20. *Hydrated Aluminium-Sulphate Minerals from New Fumaroles on Volcano Yakeyama, Niigata Prefecture.*

By Hiromichi TSUYA, Takeshi ICHIMURA and Toshiaki SHIRAI,

Earthquake Research Institute.

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By the explosive activity of Volcano Yakeyama in February, 1949, a number of fumaroles were formed on the new explosion-fissures which, passing through the top of the volcano, run in the NE.-SW. direction. In August, 1949, when two of the writers (Tsuya and Ichimura) visited the volcano, rocks around most of the fumaroles had been covered thickly with sublimates consisting principally of white fibrous minerals, besides sulphur. Ichimura collected two samples of the minerals—one (sample 1) from a fumarole on the summit (Fig. 1, a) and the other (sample 2) from a fumarole on the northeast flank of the volcano (Fig. 1, b), and Shirai analyzed them chemically with results as shown in Table I.

Table I. Composition of hydrated aluminium-sulphate minerals from Yakeyama.

	Al_2O_3	SO_3	H_2O	FeO	Other components
Sample 1	10.5	32.1	52.1	4.5	CaO 0.2, As_2O_3 0.3, Cl trace.
Sample 2	13.5	33.0	50.2	2.5	Cl trace.

The minerals occur in a white mass of delicate acicular crystals, as shown in Figs. 2, 3. They taste inky astringent. Heating them strongly, they lose water, leaving a light-brownish powdery material. The chemical composition shows the minerals to be of halotrichite group (hydrated aluminium-sulphates). General formula for the group is given by Dana[1] as $MAl_2(SO_4)_3$ 22 (or 24) H_2O, where M is a bivalent metal such as Fe, Mg or Mn. But many examples of chemical analyses of fibrous halotrichite minerals shown in the Dana's book have not any definite composition as expressed by this formula. The chemical analyses of the minerals in

1) DANA, E. S., "Dana's System of Mineralogy," 1892-1915, 929.

question also do not agree exactly with the formula, being intermedite between the ideal composition of halotrichite $FeAl_2(SO_4)_4\ 24(H_2O)$—Al_2O_3= 11.0, SO_3=34.5, FeO=7.8 and H_2O=46.7—and that of alunogen $Al_2(SO)_3$ $18H_2O$—Al_2O_3=15.3, SO_3=36.0 and H_2O=46.7. Judging from their mode of occurrence and physical properties, however, it may be safe to identify them with halotrichite.

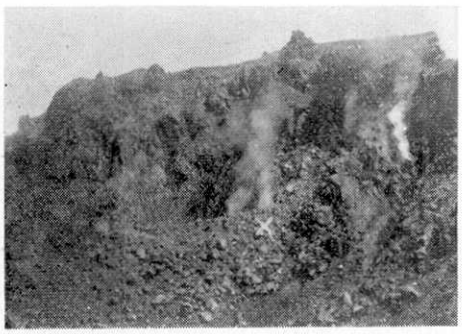

Fig. 1, a. Fumaroles on the eastern wall of the summit-crater of the Volcano Yakeyama.

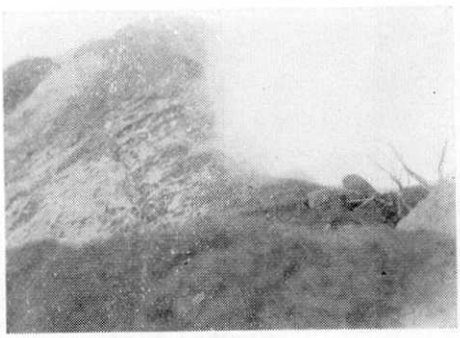

Fig. 1, b. A fumarole viewed from a short distance, on the northeastern flank of Volcano Yakeyama.

Fig. 2. Halotrichite from a fumarole on Volcano Yakeyama (Sample 1.). ×220.

Fig. 3. Halotrichite from a fumarole on Volcano Yakeyama (Sample 2.). ×220.