

APPENDIX I. PETROGRAPHY OF SOME REPRESENTATIVE VOLCANICLASTICS

Eight thin sections of representative tuff layers from Hole 808C have been studied petrographically in detail. They are from Interval 131-808C-38R-6, 75-76 cm, -53R-2, 119-120 cm, -54R-1, 73-74 cm, and from Intervals 131-808C-101R-1, 21-22 cm, -101R-2 (44-45 cm and 81-82 cm), and -101R-4 (1-2 cm and 138-139 cm). The results are summarized in Table 1.

Compared with tuffs from Core 131-808C-101R, the volcaniclastic deposits from Cores 131-808C-38R, -53R, and -54R are characterized by the following main features:

1. Generally coarser grained;
2. Better preservation of vitric particles;
3. Occurrence of mafic phases such as pyroxene and amphibole
4. Composition of plagioclase, i.e. higher Anorthite content;
5. Scarcity or lack of quartz.

Petrographic features suggest a dacitic (or rhyolitic) composition for tuffs of Core 131-808C-101R, whereas an andesitic (or basaltic-andesitic) composition is inferred for the pyroclastic layers of the other cores.

Andesitic (or basaltic-andesitic) tuffs are fine to medium grained. The main components are vitric, crystal, and lithic fragments with variable relative abundances.

Vitric grains consist of subequant to elongate platy or, less commonly, cusped glass shards representing broken bubble walls; elongate pumice shards are also common, showing fibrous or cellular structure.

Crystal fragments are generally silt-sized, subhedral to anhedral, and sometimes form glomerophyric aggregates. These crystal fragments consist mainly of compositionally zoned plagioclase (An 50-54), clinopyroxene, minor orthopyroxene, green amphibole, rare biotite, and opaque minerals; quartz is rare to absent.

Lithic particles consist of equant rounded, chilled, dark basaltic glass fragments sometimes containing unrecognizable microlites and light brown phyric andesite glass fragments, which contain plagioclase microlites and rare pyroxene microphenocrysts.

Both lithic and crystal fragments seem to be juvenile and/or cognate pyroclasts, derived directly either from the latest erupting magma or from most recent eruptions of the same volcano. No accidental pyroclasts derived from subvolcanic sedimentary or metamorphic rocks were observed. Veins are absent in these samples.

The distinct feature of the dacitic (or rhyolitic) volcaniclastic layers is the strong diagenetic alteration suffered by the vitric particles, which are almost completely devitrified and altered to clay minerals. The original shape of glass and pumice shards is seldom recognizable.

Crystal fragments consist of variable amounts of microlites and phenocrysts of plagioclase (An 20-30), sanidine, quartz, biotite, and small amounts of other ferro-magnesian minerals altered to chlorite.

Small amounts of subequant lithic particles consist of rhyolitic or accidental (mainly quartzitic) fragments.

Interval 131-808C-101R, 81-83 cm, is characterized by graded bedding of millimeter-size layers with numerous oriented crystal fragments parallel to bedding, interbedded with layers in which crystal fragments are less numerous, coarser sized, and generally non-oriented. Crystal sorting is very poor. Oxidation processes involving both crystals and glassy altered matrix are widespread.

Samples 131-808C-53R-2, 119-120 cm, and 131-808C-101R-4, 1-2 cm, having different compositions, exhibit similar structure, characterized by large tuff fragments (up to 3 cm in size) enclosed in a clayey matrix sometimes with veins and irregular cavities filled with opaque minerals. The clayey matrix most probably represents the alteration product of a former, extremely glass-rich, volcaniclastic depositional episode.

Table 1. Modal proportions (%) of vitric, lithic, and crystal fragments of some representative tuff layers of Hole 808C.

Sample	Vit. (%)	Lith. (%)	Quar.	Plag (An%)	Kfel	Bio. (%)	Cpx (%)	Opx (%)	Amp (%)	Chl (%)	Clay (%)	Ox
131-808C-36R-6, 75-76 cm	60	3	6	15 (50)	-	1	10	2	3	tr	-	-
*53R-2, 119-120	50	10	-	30	-	tr	5	-	-	-	-	5
54R-1, 73-74	50	8	5	15 (54)	-	2	5	-	-	tr	5	10
101R-1, 21-22	60	2	4	2	1	1	-	-	-	-	28	2
101R-2, 44-45	65	2	10	10 (25)	-	5	-	-	-	-	4	4
101R-2, 81-83	50	3	10	12 (25)	2	10	-	-	-	-	10	3
*101R-4, 1-2	30	-	10	35	5	10	-	-	-	tr	tr	10
101R-4, 138-139	26	6	5	4	3	4	-	-	-	25	25	2

*Refers to the coarser-grained angular fragments.

Abbreviations: Vit.: vitrics; Lith.: lithics; Quar.: quartz; Plag: plagioclase; Kfel: K-feldspar; Bio.: biotite; Cpx: clinopyroxene; Opx: orthopyroxene; Amp: amphibole; Chl: chlorite; Ox: oxide; tr: trace.