DATE: 12 August 1984 SAMPLE:
CRUISE ID: SO 33 33 DS Chain bag dredge
LOC: V
AREA: C

	time (GMT)	LAT (N)	LON (W)	water depth (m)	wire ou
ON BOTTOM =	0555	6°15.763	162°57.7982	2887	3200
OFF BOTTOM =	0707	6°16.5553	162°57.067	2387	238[illegible]
mean dredge data (corrected):		6°16'02"	162°57'35"	2714 (1484 fm)	

RECOVERY WEIGHT = total 50 kg crust < 1 kg
40 kg basalt
5 kg sediment
2 kg chalk

CRUST THICKNESS = Veneer to .5 cm
Avg = veneer
1 generation

SUBSTRATE = pillowed basalt? And 2 hexagonal shaped basalt pieces (columnar basalt?) but no freshly broken surfaces.

COMMENTS:
there is question over the columnar type basalts. Not usually found in submarine environment? No

33 DS

33 DS

Gesamtmenge: 50 kg
40 kg Basalt
5 kg Sediment
2 kg Sonstiges
5% Krusten

33 DS 1 Hyaloklastit, feinkörnig (bis 0,5 cm Stücke) 2-4 mm Fe-Umkrustung, unterschiedliche Oberfläche von feinstknospig über knotig bis konodünt

33 DS 2 Blasenlava, grau, 2 Stücke, Blasen nicht verfüllt, 0,5 cm Kruste - feinstknospig
zwischen Basalt und Kruste eine Phosphorit-Lage 1 Stück faustgroß - konodünte Krustenoberfläche 2 mm mächtig

33 DS 3 Phosphorit substrat, kleinere Bruchstücke, auflagernde feinstknotige oder grobknotige Oberfläche (~ 0,8 cm)

33 DS 4 hexagonaler dichter Basalt 40 x 40 cm mit 2 mm Fe-Kruste

Sample Description

Cruise I.D: 5033

Sample I.D: Sta: 33 DS

Location: "B.L. Smt

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:

	I	II
Rock Type:	Olivine basalt (AOB?) (Pillow lava)	– do – (may not be pillow lava)
Color:	Dark gray (N3)	– do –
Texture:	suba-phyric, hyalo pilitic/intersertal	– do –
Phenocrysts:	Olivine, ±3%, <1 mm – ±4 mm (±2 avge) (single euhedral – anhedral) ~~(some specimens have local phenocryst densities up to 35%)~~ (distinct flow)	– do – rare augite
Groundmass:	Glass, plagioclase, olivine?, clinopyroxene?, opaques (not determined)	acicular; – do –
Vesicles:	±12 % (distinct flow) ~~(some specimens have scoriaceous zones 25-30% vesicles)~~ Size: extremely variable <1 mm – ~~±15 mm~~ (avge ±1 mm) ~~(inter-vesicle w/depth but w glassy rims)~~ Shape: round (small) to ~~irregular~~ (larger) filling: empty	absent (massive, dense)
Alteration:	superficial – moderate (smectitization, hydration, oxidation)	– do –
	~~(the olivine appears to be thoroughly iddingsitized; glassy rinds are partially to thoroughly palagonitized – there seems to be quite a bit of fresh glass, though.~~	different kind of alteration of phenocrysts & groundmass olivine! completely altered to pale green smectite & calcite – probably before eruption
Remarks:	pillow lava fragments (some have rounded upper surfaces and wedge-shaped lower profiles) – most show some degree of rounding due to abrasion, though much of the fragile glass rinds are preserved; ~~took a bit of component "tapering" from sample to sample (phenocrysts, vesicles) characteristic of pillow lavas~~; not much evidence of hydrothermal activity (only calcite, no siliceous ooze on fracture faces) thin (±1 mm) nodose-to-cuspate Mn-oxide coating on exposed surfaces.	massive boulder-size blocks of dense basalt – may be fragments of a non-gaseous flow; very thin Mn-oxide coating on exposed surfaces.
Distinct flow		Note: several boulder-size sections of polygonal cross-section found in the dredge (made of this material?) strong resemblance to columnar-jointed terrestrial basalt — are they sections of submarine columnar-jointed basalt? No!

Sample Description

Cruise I.D: S033

Sample I.D: Sta: 3305

Location: "Bodo Sut

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:

Rock Type:	Basalt (AOB?) (Scoriaceous) III	→ -do-, amygdaloidal not scoriaceous IV
Color:	Brownish-black (5YR 2/1)	Grayish-black (N2)
Texture:	Aphanitic, hyalopilitic, subaphyric,	Phyric, hyalopilitic
Phenocrysts:	Olivine <<<1% ±1mm dia. (Skeletal, euhedral)	→ -do-, rare augite, ±20%, ±3mm (Olivine)
Groundmass:	Glass: plagioclase (needles), olivine?, clinopyroxene?, opaques } ±65% not determined.	→ -do- ±72%
Vesicles:	%: ±35%, 1+mm dia. Shape: round. Filling: usually empty or contain (rarely) inflorescences of calcite, scalenohedra (± 10% maximum)	±15%, ±3 mm, round to oval → Smectite(?), zeolite(?), rarely calcite. All non-exposed vesicles seem tightly-filled amygdales
Alteration:	fairly superficial ($Fe(OH)_3$?) deposits around insides of vesicles, along fractures. Groundmass glass may be altered (smectitized, hydrated?) some fairly fresh; rare olivine phenocrysts completely iddingsitized	moderate (groundmass glass probably heavily smectitized; olivine phenocrysts, possibly groundmass altered, as in AOB II to chlorophaeite + calcite mixture — these, however are brownish, as though altering to iddingsite)
Remarks:	Several pieces of phenocryst-poor, scoriaceous aphanite found in dredge; one may be a bomb (cored fractured), others are fragments some like subaerially erupted — thin (±2 mm-thick layer of isotropic Mn-Oxide deposited on exposed surfaces	large (small boulder-size) blocks perhaps related to AOB II, but more vesicular, altered; exposed surfaces have lost vesicle-fillings, leaving numerous pock-marks, coated thinly (±1mm) with Mn-Oxide on exposed surfaces

Sample Description

Cruise I.D: 5033 Sample I.D: Sta: 33 DS Location: Bolo Sat.

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:

Rock Type: Basalt, AOB(?), massive V

Color: Dark gray, (N3)

Texture: Microporphyric, intersertal-intergranular (?)

Phenocrysts: Olivine, ±5%, ±0.5 mm dia. (single euhedra)

Groundmass: Plagioclase, Olivine, Clinopyroxene, glass, opaques } not determined (± 95% min)

Vesicles: absent

Alteration: superficial (smectitization, hydration)
Olivine is partially iddingsitized, (some are fully converted, some are unaltered) interstitial glass may be partially altered

Remarks: Small, angular clasts (pebble-to cobble size) found loose in the dredge material; very fresh, crystalline aspect - not like other species recovered in the dredge haul. Fe(OH)(?) and calcite along fractures, no Mn-Oxide deposits.

Basalt hyaloclastite (Autosomitic) (Melaphyric); varying shades of yellow-brown (10YR 7/6 - 5YR 4/4)

Pyroclastic / Vitrophyric

Olivine, plagioclase, Augite } euhedra { ±25%, ±15%, ±5%

glass, glass shards ±20%
Rock fragments (Vitrophyric) ±15%

± 10% irregular - vesicles variable in size

Olivine is completely iddingsitized - both as phenocrysts and as microlites; plagioclase is completely altered to zeolites(?); only augite remains unaltered; minor calcite, zeolite deposits in vesicles

large (cobble + boulder-size) clasts of punky, friable altered rock - resembles greatly an ash-flow (ignimbrite) tuff - may represent the basaltic equivalent; serves as a substrate for thin (<1 mm) Mn-oxide rhodose crust

Sample No: S0 33 33 DS 6

Rock Type: Basalt, AOB, pillowed, scoriaceous

Color: Dark gray N3 (brownish tinge)

Texture: Hyalopilitic - intersertal

Phenocrysts: Olivine ±5%-35% (varies w/ depth below glassy margin - component layering - most abund. ±10 cm below zone) ±2 mm dia. (single euhedra and glomerophyric w/ other olivine)
Augite(?) ±1 mm dia. ±2% (varies w/ depth below glassy margin - component layering - " " in 1st cm of glassy zone) (single, very euhedral phenocrysts)

Groundmass: Plagioclase, olivine, pyroxene, glass, opaques } (not determined)

Vesicles: % varies greatly (layered component) ±12 - ±35%
Shape: round - irregular (usual shape)
Size: ±2 mm - ±4 mm - ±5 mm

Alteration: moderate - complete. (Olivine completely iddingsitized, Pyroxenes unaltered, groundmass phases probably extensively altered - oxidation, hydration, argillic, zeolitization

Remarks: cobble-size subrounded clasts apparently not derived from a volcaniclastic breccia but loose debris from a shallow-water eruption; the glassy rind is probably thoroughly palagonitized; quite glassy and rich in augite(?) euhedra, very strongly - resembling the hyaloclastite of 33 DS (and very probably the same source); coated on most surfaces

Sample Description

Cruise I.D: S033

Sample I.D: Sta: 33 DS

Location: Rodo Sur +

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.	Volcanogenic mass	
Rock Type:	Calcareous Tuff	Chalk - Phosphorite ?
Color:	Pale yellowish-brown (10YR 6/2)	very pale orange (10YR 8/2)
Texture:	clastic / granular	→ granular, less clastic
Matrix:	foraminiferal tests? ± 70%? (calcareous ooze)	↔ - do -
(single grains)	Rock fragments ±5%?	→ probably <5% of these components present here
	Crystal fragments ? ± 3%?	
	glass shards ? ± 22%?	
Cement:	not cemented / (calcite?)	calcite, Apatite? (seems better cemented than the tuffaceous sediment
Average grain size:	fine sand - silt + (0.15 mm)	± 0.20 ? mm
Sorting:	moderately well sorted	↔ - do -
Porosity	± 50%	↔ - do -
Permeability	± 50%	↔ - do -
Alteration	Smectitization, zeolitization of glass shards? phosphorization? of calcareous components	more indurated than the tuffaceous sediment. May be phosphorized
remarks:	Cobble to boulder size clasts of loosely consolidated volcaniclastic and calcareous plankton microfossil-rich sediment. very fine-grained, diffuse (some) variation in concentration and distribution of components indicating reworking of the sediment by water currents. serves as substrate for thin - to thick (up to 1.5 cm) layers of hearty Mn-Oxide crust. (also Mn-Ox is micronodules present)	Cobble-size clasts of loosely-consolidated (not cemented?) calcareous ooze composed of foraminiferal tests and small amount of volcanic material; material is apparently subjected to reg[illegible] tion along fractures (subaerial exposure) at one poi[illegible] deposits of SiO_2 & Mn-Oxide along the solution cavities; ferromanganese crusts as in the tuffa[illegible] sediment samples, developed on exposed surfaces to depths of ± 0.5 cm.