SAMPLE DESCRIPTION

Cruise Id: F11-90-CP Size (cm): 4 x 4 x 4 Location: Yap D

Sample Id: D11-16 Weight (kg): 0.3 Depth (m): 2300 – 2280

D11-16

Mn Crust Description

Surface Texture: Smooth to rough

Mn Crust Thickness (mm):

Min: – Max: 1.0 Ave: –

Outer to Inner Layers (mm)

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

Comments and XRD Mineralogy:

partly encrusted by a thin Mn layer.

S

50% KORDD
50% USGS

Substrate Description

Rock Type: altered plutonic rock or greywacke (?)

Description: · large fibrous green crystals (amphibole?) are grown in chlorite-rich groundmass.
· large pyroxene(?) crystals are heavily altered and rims of the crystals are oxidized to Fe-oxides (magnetite?)

Biology (?):

Described by: Ahn

Subsampled by:

SAMPLE DESCRIPTION

Cruise Id: F11-90-CP Size (cm): 7x6.5x6.5 Location: VAPD

Sample Id: D11-17 Weight (kg): 0.5 to 1 Depth (m): 2300 - 2800

Mn Crust Description

Surface Texture: Eroded - patina granular.

Mn Crust Thickness (mm):

Min:_____ Max:_____ Ave:_____

Outer to Inner Layers (mm)

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

D11-17

Comments and XRD Mineralogy:

S

50% HORDR

50% USGS

Substrate Description

Rock Type: Fine grained basalt

Description: Fine grained dark green basalt(?). with fractures cutting sample. This is a clast from a breccia. The outer surface is covered with fine to coarse grained rock

Biology (?): fragments in a calcite cement(?)

Described by: GS.

Subsampled by:

SAMPLE DESCRIPTION

Cruise Id: F11-90-CP Size (cm): 8x7.5x6.5 Location: YAD D

Sample Id: D11-18 Weight (kg): 2 Depth (m): 2300 - 2200

Mn Crust Description

Surface Texture: Patchy - smooth to granular Patina

Mn Crust Thickness (mm):

Min:_____ Max:_____ Ave:_____

Outer to Inner Layers (mm)

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

D11-18

Comments and XRD Mineralogy:

Su

D11-18 OC, Au 5 gm
TS, XRD

Substrate Description

Rock Type: ~~Hydrothermal Vein~~
Vesuvianite-garnet Skarn
~~Metamorphosed Granodiorite(?)~~

Description: Brecciated recrystallized orthodiorite with green prehnite(?) quartz? + laumonite?
Some Fe stained microfractures cut the sample. Some very minor calcite along veins

Biology (?): Encrusting Forams

Described by: GS

Subsampled by: G.S. G.S.

SAMPLE DESCRIPTION

Cruise Id: F11-90-CP Size (cm): 7x5x4 Location: YAP D

Sample Id: D11-19 Weight (kg): 0.5 Depth (m): [illegible]

Mn Crust Description

Surface Texture: Porous - pitchy + [illegible] granular

Mn Crust Thickness (mm):

Min:_____ Max:_____ Ave:_____

Outer to Inner Layers (mm)

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

D11-19

Comments and XRD Mineralogy:

Su

D11-19 XRD Bulk

Substrate Description

Rock Type: Serpentinized ? Cataclastite or hydrothermally altered Breccia? Eclogite?

50% HORDI
50% USGS

Description: [illegible] breccia (?). With shearing or hydrothermal activity the samples origin is unknown

A Sheared mass

There seems to be a layered or schistosity to the sample

Biology (?): Micro fractures are lined with mn. Little encrusting forams

Described by: G.S.

Subsampled by: G.S. C

SAMPLE DESCRIPTION

Cruise Id: F11-90-CP Size (cm): 7.5 x 5 x 4.5 Location: YAP D

Sample Id: D11-20 Weight (kg): 0.193 Depth (m): 2300 (2280)

Mn Crust Description

Surface Texture: eroded patchy granular Patina (only remains in side cavities)

Mn Crust Thickness (mm):

Min:_____ Max: Patina Ave:_____

Outer to Inner Layers (mm)

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

D11-20

Comments and XRD Mineralogy:

S

D11-20 DPTS

XRD

Substrate Description

Rock Type: recrystallized Manganese impregnated coral fragment (limestone)

Description: fragment is highly eroded. Manganese impregnated cell or organism boundries before recrystallization to limestone

Biology (?): None

Described by: G.S.

Subsampled by: G.S.

SAMPLE DESCRIPTION

Cruise Id: F11-90-CP Size (cm): 5x5x7 Location: YAP D

Sample Id: D11-21 Weight (kg): 0.3 Depth (m): 2300-2280

Mn Crust Description

Surface Texture: rough, fine granular

Mn Crust Thickness (mm):

Min:_____ Max:_____ Ave: 0.8

Outer to Inner Layers (mm)

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

D11-21

Comments and XRD Mineralogy:

· Sample is encrusted by a thin Mn-layer

Sub

D11-21 XRD opal vein

Substrate Description

Rock Type: Altered Basalt

50% KORDI
50% USGS

Description:

· Sample is partially coated by greenish opal (?)

· fine veins are filled with either opal(?) or calcite

· mafic minerals are heavily altered to chlorite and other clays.

Biology (?):

Described by: Ahn

Subsampled by:

J.H.

SAMPLE DESCRIPTION

Cruise Id: F11-90-CP Size (cm): 9.5 x 5.5 x 5.5 Location: YAP D

Sample Id: D11-22 Weight (kg): 2 Depth (m): 2300-2220

Mn Crust Description

Surface Texture: Patchy - eroded Patina - shear surface

Mn Crust Thickness (mm):

Min:_____ Max:_____ Ave:_____

Outer to Inner Layers (mm)

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

D11-22

Comments and XRD Mineralogy:

Sub

D11-22 DPTS. Bulk Rx

OC, Au ~5gm

XRD

Substrate Description

Rock Type: Metamorphosed + recrystallized? Serpentinized

Description: Original rock is unknown but it is highly sheared + altered (pinco fractures + Fe stained) This has then been recrystallized (?) with the orientation of the shear preserved (fractures seem to contain a cross veins) There are veins filled with a white mineral that is not calcite + softer than quartz. (Hyrothermal?) There are 2 cross cutting fractures that allowed hydrothermal fluids to enter + alter the near by clasts.

Biology (?):

Described by: G.S.

Subsampled by: G.S.

All iron oxide altered clasts crossed by ammonizing veins of magnetite - identical to D11-13

SAMPLE DESCRIPTION

Cruise Id: F11-90-CP Size (cm): 11 x 6 x 7 Location: Yap D

Sample Id: D11-23 Weight (kg): 0.8 Depth (m): 2300 - 2280

Mn Crust Description

Surface Texture: smooth

Mn Crust Thickness (mm):

Min: - Max: - Ave: -

Outer to Inner Layers (mm)

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

D11-23

Comments and XRD Mineralogy:

very small part encrusted by Mn layer

Substrate Description

Rock Type: Pebbly Sandstone or breccia

50% USGS
50% HORDD

Description: matrix are Fe oxide rich sandstone clasts consist of various sizes of recrystallized quartz, metamorphosed and altered plutonic rock, and basalt fragments, Qtz well rounded

Biology (?):

Described by: Yoo

Subsampled by:

SAMPLE DESCRIPTION

Cruise Id: F11-90-CP Size (cm): 8 x 12 x 10 Location: Yap D

Sample Id: D11-24 Weight (kg): 1.0 Depth (m): 2300 - 2280

Mn Crust Description

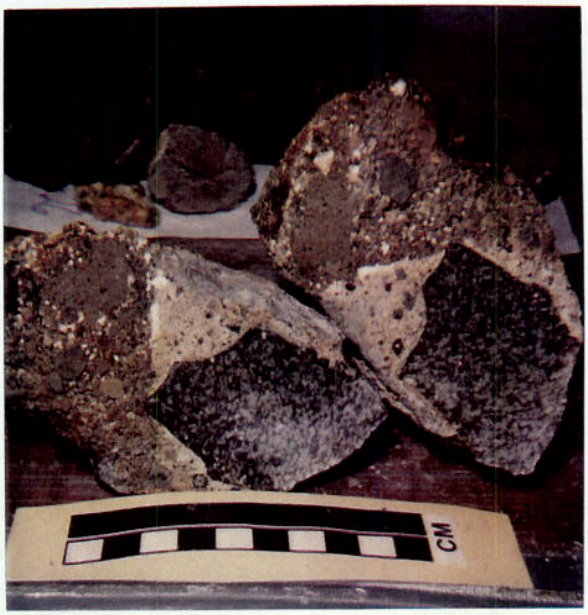
Surface Texture: Smooth - small patch

Mn Crust Thickness (mm):

Min: — Max: — Ave: —

Outer to Inner Layers (mm)

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



D11-24

Comments and XRD Mineralogy:

Small part of sample is encrusted by Mn-crust and Fe-oxide

50% HORD1
50% USGS

Substrate Description

Rock Type: Breccia

Description: Calcite cements & matrix. Poorly sorted clasts include: basalt and calcite fragments and large piece of metamorphosed gabbro (?) showing foliation. (relatively fresh) Gabbro (?) is magnetic

Biology (?):

Described by: Ahn

Subsampled by:

SAMPLE DESCRIPTION

Cruise Id: F11-90-CP Size (cm): 9x12x13 Location: Yap D

Sample Id: D11-25 Weight (kg): 1.5 Depth (m): 2300-2280

D11-25

Mn Crust Description

Surface Texture: Smooth

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:

Subsa

Substrate Description

Rock Type: Breccia

50% KORDI
50% USGS

Description: Matrix is Fe-oxide rich mudstone
Clasts are poorly sorted gabbro(?) fragments
some of which are coated by very thin Mn-layer.
All small clasts are altered, but largest one shows
relatively fresh core. Clasts are magnetic.

Core Lateable
Alice ??

Biology (?):

Described by: Ahn

Subsampled by:

SAMPLE DESCRIPTION

Cruise Id: F11-90-CP Size (cm): 3 x 4 x 4 / 9 x 9 x 10 Location: Yap D

Sample Id: D11-26 Weight (kg): 10 Depth (m): 2300 x 2280

Mn Crust Description

Surface Texture: granular + botryoidal

Mn Crust Thickness (mm):

Min: <1 Max: 6 Ave: 3

Outer to Inner Layers (mm)

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

11.7g Au

D11-26

Comments and XRD Mineralogy:

· Encrusted by a Mn crust.

S

D11-26-1 OC, Au 200gm Bulk Rx

DPTS, XRD

Substrate Description

Rock Type: Altered Basalt ??

hydrothermal Fe oxides

* more sample was needed for Au 11.7g

Description: · magnetic

· fractures are filled either with calcite veins.

· part of sample is sandstone that contain small volcanic clasts.

Biology (?):

Described by: Ahn

Subsampled by: G.S.

SAMPLE DESCRIPTION

Cruise Id: F11-90-CP Size (cm): 7x5x4 4x4x3.5 Location: YAPD

Sample Id: D11-27 Weight (kg): 0.25 Depth (m): 2300-2020

Mn Crust Description

Surface Texture: Patina ~ smooth patchy

Mn Crust Thickness (mm):

Min:_____ Max:_____ Ave:_____

Outer to Inner Layers (mm)

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

D10-27

Comments and XRD Mineralogy:

Su

All used in chem

D11-27-1 Au vein Quartz (2

D11-27-2 TS Bulk RX

XRD

Substrate Description

Rock Type: Serpentine

Description: ① light to dark green Fractured serpentine with Fe stained micro fractures cutting the rock. 30% of the rock is altered to white possibly from hydrothermal intrusions along fractures

Biology (?): None

Described by: G.S. Recrystallized

Subsampled by: G.S

② Brown serpentinized Basalt. with areas of high concentration of serpentine crystals. (Round to eliptical) These areas have alterated Rims with a lighter green on the outside to dark green. Several veins cut the rock are filled with white calcite w/ manganese flacks

③ Quartz milky fragment with manganese flakes [illegible] Surface. Some Fine to [illegible] Sandstone [illegible] quartz

SAMPLE DESCRIPTION

Cruise Id: F11-90-CP Size (cm): 9 x 5 x 3 / 7 x 4 x 3 Location: YAP D

Sample Id: D11-Z8 Weight (kg): 1 Kg Depth (m): 2300 - 2280

Mn Crust Description

Surface Texture: Smooth Patina to Smooth to granular patina

Mn Crust Thickness (mm):

Min:_____ Max: Patina Ave:_____

Outer to Inner Layers (mm)

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

D11-Z8

Comments and XRD Mineralogy:

Sub

50% KORDI
50% USGS

Substrate Description

Rock Type: Hydrothermally altered volcanic (?) Horn Fels?

Description: ① Recrystallized + Hydrothermally altered Fe stained (Tannish, Yellow) Fe stained Calcite (?). Microfractures resemble veins in a leaf. Porphyblasts (?) are yellowish brown with striations.

② Similar to ① but green in colore with more porphyblasts (?)

Biology (?): Encrusting Forams

Described by: G.S.

Subsampled by:

Both have a poorly sorted (conglomeratic) sandstone cemented to them. Probably clasts from a conglomerate

SAMPLE DESCRIPTION

+ 1 large pebble not shown in photo

Cruise Id: F11-90-CP Size (cm): 21 x 16 x 6.5 Location: YAPD

Sample Id: D11-29 Weight (kg): 2 Depth (m): 2300-2280

Mn Crust Description

Surface Texture: Granular to Smooth

Mn Crust Thickness (mm):

Min: [illegible] Max: 3 Ave: [illegible]

Outer to Inner Layers (mm)

	Min	Max	Ave	Texture & Color
1	0	3	2	Black, Porous, slight Fe stain
2				
3				
4				
5				
6				

D11-29

Comments and XRD Mineralogy:

Su

Substrate Description

50% KORDI

50% USGS

Rock Type: Breccia

Description: clasts: dark grey Basalt and breccia clasts

Matrix: light grey fine grained mud (?)

There are older breccia clasts incorporated with this sample.

All clasts seem to be surrounded with dark grey to white veins

Biology (?): Abundant encrusting Foram.

Described by: G.S.

Subsampled by:

There is evidence of shearing with several clasts fracture (fractures?) & the [illegible] show shearing motion (?)

DVC

Sample added after

photo

② Matrix: supported breccia
(fine grained rock fragments)

Clasts: are possibly basalts (various colored)
or gabbros but altered (?) some clasts
look fibrous. Some clasts
are surrounded with green
minerals possibly serpentine (?)
other clasts are altered to
clays. VOLATILE calcite in sample.

SAMPLE DESCRIPTION

Cruise Id: F11-90-CP Size (cm): 6x4x2.5 Location: YAP D

Sample Id: D11-30 Weight (kg): 0.5 Depth (m): 0300-2050

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				

D11-30

Comments and XRD Mineralogy:

Subs

Substrate Description

Rock Type: limestone breccia cataclastic(?) recrystallized.

Description: Fine to med grained limestone with grains of peridotite(?), + other Rock fragments. The large white areas are possibly recrystallized shell fragments

Biology (?): None

All TO HORDI

Described by: G.S.

Subsampled by:

SAMPLE DESCRIPTION

Cruise Id: F11-90-CP Size (cm): Pebbles Location: Yap D

Sample Id: D11-31 Weight (kg): 0.002 Depth (m): 2302-2280

Mn Crust Description

Surface Texture: None

No photo

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

Rock Type: Pumice

Description:

Biology (?):

Described by: GS.

Analyses

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

Subsampled by:

SAMPLE DESCRIPTION

Cruise Id: F11-90-CP Size (cm): Several pebbles Location: YAP D

Sample Id: D11-32 Weight (kg): 2 Depth (m): 2300 - 2280

Mn Crust Description

Surface Texture: Patina-eroded

Mn Crust Thickness (mm):

Min:_____ Max:_____ Ave:_____

Outer to Inner Layers (mm)

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

NO PHOTO

Comments and XRD Mineralogy:

Analyses

Subsample No.	Analysis	Layer Thick.	Wt.(g)
D11-32	Paleo		

Substrate Description

Rock Type: Mudstones

Description: slightly calcitic possibly laminated

Biology (?): encrusting forams

Described by: G.S.

Subsampled by: G.S.