DATE: 14 August 1984 SAMPLE:
CRUISE ID: SO 33 41 DK box dredge
LOC: VI
AREA: D (near SP Lee Guyot)

	time (GMT)	LAT (N)	LON (W)	water depth (m)	wire out
ON BOTTOM =	1520	9°8.386	164°47.364	~2500	3100
OFF BOTTOM =	1629				2188
mean dredge data (corrected):		9°08'41"	164°47'22"	2348 (1284 fm)	

RECOVERY WEIGHT = Total 5-10 kg crust <1 kg

CRUST THICKNESS = 0.5-0.7 cm Avg = 0.5 cm
1 generation

SUBSTRATE = hyalocastite, phosphorite

COMMENTS:

41 DK

41 DK

Gesamtmenge: 5 kg
davon 1 kg Kruste

Hyaloklastit, feinkörnig, phosphatisiert, auflagernd 0,5-0,7 cm Kruste, feinstknospige Oberfläche teils / knospig
nodose (?) surface partly cuspate (?)

41 DK1 Hyaloklastit, stark alteriert und porös mit 0,5 cm Mn-Kruste
strongly altered porous (?)

41 DK 2 isolierte Mn-Krustenbruchstücke, 0,5-0,9 cm mächtig, Krustenoberfläche glatt, lagiger Krustenaufbau

41 DK 3 total umkrusteter Hyaloklastit, 0,5 cm Mn-Kruste Lapilli im 0,5 cm Bereich

41 DK 4 Alkali-Olivin-Basalt mit 2-3 mm Mn-Umkrustung, feinstknotig, korrodiert.

41 DK 5 Phosphorit dicht, massig, Mn-Umkrustung 1 mm

41 DK 6 Hyaloklastit und Phosphorit, sowie Alkali-Olivin-Basalt Breccie mit 0,5 mm mächtiger Mn-Umkrustung

Sample Description

Cruise I.D: S133

Sample I.D: Sta: DK41

Location: S. P. Lee Guyot
9°08'41" N
164°47'22" W
(-) 2348 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: Olivine Scoriaceous Basalt (208?) →	(vesicular)
Color: Brownish-black (5YR 2/1) +	Dark brownish-gray (5YR 3/1)
Texture: Subaphyric; (Aphanitic) hyalopilitic, microlitic	Phyric, hyalopilitic / intersertal
Phenocrysts: extremely rare olivine (±1 mm, <1%) (single anhedra)	Olivine, ±10%, ±1 mm dia.
Groundmass: Glass, Olivine?, Plagioclase?, clinopyroxene?, opaques? (not determined) →	-do-
Vesicles: %: ±40%	± 15%
Size: ± 0.75 mm	± 2 mm
Shape: round	round to irregular, coalesing
filling: variable those near surface are 100% filled with calcite? zeolites?, those at depth 100% empty	calcite, zeolites?: ± 5% of total vesicles
Alteration: moderate to complete (Oxidation, [illegible] xysification of olivine, hydration, Zeolitization?) Original glassy rind now totally altered to zeolites?, $Fe(OH)_3$(?) Smectitization. →	-do-
Remarks: pebble-to-cobble-size free and en matrix angular clasts broken from volcanic effusa and pyroclastic material; a few pieces are flow basalt but most were probably lapilli and bombs; some bore glassy rinds which are now completely altered to zeolites and $Fe(OH)_3$(?) or goethite; Mn-oxide crusts on surfaces exposed to seawater highly variable in thickness (<1 mm – 5+ mm); knobby, cuspate surfaces on encrustations →	-do-

Sample Description

Cruise I.D: 5033 Sample I.D: Sta: 41 DK Location: SP Lee Smt area

9°08'41" N
164°47'22" W
(-) 2348 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: Basaltic Hyaloclastite Breccia	Basaltic Volcanogenic Breccia	Phosphorite / chalk
Color: Moderate reddish-brown (10 R 4/6)	Dark reddish-brown (10R 3/4)	yellowish-white (5Y 9/1 to yellowish gray (5Y 8/1)
Texture: pyroclastic	→ -do-	granular
Matrix: Basaltic glass fragments ±40%	→ ±65%	foraminifera(?) ±90%
Basaltic rock fragments: ±17%	→ ± 5%	→ -do-, ± 5%?
Manganese Micronodules ±3%		
Cement: calcite, zeolites(?) ±40% francolite(?)	→ ±30%, thin, loosely-bonded cementing by calcite around perimeter of clasts, much open space	francolite? ±5%?
Avge grain size: (± 10mm avge) varies greatly fine sand – cobble size	Varies, (± 5mm avge) Coarse sand – pebble size	±0.25 mm
" Grain Shape: angular – subangular	subangular – subround	round
Sorting: extremely poorly sorted	poorly sorted	well-sorted
Porosity: ± 30%	± 60%	90+%
Permeability: ±20%	± 60%	90+%
Alteration: extensive – complete oxidation iddingsitization of olivines, smectitization, zeolitization?, carbonation, hydration	→ -do- rare pieces are fresh, unoxidized, like 41 DK 1	original calcite mostly replaced by francolite(?) (apatite)
Remarks: pebble to boulder-size clasts both free and dislodged by dredge from outcrop, composed of widely-varied sizes and types of olivine basalt cemented by calcareous ooze; great disparity of grain sizes, shapes, suggest rapid deposition from high-energy environment, rapid cementation and induration; serves as substrate for ferromanganese encrustion dense, indurated, ± 5 mm thick, nodose, wardy surface topography	→ -do- but most components are oxidized basaltic glass froth (lapilli ejecta); probably reworked to a degree by wave action subaerially (better sorting, rounded grains); graded bedding – larger components lower down smaller higher up; serves as substrate for [illegible]	small, subangular to subround clasts (pebble-size) composed of foraminiferal tests; most of the original shell material appears to be leached, leaving a very spongy open texture; superficial reaction with HCl solution – probably mostly replaced with apatite; serves as substrate for thin, soot[illegible] encrustations of ferromanganese deposit.