DREDGE 8
Poyo Smt.

SAMPLE ID	Mn CHEM	Pt & Au	REE	Si Chem	P.Sect.	35mm Pho	Archive	Paleo	Special XRDs	Hg Chem		
D8-1	Bulk		Bulk									
D8-2					DPTS			Paleo, both layers				
D8-3												
D8-4												
D8-5	Bulk				P.S.			Paleo				
D8-6												
D8-7									2 samples			
D8-8	Bulk of D8 nod Mn											
D8-9												
D8-10												
D8-11												
D8-12	Layers				P.S.					✓		
D8-13												
D8-14												
D8-15												
D8-16												
D8-17												
D8-19												
D8-20	Bulk		Bulk							O_2 isotopes		
D8-21												
D8-22					DPTS							

SAMPLE DESCRIPTION

Cruise Id: TT192 Size: 24x17x6 (cm) Location: Poyo Seamount

Sample Id: D8-2 Weight: 3.05 kg (kg) Depth: _____ (m)

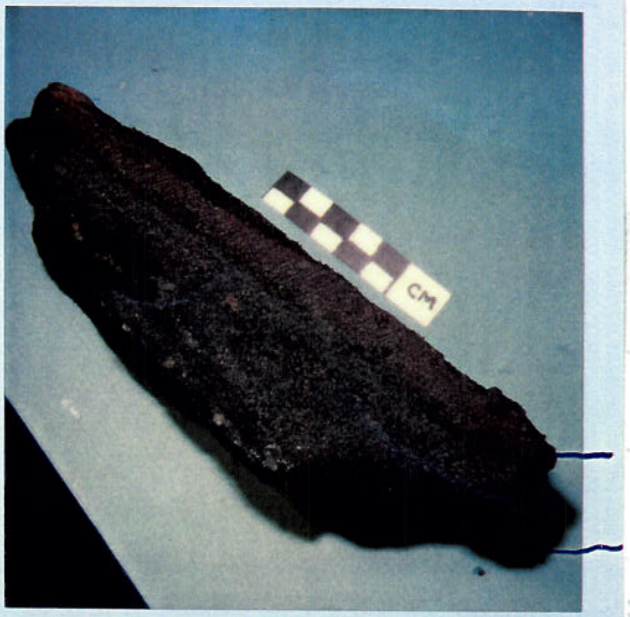
Mn Crust Description

Surface Texture: grainy with pumice clasts showing

Mn Crust Thickness (mm):
Min: _____ Max: _____ Ave: _____

Layers (Outer to Inner)(mm):

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



D8-2

Mariana

Comments and XRD Mineralogy:

ANALYSES

Subsample Number	Analysis	LayerThickness-Explanation
D8-2A Brown Layer	XRD	
D8-2B Mn Sst	XRD	
DPTS		
PALEO		

Substrate Description

Rock Type: Mn Sandstone, Two distinct layers, a rust brown layer which may be finer grained and a Mn cemented layer. The difference in the layers is the cementing material. Both layers are Foram peaches. In the Mn cemented layer the Forams appear to have dissolved leaving hollow spheres of Mn. (Seen through binocular scope)

Description:

logy ?:

D8-9 has sample with brown layer Also D8 21 D8-12

Described By: JSS 10-9-98 Subsampled By: [illegible]

D8-1 Mariana Islands

Slabbing for DPTS revealed this "structure" the area in the middle is not as mineralized.

Appears to be a rip up clast of the brown layer

Bottom of the brown layer is very loosely cemented sand, possibly layer of weakness that it broke off the ocean floor.

My inclination is to call the brown layer the bottom layer (rip up clast). The mineralization of the upper layer happened after the cementing of the brown layer. DPTS should show better how the mineralization affected the bottom layer

If the brown layer is the bottom layer, then the top of Mn is the top of sample. Where Mn made it to surface of sand here it formed colloform "bubble" structures. Best seen when magnified

Sample Description

Cruise I.D: ~~L5-83-HW~~ Mariana Islands

Sample I.D: Sta: D 8-2

Location: Poyo Seamount

Size: 34x17x6cm Weight: 3.05 kg

Mn crust thickness: 0

Total: min: max: ave:

Inner crust: min: max: ave:

Outer crust: min: max: ave:

Surface texture: Granular to smooth

Internal structure: 0

layered:
laminated:
massive:
porous:
dendritic:
other:

Mineralogy (XRD):

Associated alteration, phosphorite, or hydrothermal deposits:

Substratum:

Rock type: Manganese Sandstone

Description: See D8-1
Has a red-orange more massive layer 3-5cm below the surface

Mineralogy (XRD):

Mariana Islands
D8-2

Analyses and subsamples:

analysis:	analyst:

Sample Description

Cruise I.D: ~~L5-83-HW~~ Mariana Islands

Sample I.D: Sta: D 8-3

Location: POYO Seamount

2 pieces

Size: 25x4 cm Weight: 2.35 Kg

12x9x5cm

Mn crust thickness: 0

Total: min: max: ave:

Inner crust: min: max: ave:

Outer crust: min: max: ave:

Surface texture: Granular to slightly botryoidal

Internal structure: 0

layered:
laminated:
massive:
porous:
dendritic:
other:

Mineralogy (XRD):

Associated alteration, phosphorite, or hydrothermal deposits:

Substratum:

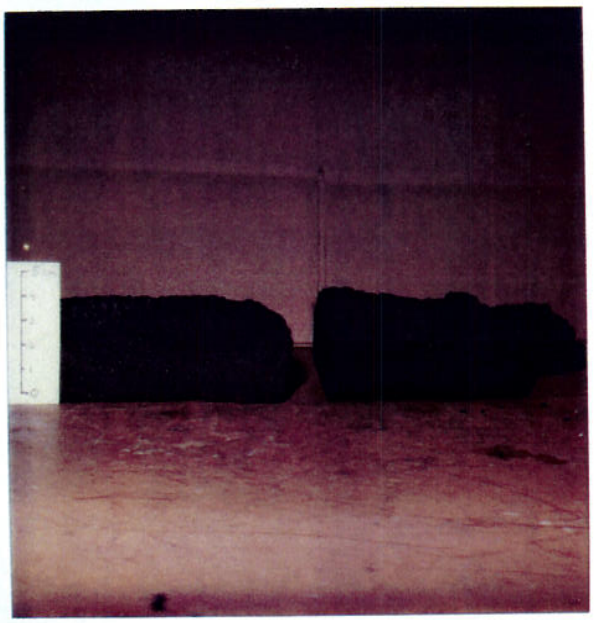
Rock type: Manganiferous Sandstone

Description: See D8-1 - more indurated than D8-1. Also has 2 layers: the upper layer is 2 cm thick & more granular like the surface; the bottom layer is 2 cm thick & more massive or indurated

15-9-86 These 2 layers are not the same as in D8-1 & D8-2. No brown layer here. Lower layer is more massive. Upper layer has dense Mn botryoids cementing sandstone and between the botryoids the sandstone is more friable and porous

Mineralogy (XRD):

Foram bearing



Mariana Islands
D8-3

Analyses and subsamples:

analysis:	analyst:

Mariana Islands
D8-3

TT192
Mariana Islands
D8·3

Note the botryoidal shapes on bottom sandstone, probably [illegible] along bedding plane

Sample Description

Cruise I.D: ~~L5-83-HW~~ Mariana Islands

Sample I.D: Sta: D8-4

Location: POYO Seamount

Size: 25x19x4cm **Weight:** 2.43 kg

Mn crust thickness: just a few small [illegible] of botryodal Mn (hydrogenous) that is actually [illegible] as opposed to the Mn intermixed w/ the sandstone

Total: min: 0 max: 2mm ave:

Inner crust: min: max: ave:

Outer crust: min: max: ave:

Surface texture: Granular to porous (hydrogenous)

Internal structure:

layered:
laminated:
massive:
porous:
dendritic:
other:

Mineralogy (XRD):

Associated alteration, phosphorite, or hydrothermal deposits:

Substratum:

Rock type: Manganiferous Sandstone

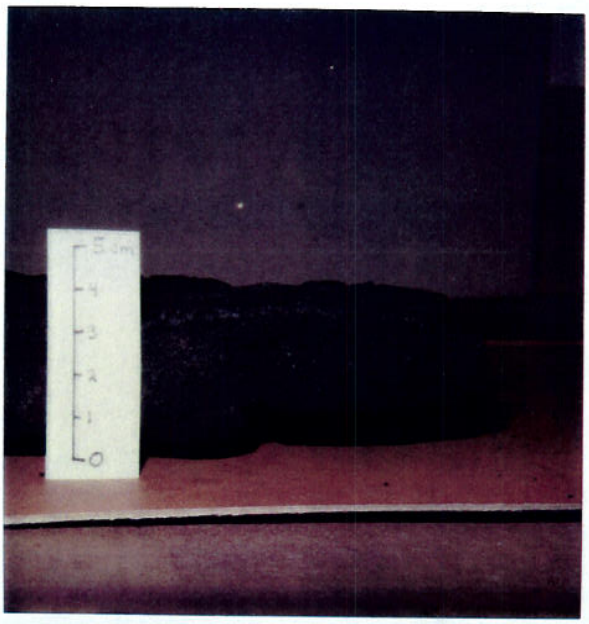
Description: See D8-1

2 layers: upper one is hydrogenous 5-10mm thick but not continuous.

Mn cemented Sandstone, dense layers of Mn are rather discontinuous, but occur through the total thickness of the sstn.

Foram bearing

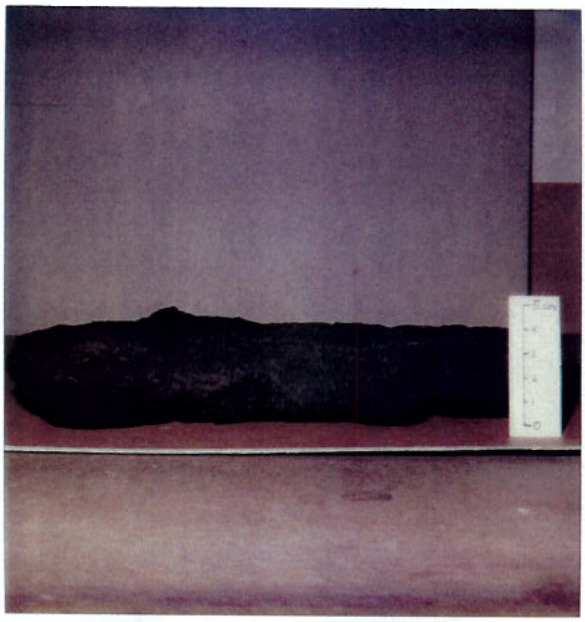
Mineralogy (XRD):



Marianas Islands
D8-4

Analyses and subsamples:

analysis:	analyst:



Marianas Islands
D8-4

TT192
D8-4 Mariana

Sample Description

Cruise I.D: ~~L5-83-HW~~ Mariana Islands Sample I.D: Sta: D8-5 Location: POYO Seamount

Size: 26x19x6cm Weight: 2.55 Kg

Mn crust thickness: * Some small patches of shiny botryoids, otherwise granular mn sst.

Total: min: 0 max: 4 ave: 2mm

Inner crust: min: max: ave:

Outer crust: min: max: ave:

Surface texture: Granular to porous (hydrogenous)

Internal structure:

layered:
laminated:
massive:
porous:
dendritic:
other:

Mineralogy (XRD):

Associated alteration, phosphorite, or hydrothermal deposits:

Substratum:

Rock type: Manganiferous Sandstone

Description: See D8-1
Also has several worm tubes on the underneath side. Has 3(?) hyd thermal layers in upper 1cm (and one hydrogenous layer 2-4mm thick 3cm down from top surface.) I don't think so. JSC 10-2-88

Similar to D8-4, however there is no dense layer ~5mm thick which is continuous through the rock and appears [illegible]

Mineralogy (XRD):

Mariana Islands
D8-5

Analyses and subsamples:

analysis:	analyst:
XRD: D8-5-I: bulk Mn-sst	Charlaine
Chemistry - Manheim Pkg. D8-5-A Bulk Mn-sst	Floyd Brown - Reston
p.t.s.	Mann Petrographics
Paleo on piece through whole sample	

D8-5 - TT192

10-2-88

Strat form layers and [illegible]
of [illegible] submetallic Mn

Foran[illegible] and are abundant on
top and bottom [illegible] don't seem to be throughout.

Sample Description

Cruise I.D: ~~L5-83-HW~~ Mariana Islands Sample I.D: Sta: D8-6 Location: POYO Seamount

Size: 26x19x3cm Weight: 2.02 Kg

Mn crust thickness:

Total: min: ____ max: ____ ave: ____

Inner crust: min: ____ max: ____ ave: ____

Outer crust: min: ____ max: ____ ave: ____

Surface texture: Granular to slightly botryoidal* in small areas

Internal structure:

layered:
laminated:
massive:
porous:
dendritic:
other:

Mineralogy (XRD):

Associated alteration, phosphorite, or hydrothermal deposits:

Substratum:

Rock type: Manganiferous Sandstone

Description: See D8-1 → Can see more shiny grains (especially quartz) so maybe not as much Mn in this sample which roots everything black. Looks layered but no real difference btw. layers just some areas that are more granular & porous.

Mineralogy (XRD):

Marianas Islands
D8-6

Analyses and subsamples:

analysis:	analyst:
Small piece of sample to Dr Kevin Shelton	~6'x4' University of Missouri

* These [illegible] appear to be caused by current activity as they are just Mn-sst as opposed to the 2 prior rocks in which [illegible]

D8-6

TT192

Sample Description

Cruise I.D: ~~L5-83-HW~~ Mariana Islands

Sample I.D: Sta: D8.7

Location: POYOS camount

Size: 28x14x4cm Weight: 1.84 Kg

Mn crust thickness: small patches of botryoidal Mn (hydrogenous) - No this is a hydrothermal Mn

Total: min: 0 max: 2 ave: 2mm

Inner crust: min: max: ave:

Outer crust: min: max: ave:

Surface texture: Granular to botryoidal
Slightly 'weathered' by current activity

Internal structure:

layered:
laminated:
massive:
porous:
dendritic:
other:

Mineralogy (XRD):

Associated alteration, phosphorite, or hydrothermal deposits:

Substratum:

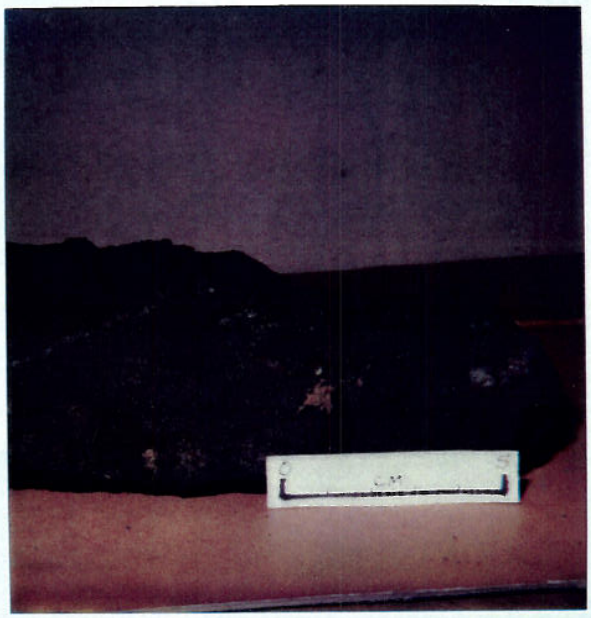
Rock type: Manganiferous Sandstone

Description: See D8-1

No J.S. (Has 2-3 layers, upper 12mm is hydrogenous rest is mn-sst.)

This is a Mn cemented sandstone with dense brown gray layers of hydrothermal Mn.

Mineralogy (XRD):



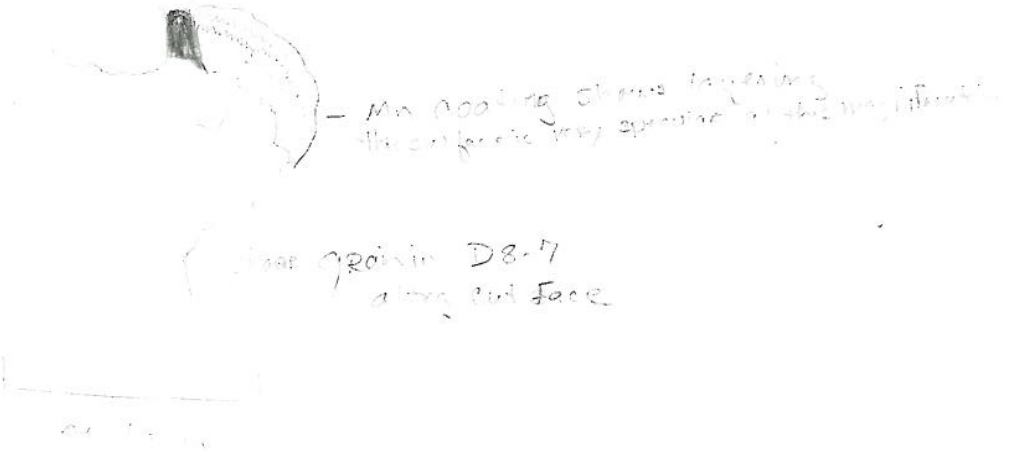
Marianas Islands
D8-7

Analyses and subsamples:

analysis:	analyst:
Sampled for XRD:	Charlaine
D8-7-I: bulk (w/no botryoidal Mn)	
D8-7-II: botryoidal Mn on sfc. (hydrothermal)	

TT192

D8·7



Sample Description

Cruise I.D: ~~L5-83-HW~~ Mariana Islands

Sample I.D: Sta: D8-8

Location: Royo Seamount

Size: 4x3x2cm (arc) largest 11x7x5cm **Weight:** 725 g bag of small rocks

Mn crust thickness:

Total: min: ____ max: ____ ave: .5mm / <1mm / <1mm

Inner crust: min: ____ max: ____ ave: ____

Outer crust: min: ____ max: ____ ave: ____

Surface texture: Smooth to granular & botryoidal

Internal structure: ____

layered: ____
laminated: ____
massive: ____
porous: ____
dendritic: ____
other: ____

Mineralogy (XRD): ____

Associated alteration, phosphorite, or hydrothermal deposits: ____

Substratum:

Rock type: Mn & basalt

Description: Three pieces of basalt in various stages of alteration, very vesicular with plagioclase & olivine phenocrysts & Fe oxide staining btw. edge of basalt & Mn; one has a 5mm thick crust the other two are <1mm. Rest of rocks are mostly hydrothermal Mn, one Mn-sst and one Mn-breccia (?): 15mm thick hydrothermal Mn on top of graded breccia which is poorly sorted 1mm-1cm clasts of vesicular basalt & ?

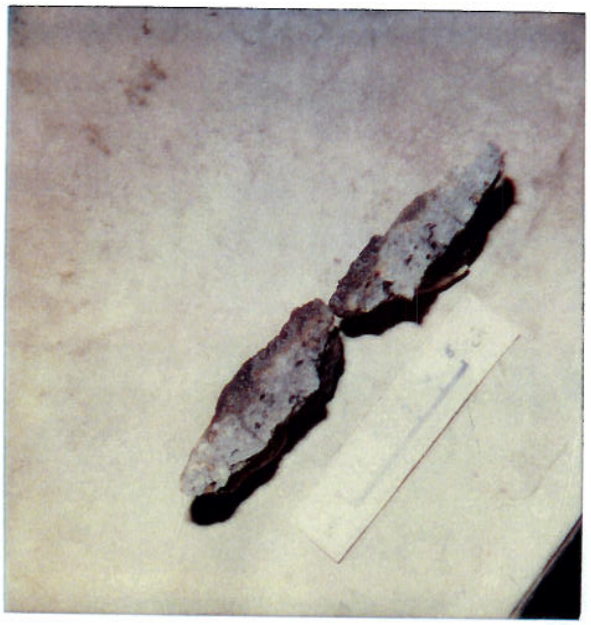
Mineralogy (XRD): ____

Mariana Islands
D8-8

Analyses and subsamples:

analysis:	analyst:
D8-8 - Massive Dense Mn - CC, XRD 8gm - layers from several small pieces used, varied from 5mm to 2m (See photo on back)	
LA-ICP-MS	Collier

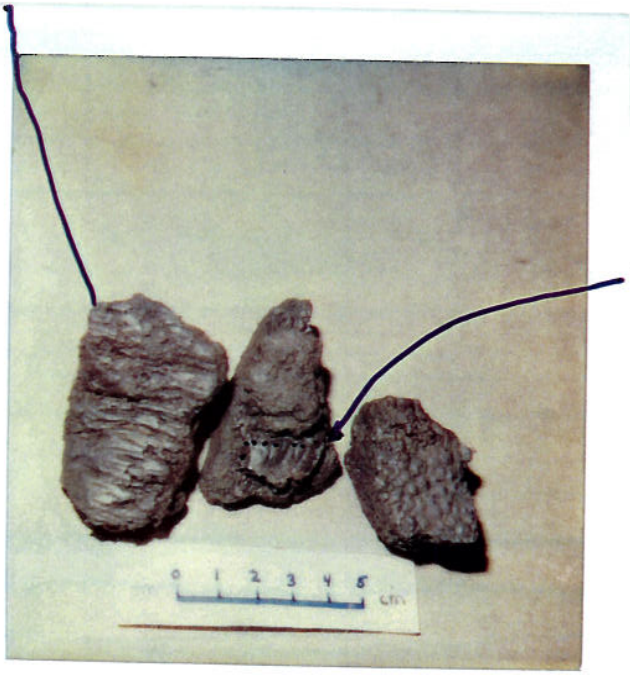
Possible
Flow structures
preserved in the
Mn layers?



D8-8 Basalt w/crust

TT192 MARIANA IS.

Bottom of this sample
used for chem.



This area used for CC chem.
The layer about 1 mm thick, thinned
as it went under ss. layer

D8-8 SOME INTERESTING SURFACE TEXTURES

TT192 MARIANA IS

- All of these textures are in
Dense massive Mn

(the color is [illegible] to [illegible] at
actual color is darker)

Sample Description

Cruise I.D: ~~L5-83-HW~~ Mariana Islands

Sample I.D: Sta: D8-9

Location: Poyo Seamount

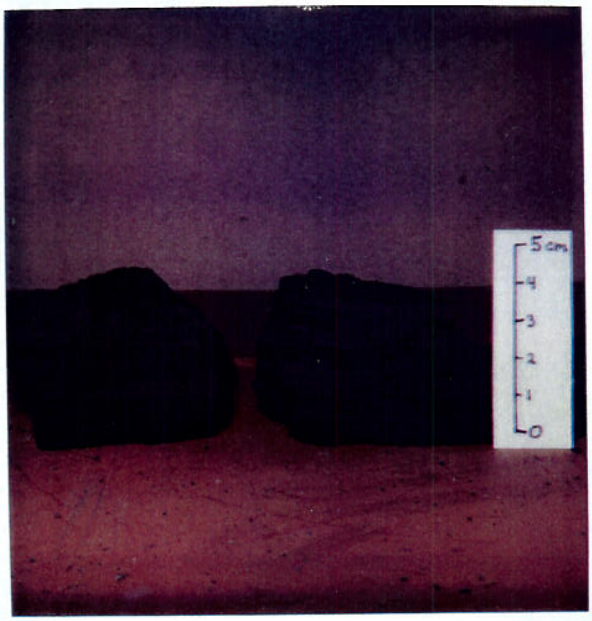
Size: Ave 13x9x3cm Weight: 1.84 Kg Bag of small rocks

Mn crust thickness:

Total: min: max: ave:

Inner crust: min: max: ave:

Outer crust: min: max: ave:



Marianas Isl.
D8-9

Surface texture: Smooth-granular to botryoidal & hydrogenous

Internal structure:

layered:
laminated:
massive:
porous:
dendritic:
other:

Mineralogy (XRD):

Associated alteration, phosphorite, or hydrothermal deposits:

Substratum:

Rock type: Manganiferous Sandstone

Description: See D8-1 Some seem like almost all Mn & no SST. The hydrogenous rock has 3 layers: middle layer is 1cm thick & massive other 2 are Mn-SST

Mineralogy (XRD):

Analyses and subsamples:

analysis:	analyst:

D8-9

TT192

Mariana Islands

Sample Description

Cruise I.D: ~~L5-83-HW~~ Sample I.D: Sta: D8-10 Location: POYO Seamount

Size: 18X14X5cm Weight: 1.2 Kg

Mn crust thickness:

Total: min: max: ave:

Inner crust: min: max: ave:

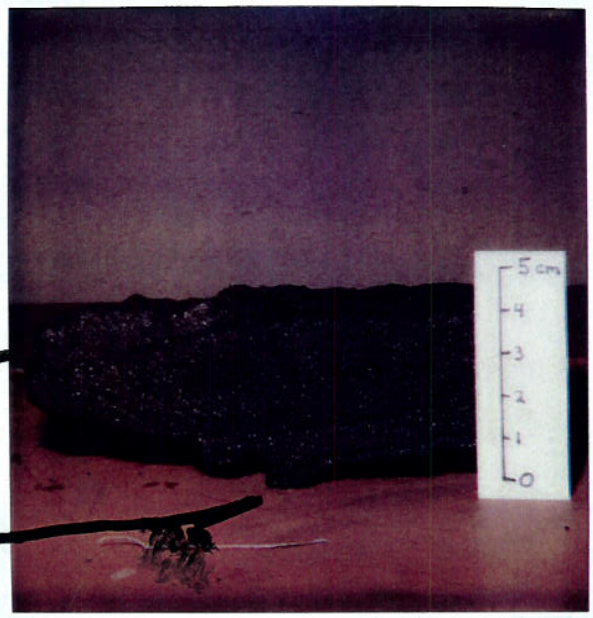
Outer crust: min: max: ave:

Surface texture: Mostly granular to botryoidal*

*one area of shiny hydrothermal Mn

Internal structure:

layered:
laminated:
massive:
porous:
dendritic:
other:



Mariana Islands
D8-10

Mineralogy (XRD):

Associated alteration, phosphorite, or hydrothermal deposits:

Substratum:

Rock type: Manganiferous Sandstone

Description: See D8-1. Appears to have 2-3 layers but no difference in composition some layers more porous-granular looking

has [illegible] porous "mounds"

Mineralogy (XRD):

Analyses and subsamples:

analysis:	analyst:

TT192

D8-10

1 - light grey Fibrous mn
Pure Mn - bubble colon
texture

x sectional [illegible]
side up
other is upside down

Sample Description

Cruise I.D: ~~L5-83-HW~~ Mariana Islands

Sample I.D: Sta: D8-11

Location: POYO Seamount

Size: 15x13x4cm Weight: 940g

Mn crust thickness: ⊖

Total: min: max: ave:

Inner crust: min: max: ave:

Outer crust: min: max: ave:

Surface texture: Granular & botryoidal (small)

Internal structure:

layered:
laminated:
massive:
porous:
dendritic:
other:

Mineralogy (XRD):

Associated alteration, phosphorite, or hydrothermal deposits:

Substratum:

Rock type: Manganiferous Sandstone

Description: See D8-1. Two layers. Upper layer slightly more porous w/ botryoidal structures penetrating down the upper 5mm

Mineralogy (XRD):

Mariana Islands
D8-11

Analyses and subsamples:

analysis:	analyst:

TT192

D8-11

Top covered with light brown mud

x-sectioned photo'd right side up.
other is upside down

similar to D8-14
in that it has burrow traces in the light brown mud and the Mn 'style' is similar

D8-14 also has this copplet of endrites and dense SS layers

Sample Description

Cruise I.D: ~~L5-83-HW~~ Mariana Islands Sample I.D: Sta: D 8-12 Location: POVO Seamount

Size: 15X11X3cm Weight: 750g

Mn crust thickness: hydrogenous/hydrothermal

Total: min: 3 max: 6 ave: 4mm

Inner crust: min: max: ave:

Outer crust: min: max: ave:

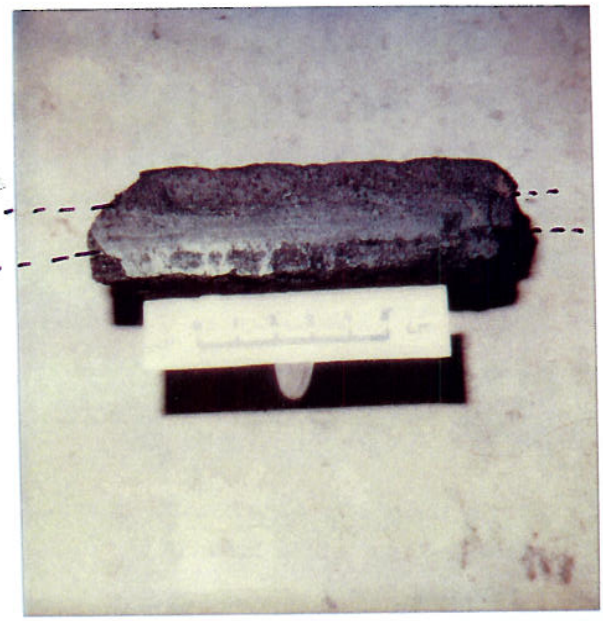
Mn sst

Hydrothermal

Surface texture: Porous to granular & glassy

Internal structure:

layered: ✓ 3
laminated:
massive:
porous:
dendritic:
other:



Mariana Islands
D8-12

Mineralogy (XRD):

Associated alteration, phosphorite, or hydrothermal deposits:

Substratum:

Rock type: Manganiferous Sandstone*

* Looks like much more Mn then sst compared to previous rocks

Description: Upper layer is black porous & granular - [illegible] 3-10mm thick; The middle layer is ≈ 10mm thick, gray & more sst like but still much more massive than previous samples; the bottom layer is 5-7mm thick, red-brown, very fine grained & granular.

Mineralogy (XRD):

Analyses and subsamples:

analysis:	analyst:
XRD:	Charlaine
D8-12-I: 1st layer hydrogenous & hydrothermal 20-30mm	
D8-12-II: 2nd " Mn-sst 8-20mm	
D8-12-III: 3rd Fe-Mn 0-8mm ~Top crust	
Chemistry - Manheim pkg.	Floyd Brown - Reston
D8-12-A: 1st layer 20-30mm	
D8-12-B: 2nd " 8-20mm	reverse mm sequence
D8-12-C: 3rd " ~~20-30mm~~ 0-8	
polished thin section	Mann Petrographics
D8-12-A 0-7mm Hydrothermal & MnSs, 5.2gm H	
D8-12 B, 7-20mm, MnSstn; 8.6gm Hg	

Red Brown Layer [illegible] D8-2, [illegible] 21

Mariana Islands

D8-12

Sample Description

Cruise I.D: ~~L5-83-HW~~ Mariana Islands **Sample I.D: Sta:** D 8-13 **Location:** POYO Seamount

Size: 12x8x4cm **Weight:** 750 g
+ several small pieces

Mn crust thickness: ∅

Total: min: ____ max: ____ ave: ____

Inner crust: min: ____ max: ____ ave: ____

Outer crust: min: ____ max: ____ ave: ____

Surface texture: Granular

Internal structure: ∅

layered:
laminated:
massive:
porous:
dendritic:
other:

Marianas Islands
D8-13

Mineralogy (XRD):

Associated alteration, phosphorite, or hydrothermal deposits:

Analyses and subsamples:

analysis:	analyst:

Substratum:

Rock type: Manganiferous Sandstone

Description: See D8-1 except finer grained ; no layers

Two samples - smaller one is a sandy stratabound sample, has several layers of dense hydrothermal Mn.

The other sample is more of a Mn sandstone with thin layer 2-3 mm of dense Mn

Mineralogy (XRD):

D8-13 TT192

Sample Description

Cruise I.D: ~~L5-83-HW~~ Mariana Islands

Sample I.D: Sta: D8-14

Location: Rove Segment

Size: 18x12x4cm Weight: 1.4kg

Mn crust thickness:

Total: min: max: ave:

Inner crust: min: max: ave:

Outer crust: min: max: ave:

Surface texture: Granular

Internal structure:

layered:
laminated:
massive:
porous:
dendritic:
other:

Mineralogy (XRD):

Associated alteration, phosphorite, or hydrothermal deposits:

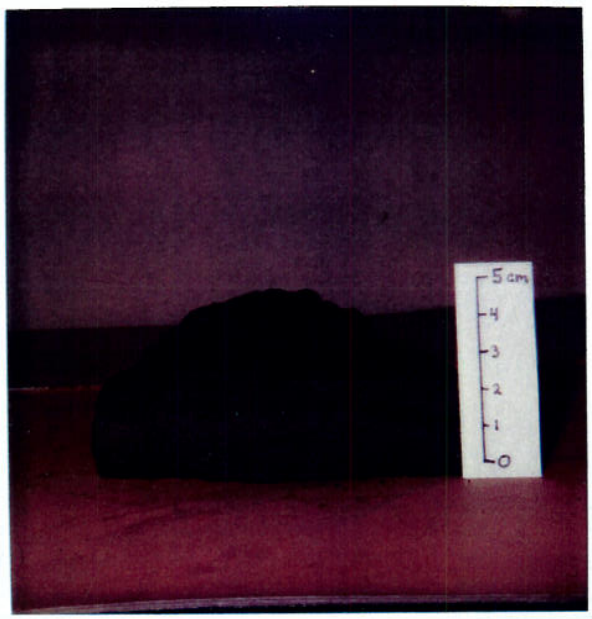
Substratum:

Rock type: Manganiferous Sandstone

Description: See D8-1. Two layers same composition.

Sandstone has more clastic and denser layers than some other samples in this dredge. Sample has mud with manganese nodules on what is presumably the top

Mineralogy (XRD):



Mariana Islands
D8-14

Analyses and subsamples:

analysis:	analyst:

D8-14

Mariana Islands

Sample Description

Cruise I.D: ~~L5-83-HW~~

Sample I.D: Sta: D 8-15

Location: Pago Seamount

Size: 16x13x5cm Weight: 1.16 Kg

Mn crust thickness:

Total: min: max: ave:

Inner crust: min: max: ave:

Outer crust: min: max: ave:

Surface texture: Granular w/a little glassy hydrothermal(?) areas

Internal structure:

layered:
laminated:
massive:
porous:
dendritic:
other:

Mineralogy (XRD):

Associated alteration, phosphorite, or hydrothermal deposits:

Substratum:

Rock type: Manganiferous Sandstone

Description: See D8-1. No distinct layers

Dense layers of Mn w/ Dendritic structure some fibrous Mn in Vugs next to dense layers

Mineralogy (XRD):

Mariana Islands
D8-15

Analyses and subsamples:

analysis:	analyst:

CM
D8-15

Mariana Islands

Sample Description

Cruise I.D: ~~L5-83-HW~~ Sample I.D: Sta: D8-16 Location: Poyo Seamount

Size: 13X11X3.5cm Weight: 570g

Mn crust thickness: 0

Total: min: max: ave:

Inner crust: min: max: ave:

Outer crust: min: max: ave:

Surface texture: Rough & vesicular(?) looking

Internal structure:

layered:
laminated:
massive:
porous:
dendritic:
other:

Mineralogy (XRD):

Associated alteration, phosphorite, or hydrothermal deposits:

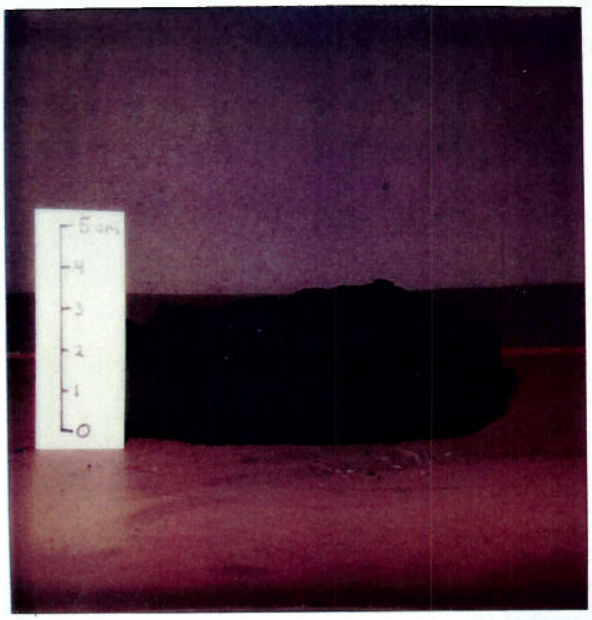
Substratum:

Rock type: Manganiferous Sandstone

Description: See D8-1. Two layers upper layer is 1cm thick & porous; bottom layer is ≈ 2cm thick & massive

Dense Mn layers - Not Continuous. Lower portion of sample ~~has~~ is a pumice layer. Mn Has oozed up between larger clasts (up to 2cm)

Mineralogy (XRD):



Mariana Islands
D8-16

Analyses and subsamples:

analysis:	analyst:

CM
D8-16

Sample Description

Cruise I.D: ~~L5-83-HW~~ Mariana Islands Sample I.D: Sta: D8-17 Location: Pavo Seamount

Size: 18x15x4cm Weight: 1.17 kg

Mn crust thickness: 0

Total: min: ____ max: ____ ave: ____

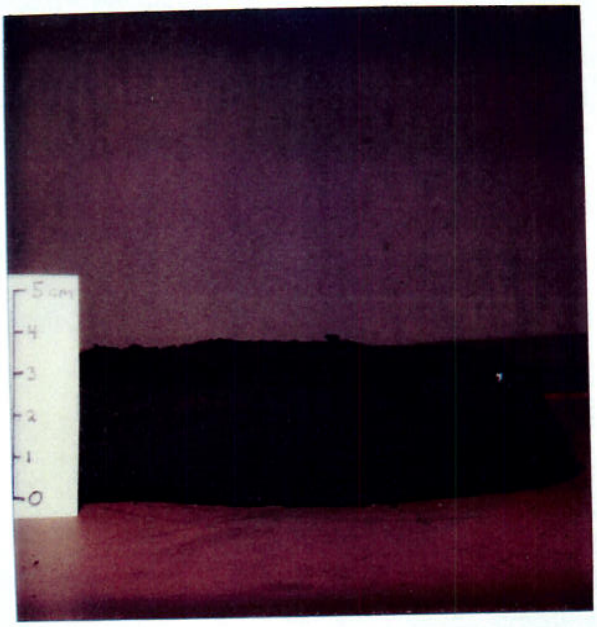
Inner crust: min: ____ max: ____ ave: ____

Outer crust: min: ____ max: ____ ave: ____

Surface texture: Granular

Internal structure: ____

layered: ____
laminated: ____
massive: ____
porous: ____
dendritic: ____
other: ____



Mariana Islands
D8-17

Mineralogy (XRD): ____

Associated alteration, phosphorite, or hydrothermal deposits:

A few forams on surface

Substratum:

Rock type: Manganiferous Sandstone

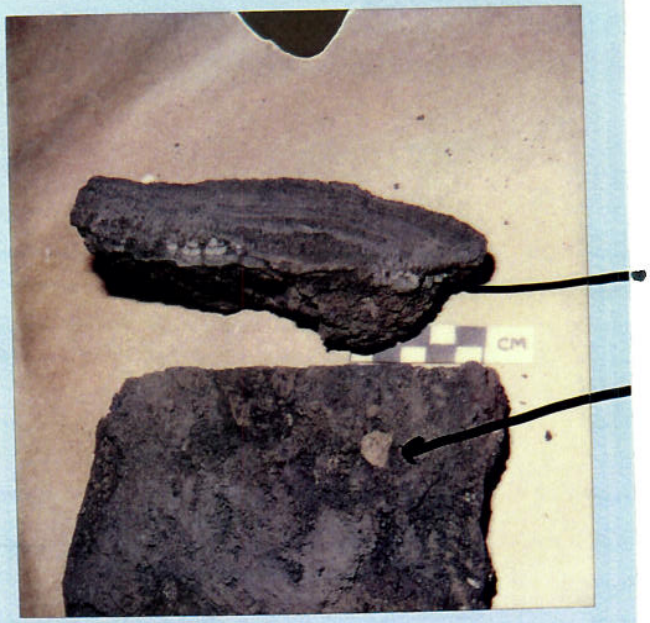
Description: See D8-1. 3 layers - really one glassy, botryoidal, 2-5mm thick, hydrothermal layer sandwiched in between the Mn-sst but varies in depth from the surface

Mineralogy (XRD):

Analyses and subsamples:

analysis:	analyst:

The bottom of this sample has the Mn fibers, (bubble columns)



Dense Mn, note the collofoon textures to left of sample

Pumice Clast

D8-17

Sample Description

Cruise I.D: ~~L5-83-HW~~ Marianas Islands Sample I.D: Sta: D8-18 Location: POYO Seamount

Size: largest [illegible] smallest [illegible] Weight: 1.95 Kg – 6 rocks in one bag –

Mn crust thickness: 0

Total: min: ____ max: ____ ave: ____

Inner crust: min: ____ max: ____ ave: ____

Outer crust: min: ____ max: ____ ave: ____

Surface texture: Granular to rough & hydrogenous

Internal structure: ____

layered: ____
laminated: ____
massive: ____
porous: ____
dendritic: ____
other: ____

Mineralogy (XRD): ____

Associated alteration, phosphorite, or hydrothermal deposits: ____

Substratum:

Rock type: Manganiferous Sandstone*

Description: See D8-1. One rock (the smallest) is medium grained & granular. The rest are very fine grained compact & massive, one of which has a glassy hydrogenous surface & a dense gray layer sandwiched btw brown-black hydrothermal? layers.

* One rock is a gray extremely vesicular basalt w/abundant plagioclase phenocrysts & a few olivine? phenocrysts

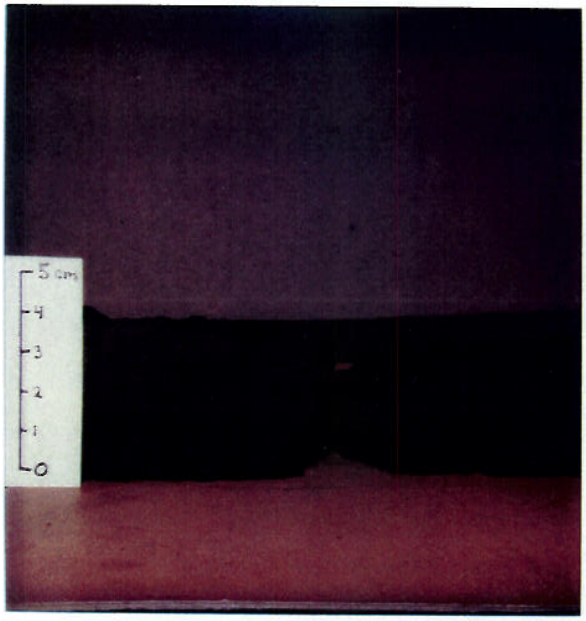
Mineralogy (XRD): ____

Marianas Islands
D8-18

Analyses and subsamples:

analysis:	analyst:

These samples Regrouped with D8-19 & D8-21 See D8-22 on



Marianas Islands

D8-18

Sample Description

Cruise I.D: ~~L5-83-HW~~ Mariana Islands Sample I.D: Sta: D8-19 Location: POYO Seamount

Size: ave. 11x9x2cm Weight: 5.67 Kg Bag of 6-20 rocks

Mn crust thickness: -0-

Total: min: ____ max: ____ ave: ____

Inner crust: min: ____ max: ____ ave: ____

Outer crust: min: ____ max: ____ ave: ____

Surface texture: Mostly Granular to hydrogenous

Internal structure: ____

layered: ____
laminated: ____
massive: ____
porous: ____
dendritic: ____
other: ____

Mineralogy (XRD): ____

Associated alteration, phosphorite, or hydrothermal deposits:

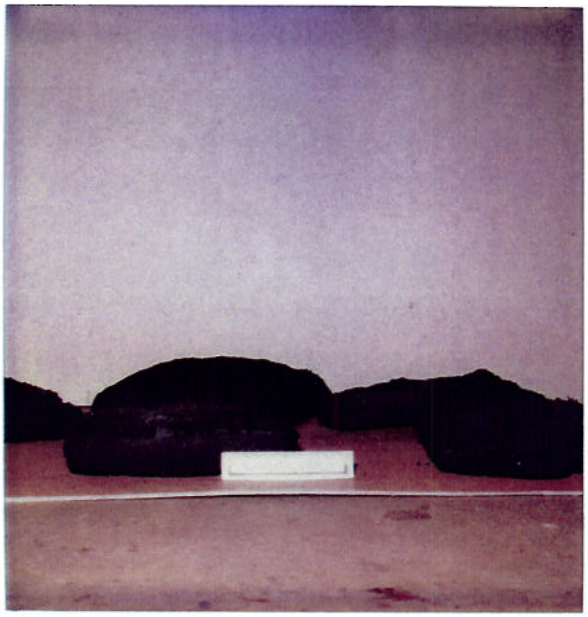
numerous worm tubes on some rocks

Substratum:

Rock type: Manganiferous Sandstone

Description: See D8-1. Number of layers vary from 1-4. Mat are thin (≤3mm) hydrogenous layers intermixed in the Mn-sst. One has a thin, glassy hydrogenous layer that completely coats the surface & has a "current rippled" texture

Mineralogy (XRD):



Mariana Islands
D8-19

Analyses and subsamples:

analysis:	analyst:
½ of one rx to	Germans - Halbach

These samples regrouped with D-8-18 & D8-21
See D8-22 on

Marianas Islands
D8-19

Sample Description

Cruise I.D: ~~L5-83-HW~~ Mariana Islands

Sample I.D: Sta: D8-20

Location: POYO Seamount

Size: cut up into ≈12 pieces ≈9x8x20 cm Weight: Wet ≈1.4 kg

Mn crust thickness:

Total: min: 3mm max: 5.8cm ave: 2.5cm

Inner crust: min: max: ave:

Outer crust: min: max: ave:

Surface texture: Porous

Internal structure:

layered:
laminated:
massive:
porous: ✓ w/sand grains interspersed throughout
dendritic:
other:

Mineralogy (XRD):

ssociated alteration, phosphorite, or hydrothermal deposits:

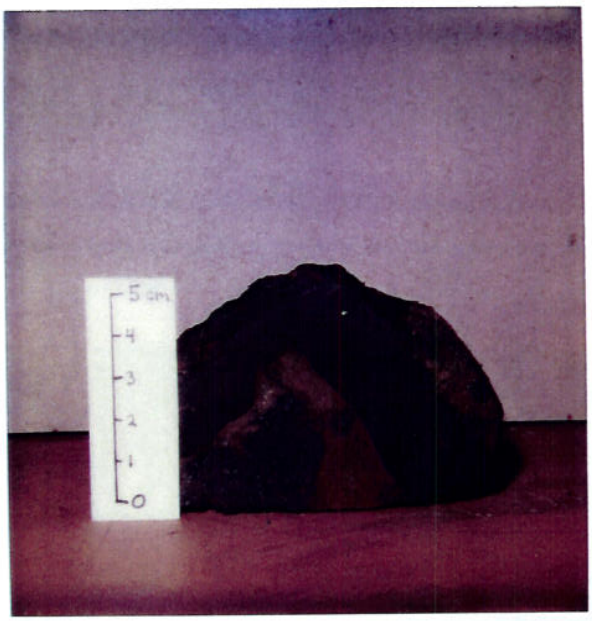
Some brown, sandy, mud ≈5mm thick, coating one corner of Mn crust

Substratum:

Rock type: Basalt - breccia

Description: Light to dark gray, vesicular basalt "clasts" with [illegible] plagioclase phenocrysts. The "clasts" are rimmed & for floating in a glassy groundmass that is completely altered to a greenish-tan clay. Some parts of the rock are all claystone. Some "clasts" are "floating" in [illegible] Mn crust.

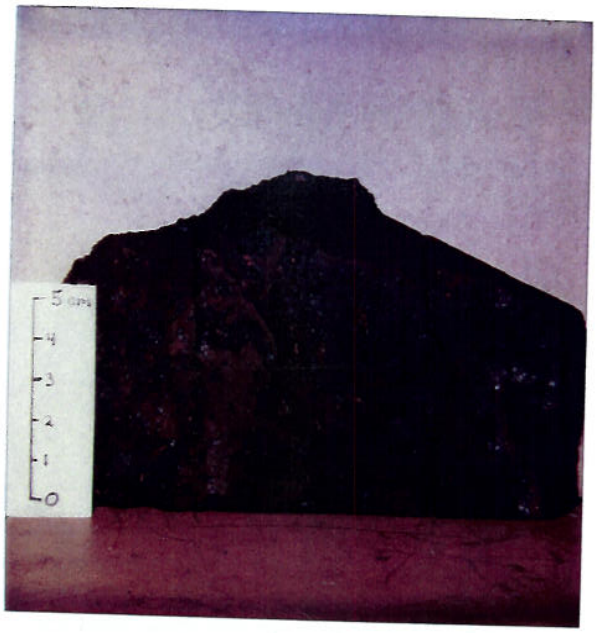
Mineralogy (XRD):



Mariana Islands
D8-20

Analyses and subsamples:

analysis:	analyst:
Sampled for XRD:	Charlaine
D8-20-I: bulk Mn crust	
II: bulk basalt	
III: "glass" altered to clay	
Sampled for chemistry:	Charlaine/USGS
REE - bulk	
Manheim pkg. - bulk	
O_2 isotopes	[illegible]
D8-20 resubmitted for Hg Chemistry	



Mariana Islands
D8-20

Sample Description

Cruise I.D: ~~L5-83-HW~~ MARIANA ISLANDS

Sample I.D: Sta: D8-21

Location: Pago Seamount

Size: 14x9x2cm (varies to 5x3x1cm) Weight: 5.53 Kg large bag of small pencil shaped rocks

Mn crust thickness: 0

Total: min: max: ave:

Inner crust: min: max: ave:

Outer crust: min: max: ave:

Surface texture: Granular

Internal structure: 0

layered:
laminated:
massive:
porous:
dendritic:
other:

Mineralogy (XRD):

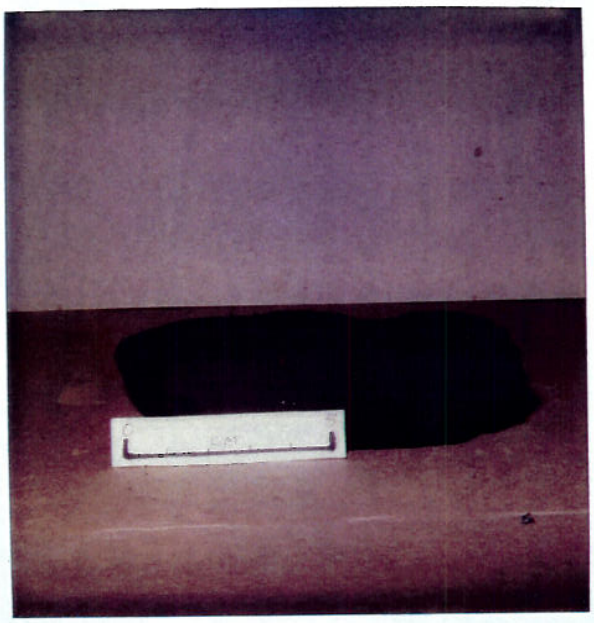
ssociated alteration, phosphorite, or hydrothermal deposits:

Substratum:

Rock type: Manganiferous Sandstone

Description: See D8-1

Mineralogy (XRD):



D8-21 MARIANAS

Analyses and subsamples:

analysis:	analyst:

These samples Regrouped with D8-18 & D8-19 see D8-22 ctn.

SAMPLE DESCRIPTION

Cruise Id: TT192 Size: _____ (cm) Location: _____

Sample Id: D8-22 Weight: each sample <1kg (kg) Depth: _____ (m)

Mn Crust Description

Surface Texture: _____

Mn Crust Thickness (mm):
Min: _____ Max: _____ Ave: _____

Layers (Outer to Inner)(mm):

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

TT192 D8-22

Comments and XRD Mineralogy:

All the samples have pumice clasts, some in both layers and some only in the Mn cemented sst. All samples but I have shiny botryoidal denser manganese on the top of the samples. These samples have dense gray black Mn cemented layer overlying the Red brown mudstone.

Substrate Description

Rock Type: Red Brown poorly sorted sandy foram bearing mudstone with large clasts of pumice (up to 10mm) layer from 3mm to 30mm thick

Description:

This is a group of samples (originally in D8-20, D8-21, D8-9 & D8-19) that I have grouped together because they all have the Red brown mudstone.

Biology ?: _____

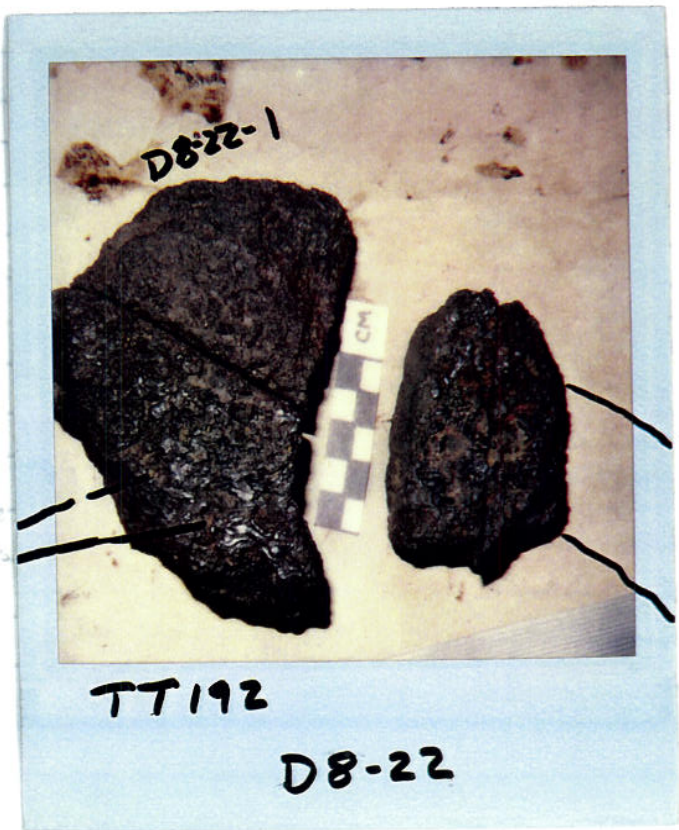
ANALYSES

Subsample Number	Analysis	LayerThickness-Explanation
DPTS	D8-22-1	(see back for photo)

Described By: JSM Subsampled By:

pumice larger

In these samples it seems that the Mn when cementing the larger pumices also took on a different texture than in the sandstones. It becomes more submetallic and less porous.



SAMPLE DESCRIPTION

Cruise Id: TT192 Size: 25 x 50 x 90 mm (cm) Location: _____

Sample Id: D8-23 Weight: < 1 kg (kg) Depth: _____ (m)

Mn Crust Description

Surface Texture: _____

Mn Crust Thickness (mm):
Min: _____ Max: _____ Ave: _____

Layers (Outer to Inner)(mm):

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

Comments and XRD Mineralogy:

ANALYSES

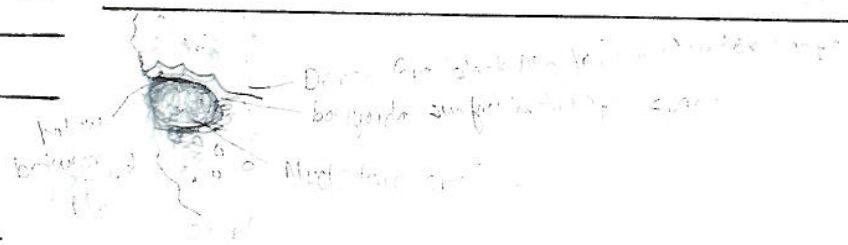
Subsample Number	Analysis	LayerThickness-Explanation
DPTS of larger sample - when I made another cut for the polished section the new cut showed that this is also a graded sand		

Substrate Description

Rock Type: Two samples of coarse Mn cemented sandstone one sample is graded.

Description: Vocaniclastic coarse sandstone with angular clasts. The graded sample has a larger mudstone/siltstone clast (~5mm) that looks to have ponded Mn on one side (or below)

Biology ?: _____



Described By: JSM Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: TT192 Size: 80x 55x 25cm (cm) Location: _____

Sample Id: D8-24 Weight: 170 x 90 x 35mm 410 x 120 x 50mm (kg) Depth: _____(m)

Mn Crust Description

Surface Texture: _____

Mn Crust Thickness (mm):
Min: _____ Max: _____ Ave: _____

Layers (Outer to Inner)(mm):

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

Comments and XRD Mineralogy:
15 Samples - Mineralogy of D8-17,18 + 21

ANALYSES

Subsample Number Analysis LayerThickness-Explanation

Substrate Description

Rock Type: These are Mn cemented sandstone with developed dense layers of Stratiform Mn

Description:

Mineralogy ?: _____

Described By: JORW Subsampled By: _____

SAMPLE DESCRIPTION

Cruise Id: TT 192 Size: 95 x 75 x 25 mm (cm) Location: _____

Sample Id: D8-25 Weight: 110 x 115 x 28 mm (kg) Depth: _____ (m)

< 1 kg

Mn Crust Description

Surface Texture: _____

Mn Crust Thickness (mm):
Min: _____ Max: _____ Ave: _____

Layers (Outer to Inner)(mm):

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

TT192

D8-25

Comments and XRD Mineralogy:

ANALYSES

Subsample Number	Analysis	LayerThickness-Explanation

Substrate Description

Rock Type: Mn cemented Sandstone w/ dense stratiform layer/layers (sandstone similar to others in this dredge. These 3 samples all have the light

Description: gray porous mounds of pure Mn on them. Under the binocular scope the structure of these mounds is seen to be linear groupings of botryoids or spheroids (bubble columns). Arrow in photo points to gray mound which fell off sample when

logy-?: I attempted to saw through it. These mound pieces are now in plastic vial

Described By: JSM Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: D8-26 Size: 140 x 120 x 80 mm 75 x 60 x 20 mm (cm) Location: _____

Sample Id: TT192 Weight: <1kg (kg) Depth: _____ (m)

Mn Crust Description

Surface Texture: _____

Mn Crust Thickness (mm):
Min: _____ Max: _____ Ave: _____

Layers (Outer to Inner)(mm):

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

TT192

D8-26

Comments and XRD Mineralogy:

ANALYSES

Subsample Number	Analysis	Layer Thickness-Explanation

Substrate Description

Rock Type: Group From D8-18, 19 & 21. These Mn Cemented Sandstones have No definite stratibound layers. The Sandstones are very similar to the others in this dredge volcaniclastic, angular to sub angular medium grained.

Description:

Biology ?: _____

Described By: JSM Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: TT192 Size: _____ (cm) Location: _____

Sample Id: D8-27 Weight: _____ (kg) Depth: _____ (m)

Mn Crust Description

Surface Texture: _____

Mn Crust Thickness (mm):
Min: _____ Max: _____ Ave: _____

Layers (Outer to Inner)(mm):

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

D8-27
TT192

Comments and XRD Mineralogy:

Substrate Description

Rock Type: This group from D8-18, 19 & 21 has botryoidal development & is the sandstones or columnar dense Mn with sand between

Description: Why is the sand between mineralized?

Biology ?: _____

ANALYSES

Subsample Number	Analysis	LayerThickness-Explanation

Described By: JSM Subsampled By:

DPTS This Face

D8-27

TT192

SAMPLE DESCRIPTION

Cruise Id: TT192 Size: 45 x 100 x 20 / 75 x 85 x 25 (cm) Location: _____

Sample Id: D8-28 Weight: _____ (kg) Depth: _____ (m)

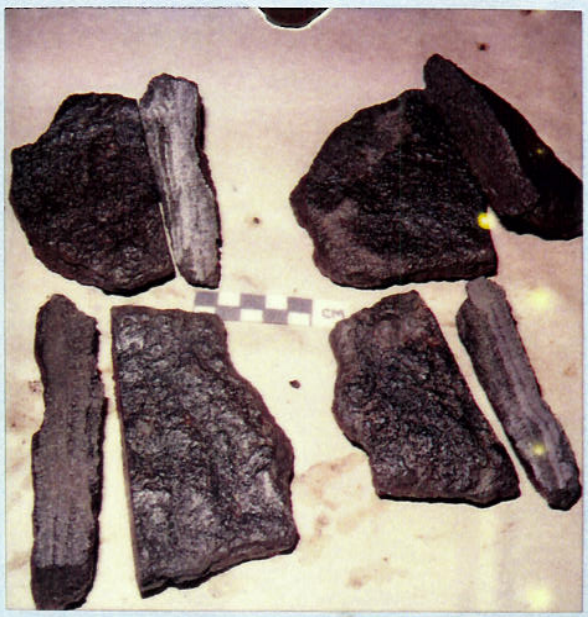
Mn Crust Description

Surface Texture: _____

Mn Crust Thickness (mm):
Min: _____ Max: _____ Ave: _____

Layers (Outer to Inner)(mm):

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



D8-28 TT192

Comments and XRD Mineralogy:

ANALYSES

Subsample Number	Analysis	LayerThickness-Explanation
DPTS AS MARKED ON BACK - POSSIBLE HYDROGENOUS MN		

Substrate Description

Rock Type: Mn Sandstones and Stratibound Mn. These Samples formerly of D8-1819 & 21 all seemed to have Thin 1mm or less of hydrogen mn crust. The crusts are polished and look current influenced, very smooth. I am not totally convinced that they are crusts maybe another type of hydrothermal layer

Description:

logy ?:

Described By: JSM Subsampled By:

D8-28 TT192

SAMPLE DESCRIPTION

Cruise Id: TT192 Size: _____ (cm) Location: _____

Sample Id: D8-29 Weight: _____ (kg) Depth: _____ (m)

Mn Crust Description

Surface Texture: Very thin <1mm Mn Crust [illegible] the surface is [illegible]

Mn Crust Thickness (mm):

Min: _____ Max: _____ Ave: _____

Layers (Outer to Inner)(mm):

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

D8-29 - TT192

Comments and XRD Mineralogy:

Substrate Description

Rock Type: Vesicular porphyritic andesite/basalt

Description:

Biology ?:

ANALYSES

Subsample Number	Analysis	LayerThickness-Explanation

Described By: JSM Subsampled By: