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 out
ON BOTTOM =	0235	9° 10.320	164° 49.555	~1848	1918
OFF BOTTOM =	0406				1368
mean dredge data (corrected):		9° 10' 43"	164° 49' 22"	1637 (895 fm)	

RECOVERY WEIGHT = total 100 kg crust 1 kg

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

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

COMMENTS:

* 1 Bio sample

38 DK

Gesamtmenge 100 kg
davon 5 kg Kruste

Hydrothermale Breccie, sehr porös, rötlich und grünliche Farbe, Basalt - hydrothermal ausgelaugt

2-4 mm Fe-Kruste mit knotiger Oberfläche

38 DK 1 hydrothermale Breccie 30×20 cm, mit 2 mm Kru
Klasten von 5 cm große Blasenlaven

Sample Description

Cruise I.D: So 33

Sample I.D: Sta: 38 OK

Location: S Plee Sun

9° 10' 43" N
164° 49' 22" W
(-) 1637 m

Size: _____ Weight: _____

Mn crust thickness:

Total: min: _____ max: _____ ave: _____

Inner crust: min: _____ max: _____ ave: _____

Outer crust: min: _____ max: _____ ave: _____

Surface texture: _____

Internal structure: _____

layered: _____
laminated: _____
massive: _____
porous: _____
dendritic: _____
other: _____

Mineralogy (XRD): _____

Associated alteration, phosphorite, or hydrothermal deposits:

Substratum:

Rock type: _____

Description: _____

Mineralogy (XRD):

Analyses and subsamples:

analysis:	analyst:

Rock Type:	Vitric Basalt Tuff (I) 2	Volcanogenic Breccia, I, Calcareous 1	Volcanogenic Breccia, II, tuffaceous 6
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:	fragments of basalt →	-do- →	-do-
Cement:	absent	phosphorized(?) Calcareous (foram.-bearing) ooze	absent
Avge grain size:	± 0.10 mm (range silt to fine sand)	extremely variable; (silt to cobble size) (± 5 mm avge)	(± 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, zeolitization)	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 seawater show basal thick (± 1 cm) encrustation of nearly 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 (foram.-bearing?) ooze (areas within cement display beds of sand-to-gravel-size basaltic clastic material); considerable $Fe(OH)_3$(?) staining to several mm below manganese-oxide encrustation (± 2 mm thick) on surfaces exposed to seawater; composed of (probably) related basalt clasts in varying states of alteration →	-do- → lapilli-and-ash stuff forms "cement" of this breccia → -do-

Sample Description

Cruise I.D: 5033 Sample I.D: Sta: 38 DK Location: SP Lee Smt area

90°10'43" N
164°49'22" W
(-) 1637 m.

Size: _____ Weight: _____

Mn crust thickness:

Total: min: _____ max: _____ ave: _____

Inner crust: min: _____ max: _____ ave: _____

Outer crust: min: _____ max: _____ ave: _____

Surface texture: _____

Internal structure: _____

layered: _____
laminated: _____
massive: _____
porous: _____
dendritic: _____
other: _____

Mineralogy (XRD): _____

Associated alteration, phosphorite, or hydrothermal deposits:

Substratum:

Rock type: _____

Description: _____

Mineralogy (XRD):

Analyses and subsamples:

analysis:	analyst:

	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 euhedra); plagioclase, ± 3% (microphenocrysts)
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 varible (±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 to 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 (±1 mm) 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 a 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)

Sample Description

Cruise I.D: 5033

Sample I.D: Sta: 38 DK

Location: SPLee Smt Area
9° 10' 43" N
164° 49' 22" W
(-) 1637 m

Size: _____ Weight: _____

Mn crust thickness:

Total: min: _____ max: _____ ave: _____

Inner crust: min: _____ max: _____ ave: _____

Outer crust: min: _____ max: _____ ave: _____

Surface texture: _____

Internal structure: _____

layered: _____
laminated: _____
massive: _____
porous: _____
dendritic: _____
other: _____

Mineralogy (XRD): _____

Associated alteration, phosphorite, or hydrothermal deposits:

Substratum:

Rock type: _____

Description: _____

Mineralogy (XRD):

Analyses and subsamples:

analysis:	analyst:

4 III	4A
Rock Type: Volcanogenic Breccia III	Basalt (AOB?) Flow Breccia (Aa)
Color: Moderate yellowish-brown (10YR 5/4) to moderate brown (5YR 4/4)	(Mottled - variegated) moderate brown (5YR 4/4) 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% {open space 10% {zeolite 5% {phosphorite 5%	∅ ∅
Cement:	
Phenocrysts: Absent	- do.
Groundmass: ∅	opaques, Glass, microlites, undetermined.
Average grainsize: ± 5 mm (sand-pebbles range) " Grain shape: Subangular	∅ ∅
Vesicles: ∅	(absent in moderate brown basalt "cement", irreg. shape, ± 0.5 mm size, ± 5% (calcite-filled in brownish-black basalt aa-clinker matrix material
Sorting: Very poorly-sorted	∅
Porosity: 10-15%	∅
Permeability: ±15%	∅
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 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 (absnd. ore plates, pyroxene(?), no phenocrysts) Probably related to Basalts I, II, & III.

Sample Description

Cruise I.D: So 33

Sample I.D: Sta: 38 DK

Location: SP Lee Smt Area
9°10'43" N
164°49'22" W
(-) 1637 m

Size: _____ Weight: _____

Mn crust thickness:

Total: min: _____ max: _____ ave: _____

Inner crust: min: _____ max: _____ ave: _____

Outer crust: min: _____ max: _____ ave: _____

Surface texture: _____

Internal structure: _____

layered: _____
laminated: _____
massive: _____
porous: _____
dendritic: _____
other: _____

Mineralogy (XRD): _____

Associated alteration, phosphorite, or hydrothermal deposits:

Substratum:

Rock type: _____

Description: _____

Mineralogy (XRD):

Analyses and subsamples:

analysis:	analyst:

Rock Type: Lithic Basalt Tuff (II) 5 → Basalt, (AOB (?)) 6

Color: Pale grayish purple red (5RP 5/2) → Light brownish-gray (5YR 5/1)

Texture: Pyroclastic → intersertal (?)

Matrix: Basalt fragments

(Phenocrysts): Olivine (microphenocrysts, ± 0.5 mm, ± 20%

(Groundmass): Plagioclase
olivine
pyroxene (?)
opaques (?)
glass
} (not determined)

Cement: calcite / zeolites (?)

Avge grain size: fine Sand (0.10 mm)

" " shape: angular subequidimensional

(Vesicles:) %: ± 20%
Shape: irregular
Size: ± 3 mm
Filling: empty, calcite, chalk, Phosphate (± 25% of total ves.

Sorting: well-sorted

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 marble-inclusion of baked (?) phosphorite (?) in the groundmass, as well as infiltration (?) into vesicles, yielding amygdales exposed surfaces coated with a patina of maroon $Fe(OH)_3$ (?) instead of ferromanganese crust.