971); Tera et al., (1970); Murthy et al., (1970); Reed & Jovanovic, (1970); Brown et al., (1970); Papanastassiou et al., (1970); Moore et al., (1970); Meyer, (1972).

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