*** **Petrographische Daten Substrat**

RV Sonne So 33 Midpac II 29.7 - 29.8.1984

Datum: Areal: A Lokation: I Station: 1

Probennummer: So 33 1DK

Längengrad, nk: 158° 23.571 k:

Breitengrad, nk: 18° 41.056 N k:

Wassertiefe (m): 3289 Bereich (m):

Typ: Basalt hyaloclastite Farbe: * varies greatly; most fragments are grayish-brown (5YR 3/2) or moderate yellowish brown 10YR 5/4

Erhaltungszustand: Very highly altered (oxidation, smectitization, zeolitization?)

Gefüge: Aphanitic, hyalopilitic to subtrachytic

Grundmasse: glass
smectite
zeolite(?)

Einsprenglinge: not observed

Bemerkungen: angular to subangular fragments of highly altered basalt set in cement composed of small rock fragments, smectite, zeolites?; very irregular upper surface coated with δ-MnO_2(?) layer ± 1 cm thick; no vesicles observed; no phosphorite deposits

* Reference: Rock Color Chart, Geological Society of America, New York, 1951

*** **Petrographische Daten Substrat**

RV Sonne So 33 Midpac II 29.7 - 29.8.1984

Datum: Areal: A Lokation: I Station: 1

Probennummer: S033 1DK

Längengrad, nk: 158°23.571 k:

Breitengrad, nk: 18°41.056 N k:

Wassertiefe (m): 3289 Bereich (m):

Typ: Basalt, (Alkali Olivine?), massive Farbe: moderate yellowish-brown (10YR 5/4)

Erhaltungszustand: very highly altered (oxidation, [illegible], zeolitization?) (groundmass) phenocrysts better preserved

Gefüge: subaphyric, hyalopilitic/microcrystalline, subtrachytic

Grundmasse: crystals (plagioclase & olivine?) - ±50%?, 0.10 - 0.25 mm
glass - ±50%(?), 0.10 - 0.25 mm

Einsprenglinge: Olivine - ±2%, ±1 mm
Plagioclase - ±1%, ±1 mm

Bemerkungen: Groundmass is very highly altered, probably the glass to the greatest extent; microphenocrysts appear fresh, plagioclase in particular, appears skeletal; alteration is predominantly smectitization, oxidation, [illegible] zeolitization. vesicles, when present are generally [illegible], though often are lined with zeolite [illegible], [illegible] orientation [illegible], [illegible] no [illegible], no polygonization observed, possibly because of abrasion of the samples - most are subrounded, have thin (±2 mm) layer of f-MnO2(?)

*** **Petrographische Daten Substrat**

RV Sonne So 33 Midpac II 29.7 - 29.8.1984

Datum:	Areal:	Lokation:	Station:
	A	I	2

Probennummer: So 33 20K

Längengrad, nk: 158° 17.153 k:

Breitengrad, nk: 18° 38.039 N k:

Wassertiefe (m): 2680-2033 Bereich (m):

Typ: Trachyte, massive Farbe: Medium Light gray (N6)

Erhaltungszustand: glass partly altered to smectite, crystalline components unaltered.

Gefüge: Subtrachytic to trachytic hyalopilitic; subaphyric

Grundmasse: Glass — ± 10 % ?
Feldspar (Sanidine/anorthoclase ?) ± 80 % } 0.10 - 0.20 mm dia?
Biotite — ± 5 %.
Opaques — ± 5 %.

Einsprenglinge: Biotite, ± 2 %, avge, ± 2 mm dia.
Feldspar, ± 1 %, avge, - do -
(Plagioclase?
Sanidine/Anorthoclase?)

Bemerkungen: pebble to cobble-size subangular to subrounded clasts, most coated with thin ζ-MnO_2 (?), some nearly free of it, some dendritic MnO_2 along fractures and as spots on uncoated rock fragments; highly directed texture, but generally lacks extreme preferred orientation needed to class as trachytic fabric (phenocrysts, especially display random orientation); recicles not observed.

*** **Petrographische Daten Substrat**

RV Sonne So 33 Midpac II 29.7 - 29.8.1984

Datum: 7 - 84 Areal: A Lokation: I Station: 2

Probennummer: SO 33 20K

Längengrad, nk: 158 °17.153 k:

Breitengrad, nk: 18 °38.039 N k:

Wassertiefe (m) : 2860-2033 Bereich (m):

Typ: Trachyte, hyaloclastite Farbe: Light gray (N7)

Erhaltungszustand:
Ground mass glass considerably altered by smectitization, zeolitization(?), oxidation

Gefüge: Subtrachytic to trachytic hyalopilitic; subaphyric

Grundmasse: Glass – Feldspar – Biotite – Opaques – } too small to estimate, % crystal dia.

Einsprenglinge: Feldspar (Plagioclase?; Sanidine/Anorthoclase?) – ±1%, ±0.50 mm
Biotite, ±2%, ±0.50 mm

Bemerkungen: pebble to boulder-size subrounded clasts, frequently bearing no MnO_2 deposits (removed through abrasion(?)) this deposit rests directly on underlying massive trachyte; cemented with smaller rock fragments, smectites, zeolites(?); appears generally much more altered than the massive trachyte

*** **Petrographische Daten Substrat**

RV Sonne So 33 Midpac II 29.7 - 29.8.1984

Datum: 7-_ -84 Areal: A Lokation: I Station: 2

Probennummer: So 33 2 DK

Längengrad, nk: 158° 17.153 k:

Breitengrad, nk: 18° 38.039 N k:

Wassertiefe (m): 2860-2033 Bereich (m):

Typ: Basalt (Tholeiite?), massive Farbe: Dark gray (N3) to grayish-black (N2)

Erhaltungszustand: Oxidation, smectitization – superficial

Gefüge: Porphyritic, hyalopilitic

Grundmasse: Glass
Feldspar (plagioclase?)
Opaques

Einsprenglinge: Plagioclase, ±10%, ± 3mm

Bemerkungen: Strong layering of vesicles parallel to upper contact with Manganese crust; random orientation of plagioclase phenocrysts; strongly oxidized groundmass peripheral to vesicles and progressively more intense toward the upper contact; phenocrysts include oxidized, altered glass. vesicles round to oval ±38%, ±1 mm dia., lined with goethite ±13% are filled with deuteric calcite (white) and radiated zeolite fascicles (pale yellow); manganese crust generally thin sometimes absent from these sub angular pebble-to-boulder size clasts; some thin, discontinuous pale orange phosphorite observed.

*** **Petrographische Daten Substrat**

RV Sonne So 33 Midpac II 29.7 - 29.8.1984

Datum: 7. '84 Areal: A Lokation: I Station: 2

Probennummer: So33 2DK

Längengrad, nk: 158°.17.153 k:

Breitengrad, nk: 18°38.039 N k:

Wassertiefe (m): 2860-2033 Bereich (m):

Typ: Basalt, hyaloclastite Farbe: Pale yellowish-orange (10YR 8/6) to Light brown (5YR 5/6)

Erhaltungszustand: Intense (smectitization, zeolitization, oxidation)

Gefüge: Holohyaline - devitrified

Grundmasse: Glass, Smectite, Zeolite(?), Goethite(?)

Einsprenglinge: not observed

Bemerkungen: cobble - to - boulder - size subrounded to discoid clasts with generally heavy (30+ cm thick) coating of δ-MnO_2(?) on generally low-relief surfaces; intraclasts were glassy, probably totally now altered to smectite, zeolites(?), goethite(?). Most are light brown internally, rimmed with pale greenish-yellow (10Y 8/2) smectite/zeolite(?) which also serves to cement the clasts

*** **Petrographische Daten Substrat**

RV Sonne So 33 Midpac II 29.7 - 29.8.1984

Datum: 7- -84 Areal: A Lokation: I Station: 3

Probennummer: So33 30K

Längengrad, nk: 158° 17,878 k:

Breitengrad, nk: 18° 38.754 N k:

Wassertiefe (m): 1966–1506 Bereich (m):

Typ: Trachyte, massive Farbe: Medium gray (N5) to pale olive (10Y 6/2)

Erhaltungszustand: Marked (but varies considerable from sample to sample) Smectitization (montronite?)

Gefüge: subaphyric to porphyritic, pilotaxitic to holocrystalline

Grundmasse: Feldspar (Sanidine/anorthoclase?) – 70–99%.
Glass – 0–29%.
Ferromagnesians (Biotite, amphibole, opaques?) } 0.25–0.50 mm

Einsprenglinge: Biotite – ±1–20%.
Amphibole(?) <1–4%, ±1 mm dia.
Feldspar (Plagioclase, sanidine/anorthoclase?) <1–7%, ±5 mm

Bemerkungen: Subangular pebble to boulder-size clasts generally coated with δ-MnO_2 (?) ±1 cm average thickness; all rocks recovered appear to be similar trachyte, but because of the variations in texture, alteration, and phenocryst abundances, several flows may have been sampled by the dredge; since the general composition appears to be the same, however, the variances may simply be local conditions in a large, single flow. contacts of substrate with δ-MnO_2 and phosphorite coatings are sharp — no quench-glass rinds observed. Discontinuous deposits of phosphorite and chalk(?) observed in low spots on the substrate clasts covered by δ-MnO_2. vesiculation varies from 0–±7%, ±1–±15 mm dia., shape elongate elliptical

*** **Petrographische Daten Substrat**

RV Sonne So 33 Midpac II 29.7 - 29.8.1984

Datum: 7- -84 Areal: • A Lokation: I Station: 3

Probennummer: So 33 3 Dk

Längengrad, nk: 158° 17 878 k:

Breitengrad, nk: 18° 38 665 N k:

Wassertiefe (m): 1966-1501 Bereich (m):

Typ: Trachyte breccia Farbe: Medium gray (N5)

Erhaltungszustand: superficial (groundmass glass may be somewhat altered to smectite, zeolites?)

Gefüge: Sub aphyric, intersertal

Grundmasse: Tabular feldspar — 85-95%
Glass 3 — 15%
ferromagnesians(?) and opaques — ±1.5% } 0.10 - 0,25 mm

Einsprenglinge: Biotite — ±1% — ±2 mm
Fayalite? — ±1% — ±1 mm
Amphibole ≤1% — ±1 mm
Plagioclase? ≤1% — ±1 mm
Sanidine? ≤1% — ±1 mm

Bemerkungen: Rock appears to be fresher in the breccia than in the larger free clasts; composition is coarse gravel to pebble-size subangular to subrounded trachyte fragments cemented quite well with phosphorite, chalk, & smectite mixtures and coated with δ-MnO_2(?) which sometimes reaches thicknesses of up to 4.0 mm.; rock is generally finer-grained than the massive trachyte, but variations in texture, crystal ratios from fragment to fragment may indicate material derived from several flows; vesicalation absent.

*** **Petrographische Daten Substrat**

RV Sonne So 33 Midpac II 29.7 - 29.8.1984

Datum: 8-1-84 Areal: A Lokation: I. Station: 6

Probennummer: So 33 6 DK

Längengrad, nk: 153° 12.74 k:

Breitengrad, nk: 18° 41.32' N k:

Wassertiefe (m): 1060-490 Bereich (m):

Typ: Basalt (Alkali Olivene?), Massive Farbe: Dark Gray (N3) to Dark yellowish-Brown (10 YR 4/2)

Erhaltungszustand: Variable (fresh to very altered) (Smectitization Oxidation)

Gefüge: Aphanitic to subaphyric, hyalopilitic, subtrachytic

Grundmasse: Glass ± 30% (?)
Plagioclase - ± 65%, ± 0.5 mm
opaques - ± 5%; < 0,5 mm

Einsprenglinge: Olivine < 1% - ± 1 mm
Plagioclase ± 1% - ± 1 mm
Pyroxene (?) << 1% - 0.75 mm

Bemerkungen: Angular to subangular pebble to boulder-size free clasts, alteration is localized with very fresh material adjacent to very altered material (aureolic around fractures? - evidence of hydrothermal activity along fractures in form of goethite? observed); texture is highly directed: feldspar appears pilotaxitic ⊥ to top of flow, micaceous ∥ to top of flow; vesicles large (5-10 cm dia), flat, lensoid. clasts generally covered with thin crust of δ-MnO_2(?) which overlies discontinuous deposits of grayish-orange (10 YR 7/4) phosphorite deposited in low spots on the surfaces of the basalt.

*** **Petrographische Daten Substrat**

RV Sonne So 33 Midpac II 29.7 - 29.8.1984

Datum: 8-1-84 Areal: A Lokation: I Station: 6

Probennummer: So 33 6 DK

Längengrad, nk: 158° 17.74 k:

Breitengrad, nk: 18° 41.32 N k:

Wassertiefe (m): 1060-490 Bereich (m):

Typ: Basalt, hyaloclastite (Alkali Olivine ?) Farbe: Light brown (5YR/6) to yellowish-gray (5Y 7/2) to moderate greenish-yellow (10Y 7/4) to pale olive (10Y 6/2)

Erhaltungszustand: Highly to completely altered (smectitization, zeolitization ?, oxidation)

Gefüge: Aphanitic hyalopilitic, pilotaxitic

Grundmasse: glass - 95-99+%
smectite?
zeolites?
goethite?

Einsprenglinge: not observed

Bemerkungen: composed of subangular to angular fragments ranging from <1 mm dia. to 50+ mm dia., average 1+ cm; frequently deposited directly on top of the larger basalt clasts although some larger, less altered basalt clasts of the massive type are incorporated in the hyaloclastite itself; flow structure is easily observed in many of the rock fragments in the hyaloclastite; fragments range from dense to scoriaceous vesicular, size of vesicles ranging from <1 mm to ±3 mm; shape of vesicles ranges from round to elliptical and they contain no deposits, generally coated with ± 1 cm-thick layer of δ-MnO_2 (?), cemented with pale brown 5YR 5/2 to grayish-orange-pink (5YR 7/2) phosphorite and lighter-colored chalk