DATE: 25 August 1984 SAMPLE: 72 DK
CRUISE ID: SO 33
LOC: VIII
AREA: F

	time (GMT)	LAT (N)	LON (W)	water depth (m)	wire o
ON BOTTOM =	0424	20° 13.06	170° 35.35	1480	1903
(uncorrected) OFF BOTTOM =	0535	20° 13.021	170° 35.17	1404	1355
mean dredge data (corrected):		20° 13' 06"	170° 35' 30"	1548 (847 fm)	

RECOVERY WEIGHT = ~~total~~ 250 kg ~~crust~~ 40 kg
2 generations

CRUST THICKNESS = veneer to 4 cm? Avg 3 cm
some sooty-looking Mn and knobby thick crus
2 generations, porous center unit

SUBSTRATE = trachyte, phosphorite w/ Mn dendrite
phosphorite breccia

COMMENTS:

* 1 microbio sample
+ 1 bio sample

72 DK

72 DK

Basalt-Breccia
Trachyte
Basalt
Phosphorite / Basalt Breccia

Gesamtmenge: 250 kg
davon 40 kg Kruste

72 DK 1 — 3 cm Fm-Kruste auf Phosphorit, nämlich rein, einzelne Fm-Bruchstücke, Grabgänge, Fm-überkrustet, Kruste dicht, lagig

72 DK 2 — basaltische Breccie mit 7 cm Fm-Kruste 3 lagig unten dicht, Phosphorit imprägniert, mitte porös, oben junge-lagig
Oberfläche feinknotig
junge - 1,5 cm
mitte - 2 cm
alte - 2,5 cm

72 DK 3 — basaltische Breccie selbst sortiert, teilweise frisch, 7 cm Fm-Kruste - 3 lagig,
alte - dicht, phosphatisiert
mitte - porös, rötlich, Phosphorit Stücke eingelagert
j-ge - lagig
Oberfläche - feinknotig bis glatt

72 DK 4 — sehr stark durch bohrter Phosphorit, durchzogen mit Fm
3 cm Fm-Kruste, Oberfläche knotig
1 Generation, stückig porös, lagig

72 DK 5 — total umkrustete basaltische Breccie, alteriert, Kruste 0,4 cm glatt bis knotig (2 Stücke)

72 DK 6 — Trachyt, gelängtes stückig, alteriert, durchsetzt mit Phosphorit, überzogen mit 2-3 mm Fm-Kruste

72 DK 7 — Phosphorit mit basaltischen Einsprenglingen
Dendritenwachstum, 2-4 cm Fm-Kruste
lagiges Wachstum, mittlere Bereich porös

72 DK 8 — 15 x 15 cm total umkrusteter Phosphorit, ~1 cm Kruste, Oberseite regelmäßig, knotige Unterseite, porös

72 DK 9 — 40 x 40 cm basaltisches Substrat mit bis zu 7 cm Fm-Kruste, lagig aufgebaut, wobei der mittlere Teil porös und Detritus eingelagert.

Sample Description

Cruise I.D: 5033

Sample I.D: Sta: 72 DK

Location: Mid-Pac M
(Area f)
20° 13'06" N
170° 35'30" W
~1548 m.

Size: _____ Weight: _____

Mn crust thickness:

Total: min: _____ max: _____ ave: _____

Inner crust: min: _____ max: _____ ave: _____

Outer crust: min: _____ max: _____ ave: _____

Surface texture: _____

Internal structure: _____

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

Mineralogy (XRD): _____

Associated alteration, phosphorite, or hydrothermal deposits:

Substratum:

Rock type: _____

Description: _____

Mineralogy (XRD):

Analyses and subsamples:

analysis:	analyst:

	2	1
Rock Type:	Trachyte, Massive	Basalt, Alkalic(?) flow (scoriaceous)
Color:	Very pale brown (5YR 5/2) (weathers medium yellowish orange (10YR 7/6))	Moderate yellowish-brown (10YR 5/4)
Texture:	Aphyric, subtrachytic (in part diktytaxitic)	→ -do-
Phenocrysts	rare Sanidine(?) ±2mm; " Amphibole(?) <1%, ±1mm; " Biotite(?) ±0.5mm	→ -do-
Groundmass:	Sanidine(?), Amphibole(?), Biotite(?), glass(?), opaques(?) (not determined)	→ -do-
Vesicles:	(open spaces – diktytaxitic texture)	
	%: ±5%	≠ varies greatly (±30%)
	Size: ±0.5mm (individual cells) (usually grouped and interconnected)	±2mm
	Shape: clusters of angular openings	≠ Oval to irregular elongate
	fillings: lined or stuffed with biotite(?) flakes	lined with phillipsite?, calcite, Mn-oxide (very nice euhedra in some cases)
Alteration:	moderate to extensive (Oxidation, hydration, zeolitization, smectitization)	→ -do- Extensive to virtually complete
Remarks:	generally subrounded (water-worked to subangular pebble-to-large cobble-size clasts incorporated in volcanogenic breccias)	→ -do-
	may be a trap rock (larger grain sizes of crystal components, diktytaxitic open spaces lined with deuteric biotite), amphiboles completely altered (oxidized) in more altered specimens; some free clasts serve as substrate for encrustation of ferromanganese oxide (compact, ±2mm thick, arborescent surface topography; phosphorite deposits locally between substrate and crust ±15mm thick, beddet.	≠ (probably part of a subaerial basalt flow) → -do-

Sample Description

Cruise I.D: 5033

Sample I.D: Sta: 72 Dk

Location: Mid-Pac M
(Area F)
20° 13'06" N
170° 35'30" W
(-) 1548 m.

Size: _____ Weight: _____

Mn crust thickness:

Total: min: _____ max: _____ ave: _____

Inner crust: min: _____ max: _____ ave: _____

Outer crust: min: _____ max: _____ ave: _____

Surface texture: _____

Internal structure: _____

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

Mineralogy (XRD): _____

Associated alteration, phosphorite, or hydrothermal deposits:

Substratum:

Rock type: _____

Description: _____

Mineralogy (XRD):

Analyses and subsamples:

analysis:	analyst:

Sample No. [illegible]

	3	4
Rock Type:	Volcanogenic Conglomerate I	→ -do-, II
Color:	± Pale brown (5YR 5/2)	Moderate yellowish-brown (10YR 5/4)
Texture:	Clastic	→ -do-, ± 70%
Matrix:	Trachyte clasts ± 60%	→ (Basalt clasts), phosphorite fragments, ± 10%
Cement:	calcite ± 4% phillipsite(?) ± 3% francolite(?) ± 3%	≠ → ± 20%
	(Open space) ± 30%	≠
Average grain size:	(enormous variation)	→ -do-
	(range: sand through small cobbles)	→ (fine gravel through pebble-size)
" grain shape:	Angular to Subrounded	→ angular to subrounded
Sorting:	extremely poorly sorted	→ -do-
porosity:	open textured	± 50%
permeability:	30+%	± 20%
Alteration:	moderate; (zeolitization, phosphorization of chalk cement)	extensive; (phosphorization of chalk cement) minor zeolitization
Remarks:	cobble to boulder-size clasts probably dislodged from outcrop by dredge; most pieces display extensive evidence of reworking by water currents (wave-action?) deposit is loosely but firmly cemented near top, increasingly dense below, cemented with phosphorite; appears to have been a beach or stream deposit prior to submergence (zeolitization subsequent to submergence?); serves as substrate for arborescent, cuspate ± 1mm-thick deposit of ferromanganese oxide	→ -do- → many pieces of basalt are extensively weathered (subaerially) becoming golden yellow and micaceous in consistency → -do- → -do-, some pieces are overlain by burrowed (or b[illegible]) phosphorized chalk upon which is deposited compact warty, (± 15 mm-thick) ferromanganese crust.

Sample Description

Cruise I.D: 5033

Sample I.D: Sta: 72 DK

Location: M. del Pac MF (Area F) 20°13'06"N 170°35'30"W (-) 1548 m

Size: _____ Weight: _____

Mn crust thickness:

Total: min: _____ max: _____ ave: _____

Inner crust: min: _____ max: _____ ave: _____

Outer crust: min: _____ max: _____ ave: _____

Surface texture: _____

Internal structure: _____

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

Mineralogy (XRD): _____

Associated alteration, phosphorite, or hydrothermal deposits:

Substratum:

Rock type: _____

Description: _____

Mineralogy (XRD):

Analyses and subsamples:

analysis:	analyst:

5

6

Rock Type :	Phosphorite	chalk, foraminiferal to phosphorized ?
Color :	Moderate yellowish-brown (10YR5/4) + light yellowish-brown (10YR6/4)	white (N 9)
Texture :	microgranular	—do—, but coarser
Matrix : / Cement :	apatite (francolite ?) have merged and become one-in-same	—do—, not distinguishable (probably mixed calcite and francolite)
Average grain size :	< 0.005 mm	<± 0.010 ?
" " shape :	probably shortacicular	probably equigranular
Sorting :	uniformly fine-grained	—do—
porosity :	nil	≠ ± 50 %.
permeability :	nil	≠ ± 50 %.
Alteration :	Complete (phosphorization of original calcite/siderite) foraminiferal test material and cement, oxidation of $FeCO_3$ (?) component to $Fe(OH)_3$, yielding brown color)	Extensive to moderate (phosphorization of orig. calcitic foraminiferal test component, oxidation of siderite component (very slight) grades directly into hard dense phosphorite
Remarks :	Forms a layer varying from millimeters to centimeters in thickness directly underlying ± 1 mm – ± 2 cm-thick dense chalk (internal structure), one-generation coarsely botryoidal, finely nodose (superposed) ferromanganese oxide deposit and directly overlies vesicular basalt; also serves as cement for volcanogenic conglomerates I & II, especially II.	—do— remarkably fine-grained, even-textured; grades directly into dense brown phosphorite, remarkable in that the chalk is beneath the phosphorite, in turn capped by Mn-oxide deposit; the chalk has the appearance of magnesite derived from serpentine.