VARIATIONS IN CHEMICAL COMPOSITION AND OPTIC PROPERTIES IN RHOMBIC PYROXENES : Summary of the original paper in Japanese

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VARIATIONS IN CHEMICAL COMPOSITION AND OPTIC PROPERTIES IN RHOMBIC PYROXENES

— Summary of the original paper in Japanese[1] —

By

Sadakatu TANEDA

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There is urgent need for more accurate variation diagram of the optic properties with $FeSiO_3$ content in the orthorhombic pyroxenes. The writer attempted to construct the diagram (Fig. 1) on the basis of data as listed in the Table I.

The intensity of influence of Al_2O_3, CaO, Na_2O, K_2O and TiO_2 to the refractive index and optic angle is estimated approximately as follows:

Al_2O_3 (for Al replacing Mg): 1%* Increases the refractive index about 0.004-0.007.

Al_2O_3 (for Al replacing Si): 1%* increases it about 0.002.

When Na_2O is rich ($>0.2\% \pm$), the influence of Al_2O_3 is much little.

CaO (for Ca replacing Mg): 1%* decreases it about 0.002.

CaO (for Ca replacing Si**): 1%* decreases it about 0.0002.

Na_2O: 1%* decreases it about 0.001-0.01.

K_2O: 1%* increases it about 0.04.

TiO_2: 1%* increases it about 0.008.

Fe_2O_3 (as FeO)/Total FeO: 0.1* decreases it about 0.005.

The factor decreasing the refractive index may increase the optic angle about X. The detailed discussion should be done referring to the studies on the mother rocks.

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[1] See a paper in Journ. Geol. Soc. Japan, vol. LIII.

* The excess of amount over the average value (%).

** It should be discussed on a later occasion.

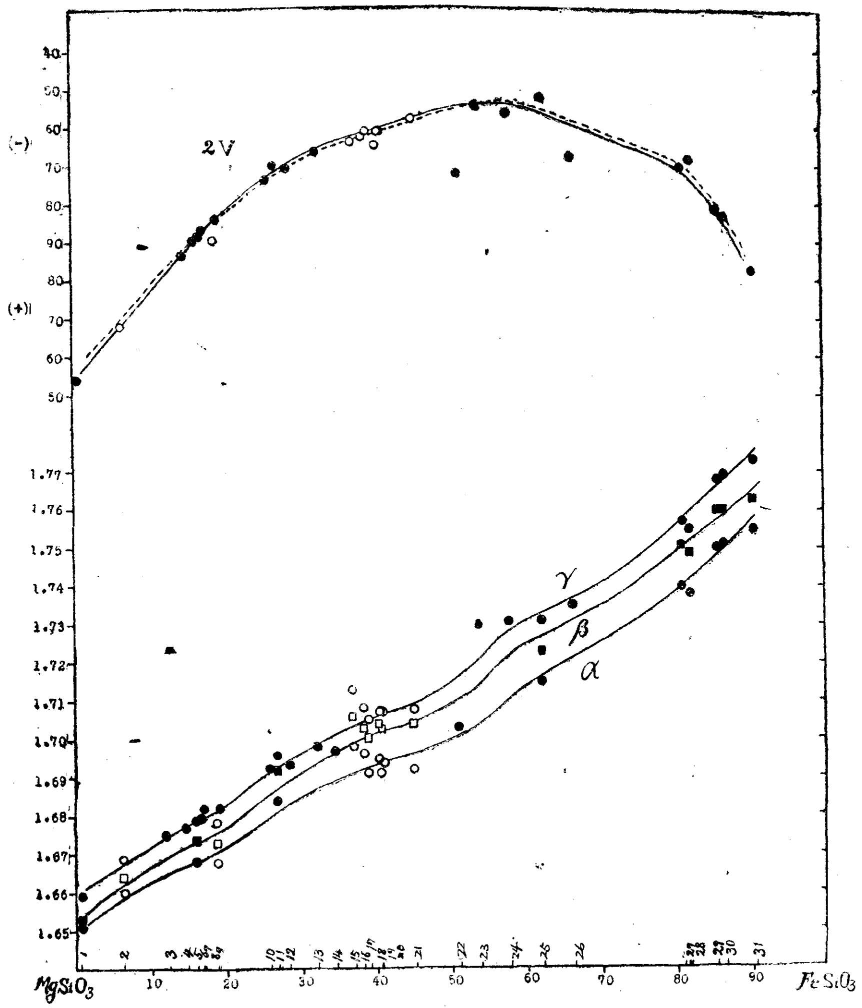

Fig. 1. Diagram showing the variation of the optic properties with $FeSiO_3$ content (in Wt.%) in the orthorhombic pyroxene series.
Figures, 1——31, refer to the Table 1.
Dotted line for Optic angle is for red light and full line for blue light.

Table I.

The details are abbreviated in this part.

		Locality	Analyst
1.	Enstatite,	Shallowater meteorite	W. F. Foshag
2.	,, ,	Kamogawamachi, Tiba. Pref. Japan	Tada & Fujimote
3.	,, ,	Espedalen Norway	Washington
4.	,, ,	North Carolina	Phillips
5.	,, ,	Webster, North Carolina	Phillips
6.	Bronzitite,	Bushveld Complex	C. F. v. d. Wald
7.	,, ,	Jagdlust, Bushveld Complex	H. G. Weall
8.	,, ,	Chichijima, Ogasahara	Kono
9.	,, ,	Stillwater Complex	T. Kameda
10.	Hypersthene,	,,	Phillips
11.	,, ,	Johnstown meteorite, Colorado	E. V. Shannon
12.	,, ,	Bay of Island Complex, New foundland	A. Willman
13.	,, ,	Stillwater Complex	R. B. Ellestad
14.	,, ,	Nain, Labrador	Washington
15.	,, ,	Komagatake, Hokkaido, Japan	Seto
16.	,, ,	Tônomine, Hakone, Japan	Tada & Fujimoto
17.	,, ,	Odawara, Japan	Tanaka
18.	,, ,	Kamakura, Japan	Fujimoto
19.	Hypersthene,	Haruna volcano, Central Japan	Kozima & Taneda
20.	,, ,	Hichiseisan, Formosa	Tada & Fujimoto
21.	,, ,	Inawashiro-lake, Japan	Yagi
22.	,, ,	Arnage mass, Railway Bridge Croft, Arnage, Aberdenshire, Scotland	A. W. Groves
23.	,, ,	Haddo mass, Quilquox, Methlik, Aberdenshire, Scotland	,,
24.	,, ,	Quilquox Methlick, Aberdenshire Scotland	,,
25.	,, ,	Craig Wood, Glen Buchat, Aberdenshire	N. F. M. Henry
26.	,, ,	Inish mass, old meldrum, Easter Saphock, Aberdenshire, Scotland	A. W. Groves
27.	,, ,	Vittanki, Finland	N. Shalbom
28.	,, ,	Ross-shire, Loch Duich, Duideag Lodge	N. F. M. Henry
29.	,, ,	Tunaberg, Sweden	R. Mauzelius
30.	,, ,	Mansjö Mt., Sweden	N. F. M. Henry
31.	Ortho ferrosilite,	Yu-hsi-Kou, Manchuria	N. F. M. Henry