DREDGE SAMPLE LOG

			JD	LOCAL
CRUISE	KODOS97-4	DATE	240 / 241	8-30-97
STATION	7		GMT	LOCAL
DREDGE	D7	TIME	22:20 - 1:05	10:20 - 13:05
DEPTH INTERVAL(m)	1912 - 1476	LATITUDE (N,S)	11°39.3' - 11°39.12'	
DEPTH(m) CORRECTED	1800 - 1550	LONGITUDE (E,W)	161°41.9' 161°40.7'	

TOTAL WEIGHT : DREDGE 97kg CRUST 90kg

%OF ROCK COVEREDBY CRUST 100%

%BROKEN FROM : OUTCROP 100% TALUS 0%

THICKNESS OF CRUST : MAX 130mm MIN 28mm AVG 100mm

DOMINANT SURFACE TEXTURE Botryoidal

SUBSTRATE LITHOLOGY hyaloclastite and Breccia

NODULES PRESENT ∅

REMARKS: very thick crust w/ recent growth surfaces.

KORDOS 97-4
D7

Dredge Sample Summary Sheet

D7

Sample ID	Bulk CC	Layer CC	Pt & Au	REE	OC	DPTS/TS	XRD	35mm Photo	Archive	Paleo	powders to KORDI
											10g
											10g
											10g
											10g
											10g
											10g

Cruse Id: KODOS97-4 Size(cm): 31 x 32 x 22 Location: Lomilik

ample Id: D7-1 Weight(kg): 61.4kg Depth(m): 1800-1550

Mn Crust Description

Surface Texture: Botryoidal on top
microbotryoidal on sides
microbotryoidal → granular on base

Mn Crust Thickness(mm):

top Min: 75 mm Max: 130mm Ave: 110 mm

Outer to Inner Layers(mm)

	Min	Max	Ave	Texture & Color
top 1	15 mm	20mm	17m	massive botryoidal black
2	12	20	15	Porous, black. some
3				vugs lined w/ Fe-oxide
3 4	38	51	42	massive black CFA filled vugs
4 5	9	38	30	massive black
6				

under side 1 35mm 45mm 40mm black highly porous (layer continues from top 1) veinlets of CFA & Fe-oxide.

KODOS 97-4
D7-1

Comments and XRD Mineralogy:

outermost layer is continuous on 3-sides of sample although much more porous on base. Fe-oxide lining is present in vugs & veinlets.

Analyses

Subsample No.	Analysis	Layer Thick.	Wt.(g)
D7-1A	CC, PGE,	Bulk (112 mm)	25
D7-1B	CC, PGE,	layer 1 (top) (12 mm)	
D7-1C	CC, PGE,	layer 2 (15 mm)	
D7-1D	CC, PGE	layer 3 (46 mm)	
D7-1E	CC, PGE	layer 4 (base)	58
D7-1F	PTS		

10 gm of each (5 samples 1A → 1E) powder given to KORDI

60% KORDI
40% USGS

Substrate Description

RockType: Breccia

Description: Clasts on ave. 5mm (largest 30mm) clasts. red brown basalt → Mn-oxide (perhaps old crust) in a CFA cement large vugs up to 55mm are empty (2) to partially filled (1) to filled (5) w/ CFA (lt to dark tan)

Biology: encrusting forams on surface

Described by: Leanne Roberts

Subsampled by: Suzie Zielinski

SAMPLE DESCRIPTION

Cruse Id: KODOS97-4 Size(cm): 32 x 29½ x 13 Location: Lomilik

Sample Id: D7-2 Weight(kg): 12kg Depth(m): 1800 - 1550

Mn Crust Description

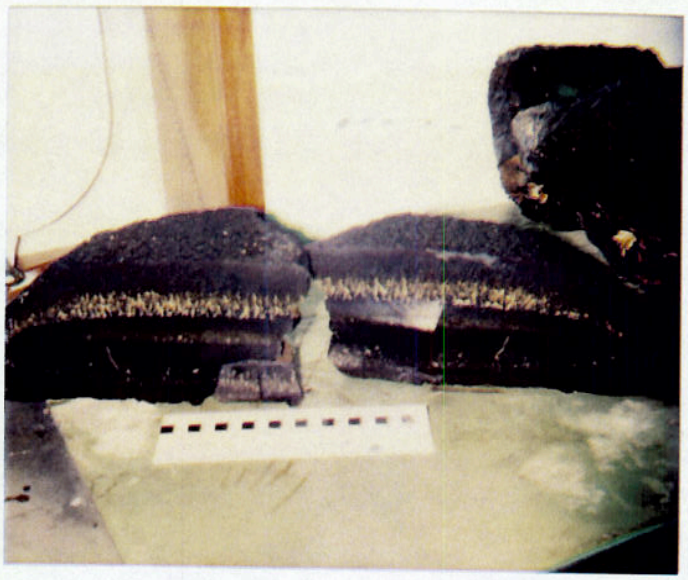
Surface Texture: Botryoidal

Mn Crust Thickness(mm):

Min: 115 Max: 125 Ave: 120

Outer to Inner Layers(mm)

	Min	Max	Ave	Texture & Color
1	7	10	8	black slightly porous
2	27	37	36	Porous, vugs, almost dendritic
2 3				filled w/ Sed
3 4	10	12	36	finely laminated between porous & not porous
4 5	2	10	5	black - black porous.
5 6	51	63	59	black massive w/ some layers (up to 20mm) of dendritic CFA filled veinlets



KODOS 97-4
D7-2

Comments and XRD Mineralogy:

Layers are very consistant w/ constant width throughout top

Complete Crust

Analyses

Subsample No.	Analysis	Layer Thick.	Wt.(g)
D7-2A	CC Bulk	0-116	50g
D7-2B	CC Layer 1	0-9	15g
D7-2C	CC Layer 2	9-45	15g
D7-2D	CC Layer 3	45-56	30g
D7-2E	CC Layer 4	56-61	15g
D7-2F	CC Layer 5	61-122	65g

50% USGS
50% HORDT

Substrate Description

RockType: Hyaloclastite

Description: On patina of yellow brown

Biology: few encrusting forams

Described by: Leanne Roberts.

Subsampled by:

SAMPLE DESCRIPTION

Cruise Id: KODOS97-4 Size(cm): 27 x 15 x 9 1/2 Location: Lomilik

Sample Id: D7-3 Weight(kg): 3.7 kg Depth(m): 1800-1550

Mn Crust Description

Surface Texture: Botryoidal on top granular on side + bottom

Mn Crust Thickness(mm):

Min: 80 Max: +95 Ave: +90

Outer to Inner Layers(mm)

	Min	Max	Ave	Texture & Color
1			18	Massive, with some pores
2			22	Porous grading down to
3				Vuggy filled w/ sed
4 3	20	26	24	layered porous-massive
5				mm-Thick laminae
6 4	17	25	25	Black massive

KODOS 97-4
D7-3

Comments and XRD Mineralogy:

underside of sample is coated w/ a thin granular mm-Thick layer

Sample attached to outcrop from one end

Substrate Description

RockType: No Substrate

Description: -

Biology: encrusting forams.

Described by: Leanne Roberts

Analyses

Subsample No.	Analysis	Layer Thick.	Wt.(g)

50% KORDI

50% USGS

Subsampled by:

Cruse Id: KODOS97-4 Size(cm): 26 x 21 x 7 Location: Lomilik

Sample Id: D7-4 Weight(kg): 2.9kg Depth(m): 1800 - 1580

Mn Crust Description

Surface Texture: modified botryoidal (elongate on top to cauliflower on sides). microbotryoidal on backside

Mn Crust Thickness(mm):

Min: _____ Max: _____ Ave: ~70

Outer to Inner Layers(mm)

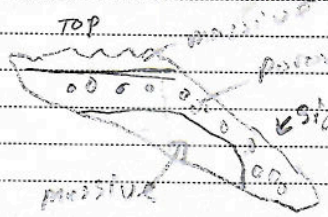
	Min	Max	Ave	Texture & Color
1	10	15		columnar, black
2	25	33		Black Porous w/large vugs
~~3~~ 2				sublayer (7mm) where vugs lined w/ Fe-oxide.
~~4~~ 3	43			massive w/CFAOT
~~5~~ 4				unfilled vugs in upper part lower portion has
~~6~~ 5				CFA filled veinlets.

KODOS 97-4

D7-4

Comments and XRD Mineralogy:

layer 3 is incomplete so thickness is minimum thickness.



Substrate Description

RockType: No Substrate

Description:

Biology: few encrusting forams.

Described by: Leanne Roberts.

Analyses

Subsample No.	Analysis	Layer Thick.	Wt.(g)

70% for DI

30% USGS

Subsampled by:

SAMPLE DESCRIPTION

Cruse Id: KODOS97-4 **Size(cm):** 16X15Y12 **Location:** Lamilik

Sample Id: D7-5 **Weight(kg):** 1.8 **Depth(m):** 1800-1550

KODOS 97-4
D7-5

Mn Crust Description

Surface Texture: Botryoidal

Mn Crust Thickness(mm):

Min: _____ Max: +120 Ave: +120

Outer to Inner Layers(mm)

	Min	Max	Ave	Texture & Color
1			20	massive black - [illegible]
~~2~~				[illegible] to [illegible]
~~3~~ 2			20	porous grading to
~~4~~				vuggy w/ sediment -
~~5~~				sharp lower cont.
~~6~~ 3			70	massive black w/

CFA filled vugs in upper part

Comments and XRD Mineralogy:

incomplete layer 3, min Thickness

Substrate Description

RockType: NONE

Description:

Biology: Encrusting forams

Described by: Hein

Analyses

Subsample No.	Analysis	Layer Thick.	Wt.(g)

50% KORDI
50% USGS

Subsampled by:

SAMPLE DESCRIPTION

Cruse Id: KODOS97-4 Size(cm): 12 X 11 X 10 Location: Lomilik

Sample Id: D7-6 Weight(kg): 1.2 Depth(m): 1800-1560

Mn Crust Description

Surface Texture: Botryoidal

Mn Crust Thickness(mm):

Min: 111 Max: 113 Ave: 112

Outer to Inner Layers(mm)

	Min	Max	Ave	Texture & Color
1			10	black massive botryoidal
2			20	porous - no sed
3			15	vuggy filled w/ sed
4			10	massive Black
5			10	massive black porous
6			40	massive black w/ CPA vugs + veins

Comments and XRD Mineralogy:

Complete Crust

Substrate Description

RockType: Hyaloclastite

Description: yellowish-brown to reddish-brown Fe

Biology: Encrusting forams

Described by: Heim

Analyses

Subsample No.	Analysis	Layer Thick.	Wt.(g)

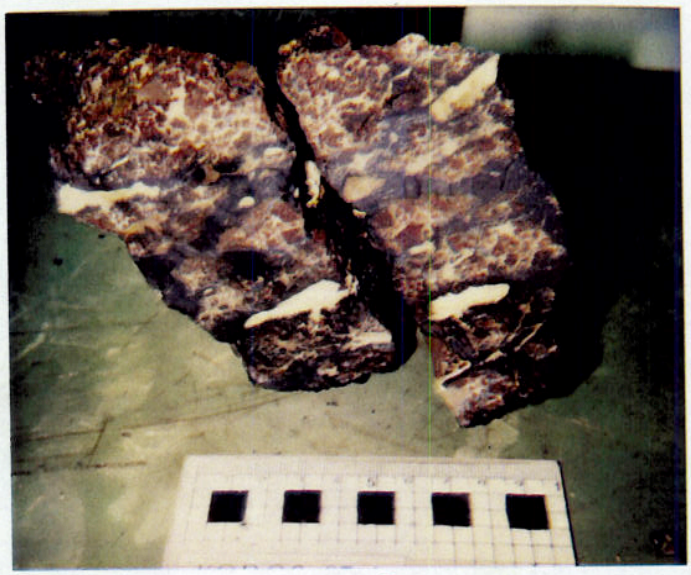
50% KORDI

50% USGS

Subsampled by:

SAMPLE DESCRIPTION

Cruse Id: KODOS97-4 Size(cm): 20 x 11 x 5 Location: Lomilik
Sample Id: D7-7 Weight(kg): 1.4 Depth(m): 1800-1550



KODOS 97-4
D7-7

Mn Crust Description

Surface Texture: NONE

Mn Crust Thickness(mm):

Min: _____ Max: _____ Ave: _____

Outer to Inner Layers(mm)

	Min	Max	Ave	Texture & Color
1				
2				
3				
4				
5				
6				

Comments and XRD Mineralogy:

Substrate Description

RockType: Breccia

Description: lg clasts of breccia w/ red-brown altered volcanic frags cemented by CFA in turn cemented by Mn-oxide - lg vugs between lg clasts filled or partly filled by geopedal CFA -

Biology: NONE

Described by: Hein

Analyses

Subsample No.	Analysis	Layer Thick.	Wt.(g)
D7-7A	XRD, OC, Paler isotopes Sr-date	CFA + 18 mm³	~35 gm
D7-7B	Sr isotopes, paler	~1 cm³	light colored CFA in some vug
D7-7C	XRD, CC	12 mm	Mn cement
	Thick patch	~45 gm	5g
D7-7D	pbs CFA after volc-breccia also 2 generations (?) vug fill		

½ to KORDI

½ to USGS

Subsampled by: Laura B

SAMPLE DESCRIPTION

Cruse Id: KODOS97-4 Size(cm): 10 x 10 x 7 Location: Lomilik

Sample Id: D7-8 Weight(kg): 0.55 Depth(m): 1800-1550

Mn Crust Description

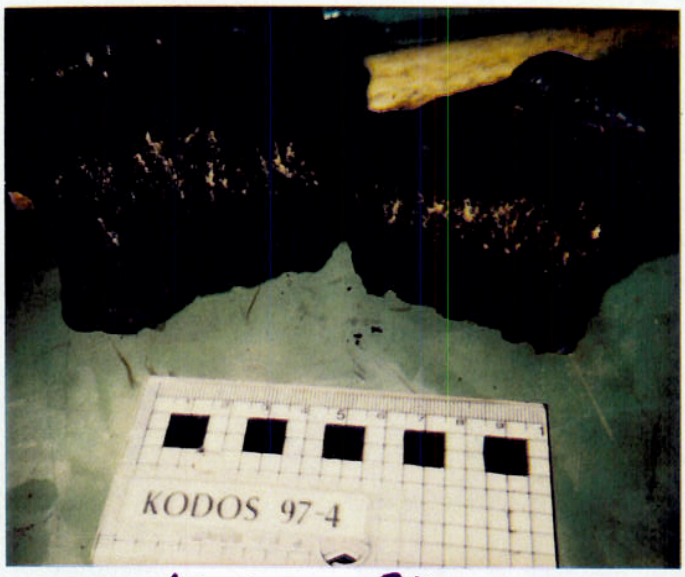
Surface Texture: Botryoidal

Mn Crust Thickness(mm):

Min: 60 Max: 170 Ave: 165

Outer to Inner Layers(mm)

	Min	Max	Ave	Texture & Color
1			7	Black botryoidal
2			35	Porous becomes
3				vuggy w/ depth
4			25	Massive black w/
5				CFA veins
6				



KODOS 97-4
D7-8

Comments and XRD Mineralogy:

Layer 3 not complete

Analyses

Subsample No.	Analysis	Layer Thick.	Wt.(g)
	100%	XRDI	

Substrate Description

RockType: NONE

Description:

Lithology:

Described by: Hein

Subsampled by:

Cruse Id: KODOS97-4 Size(cm): 16 x 13 x 6 Location: Lomilik

Sample Id: D7-9 Weight(kg): 1.1 Depth(m): 1800 - 1550

Mn Crust Description

Surface Texture: Botryoidal granular in lows

Mn Crust Thickness(mm):

Min: 60 Max: +70 Ave: +65

Outer to Inner Layers(mm)

	Min	Max	Ave	Texture & Color
1			8	Black Botryoidal
2			20	Fe-stained v porous
3				vuggy - not much
4				sed
5 3			38	black massive -
6				more porous sublayer - in middle

KODOS 97-4
D7-9

Comments and XRD Mineralogy:

layer 3 not complete

Analyses

Subsample No.	Analysis	Layer	Thick.	Wt.(g)
D7-9A	CC	Bulk	0-65mm	~45g
D7-9B	CC	layer 1	0-7mm	~35g
D7-9C	CC	layer 2	7-32mm	~35g
D7-9D	CC	layer 3	32-64mm	~30g

50% USGS

50% KODI

Substrate Description

RockType: NONE

Description:

Biology: Encrusting Foraris

Described by: Hein

Subsampled by: Leanne & Laura

SAMPLE DESCRIPTION

Cruse Id: KODOS97-4 Size(cm): 125 x 110 x 30 mm Location: Lomilik

Sample Id: D7-10 Weight(kg): 0.55 Depth(m): 1800-1550

Mn Crust Description

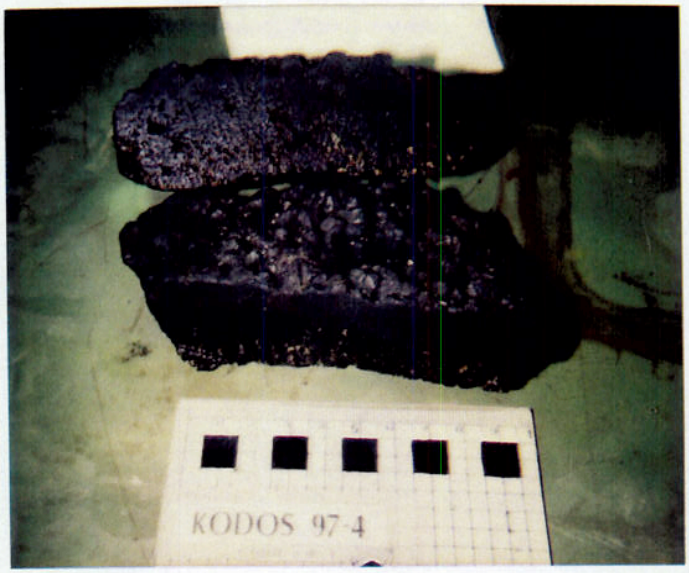
Surface Texture: Botryoidal, some vugs

Mn Crust Thickness(mm):

Min: 28 Max: 35 Ave: 32

Outer to Inner Layers(mm)

	Min	Max	Ave	Texture & Color
1		12	10	Black Botryoidal
2		25	22	V Porous, vuggy
3				filled w/ Sediment
4				
5				
6				



KODOS 97-4
D7-10

Comments and XRD Mineralogy:

Crust seems to be complete?

Substrate Description

RockType: NONE

Description:

Biology: Encrusting Forams

Described by: Hein

Analyses

Subsample No.	Analysis	Layer Thick.	Wt.(g)
D7-10 A	CC Bulk	0-31mm.	~65g

50% USGS

50% Kordi

~10g powder to KOR DI
(~65g left to USGS)

Subsampled by:

SAMPLE DESCRIPTION

Cruse Id: KODOS97-4 Size(cm): 170 x 115 x 50 mm Location: Lamilik

Sample Id: D7-11 Weight(kg): 0.6 Depth(m): 1800-1550

Mn Crust Description

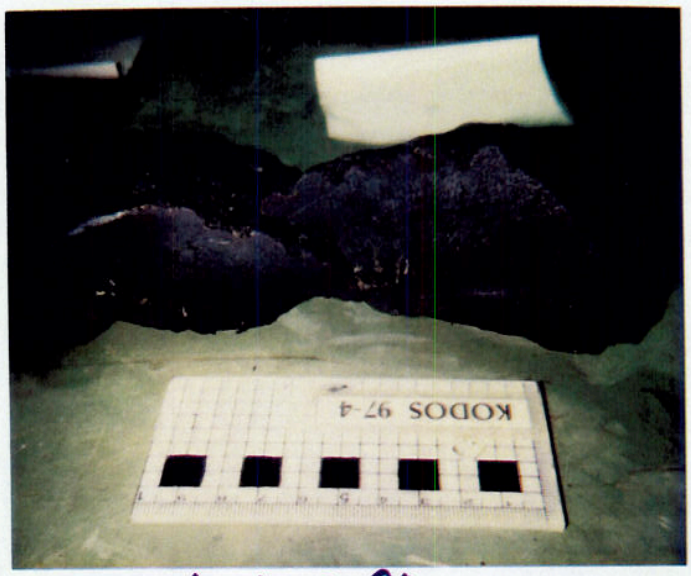
Surface Texture: Botryoidal

Mn Crust Thickness(mm):

Min: _____ Max: +55 Ave: +50

Outer to Inner Layers(mm)

	Min	Max	Ave	Texture & Color
1			15	Botryoidal Black massi
2			6	Acicular Black
3			15	V. Porous, vuggy,
~~4~~				Fe-stained,
~~5~~ 4			20	Black massive
~~6~~				



KODOS 97-4
D7-11

Comments and XRD Mineralogy:

Some of Layer 4 is missing - Total Thickness not represented

Substrate Description

RockType: NONE

Description:

Biology: Encrusting Forams

Described by: Hein

Analyses

Subsample No.	Analysis	Layer Thick.	Wt.(g)

100% KORDI

Subsampled by:

SAMPLE DESCRIPTION

Cruse Id: KODOS97-4 Size(cm): 100×55×90 mm Location: Lomilik

Sample Id: D7-12 Weight(kg): 0.55 Depth(m): 1800-1550

Mn Crust Description

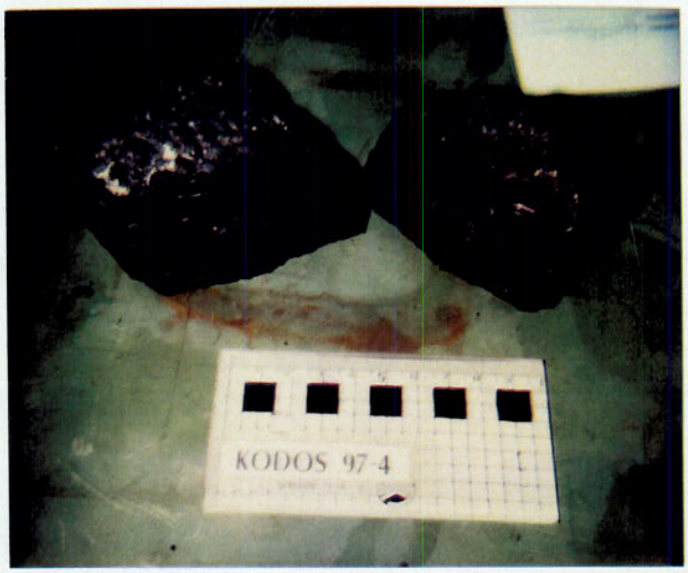
Surface Texture: Botryoidal w/ Vugs

Mn Crust Thickness(mm):

Min: 50 Max: 158 Ave: 455

Outer to Inner Layers(mm)

	Min	Max	Ave	Texture & Color
1			8	Black Botryoidal massive
2			48	Black, dense, massive
3				
4				
5				
6				



KODOS 97-4
D7-12

Comments and XRD Mineralogy:

Total Thickness not represented
Layer 2 not complete

Thin CFA vein x-cut massive layer 2
pores
Typical layer 2 seems to be missing

Substrate Description

RockType: NONE

Description:

Biology: Encrusting Foram

Described by: Hein

Analyses

Subsample No.	Analysis	Layer Thick.	Wt.(g)

All KORDI

Subsampled by:

SAMPLE DESCRIPTION

100 x 120 x 35 mm 70
80 x 50 x 30 mm

Cruse Id: KODOS97-4 Size(cm): 11 Cobbles Location: Lomilik

Sample Id: D7-13 Weight(kg): 2.8 Depth(m): 1800-1550

Mn Crust Description

Surface Texture: Botryoidal

Mn Crust Thickness(mm):

Min: 25 Max: 40 Ave: 30

Outer to Inner Layers(mm)

	Min	Max	Ave	Texture & Color
1			10	Massive Black
2			20	V. Porous Black w/
3				Fe staining
4				
5				
6				

KODOS 97-4
D7-13

Comments and XRD Mineralogy:

maybe complete Thin crusts on upper 2 layers decapitated from Thick crusts

Substrate Description

RockType: NONE

Description:

Biology: Encrusting forams

Described by: Hein

Analyses

Subsample No.	Analysis	Layer Thick.	Wt.(g)

50% KORDI

50% USGS

Subsampled by:

Cruse Id: KODOS97-4 Size(cm): 2 cobbles 6.5x4x4; 5x5x4 Location: Lomilik

Sample Id: D7-14 Weight(kg): 0.35 Depth(m): 1800-1550

Mn Crust Description

Surface Texture: Granular

Mn Crust Thickness(mm):

Min: 55 Max: 70 Ave: 62

Outer to Inner Layers(mm)

	Min	Max	Ave	Texture & Color
1			10	laminated
2			60	massive Black w/
3				CFA deposits in
4				blebs +
5				
6				

KODOS 97-4
D7-14

Comments and XRD Mineralogy:

Complete Crust

Analyses

Subsample No.	Analysis	Layer Thick.	Wt.(g)

All FORD1

Substrate Description

RockType: Hyaloclastite

Trace only

Description:

Biology: NONE

Described by: Hein

Subsampled by:

SAMPLE DESCRIPTION

Cruse Id: KODOS97-4 Size(cm): 6x4x3.5, 11x7x5, 8.3x6x3, 4.5x3.5x1.5, 7.5x7x6, 11x7x3 Location: Lomilik

Sample Id: D7-15 Weight(kg): 0.085 Depth(m): 1500 - 1500

Mn Crust Description

Surface Texture: Some botryoidal most missing surface layer 3 only

Mn Crust Thickness(mm):

Min: 12 Max: 45 Ave: 40

Outer to Inner Layers(mm)

	Min	Max	Ave	Texture & Color
1				massive black
2				stained with Fe ox
3				
4				
5				
6				

KODOS 97-4
D7-15

Comments and XRD Mineralogy:

- phosphorite mixed with Mn oxide
- some hard small vein filled with CFA
- Contain Fe oxide dendrite

Substrate Description

RockType: Breccia cemented by CFA

Description: altered basalt breccia

Biology: No

Described by: SH park

Analyses

Subsample No.	Analysis	Layer Thick.	Wt.(g)
All KORDI			

Subsampled by:

SAMPLE DESCRIPTION

6 rocks ranging in size from

Cruise Id: KODOS97-4 Size(cm): 9x5½x3½ . 6½x6½x3½ Location: Lomilik

Sample Id: D7-16 Weight(kg): 1.4kg Depth(m): 1800-1550

Mn Crust Description

Surface Texture: Botryoidal → Subdued Botryoidal → microbotryoidal

Mn Crust Thickness(mm):

Min: 6 Max: _____ Ave: _____

Outer to Inner Layers(mm)

		Min	Max	Ave	Texture & Color
Rock	1	25+ 40+			massive, dense (top) Porous, Fe-oxide lining vugs.
Rock	2	25+			massive dense
Rock	3	20+			massive, dense
Rock	4	20+			massive, dense
Rock	5	6+			massive, dense
Rock	6	35+			massive, dense w/CFA veins

KODOS 97-4
D7-16

Comments and XRD Mineralogy:

6 rocks all showing part of upper massive, dense layer
Rock 1 shows 40 mm of Underside layer
Rock 2-5 shows ~ 2mm of basal layer (black, porous)

Analyses

Subsample No.	Analysis	Layer Thick.	Wt.(g)
½	USGS		
½	KORDI		

Substrate Description

RockType: Breccia (Rock 6, no substrate)

Description: clasts: red-brown basalt in CFA cement (more rarely Mn-oxide + CFA cement)

Biology: NONE

Described by: Leanne Roberts.

Subsampled by:

SAMPLE DESCRIPTION

Cruse Id: KODOS97-4 Size(cm): 2 rocks 7x8x2½, 7x3½x3 Location: Lomilik

Sample Id: D7-17 Weight(kg): 0.1kg, 0.1kg Depth(m): 1800-1550

Mn Crust Description

Surface Texture: granular to microbotryoidal

Mn Crust Thickness(mm):

Min: patina Max: 4mm Ave: 2.

Outer to Inner Layers(mm)

		Min	Max	Ave	Texture & Color
top	1	patina	4mm	2	Porous, black
	2				
base	3 1	10mm	17mm	14	massive, dense, black
	4				
	5				
	6				

KODOS 97-4
D7-17

Comments and XRD Mineralogy:

older broken crust on base of sample (massive & dense)

Substrate Description

RockType: Breccia

Description: clasts - Red-brown basalt in a CFA & Mn-oxide cement

Biology: NONE

Described by: Leanne Roberts

Analyses

Subsample No.	Analysis	Layer Thick.	Wt.(g)

all KORDI

Subsampled by:

SAMPLE DESCRIPTION

Cruse Id: KODOS97-4 Size(cm): ~50 Pebble + Cobble size Location: Lomilik

Sample Id: D7-18 Weight(kg): 4.0 Depth(m): 1800-1550

UNCUT

Mn Crust Description

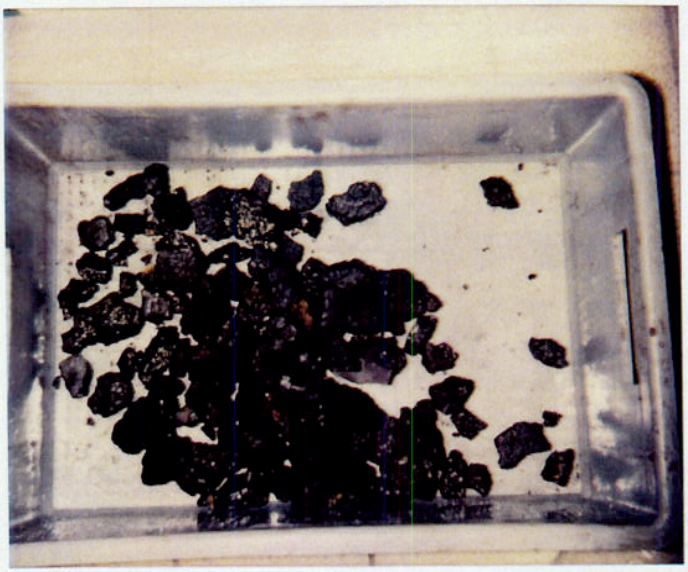
Surface Texture: Botryoidal

Mn Crust Thickness(mm):

Min: 10 Max: 25 Ave: 20

Outer to Inner Layers(mm)

	Min	Max	Ave	Texture & Color
1				1 massive Black
2				
3				
4				
5				
6				



KODOS 97-4
D7 - 18

Comments and XRD Mineralogy:

Mostly complete Thin Crusts

Some w/only inner or outer layers

Analyses

Subsample No.	Analysis	Layer Thick.	Wt.(g)

50% HORDI

50% USGS

Substrate Description

RockType: NONE TO Trace of hyaloclastite

Description:

Biology:

Described by:

Subsampled by:

DREDGE OPERATIONS LOG

			JD	LOCAL
CRUISE	KODOS97-4	DATE	~~240/241~~ 241-242	8/30/97
STATION	7	CHIEF SCIENTIST	Moon / Hein	
DREDGE NO.	D7	TECH ON WATCH	Lee	
DEPTH INTERVAL(m)	1912-1476			
CORRECTED DEPTH	1800-1550			

Water depth from F10-89-CP (1989) 1870 - 1690

	ON STATION	DREDGE ON BOTTOM	DREDGE OFF BOTTOM	OFF STATION
GMT	21:45	22:20	01:05	01:52
LAT	11°39.10	11°39.3	11°39.12	11°39.113
Lon	161°42.10	161°41.8	161°40.7	161°39.95
Depth	1861	~~1912~~ 1843	1476	1471

Site Description and Target:

dredging 1850m ~ 1450m

Operation*	GMT	Depth(m)	Wire Out(m)	Tension	HDG/SPD	Comments
on bottom	22:20	1853	1912	0.7	272 / 1.0	11°39.3 / 161°41.8
wire out	22:26	1846	2250	0.8	147 / 1.4	11°39.3 / 161.41.8
Begin dredge	22:27	1844			1.5	
Small bites	22:39	1824	2302	1.3	253 / 1.3	11°39.3 / 161.41.7
"	22:48	1756	2298	1.5	0.8	
"	"	"	"	1.6		
"	22:49	1754	2297	1.6	275 / 0.9	11°39.3 / 161°41.5
"	22:50	1744		1.6		
"	22:54	1723	2288	1.5, 1.6		
"	23:00	1684	2254	1.6		
"	23:04	1674	2247	1.6		
"	23:38	1475	2094	1.7, 1.8		11°39.4 / 161°40.8
"	23:39	1472	2090	2.1, 2.3		
Good Bite	23:46	1470	2100	2.3, 2.4	309° / 1.0	11°39.5 / 161°40.7

*on/off bottom, bites, etc.

Other Comments: 수심의 변화가 자꾸 생기는것으로 보아 (1756 ~ 1500) 작은 seamount에 봉우리들이 꺾것으로 예상

DREDGE OPERATIONS LOG

			JD	LOCAL
CRUISE	KODOS97-4	DATE	240/241 (241-242)	8/30/97
STATION	7	CHIEF SCIENTIST	Moon / Hein	
DREDGE NO.	D7	TECH ON WATCH	Lee	
DEPTH INTERVAL(m)	1912-1476			

ON STATION	DREDGE ON BOTTOM	DREDGE OFF BOTTOM	OFF STATION
	See	page 1	

Site Description and Target:

Operation*	GMT	Depth(m)	Wire Out(m)	Tension	HDG/SPD	Comments
Small bites	23:50	1470	2096	1.7		11°39.4 / 161°41.1
"	23:52			1.8		
"	23:53	1469	2096	2.0, 2.6	242° / 0.7	11°39.5 / 161°40.6
"	23:54			2.0		"
"	"	1468		2.1, 2.2, 2.3		
"	"	"	2097	2.7		"
Good bites	23:55	1468	2100	2.8, 2.9	3.4 344 / 0.8	11°39.5 / 161°40.6
"	"			3.4		"
Big bites	23:57	1468	2111	3.8, 3.7		"
"	"	"	"	4.0, 4.2		"
"	23:59	"	2108	3.8		Broken
"	24:00	1467	2076	3.4, 3.8		
"	0:02	"	2056	3.7, 3.4		
Bite	0:04	1471		2.3, 2.4, 2.9, 3.0, 3.5 3.3	10.9	Broken

*on/off bottom, bites, etc.

Other Comments:

1470 m 수심변화 없이 진행됨.

DREDGE OPERATIONS LOG

			JD	LOCAL
CRUISE	KODOS97-4	DATE	240/241 241-242	8-30-97
STATION	7	CHIEF SCIENTIST	Moore/Hein	
DREDGE NO.	D7	TECH ON WATCH	Lee	
DEPTH INTERVAL(m)	1912-1476			

ON STATION	DREDGE ON BOTTOM	DREDGE OFF BOTTOM	OFF STATION
	see page 1		

Site Description and Target:

Operation*	GMT	Depth(m)	Wire Out(m)	Tension	HDG/SPD	Comments
Bite	0:05	"		22 0.4		Broke
Bite	0:06	"		29,31,3.5,3.8		Broke
Bite	0:07	1470		1.9	349/1.0	Broke 11° 39 + 161° 4K.
Hung up	0:09	"		30,31,3.5,3.8,4.1,4.3		
	0:31	1472		4.4,4.5	255/1.0	Broke. 11°39.3 161°40.6'
Bite	0:34	"		2.2,2.1		Broke
Bite	0:35	"		2.3,2.2,2.2,2.8,2.7		
				2.9,3.1		Broke
Bites	0:36	1475		2.0,2.3,2.5,2.8,3.0,		?
				3.1,3.2		Broke
Sml Bite	0:37	"		2.1,2.3		
Bite	0:40	"		2.1,2.2,2.1,2.0		Broke
Small Bite	0:40	1474		1.9,2.2.		
Bite	0:42	"		2.3,2.0		

*on/off bottom, bites, etc.

Other Comments: