

168-1029A-25X-03 (piece 12, 83–87 cm)

ROCK NAME: Glomeroporphyritic plagioclase-olivine basalt

GRAIN SIZE: Microcrystalline to cryptocrystalline

TEXTURE: Plumose; sheaf-spherulitic ± honeycomb; glomeroporphyritic; vesicular

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Olivine	0	0.2	0.5–0.6 (Ave 0.6)		Subhedral to euhedral	Occur singly or associated with plagioclase laths. Completely replaced by clay minerals (granular saponite and celadonite). Highly fractured.
Plagioclase	2.4	2.4	0.5-1.0 (Ave 0.8)		Euhedral; skeletal	Form elongate laths and stubby crystals. Occur singly and within glomeroporphyritic clots with pyroxene microcrysts.
GROUNDMASS						
Plagioclase	6.6	6.6	0.05–0.4 (Ave 0.1)		Euhedral to anhedral	Form large glomeroporphyritic clusters (up to 6mm) associated with pyroxene; also occurs singly. Some swallowtail and hollow crystals.
Olivine	0	0.2	0.2–0.4 (Ave 0.3)		Anhedral to skeletal	Completely replaced by clay minerals, often consisting of intergrowths of saponite ± iddingsite ± celadonite. Occur singly, associated with plag laths, or at the edges of plag-px glomeroporphyritic clots.
Clinopyroxene	4.6	4.6	0.05–0.4 (Ave 0.1)		Anhedral to subhedral	Form large glomeroporphyritic clusters (up to 6mm) associated with plagioclase; sparse amount of small (≤0.1mm) grains occur singly.
Pyrite	Tr	Tr	≤0.03 (Ave 0.01)		Granular to globular	Disseminated through the mesostasis. Some round globules (0.02mm) occur — immiscible droplets.
Mesostasis	84.6	85.4				
SECONDARY MINERALOGY						
	PERCENT	REPLACING/ FILLING				COMMENTS:
Saponite	1.0	Vesicles; olivine; vein; mesostasis				Pale brown; cryptocrystalline granular to fibrous.
Celadonite	0.2	Vesicles; olivine; vein; mesostasis				Massive to microcrystalline to fibrous; bright green.
Iddingsite	Tr	Vesicle; olivine; vein				Massive texture; red.
Pyrite/pyrrhotite	Tr	Vesicle; mesostasis				Completely fills one 0.15mm vesicle; disseminated in groundmass.
VESICLES/ CAVITIES						
	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS:
Gas vesicles		Even	0.1–0.3 (Ave 0.2)	Clay	Round to ovoid	Filling varies in different zones from celadonite + iddingsite to saponite, to saponite + celadonite. When all phases are together, celadonite is the first phase to form, whereas saponite is the last.
Cavities	0.6 Tr	Near rim	≤0.6	Clay	Irregular	As vesicles; commonly have granular celadonite rim, followed by granular to fibrous saponite ± celadonite fill. Some have an iddingsite rim and mixed iddingsite + saponite + celadonite fill.

COMMENTS: Parallel bands of different textures occur in the mesostasis. Parallel to these are pyrite/pyrrhotite rich zones consisting of 0.02-0.03mm granules. These interstitial sulfides are preferentially localized along the edge of the oxidation halo.

168-1029A-25X-04 (piece 3, 18-21 cm)

ROCK NAME:

GRAIN SIZE: Microcrystalline to cryptocrystalline

TEXTURE: sheaf-spherulitic; glomeroporphyritic; vesicular

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPOSITION	MORPHOLOGY	COMMENTS
PHENOCRYSTS						
Olivine	0	0.6	0.4-0.6		Euhedral	Completely replaced by clays (celadonite + saponite); occur singly and associated with plagioclase laths.
Plagioclase	1.6	1.6	0.6-1.6 (Ave 0.8)		Euhedral to subhedral	Laths and stubby crystals. One lath is 3.6mm long, with simple zoning and a core rich in glass inclusions (along lamellae). Simple and oscillatory zoning; sector zoning in stubby crystals. Occur singly or in glomeroporphyritic clots.
Pyroxene	Tr	Tr	0.4-0.8		Subhedral	Occur singly, but more frequently in glomeroporphyritic clots or associated with plagioclase laths.
GROUNDMASS						
Plagioclase	6.4	6.4	0.05-0.5		Euhedral to skeletal	Microlaths, microlites and quench crystals (swallowtails and hollow). Occur singly and in glomeroporphyritic clots.
Olivine	0	0.2	0.1-0.3 (Ave 0.2)		Subhedral to euhedral	Completely replaced by granular saponite and/or fibrous celadonite.
Clinopyroxene	5.0	5.0	0.05-0.35 (Ave 0.2)		Subhedral to granular	Some single grains (0.05-0.1mm), but most are in glomeroporphyritic clots or attached to plagioclase laths.
Pyrite	Tr	Tr	0.005-0.05		Anhedral to granular	Disseminated throughout the groundmass. Some pyrite grains are ≤ 0.05 mm; most are ≤ 0.01 mm.
Mesostasis	83.8	84				
SECONDARY MINERALOGY						
	PERCENT	REPLACING/ FILLING				COMMENTS:
Saponite	0.8	Olivine; vesicles; mesostasis				Tan brown; granular. Occurs as pure saponite or mixed with celadonite.
Celadonite	0.2	Olivine; vesicles; mesostasis				Bright green, fibrous. Mixed with saponite; restricted in the most part to the alteration halo.
Iddingsite	Tr	Vesicles				Fills or lines some vesicles in the alteration halo.
Hematite	Tr	Vesicles				Fills or lines some vesicles in the alteration halo.
Pyrite/pyrrhotite	Tr	Vesicles				≤ 0.03 mm globules and granules in vesicle linings at the rim.
VESICLES/CAVITIES						
	PERCENT	LOCATION	SIZE (mm)	FILLING	SHAPE	COMMENTS:
Gas vesicles	2.2	Even	0.1-0.6 (Ave 0.4)	Empty or clay, hematite	Round to ovoid	In the interior of the rock, the vesicles are empty. In the alteration halo they are lined to filled by celadonite; saponite + celadonite mixture; \pm saponite; \pm iddingsite; \pm hematite from rim to core.
Cavities	Tr	Even	≤ 0.5	Empty or clay, hematite	Irregular	As above.

COMMENTS: Vesicles can be filled by a series of layers, or have a more intricate mixed central fill.