SAMPLE DESCRIPTION

Cruise Id: F7-91-WP Size (cm): 60 x 30 x 30 Location: Palau D ~~V3-91-NB~~

Sample Id: D17-10 Weight (kg): ~45 Depth (m): 3950 - 3500

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				

D17-10

Comments and XRD Mineralogy:

Sub

D17-10A XRD Shear Plane deposit
10B XRD dark green host

Substrate Description

Rock Type: Serpentinite

all USGS

Description: dark green colored, highly sheared. sheared fractures are filled w/ calcite vein magnetite

sheared whitish-green calcite-serpentine
Shear plane deposit XRD A

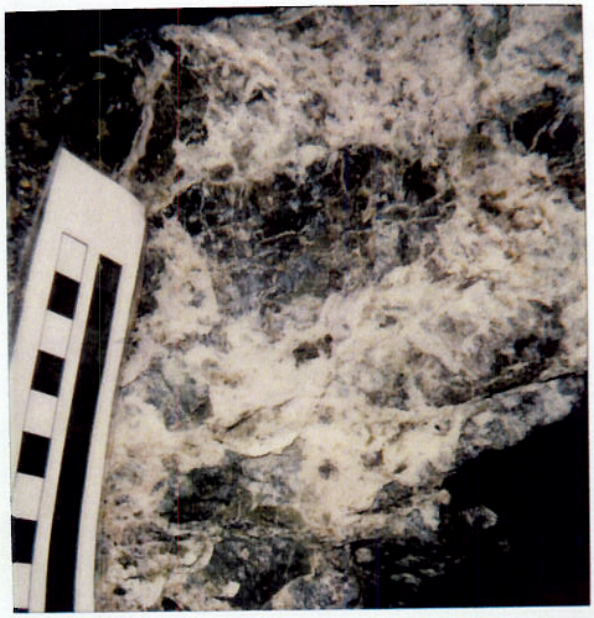
end piece cut & described elsewhere (D17-11) shows altered basalt? w/ serpentine matrix
breccia

Biology (?):

Described by: J.W. [illegible]

Subsampled by: HEIN

Cut on Bit Saw



D17-10

SAMPLE DESCRIPTION

Cruise Id: F7-91-WP Size (cm): 8x8x6 ~ 20x20x15 Location: [redacted]

Sample Id: D17-11 Weight (kg): ~ 20 Depth (m): 3950 - 3500

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				

D17-10 1 To KORDI

D17 - 11

Comments and XRD Mineralogy:

Subs

D17-11-1 TS, XRD (2)
-11-1A → host Rx 17-1A
-11-1B → Serpentine Rim

Substrate Description

Rock Type: Serpentinized basalt breccia —

Description: highly sheared serpentinized basalt clasts separated by veinlets of serpentine [illegible] + magnetite [illegible]

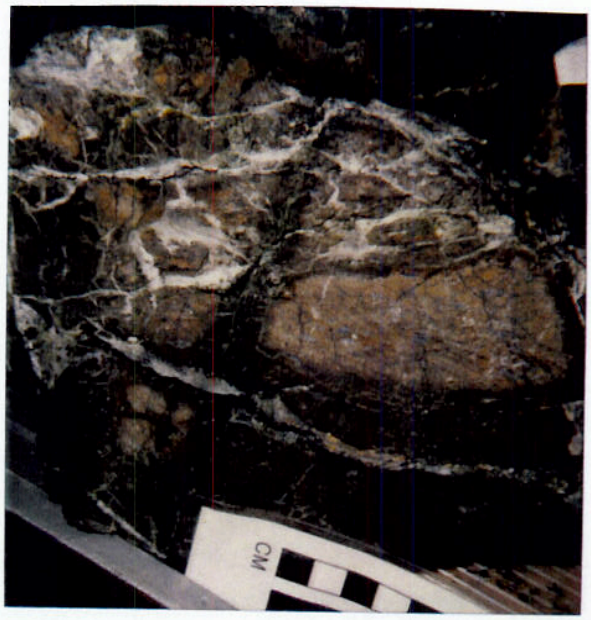
Same as D17-10
most other pieces like D17-6 Box work
1 piece = ultramafic w/ serpintine rind

Biology (?): greenish-black sheaves

75% KORDI
25% USGS

Described by: KSD

Subsampled by: HEIN



D17-11

SAMPLE DESCRIPTION

Cruise Id: F7-91-WP Size (cm): Cobble Location: ~~V3-91-ND~~ [illegible]

Sample Id: D17-12 Weight (kg): 1 kg Depth (m): 3950-3500

Mn Crust Description

Surface Texture:

Mn Crust Thickness (mm):

Min:_____ Max:_____ Ave:_____

Outer to Inner Layers (mm)

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

D17-12

Comments and XRD Mineralogy:

Subsa

D17-12A Calcite vein fill w/ small [illegible] XRD [illegible]

D17-12B Fe oxide repl. volc. XRD

D17-12C [illegible] XRD

Substrate Description

Rock Type: [illegible] oxide replaced volc. [illegible] w/ calcite veins. [illegible] [illegible] veins (up to 20mm) and

60% [illegible]

40% [illegible]

Description: [illegible]

[illegible] edges of vein fill [illegible] [illegible] up to 5mm [illegible]

D17-12A Aragonite for isotopes, XRD (Again)

4.66g

Biology (?):

Described by: [illegible]

Subsampled by: [illegible]

SAMPLE DESCRIPTION

Cruise Id: F7-91-WP Size (cm): 8×6×4 - 16×11×10 Location: Palau D ~~M3-91-NP~~

Sample Id: D17-13 Weight (kg): 5 Depth (m): 3950 ~ 3500

Mn Crust Description

Surface Texture:

Mn Crust Thickness (mm):

Min:_____ Max:_____ Ave:_____

Outer to Inner Layers (mm)

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

D17 - 13

Comments and XRD Mineralogy:

Sub

Substrate Description

Rock Type: Serpentinite

50% KORDI
50% USGS

Description: Originally basalt, but completed altered to serpentinite. greenish-brown colored. very sheared and filled w/ calcite veins slightly magnetic. — Network of calcite veins

Biology (?):

Described by: J. W. Moore

Subsampled by:

SAMPLE DESCRIPTION

Cruise Id: FM-91-WP Size (cm): 9x6x5 ~ 10x6x5 Location: Palau D

Sample Id: D17-14 Weight (kg): 2 Depth (m): 2950-2625

Mn Crust Description

Surface Texture:

Mn Crust Thickness (mm):

Min:_____ Max:_____ Ave:_____

Outer to Inner Layers (mm)

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

D17-14

Comments and XRD Mineralogy:

Sul

D17-14 TS, XRD

50% KORDI
50% USGS

Substrate Description

Rock Type: Basalt

Description: dark gray color, but outer zones are brown colored by alteration. Slightly fractured unaltered parts are magnetic!

Biology (?):

Described by: J.W. Moore

Subsampled by: A.D.

SAMPLE DESCRIPTION

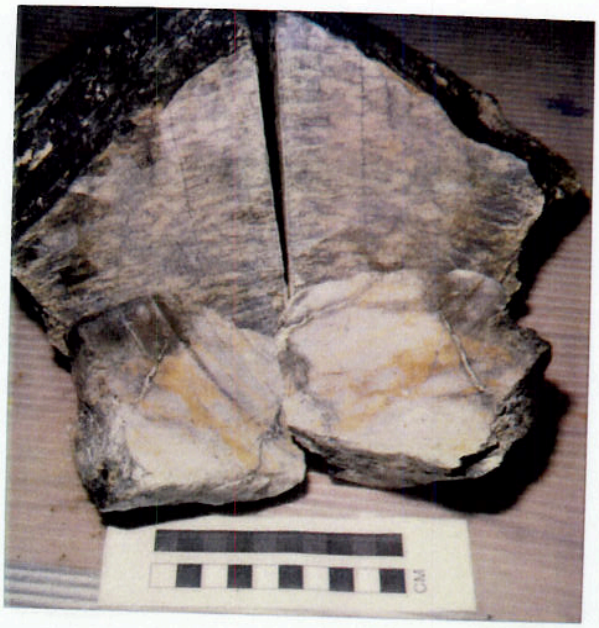
Palau 3

Cruise Id: F7-91-WP Size (cm): 10×7×6 17×15×13 Location: [redacted]

Sample Id: D17-15 Weight (kg): 11 Depth (m): 3950 - 3500

Mn Crust Description

Surface Texture: Patina - eroded



D17-15

Mn Crust Thickness (mm):

Min: P Max: 3 Ave: 1

Outer to Inner Layers (mm)

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

Comments and XRD Mineralogy:

Sub

Substrate Description

Rock Type: Serpentinite

50% USPDI
50% USBS

Description: Massive brownish-black to greenish-brown serpentinite, area of serpentine minerals intertwining with magnetite-rich areas -

Magnetite - iron oxide (goethite) + Tiger type Serpentine [illegible] Serpentine Rim

Biology (?):

Described by: KSD

Subsampled by:

D17-15

SAMPLE DESCRIPTION

Cruise Id: F7-91-WP Size (cm): 8x7x6 a 11x16x8 Location: Palau D ~~[illegible]~~

Sample Id: D17-16 Weight (kg): ~4 Depth (m): [illegible]

Mn Crust Description

Surface Texture: granular
Patina

Mn Crust Thickness (mm):

Min:_____ Max: P Ave:_____

Outer to Inner Layers (mm)

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

D17-16

Comments and XRD Mineralogy:

Subs

D17-16 TS
16A XRD matrix
16B XRD Clast

50% USGS
50% KORDI

Substrate Description

Rock Type: Serpentinized volcanic breccia

Description: angular to subrounded volcanic [illegible] (<1cm to 15cm) [illegible] to red [illegible] [illegible]

Biology (?): [illegible] crystalline ??

Described by: [illegible]

Subsampled by:

SAMPLE DESCRIPTION

Cruise Id: F1-91-WP Size (cm): 12 x 5 x 4 Location: ~~V3-91-NP~~ Blue D

Sample Id: D17-17 Weight (kg): ~1 Depth (m): 3950-3500

Mn Crust Description

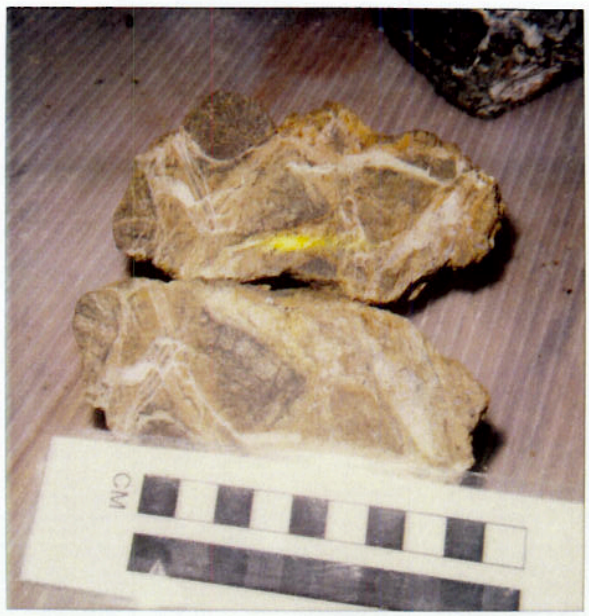
Surface Texture:

Mn Crust Thickness (mm):

Min:_____ Max:_____ Ave:_____

Outer to Inner Layers (mm)

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



D17-17

Comments and XRD Mineralogy:

Subs

D17-17A XRD Host RX

-17B XRD Vein - Lt & dark color

Substrate Description

Rock Type: Serpentinite & breccia

Description: dk-brown serpentinized clasts and small angular greenish clasts [illegible] yellow [illegible] matrix [illegible] radial zeolites

Biology (?): minor zeolites

50% USGS

50% KORDI

Described by: KSD

Subsampled by:

SAMPLE DESCRIPTION

Cruise Id: [illegible] Size (cm): 11×6×5 ^ 11×9×6 Location: [redacted]

Sample Id: D17-18 Weight (kg): 1 Depth (m): 3950-3500

Mn Crust Description

Surface Texture:

Mn Crust Thickness (mm):

Min:_____ Max:_____ Ave:_____

Outer to Inner Layers (mm)

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

D 17-18

Comments and XRD Mineralogy:

Subs

60% USGS
40% HORDT

Substrate Description

Rock Type: Serpentinite

Description: Yellow-brown sheared serpentine & conjugate shears fractured filled with [illegible] [illegible] minerals and iron oxide

Magnetite-Serpentine rock

Biology (?):

Described by: KSD.

Subsampled by:

SAMPLE DESCRIPTION

Cruise Id: F7-91-WP Size (cm): 15 x 10 x 9 Location: [redacted]

Sample Id: D17-19 Weight (kg): < 1 kg Depth (m): 3950-3500

D17-19

Mn Crust Description

Surface Texture: Pa[illegible] - [illegible]

Mn Crust Thickness (mm):

Min:_____ Max: P Ave:_____

Outer to Inner Layers (mm)

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

Comments and XRD Mineralogy:

Subs

Substrate Description

Rock Type: Serpentine

40% HORDI
60% USGS

Description: Green [illegible] black serpentine [illegible] mottled "[illegible]" [illegible] of green [illegible] and [illegible] [illegible]

Biology (?):

Described by: [illegible]

Subsampled by:

SAMPLE DESCRIPTION

Cruise Id: F7-91-WP Size (cm): 16×10×5 Location: [redacted]

Sample Id: D17-20 Weight (kg): 2 Depth (m): 2950-3500

Mn Crust Description

Surface Texture: [illegible]

Mn Crust Thickness (mm):

Min:_____ Max: P Ave:_____

Outer to Inner Layers (mm)

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

D17-20

Comments and XRD Mineralogy:

Subsa

D17-20 TS, XRD

60% USGS
40% KORDI

Substrate Description

Rock Type: Serpentinized basalt

Description: [illegible]

Biology (?): Vesicular [illegible]

Described by:

Subsampled by:

AD

SAMPLE DESCRIPTION

Cruise Id: F7-91-WP Size (cm): 11×8×4 Location: Palau D [redacted]

Sample Id: D17-21 Weight (kg): 0.3 Depth (m): 3950-3500

Mn Crust Description

Surface Texture: smooth to granular

Mn Crust Thickness (mm):

Min: <1 Max: 2 Ave: 1

Outer to Inner Layers (mm)

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

D17-21

Comments and XRD Mineralogy:

Sul

60% USGS
40% KORDI

Substrate Description

Rock Type: Serpentinized Basalt

Description: greenish-brown color. slightly sheared, some sheared fractures are filled w/ serpentinite mineral (?).
slightly magnetic

Magnetite-Serpentine Rx

Biology (?):

Described by: J. W. Wm

Subsampled by:

SAMPLE DESCRIPTION

Cruise Id: FT-91-WP Size (cm): 8x8x4 Location: [redacted]

Sample Id: D17-22 Weight (kg): ~1 Depth (m): [illegible]

Mn Crust Description

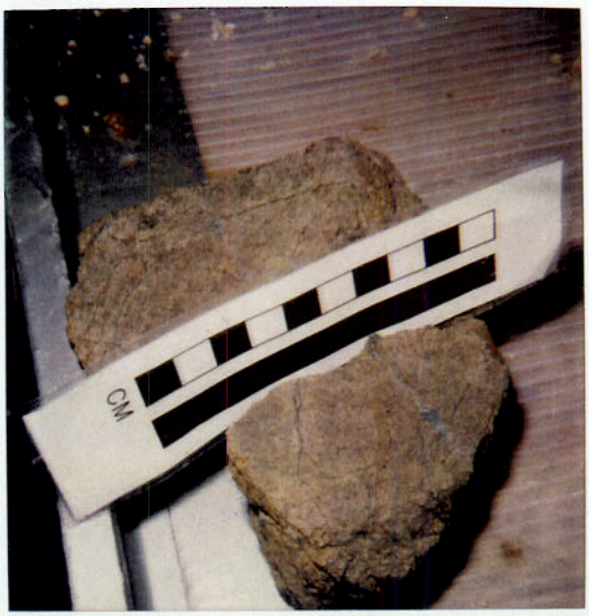
Surface Texture: [illegible]

Mn Crust Thickness (mm):

Min:_____ Max: P Ave:_____

Outer to Inner Layers (mm)

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



D17-22

Comments and XRD Mineralogy:

Sub

Substrate Description

Rock Type: [illegible] 30% HORDL 70% USFS

Description: highly sheared [illegible]

Biology (?): magnetite vein

Described by: [illegible]

Subsampled by:

SAMPLE DESCRIPTION

Cruise Id: F7-91-WP Size (cm): 54 × 35 × 30 Location: V3-91-NP

Sample Id: D17-23 Weight (kg): ~40 Depth (m): 3950 ~ 3500

Mn Crust Description

Surface Texture:

Mn Crust Thickness (mm):

Min:_____ Max:_____ Ave:_____

Outer to Inner Layers (mm)

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

D17-23

Comments and XRD Mineralogy:

Subsa

Substrate Description

Rock Type: Serpentinite

Description: Highly sheared yellow-brown serpentinized breccia with abundant cross-cross veinlets (~5 cm) of stellate (?) zeolite + minor

Biology (?): calcite

Described by: XSD

Subsampled by:

Cut on Big Saw

SAMPLE DESCRIPTION

Cruise Id: [illegible] Size (cm): Pebble Location: Palau D [redacted]

Sample Id: D17-24 Weight (kg): < 1 kg Depth (m): 3950 - 2500

Mn Crust Description

Surface Texture:

Mn Crust Thickness (mm):

Min:_____ Max:_____ Ave:_____

Outer to Inner Layers (mm)

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

D17-24

Comments and XRD Mineralogy:

Subs

Substrate Description

Rock Type: Fractured serpentinite and altered ultramafics - fracture breccia

Small cobble of fracture breccia w/

Description: calcite in fractures and as a matrix or cement. Clasts are magnetic. Calcite is generally botryoidal and slightly green, and in a few places grey

Biology (?):

Described by: JSS

Subsampled by:

SAMPLE DESCRIPTION

Palau D

Cruise Id: F7-91-WP Size (cm): 2 small cobbles Location: [redacted]

Sample Id: D17-25 Weight (kg): <1 kg Depth (m): 3950 - 3500

Mn Crust Description

Surface Texture:

Mn Crust Thickness (mm):

Min:_____ Max:_____ Ave:_____

Outer to Inner Layers (mm)

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

D17-25

Comments and XRD Mineralogy:

Subsa

D17-25 XRD

Substrate Description

Rock Type: Altered basalt or Ultra Mafic? Maybe silicified or phosphatized?

Description: Blueish green material w/ white alteration(?) hard (but can be scratched) w/ a knife. One piece has vein fill of white (not calcareous) not siliceous stuff

Biology (?):

Described by: JSD

Subsampled by:

SAMPLE DESCRIPTION

Palau D

Cruise Id: F7-91-WP Size (cm): 11 x 5 x 2.5 Location: [redacted]

Sample Id: D17-26 Weight (kg): < 1 kg Depth (m): 3950-3500

Mn Crust Description

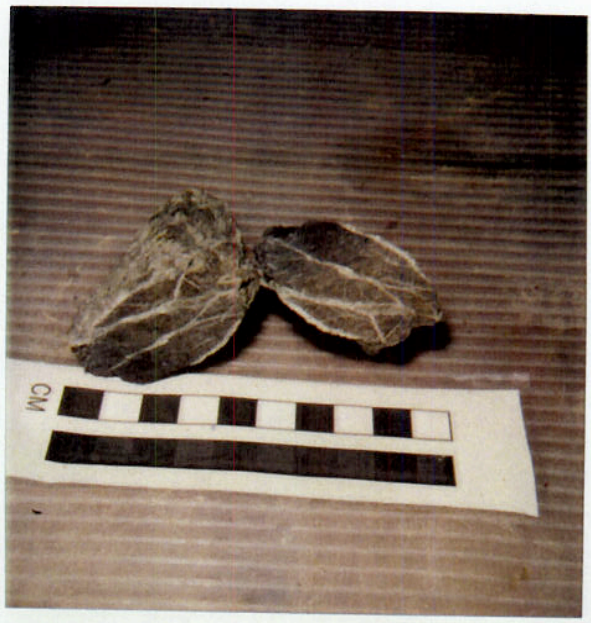
Surface Texture:

Mn Crust Thickness (mm):

Min:_____ Max:_____ Ave:_____

Outer to Inner Layers (mm)

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



D17-26

Comments and XRD Mineralogy:

Sub

Substrate Description

Rock Type: Sheared & slightly Altered Basalt(?) or Ultramafic (?)

Description: Rock appears Foliated, may be shear fractures. Calcite veins on the outer surface are in general botryoidal, but in some places have a sheared texture, slightly magnetite

Biology (?):

Described by: JSS

Subsampled by:

SAMPLE DESCRIPTION

Cruise Id: F7-91-WP Size (cm): 9.5 x 5.1 x 7 Location: [redacted] - Palau D

Sample Id: D17-27 Weight (kg): <1 Depth (m): 3950 - 3500

Mn Crust Description

Surface Texture:

Mn Crust Thickness (mm):

Min:_____ Max:_____ Ave:_____

Outer to Inner Layers (mm)

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

D17-27

Rock is [illegible] thin photo

Comments and XRD Mineralogy:

Sub

D17-27, DPTS, XRD, ICP 20gms

Substrate Description

Rock Type: Serpentinized (Peridotite or Ultramafic?) layers of serpentine and magnetite, slightly fractured; fibrous and massive

Description: serpentine. Fractures contain Fe-colored mud.

Biology (?):

Described by: JSD

Subsampled by:

SAMPLE DESCRIPTION

Cruise Id: F7-91-WP **Size (cm):** 16 Y 13 x 20 **Location:** ~~V3-91-M~~ Palau D

Sample Id: D17-28 **Weight (kg):** 5 kg **Depth (m):** 3950 - 3500

Mn Crust Description

Surface Texture:

patina of Mn on upper surface

Mn Crust Thickness (mm):

Min:_____ Max:_____ Ave:_____

Outer to Inner Layers (mm)

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

D17-28

Comments and XRD Mineralogy:

Subs

D17-28A XRD of phosphate ?

Substrate Description

Rock Type: Serpentinized, Altered Basalt (?)

Very fractured: blebs of magnetite w/Fe halos.

Perhaps replaced phenocrysts?

50% USGS

50% KORDI

Description: Fractures infilled w/ light brown phosphate (?), these phosphate filled fractures look like they were exposed to the seafloor, may account for presence of phosphate

Biology (?):

Described by: JSS

Subsampled by: