DATE: 31 July 1984 SAMPLE:
CRUISE ID: SO 33 2 DK Box dredge
LOC: I
AREA: A (Cross Seamount)

	time (GMT)	LAT (N)	LON (W)	water depth (m)	wire ou
ON BOTTOM =	1247	18°38.5532	158°17.6935	1924	348
(uncorrected) OFF BOTTOM =	1403	18°38.5784	158°18.0148	1883	200
mean dredge data (corrected):		18°39'07"	158° 17'59"	2021 (1105 fm)	

time on bottom = 1 hr. 21 min

RECOVERY WEIGHT = Total: 500 kg Crust: 20?

CRUST THICKNESS = Veneer to 7.5 cm
Avg = 1 cm
2 generations of crust

SUBSTRATE = Altered basalt, hyaloclastite, breccia w/ trachyte clasts. Phosphorite between the Mn layers.

COMMENTS:

2 generations of Mn crust, with phosphorite between the layers. Surfaces of Mn are either very smooth (from currents) or knobby (accretionary)

* smear slides made of sediment (very little recovered)
* 1 microbio sample
* 1 bio sample

2DK

PROTOKOLL DREDGE
Ship cruise# Station# dredge Loc. Area SAMPLE

Schiff	Fahrt-Nr.	Stat.-Nr.	Gerät	Lok.	Areal
S O	33	2	DK	I	A

Datum: 31.07. 1984 Protokoll: Otten, Sattler
Date On Duty

	Zeit (GMT)	N	W	Tiefe (Water Depth)	Seil (m) (Cable)	Seilzug (t) (tension on cable)
Beginn Operation	11.13	18°37.416	158°17.045	2680	0	
Beginn Fieren	11.19	18°37.420	158°17.087	2677	0	1.0
1. Bodenkontakt (Lower on Bottom)	12.47	18°38.496	158°17.550	1927	3500	5.0
Ende Bodenkont. (off Bottom)	14.03	18°38.291	158°17.432	1898	2000	4.0
Hieven Lift						
2. Bodenkontakt						
Ende Bodenkont.						
Hieven Lift						
3. Bodenkontakt						
Ende Bodenkont.						
Beginn Hieven						
Ende Hieven					0	
Ende Operation	14.44	18°38.039	158°17.153	2032	0	

Kurs Schiff (course ship): 0 Geschwindigkeit Schiff: kts

Gesamtzeit am Boden: min Länge des Dredgezuges (length of ship): m

Bodentopographie: Bottom topography

Ergebnis:

Knollen (nodules) Kg
Krusten (crusts)
Basalt
Sediment
Sonstiges (Bims, Org. u.a.)

Echogramm:
Seil Ø : 18mm
Winde: Fischer
Fotos:

Comments
Weitere Bemerkungen siehe Anlageprotokoll

Basaltisches Substrat, Hyaloklastite (Breccien) und Trachyt (?) mit häufig dicker Krustenbedeckung (2 Generationen). Phosphorit zwischen den beiden Generationen. Oberfläche meist glatt; Strömungsmarken (?) mit knotiger Kruste. Menge ca. 500 kg

ZDK

SAMPLE

ANLAGEPROTOKOLL

Seite: ..... von: .....

Zu: 2 DK

So 33 Fahrt: So 33 Station: 2 DK Position:

Bearbeiter: Otten, Sa Datum: 31.07.89

13.08	100 t	
13.38	150 t	(Hänger)
13.58		Bredge frei

2DK

*** $CaCO_3$-Untersuchungen Sediment

RV Sonne So 33 Midpac II 29.7 - 29.8.1984

Datum: 31.07 Areal: A Lokation: I Station: 2DK

Probennummer:

Längengrad, nk: 158° 17,55' - 17,43' k:

Breitengrad, nk: 18° 38,50' - 18°38,29' k:

Wassertiefe (m) : 2200

Sedimenttyp: foraminiferal ooze Farbe: gray-brown

Kernlänge (cm) : (dredge) Probensektion:

Anteil (Gew.%) > 63 µm : m.b. Anteil (Gew.%) < 63 µm:

$CaCO_3$ (Gew.%) < 63 µm : m.b. $CaCO_3$ (Gew.%) > 63 µm :

$CaCO_3$ (Gew.%) gesamt :

Bemerkungen: Grayish foraminiferal ooze, sieved into 6 size fractions, from which I made 5 smear slides (>500 µ, 315-500 µ, 200-315 µ, 125-200 µ, 63-125 µ).

The major components include:

Fresh Foraminifera
- Globorotalia
- Globigerina (Sacculifer?)

Lithic fragments (Mn chips + micronodules, + others)

? Radiolaria ?? (may be broken Globigerina)

The foraminifera are better preserved than in 1DK, and there are fewer biological species than in 1DK.

smear slide notes →

• Smear slide notes:

> 500 μ: includes shark teeth, some with Mn veneer.
90% unbroken foraminifera (Globorotalia + Globigerina) 10% Lithic fragments (Mn chips, or stain with Mn or Fe) Several Agglutinated Forams.

315 μ:
90% Globorotalia + Globogerina
10% Lithic fragments
(of the foraminifera, 50% are stained orange, 30% are broken fragments, 10% have chambers filled with white opaque calcareous mud, and several have Mn micronodules in the chambers)

200 μ:
80% broken Globorotalia + Globogerina
10% Globogerina (whole)
9% Agglutinated forams + Lithic fragments
1% fish debris

125 μ:
70% broken Globorotalia + Globogerina
20% whole Globogerina
10% Lithic fragments

63 μ:
50% broken Globorotalia + Globogerina
40% whole Globogerina
10% Lithic fragments

Sample Description

Cruise I.D: 5033

Sample I.D: Sta: DK 4

Location: Gross Smt
158° 17' 59" W
18° 39' 07" N
(-) 2021 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: Trachyte / Basalt Hyaloclastite / Basalt

Description: Color: [Trachyte (massive)] - medium light gray (N6); Trachyte (hyaloclastite) light gray (N7)
Basalt Hyaloclastite - pale yellowish-orange (10YR 8/6) (small granules) to light brown (5YR 5/6)
Basalt - dark gray (N3)

Mineralogy (XRD):

Analyses and subsamples:

analysis:	analyst:

2DK1 Trachyte, massive	Trachyte, Hyaloclastite volcanoclastic breccia	Basalt, massive	Basalt, Hyaloclastite
Color: Medium light gray (N6)	Light gray (N7) 2DK2	Dark Gray (N3) to grayish black (N2)	Pale yellowish-orange (10 YR 8/6) to light brown (5 YR 5/6)
Groundmass: tabular feldspar, biotite, opaques	tabular feldspar, biotite, opaques	acicular feldspar? opaques	
Texture: Subaphyric subtrachytic to trachytic; hyalopilitic to intersertal	Subaphyric subtrachytic to trachytic; hyalopilitic to intersertal	Porphyritic, hyalopilitic 2DK3	Aphanitic, hyalopilitic 2DK4
Phenocrysts: Plagioclase? Sanidine? Biotite	Plagioclase? Sanidine? Biotite	Plagioclase	—
Size (mm) 0.5 – 1.5 mm (2)	-do-	1-3 mm	—
Range: ↔		1.5 mm	—
Avge: 0.00 mm	-do-		
% 1% Sanidine? (feldspar) 1-3% Biotite		7-10% plag.	
Vesicles: not observed, rare(?)		0.5 mm – 1.5 mm	not observed
Size (mm)		1 mm	
Range:	-do-		
Avge:			
filling:		goethite lining, fasciculate zeolites (yellowish)	not observed
Shape		calcite (whitish) round to oval 10-15%	
%		35-40%	—
% amygdules	-do-	1 – 100 mm	
Clasts 1 mm – 300 mm		pebble-to-boulder-sized subangular clasts	
Remarks: Very directed texture, subparallel orientation of sanidine, biotite platelets, phenocrysts less so. pebble-to-cobble-size subangular to subrounded clasts, most coated with thin MnO_2 layer, though some nearly free of it. Some dendritic MnO_2 along fractures and as spots on uncoated pieces;	Same as massive material but more altered (smectitization, zeolitization, oxidation) pebble to boulder-size subrounded clasts frequently bearing no or little MnO_2 deposits (removed through abrasion?) deposit rests directly on underlying massive trachyte; (cemented with smaller rock fragments, smectite zeolites? Graded bedding)	Intense layering of vesicles parallel to upper contact with Mn-oxide layer (usually thin or absent) random orientation of plagioclase pxts. oxidation particularly strong around peripheries of vesicles and alteration near upper contact (palagonite?) phenocrysts include altered glass, sometimes thin, discrete phosphorite in low spots	Intensely altered to smectites, zeolites, iron oxide (goethite?)

3YRD: Labradorite, Augite, Montmorillonite, Phillipsite, Clinoptilolite