

168-1024B-18X-CC (Piece 3, 009-027 cm)

ROCK NAME: Aphyric plagioclase-clinopyroxene basalt
 GRAIN SIZE: Aphanitic: cryptocrystalline-microcrystalline
 TEXTURE: Variolitic-subvariolitic; holohyaline-hypocrystalline

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	0.1	0.1	0.4-1.6		Euhedral laths	Present as individual crystals; simple to oscillatory zoning in the cores. One anhedral xenocryst present, with glass inclusions (c.8 microns) in the core.
Clinopyroxene	Tr	Tr	0.25		Euhedral	Two crystals found; faint oscillatory zoning.
GROUNDMASS						
Plagioclase	4.6	4.6	0.05-0.15		Microlitic laths	Swallowtail, acicular needles.
Clinopyroxene	3.3	3.3	≤0.2		Euhedral	
Mesostasis	86.3	86.3				Changes from dark brown subvariolitic, to a orange-brown honeycomb to a yellow-brown honeycomb and finally to a light gray-brown branching texture with increasing distance from the chilled margin.
Glass	3.5	3.5				Clear ≤0.6mm-thick glass margin containing discrete varioles centered around plagioclase and pyroxene microlites
Pyrite	Tr	Tr	0.0		Granular	In mesostasis.
SECONDARY MINERALOGY						
	PERCENT	REPLACING/ FILLING				COMMENTS:
Celadonite	Tr	Vesicles and microfractures				Forms a fine layer within some vesicles, and partially fills some microfractures.
Saponite	0.4	Vesicles and microfractures				Lines the microfractures cross cutting the section and partially fills some vesicles, after celadonite and/or iddingsite.
Iddingsite	Tr	Vesicles				Forms a layer of fine granules after celadonite in some vesicles.
Pyrite	Tr	Vesicles				Forms drusy euhedral grains partially lining some vesicles.
VESICLES/CAVITIES						
	PERCENT	DISTRIBUTION	SIZE (mm)	FILLING	SHAPE	COMMENTS:
Vesicles	1.8	Even	0.05-0.1	Partial to complete	Round to irregular.	See comments above.

COMMENTS: Plagioclase microlites and varioles exhibit a preferred alignment parallel to the chilled margin.
 Secondary alteration minerals are restricted to a 1-2mm band on either side of the microfractures cross cutting the rock.

168-1024B-18X-CC (Piece 12, 009-027 cm)

ROCK NAME: Aphyric plagioclase-pyroxene basalt
 GRAIN SIZE: Aphanitic: microcrystalline to cryptocrystalline
 TEXTURE: Variolitic to subvariolitic; hypocrySTALLINE

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Plagioclase	Tr	Tr	0.1-0.5		Sub- to euhedral laths	Individual crystals and as monomineralic and bimineralic glomeroporphyritic cluster with clinopyroxene; some glass inclusions present. Simple and oscillatory zoning in some crystals.
Clinopyroxene	Tr	Tr	0.2-0.3		Subhedral-euhedral	Present singly and in a bimineralic glomeroporphyritic clots with plag.
GROUNDMASS						
Plagioclase	11.3	11.3	0.03-0.1		Microlitic laths	Skeletal, hollow and swallowtails.
Olivine	Tr	Tr	0.05-0.1		Sub- to euhedral	
Clinopyroxene	7.6	7.6	≤0.05		Subhedral equant	Often aggregated with plagioclase microlite
Mesostasis	79.0	79.0				Changes from dark brown subvariolitic, to a deep reddish brown plumose, to dark gray-brown plumose and finally to a light gray-brown branching texture with increasing distance from the chilled margin.
Glass	0.7	0.7				Clear ≤2.5mm-thick glassy margin with minor amounts of plagioclase microlites, olivine ± pyroxene microphenocrysts (acting as nuclei for varioles) and devitrified glass.
Pyrite	Tr	Tr	≤0.002		Granular	In glass.
Chalcopyrite	Tr	Tr	≤0.02		Granular	In mesostasis.
SECONDARY MINERALOGY						
	PERCENT	REPLACING/ FILLING				COMMENTS:
Saponite		Vesicles				Forms an inner lining in some vesicles, preceded by an earlier coating of celadonite.
Celadonite		Vesicles and fractures				Restricted to alteration halo, lines vesicles and forms irregular groundmass clots perhaps replacing olivine. In some vesicles, the lining may be followed by pale green celadonite, saponite or iddingsite.
Pyrite, pyrrhotite, chalcopyrite	Tr	Groundmass and vesicles				A 400 micron diffuse band contains concentrated 1-5 micron granular sulfides (a few reach 70 microns). This band corresponds to the inner edge of the alteration halo. In one vesicle, two botryoidal masses of sulfide (15 microns wide) occur on the wall.
VESICLES/CAVITIES						
	PERCENT	DISTRIBUTION	SIZE (mm)	FILLING	SHAPE	COMMENTS:
Vesicles	1.4	Even	0.05-0.1	Partial	Round to oval	Clear or partially filled with saponite, celadonite, iddingsite ± sulfide

COMMENTS: The crystallinity gradually increases towards the interior of the rock. A dark alteration halo extends 2-10mm into the rock from the glass margin. The shape of the halo is also influenced by the presence of small microfractures.

168-1024C-01R-01 (piece 1, 0–8 cm)

ROCK NAME: Aphyric basalt

GRAIN SIZE: Aphanitic; cryptocrystalline

TEXTURE: Variolitic to subvariolitic

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS	
PHENOCRYSTS							
Olivine							
Plagioclase	Tr	Tr	0.5-1.2		Euhedral	Solitary crystals or within glomeroporphyritic clots. Some have an irregular outline, and are partially devitrified with glass inclusions in the core; the crystals are strongly zoned.	
Clinopyroxene							
Opagues							
GROUNDMASS							
Plagioclase	1.6	1.6	≤0.1		Euhedral	Laths and needles; microlites exhibit a subparallel orientation, parallel to the chilled margin. Microlite grain size increases with distance from the margin.	
Olivine							
Clinopyroxene	0.4	0.4	≤0.05		Granular	Skeletal grains.	
Opagues							
Glass	Tr	Tr				Fresh pale brown glass containing abundant varioles and plagioclase microlites.	
Mesostasis	96.2	98				Skeletal cryptocrystalline microcrysts set within a sheaf-spherulitic to plumose cryptocrystalline mass.	
SECONDARY MINERALOGY							
PERCENT	REPLACING/ FILLING	COMMENTS:					
Iddingsite	0.6	Vesicles; mesostasis	Red-brown; granular to massive; fills the vesicles. In some vesicles, iddingsite is associated with hematite.				
Saponite	0.2	Vesicles; mesostasis	Tan color; granular to massive texture.				
Celadonite	1	Vesicles; mesostasis	Green; granular to fibrous, either forming bands at the rims or completely fills vesicles.				
Pyrrhotite	Tr		Interstitial, granular (0.005–0.03mm) concentrated in a discontinuous band just beyond the leading edge (celadonitic) of the alteration halo.				
VESSICLES/CAVITIES							
PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS:		
Gas vesicles	0.8	Even	≤0.05	Clay	Round	Iddingsite, saponite and celadonite partially to completely fill the vesicles. The type of clay filling the vesicle depends on its location in the alteration halo.	

COMMENTS: The section contains one small vein (≈0.01mm wide) filled by red-orange iddingsite ± saponite, cutting across the mesostasis as well as plagioclase phenocrysts. The vein has a 1.5mm oxidation halo associated with it, on either side.

168-1024C-01R-01 (piece 2, 8–15 cm)

ROCK NAME: Aphyric basalt

GRAIN SIZE: Aphanitic; microcrystalline to cryptocrystalline

TEXTURE: Intersertal to intergranular.

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Olivine						
Plagioclase	Tr	Tr	0.4-0.8		Euhedral	Laths and stubby crystals; occur singly and within monomineralic glomeroporphyritic clots; minor simple zoning.
Clinopyroxene						
Opaques						
GROUNDMASS						
Plagioclase	7.7	7.7	≤0.1		Euhedral-subhedral	Microlaths and microlites form an intersertal framework.
Olivine	Tr	Tr	≤0.1		Euhedral	Completely replaced by pale brown saponite.
Clinopyroxene	10.3	10.3	0.02-0.05		Granular	Grains are interstitial to plagioclase.
Opaques	Tr	Tr	≤0.005		Granular	Disseminated throughout the mesostasis.
Mesostasis	79.1	81.6				Characterized by sheaf-spherulitic to plumose texture, interstitial to the plagioclase ± pyroxene framework.
SECONDARY MINERALOGY						
PERCENT	REPLACING/ FILLING	COMMENTS:				
Iddingsite	0.2	Vesicles; mesostasis	Red–brown; granular to massive either filling or lining vesicles and cavities.			
Saponite	0.2	Vesicles	Green; fibrous to granular; fills to lines vesicles and cavities.			
Celadonite	2.5	Vesicles; mesostasis	Yellow to pale brown; granular; lines vesicles and can be pure or mixed with celadonite.			
Pyrrhotite + pyrite	Tr	Vesicles; alteration halo	Small anhedral grains (≤0.02mm) located at the front of the alteration halo and within vesicles. One 0.3mm irregular pyrite grain fills the end of an irregular cavity.			
VESICLES/ CAVITIES						
PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS:	
Gas vesicles	1.7	Even	0.05-0.15	None-clay	Round to ovoid	Iddingsite, saponite and celadonite partially to completely fill the vesicles. The type of clay filling the vesicle depends on its location in the alteration halo.
Cavities	1.7	Concentrated at the top.	0.1-1.5	None-clay	Irregular	The cavities are filled in a similar manner to the vesicles. They are irregular and convolute in shape, and occur in the upper half of the section, with their long axes parallel to the top of the rock.
COMMENTS:	The alteration halo is c.5mm thick and zoned consisting of a sequence of iddingsite, celadonite and saponite from the external surface in towards the center of the rock.					