DATE: 11 August 1984 SAMPLE:
CRUISE ID: SO 33 29 DK box dredge
LOC: IV
AREA: C

	time (GMT)	LAT (N)	LON (W)	water depth (m)	wire o
ON BOTTOM =	0616	6°16.2587	16252.5302	2957	340
OFF BOTTOM =	0724	6°16.3652	162°52.3315	2414	257
mean dredge data (corrected):		6° 16' 35"	162° 52' 23"	2788 (1525 fm)	

RECOVERY WEIGHT: ~~total~~ 20 kg crust < 1 kg
5 kg chalk
5 kg basalt
5 kg breccia
5 kg ash hyaloc

CRUST THICKNESS: Veneer to .2 cm very thin
Mg = veneer

SUBSTRATE: Basalt, breccia, consolidated white sediment; Nice contact of (hyaloclastic) ash with breccia, with crust.

COMMENTS:
Bioturbation - worm burrows, especially in the chalk.

* smear slides of consolidated sediment

29 DK

*** **Petrographische Daten Sediment**

RV Sonne So 33 Midpac II 29.7 - 29.8.1984

Datum: 11.08.84 Areal: C Lokation: IV Station: 29 DK

Probennummer: 29 DK Sediment

Längengrad, nk: Lat = 6°15.717-6°16.943 N k: bottom contact 6°16.25 N' Lat

Breitengrad, nk: Lon = 162°52.963-162°52.943 Wk: -162° 52.53 Long

Wassertiefe (m) : 2953-2350 Bereich (m):

Typ: consolidated white foraminiferal ooze Farbe: white

>63µm (Gew.%): < 63 um (Gew.%): 97.3% $CaCO_3$

Hpt. Bestd. Teile >63µm.:

Neb. Bestd. Teile >63µm.:

Hpt. Bestd. Teile <63µm.:

Neb. Best. Teile <63µm.:

H_2O-Gehalt (Gew.%) :

Bemerkungen: In smear slides:
Very clean, very little Fe-staining

315-500µ: 97% recrystallized solid white chips
2% Dorothia Foraminifera
1% micronodules + other lithic fragments

125-200µ: 70% Dorothia
19% Recrystallized white fragments + broken forams
10% Globogerinella (siphonifera).
1% Mn micronodule, zeolite

25 DK 5 — 30 x 30 cm Blasenlava, Blasengröße ~ 2 mm schwarzer Mn-Belag (lapis)

25 DK 6 — Hyaloklastit mit 3-4 mm Mn-Kruste, feinknotig

25 DK 7 — Tuffit, einige Bereiche feinkörniger, ohne, gelblich -> hydrothermaler Einfluß ?

25 DK 8 — dunkelbrauner Tuffit, zeolithisiert

25 DK 9 — Tuffit mit Grabgängen, verfüllt mit $CaCO_3$, 2 mm Kruste, feinstknotig

25 DK 10 — basaltische Brocken

29 DK

Gesamtmenge: 20 kg
davon 100 g Mn-Kruste

- Verfestigtes, carbonatisches Sediment, brecciiertes basaltisches Material, teils hyaloklastisch, stark alteriert bis frisch, durch Carbonat wieder zementiert.
- dünn überkrustet, dichte feinstknotige Oberfläche
- Carbonatsediment weiß, vereinzelt eingelagerte feine Krustenstücke

29 DK 1 — 50 x 40 cm Breccie (basalt, trachyt., montonit.) zementiert mit carbonatischem Sediment, dünn überkrustet mit Mn-Kruste, dicht, feinstknopig

29 DK 2 — massiger Basalt 20 x 15 cm, an 3 Seiten dünn überkrustet, feinstknotig

29 DK 3 — Hyaloklastit, carbonatisch, 2 mm Kruste, an den Ausbißkellen glatt sonst feinstknotig

29 DK 4 — Carbonatisches Sediment, kaum dünn überkrustet, Wurmröhren, Mikromangankollen

29 DK 5 — 10 x 8 cm basalt. Breccie, carbonatisch zementiert einseitig dünn überkrustet

Sample Description

Cruise I.D: S033

Sample I.D: Sta: 29 DK

Location: "Bo Lo Sm
162°52'23"
6°16'35"N
(→2788 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:

Sample No.	1	2
Rock Type:	Tholeiitic Basalt,	Alkali Olivine Basalt (?)
Color: (fresh break)	Medium dark gray (N4) to olive gray (5Y 4/1)	olive gray (5Y 4/1) to dark yellowish-orange (10YR 6/6)
Texture:	subaphyric – phyric intergranular	– hyalopilitic – intersertal holohyaline ↔ phyric
Phenocrysts	Olivine – ±1%, ± 1mm (phyric to glomero-phyric with olivine only)	– do – ↔ ± 2%, ± 3mm dia
(microglomero-phyric)	Plagioclase, Clinopyroxene – ±1%, ±0.5mm – 10%	
Groundmass:	Glass, Plagioclase, Olivine, Clinopyroxene, Opaques – not determined	↔ – do –
Vesicles:	Size: ±1mm; Shape: elongate irregular; % : ±50% (scoriaceous pieces)	0 – ±50% (scoriaceous pieces); round to irregular; ±2 mm dia.
directed, layered:	filling: most are lined with nontronite yellow smectite, sometimes zeolites	most are filled, or at least lined with smectite, calcite
Alteration:	superficial (smectitization, oxidation, hydration, zeolitization	moderate to complete (smectitization, zeolitization ?, hydration, oxidation)
Remarks:	flow rock clasts, highly angular, apparently not related to the breccias made of basaltic rocks dominating this dredge, as it has no remnant of this adhering to any of its surfaces. exposed surfaces coated with thin ±1mm phosphorite layer (±1mm) coating of cuspate MnO_2 deposit on top of that. Olivine pxts are single totally altered to smectite; pc/cpx microglomerocrysts are small, but visible with the naked eye; cpx is dark greenish-black and sparsy.	angular to subangular basalt fragments ranging in size from coarse silt to large pebble size, set in calcareous (phosphorized ?) ooze cement; the basalt includes varying degrees of vesicularity, crystallinity, alteration, representing AOB basalt fragments derived from several sources (flow units ?), consolidated into a volcanogenic breccia.

Sample No.	3
Rock Type:	AOB (?) Hyaloclastite – Volcanogenic Breccia
Color:	Dusky yellow (5Y 6/4)
Texture:	Pyroclastic
Matrix:	AOB ? Glass shards – ±80%; AOB ? Palagonitized fragments – ±10%
Cement:	Smectite, zeolites – ±10%
Large grainsize:	±2 mm (fine sand – gravel)
Large grain shape:	subangular
Sorting:	poor
Porosity:	±20%
Permeability:	±7%
Alteration:	Complete (argillitization, zeolitization, oxidation, hydration, nontronite ?)

Same as V.B. II

Sample Description

Cruise I.D: S033

Sample I.D: Sta: 29 DK

Location: "Bodo" Sm
162°52'23"
6°16'35"
(-) 2788 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: Volcanogenic Breccia I 4

Color: Pinkish-gray (5YR 8/1)

Texture: Clastic

Matrix: predominantly AOB rock fragments, some tholeiitic basalt fragments (±5% ?)

Total: ±60%

Cement: ±40% – calcareous ooze (?) (phosphorized (?))

Average grain size: ±5 mm (gravel size)

Sorting: extremely poor

Grain shape: Angular – subangular

Porosity: ±20%

Permeability: ±15%

Alteration: phosphorization? (cement)

Remarks: Disparity of grain size and angularity of fragments suggests rapid, high-energy deposition of the components of this rock; also the preponderance of AOB basalt fragments over tholeiitic basalt fragments. Very thin (<1 mm) coating of Mn-oxide on exposed surfaces; Mn-micronodules observed in cement.

Basaltic (?) Glass Amygdaloidal/Scoria 5

Moderate yellowish-brown (10YR 5/4)

Amygdaloidal, holohyaline

(Groundmass) Glass

(Phenocrysts) —

(Vesicles) round ±0.5 mm, ±50% completely filled with smectite/zeolite (?) mixture

(Alteration) total hydrothermal smectitization, origin? zeolitization?

(Remarks) – Appears to be a basaltic (?) scoriaceous/amygdaloidal hydrothermally altered rock – very friable, found incorporated in volcanogenic Breccia I and as loose fragments. Coated with thin layer (±1 mm) of cuspate MnO_2 amygdules appear to be of same composition and color as the host altered glass

Volcanogenic Breccia II 6

Light olive gray (5Y 6/1) to Dusky yellow (5Y 6/4)

Clastic

Predominantly tholeiitic basalt fragments (±10% AOB (?))

Total ±80%

Smectite (?), zeolite (?)

extremely poor

Subangular – subrounded

±35%

±25%

Smectitization?, zeolitization?

Again, great disparity of grain size as in Breccia I, but matrix component seems more rounded, weathered, curious that tholeiitic basalt fragments seem present in greater abundance than AOB fragments, much of the tholeiite seems weathered, coated lightly, as in Breccia I, with Mn-Oxide

5033 29 DK 6

Rock Type: Foraminiferal Chalk

Color: white

Texture: granular

Matrix: Globegerinal (?), Globorotalia (?), other planktonic calcareous fossils.

Cement: Calcite (?) (essentially uncemented)

Average grain size: ±0.20 mm (?)

Sorting: fairly well sorted

Porosity: ±50%

Permeability: -do-

Alteration: incipient phosphorization (?)

Remarks: extensively burrowed by rock drill clams or worms – these serve as conduits for deposition of and substrate for thin Mn-Oxide & $Fe(OH)_3$ (?) deposits << 1 thick)