

Kitchener-Waterloo Gem and Mineral Club

Mineral of the Month: SODALITE

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SODALITE is a relatively rare mineral. It is named after its sodium content. Its chemical formula is



It is a silicate, which means it contains the elements silicon and oxygen bonded together. More precisely, it is a tectosilicate, which means its chemical structure is based on "a three-dimensional framework of linked SiO_4 tetrahedra" [1, p.475]. It belongs to the feldspathoid group of minerals; these are "low silica igneous minerals that would have formed feldspars if only more silica (SiO_2) were present in the original magma" [2]. In a feldspathoid, the ratio of aluminum atoms to silicon atoms is usually 1:1, whereas in a feldspar it would be 1:3. And finally, SODALITE has its own group of minerals, the sodalite group, which consists of the minerals hauyne, lazurite, nosean, and SODALITE itself.

SODALITE can be white, gray, purple, or green, but the blue variety is most familiar. It crystallizes in the isometric system, and dodecahedral (12-sided) crystals are known, but are rare. Usually SODALITE is massive.

The dark blue form of SODALITE is usually not fluorescent under ultraviolet light. But some lighter-coloured forms, specifically the variety called "hackmanite", can be fluorescent. Usually the response is bright orange under long wave, and white or pink under short wave, with white phosphorescence -- this is one of the few minerals where the long wave response is better than the short wave (other minerals with this property include fluorite and the yellow-fluorescing scapolite called "wernerite" from Québec). Some varieties of hackmanite are "tenebrescent". This means they actually change colour (not just fluoresce) when exposed to short-wave ultraviolet light, becoming a rich raspberry red or purple. When the short-wave light is removed, they slowly change back, in the presence of visible light, to their original colour. The fluorescent and tenebrescent properties of hackmanite have been attributed to the presence of sulfur. Hackmanite is found at the Davis Quarry and the CN Rock Dump in Bancroft, Ontario, as well as Afghanistan.

SODALITE's hardness is 5.5-6.0, and its specific gravity is 2.1-2.3.

SODALITE occurs in a number of different locations -- at least 182, according to www.mindat.org. Here are some of the most famous localities:

Afghanistan, in Sar-e-Sang, Badakhshan Province: dark blue SODALITE and purple hackmanite occurs in crystal form, some as large as 8 cm.

Greenland, in the Ilimaussaq complex, Narsaq: this is the type locality, where SODALITE was first discovered, in 1806. Greenland is also where green SODALITE can be found.

Brazil: reportedly the world's largest deposit of SODALITE is from Bahia. This is where most SODALITE that one sees these days at mineral and gem shows comes from.

South Africa: large amounts are found at Gauteng. This is another popular source for SODALITE at mineral and gem shows.

Namibia: dark blue material found at Ohopoho.

Canada: Ice River Complex, British Columbia, and Mt. St. Hilaire, Québec (where small crystals can

occasionally be found).

But of course the most famous locality is Bancroft, Ontario, where SODALITE occurs in massive form in a number of different locations, most famously the Princess Sodalite Mine, 4km east of the town, on Highway 28. This deposit was found by Frank D. Adams in 1892, and SODALITE from the deposit was featured at the Columbian Exposition in Chicago in 1893. You can still find specimens of the mineral at the CN Rock Dump in Bancroft.

The Duke and Duchess of Cornwall (later Prince and Princess of Wales, and later King George V and Queen Mary) visited Canada in 1901, and were taken by the blue colour of the mineral. They ordered SODALITE to decorate their residence, Marlborough House. Peter Russell tried to find out where the SODALITE was used in this house, but was unsuccessful. It is possible it was never used.

The Canadian Rockhound online magazine for Winter/Spring 2000 contains an interesting article by E. G. Pye about how amethyst beat out SODALITE in the race to become the official provincial mineral of Ontario. I quote: "the Bancroft Gem & Mineral Club prepared a submission to the [Central Canadian Federation of Mineralogical Societies](#) (CCFMS), urging the latter to recommend Bancroft sodalite as a provincial emblem. In its submission, the Bancroft Gem & Mineral Club stressed that for many years sodalite had been assumed by mineral collectors to actually be Ontario's mineral emblem. Indeed, as early as 1964, it had been referred to as such by C. Grant Waite in an article published in the Lapidary Journal. The club also noted that Ontario is one of the two major sources of sodalite (the other being South Africa), and that, on a Royal visit, Bancroft sodalite had been chosen by Princess Patricia for interior decoration of Marlborough House, England.

"On October 24, 1972, Dr. J. Russell Scott, mayor of Belleville, Ontario, forwarded a copy of the Society's proposal to Mr. Bernier. The proposal was again brought to Mr. Bernier's attention by Mrs. Margaret Scrivener, M.P.P. for the Riding of St. David. Mr. Bernier, in turn, referred the matter to the Ontario Geological Survey, of which I happened to be the director at the time, for comment. In my response of February 2, following lengthy discussions with my geologists, I advised Mr. Bernier that the Survey did not favor sodalite, despite its beautiful blue color, as an official emblem for three reasons:

1. Sodalite had been found in Ontario only at the privately-owned Princess mine at Bancroft, a monopoly source not in keeping with the concept of a provincial emblem;
2. Most specimens familiar to the Survey lacked any attractive crystal form, and were adulterated with inclusions of other minerals;
3. Blasting might be necessary to recover the mineral, and this could fracture or shatter specimens." [3]

SODALITE is sometimes faceted as a gemstone, but the dark blue variety is usually only suitable as cabochons.

References

1. Cornelis Klein, Mineral Science, John Wiley & Sons, 1977.
2. Amethyst Galleries, <http://www.galleries.com/minerals/silicate/sodalite/sodalite.htm>
3. E. G. Pye, "Amethyst: Ontario's Mineral Emblem", Canadian Rockhound, Vol. 4, No. 1, Winter/Spring 2000, http://epe.lac-bac.gc.ca/100/201/300/cdn_rockhound/1997-2000/2000/01/cr0004101_amethyst.html