THIN SECTION LABEL ID: 397T-U1585A-4R-3-W 101/102-TSB-TS 10 Thin section no.: 10 Unit/subunit: Observer: RB microfossil bearing volcanic clastic, with vesicles and interstitial spaces filled with carbonate and zeolite. Thin section summary:



Cross-polarized: 64161331



Sediments and Sedimentary Rock

Complete lithology name:

lapillistone

Framework grain abundance

D=dominant; A=abundant; C=common; R=rare; Tr=trace

Rel. abundance	Component	Rel. abundance
	Calcite (allogenic)	С
	Mica	
	Glauconite	
	Zeolite	С
	Undifferentiated calcareous bioclasts	R
-		Mica Glauconite Zeolite

THIN SECTION LABEL ID:	397T-U1585A-4R-4-W 53/54-TSB-TS 11	Thin section no.: 11
Observer:	RB	Unit/subunit:
Thin section summary:	microfosilliferous (brvozans and forams?) lapillisto	one with carbonate cement, some

microfosilliferous (bryozans and forams?) lapillistone with carbonate cement. some fragments of pyroxene and plagioclase are present.

Cross-polarized: 64161371



Sediments and Sedimentary Rock

Complete lithology name:

lapillistone

Framework grain abundance

D=dominant; A=abundant; C=common; R=rare; Tr=trace

Component	Rel. abundance	Component	Rel. abundance
Quartz		Calcite (allogenic)	С
Feldspar		Mica	
Clay minerals	R	Glauconite	
Lithic grains		Zeolite	
Chert		Undifferentiated calcareous bioclasts	С

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THIN SECTION LABEL ID: Observer:	397T-U1585A-4R-CC-W WN/MW	2/4-TSB-TS 12	Thin section no.: 12 Unit/subunit:	
Thin section summary:	Domain 1 consists of a vesicular basalt fragment dominated by altered glass with skeletal plagioclase crystals throughout the glass. Vesicles are filled with clay and calcite. Domain 2 consists of A mix of altered lithic clasts and biogenic carbonate. lithic clasts has altered plagioclase needles with Fe-oxyhydroxides. biogenic carbonate portion have microfossils (forams?). Some of these shells have the original morphology preserved			
Plane-p	oolarized: 64161511	Cross-polarized:	64161531	



Framework grain abundance

D=dominant; A=abundant; C=common; R=rare; Tr=trace

Dominant Cement:

carbonate

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	397T-U1585A-4R-CC-W 2/4-TSB-TS 12	Thin section no.: 12
Observer:	WN/MW	Piece no.:
Thin section thickness:		Unit/subunit:
Thin section summary:	Domain 1 consists of a vesicular basalt fragment skeletal plagioclase crystals throughout the glass calcite. Domain 2 consists of A mix of altered lithic clasts has altered plagioclase needles with Fe-ox portion have microfossils (forams?). Some of thes preserved	. Vesicles are filled with clay and c clasts and biogenic carbonate. lithic yhydroxides. biogenic carbonate

Cross-polarized: 64161531

Plane-polarized: 64161511



Igneous Petrology

igneous i e		y y							
Lithology:			ighly				plagioclase ph	yric basalt	
Grain size distribution: Major texture:		: bi	imodal			Groundmass grain size (avg.):		cryptocrystalline	
		de	dendritic or skeletal			Minor Texture:		hypohyaline	
Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments	
Plagioclase	30	10	20	0.1	0.3	euhedral	elongate	Skeletal plag with	hollow centers
Glass	45		45	N/A	N/A	N/A	N/A		
Vesicle	Original (%)	Empty (%)	Filled (%)	Size min. (mm)	Size max. (mm)	Shape	Comments		
Vesicle	25	5	20	0.5	3	subrounded	Vesicles are mo	stly filled. Shape vari	es from spherical to elongate

THIN SECTION LABEL ID:	397T-U1585A-5R-1-W 11/14-TSB-TS 13	Thin section no.: 13
Observer:	RB	Unit/subunit:
Thin section summary:	carbonaceous tuff with bioclasts.	



Sediments and Sedimentary Rock

Complete lithology name:

carbonaceous coarse tuff

Texture	%	Constituent	%
Gravel texture:		Volcaniclastic:	
Sand texture:		Carbonate:	30
Silt texture:		Siliclastic:	
Clay texture:		Biogenic silica:	

Framework grain abundance

D=dominant; A=abundant; C=common; R=rare; Tr=trace

Component	Rel. abundance	Component	Rel. abundance
Quartz		Calcite (allogenic)	С
Feldspar		Mica	
Clay minerals	R	Glauconite	
Lithic grains	R	Zeolite	
Chert		Undifferentiated calcareous bioclasts	С

Dominant carbonate

THIN SECTION LABEL ID: 397T-U1585A-5R-4-W 99/102-TSB-TS 14 Thin section no.: 14 Unit/subunit: Observer: RB Thin section summary:

vesicules in lapilli filled with zeolite, carbonate. cemented with dolomitic and clayey carbonate cement. bioclasts and biogenic carbonate common

Cross-polarized: 64228561



Sediments and Sedimentary Rock

Complete lithology name:

lapillistone

Texture	%	Constituent	%
Gravel texture:		Volcaniclastic:	
Sand texture:		Carbonate:	20
Silt texture:		Siliclastic:	
Clay texture:		Biogenic silica:	

Framework grain abundance

D=dominant; A=abundant; C=common; R=rare; Tr=trace

Component	Rel. abundance	Component	Rel. abundance
Quartz		Calcite (allogenic)	С
Feldspar		Mica	
Clay minerals	С	Glauconite	
Lithic grains		Zeolite	
Chert		Undifferentiated calcareous bioclasts	С

Dominant Cement:

carbonate

397T-U1585A-5R-4-W 99/102-TSB-TS 14 Page 1 of 0

Thin section no.: 15

Unit/subunit:

THIN SECTION LABEL ID: Observer: Thin section summary:

397T-U1585A-6R-3-W 51/54-TSB-TS 15

RB

vesicular lapilli and altered basaltic clasts in carbonate cement. the carbonate cement appears to be biogenic. at places carbonate looks clayey and dolomitized. vesicles in the altered basaltic clasts are filled with carbonates/zeolites/clay. Within the altered basaltic clast, the gorundmass is altered to brownish unidentifiable minerals.

Plane-polarized: 64228581





Sediments and Sedimentary Rock

Complete lithology name: lappilistone with altered volcanic clasts

Texture	%	Constituent	%
Gravel texture:		Volcaniclastic:	
Sand texture:		Carbonate:	20
Silt texture:		Siliclastic:	
Clay texture:		Biogenic silica:	

Framework grain abundance

D=dominant; A=abundant; C=common; R=rare; Tr=trace

Component	Rel. abundance	Component	Rel. abundance
Quartz		Calcite (allogenic)	С
Feldspar		Mica	
Clay minerals	R	Glauconite	
Lithic grains		Zeolite	С
Chert		Undifferentiated calcareous bioclasts	

Dominant Cement: carbonate

Volcanic glass roundness: sub-rounded

Lithic grain roundness:

sub-rounded

THIN

IN SECTION LABEL ID:	397T-U1585A-11R-3-W 0/3-TSB-TS 16	Thin section no.: 16
Observer:	WN	Piece no.:
Thin section thickness:		Unit/subunit:
Thin section summary:	Highly olivine-phyric basalt with strong intersertial texture replaced by clay minerals. Abundant groundmass plagiod Glass is completely replaced.	es. Olivine is completely clase has skeletal textures.



Cross-polarized: 64191531



Igneous P	Petrolo	gy								
Lithology:		hi	highly olivine phyric basalt							
Grain size dis	stribution	: bi	imodal		Groundmass grain size (avg.): cryptocrystalline					
Major texture	e:	in	terserta	al			Minor Texture	2:	dendritic or skeletal	
Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments		
Olivine	15		15	0.3	0.8	subhedral	subhedral		ed by clay. Often appears in ne iddingsite along fractures.	
Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments		
Plagioclase	40	35	5	0.2	0.6	euhedral	elongate	skeletal plag with	hollow centers.	
Fe-Ti oxide	5		15			euhedral	equant	N/A		
Glass	40		40	N/A	N/A	N/A	N/A			
Vesicle	Original (%)	Empty (%)	Filled (%)	Size min. (mm)	Size max. (mm)	Shape	Comments			
Vesicle	4		4	0.5	1.2	rounded	completely fil	led, sometimes with m	ore than one secondary mineral.	

WN	Piece no.:
ess:	Unit/subunit:
replaced by clay minerals and o	t with strong interstirial textures. Olivine is completely calcite. Abundant groundmass plagioclase has skeletal tely replaced.
ane-polarized: 64191551	Cross-polarized: 64191571
ISBA . IT	15854 (17)
	ary: Moderately olivine-phyric basal replaced by clay minerals and o textures. Mesostasis is complet ane-polarized: 64191551

Igneous Pe	etrolo	gy							
Lithology:		moderately olivine phyric basalt							
Grain size distr	ibution	: bi	bimodal Groundmass grain size (avg.):						fine-grained
Major texture:		in	terserta	al			Minor Texture	:	dendritic or skeletal
Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments	
Olivine	8		8	0.3	1	subhedral	subhedral	completely replace	ed by clay and/or calcite
Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments	
Plagioclase	40	15	25	0.1	0.5	euhedral	elongate	skeletal plag, parti	ally altered
Fe-Ti oxide	3		8	0.02	0.05	euhedral	equant	N/A	
Mesostasis	49		49	N/A	N/A	N/A	N/A		
Vesicle	Original (%)	Empty (%)	Filled (%)	Size min. (mm)	Size max. (mm)	Shape	Comments		
Vesicle	3		3	0.3	1	rounded	completely fill	ed with calcite or clay	

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THIN SECTION LABEL ID:	397T-U1585A-12R-1-W 115/119-TSB-TS 1	18 Thin section no.: 18
Observer:	MT	Piece no.:
Thin section thickness:		Unit/subunit:
Thin section summary:	Sparsely plagioclase-olivine phyric basaltic plagioclase (48%) and mesostasis (50%). E 6 mm in size. Calcite appear to fill some ve faint. Olivine is completely replaced by calc	Empty vesicles are common and can be up to sicles partially. Twinning in plagioclase is
Plane-p	polarized: 64228621	Cross-polarized: 64228641





Lithology:		sp	arsely				plagioclase-oliv	/ine phyric basal	t		
Grain size distribution: inequigranular							Groundmass grain size (avg.): microcrystalline				
Major texture:		in	terserta	al			Minor Texture:		aphanitic		
Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments			
Olivine	2		2	0.5	1	subhedral	subhedral	All olivine phenoc	rysts altered to calcite		
Plagioclase	3		3	0.5	1	anhedral	elongate	All plag show alter	ation. Twinning is faint		
Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments			
Plagioclase	45		45	0.04	0.5	anhedral	elongate	Randomly oriented alteration	d slender grains. All grains show		
Fe-Ti oxide			2					N/A			
Mesostasis	50	20	30	N/A	N/A	N/A	N/A				
Vesicle	Original (%)	Empty (%)	Filled (%)	Size min. (mm)	Size max. (mm)	Shape	Comments				
Vesicle	4	4		0.4	6	rounded	Some vesicles a some vesicles	re irregularly shaped	. Calcite appear to partially fill		

THIN SECTION LABEL ID:	397T-U1585A-14R-2-W 43/49-TSB-TS 19	Thin section no.: 19
Observer:	WN	Piece no.:
Thin section thickness:		Unit/subunit:
Thin section summary:	Moderately olivine-phyric vesicular basalt. Highly by at least 2 secondary minerals. Groundmass pla moderately altered. Vesicles are dominantly filled altered to red and brown clay minerals.	agioclase has skeletal habits and is

Plane-polarized: 64210091

Cross-polarized: 64210111

microcrystalline



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Igneous Pe	trolo	gy							
Lithology:		m	oderate	ely			ol	ivine phyri	c basalt
Grain size distri	bution	: bi	modal				G	roundmass	grain size (avg.):
Major texture:		de	endritic	or skel	etal		М	inor Textu	re:
Phenocrysts	Original	Procont (04)	Replaced	Size	Size	Shapo		Habit	Comments

Major texture:		de	endritic	or skel	etal	l	Minor Texture:	ure: hypocrystalline		
Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments		
Olivine	6		6	0.5	1	subhedral	subhedral	Completely replaced by calcite and a green clay		
Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments		
Plagioclase	40	30	10	0.2	0.8	euhedral	elongate	Skeletal grains, partially altered with a range of sizes		
Fe-Ti oxide	3		6	0.2	0.3	euhedral	equant	N/A		
Mesostasis	26		26	N/A	N/A	N/A	N/A	highly altered to orange and green		
Vesicle	Original (%)	Empty (%)	Filled (%)	Size min. (mm)	Size max. (mm)	Shape	Comments	Comments		
Vesicle	25		25	1	4	subrounded	Most were filled with calcite but some centers lost material during TS creation			

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THIN SECTION LABEL ID:	397T-U1585A-14R-2-W 133/1	36-TSB-TS 20 Thin section no.: 20	
Observer:	WN	Piece no.:	
Thin section thickness:		Unit/subunit:	
Thin section summary:	groundmass. Olivine is altered moderate alteration. Cpx is on completely empty and complet	basalt with significant alteration. Hypocrystalline to both iddingsite and calcite. Plag phenocrysts show ly present as groundmass phase. Vesicles are both tely filled. Groundmass oxides have dendritic habits, a textures with small, hollow cores.	
Plane-p	polarized: 64210161	Cross-polarized: 64210181	



Igneous Petrology

Lithology:		m	oderate	ely			olivine-plagiocla	gioclase phyric basalt				
Grain size distr	ibution	: bi	modal				Groundmass grain size (avg.): fine-grained					
Major texture:	dendritic or skeletal						Minor Texture:		hypocrystalline			
Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments				
Olivine	3		3	0.3	0.8	subhedral	subhedral	Completely altered iddingsite rims	d. Contains calcite cores and			
Plagioclase	5	3	2	0.4	1	subhedral	elongate	Plag phenocrysts I sometimes to serio	nave moderate alteration, ite, sometimes to another clay.			
Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments				
Plagioclase	30	25	5	0.05	0.3	euhedral	elongate	abundant skeletal	plag, partially altered			
Clinopyroxene	11	8	3	0.02	0.1	subhedral	equant					
Fe-Ti oxide	7		3	0.01	0.03	euhedral	equant	N/A				
Mesostasis	30		30	N/A	N/A	N/A	N/A					
Vesicle	Original (%)	Empty (%)	Filled (%)	Size min. (mm)	Size max. (mm)	Shape	Comments					
Vesicle	15	10	5	0.5	1.8	subrounded	Range in shape a	nd filling				

THIN SECTION LABEL ID: Observer: Thin section summary:

397T-U1585A-14R-3-W 120/123-TSB-TS 21

RB

altered.

Thin section no.: 21

Unit/subunit:

vesicular altered basalt. vesicles are largely empty lined with fibrous chlorite or calcite. All plagioclase and pyroxenes are sericitized and chloritized. groundmass plagioclase are also similarly altered. the fine grained groundmass/mesostasis has been completely

Plane-polarized: 64228661





Sediments and Sedimentary Rock

Complete lithology Domain 2(carbonate-clay vein) name:

Texture	%	Constituent	%
Gravel texture:		Volcaniclastic:	
Sand texture:		Carbonate:	ccccccccc c
Silt texture:		Siliclastic:	
Clay texture:		Biogenic silica:	

Framework grain abundance

D=dominant; A=abundant; C=common; R=rare; Tr=trace

Component	Rel. abundance	Component	Rel. abundance
Quartz		Calcite (allogenic)	С
Feldspar		Mica	
Clay minerals	С	Glauconite	
Lithic grains		Zeolite	
Chert		Undifferentiated calcareous bioclasts	

THIN SECTION LABEL ID: Observer: Thin section thickness: Thin section summary:

397T-U1585A-14R-3-W 120/123-TSB-TS 21

Thin section no.: 21

Piece no.:

Unit/subunit:

vesicular altered basalt. vesicles are largely empty lined with fibrous chlorite or calcite. All plagioclase and pyroxenes are sericitized and chloritized. groundmass plagioclase are also similarly altered. the fine grained groundmass/mesostasis has been completely altered.

Plane-polarized: 64228661

RB





Igneous Petrology

Lithology:		hi	ghly				plagioclase-aug lava flow	ite phyric basalt	
Grain size distr	ibution	se	eriate			(Groundmass gra	ain size (avg.):	medium-grained
Major texture:		ро	orphyri	tic		I	Minor Texture:		glomeroporphyritic
Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments	
Plagioclase	10	0	10	0.5	1.4	subhedral	elongate	altered and skeleta	
Clinopyroxene	2		2	0.1	1	subhedral	subequant	altered	
Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments	
Plagioclase	30		30	0.05	0.5	subhedral	elongate	altered and skeleta	
Vesicle	Original (%)	Empty (%)	Filled (%)	Size min. (mm)	Size max. (mm)	Shape	Comments		
Vesicle	2	2		0.01	1	rounded	largely empty, lir	ed with chlorite/calo	ite

	ON LABE	L ID:		U1585	A-14R-	4-W 48/50-	TSB-TS 22	Thin section no.: 22
Observe			DH				Piece no.:	
Thin sec							Unit/subunit:	
Thin sec	tion sum	mary:	Moder replace texture	rately o ed by o es. Mes	livine-p clay mir sostasis	hyric basal nerals and c s is complet	t with strong i alcite. Abund ely replaced.	ntersertal textures. Olivine is completely ant groundmass plagioclase has skeleta
		Plane-po	olarized	d: 642	10201		С	ross-polarized: 64210221
							4R-4, 10 48/50	585A > (22)
Lithology:		m	ioderat	ely			olivine phyric Groundmass (
-	tribution	m bi	ioderat imodal terserta	·				grain size (avg.): fine-grained
Grain size dis	tribution	m bi	imodal	·	Size max. (mm)		Groundmass	grain size (avg.): fine-grained
Lithology: Grain size dis Major texture Phenocrysts	tribution	m bi in	imodal terserta _{Replaced}	al Size min.	max.		Groundmass of Minor Texture	grain size (avg.): fine-grained :: dendritic or skeletal
Lithology: Grain size dis Major texture Phenocrysts Dlivine	tribution 2: Original (%)	m bi in	imodal terserta Replaced	al Size min. (mm)	max. (mm)	Shape	Groundmass of Minor Texture	grain size (avg.): fine-grained dendritic or skeletal
Lithology: Grain size dis Major texture Phenocrysts Dlivine Groundmass	tribution Criginal (%) 7	m : bi in Present (%)	replaced (%) 7 Replaced	al Size min. (mm) 0.3 Size min.	max. (mm) 1.2 Size max.	Shape subhedral	Groundmass of Minor Texture Habit subhedral	grain size (avg.): fine-grained dendritic or skeletal Comments Completely replaced by clay and/or calcite
Lithology: Grain size dis Major texture Phenocrysts Dlivine Groundmass	tribution Criginal (%) 7 Original (%)	m bi in Present (%)	replaced (%) 7 Replaced (%)	al Size min. (mm) 0.3 Size min. (mm)	max. (mm) 1.2 Size max. (mm) 0.6	Shape subhedral Shape	Groundmass of Minor Texture Habit subhedral Habit	grain size (avg.): fine-grained comments dendritic or skeletal Completely replaced by clay and/or calcite Comments
Lithology: Grain size dis Major texture Phenocrysts Dlivine Groundmass Plagioclase Clinopyroxene	tribution Criginal (%) 7 Original (%) 40	m bi in Present (%) Present (%)	rmodal terserta Replaced (%) 7 Replaced (%) 30	al Size min. (mm) 0.3 Size min. (mm) 0.1	max. (mm) 1.2 Size max. (mm) 0.6	Shape subhedral Shape euhedral	Groundmass of Minor Texture Habit subhedral Habit elongate	grain size (avg.): fine-grained comments dendritic or skeletal Completely replaced by clay and/or calcite Comments
Lithology: Grain size dis Major texture Phenocrysts Olivine Groundmass Plagioclase Clinopyroxene Fe-Ti oxide	tribution Criginal (%) 7 Original (%) 40	m bi in Present (%) Present (%)	rmodal terserta Replaced (%) 7 Replaced (%) 30 3	al Size min. (mm) 0.3 Size min. (mm) 0.1	max. (mm) 1.2 Size max. (mm) 0.6 0.2	Shape subhedral Shape euhedral	Groundmass of Minor Texture Habit subhedral Habit elongate	grain size (avg.): fine-grained comments dendritic or skeletal Completely replaced by clay and/or calcite Comments skeletal plag, mostly altered
Lithology: Grain size dis Major texture	tribution Criginal (%) 7 Original (%) 40 4	m bi in Present (%) Present (%) 10 1	rmodal terserta Replaced (%) 7 Replaced (%) 30 3 7	Al Size min. (mm) 0.3 Size min. (mm) 0.1 0.1	max. (mm) 1.2 Size max. (mm) 0.6 0.2	Shape subhedral Shape euhedral anhedral	Groundmass of Minor Texture Habit subhedral Habit elongate equant	grain size (avg.): fine-grained comments dendritic or skeletal Completely replaced by clay and/or calcite Comments skeletal plag, mostly altered

397T-U1585A-14R-4-W 48/50-TSB-TS 22 Page 1 of 0

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THIN SECTION LABEL ID: Observer:	397T-U1585A-14R-4-W 7 WN	Piece no.:
Thin section thickness: Thin section summary:	replaced to the point that	Unit/subunit: basalt with microcrystalline groundmass. Olivine is completely grain boundaries, at times, are difficult to see. Groundmass blocky cpx, and highly altered glass. Groundmass plag and cpx
Plane-p	oolarized: 64210241	Cross-polarized: 64210261
-		S CONTRACTOR ON



Igneous Pe	etrolo	gу								
Lithology: moderately						olivine phyric basalt				
Grain size distr	ibution	: bi	imodal		Groundmass grain size (avg.):					microcrystalline
Major texture:		р	orphyri	tic			Mi	nor Texture:		dendritic or skeletal
Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape		Habit	Comments	
Olivine	6		6	0.5	1.6	subhedral	:	subhedral	Completely replace iddingsite	ed by zeolite and/or calcite. No
Plagioclase	1		1	0.3	0.5	subhedral		elongate	significant alteration	on to sericite
Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape		Habit	Comments	
Plagioclase	30	5	25	0.05	0.2	euhedral		elongate	skeletal center with	n altered mesostasis
Clinopyroxene	20		20	0.02	0.06	subhedral		equant		
Fe-Ti oxide	2		6	0.01	0.03	euhedral		equant	N/A	
Glass	35		35	N/A	N/A	N/A		N/A	all reddish in color	with tiny oxides inside
Vesicle	Original (%)	Empty (%)	Filled (%)	Size min. (mm)	Size max. (mm)	Shape		Comments		
Vesicle	4		4	0.1	0.4	subangular		highly irregular v	esicles - potentially	from diktytaxitic plag

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THIN SECTION LABEL ID: Observer: Thin section thickness:	397T-U1585A-14R-4-W 88/90-TSB-TS 24 MT	Thin section no.: 24 Piece no.: Unit/subunit:				
Thin section summary:	Moderately olivine-plagioclase phyric basalt clast with an overall aphanitic te Groundmass consists of altered olivine, plagioclase and mesostasis. Groun- alteration intensity varies across the sample. There s an occurrence of scatt subhedral Fe-Ti oxides.					
Plane-p	olarized: 64235671 Cro	ss-polarized: 64235691				
	1585A · (24)	1585				

Igneous Petrology Lithology: olivine-plagioclase phyric basalt moderately Grain size distribution: seriate Groundmass grain size (avg.): microcrystalline Major texture: aphanitic Minor Texture: Size Size Original (%) Replaced (%) Habit Phenocrysts Present (%) min. max. Shape Comments (mm) (mm) Olivine 3 0.3 All olivine phenocryts have been altered to calcite 3 0.8 anhedral anhedral Plagioclase 2 2 0.3 1 anhedral elongate Size Size Original (%) Replaced (%) Groundmass Present (%) min. max. Shape Habit Comments (mm) (mm) Olivine 3 0.1 3 0.3 anhedral equant Plagioclase 40 40 0.1 0.3 anhedral elongate Fe-Ti oxide 3 3 0.01 0.1 subhedral equant N/A Mesostasis 49 22 27 N/A N/A N/A N/A

HIN SECTION LABEL ID:	397T-U1585A-26R-4-W 20/25	-TSB-TS 25	Thin section no.: 25
Observer:	DH		Piece no.:
Thin section thickness:			Unit/subunit:
Thin section summary:	Aphyric basalt with microcrysta microphenocrysts have nearly microphenocryst was about ha completely altered and there a	alline groundmass. The larg been completely replaced. If altered to iddingsite. The re a minor amount of oxide	er plagioclase A single olivine mesostasis has been minerals present.
Plane-p	olarized: 64228701	Cross-polarize	d: 64228721
	1585	26R-4. 4	1585A
		N	AN IN

	gу								
						ар	hyric basalt		
bution	: bi	modal				Gr	oundmass gra	ain size (avg.):	microcrystalline
	m	icrolitic				Mi	nor Texture:		intersertal
Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape		Habit	Comments	
2		2	0.2	0.3	subhedral		equant		
70	10	60	0.1	0.5	euhedral		elongate	Plagioclase is bein	g altered.
1			0.1	0.2	euhedral		equant	N/A	
27		27	N/A	N/A	N/A		N/A	highly alterd	
	Original (%) 2 70 1	Original (%) Present (%) 2 70 10 1	bution: bimodal microlitic ^{Original} (%) Present (%) Replaced (%) Replaced (%) Compared (%) Compared (%) 2 2 2 70 10 60 1	bution: bimodal microlitic Original (%) Present (%) Replaced (%) Replaced Size min. (mm) 2 2 2 0.2 70 10 60 0.1 1 0.1	Original (%) Present (%) Replaced (%) Size min. (%) Size min. (mm) Size max. (mm) 2 2 0.2 0.3 70 10 60 0.1 0.5 1 0.1 0.2	bimodal microliticOriginal (%)Present (%)Replaced (%)Size min. (mm)Size max. (mm)Shape220.20.3subhedral7010600.10.5euhedral140.10.2euhedral	original (%) Present (%) Replaced (%) Size min. (mm) Size max. (mm) Shape 2 2 0.2 0.3 subhedral 70 10 60 0.1 0.5 euhedral 1 0.1 0.2 euhedral	original (%) Present (%) Replaced (%) Size min. (mm) Size max. (mm) Shape Habit 2 2 0.2 0.3 subhedral equant 70 10 60 0.1 0.5 euhedral elongate 1 1 0.1 0.2 euhedral equant	aphyric basalt bution: bimodal microlitic Groundmass grain size (avg.): Minor Texture: Original (%) Present (%) Replaced (%) Size min. (mm) Shape max. (mm) Habit Comments 2 2 0.2 0.3 subhedral equant 1 70 10 60 0.1 0.5 euhedral elongate Plagioclase is bein 1 1 1 0.1 0.2 euhedral equant N/A

Thin section no.: 26

Unit/subunit:

THIN SECTION LABEL ID: Observer: Thin section summary:

397T-U1585A-30R-2-W 133/135-TSB-TS 26

RB

Altered basaltic clasts and lapilli of varying sizes and angularity in carbonaceous clay matrix. altered basaltic clasts are aphyric with < 1mm altered needles of plagioclase. groundmass is altered to brownish unidentifiable minerals. layered lapilli have altered glass layers with varying degree of altered plagioclase crystals.

Cross-polarized: 64228761

Plane-polarized: 64228741



Sediments and Sedimentary Rock

Complete lithology name: lapillistone with volcanic clasts

Texture	%	Constituent	%
Gravel texture:		Volcaniclastic:	
Sand texture:		Carbonate:	10
Silt texture:		Siliclastic:	
Clay texture:		Biogenic silica:	

Framework grain abundance

D=dominant; A=abundant; C=common; R=rare; Tr=trace

Component	Rel. abundance	Component	Rel. abundance
Quartz		Calcite (allogenic)	С
Feldspar		Mica	
Clay minerals	С	Glauconite	
Lithic grains	С	Zeolite	
Chert		Undifferentiated calcareous bioclasts	

Dominant carbonate

Volcanic glass roundness: sub-angular

Lithic grain roundness:

sub-angular

THIN SECTION LABEL ID:	397T-U1585A-30R-4-W 128/131-TS	B-TS 27 Thin section no.: 27
Observer:	DH	Piece no.:
Thin section thickness:		Unit/subunit:
Thin section summary:	Aphyric basalt with microcrystalline of microphenocrysts have been complet were altered with their core intact. The there are a minor amount of oxide methods the second secon	tely replaced. The rims of olivine microphenocrysts ne mesostasis has been completely altered and
Plane-p	Cross-polarized: 64228801	



Igneous Petrology

Lithology:

aphyric basalt

Grain size distribution: bimodal Groundmass grain size (avg.): microcrystalline Major texture: microlitic Minor Texture: intersertal Size Size Original (%) Replaced (%) Habit Groundmass Present (%) min. max. Shape Comments (mm) (mm) The rims of the microphenocrysts olivines are Olivine 1.5 0.5 1 0.05 0.3 subhedral equant altered with their cores intact. Plagioclase microphenocrysts are all completely altered. Plagioclase 16 8 8 0.1 0.8 euhedral elongate N/A Fe-Ti oxide 3 0.1 0.1 subhedral equant N/A 78.5 78.5 N/A N/A N/A Mesostasis Original (%) Size min. (mm) Size max. (mm) Vesicle Empty (%) Filled (%) Shape Comments Vesicle 1 1 0.2 0.2 rounded

THIN SECTION LABEL ID: Observer: Thin section thickness: Thin section summary:

397T-U1585A-30R-5-W 56/60-TSB-TS 28

DH

Thin section no.: 28

Piece no.:

Unit/subunit:

Highly plagioclase phyric basalt. There is a glassy rim that has been completely altered. The alteration progressively lessens as the distance from the rim increased. The plagioclase phenocrysts are mostly unaltered but contain an abundant amount of altered oxides or inclusions.

Plane-polarized: 64235831





Igneous Petrology

Lithology:			ghly				plagioclase phy	ric basalt		
Litilology.			giny				plagioclase priy			
Grain size dist	ribution	: bi	modal			Groundmass grain size (avg.): microcrystalline				
Major texture:		m	icrolitic			I	Minor Texture:	trachytic		
Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments		
Plagioclase	30	30		0.8	4	subhedral	tabular	Plagioclase phenocrysts have abundant oxides and inclusions		
Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments		
Plagioclase	4	2	2	0.1	0.2	euhedral	elongate			
Fe-Ti oxide	4			0.1	0.1	subhedral	equant	N/A		
Mesostasis	42		42	N/A	N/A	N/A	N/A			
Glass	20		20	N/A	N/A	N/A	N/A	The glass rim has been completely altered. There are some small plagioclase crystals.		

THIN SECTION LABEL ID:**397T-U1585A-31R-5-W 70/74-TSB-TS 29**Thin section no.: 29Observer:RBUnit/subunit:Thin section summary:Fine mixture of clay and carbonate. indications for the presence of nanno and
microfossils.

Cross-polarized: 64228841

Plane-polarized: 64228821



Sediments and Sedimentary Rock

Complete lithology name:

Carbonaceous clay

Texture	%	Constituent	%
Gravel texture:		Volcaniclastic:	
Sand texture:		Carbonate:	20
Silt texture:		Siliclastic:	
Clay texture:	100	Biogenic silica:	

Framework grain abundance

D=dominant; A=abundant; C=common; R=rare; Tr=trace

Component	Rel. abundance	Component	Rel. abundance
Quartz		Calcite (allogenic)	С
Feldspar		Mica	
Clay minerals	A	Glauconite	
Lithic grains		Zeolite	
Chert		Undifferentiated calcareous bioclasts	

Dominant Cement:

clay

THIN SECTION Observer: Thin section Thin section	on thick	ness:	WN Sparse phases ground	ely olivi s are p dmass stasis is	ine phy artially consis	ric massive to complet	ely altered. Ti-	ystal-rich fine-g rich cpx is only grains as inclus	hin section no.: 30 l'iece no.: Init/subunit: grained groundmass. All partially altered. Oxide-rid sions in olivine and cpx. sible in the altered
	F	Plane-po	plarized	l: 642	28861		C	ross-polarized:	64228881
31R-5, 5 111/115							SIR-5, 5 INVIS		
Igneous Pe Lithology:		sp	barsely				olivine phyric lava flow		fine avaired
-		sp	oarsely Ibophit	ic			lava flow	ırain size (avg.):	fine-grained intersertal
Lithology: Grain size distr		sp	·	ic Size min. (mm)	Size max. (mm)	Shape	lava flow Groundmass g	ırain size (avg.):	-
Lithology: Grain size distr Major texture: Phenocrysts	ibution :	sp : su	Ibophit	Size min.	max.	Shape subhedral	lava flow Groundmass <u>c</u> Minor Texture	rain size (avg.):	-
Lithology: Grain size distr Major texture: Phenocrysts Olivine	original	sp : su	Ibophit	Size min. (mm)	max. (mm)		Iava flow Groundmass <u>c</u> Minor Texture _{Habit}	rain size (avg.):	intersertal
Lithology: Grain size distr Major texture: Phenocrysts Olivine Groundmass	Original (%)	SU Present (%)	Replaced (%) 1 Replaced	Size min. (mm) 1 Size min.	max. (mm) 1.2 Size max.	subhedral	lava flow Groundmass <u>c</u> Minor Texture Habit subhedral	yrain size (avg.): Comments seriate texture w Comments olivine is comple were probably or	intersertal
Lithology: Grain size distr Major texture:	ribution: Original (%) Original (%)	SU Present (%)	Replaced (%) 1 Replaced (%)	Size min. (mm) 1 Size min. (mm)	max. (mm) 1.2 Size max. (mm)	subhedral	lava flow Groundmass g Minor Texture Habit subhedral Habit	rain size (avg.): Comments seriate texture w Comments clusters, which w hand sample. Most are very sle is unclear if these zoned centers, an while the exterio along cleavage p of the crystal, or	intersertal ith groundmass olivine tely replaced by chlorite (?). Grain nee euhedral. Often occur in rould look like one larger grain in nder laths with altered centers. If a re slender crystals (1) with nd the interior zone is altered r zoned survived, (2) alteration lanes running through the center (3) skeletal crystals with hollow h mesostasis material that has

7

25

Original (%)

3

Empty (%)

1

25

Filled (%)

3

0.01

N/A

Size min. (mm)

0.2

0.1

N/A

Size max. (mm)

1

euhedral

N/A

Shape

subangular

equant

N/A

Comments

N/A

Vesicles are odd-shaped due to diktytaxitic texture.

Mesostasis may have been glassy at one point, but it is all chloritized now. Thin, randomly oriented microlites are visible through alteration patches.

Heterogenous abundance through thin section some portions are more crystal rich than others, which affects the abundance of mesostasis.

Fe-Ti oxide

Mesostasis

Vesicle

Vesicle

THIN SECTION LABEL ID:	397T-U1585A-32R-2-W 63/66-TSB-TS 31	Thin section no.: 31
Observer:	WN	Piece no.:
Thin section thickness:		Unit/subunit:
Thin section summary:	Highly Ti-cpx phyric with very sparse (<1%) pl most cpx are phencrysts and most plag are gr quantities in the groundmass, but it is complet completely chloritized. Subophitic textures with forms. The centers of all plag crystals are alter core whereas more slender crystals look to be	oundmass. Olivine is present in modest ley chloritized. Mesostasis is also n most plag showing slender, elongrate
Plane-p	polarized: 64228901 Cro	oss-polarized: 64228921
SP CALL	1585A	

Igneous Petrology

Grain size distribution:

Lithology:

Major texture:

subonhiti

highly

Ti-rich augite phyric basalt massive lava flow

Minor Texture:

Groundmass grain size (avg.):

fine-grained intersertal

su	ibophit	IC		
		Size	Size	

Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Plagioclase	0.5	0.5		1	1	subhedral	equant	rare (<1%) blocky plag phenocrysts. with mild to moderate seritiziation.
Clinopyroxene	17	17		1	3	subhedral	subequant	Mostly fresh Ti-cpx. Subophitic texure around plag. Grain sizes grade to groundmass without distinguishing groundmass vs phenocryst pyroxene (i.e. seriate texture)
Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Olivine	2		2	0.4	0.6	subhedral	equant	Olivine is completely chloritized. Mesostasis is also chloritized, and only sometimes is the relief difference such that olivine can be distinguished.
Plagioclase	29	20	9	0.4	1	euhedral	elongate	Most have altered centers. Some look like skeletal plag whereas more block groundmass plag show interior zoning. Alteration of the interior zone looks different (less intense) than the slender laths suspected of being skeletal crystals. Skeletal crystals have identical alteration as the mesostasis.
Clinopyroxene	13	5	8	0.8	1	subhedral	elongate	
Fe-Ti oxide	7			0.01	0.3	euhedral	equant	N/A
Mesostasis	30		30	N/A	N/A	N/A	N/A	Chloritized
Vesicle	Original (%)	Empty (%)	Filled (%)	Size min. (mm)	Size max. (mm)	Shape	Comments	
Vesicle	2	1	1	0.8	1.4	subangular	Vesicles are lined with chlorite or a zeolite. Irregular shaped from intersertal texture.	

THIN SECTION LABEL ID:	397T-U1585A-32R-5-W 60/63-TSB-TS 32	Thin section no.: 32
Observer:	WN	Piece no.:
Thin section thickness:		Unit/subunit:
Thin section summary:	Highly Ti-cpx phyric with very sparse (<1%) plag pl most cpx are phenocrysts and most plag are groun as whole, euhedral phenocrysts in the groundmass quantities in the groundmass, but it is completely c completely altered to chlorite and calcite. Most plag Plag is less altered, and the grains a little less thin. grains.	dmass. Some subophitic cpx as well s. Olivine is present in modest hloritized. Mesostasis is also a showing slender, elongate forms.



highly

Igneous Petrology

Grain size distribution:

Lithology:

Ti-rich augite phyric basalt massive lava flow

Groundmass grain size (avg.):

fine-grained

Cross-polarized: 64234961

Major texture:		SL	ubophit	ic			Minor Texture:	intersertal
Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Clinopyroxene	15	13	2	1	3	subhedral	subequant	Moslty fresh Ti-cpx. Contains both subhedral subophitic grains and more euhedral grains with small inclusions.
Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Olivine	4		4	0.2	0.5	subhedral	equant	completely replaced by chlorite and sometimes calcite
Plagioclase	19	15	4	0.3	1.2	euhedral	elongate	Plag are not as slender/needle-like in this sample. Less altered with preserved zoning.
Clinopyroxene	12	10	2	0.2	0.8	subhedral	equant	
Fe-Ti oxide	5			0.01	0.4	subhedral	equant	N/A
Mesostasis	41		41	N/A	N/A	N/A	N/A	
Vesicle	Original (%)	Empty (%)	Filled (%)	Size min. (mm)	Size max. (mm)	Shape	Comments	
Vesicle	4		4	0.5	2	subangular	Vesicles are fillec pyrite.	with calcite, but lined with zeolite/chlorite and

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THIN SECTION LABEL ID:	397T-U1585A-32R-7-W 77/81-T	SB-TS 33 Thin section no.: 33
Observer:	WN	Piece no.:
Thin section thickness:		Unit/subunit:
Thin section summary:	is present but replaced by chlorit	ined plag-rich groundmass. Sparse groundmass olivine e and calcite. Mesostasis is completely altered. es. Vesicles vary from round and filled to irregular and
Plane-p	oolarized: 64234981	Cross-polarized: 64235001



Igneous Petrology

Lithology:

highly

Ti-rich augite phyric basalt massive lava flow

Groundmass grain size (avg.):

fine-grained

Grain size distribution:

Major texture:		SU	ıbophit	ic		ľ	Minor Texture:	intersertal
Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Clinopyroxene	25	22	3	1.4	3	subhedral	subequant	Mostly fresh. Highly fractured.
Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Olivine	2		2	0.3	0.6	subhedral	equant	completely replaced by iddingsite then by calcite.
Plagioclase	37	15	22	0.3	1.1	euhedral	elongate	Moderate alteration. Some zoning but more intact cores.
Fe-Ti oxide	8			0.02	0.5	subhedral	equant	N/A
Mesostasis	22		22	N/A	N/A	N/A	N/A	significantly altered, though microlites are visible in some patches.
Vesicle	Original (%)	Empty (%)	Filled (%)	Size min. (mm)	Size max. (mm)	Shape	Comments	
Vesicle	6	3	3	0.3	1.2	subrounded		re complelty filled. Some are more round while rregular due to crystal boundaries.

THIN SECTION LABEL ID: Observer: Thin section thickness:	397T-U1585A-33R-2-W 62/66-T S WN	SB-TS 34 Thin section no.: 34 Piece no.: Unit/subunit:
Thin section summary:	most cpx are phenocrysts and mo olivine is present it is completely chlorite and calcite. Most plag are the grains a little less thin. Zoninc	arse (<1%) plag phenocrysts. Seriate texture, though ost plag are groundmass. Some subophitic cpx. Sparse chloritized. Mesostasis is also completely altered to a tabular rather than slender. Plag is less altered, and is visible in more blocky grains. This samples shows (tytaxitic texture; some are filled while others only lined. ad by zeolite (?).
Plane-r	polarized: 64235021	Cross-polarized: 64235041





Igneous Petrology

Lithology:

Grain size distribution:

Major texture:

intersertal

highly

Minor Texture:

augite-plagioclase phyric basalt massive lava flow

Groundmass grain size (avg.):

fine-grained diktytaxitic

Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Plagioclase	3	3			1.3	subhedral	tabular	reasonably fresh with minor inclusions of minerals. Seriate texture with groundmass plag.
Clinopyroxene	23	20	3	1	4	subhedral	subequant	Moderately fresh. Some subophtic textures.
Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Olivine	4		4	0.4	0.6	subhedral	equant	completely replaced and difficult to distinguish
Plagioclase	25	17	8	0.7	1	euhedral	tabular	Tabular crystals with moderate alteration. Dikytaxitic texture and responsible for irregular vesicles
Fe-Ti oxide	6			0.2	1.1	subhedral	subequant	N/A
Mesostasis	25		25	N/A	N/A	N/A	N/A	signficant alteration
Vesicle	Original (%)	Empty (%)	Filled (%)	Size min. (mm)	Size max. (mm)	Shape	Comments	
Vesicle	14	8	6	0.5	2.2	subangular	Diktytaxitic textu	re creates irregular vesicle shapes.

THIN SECTION LABEL ID: Observer: Thin section thickness:	397T-U1585A-33R-6-W 88/92-TSB-TS 35 WN	Thin section no.: 35 Piece no.: Unit/subunit:
Thin section summary:	Highly Ti-cpx-plag phyric with very sparse altered textures with compositional zoning, and alteration interiors. Cpx shows mild subophitic textures but r above this one. Diktytaxitic texture creates a mode shapes. Some are empty while others are lined wi fills the vesicles. Patchy mesostasis is shows sign microlites persists.	is especially prevalent in zoned not as strongly as in cores immediately erate vesicularity with irregular vesicle th fibrous zeolite. Calcite commonly



Igneous Petrology

Lithology:

augite-plagioclase phyric basalt massive lava flow

Groundmass grain size (avg.):

Cross-polarized: 64235081

fine-grained

Grain size distribution:
Major texture:

hypocrystalline

highly

Minor Texture:

diktytaxitic

Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Olivine	0.5		0.5	1	1	subhedral	subhedral	completely replaced. Faint iddingsite rims remain, but center is calcite.
Plagioclase	5	3	2	1	1.2	subhedral	tabular	Seriate texture - grains at the coarser end are large enough to be considered groundmass. Moderate to high sericite alteration is present, especially in the core of the phenocrysts. Shape ranges from somewhat slender to more tabular/blocky. Mild subophitic texture with cpx.
Clinopyroxene	9	7	2	1	1.3	subhedral	subequant	Mildly altered, blocky Ti-cpx with mild subophitic textures (not as strong as previous TS 30-34). Small inclusions present.
Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Olivine	2		2	0.5	0.8	subhedral	equant	completely replaced
Plagioclase	34	24	10	0.5	1	euhedral	tabular	Tabular crystals with moderate alteration. Dikytaxitic texture and responsible for irregular vesicles. Zoning visible, and most of the alteration is in the zoned center.
Fe-Ti oxide	8		0.5	0.2	0.8	subhedral	subequant	N/A
Mesostasis	30		30	N/A	N/A	N/A	N/A	Altered but numerous microlites visible in most mesostasis patches. Heterogenously distributed throughout TS
Vesicle	Original (%)	Empty (%)	Filled (%)	Size min. (mm)	Size max. (mm)	Shape	Comments	
Vesicle	12	5	7	0.5	2	subangular	usually filled wh	ure creates irregular vesicles. Larger vesicles are ereas smaller are empty. Vesicle fill is dominantly brous zeolite is visible lining some vesicle walls.

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Т	HIN SECTION LABEL ID: Observer: Thin section thickness:	397T-U1585A-34R-1-W 6/ WN	Pie	n section no.: 36 ce no.: it/subunit:
	Thin section summary:	alteration is especially pre- Diktytaxitic texture creates are filled with fibrous zeolit	Plag show seriate textures with com valent in zoned interiors. Cpx shows a moderate vesicularity with irregul e or calcite. Patchy mesostasis is s persists. Sparse groundmass cpx is	positional zoning, and mild subophitic textures. ar vesicle shapes. Most hows significant alteration,
	Plane-p	oolarized: 64235101	Cross-polarized: 6	64235121
	C. RESIDENTS	Stansteinen On		



Igneous Petrology

Lithology:

moderately

Ti-rich augite phyric basalt massive lava flow

Groundmass grain size (avg.):

fine-grained

Minor Texture:

diktytaxitic

Major texture:

hypocrystalline

Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Plagioclase	5	2	3	1	1.6	subhedral	tabular	Seriate texture. Abundant alteration in zoned core.
Clinopyroxene	8	7	1	1	1.6	subhedral	subequant	Mildly altered with inclusions. Subophitic. Subtle zoning visible.
Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Olivine	3		3	0.1	0.7	subhedral	equant	Completely replaced by iddingsite and calcite
Plagioclase	40	15	25	0.4	1	subhedral	tabular	Most crystals are enlongate tabs with zonation and twinning. All have a degree of sericite alteration, with cores sustaining the highest degree of alteration.
Clinopyroxene	2	2		0.02	0.06	subhedral	equant	
Fe-Ti oxide	6			0.1	0.8	subhedral	subequant	N/A
Mesostasis	27		27	N/A	N/A	N/A	N/A	
Vesicle	Original (%)	Empty (%)	Filled (%)	Size min. (mm)	Size max. (mm)	Shape	Comments	
Vesicle	9		9	0.5	1.6	subangular	Diktytaxitic tex with zeolite or	xture creates irregular vesicle shapes. Most are filled calcite

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THIN SECTION LABEL ID:		
Observer:	WN	Piece no.:
Thin section thickness:		Unit/subunit:
Thin section summary:	falling in groundmass sizes. alteration (chlorite?). Cpx sh Diktytaxitic texture creates a	Plag and olivine show seriate textures with most crystals Olivine cores are fresh while rims and fractures show hows mild subophitic textures and is subtly zoned. a moderate vesicularity with irregular vesicle shapes. Most or calcite. Patchy mesostasis is shows complete alteration
Plane-	polarized: 64235141	Cross-polarized: 64235161
201/03 I 2542	1585A (37)	
Igneous Petrology		

Lithology:

highly

augite-olivine phyric basalt massive lava flow

Minor Texture:

Groundmass grain size (avg.):

fine-grained

diktytaxitic

Grain size distribution:

Major texture:

Hypocrystalline

Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Olivine	2		2	1	1.6	euhedral	euhedral	Fresh cores with thin alteration rims
Plagioclase	2	1	1	1	1.2	subhedral	tabular	seriate texture. Cores sustain the highest degree of alteration.
Clinopyroxene	20	20		1	3.4	subhedral	subequant	Mildly altered. Subtle zoning visible. Subophitic
Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Olivine	9	7	2	0.3	1	euhedral	equant	Fresh cores with thin to moderate alteration rims. Alteration is also visible along grain fractures.
Plagioclase	35	10	25	0.4	1	subhedral	tabular	Significant alteration. Patches of the thin section are more altered than others.
Fe-Ti oxide	5		2	0.04	0.4	subhedral	subequant	N/A
Mesostasis	23		23	N/A	N/A	N/A	N/A	Significantly altered. Present in irregular patches in the thin section.
Vesicle	Original (%)	Empty (%)	Filled (%)	Size min. (mm)	Size max. (mm)	Shape	Comments	
Vesicle	4		4	0.5	1.3	subrounded	Diktytaxitic text little round.	ure creates somewhat irregular vesicles - most are a

THIN SECTIO	N LABE	L ID:	397T-	U1585	A-35R-	-4-W 85/88-T	SB-TS 38	Tł	nin section no.: 38		
Observer:	:		WN					Pi	ece no.:		
Thin secti	on thick	ness:					Unit/subunit:				
Thin secti	on sumi	mary:	falling Cpx sl round	in grou hows n ed - no	undmas nild sub t a stro	ss sizes. Oliv pophitic textu ong diktytaxiti	vine is complete ires and is sub	ely replaced by tly zoned. Spai t are filled with	tures with most crystals serpentine and chlorite rse vesicles are more fibrous zeolite or calcite		
	I	Plane-po	olarized	l: 642	35181		Cro	ss-polarized:	64235201		
Igneous Pe											
ULIEUUS FU		чү									
Lithology:			ighly			á	augite-olivine-p	lagioclase phyri	ic		
Lithology:		hi	ghly			I	basalt massive l	ava flow			
Lithology: Grain size dist	ribution	hi				 (basalt massive la Groundmass gra	ava flow	fine-grained		
Lithology:	ribution	hi	ghly ypocrys	talline		 (basalt massive l	ava flow			
Lithology: Grain size dist Major texture:	ribution	hi		talline Size min. (mm)	Size max. (mm)	 (basalt massive la Groundmass gra	ava flow	fine-grained		
Lithology: Grain size dist Major texture: Phenocrysts	ribution:	hi : hy	ypocrys Replaced	Size min.	max.		basalt massive la Groundmass gra Minor Texture:	ava flow ain size (avg.):	fine-grained intersertal		
Lithology: Grain size dist Major texture: Phenocrysts Olivine	ribution:	hi : hy	ypocrys Replaced	Size min. (mm)	max. (mm)	Shape	basalt massive li Groundmass gra Minor Texture: Habit	completely replac	fine-grained intersertal red by serpentine		
Lithology: Grain size dist Major texture: Phenocrysts Olivine	ribution: Original (%)	hi Present (%)	ypocrys Replaced (%)	Size min. (mm) 1	max. (mm) 1.5	Shape subhedral	basalt massive la Groundmass gra Minor Texture: Habit subhedral	completely replac	fine-grained intersertal red by serpentine ntinuous and oscillatory zoning ost alteration. Seriate texture		
Lithology: Grain size dist Major texture: Phenocrysts Olivine Plagioclase Clinopyroxene	Criginal (%) 3 2	hi Present (%)	ypocrys Replaced (%)	Size min. (mm) 1	max. (mm) 1.5 1.2	Shape subhedral subhedral	basalt massive la Groundmass gra Minor Texture: Habit subhedral tabular	completely replac Contains both cor Cortains both cor	fine-grained intersertal red by serpentine ntinuous and oscillatory zoning ost alteration. Seriate texture		
Lithology: Grain size dist Major texture: Phenocrysts Olivine Plagioclase Clinopyroxene Groundmass	ribution: Original (%) 3 2 15	hi Present (%) 1 15	ypocrys Replaced (%) 3 1 Replaced	Size min. (mm) 1 1.5 Size min.	max. (mm) 1.5 1.2 2.6 Size max.	Shape subhedral subhedral subhedral	basalt massive la Groundmass gra Minor Texture: Habit subhedral tabular subequant	Ava flow ain size (avg.): Comments completely replace Contains both cor Cores show the m Fresh. No inclusion Comments	fine-grained intersertal red by serpentine ntinuous and oscillatory zoning ost alteration. Seriate texture ns. Subophitic.		
Lithology: Grain size dist Major texture: Phenocrysts Olivine Plagioclase Clinopyroxene Groundmass Olivine	ribution: Original (%) 3 2 15 Original (%)	hi Present (%) 1 15	xpocrys Replaced (%) 3 1 Replaced (%)	Size min. (mm) 1 1 1.5 Size min. (mm)	max. (mm) 1.5 1.2 2.6 Size max. (mm)	Shape subhedral subhedral subhedral Shape	basalt massive la Groundmass gra Minor Texture: Habit subhedral tabular subequant Habit	ava flow ain size (avg.): Comments completely replace Contains both cor Cores show the m Fresh. No inclusion Comments Completely replace Often round in loc Significant alterat	fine-grained intersertal red by serpentine ntinuous and oscillatory zoning ost alteration. Seriate texture ns. Subophitic.		
Lithology: Grain size dist Major texture: Phenocrysts Olivine Plagioclase Clinopyroxene Groundmass Olivine	ribution: Original (%) 3 2 15 Original (%) 13	hi Present (%) 1 Present (%)	xpocrys Replaced (%) 3 1 Replaced (%) 13	Size min. (mm) 1 1.5 Size min. (mm) 0.2	max. (mm) 1.5 1.2 2.6 Size max. (mm) 1	Shape subhedral subhedral Shape subhedral	basalt massive la Groundmass gra Minor Texture: Habit subhedral tabular subequant Habit equant	Ava flow ain size (avg.): Comments completely replace Contains both cor Cores show the m Fresh. No inclusion Comments Completely replace Often round in loc Significant alteraticores while other	fine-grained intersertal ed by serpentine ntinuous and oscillatory zoning ost alteration. Seriate texture ns. Subophitic.		
Lithology: Grain size dist Major texture: Phenocrysts Olivine Plagioclase Clinopyroxene Groundmass Olivine Plagioclase	ribution: Original (%) 3 2 15 Original (%) 13 32	hi Present (%) 1 15 Present (%) 12	xpocrys Replaced (%) 3 1 Replaced (%) 13	Size min. (mm) 1 1 1.5 Size min. (mm) 0.2 0.4	max. (mm) 1.5 1.2 2.6 Size max. (mm) 1 1	Shape subhedral subhedral subhedral Shape subhedral subhedral	basalt massive la Groundmass gra Minor Texture: Habit subhedral tabular subequant Habit equant tabular	Ava flow ain size (avg.): Comments completely replace Contains both cor Cores show the m Fresh. No inclusion Comments Completely replace Often round in loc Significant alteraticores while other	fine-grained intersertal ed by serpentine ntinuous and oscillatory zoning ost alteration. Seriate texture ns. Subophitic. ed by serpentine and chlorite. ose clusters. ion. Sometimes restricted to th		
Lithology: Grain size dist Major texture: Phenocrysts Olivine Plagioclase Clinopyroxene Groundmass Olivine Plagioclase Clinopyroxene Fe-Ti oxide	ribution: Original (%) 3 2 15 Original (%) 13 32 1	hi Present (%) 1 15 Present (%) 12	xpocrys Replaced (%) 3 1 Replaced (%) 13 20	Size min. (mm) 1 1.5 Size min. (mm) 0.2 0.4 0.02	max. (mm) 1.5 1.2 2.6 Size max. (mm) 1 1 1 0.07	Shape subhedral subhedral subhedral Shape subhedral subhedral subhedral	basalt massive la Groundmass gra Minor Texture: Habit subhedral tabular subequant Habit equant tabular equant	Ava flow ain size (avg.): Comments completely replace Contains both cor Cores show the m Fresh. No inclusion Comments Completely replace Often round in loc Significant alterati cores while other crystal.	fine-grained intersertal red by serpentine ntinuous and oscillatory zoning ost alteration. Seriate texture ns. Subophitic.		
Lithology: Grain size dist Major texture: Phenocrysts Olivine Plagioclase Clinopyroxene Groundmass Olivine Plagioclase Clinopyroxene	ribution: Original (%) 3 2 15 Original (%) 13 32 1 4	hi Present (%) 1 15 Present (%) 12	xpocrys Replaced (%) 3 1 Replaced (%) 13 20 3	Size min. (mm) 1 1.5 Size min. (mm) 0.2 0.4 0.02 0.05	max. (mm) 1.5 1.2 2.6 Size max. (mm) 1 1 1 0.07 0.5	Shape subhedral subhedral subhedral Shape subhedral subhedral subhedral subhedral	basalt massive la Groundmass gra Minor Texture: Habit subhedral tabular Habit Habit equant tabular equant subequant	Ava flow ain size (avg.): Comments completely replace Contains both cor Cores show the m Fresh. No inclusion Comments Completely replace Often round in loc Significant alteratic cores while other crystal.	fine-grained intersertal red by serpentine ntinuous and oscillatory zoning ost alteration. Seriate texture ns. Subophitic.		

Groundmass Plagioclase Clinopyroxene Fe-Ti oxide Mesostasis Vesicle Vesicle Usicle Lithology: Grain size dis	10 7 40 0riginal (%) 6 etrolo	Empty (%) gy hi	40 Filled (%) 6	0.01 N/A Size min. (mm) 0.1	0.3 N/A Size max. (mm) 0.8		augite-olivine- basalt massive	N/A Significantly altered but microlites are still visible ite except where plucked plagioclase phyric lava flow grain size (avg.):
Plagioclase Clinopyroxene Fe-Ti oxide Mesostasis Vesicle Vesicle	10 7 40 Original (%) 6	Empty (%)	Filled (%)	N/A Size min. (mm)	N/A Size max. (mm)	N/A Shape subrounded	N/A Comments filled with calc	Significantly altered but microlites are still visible ite except where plucked
Plagioclase Clinopyroxene Fe-Ti oxide Mesostasis Vesicle	10 7 40 Original (%)		Filled (%)	N/A Size min. (mm)	N/A Size max. (mm)	N/A Shape	N/A Comments	Significantly altered but microlites are still visible
Plagioclase Clinopyroxene Fe-Ti oxide Mesostasis Vesicle	10 7 40 Original (%)		Filled (%)	N/A Size min. (mm)	N/A Size max. (mm)	N/A Shape	N/A Comments	Significantly altered but microlites are still visible
Plagioclase Clinopyroxene Fe-Ti oxide	10 7 40		40	N/A	N/A	N/A		
Plagioclase Clinopyroxene Fe-Ti oxide	10	10						
Plagioclase Clinopyroxene	10	10						
	30	10		0.05	1	subhedral	subequant	
Groundmass	30	15	15	0.3	0.8	subhedral	tabular	Almost compeltely altered to sericite
	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Clinopyroxene	7	7		1	3.2	subhedral	subequant	Large skeletal grains.
Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Grain size dis Major texture			orphyri	tic			Minor Texture	rain size (avg.): fine-grained : aphanitic
gneous P Lithology:		m	oderate	ely			augite phyric l	
307 9. 10 AUMS					15854 (39)			
_		Plane-po	olarized	d: 642	35221		C	ross-polarized: 64235241
	ion sumi	mary:	cpx, se skeleta graine Small, olivine catego compl	ome as al and d than blocky prized a etely re	s pheno mildly s in the groun phyric. as grou eplaced	ocrysts but a subophitic te massive flow dmass oxide Plag and oliv Indmass. Ol	Ilso some as exture. No oliv v but highly al es have skele vine have ser ivine is model . Plag is signif	ner-grained basaltic vein. Vein contains T groundmass. Slender crystals have a ine present. Groundmass plag is finer tered. Mesostasis is also highly altered. tal textures. Massive flow is highly Ti-cpx iate textures with most phenocrysts rately abundant in the groundmass but is icantly replaced. Mesostasis is completel
I hin sect			• •					Unit/subunit:
Thin sect Thin sect			WN					Piece no.:
Observer Thin sect Thin sect		L ID:	397T-	U1585	A-35R-	·9-W 42/46-	TSB-TS 39	Thin section no.: 39

Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Olivine	1		1	1	1.2	subhedral	subhedral	Completely replaced by chlorite. Seriate texture with most grains categorized as groundmass based on size.
Plagioclase	1		1	1	1.2	subhedral	elongate	Each crystal is almost completely altered. Seriate texture with most grains categorized as groundmass based on size.
Clinopyroxene	18	18		1.5	3.5			Fresh. subophitic textures. Poikolitic with both plag and olivine oikocrysts.
Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Olivine	12		12	0.2	1	subhedral	equant	Completely replaced by chlorite
Plagioclase	15		15	0.4	1			Most plag is partially to completely altered to sericite
Fe-Ti oxide	5		1	0.02	0.2		equant	N/A
Mesostasis	36		36	N/A	N/A	N/A	N/A	Significantly altered but microlites still visible
Vesicle	Original (%)	Empty (%)	Filled (%)	Size min. (mm)	Size max. (mm)	Shape	Comments	
Vesicle	2		2		1.3		filled with cal	ite

THIN SECTION LABEL ID:	397T-U1585A-36R-3-W 1/4-TSB-TS 40	Thin section no.: 40
Observer:	WN	Piece no.:
Thin section thickness:		Unit/subunit:
Thin section summary:	Highly Ti-cpx phyric with sparse olivine and plag p seriate textures with most crystals considered gro rimmed by chlorite; a few portions of the TS have sparse. Olivine can be found as clusters or individ altered to sericite. Mesostasis is altered but retain oxides. Oxides are blocky (not skeletal). Sparse s	undmass. Fresh olivine cores are completely replace olivine, but that is lual crystals. Plag is moderately is microcrystals of plag, cpx, and



highly

Igneous Petrology

Lithology:

Major texture:

Grain size distribution:

augite-olivine-plagioclase phyric basalt massive lava flow

Groundmass grain size (avg.):

Minor Texture:

fine-grained subophitic

Cross-polarized: 64235281

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Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments	
Olivine	1	1		1	1.2	euhedral	euhedral	Fresh cores with thin chlorite alteration rims	
Plagioclase	1	0.5	0.5	1	1.2	subhedral	elongate	Seriate texture. Contains both continuous and discontinuous zoned crystals	
Clinopyroxene	16	16		1	3	subhedral	subequant	Poikolitic around both plag and olivine. Fresh	
Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments	
Olivine	15	10	5	0.2	1	euhedral	equant	Fresh cores with rims of chlorite. Sometimes crystals are solo whereas other times they are in clusters	
Plagioclase	27	12	15	0.3	1	subhedral	tabular	Seriate texture. Plag is partially altered to sericite.	
Clinopyroxene	3	3		0.04	1	subhedral	subequant		
Fe-Ti oxide	4			0.05	0.3	subhedral	equant	N/A	
Mesostasis	31		31	N/A	N/A	N/A	N/A	Small oxide and plag microlite needles are visible	
Vesicle	Original (%)	Empty (%)	Filled (%)	Size min. (mm)	Size max. (mm)	Shape	Comments		
Vesicle	2	1	1	0.8	1.2	subrounded	vesicles are liked	vesicles are liked with radial zeolite	

THIN SECTION LABEL ID: Observer:	397T-U1585A-36R-7-W 7/10-TSB-TS 41 WN	Thin section no.: 41 Piece no.:
Thin section thickness:		Unit/subunit:
Thin section summary:	Highly Ti-cpx phyric with sparse olivine and plag seriate textures with most crystals considered gre average crystal size straddles the phenocrysts-g across the thin section. Veins of alteration create groundmass. This material was more susceptible processing. Fresh olivine cores are rimmed by ch completely replace olivine, but that is sparse. Pla sericite. Oxides are blocky (not skeletal). Sparse	oundmass. Cpx is a little finer, and the roundmass divide. Variable alteration e zones of highly altered crystals and to plucking during thin section hlorite; a few portions of the TS have ag is moderately to highly altered to

Plane-polarized: 64235711



Igneous Petrology

Lithology:

highly

Grain size distribution:

Major texture:

hypocrystalline

Cross-polarized: 64235731

augite-olivine-plagioclase phyric basalt massive lava flow

Groundmass grain size (avg.):

Minor Texture:

fine-grained subophitic

Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Olivine	1	1		1	1.2	euhedral	euhedral	Fresh cores with chlorite rims. Some small ol are completely altered. Seriate texture.
Plagioclase	1	0.5	0.5	1	1.2	subhedral	elongate	Seriate texture. Contains both continuous and discontinuous zoned crystals
Clinopyroxene	10	10		1	2.2	subhedral	subequant	Not as many very large phenocrysts. Fresh. Poikolitic with ol and plag oikocrysts
Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Olivine	21	15	6	0.3	1	euhedral	equant	Fresh cores with chlorite rims. Some small ol are completely replaced. Seriate texture.
Plagioclase	27	17	10	0.3	1	subhedral	tabular	Seriate texture. Elongate tabs. Plag is partially altered to sericite.
Clinopyroxene	10	10		0.04	1	subhedral	subequant	
Fe-Ti oxide	4			0.02	0.6	subhedral	subequant	N/A
Mesostasis	25		25	N/A	N/A	N/A	N/A	
Vesicle	Original (%)	Empty (%)	Filled (%)	Size min. (mm)	Size max. (mm)	Shape	Comments	
Vesicle	1	0.5	0.5	0.5	1	subrounded	vesicles are liked with radial zeolite	

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THIN SECTION LABEL ID:	397T-U1585A-37R-5-W 124/127-TSB-TS 42	Thin section no.: 42
Observer:	WN	Piece no.:
Thin section thickness:		Unit/subunit:
Thin section summary:	Highly Ti-cpx phyric with sparse olivine and plag physic seriate textures with most crystals considered groun rimmed by chlorite; a few portions of the TS have con- sparse. Plag is moderately altered to sericite. Meso- (not skeletal). Sparse subround vesicles are lined by on one side of the TS but otherwise texturally equiva-	ndmass. Fresh olivine cores are ompletely replace olivine, but that is stasis is altered. Oxides are blocky y zeolites. Band of higher alteration

Plane-polarized: 64235301





Igneous Petrology

Lithology:

highly

Grain size distribution:

augite-olivine-plagioclase phyric basalt massive lava flow

Groundmass grain size (avg.):

fine-grained

Major texture:		hy	ypocrys	talline			Minor Texture:	subophitic
Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Olivine	2	2		1	1.4	euhedral	euhedral	Fresh cores. Larger grains with alteration on rims and along fractures. Seriate texture
Plagioclase	2	1	1	1	1.2	subhedral	elongate	Seriate texture. Contains both continuous and discontinuous zoned crystals
Clinopyroxene	19	19		1	2.2	subhedral	subequant	Poikolitic with both plag and olivine. Fresh
Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Olivine	21	15	6	0.2	1	euhedral	equant	Fresh cores with chlorite rims. Seriate texture. Some form small clusters.
Plagioclase	29	12	17	0.3	1	subhedral	tabular	Seriate texture. Elongate tabs. Plag is partially altered to sericite.
Clinopyroxene	4	4		0.2	1	subhedral	subequant	
Fe-Ti oxide	4			0.02	0.2	subhedral	equant	N/A
Mesostasis	18		18	N/A	N/A	N/A	N/A	
Vesicle	Original (%)	Empty (%)	Filled (%)	Size min. (mm)	Size max. (mm)	Shape	Comments	
Vesicle	1	0.5	0.5	0.7	1	subrounded	vesicles are liked	with radial zeolite

Vesicle	5	1	4	0.5	1.2	subrounded	Lined with zeolit	e. Sometimes filled with calcite.		
Vesicle	Original (%)	Empty (%)	Filled (%)	Size min. (mm)	Size max. (mm)	Shape	Comments			
Mesostasis	10		10	N/A	N/A	N/A	N/A			
Fe-Ti oxide	3			0.02	0.2	subhedral	equant	N/A		
Clinopyroxene	10	10		0.2	1	subhedral	subequant			
Plagioclase	29	15	14	0.2	1	subhedral	tabular	Seriate texture. Elongate tabs. Zoning sometimes present.		
Olivine	33	25	8	0.2	1	subhedral	equant	Mostly fresh cores with chlorite rims. More complete alteration than see in many other TS wit fresh olivine. Seriate texture		
Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments		
Clinopyroxene	8	8		1	1.4	subhedral	subequant	Poikolitic with olivine and plag. Seriate texture wi more groundmass cpx than "normal"		
Olivine	2	2		1	2.2	euhedral	euhedral	Fresh cores. Seriate texture. Chlorite rim alteration is common; sometimes replaces entire crystal.		
Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments		
Major texture:		hy	ypocrys	talline		Ν	/linor Texture:	subophitic		
Grain size dist	ribution	:				C	Groundmass gra	ain size (avg.): fine-grained		
Lithology:			oderate	ely		a r	augite-olivine phyric basalt massive lava flow			
Igneous Pe	etrolo	av								
2-6. 92 9/4					85A (43)					
2	21000 m	Plane-po	olarized	l: 642	35341		Cro	ss-polarized: 64235361		
			Sparse	e subro	bund ve	esicles are lin	led by zeolites	d. Oxides are blocky (not skeletal).		
Thin secti	on sumi	mary:	texture chlorit	es with e; a fe	most o v portio	crystals consi ons of the TS	dered groundr have complet	nenocrysts. Olivine and plag have seria mass. Fresh olivine cores are rimmed b ely replace olivine. Plag is moderately d. Ovides are blocky (net ekoletel)		
Thin section								Unit/subunit:		
Observer:			WN					Piece no.:		
	N LABE	LID.	29/1-	01202	A-37 K	-6-W 1/4-TSE	5-13 43	Thin section no.: 43		

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THIN SECTION LABEL ID:	397T-U1585A-38R-5-W 96/99-TSB-TS 44	Thin section no.: 44				
Observer:	WN	Piece no.:				
Thin section thickness:		Unit/subunit:				
Thin section summary:	Sparsely olivine-Ti-cpx phyric massive flow. Most of the crystal cargo is groundma The largest crystals are olivine. Olivine is partially (rims and fractures) to complete altered to chlorite. Cpx is fresh. Plag is moderately altered. Sparse altered mesos present. Sparse vesicles are irregular and lined to filled with zeolite and calcite.					
Plane-p	oolarized: 64235751 Cross	s-polarized: 64235771				
	the second s					



Igneous Petrology

Lithology:

sparsely

olivine-augite phyric basalt massive lava flow

Groundmass grain size (avg.):

fine-grained

Grain size distribution:

Major texture:		hy	pocrys	talline		l	Minor Texture:	subophitic
Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Olivine	2	2		1	3	euhedral	euhedral	Fresh cores in some grains. Alteration on rims and fractures. Some completely replaced. Seriate texture.
Clinopyroxene	2	2		1	1.2	subhedral	subequant	Poikolitic with plag and olivine oikocrysts. Most cpx is groundmass-sized
Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Olivine	35	27	8	0.3	1	euhedral	equant	Mostly fresh cores with chlorite rims. More complete alteration than see in many other TS with fresh olivine. Seriate texture
Plagioclase	25	8	17	0.2	1	subhedral	tabular	Seriate texture. Elongate tabs. Zoning sometimes present.
Clinopyroxene	13	13		0.3	1	subhedral	subequant	
Fe-Ti oxide	8			0.02	0.12	subhedral	subequant	N/A
Mesostasis	9		9	N/A	N/A	N/A	N/A	
Vesicle	Original (%)	Empty (%)	Filled (%)	Size min. (mm)	Size max. (mm)	Shape	Comments	
Vesicle	6		6	0.3	1	subangular	Lined or filled wi	th zeolite

THIN SECTION LABEL ID: Observer:	397T-U1585A-38R-9-W 34/38-TSB-TS 45 WN	Thin section no.: 45 Piece no.:
Thin section thickness:		Unit/subunit:
Thin section summary:	Thin section poorly made with large patches missir olivine and Ti-cpx. Ti-Cpx if fresh but quite jagged fresh with only minor alteration rims. Groundmass However, altered plag and mesostatis become diffi missing rock. Groundmass oxides are small and bl phyric vein with highly altered groundmass and pla minerals are common. Skeletal groundmass oxides except for in cpx. Again, full description suffers from	due to missing patches. Olivine is plag, where in fact, look mostly fresh. icult to distinguish due to thin and locky. Domain 2: olivine-free Ti-cpx ig. Large radiating secondary s are scattered through entire vein







Igneous Petrology

Lithology:

moderately

Grain size distribution:

Major texture:

hypocrystalline

augite-olivine phyric basalt massive lava flow

Minor Texture:

Groundmass grain size (avg.):

fine-grained dendritic or skeletal

		,	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,					
Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Olivine	2.5	2	0.5	1	2.4	subhedral	subhedral	Fresh cores with minimal rim alteration. Seriate texture with most grains <1 mm.
Clinopyroxene	3	3			1.3			Seriate texture. Fresh.
Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments
Olivine	18	15	3	0.06	1	subhedral	equant	Very fresh with only small rims of chlorite alteration.
Plagioclase	35	20	15		1	anhedral		Seriate texture. Grain boundaries not always well defined
Clinopyroxene	10	10		0.3				
Fe-Ti oxide	7		0.5	0.3	0.12		equant	N/A
Mesostasis	25		25	N/A	N/A	N/A	N/A	
Vesicle	Original (%)	Empty (%)	Filled (%)	Size min. (mm)	Size max. (mm)	Shape	Comments	
Vesicle							Only one filled ve to evaluate	esicle. Too much TS was polished away, so its difficu

Igneous Pe	etrolo	gy							
Lithology: moderately					augite phyric vein massive lava flow				
Grain size distr	ibution	:					Groundmass g	rain size (avg.): fine-grained	
Major texture:	pocrystalline				Minor Texture:	radial			
Phenocrysts	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments	
Clinopyroxene	10	10		1	3.6	subhedral	subequant	Seriate texture. Skeletal Ti-cpx with plag or alteration in empty spaces.	
Groundmass	Original (%)	Present (%)	Replaced (%)	Size min. (mm)	Size max. (mm)	Shape	Habit	Comments	
Plagioclase	35	8	27	0.2	0.8	subhedral	tabular	Seriate texture where visible. Significant alteration makes it difficult to determine plag from something else.	
Clinopyroxene	6	6		0.04	1	subhedral	subequant		
Fe-Ti oxide	3			0.04	0.3	subhedral	subequant	N/A	
Mesostasis	36		36	N/A	N/A	N/A	N/A	abundant radiating crystals with microlites	
Vesicle	Original (%)	Empty (%)	Filled (%)	Size min. (mm)	Size max. (mm)	Shape	Comments		
Vesicle	8		8		1.8	subrounded	Only one large	vesicle, completely filled with radiating material.	

THIN SECTION	N LABE	L ID:	397T-l	U1585/	4-39R·	3-W 3/6-TSE	3-TS 46	Thi	in section no.:	46
Observer:			WN					Pie	ece no.:	
Thin section	on thick	ness:						Un	it/subunit:	
Thin sectio	mary:	Moderately Ti-cpx-olivine phyric massive basalt. All phases have seriate textures. Olivine is more abundant than Ti-cpx but is mostly a groundmass phase. Ti-cpx has some subophitic crystals though most are blocky. Olivine has thin rims of chlorite with fresh cores. All plag is groundmass-sized and is significantly altered. Mesostasis is al altered and contains microphenocrysts of oxides and cpx. Groundmass oxides are blocky.								
	F	Plane-po	olarized	l: 642:	35421		Cro	ss-polarized: 6	64235441	
P-3, 12 3/					(b) VCQC					
Igneous Pe Lithology:	etrolog		oderate	ely	0		nugite-olivine p	hyric basalt		
		m	oderate	ely		a	nassive lava flo	W	fine-grained	
•		m	oderate			a r (augite-olivine p nassive lava flo Groundmass gra Minor Texture:	W	fine-grained intersertal	
Lithology: Grain size distri Major texture:		m			Size max. (mm)	a r (nassive lava flo Groundmass gra	W	-	
Lithology: Grain size distri Major texture:	ibution:	m : hy	/pocrys	talline Size min.	Size max.	a r C N	nassive lava flo Groundmass gra Minor Texture:	w ain size (avg.):	intersertal	
Lithology: Grain size distri Major texture: Phenocrysts Olivine	ibution:	m hy Present (%)	/pocrys	talline Size min. (mm)	Size max. (mm)	a r C N Shape	nassive lava flo Groundmass gra Minor Texture:	w ain size (avg.): Comments Fresh cores. Altered Seriate texture. Sor	intersertal	s but not al to being
Lithology: Grain size distri Major texture: Phenocrysts	original (%) 2.5	m hy Present (%) 2	/pocrys	Size min. (mm)	Size max. (mm) 1.8	Shape subhedral	nassive lava flo Groundmass gra Minor Texture: Habit subhedral	w ain size (avg.): Comments Fresh cores. Altered Seriate texture. Sor Overall on the bloc	intersertal d rims ne subophitic grain	s but not al to being
Lithology: Grain size distri Major texture: Phenocrysts Olivine Clinopyroxene	ibution: Original (%) 2.5 4	m hy Present (%) 2 4	/pocrys Replaced (%) 0.5 Replaced	talline Size min. (mm) 1 1 Size min.	Size max. (mm) 1.8 3.2 Size max.	Shape subhedral subhedral	nassive lava flo Groundmass gra Minor Texture: Habit subhedral subequant	w ain size (avg.): Comments Fresh cores. Altered Seriate texture. Sor Overall on the bloc long and slender.	intersertal d rims ne subophitic grain ky side as opposed	s but not al to being

10

6

25

Original (%)

3

10

Empty (%)

0.2

0.04

N/A

Size min. (mm)

0.4

0.5

25

Filled (%)

3

1

0.2

N/A

Size max. (mm)

2.6

Clinopyroxene

Fe-Ti oxide

Mesostasis

Vesicle

Vesicle

subhedral

subhedral

N/A

Shape

subrounded

subequant

subequant

Comments

N/A

N/A

varies from roughly circular to rather elongate.

difficult to destinguish between altered plag and altered mesostasis