



D1

Start  
22°17.62'S  
176°39.31'W  
2063m

End  
22°17.93'S  
176°38.48'W  
1965m

Three samples were numbered individually, but grouped together by whomever did the initial sampling and descriptions.

So, as I go back through these I am regrouping some of them. The groupings start with D1-A on the description sheets are the individual rock <sup>sample</sup> numbers. The original description and chemist sheets are at the end of these group descriptions.

In many samples of *Trochocenta* and *Ala* there is good development of "Trochocenta" crystals; they are fibrous and can give the surface a "furry" look

↑  
Porous - fibrous mass

**SAMPLE DESCRIPTION**

DI-A These are groups of  
together, as the samples w/ signifi  
xtals in mud (Volcanic Glass)

C Id: L3-84-SP Size: \_\_\_\_\_ Location: Lau Basin

Sample Id: D1-69, 65, 61, 50, 51, 43, 23 Weight: < 1 kg Depth: \_\_\_\_\_

approx 1000  
to 1000 density  
-15 g/cm<sup>3</sup>

**Mn Crust Description**

Surface Texture: pieces of hydrothermal Mn, layers  
w/ radial spines of radiolite stals between layers,  
also between Mn on hydrothermal Mn layers

**Mn Crust Thickness:**

Min: \_\_\_\_\_ Max: \_\_\_\_\_ Ave: \_\_\_\_\_

**Layers (Outer to Inner):**

	Min	Max	Ave	Texture
1.				
2.				
3.				
4.				
5.				
6.				



**L3-84-SP  
Lau Basin DI-A**

**nts and XRD Mineralogy:**

These groups of samples all have a  
white, fibrous, fibrous, fibrous mineral  
in one side. (Halite? Zeolite? Gypsum? or  
some hydrothermal mineral). These are later in nature  
embedded in the mud that is on the sample,  
although some of the crystalline material is embedded  
in the Mn. Did the Mn or the hydrothermal create  
these stals by interacting with the muds?  
XRD sample does have some of the mud in it  
10-5000 xtal turn out to be volcanic glass!

**ANALYSES**

DI-A xtal: XRD of xtls in crust  
35mm photo of xtls on D1-63  
Cronan - pashia

**Substrate Description**

Rock Type: \_\_\_\_\_

**Description:**

Hydrothermal Mn, metallic to submetallic  
layers.

Described By: Jim

Subsampled By: \_\_\_\_\_





all hydrothermal

SAMPLE DESCRIPTION

D1-C unnumbered small samples all hydrothermal

Id: L3-84-SP Size: \_\_\_\_\_ Location: \_\_\_\_\_

Sample Id: D1-C Weight: \_\_\_\_\_ Depth: \_\_\_\_\_

Mn Crust Description

Surface Texture: \_\_\_\_\_

Mn Crust Thickness:

Min: \_\_\_\_\_ Max: \_\_\_\_\_ Ave: \_\_\_\_\_

Layers (Outer to Inner):

	Min	Max	Ave	Texture
1.				
2.				
3.				
4.				
5.				
6.				



Contents and XRD Mineralogy:

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

ANALYSES

SEM sample of layered Mn

Coron pathia

Substrate Description

Rock Type: \_\_\_\_\_

Description:

Various small pieces of layered hydrothermal Mn

Described By: JSM

Subsampled By: \_\_\_\_\_









Cruise I.D: E5-83-HW

Sample I.D: Sta: D1-17

Location: Lau Basin

Size: 2x8x2cm Weight: \_\_\_\_\_

Mn crust thickness:

Total: min: 10mm max: 12mm ave: \_\_\_\_\_

Inner crust: min: \_\_\_\_\_ max: \_\_\_\_\_ ave: \_\_\_\_\_

Outer crust: min: \_\_\_\_\_ max: \_\_\_\_\_ ave: \_\_\_\_\_

Surface texture: granular

Internal structure: \_\_\_\_\_

layered: \_\_\_\_\_

laminated:  grey & black

massive:  grey layers

porous:  black

dendritic: \_\_\_\_\_

other: \_\_\_\_\_

Mineralogy (XRD):

III A: Todorakite (chatterite), birnessite,  $\text{Fe Mn O}_2$

III B: Birnessite, todorakite,  $\text{Fe Mn O}_2$

IV: Crystalline Todorakite,  $\text{Fe Mn O}_2$

Associated alteration, phosphorite, or hydrothermal deposits:

Substratum: \_\_\_\_\_

Rock type: P Mn

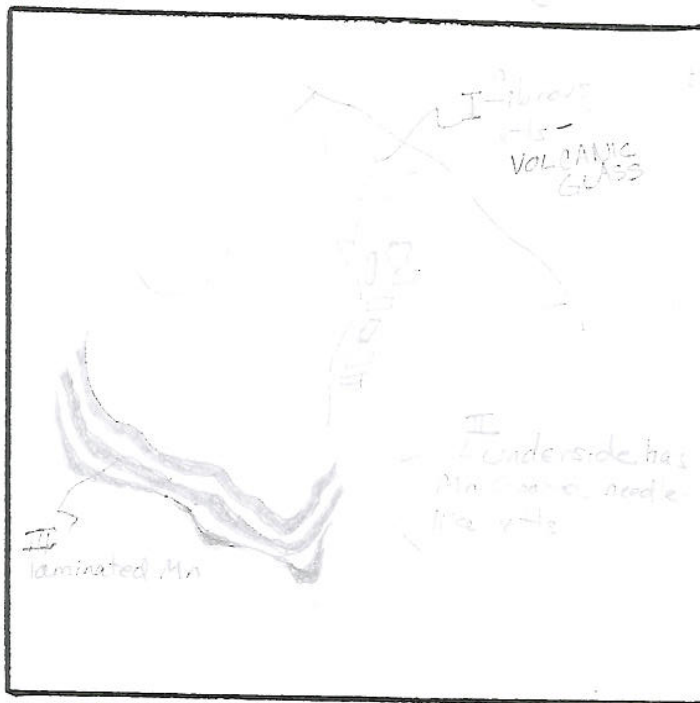
Description: Grey-black laminated Mn-bearing mass. Underneath side of rock has long fibrous, needle-like crystals of ~~crystalline Mn~~ Todorakite

Mineralogy (XRD):

I: Amorphous glass

This sample with Pacific Ocean samples

only rock in this sample took a few scrapings



Analyses and subsamples:

analysis:

analyst:

Sr-Isotope \_\_\_\_\_

Ham-Ingram \_\_\_\_\_

For XRD: \_\_\_\_\_

C. Daniel \_\_\_\_\_

D1-17-I: gypsum? xts 0-1mm

D1-17-II: Mn xts 11-12mm

D1-17-III: Mn laminations D1-17-III For Hg Chem

a = black lam 1-5mm

b = grey layer 5-10mm

Polished Thin Section

Chem: 5 layers

Mass Petrograph

U.S.G.S. Manila Pack

D1-17-I: Surface 0-1mm

D1-17-II: bottom crystals 11-12mm

D1-17-III A: 1st layer 1-4mm

D1-17-III B: 2nd layer 1-5mm

D1-17-III C: 3rd layer 2-11mm

211K6 Resampled for chem - pt group REE Chalains

D1-17-IV bulk of D1-17- Reston - Fluo. Brown

III A B, C Member package

D1-17-IV sent for Hg Chem

SEM of white crystals - Volcanic Glass



DI-17 Top of sample  
w/ translucent crystals (quartz glass)





Sample consists of 3 small bags (each with several small pieces) and 2 small hard size rocks. The 2 hard size specimens are almost completely covered with orange clay sediment & have cone porous Mn (maybe whole inside is Mn). The rest of the eggs are the same as the one described in front.

Sample consists of 3 small bags (each with several small pieces) and...

SAMPLE DESCRIPTION

Cruise Id: L3-84-SP Size: \_\_\_\_\_ (cm) Location: \_\_\_\_\_

Sample Id: D1-18 Weight: \_\_\_\_\_ (kg) Depth: \_\_\_\_\_ (m)

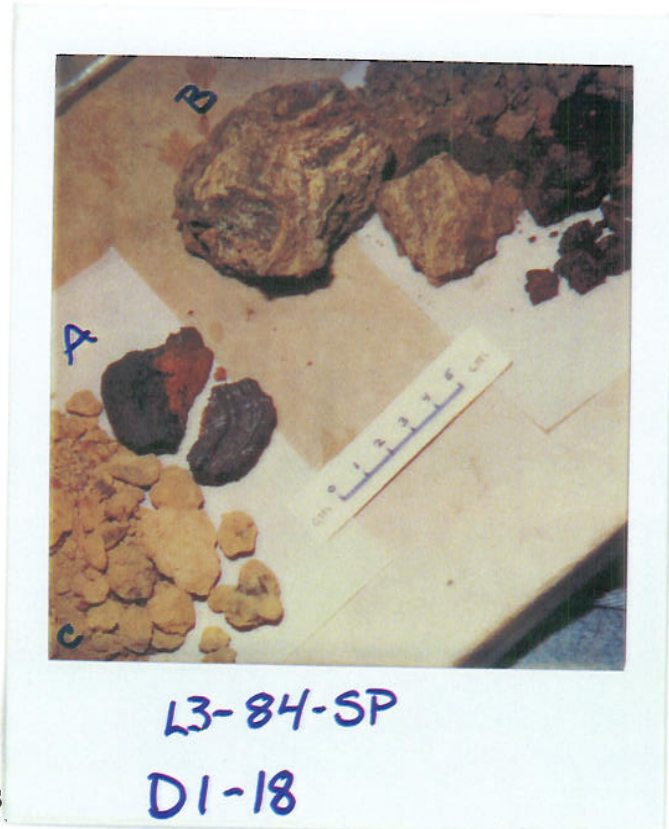
Mn Crust Description

Surface Texture: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Mn Crust Thickness (mm):  
 Min: \_\_\_\_\_ Max: \_\_\_\_\_ Ave: \_\_\_\_\_

Layers (Outer to Inner)(mm):  
 Min Max Ave Texture & Color

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_



L3-84-SP

D1-18

Comments and XRD Mineralogy:

3 types of things here  
A - Hydrothermal layered Mn w/ orange mud/siltstone on bottom(?)  
B - Orange mud w/ Mn (layers?) and Mn staining throughout Basalt clasts (orange and large clast coated w/ the Mn mud)  
C - Orange mud & siltstone with very little Mn some evidence of burrows

ANALYSES

Subsample Number	Analysis	Layer Thickness-Explanation
D1-18B	XRD	Mud & basalt from "B"
D1-18C	XRD	Mud
D1-18A <sup>g, CC, Hg</sup>		Hydrothermal Mn
D1-18A	Li isotopes	9 gm Yeh
D1-18A	MISSbauer	16 gm V. Rusanov

Substrate Description

Rock Type: \_\_\_\_\_

Description:

The large B sample is basalt on lower ocean and may be covered with the mud coating (see photo back). A small thin layer of basalt (or lava?) that was altered.

Topology?: \_\_\_\_\_

Described By: JSM

Subsampled By: \_\_\_\_\_



L3-84-SP

Wet  
Sample

D1-18B





Rest of samples from this dredge are similar to rock described on front. No Mn crust is not much Mn - just a couple of packets or lenses of Mn. Lots of orange mud covering rocks





D1-71-A amorphous  
D1-71-B amorphous

D1-71-C  $\delta\text{MnO}_2$  - Birnessite - Todokite

Cruise I.D.: L5-83-HW

Sample Description

Sample I.D.: Sta: D-204

Location: au Basin

Size: \_\_\_\_\_ Weight: \_\_\_\_\_

\* Sample # changed from #33 to #46-72 Group 0

Mn crust thickness:

Total: min: \_\_\_\_\_ max: \_\_\_\_\_ ave: \_\_\_\_\_

Inner crust: min: \_\_\_\_\_ max: \_\_\_\_\_ ave: \_\_\_\_\_

Outer crust: min: \_\_\_\_\_ max: \_\_\_\_\_ ave: \_\_\_\_\_

Surface texture: Smooth

Internal structure: \_\_\_\_\_

- layered: \_\_\_\_\_
- laminated:  \_\_\_\_\_
- massive: \_\_\_\_\_
- porous:  \_\_\_\_\_
- dendritic: \_\_\_\_\_
- other: \_\_\_\_\_

Mineralogy (XRD):

Brenesite  
MnO<sub>2</sub>  
Todorokite

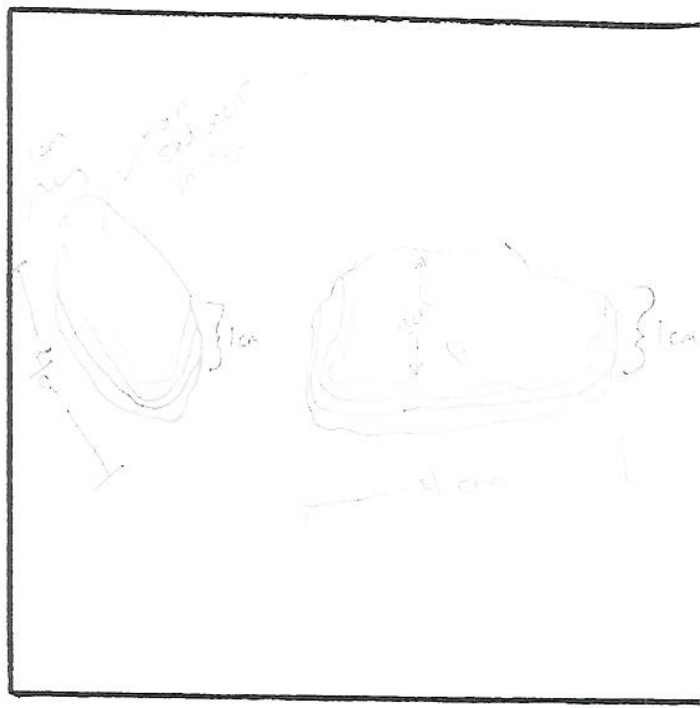
Associated alteration, phosphorite, or hydrothermal deposits:

Substratum:

Rock type: Mn

Description: laminated w/ black granular layer; grey massive base. On piece has ten sediment crust

Mineralogy (XRD):



Analyses and subsamples:

analysis:

analyst:

Took 2 small pieces for XRD. D. 1/2/81

D. 1/2/81

A: the rocks (~30 small handsize) consist of dirty brown-black  
Mn with no substrate, except two which are gray/aphant  
vesicular andesite? The majority are laminated, gray/black  
like as one described on front.

All the rocks (~30 small handsize) consist of dirty brown-black...