# PROTOCOL DREDGE

| Cruise No. SO 37 | Stat. No. Equipm. 10 DK | Location II | Area G |
|---|---|---|---|
| Date 23/05 1985 | Protocol written by : Sattler, Herzig | | |

Pinger on wire 300 m from dredge

| | Time GMT | Latit. N | Longit. W | Water depth | Wire length | Tension (t) | Remarks (OURS |
|---|---|---|---|---|---|---|---|
| begin operation | 10.01 | 14°27.17 | 169°00.30 | 1815 | – | – | |
| begin lowering | 10.03 | 14°27.20 | 169°00.27 | 1802 | 0 | 1 | |
| +1. bottom contact | 10.33 | 14°27.28 | 169°00.22 | 1770 | 1840 | 2 | |
| | 10.44 | 14°27.27 | 169°00.03 | 1740 | 1984 | 1.6 | |
| 100 gefiert – | 10.52 | 14°27.24 | 168°59.90 | 1674 | 2080 | 1.2 | |
| 100 gefiert | 10.57 | 14°27.19 | 168°59.80 | 1562 | 2180 | 1.2 | |
| | 11.03 | 14°27.16 | 168°59.72 | 1503 | 2180 | 2.5 | ← |
| Gedredgte Bereich: | 11.18 | 14°27.02 | 168°59.73 | 1540 | 2179 | 3.7 | |
| | 11.23 | 14°27.05 | 168°59.63 | 1476 | 2178 | 4.6 | 60° |
| ~1750 - 1480 m | 11.32 | 14°27.05 | 168°59.61 | 1477 | 2047 | 6.3 | 72° |
| | 11.36 | 14°27.06 | 168°59.61 | 1453 | 1947 | 5.0 | 52° |
| | 11.39 | 14°27.11 | 168°59.53 | 1510 | 1895 | 4.6 | -"- |
| begin heaving | 11.56 | 14°27.28 | 168°59.54 | 1612 | 1467 | 2.8 | |
| end heaving | 12.24 | 14°27.45 | 168°59.65 | 1757 | 0 | 1.0 | |
| end operation | 12.26 | 14°27.45 | 168°59.65 | 1720 | 0 | | |

+Corrected data 14°27.38'N 169°0.17'W

ship course ....5:0..... calcul. mean water depth 1550 m

total time of bottom contact: 83 min ship velocity 0.6 kts

bottom topography Hoher Hengst Plateau length of dredge section .....m

Result

300 kg Total 178 kg Substrate

100 kg Nodules (5-12 cm) 2 kg Sediment

# S037 10 DK (Area G) Station Data 5-22-85

Pinger on wire 300 m from dredge

| | Time (Gmt) | Lat N | Long W | Water Depth | Wire Length | Tension | Ship Course |
|---|---|---|---|---|---|---|---|
| begin operation | 10:01 | 14°.27.17" | 169°.00'30" | 1815 | — | — | |
| begin lowering | 10:03 | 14°27'.20" | 169°00'27" | 1802 | 0 | 1 | |
| + bottom contact | 10:33 | 14°27'28" | 169°00'22" | 1770 | 1840 | 2 | |
| begin heaving | 11:56 | 14°27'29" | 168°59'.54" | 1612 | 1467 | 2.8 | |
| end heaving | 12:24 | 14°27'45" | 168°58'65 | 1737 | 0 | 1.0 | |
| end operation | 12.26 | 14°27'45" | 168°53'65" | 1720 | 0 | | |

Ship course 5.0 Calc. mean water depth 1550 m

total time of bottom contact 83 min Ship velocity 0.6 Kts.

1. Hour topography Major Hits (dredge) ~1750-1400 meters

Result:

300 kg total
100 kg Nodules (5-10 cm ϕ)
20 kg. crusts

170 kg. substrate
2 kg. sediment

90% nodules & talus

95% covered w/ crusts

50% nodules

Thickest crust - 4-4.5 cm
Thinest crust - patina } 1.5 cm auger

botryoidal surface topography

One generation of crust

-% encrusting organisms

photos of dredge

Substrates: Chalk Phosphorite
AOB AOB / Phosphorite Breccia
Trachyte

| 1 | 2 | 3 |
|---|---|---|
| Rock Type: AOB | Trachyte | -do-, paisanitic |
| Color: Moderate yellowish-brown (10YR 5/4) | Yellowish-brown (10YR 5/2) | White (N9) to very pale o.a. g (10YR 9/2) ( ) |
| Texture: Intergranular, subtrachytic microphyric | intergranular - very fine-grained surprisingly lacking in directed texture! | -do- |
| Phenocrysts: Olivine, ±2%, ±0.5mm dia (Idiomorphic, glomerophyric w/itself) | Sanidine (by XRD 5-22-85) ±5% 2mm dia. (many sanidine microprts, ±15%(?) rare amphibole & biotite? <1%) | -do- but ±2%, ±1mm dia fayalite(?) (completely altered) microphenocrysts ±20%, 0.5mm dia biotite(?) quinquefolia, ±25%, 1mm dia |
| Groundmass: Olivine, plagioclase?, Augite?, opaques } not determined | Groundmass: Sanidine, amphibole?, fayalite? } not determined | -do-, but w/ abund. fayalite(?) |
| Vesicles: absent (dense) | Vesicles: absent (dense) | -do- |
| Alteration: extensive (oxidation, smectitization) | Alteration: slight (XRD deter.) (mainly peripheral) smectitization, oxidation) | -do- |
| Remarks: Rare, flat, angular clasts in dredge material, prob. derived from volcanogenic breccia. texture causes breakage into flat, prismatic clasts with stair step fractures. usually free, loose, bearing a shiny, patinate layer of $MnO_2$, sometimes thin botryoidal crust (±mm thick) -do- | Remarks: Pebble-to-boulder size subangular-subrounded loose talus or incorporated into volcanogenic breccia. cross-fractured (irregular spider-web-like network) and altered peripherally to the fractures (deposition of todorokite(?) dendrites, generation of montronite(?)). The talus pieces generally form in to warty, botryoid truffle-like manganese nodules. Some display 2 generations of growth, both dendritic with carpate, dendritic superfopography. The phenocrysts* in the groundmass are unusual: generally equidimensional hexagonal prisms terminated by basal pinacoids - except for their vitreous luster, they look like nepheline crystals | -do- |

One specimen includes a fragment of 10DK1, indicating that it predates the eruption of trachyte. Curious development of biotite folia en matrix giving the rock a spotted appearance, like paisanit

* [illegible] fine, [illegible] XRD

| Rock Type: | Volcanogenic Breccia 4 | Volcanogenic Sandstone 5 | Trachyte Volcanogenic Breccia 6 |
|---|---|---|---|
| Color: | Very pale yellowish brown (10YR 7/2) → | -do- | White (N9) matrix; pale yellowish-brown (10YR 6/2) (cement) |
| Texture: | clastic → | do | |
| Framework Grains: | Trachyte clasts, → ±10%; AoB Clasts, → ±10%; Phosphorite Clasts, → ±10%; Sanidine Crystals, → ±1%; extremely variable proportions (5-75%); biotite flakes ±3%; amphibole needles ±3%; AoB hyaloclastite frags. ±10%; = Matrix/cement, ±40% | | Framework Grains: Paisanitic trachyte clasts, ±8% (average grain size = ±3 cm) (range: 3 mm – 6 cm); = Matrix/cement, -do-, but ±15% |
| Matrix: | Phosphorite sandstone (10 DK5) | | |
| Cement: | | apatite, ~50% | |
| Average grain size: | ±1 mm (range: ≤ 0.20 mm – 2 cm) | ±0.5 mm (range ≤ 0.10 mm – 2 mm) | ±1 cm (range: ≤ 0.10 mm – 6 cm) |
| Average grain shape: | Subangular | subrounded (great range: angular – rounded) | angular |
| Sorting: | moderately poor → | very poor | extremely poor |
| Porosity: | very Low → | -do- | |
| Permeability: | very Low → | -do- | |
| Alteration: | extensive (phosphorization of foram. ooze cement) complete → | do | total (Smectitization, phosphorization, zeolitization, carbonation) |
| Remarks: | apparently one of several thin clastic sediment drapings: one fragment broken from the outcrop displays 3 distinct units, each about 4 cm thick, with 10 DK4 in the center. apparently derived from intense weathering or chemical alteration of trachyte debris - many loose sanidine and biotite crystals observed in matrix. serves as substrate for ferro-manganese crust of varying thickness (dendritic both internally and externally knobby, warty external topography, with dendritic supertopography. | was once apparently composed of sand-size particles set in foraminiferal chalk with subsequent complete phosphorization; serves as "cement" for volcanogenic breccias at this site. | Similar to 9 DK4, but w/ with much different cement. same origin and same alteration processes, except for phosphorization |

Missing!

6-3-95

Rock Type: Trachyte Volcanogenic Breccia 7

Same as previous volcanogenic breccias only the Framework clasts are fresh, unaltered trachyte and the cement is porous, only partially phosphorized foram chalk. → this lithology has not been located, neither has the phosphorite!