

THIN SECTION: 330-U1373A-1R-1-W 8_12-BILLET 72-SLIDE 72
 ROCK NAME: aphyric basalt clast
 WHERE SAMPLED: Clast Type 2a in bioclast breccia (bottom left)
 GRAINSIZE: fine grained
 TEXTURE: aphyric

Piece No: Unit: I

OBSERVER: THIN SECTION: SLIDE 72

PRIMARY MINERALOGY	PERCENT ORIGINAL	REL. VOL. REPLACED	SIZE(mm)			MORPHOLOGY	VESICLE SPHERICITY	VESICLE Infilling [%]	COMMENTS
			min.	max.	mode.				
PHENOCRYSTS	1.03								
MICROPHENOCRYST									
olivine	1	100		0.2	0.1	anhedral			
augite	0.03	0		0.2		euhedral			
VESICLES	3		0.1	0.4	0.2		low[330]	95 calcite+sediments (clays)	
GROUNDMASS	95								
glass	69	100						altered to brown and green clays	
opaque minerals	6	0							
clinopyroxene	1	0				anhedral			
plagioclase	20	40		0.2	0.1	laths[330]		replaced by clays	
olivine	0.07	100				anhedral		altered to clays	

SECONDARY MINERALOGY	SIZE(mm)			REPLACING/FILLING vesicle	COMMENTS
	min.	max.	mode.		
calcite					also filled with sediment

STRUCTURE no structure in groundmass

COMMENTS

SUMMARY DESCRIPTION





THIN SECTION: 330-U1373A-1R-1-W 40_42-BILLET 73-SLIDE 73
 ROCK NAME: aphyric basalt clast
 WHERE SAMPLED: clast type 2a
 GRAINSIZE: fine grained
 TEXTURE: aphyric

Piece No: Unit: I

OBSERVER: THIN SECTION: SLIDE 73

PRIMARY MINERALOGY	PERCENT ORIGINAL	REL. VOL. REPLACED	SIZE(mm)			MORPHOLOGY	VESICLE SPHERICITY	VESICLE Infilling [%]	COMMENTS
			min.	max.	mode.				
PHENOCRYSTS	19.5								
MICROPHENOCRYST									
clinopyroxene	0.5	0		0.5		subhedral			
olivine	4	90		0.7	0.3	subhedral to anhedral[330]		Altered to minerals of brown & white clays +/- carbonates	
plagioclase	15	0		0.4	0.2	laths[330]		Trachytic texture	
VESICLES	0.5		0.08	0.5	0.2		low[330]	100 filled by fibrous brown & white clays	
GROUNDMASS	80								
glass	70	100							
plagioclase	3	20		0.04	0.02	subhedral		Altered to brown and green clays (nontronite) and iron partly altered to clays.	
opaque minerals	5	0							
clinopyroxene	2	0		0.04	0.03	anhedral			

SECONDARY MINERALOGY	SIZE(mm)			REPLACING/FILLING vesicle	COMMENTS
	min.	max.	mode.		
brown clay					filled with fibrous brown and white clay

STRUCTURE COMMENTS trachytic flow texture defined by aligned plagioclase laths

SUMMARY DESCRIPTION



THIN SECTION: 330-U1373A-1R-2-W 7_9-BILLET 74-SLIDE 74 Piece No: Unit:I OBSERVER:THIN SECTION:SLIDE 74
 ROCK NAME: aphyric basalt clast
 WHERE SAMPLED: Clast type 5a in breccia; down right-hand side
 GRAINSIZE: fine grained
 TEXTURE: aphyric

PRIMARY MINERALOGY	PERCENT ORIGINAL	REL. VOL. REPLACED	SIZE(mm)			MORPHOLOGY	VESICLE SPHERICITY	VESICLE Infilling [%]	COMMENTS
			min.	max.	mode.				
PHENOCRYSTS	1								
MICROPHENOCRYST augite	1			0.5	0.1	euohedral to subhedral[330]			
VESICLES	15		0.1	1.6	0.3		moderate[330]	10	
GROUNDMASS	84								
augite	1	0		0.05	0.03	anhedral			
opaque minerals	3	0							
plagioclase	10	0		0.2	0.1	laths[330]			
glass	70	100							

SECONDARY MINERALOGY	SIZE(mm)	REPLACING/FILLING	COMMENTS
	min. max. mode.	vesicle	
clay			clay at the rim

STRUCTURE no structure in groundmass
 COMMENTS

SUMMARY DESCRIPTION



THIN SECTION: 330-U1373A-1R-2-W 123_125-BILLET 76-SLIDE 76 Piece No: Unit:l OBSERVER:THIN SECTION:SLIDE 76
 ROCK NAME: highly phyric augite-olivine-plagioclase[EXP330] basalt clast
 WHERE SAMPLED: clast type 7a
 GRAINSIZE: fine grained
 TEXTURE: highly phyric & aphanitic[330]

PRIMARY MINERALOGY	PERCENT ORIGINAL	REL. VOL. REPLACED	SIZE(mm)			MORPHOLOGY	VESICLE SPHERICITY	VESICLE Infilling [%]	COMMENTS
			min.	max.	mode.				
PHENOCRYSTS	23								
olivine	8	40		3.8	1	subhedral		edges & cracks altered (can also be glomerocryst).	
plagioclase	5	0		4	1.4	euhedral		oscillatory zoning (can also be glomerocryst).	
augite	10	0		8.5	2.4	euhedral		oscillatory zoning (can also be glomerocryst).	
MICROPHENOCRYST VESICLES				0					
GROUNDMASS	77								
olivine	7	80		0.08	0.01	subhedral		(in log sheet only: "...and also subhedral" -- under "Shape/Habit".	
plagioclase	25	0		0.1	0.03	laths[330]			
glass	40	0							
Fe-Ti oxides	5	0		0.6	0.05	subhedral			

SECONDARY MINERALOGY	STRUCTURE	COMMENTS
	no structure in groundmass	

SUMMARY DESCRIPTION See: Photos.



THIN SECTION: 330-U1373A-1R-3-W 66_70-BILLET 77-SLIDE 77 Piece No: Unit:I OBSERVER:THIN SECTION:SLIDE 77
 ROCK NAME: basalt conglomerate
 WHERE SAMPLED: basalt clast type 5a in upper conglomerate; several clasts; clast bottom left
 GRAINSIZE: fine grained
 TEXTURE: aphyric

PRIMARY MINERALOGY	PERCENT ORIGINAL	REL. VOL. REPLACED	SIZE(mm)			MORPHOLOGY	VESICLE SPHERICITY	VESICLE Infilling [%]	COMMENTS
			min.	max.	mode.				
PHENOCRYSTS	1								
MICROPHENOCRYST									
olivine	1	100		0.5	0.25	skeletal			
VESICLES	5		0.05	0.4	0.2		low[330]	75	
GROUNDMASS	94								
Fe-Ti oxides	5	0			0.2	0.01			
plagioclase	36	0			0.2	0.1	laths[330]		
glass	38	100						replaced	
augite	5	0			0.2	0.1			
olivine	10	100			0.1	0.1		replaced by iddingsite	

SECONDARY MINERALOGY	STRUCTURE	COMMENTS
	no structure in groundmass	

SUMMARY DESCRIPTION



THIN SECTION: 330-U1373A-2R-3-W 133_135-BILLET 78-SLIDE 78 Piece No: Unit:3 OBSERVER:THIN SECTION:SLIDE 78
 ROCK NAME: moderately olivine-phyric basalt
 WHERE SAMPLED: auto brecciated lava flow
 GRAINSIZE: fine grained
 TEXTURE: moderately phyrlic

PRIMARY MINERALOGY	PERCENT ORIGINAL	REL. VOL. REPLACED	SIZE(mm)			MORPHOLOGY	VESICLE SPHERICITY	VESICLE Infilling [%]	COMMENTS
			min.	max.	mode.				
PHENOCRYSTS	4.5								
olivine	2	100		2.2	1.5	euhedral		altered to iddingsite & brown clays (hematite?)	
augite	0.5	0		2.3	1.1	subhedral			
MICROPHENOCRYST									
olivine	0.5	0		0.5	0.3	subhedral		altered to iddingsite & brown clays (hematite?)	
plagioclase	0.5	0		0.5	0.1	laths[330]			
augite	1	0		0.3	0.1	subhedral			
VESICLES	15		0.5	10	1		low and elongated[EXP330]	80 filled by calcite & zeolite	
GROUNDMASS	79.5								
plagioclase	3	0				subhedral			
glass	70	100						altered to brown clays	
augite	0.5	0				anhedral			
opaque minerals	5	0							
olivine	1	100				anhedral		replaced by iddingsite.	

SECONDARY MINERALOGY	SIZE(mm)			REPLACING/FILLING vesicle	COMMENTS
calcite	min.	max.	mode.		
calcite					Some zeolite present also

STRUCTURE COMMENTS no structure in groundmass

SUMMARY DESCRIPTION Photo of carbonate cutting an olivine crystal; altered olivines.



THIN SECTION: 330-U1373A-7R-1-W 84_86-BILLET 89-SLIDE 89 Piece No: Unit:III OBSERVER:THIN SECTION:SLIDE 89
 ROCK NAME: highly olivine-phyric[EXP330] basalt
 WHERE SAMPLED: CLAST TYPE 7
 GRAINSIZE: fine grained
 TEXTURE: highly phyric & intergranular

PRIMARY MINERALOGY	PERCENT ORIGINAL	REL. VOL. REPLACED	SIZE(mm)			MORPHOLOGY	VESICLE SPHERICITY	VESICLE Infilling [%]	COMMENTS
			min.	max.	mode.				
PHENOCRYSTS	17.2								
augite	8	0		6	2.4	euhedral to subhedral[330]		CLAST TYPE 7: centered-zoning and rich in Ti.	
olivine	9	100		5	3	subhedral		CLAST TYPE 7: replaced by green clay and smectite.	
plagioclase	0.2	0		3.2	3.2	anhedral		CLAST TYPE 7.	
MICROPHENOCRYST VESICLES	3		0.8	5	3		high[330]	100	CLAST TYPE 7
GROUNDMASS	CLAST TYPE 7: 79.8								
olivine	2	100		0.8	0.3	subhedral to anhedral[330]			CLAST TYPE 7
plagioclase	25	0		1	0.8	laths[330]			CLAST TYPE 7
augite	20	0		0.8	0.2	subhedral to anhedral[330]			CLAST TYPE 7: Rich in Ti.
glass	31.8	100							

SECONDARY MINERALOGY	SIZE(mm)			REPLACING/FILLING vesicle	COMMENTS
calcite	min.	max.	mode.		
					CLAST TYPE: Zeolites also present

STRUCTURE COMMENTS CLAST TYPE 7: Spherules in vesicles; no structure in groundmass. Vein is straight; 1mm in length/width. Carbonate vein & vesicles.

SUMMARY DESCRIPTION weak-to moderate vertical trachytic texture; vein is straight (about 1.8 mm in size, filled with carbonate, brown clay & with palagonized rim).



THIN SECTION: 330-U1373A-7R-2-W 128_130-BILLET 90-SLIDE 90 Piece No: Unit:6 OBSERVER:THIN SECTION:SLIDE 90
 ROCK NAME: highly olivine-pyroxene phyric basalt
 WHERE SAMPLED: lava flow, representative of unit 6
 GRAINSIZE: fine grained
 TEXTURE: highly phyric

PRIMARY MINERALOGY	PERCENT ORIGINAL	REL. VOL. REPLACED	SIZE(mm)			MORPHOLOGY	VESICLE SPHERICITY	VESICLE Infilling [%]	COMMENTS
			min.	max.	mode.				
PHENOCRYSTS	28								
augite	5	0		3.2	1.4	euhedral to subhedral[330]			
olivine	6	8		4	2	euhedral		Olivine is partly altered to green clay.	
MICROPHENOCRYST									
plagioclase	9	0		0.7	0.2	laths[330]			
olivine	5	8		0.9	0.4	euhedral		Olivine is partly altered to green clay.	
augite	3	0		0.9	0.5	euhedral to subhedral[330]			
VESICLES	1		0.06	0.4	0.2		high[330]	100	Rounded. Filled by calcite.
GROUNDMASS	71								
opaque minerals	4	0							
glass	31	100							
augite	26	0		0.3	0.06				
plagioclase	8	0		0.8	0.01				
olivine	1	10		0.1	0.01			Olivine is partly altered to green clay.	

SECONDARY MINERALOGY	SIZE(mm)			REPLACING/FILLING vesicle	COMMENTS
calcite	min.	max.	mode.		

STRUCTURE COMMENTS Ti-Augite; no structure in groundmass

SUMMARY DESCRIPTION Highly olivine-pyroxene-phyric lava flow. Photos of olivine & vesicles.



THIN SECTION: 330-U1373A-7R-3-W 93_97-BILLET 91-SLIDE 91 Piece No: Unit:6 OBSERVER:THIN SECTION:SLIDE 91
 ROCK NAME: Aphyric basalt (Type 1) and highly olivine-angite-phyric basalt. (Type 2)
 WHERE SAMPLED: Breccia between unit 6 and 7 clast type 1 and 2
 GRAINSIZE: fine grained
 TEXTURE: highly phyric & aphyric

PRIMARY MINERALOGY	PERCENT ORIGINAL	REL. VOL. REPLACED	SIZE(mm)			MORPHOLOGY	VESICLE SPHERICITY	VESICLE Infilling [%]	COMMENTS
			min.	max.	mode.				
PHENOCRYSTS	17								
olivine	9	100		3.2	1.2	euhedral to subhedral[330]		CLAST TYPE 2	
augite	2	0		1.4	1.2	euhedral to subhedral[330]		CLAST TYPE 2	
MICROPHENOCRYST									
plagioclase	4	10		0.5	0.3	laths[330]		CLAST TYPE 1	
augite	2	0		0.4	0.2	subhedral to anhedral[330]		CLAST TYPE 1	
olivine	1	100		0.9	0.3	euhedral to subhedral[330]		CLAST TYPE 2	
plagioclase	5	50		0.6	0.5	laths[330]		CLAST TYPE 2, tabular laths, polysynthetic twinning, altered	
olivine	0.5	100		0.6		subhedral		CLAST TYPE 1	
VESICLES	2		0.2	2.2	0.4		low[330]	90	
	2		0.02	0.1	0.06			100	
GROUNDMASS	CLAST TYPE 2: 81 CLAST TYPE 1: 77.5								
glass	75	100						CLAST TYPE 2	
opaque minerals	5	0						CLAST TYPE 1	
plagioclase	5	0		0.05	0.03			CLAST TYPE 1	
augite	3	0		0.05	0.04	anhedral		CLAST TYPE 1	
augite	1	0		0.1	0.04	subhedral to anhedral		CLAST TYPE 2	
opaque minerals	6	0						CLAST TYPE 2	
olivine	2	0		0.09	0.05	subhedral		CLAST TYPE 2	
plagioclase	3	0		0.09	0.06	laths[330]		CLAST TYPE 2	
glass	62.5	100						CLAST TYPE 1	

SECONDARY MINERALOGY	SIZE(mm)			REPLACING/FILLING vesicle	COMMENTS
clay	min.	max.	mode.		
clay					partially filled with green clay

STRUCTURE no structure in groundmass
 COMMENTS

SUMMARY DESCRIPTION Clast Type 1 & 2: See attached figure.



THIN SECTION: 330-U1373A-7R-3-W 109_111-BILLET 92-SLIDE 92 Piece No: Unit:7 OBSERVER:THIN SECTION:SLIDE 92
 ROCK NAME: highly olivine-pyroxene-phyric basalt
 WHERE SAMPLED: pillow lava, representative of unit 7
 GRAINSIZE: fine grained
 TEXTURE: highly phyric & glomeroporphyritic

PRIMARY MINERALOGY	PERCENT ORIGINAL	REL. VOL. REPLACED	SIZE(mm)			MORPHOLOGY	VESICLE SPHERICITY	VESICLE Infilling [%]	COMMENTS
			min.	max.	mode.				
PHENOCRYSTS	23								
augite	5	0		3.6	1.4	subhedral to euhedral[330]			
olivine	7	8		2.2	0	euhedral to subhedral[330]		little alteration; green clay & carbonate.	
MICROPHENOCRYST									
olivine	3	8		0.9	0	euhedral to subhedral[330]		little alteration; green clay & carbonate.	
plagioclase	6	0		0.6	0.3	laths[330]			
augite	2	0		0.9	0.5	subhedral to euhedral[330]			
VESICLES	1		0.1	0.4	0.2		high[330]	100	filled by green clay & calcite
GROUNDMASS	76								
glass	57.5	100							
augite	2	0		0.05	0.04	subhedral to anhedral[330]			
plagioclase	10	0		0.09	0.07	laths[330]			
olivine	0.5	0		0.03	0.01				
opaque minerals	6	6							

SECONDARY MINERALOGY	SIZE(mm)	REPLACING/FILLING vesicle	COMMENTS
	min. max. mode.		
clay			filled with green clay and some calcite
STRUCTURE COMMENTS	no structure in groundmass		

SUMMARY DESCRIPTION Highly olivine-pyroxene-phyric basalt.



THIN SECTION: 330-U1373A-7R-4-W 11_13-BILLET 93-SLIDE 93 Piece No: Unit:8 OBSERVER:THIN SECTION:SLIDE 93
 ROCK NAME: aphyric basalt
 WHERE SAMPLED: lava flow, representative of unit 8
 GRAINSIZE: fine grained
 TEXTURE: aphyric

PRIMARY MINERALOGY	PERCENT ORIGINAL	REL. VOL. REPLACED	SIZE(mm)			MORPHOLOGY	VESICLE SPHERICITY	VESICLE Infilling [%]	COMMENTS
			min.	max.	mode.				
PHENOCRYSTS	16								
augite	0.01	0		1.1	0	subhedral		single crystal	
MICROPHENOCRYST									
plagioclase	10	0		0.9	0.3	laths[330]		altered by saussurtization	
olivine	2	100		0.8	0.5	subhedral to anhedral[330]			
augite	4	0		0.6	0.3	subhedral		single crystal	
VESICLES	10		0.7	4.8	2		low[330]	30 zeolite & calcite	
GROUNDMASS	74								
plagioclase	15	0				laths[330]			
augite	4	0				subhedral to euhedral[330]			
glass	46	100							
opaque minerals	7	0							
olivine	2	100		0.1	0.8	euhedral to subhedral[330]		iddingsized.	

SECONDARY MINERALOGY	SIZE(mm)			REPLACING/FILLING vesicle	COMMENTS
zeolite	min.	max.	mode.		
zeolite					green clay along vesicle walls

STRUCTURE no structure in groundmass
 COMMENTS

SUMMARY DESCRIPTION Aphyric basalt



THIN SECTION: 330-U1373A-7R-4-W 61_63-BILLET 94-SLIDE 94 Piece No: Unit:9 OBSERVER:THIN SECTION:SLIDE 94
 ROCK NAME: aphyric basalt
 WHERE SAMPLED:
 GRAINSIZE: fine grained
 TEXTURE: aphyric

PRIMARY MINERALOGY	PERCENT ORIGINAL	REL. VOL. REPLACED	SIZE(mm)			MORPHOLOGY	VESICLE SPHERICITY	VESICLE Infilling [%]	COMMENTS
			min.	max.	mode.				
PHENOCRYSTS	8								
MICROPHENOCRYST									
augite	4	0		0.9	0.2	subhedral to			
olivine	2	100		0.9	0.5	subhedral			
plagioclase	2	70		0.8	0.4	tabular clots[330]		tabular clots & laths; saussuritization	
VESICLES	23		0.3	7	2		low[330]	60 Calcite & zeolite.	
GROUNDMASS	69								
opaque mineral	3	0							
plagioclase	50	0		0.2	0.1	laths[330]			
augite	4	0		0.08	0.06	anhedral			
glass	11	0							
olivine	1	100		0.07	0.04	subhedral		liddingsized rim.	

SECONDARY MINERALOGY	SIZE(mm)			REPLACING/FILLING vesicle	COMMENTS
zeolite	min.	max.	mode.		
zeolite					green clay along walls with zeolite and some calcite in the interiors

STRUCTURE COMMENTS no structure in groundmass

SUMMARY DESCRIPTION



THIN SECTION: 330-U1373A-7R-4-W 108_110-BILLET 95-SLIDE 95 Piece No: Unit:10 OBSERVER:THIN SECTION:SLIDE 95
 ROCK NAME: aphyric basalt
 WHERE SAMPLED:
 GRAINSIZE: fine grained
 TEXTURE: aphyric

PRIMARY MINERALOGY	PERCENT ORIGINAL	REL. VOL. REPLACED	SIZE(mm)			MORPHOLOGY	VESICLE SPHERICITY	VESICLE Infilling [%]	COMMENTS
			min.	max.	mode.				
PHENOCRYSTS	15								
plagioclase	0.01	90		1.4	0	tabular altered single crystal[330]		saussuritization	
MICROPHENOCRYST									
augite	2	0		0.7	0.2	subhedral to anhedral[330]			
plagioclase	3	0		0.8	0.6	laths[330]			
olivine	10	100		0.9	0.3	subhedral to anhedral[330]			
VESICLES	15		0.2	5.6	1.6		low and elongated[EXP330]	35	
GROUNDMASS	70								
opaque minerals	8	0							
augite	1	0		0.07	0.05	subhedral to anhedral[330]			
plagioclase	10	0		0.2	0.05	laths[330]			
olivine	1	100		0.09	0.2	altered by iddingsite[330]			
glass	50	100							

SECONDARY MINERALOGY	SIZE(mm)			REPLACING/FILLING vesicle	COMMENTS
clay	min.	max.	mode.		
clay					Fe-oxides and clay
STRUCTURE COMMENTS	no structure in groundmass				

SUMMARY DESCRIPTION



THIN SECTION: 330-U1373A-8R-1-W 90_92-BILLET 96-SLIDE 96 Piece No: Unit:11 OBSERVER:THIN SECTION:SLIDE 96
 ROCK NAME: sparsely phyric basalt
 WHERE SAMPLED:
 GRAINSIZE: fine grained
 TEXTURE: sparsely phyric & sometimes intersertal

PRIMARY MINERALOGY	PERCENT ORIGINAL	REL. VOL. REPLACED	SIZE(mm)			MORPHOLOGY	VESICLE SPHERICITY	VESICLE Infilling [%]	COMMENTS
			min.	max.	mode.				
PHENOCRYSTS	6.5								
plagioclase	0.5	90		1.2	1	tabular clots[330]		saussuritization	
augite	0.5	0		1.8	0	subhedral			
MICROPHENOCRYST									
augite	3	0		0.8	0.2	subhedral to anhedral[330]			
olivine	2	95		0.6	0.4	euohedral to subhedral[330]			
plagioclase	0.5	0		0.8	0.6	laths[330]			
GROUNDMASS	93.5								
opaque mineral	6	0							
augite	7	0		0.03	0.01	anhedral			
olivine	1.5	100		0.1	0.06	euohedral to subhedral[330]		iddingsized	
glass	39	100							
plagioclase	40	0		0.2	0.01	laths[330]			

SECONDARY MINERALOGY	SIZE(mm)	REPLACING/FILLING vesicle	COMMENTS
	min. max. mode.		
zeolite			

STRUCTURE no structure in groundmass
 COMMENTS

SUMMARY DESCRIPTION



THIN SECTION: 330-U1373A-8R-2-W 112_115-BILLET 97-SLIDE 97 Piece No: Unit:12 OBSERVER:THIN SECTION:SLIDE 97
 ROCK NAME: sparsely olivine-phyric basalt
 WHERE SAMPLED: lava flow (sparsely olivine phyric bsalt)
 GRAINSIZE: fine grained
 TEXTURE: sparsely phyric

PRIMARY MINERALOGY	PERCENT ORIGINAL	REL. VOL. REPLACED	SIZE(mm)			MORPHOLOGY	VESICLE SPHERICITY	VESICLE Infilling [%]	COMMENTS
			min.	max.	mode.				
PHENOCRYSTS									
olivine	1	100		1.5	1	subhedral			
plagioclase	0.1	0		1.5	1.5	subhedral			
clinopyroxene	0.5	0		1	0.6	subhedral			
MICROPHENOCRYST									
clinopyroxene	3	0		0.4	0.2	subhedral			
VESICLES									
	5		0.15	4	2		low[330]		
GROUNDMASS									
glass	1	100		0.05	0.03				
plagioclase	35	0		0.6	0.1	subhedral			laths
Fe-Ti oxide	5	0		0.2	0.05	subhedral			
clinopyroxene	25	0		0.1	0.05	subhedral			

SECONDARY MINERALOGY	clay	clay	SIZE(mm)			REPLACING/FILLING vesicle	COMMENTS
			min.	max.	mode.		
							green clay lining walls of vesicles

STRUCTURE no structure in groundmass
 COMMENTS

SUMMARY DESCRIPTION



THIN SECTION: 330-U1373A-9R-1-W 17_20-BILLET 98-SLIDE 98
 ROCK NAME: aphyric basalt
 WHERE SAMPLED: lava flow (sparsely phyric basalt)
 GRAINSIZE: fine grained
 TEXTURE: aphyric & aphyric

Piece No: Unit:13

OBSERVER:THIN SECTION:SLIDE 98

PRIMARY MINERALOGY	PERCENT ORIGINAL	REL. VOL. REPLACED	SIZE(mm)			MORPHOLOGY	VESICLE SPHERICITY	VESICLE Infilling [%]	COMMENTS
			min.	max.	mode.				
PHENOCRYSTS	3								
MICROPHENOCRYST									
clinopyroxene	2	0		0.4	0.2	subhedral			
plagioclase	1	0		0.3	0.2	subhedral			
VESICLES	5		0.2	1.8	1		high[330]		
GROUNDMASS	90								
glass	20	0							
Fe-Ti oxide	7	0		0.1	0.05	subhedral			
plagioclase	32	0		0.4	0.1	subhedral		laths	
clinopyroxene	31	0		0.1	0.03	subhedral			

SECONDARY MINERALOGY	SIZE(mm)	REPLACING/FILLING	COMMENTS
	min. max. mode.	vesicle	
zeolite			

STRUCTURE no structure in groundmass
 COMMENTS

SUMMARY DESCRIPTION



THIN SECTION: 330-U1373A-9R-2-W 42_43-BILLET 99-SLIDE 99
 ROCK NAME: aphyric basalt
 WHERE SAMPLED: lava flow (aphyric basalt)
 GRAINSIZE: fine grained
 TEXTURE: aphyric & aphyric

Piece No: Unit:14

OBSERVER:THIN SECTION:SLIDE 99

PRIMARY MINERALOGY	PERCENT ORIGINAL	REL. VOL. REPLACED	SIZE(mm)			MORPHOLOGY	VESICLE SPHERICITY	VESICLE Infilling [%]	COMMENTS
			min.	max.	mode.				
PHENOCRYSTS	1.5								
MICROPHENOCRYST									
clinopyroxene	0.5	0		0.7	0.3	subhedral			
plagioclase	1	0		0.5	0.4	subhedral			
VESICLES	2		0.1	7	2		elongate[330]		
GROUNDMASS	96								
glass	25	90							
Fe-Ti oxide	15	0		0.05	0.03	subhedral			
plagioclase	40	0		0.3	0.05	anhedral		laths	
clinopyroxene	20	0		0.1	0.1	subhedral		laths	

SECONDARY MINERALOGY	SIZE(mm)	REPLACING/FILLING	COMMENTS
	min. max. mode.	vesicle	
zeolite			zeolites partially filling most vesicles

STRUCTURE moderate trachytic texture, aligned vesicles; horizontal
 COMMENTS

SUMMARY DESCRIPTION



THIN SECTION: 330-U1373A-9R-2-W 76_79-BILLET 100-SLIDE 100 Piece No: Unit:15 OBSERVER:THIN SECTION:SLIDE 100
 ROCK NAME: volcanic sandstone
 WHERE SAMPLED: lava flow with peperitic top
 GRAINSIZE: fine grained
 TEXTURE: aphyric & aphyric

PRIMARY MINERALOGY	PERCENT ORIGINAL	REL. VOL. REPLACED	SIZE(mm)			MORPHOLOGY	VESICLE SPHERICITY	VESICLE Infilling [%]	COMMENTS
			min.	max.	mode.				
PHENOCRYSTS	1.6								
MICROPHENOCRYST									
olivine	0.1	0		0.3	0.3	subhedral			
plagioclase	0.5	0		0.5	0.4	subhedral			
clinopyroxene	1	0		0.3	0.2	subhedral		radiate arrangement	
VESICLES	10		0.1	4	2		low[330]		
GROUNDMASS	90								
Fe-Ti oxide	2	0		0.03	0.02	subhedral			
plagioclase	23	0		0.4	0.1	subhedral		laths	
glass	47	0							
clinopyroxene	28	0		0.1	0.05	subhedral			

SECONDARY MINERALOGY	SIZE(mm)			REPLACING/FILLING vesicle	COMMENTS
zeolite	min.	max.	mode.		

STRUCTURE no structure in groundmass; few 0.04 mm veins
 COMMENTS

SUMMARY DESCRIPTION



THIN SECTION: 330-U1373A-9R-2-W 113_115-BILLET 101-SLIDE 101 Piece No: Unit:15 OBSERVER:THIN SECTION:SLIDE 101
 ROCK NAME: aphyric basalt
 WHERE SAMPLED: lava flow with peperitic top; area with high magnetic susceptibility
 GRAINSIZE: fine grained
 TEXTURE: aphyric & aphyric

PRIMARY MINERALOGY	PERCENT ORIGINAL	REL. VOL. REPLACED	SIZE(mm)			MORPHOLOGY	VESICLE SPHERICITY	VESICLE Infilling [%]	COMMENTS
			min.	max.	mode.				
PHENOCRYSTS	3.5								
MICROPHENOCRYST									
plagioclase	0.5	0		1	0.6	subhedral			
clinopyroxene	0.2	0		0.5	0.2	subhedral			
olivine	3	100		0.6	0.4	subhedral			
VESICLES	5		0.13	5.5	1.8		low[330]		
GROUNDMASS	95								
plagioclase	29	0		0.3	0.1	subhedral		laths	
glass	13	0							
olivine	20	100		0.1	0.05	subhedral			
Fe-Ti oxide	4	0		0.04	0.02	subhedral			
clinopyroxene	29	0		0.1	0.02	subhedral			

SECONDARY MINERALOGY	SIZE(mm)			REPLACING/FILLING	COMMENTS
	min.	max.	mode.		
STRUCTURE	weak trachytic texture; several directions				
COMMENTS					

SUMMARY DESCRIPTION



THIN SECTION: 330-U1373A-9R-3-W 39_41-BILLET 102-SLIDE 102 Piece No: Unit:15 OBSERVER:THIN SECTION:SLIDE 102
 ROCK NAME: aphyric basalt
 WHERE SAMPLED: vesicular in upper part of UNIT 15 (with low magnetic susceptibility)
 GRAINSIZE: fine grained
 TEXTURE: aphyric & very rare glomeroporphyritic; subophytic

PRIMARY MINERALOGY	PERCENT ORIGINAL	REL. VOL. REPLACED	SIZE(mm)			MORPHOLOGY	VESICLE SPHERICITY	VESICLE Infilling [%]	COMMENTS
			min.	max.	mode.				
PHENOCRYSTS	3.5								
plagioclase	0.5	0		1.6	1	laths[330]		centered zoning	
MICROPHENOCRYST									
augite	0.5	0		0.6	0.1	subhedral			
olivine	2	100		0.8	0.5	subhedral to anhedral[330]			
VESICLES	2		0.1	2	0.8		low and elongated[EXP330]	100	
GROUNDMASS	94.5								
augite	3	0		0.3	0.02	subhedral to anhedral[330]			
glass	53	100							
plagioclase	37	0		0.6	0.01	laths[330]		Laths embedded in completely altered glass.	
olivine	0.5	100		0.09	0.02	subhedral to anhedral[330]			
opaque mineral	1	0		0.1	0.04				

SECONDARY MINERALOGY	SIZE(mm)			REPLACING/FILLING vesicle	COMMENTS
clay	min.	max.	mode.		
clay					

STRUCTURE weak trachytic texture; straight vein (0.6 mm).
 COMMENTS

SUMMARY DESCRIPTION



THIN SECTION: 330-U1373A-10R-4-W 28_30-BILLET 103-SLIDE 103 Piece No: Unit:15 OBSERVER:THIN SECTION:SLIDE 103
 ROCK NAME: aphyric basalt
 WHERE SAMPLED: non-vesicular part of unit 15, with flow texture
 GRAINSIZE: fine grained
 TEXTURE: aphyric

PRIMARY MINERALOGY	PERCENT ORIGINAL	REL. VOL. REPLACED	SIZE(mm)			MORPHOLOGY	VESICLE SPHERICITY	VESICLE Infilling [%]	COMMENTS
			min.	max.	mode.				
PHENOCRYSTS	3								
MICROPHENOCRYST									
augite	1	0		0.2	0.1	euhedral			
plagioclase	0.5	0		0.8	0.5	laths[330]		trachytic texture	
olivine	1.5	100		0.6	0.3	subhedral to anhedral[330]			
GROUNDMASS	97								
olivine	1	100		0.08	0.03	subhedral to anhedral[330]			
opaque mineral	6	0		0.02	0.01				
plagioclase	40	0		0.3	0.1	laths[330]			
glass	48	100							
augite	2	0		0.08	0.06	subhedral			

SECONDARY MINERALOGY	SIZE(mm)	REPLACING/FILLING	COMMENTS
	min. max. mode.		
STRUCTURE COMMENTS	new-vertical trachytic flow texture.		

SUMMARY DESCRIPTION



THIN SECTION: 330-U1373A-11R-2-W 96_98-BILLET 104-SLIDE 104 Piece No: Unit:15 OBSERVER:THIN SECTION:SLIDE 104
 ROCK NAME: aphyric basalt basalt
 WHERE SAMPLED: Aphyric basalt
 GRAINSIZE: fine grained
 TEXTURE: aphyric & sometimes subophitic texture in groundmass

PRIMARY MINERALOGY	PERCENT ORIGINAL	REL. VOL. REPLACED	SIZE(mm)			MORPHOLOGY	VESICLE SPHERICITY	VESICLE Infilling [%]	COMMENTS
			min.	max.	mode.				
PHENOCRYSTS	0.2								
MICROPHENOCRYST									
plagioclase	0.2	0		0.9	0.5	tabular			
GROUNDMASS	99.8								
augite	1	0		0.4	0.04	subhedral to anhedral[330]			
olivine	1	100		0.5	0.2	anhedral		replaced by green & brown clay	
plagioclase	55	0		0.3	0.2	laths[330]			
opaque minerals	3	0		0.1	0.05	subhedral to euhedral[330]			
glass	39.8	100							

SECONDARY MINERALOGY	SIZE(mm)			REPLACING/FILLING	COMMENTS
	min.	max.	mode.		
STRUCTURE COMMENTS	weak-to moderate vertical trachytic texture; vein is straight (about 1.8 mm in size, filled with carbonate, brown clay & with palagonized rim).				

SUMMARY DESCRIPTION weak-to moderate vertical trachytic texture; vein is straight (about 1.8 mm in size, filled by carbonate, brown clay & with palagonized rim).



THIN SECTION: 330-U1373A-13R-1-W 33_36-BILLET 105-SLIDE 105 Piece No: Unit:15 OBSERVER:THIN SECTION:SLIDE 105
 ROCK NAME: moderately olivine-augite-plagioclase[EXP330] basalt
 WHERE SAMPLED: phyric patch in Unit 15
 GRAINSIZE: fine grained
 TEXTURE: moderately phyric & glomeroporphyritic

PRIMARY MINERALOGY	PERCENT ORIGINAL	REL. VOL. REPLACED	SIZE(mm)			MORPHOLOGY	VESICLE SPHERICITY	VESICLE Infilling [%]	COMMENTS
			min.	max.	mode.				
PHENOCRYSTS									
olivine	1	100		2	1.2	subhedral			
plagioclase	1	0		1.6	1.2	laths[330]			glomerocrysts; zoned
augite	1	0		1.8	1.2	euohedral to subhedral[330]			glomerocrysts
MICROPHENOCRYST									
olivine	2	100		0.9	0.4	subhedral			
augite	2	0		0.9	0.6	euohedral to subhedral[330]			glomerocrysts
plagioclase	1	0		0.9	0.6	laths[330]			glomerocrysts; zoned
VESICLES									
	2		0.2	10	0.5		moderate[330]		
GROUNDMASS									
opaque mineral	90								
	4	0		0.06	0.02	subhedral to anhedral[330]			
augite	1	0		0.1	0.01	anhedral			
plagioclase	20	0		0.2	0.08	laths[330]			trachytic texture
glass	65	0							

SECONDARY MINERALOGY	SIZE(mm)			REPLACING/FILLING vesicle	COMMENTS
	min.	max.	mode.		
clay					clay along vesicle walls

STRUCTURE near-vertical trachytic texture; irregular & banded veins (0.32 mm)
 COMMENTS

SUMMARY DESCRIPTION



THIN SECTION: 330-U1373A-13R-3-W 10_13-BILLET 106-SLIDE 106 Piece No: Unit:15 OBSERVER:THIN SECTION:SLIDE 106
 ROCK NAME: aphyric basalt
 WHERE SAMPLED: slightly altered part of unit; representative aphyric part of unit 15
 GRAINSIZE: fine grained
 TEXTURE: aphyric

PRIMARY MINERALOGY	PERCENT ORIGINAL	REL. VOL. REPLACED	SIZE(mm)			MORPHOLOGY	VESICLE SPHERICITY	VESICLE Infilling [%]	COMMENTS
			min.	max.	mode.				
PHENOCRYSTS	4								
MICROPHENOCRYST									
olivine	1	100		0.9	0.2	subhedral		glomerocysts zonation	
augite	1	0		0.4	0.1	subhedral to anhedral[330]		hour glass zonation	
plagioclase	2	0		0.8	0.4	laths[330]		glomerocysts zonation	
VESICLES	0.03			0.9	0.9		high[330]	100	
GROUNDMASS	96								
plagioclase	30	0		0.3	0.04	laths[330]		trachytic texture	
opaque mineral	4	0							
augite	2	0		0.06	0.01	anhedral			
glass	58	100							
olivine	2	100		0.06	0.02	subhedral to euhedral[330]			

SECONDARY MINERALOGY	SIZE(mm)			REPLACING/FILLING vesicle	COMMENTS
	min.	max.	mode.		
calcite					green clay in some vesicles

STRUCTURE vertical trachytic texture (flow) defined by aligned plagioclase laths. Oriented in a near-vertical position. Straight vein (0.08 mm)

COMMENTS

SUMMARY DESCRIPTION