DATE: 14 August 1984 SAMPLE:
CRUISE ID: SO 33 38 DK box dredge
LOC: VI
AREA: D (near SP Lee Guyot)

	time (GMT)	LAT (N)	LON (W)	water depth (m)	wire c
ON BOTTOM =	0235	9°10.320	164°49.555	~1848	1918
OFF BOTTOM =	0406				1362

RECOVERY WEIGHT = total 100 kg crust 1 kg

CRUST THICKNESS = 2-4 mm Veneer
Avg 2 mm
1 generation

SUBSTRATE = tan phosphorite, scorria w/ phosphorite in the vesicles, breccia (hydrothermal?)

COMMENTS:

* 1 Bio sample

2	1	6
Rock Type: Vitric Basalt Tuff (I)	Volcanogenic Breccia, I Calcareous	Volcanogenic Breccia, II tuffaceous
Color: Dusky yellowish-brown (10 YR 2/2) to Moderate brown (5 YR 4/4)	Very pale orange (10 YR 8/2) (cement color)	Blackish red (5R 2/2)
Texture: pyroclastic granular	Clastic →	→ -do-
Matrix: fragmental basalt →	→ -do- →	→ -do-
Cement: absent	phosphorized? Calcareous (foramin-feral) ooze	absent
Avge grain size: ± 0.10 mm (avge) (silt to fine sand)	extremely variable; (± 5 mm avge) (silt to cobble-size)	(± 3 mm avge) (sand size – cobble size)
Grain shape angular →	→ -do- →	→ -do-
Sorting: well-sorted	extremely poor sorting →	→ -do-
porosity: 70-80 %	± 10 %	70-80%
permeability: -do-	± 5 %	-do-
Alteration: extensive to complete (oxidation, hydration, smectitization)	extensive; → (phosphorization of cement, iddingsitization of olivine, oxidation, hydration of glass)	→ -do- Oxidation, hydration, iddingsitization of olivine, zeolitization, smectitization?
Remarks: angular clasts from pebble to cobble-size dislodged from outcrop by dredge. Very well-sorted and size graded indicating reworking by water (probably wave-action on a beach). Some specimens are highly weathered, indicating development of soil. Outcrops exposed to sea water often bear thick (± 1 cm) encrustation of warty ferromanganese crust	angular pebble-to-boulder-size clasts (probably dislodged from outcrop by dredge) composed of pebble-to-cobble-size fragments → scoriaceous basalt cemented by phosphorized, indurated calcareous (foramin-feral) ooze (areas within cement display beds of sand-to-gravel-size basaltic clastic material); considerable $Fe(OH)_3$ staining to several mm below Mn-oxide encrustation (± 2 mm thick) on surface exposed to sea water; composed of (probably) related basalt clasts in varying states of alteration	→ -do- → lapilli-and-ash tuff form "cement" of this breccia ≠ → -do-

	1A	1B	3
Rock Type:	Basalt (AoB) I (Scoriaceous)	- do -, II	- do -, III (not scoriaceous)
Color:	Very dusky red (10R2/2)	Dark Gray (N3)	Dark brownish-gray (5YR3/1)
Texture:	subaphyric hyalo-pilotic	- do -	Phyric, intersertal (intergranular)
Phenocrysts:	Olivine, ± 1%, ±1mm	- do - <<1%, ±1mm	Olivine, ± 7% (glomerophyric and single euhedral microphenocrysts); plagioclase, ± 3%
Groundmass:	Glass, Plagioclase?, Olivine, Clinopyroxene?, Opaques (not determined)	- do -	Plagioclase ±, Olivine, Clinopyroxene, Opaques, glass (not determined)
Vesicles:	%: extremely variable (60-80%) avge	± 50%	± 15%
	Size: quite variable (±1 mm avge)	±1 mm dia.	quite variable (± 3mm avge)
	Shape: round to irregular oval (usually coalescing)	irregular coalescing, giving a very spongy texture	round to irregular (coalescing)
	Filling: generally empty	calcite (± 50% of total vesicles)	Calcite (± 25% of total vesicles)
Alteration:	intense: Oxidation, iddingsitization of all olivine, hydration?	superficial; partial iddingsitization of olivines	extensive; oxidation, partial complete iddingsitization of olivine
Remarks:	pebble to boulder-size angular clasts of Volcanogenic breccia containing pebble-to-cobble-size angular (lapilli) fragments of basalt scoria cemented by phosphorized calcareous ooze; basalt appears to have been oxidized and hydrated prior to eruption (dark red color) surfaces exposed to seawater coated thinly (±1mm) with Mn-oxide encrustation	similar size grades to material described at left, but basalt appears to be much fresher; lapilli and bombs cemented with lapilli tuff (very oxidized material) and coated with thin (±1 mm) encrustation of Mn-oxide on surfaces exposed to seawater.	More dense, more crystalline basalt material found cemented in phosphorized calcareous ooze, altered, but much less so than the basalt scoria described at far left; mineralogy and morphology suggest origin in a different eruption.

all related?

(Component of Volcanogenic Breccia I)

4

Rock Type: Volcanogenic Breccia III	50 S3 38 DR 4A Basalt (AOB(?)) Flow Breccia (Aa)
Color: Moderate yellowish-brown (10YR 5/4) to moderate brown (5YR 4/4)	(Mottled - variegated) moderate Brown (5YR 4/ to pale grayish-brown (5YR 4/2) to brownish-black (5YR 2/1)
Texture: Clastic	Hyalopilitic Aphyric
Matrix: frags, 50%; Volcanogenic Breccia II frags, 30%	Ø
Cement: open space 10%; zeolite 5%; phosphorite 5%	Ø
Phenocrysts: ~~Absent~~	- do.
Groundmass: Ø	opaques, Glass, microlites, undetermined.
Average grainsize: ± 5 mm (sand - pebbles range)	Ø
" Grain shape: Subangular	Ø
Vesicles: Ø	absent in moderate brown basalt "cement", irreg. shape, ± 0.5 mm size, ± 15% (calcite - fi... in brownish-black basalt aa-clinker mat... material
Sorting: Very poorly-sorted	Ø
Porosity: 10-15%	Ø
Permeability: ±15%	Ø
Alteration: superficial (phosphorization of cement)	moderate to (almost) complete (oxidation, zeolitization, argillation, hydration, carbonation)
Remarks: Crust-like clasts composed of small AOB(?) fragments & cinders from Volcanogenic Breccia II & III loosely-cemented with chalk/phosphorite and zeolites, covered with a soot-like mantle of ferromanganese oxide; presents a very rough, pebbly-looking surface.	fine gravel-to-pebble-size clasts of vesicular, fresher basalt set in "cement" of much-more-altered basalt of different composition (aband. ore, plases, pyroxene(?), no phenocrysts) Probably related to Basalts I, II, & III.

	7		8
Rock Type:	Lithic Basalt Tuff (II)	→	Basalt, (AOB (?))
Color:	Pale grayish purplered (5RP 5/2)	→	Light brownish-gray (5YR 5/1)
Texture:	Pyroclastic	→	Intersertal (?)
Matrix:	Basalt fragments		(Phenocrysts:) Olivine (microphenocrysts, ± 0.75 mm, ± 20
Cement:	calcite / zeolites (?)		(Groundmass:) Plagioclase, olivine, pyroxene (?), opaques (?), glass } (not determined)
Avge grain size:	fine sand (0.10 mm)	≠	
" " shape:	angular subequidimensional	≠	
Sorting:	well-sorted		(Vesicles:) %: ± 20%; shape: irregular; size: ± 3 mm; filling: empty, calcite, chalk, phosph (± 25%
Porosity:	± 70%	≠	
Permeability:	± 70%	≠	
Alteration:	Extensive (oxidation, argillation, zeolitization (?), carbonation (?), hydration)	→	; do -
Remarks:	Small fragments probably derived from volcanogenic breccia III (contains included pieces of the AOB (?) flow breccia "cement" and has adhering zeolite / carbonate / ash.) generally uniform grain size throughout, but disparate particles up to coarse sand size concentrated on one side of a fragment. appears to be composed largely of material related to other basaltic material recovered from this dredge.	→	fragments of large clasts, probably derived from volcanogenic breccia I or III; contains curious marbled inclus of baked (?) phosphorite (?) in the groundm as well as infiltration (?) into vesicles, yield amygdales exposed surfaces coated w a patina of maroon $Fe(OH)_3$ (?) instead of ferromanganese crust.