Contribution to the mineralogy of Norway, No 44

On Natrojarosite in Norway

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Natrojarosite is reported as a secondary mineral from Forvik antimony deposit, Helgeland, North Norway. X-ray powder data are tabulated, $a_0 = 7.31$ Å, $c_0 = 16.65$ Å.

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The antimony deposit at Forvik, Helgeland, North Norway was described by Carstens (1937). The main ore mineral, called 'plumosite', occurs very abundantly in a narrow, steeply dipping quartz vein, 30–60 cm wide, which can be followed for a distance of 250 m. The bedrock is mica schist. X-ray powder diagrams show the antimony mineral to be boulangerite. A silver-rich tetrahedrite (freibergite) with $a_0 = 10.57$ Å is also present in the ore, as are pyrite and very small amounts of chalcopyrite and pyrrhotite.

Natrojarosite is found as a yellow powder composed of rhombohedral crystals of average size 2–3 microns, being formed by the decomposition of the sulfides. White incrustations of cerussite were also detected. X-ray powder data of natrojarosite are given in Table 1. These are very close to the data given for natrojarosite by Mitchell & Giannini (1958). The strongest reflections of quartz, (100), (101), (110), were also present in the diagram. The unit cell was determined from the (220) and (006) reflections, giving $a_0 = 7.31$ Å, $c_0 = 16.65$ Å, $c_0/a_0 = 2.28$. These values are in very good agreement with the data presented for synthetic natrojarosites by Brophy & Sheridan (1965). An optical spectrogram proved the presence of Na, but no K was detected.

The X-ray powder patterns of natrojarosite and jarosite are easily distinguished, especially by the presence of the strong 5 Å reflection in the natrojarosite pattern (Van Tassel 1956). There are also other characteristic differences, the natrojarosite pattern showing larger spread between the (101)–(003) and (021)–(113) reflections, and the presence of a strong and broad (404) reflection. Jarosite minerals were reported as a secondary product on graphite schists from several Norwegian localities (Neumann 1959). All X-ray films of Norwegian jarosites in the files of the Mineralogical-Geological Museum are seen to be true jarosites.

Natrojarosite was described from another Norwegian occurrence at a very

Table 1. X-ray powder data of natrojarosite from Forvik, Helgeland. a_0 = 7.31 Å, c_0 = 16.65 Å, c_0/a_0 = 2.28.

I/I_0 est.	d (Å) obs.	d (Å) calc.	(hkl)*
w	5.93	5.92	(101)
w	5.56	5.56	(003)
s	5.05	5.04	(012)
w	3.66	3.66	(110)
w	3.48	3.48	(104)
vs	3.11	3.11	(021)
vs	3.06	3.05	(113)
vw	2.963	2.960	(202)
w	2.775	2.776	(006)
w	2.522	2.521	(024)
m	2.228	2.227	(107)
m	1.975	1.973	(303)
		1.977	(018)
w	1.902	1.902	(027)
m	1.828	1.828	(220)
vw	1.738	1.739	(208)
vw	1.720	1.719	(312)
vw	1.620	1.618	(134)
w	1.576	1.571	(128)
w	1.556	1.553	(315)
w	1.529	1.527	(226)
w (b)	1.477	1.480	(404)
vw	1.433		
w	1.343	1.342	(318)
w	1.240		
vw	1.221		
w	1.195		
w	1.151		
w (b)	1.128		

9 cm Debye-Scherrer camera, Fe radiation, Mn filter. (b = broad line).
* Hexagonal indices.

early date (Scheerer 1838). It was found as a yellow secondary mineral in the black shales at Modum, South Norway. The chemical analyses quoted by Scheerer (Na_2O 5.20, Fe_2O_3 49.63, SO_3 32.45, H_2O 13.11, sum 100.39% – mean of two nearly identical analyses) are in close agreement with modern analyses (Brophy & Sheridan 1965), and there can be no doubt about the correct determination of natrojarosite, although Scheerer did not use any name, natrojarosite being first described in 1902, jarosite in 1852. This old report of Scheerer seems to have been almost forgotten, as natrojarosite is not listed by Oftedal (1948) in his survey of the minerals of Norway. However, the Modum locality is mentioned in all the larger standard reference works on mineralogy as a finding place for natrojarosite (Doelter & Leitmeier 1929, Hintze 1930, Palache, Berman & Frondel 1951).

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