DATE: 5 August 1984 SAMPLE:
CRUISE ID: SO 33 8DK Box dredge
LOC: II
AREA: B

	time (GMT)	LAT (N)	LON (W)	water depth (m)	wire
ON BOTTOM =	0333	9°41.6316	162°10.7043	1993 (1090 fm)	
(uncorrected) OFF BOTTOM =	0412	9°42.2912	162°10.5936	1829 (1000 fm)	2000
mean dredge data (corrected):		9°42'06"	162° 10'58"	2262 (1237 fm)	

time on bottom = 39 min

RECOVERY WEIGHT = Total 120 kg crust 8 kg
15 kg basalt
97 kg sediment

CRUST THICKNESS = 2 mm - 2 cm Avg = 0.5 cm
"Rusty" looking crusts

SUBSTRATE = basaltic, hyaloclastic breccia, phosphorite, carbonate w/ Fe-stain
Sediment is white, compacted (1 m × 1 m × 0.1

COMMENTS:
No biota
"Rusty" looking crusts - maybe hydrothermal?

* 1 microbio sample

8DK

8 DK

Gesamtmenge: 100 kg

Mn-Krusten überwiegend dünn, teilweise bis 2 cm auf basa
Breccie, stark phosphatisiert, reine Basaltbruchstücke, carbo
natisch bis phosphatisierter Sandstein mit haardünnen Krus
teilweise ist das gesamte Substrat mit Fe-hydroxid über-
zogen (Rotfärbung), Krusten sind durch eine Phosphorit-La
vom Substrat getrennt.

8 DK 1 basaltische Breccie Stücke von 0,5 - 5 cm Größe,
zementiert mit Phosphorit, Krusten durch 2 mm
Phosphorit-Lage getrennt, Krustenoberfläche grob
(1 cm), knotig (0,5-1 cm), darauf feinknospige
Strukturen aufliegend.

8 DK 2 2 cm Kruste auf basaltischer Breccie, Substrat u
unter mit Fe rote Übergänge verseden.

8 DK 3 teilweise grob-, teils knospige Oberfläche isolierte
Mn-Kruste

8 DK 4 rötlicher hyaloklastischer Material ohne Kruste

8 DK 5 hellgelber, carbonatischer Sandstein, teils phosphat

8 DK 6 grobe basalt. Breccie, phosphatisiert, Krusten
seitlich 2 cm, Oberfläche feinknospig, Oberseite
Kruste 0,5 cm, glatte stromatolithische Oberfläche

8 DK 7 basalt. Substrat, zonare Kontaktzone, Krustenauf-
lage 1 cm, grobknotig mit aufsitzenden kleine
Knospen

8 DK 8 poröse knotige Krustenoberfläche auf Breccie

8 DK 9 isolierte knotige Mn-Kruste Unterseite phospha

ca 20 kg Kruste

Sample Description

Cruise I.D: S033 BOK Sample I.D: Sta: Location: "Sonne" Sm
162°10'58" W
9°42'06" N
(-) 2262 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:

	8DK1	8DK2	8DK3
Rock Type:	Basalt (AOB?) (some pillowed)	Basalt Hyalo clastite	Basalt Breccia
Color:	Dark gray N3 (fresh break)	Light brown 5YR 6/4	Moderate Brown (5YR 3/4) & (5YR 4/4) grayish-brown (5YR 3/2) to light brown (5YR 6/4)
Texture: (~2900 m depth)	Subaphyric, subtrachytic, hyalopilitic – ? intersertal ?	Clastic (? holohyaline / hyalopilitic)	Clastic
Phenocrysts:	Plagioclase – ±1% ±0.5 mm Olivine – ± 1%, ±1.5 mm	not observed	not observed
Groundmass:	Plagioclase Olivine ? Clinopyroxene ? Opaques Glass } <0.10 mm diam. av % est.	foraminiferal tests – ±8% devitrified glass ≈60 rock fragments – ±30% manganese micronodules ±1%, ±1 mm dia Clasts ± 1 cm dia. ±1% basalt, phosphorite, chalk- Smectite, zeolites, phosphorite;	as in basalt samples
Cement			phosphorite very pale orange (10YR 9/2) grayish-orange to dark yellowish-brown (10YR 6/2)
Vesicles:	absent in lower parts of flows, near contact 35 ±%, round, ±3 mm dia. flat vesicle ½ x 10 cm observed 1 cm below contact, empty to 50±% filled w/ calcite, aragonite, zeolites;	free in some hyaloclastite fragments – very small	not observed
Alteration:	along fractures (localized subsolidus – oxidation, predominantly also hydroxylation, smectitization)	to smectite zeolites; $Fe(OH)_3$ highly weathered to brown rock	intense oxidation of rock fragments, remobilization of Fe-oxide, smectite, zeolitization, phosphatization;
Sorting:		moderately sorted	very poorly sorted
Clasts:	axial directed texture; oriented plagioclase gives rock a micaceous appearance on broken ⊥ to upper surface, acicular appearance ∥ to upper surface; $Fe(OH)_3$ stains along fractures Suggests hydrothermal activity (according to phosphate) Vesicles show flattening of flows against lighter gray (~N7) often stained with $Fe(OH)_3$. Some pillows bear ±1 cm-thick fine-grained ~YYR glassy rind ← (intersect pod edit?)	fragmental, highly altered rock – sorting indicates possible subaerial exposure, deposition, $Fe(OH)_3$ staining & Mn-Oxide deposits on fracture free indicate hydrothermal activity, also do zeolites?) smectite. Since it incorporates clasts of phosphorite and basalt must be later in development	angular clasts of coarse gravel through pebble size AOB? basalt and basaltic glass generally very altered Cemented by phosphorite and coated with thin (2-3 mm) crust of warty, aspute [-Mn?]

Sample Description

Cruise I.D: So 33 5 DK Sample I.D: Sta: Location: Sonne Stn
162°10'58" W
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(-) 2262 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:

	8DK4	8DK5	8DK6
Rock Type:	Chalk-Phosphorite (foraminiferal SS)	Volcanogenic Marl	Hyaloclastite - Chalk-Phosphorite
Color:	Very pale orange (10YR 8/2)	Pale orange brown (5YR 6/2)	Light orange brown (5YR 7/4)
Texture:	coarsely granular	finely granular	coarsely granular
Matrix:	Globigerina, Globorotalia? forams.	micromanganese nodules 5% 0.25mm; Calcareous foraminiferal tests?) - ±50%; lithic volcanic fragments - ±10%; vitric? volcanic fragments - ±5%; smectite? - ±30%; (0.001-0.5+ mm dia.	Globigerina(?), globorotalia(?) tests phosphorized; basaltic glass shards ±30%; basaltic rock fragments - ±5%, ±1mm; Manganese micronodules?) - ~2%, ±1mm
Comp. %	±75%		
Size	0.5mm avge		
Cement:	zeolite?, calcite?, dahllite? ±25%	smectite? ±30%	phosphorite? - ±5%; smectite - ±10%; zeolites? - ±3%; Fe(OH)? - <1%; calcite? - ±5%
Autochems	calcite(?) zeolites	micromanganese nodules; zeolites(?); calcite?; dahllite(?) →	
Allochems:	phosphorite; basaltic rx, glass fragments (silt-to fine sand)	volcanic rx fragments →	
Allofiths			
Autoliths:	reworked pieces of phosphorite	reworked calcite, phosphorite →	
Sorting	moderately well-sorted	well-sorted	moderately well-sorted
Grain size:	±0.5mm (avge) (moderate sand)	0.01mm? (avge)	0.5mm (avge)
Porosity:	±45%	40-60%	±50%
Permeability:	±50%	±50%	±50%
Remarks:	Looks like it may have originally been Globigerina most now partly recrystallized ooze, subsequently altered partly to dahllite (still effervesces [illegible]), stained yellowish by Fe(OH)3; highly stratified fairly indurated; breaks along bedding planes to give rough flagstones; stained along fractures by soot-black to dark-ite, remobilized Mn-oxide; bears numerous worm burrows ⊥ to bedding (~3mm dia) sometimes cavernous due to solution erosion? could possibly have been subaerially exposed?	Very strongly stratified silty clay (visible bed thickness varies up to ±10mm, beds frequently delineated by thin layers (±0.25mm) of micromanganese nodules. larger, isolated clasts of subangular phosphorite basalt rarely apparent; hyaloclastite; penetrated by worm burrows which have subsequently been infilled with nanno/globigerina(?) ooze. fracture faces coated with Mn-oxide coatings	Similar to the chalk-phosphorite but more volcanogenic component probably penecontemporaneous with it. does not effervesce much; stained pale orange by Fe(OH)3 (ubiquitous component - may be of hydrothermal origin;