54. *Petrography of the 1950-lavas of Oshima volcano, Seven Izu Islands, Japan.*

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After 10 years' quiescence, Mt. Mihara, the central cone of the volcano Oshima, one of the Seven Izu Islands, suddenly began her recent eruption at 9 : 15 (Japan standard time) on the morning of July 16, 1950. The activity continued for 10 weeks till it stopped on September 23 at midnight. During the 70 days, about 50,000,000 tons [1] of new lava filled up successively the central pit (August 15) and the

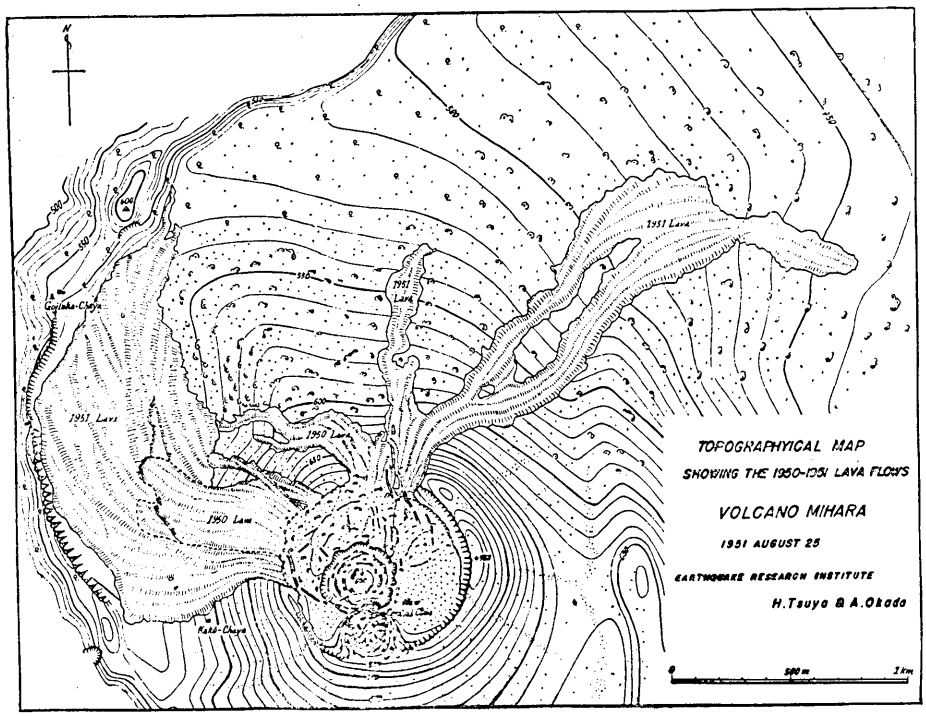


Fig. 1.

1) An estimate based on the topographic survey of the new lava field by R. Takahashi and D. Shimozuru. The bulk specific gravity was weighed in our laboratory as 1.7 for the cinder, 2.2 for the lavas which flowed down from the crater, and 2.7 for the lava on the crater floor.

Table I. Chemical Composition of the 1950-lavas.
(Analyst J. Ossaka)

Constitutents	1	2	3	4	5
SiO_2	52.68	52.02	52.25	52.25	52.30
Al_2O_3	15.28	15.83	15.55	15.33	15.50
Fe_2O_3	2.78	2.28	2.92	3.84	2.96
FeO	10.56	10.80	10.22	9.46	10.26
MgO	4.59	4.47	4.86	4.65	4.64
CaO	9.78	9.48	9.92	9.41	9.65
Na_2O	1.47	1.58	1.72	1.65	1.61
K_2O	0.26	0.29	0.39	0.37	0.33
H_2O+	0.20	0.99	0.71	0.91	0.70
H_2O-	0.11	0.24	0.21	0.28	0.21
TiO_2	1.67	1.52	1.57	1.21	1.49
P_2O_5	0.17	n. d.	tr.	n. d.	0.09*
MnO	0.09	0.09	0.06	0.15	0.10
	99.64	99.59	100.38	99.51	99.84

Norms

Quartz		11.83	10.39	9.25	11.23	10.75
Orthoclase		1.67	1.67	2.23	2.23	2.23
Albite		12.58	13.11	14.68	14.16	13.63
Anorthite		34.21	35.32	33.65	33.10	33.93
Wollastonite		5.57	4.88	6.50	5.69	5.46
Enstatite		11.44	11.14	12.15	11.54	11.54
Ferrosilite		14.51	15.57	13.85	12.53	13.98
Magnetite		3.94	3.24	4.17	5.56	4.40
Ilmenite		3.19	2.88	3.04	2.28	2.88
Apatite		0.33	n. d.	tr.	n. d.	0.33
NF	or	3	3	4	4	5
	ab	26	26	29	29	27
	an	71	71	67	67	68
NPl	An	73	73	70	70	71
NPy	Wo	18	16	20	19	18
	En	36	35	37	39	37
	Fs	46	49	43	42	45

(to be continued)

Modes**

Constitutents	1	2	3	4	5
Plagioclase	4.6	5.1	9.8	7.4	6.7
Hypersthene.....	0.5	tr.	0.3	0.9	0.4
Augite	0.2	tr.	tr.	0.7	0.2
Groundmass	94.5	94.9	89.9	91.0	92.6

1. Bomb ejected on July 22 (cf. Fig. 4). The groundmass consists of brown glass with microlites of plagioclase and pigeonite and iron ore dust.

2. Lava filled up the crater on August 23. The groundmass consists mainly of pigeonite, about half percent in volume, bytownite (An 75) and dark brown glass. The hypersthene phenocrysts are replaced by pigeonite grains.

3. Lava flowing out from the crater to the direction of Nomashi on September 18 (cf. Fig. 5). The groundmass consists of pigeonite, bytownite (An 75), skeletal crystals of magnetite and brown glass.

4. Bomb ejected on September 23. The groundmass is composed of light coloured porous glass. Thin film of iron ores is found on the surface of the bomb.

5. Mean chemical composition of 1–4.

* Mean of 1 and 3. ** Percentage in volume.

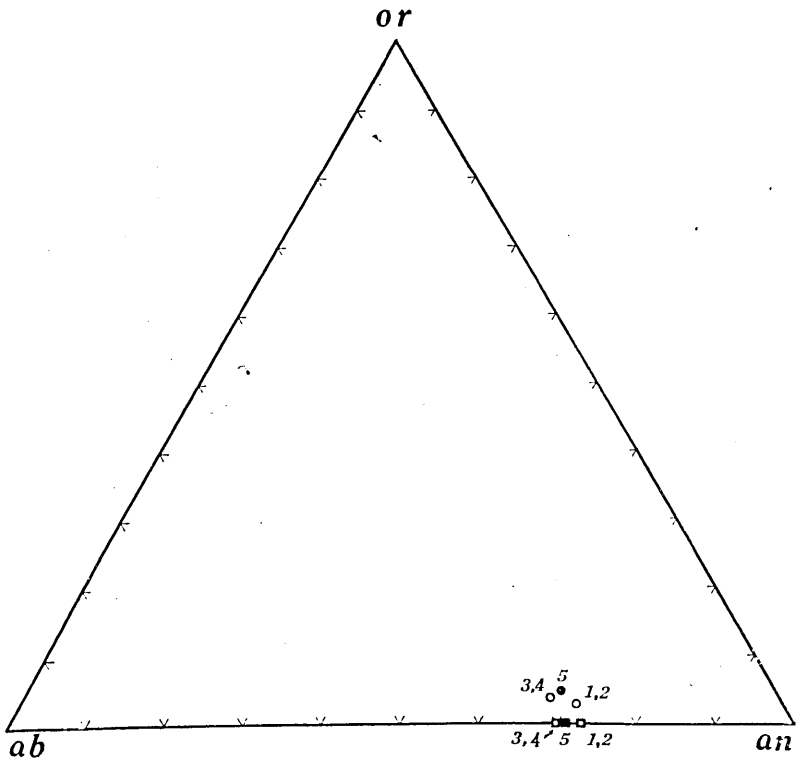


Fig. 2. Compositions of normative feldspars of the 1950-lavas. Figures are same in Table I. Normative plagioclases are shown by squares.

surrounding crater-floor (September 13), then flowed out from the crater to the atrio (Fig. 1). In February, 1951, the activity of the volcano revived in eruption of larger scale, with more extensive lava outflow. In this paper, the writers present a preliminary note on the petrography of the 1950-lavas.

Both the lavas and fragmental ejecta (scoriaceous cinder and bombs) of 1950 are petrographically identified as an uniform augite-hypersthene-bytownite-basalt. Their chemical and mineralogical compositions are shown in the following tables (Table I, II). The peculiarity in the chemical composition of historic lavas of the volcano[2] is revealed as usual in the petrochemical features of the present lavas. The high excess of silica in the norm is reflected in the presence of cristobalite in the higher crystalline groundmass, although it is entirely occult in

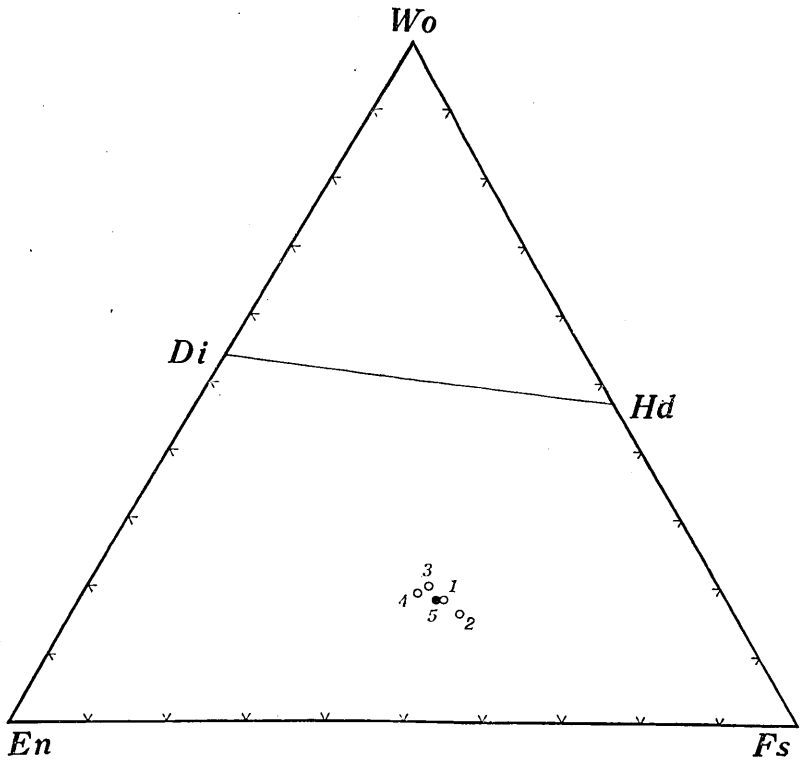
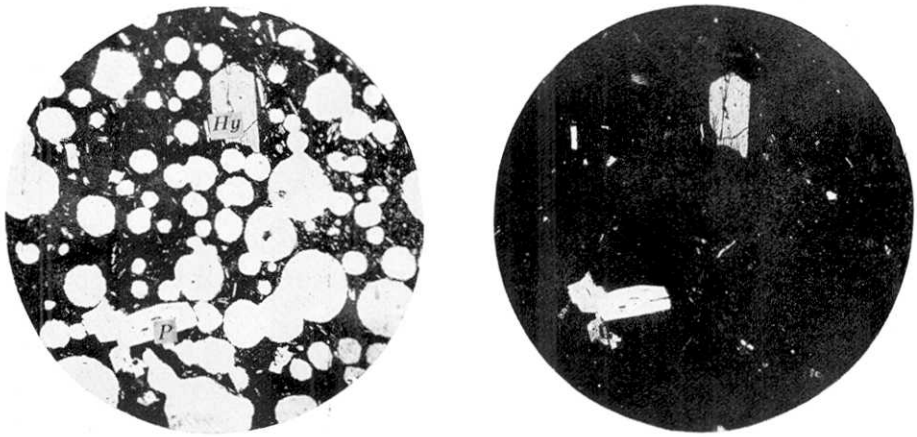


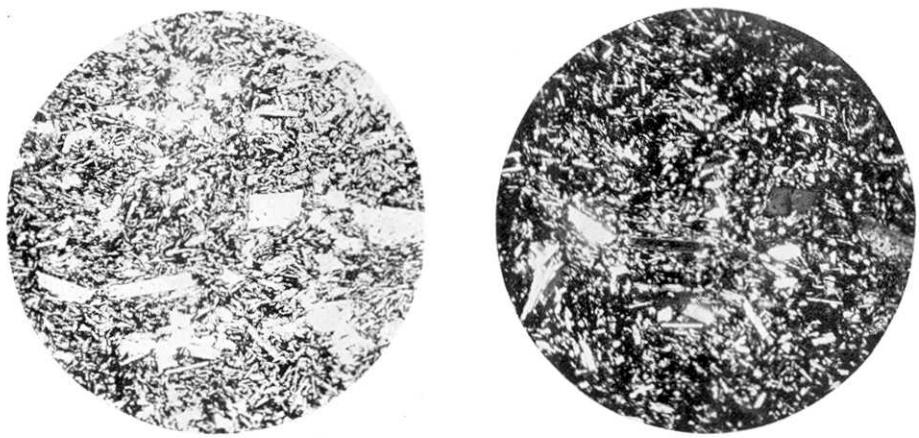
Fig. 3. Compositions of normative pyroxenes of the 1950-lavas. Figures are same in Table I.

2) S. TSUBOI, *Jour. Col. Sci. Imp. Univ. Tokyo, Art 6*, **43** (1920), 86–7.



a b

Fig. 4. Photomicrographs of 1950-bomb. a...Polarizer only, b...Analyser being inserted. Hy : hypersthene, P : plagioclase (× ca. 14).



a b

Fig. 5. Photomicrographs of 1950-lava. Microphenocrysts of bytownite are embedded in the groundmass composed of pigeonite, sodic bytownite and dark brown glass. a...Polarizer only, b...Analyser being inserted (× ca. 14).

the glassy groundmass. Compositions of normative feldspars are markedly calcic (Fig. 2). High content of iron oxides and large ratio of total iron to magnesia are also noticeable.

This oversaturated basalt contains anorthite-bytownite, hypersthene and augite as porphyritic minerals scattered in the groundmass composed of bytownite, pigeonite, iron ores and glass. Cristobalite is

found in the higher crystalline portion of the lava. Porphyritic structure is not so remarkable: phenocrysts occupy 5–10 percents of the rock in volume; they scarcely attain to 3 mm or more in length; they are seriate to the groundmass minerals in size in the higher crystalline portion of the rock. In spite of its various contents of phenocrysts, especially of plagioclase, the rock is quite uniform in bulk composition, as shown in Table I.

The main constituent minerals of the rock have optical properties as shown in Table II. Their mode of occurrence is briefly described as follows:

Plagioclase: The mineral occurs as the most essential constituent both of the phenocrysts and the groundmass. In composition, it varies from anorthite and calcic bytownite in phenocrysts to sodic bytownite in groundmass.

Hypersthene: Phenocrysts of hypersthene are always found in the rock either as single-crystals or grouped ones associated with or without plagioclase and augite. In the glassy bombs, the mineral occurs as clear euhedral prisms, attaining to 0.5–1.0 mm in length, while in the higher crystalline lavas, it is always fringed with minute grains of quasi-uniaxial pigeonite. It is almost entirely replaced by the latter in the portion of the lava showing a more advanced crystallization.

Augite: Augite is nearly always found as microphenocrysts, but in quite a subordinate amount. Twinnings on 100 are common. There is no microscopic feature showing any discontinuity of crystallization between the augite microphenocrysts and the groundmass pigeonite.

Pigeonite: Pigeonite is the main constituent mineral, occurring as minute grains in the higher crystalline groundmass, either as spindle-formed microphenocrysts or swallow-tailed acicular crystals in the glassy groundmass. Twinnings on 100 are common. Aggregates of pigeonite grains as a pseudomorph of the hypersthene phenocryst are commonly found in the more crystalline portion of the lavas.

Cristobalite: In the highly crystalline groundmass of the present lavas, silica mineral occurs as cristobalite in cavities. Besides, transparent glass of low refractive index occurs in the interstices of the same groundmass.

Iron ores: Magnetite is found in the groundmass only, occurring as euhedral octahedrons in the more crystalline portion of the mass and dendritic or skeletal crystals in the less crystalline part. In the

glassy parts of the lavas and bombs, magnetite or hematite is also found as a thin film covering the rock surface. The glass coated with such films of iron-oxides is comparatively high in transparency, while the glass in the more crystalline portion of the lavas is subtransparent in thin slices. Interstitial glass of the rock in which magnetite occurs as euhedral octahedrons is quite transparent and colourless in thin section.

Table II. Optical properties of the main constituent minerals.

Phenocrysts	Groundmass
Plagioclase: An 96–83* An 85–82 (microphenocryst)	Plagioclase: An 75–70
Hypersthene: (−) 2V=63°—60° $\rho > v$ about X $En_{63}Fs_{37}$—$En_{60}Fs_{40}$**	———
Augite: (microphenocrysts) 2V=51°, 51° in (010)	Pigeonite: 2V≒0° in (010) β=1.700—1.704 $Wo_{11}En_{41}Fs_{48}$***

* Inferred from n_1' on cleavage frakes by means of Tsuboi's diagram. S. TSUBOI, *Jap. Jour. Geol. Geogr.* **11** (1934), 326–7.

** Inferred from 2V and type of dispersion by means of the diagram by Kuno. H. KUNO, *Proc. Imp. Acad. Tokyo,* **17** (1941), 205.

*** Inferred from 2V and β by means of the diagram by Kuno. H. KUNO, *Jap. Jour. Geol. Geogr.* **13** (1936), 110.

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54. 伊豆大島三原山1950年熔岩の化學成分

地震研究所　津屋弘達
森本良平

伊豆大島三原山の 1950 年の活動中に噴出した，代表的な熔岩，火山彈を選んで，その岩石化學的性質を記載した。