

# Note on a molybdenite-dolomite-bearing pegmatite in Velfjord, Nordland, Norway

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## Abstract

A small area of basic gabbro occurs within the granodiorite pluton north of Velfjord. In this gabbro was found a peculiar pegmatite dike, rich in molybdenite, and composed of quartz, albite, and dolomite as major minerals.

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Velfjord is situated in Søndre Helgeland, the southernmost part of Nordland fylke. North of Velfjord the geologic map of Rekstad (1902, p. 8) shows a large massif of intrusive granite. Not shown on the map is a gabbro massif which may be several kilometers in diameter, situated east of the little fjord Andalsvågen. The massif contains a great variety of gabbroic rocks. Fine-grained to medium-grained gabbros predominate, but very coarse-grained varieties are met with, and a number of peridotite areas are found. About 1.0 km northwest of the top of the mountain Andalsshatten (900 m high) a little pegmatite dike occurs in very coarse-grained peridotite.

Petrographically the granitic rocks are for the most part medium to coarse-grained granodiorite, or close to quartz diorite, with around 10 % microcline. In places they are porphyritic, with plagioclase crystals of size up to 4 cm.

Some results from a detailed study of the rather homogenous medium-grained gabbro around Andalsvågen may be mentioned. Bright green augite is the most important mineral (25 - 50 %), followed by plagioclase (10 - 30 %), olivine (10 - 20 %), orthorhombic pyroxene (5 - 15 %), light brownish hornblende (5 - 15 %), and similarly light brownish biotite (5 - 15 %). Ore minerals make up less than one per cent. The geologic setting and mineral composition suggest a basic gabbro, crystallized or recrystallized under conditions of strong regional metamorphism.

The pegmatite dike was found by Mr. Olav J. Andal and was subsequently mined for molybdenite in 1936. The outlines of the dike could not be seen during my visit on Aug. 16, 1958, due to snow filling of the mined-out area, but Mr. Andal tells that it was 35 cm wide and 8 m long. The dumps contain

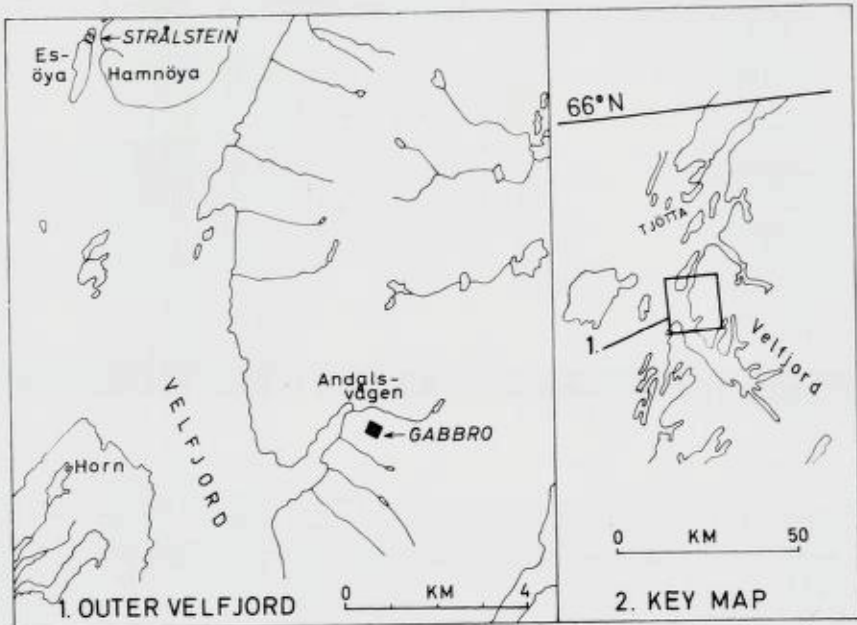


Fig. 1. 1. Sketch map of outer Velfjord with the gabbro area at Andalsvågen schematically shown. Also shown is the outcrop on the small island Esöya of an extraordinary rock type (strålstein). It is composed of fibrous actinolite aggregates of a very bright and fresh green colour, set in a matrix of white calcite.

2. Key map showing the location of Velfjord on the Nordland coast, at  $65^{\circ}30' N$ .

big pieces of the pegmatite with the following minerals: molybdenite, quartz, ankeritic dolomite, albite, biotite, muscovite, talc, tourmaline, and traces of chlorite.

The molybdenite occurs in the dike as scattered platy crystals and blades with a diameter up to 3 cm, with a reported maximum size of 8 cm. Most of the molybdenite occurs as blades larger than 1 cm, accordingly much molybdenite could simply be handpicked by blasting the pegmatite.

The main minerals of the pegmatite must have a zonal arrangement, because all inspected fragments are rich in either quartz or in albite and dolomite. The quartz-rich type carries muscovite, tourmaline, and molybdenite as accessory minerals, and the albite plus dolomite type contains talc, biotite, a few clear quartz grains, molybdenite, and a little chlorite. In the latter type the feldspar and dolomite may have all proportions in the various pieces available for inspection. Both quartz, dolomite, and albite may make up large continuous mineral aggregates with single crystals of size up to 2 - 3 cm.

The mica blades are less than 0.5 cm in diameter, and the talc occurs as fine plates, 0.1 cm in size, growing on the dolomite. The tourmaline needles are less than 0.1 cm in diameter and may have a length up to 1.0 cm.

The occurrence of this pegmatite dike rich in feldspar and dolomite is reported here because such a type of pegmatite dike seems to be rather rare and is not reported earlier from the Caledonian zone of Norway. Probably this dike is the same as the one mentioned by A. Bugge (1963, p. 116) as molybdenite-bearing tourmaline vein. If so, this characterization is erroneous due to incomplete or wrong information given to Mr. Bugge. In the vicinity I found a few molybdenite-bearing quartz-tourmaline veins, also reported by Bugge. Grains of molybdenite occur also in hornblende veins cutting the peridotite and in small granite veins. Quartz veins reported to carry gold are also found within the gabbro massif.

Molybdenite mineralization is reported in various places in Velfjord in the area around Andalsvågen. This mineralization must be seen in relation to the adjacent massif of granodiorite, which is clearly an intrusive batholithic body with crosscutting contacts against the metamorphosed sediments and with a slight contact metamorphism.

#### References

- Bugge, A.*: Norges molybdenforekomster. Norges Geol. Unders., 217, 1963.  
*Rekstad, J.*: Geologisk kartskisse over trakterne omkring Velfjorden med beskrivelse. Norges Geol. Unders., 34, 1902.