GM 11219

NOTES ON APATITE

Documents complémentaires

Additional Files



Licence



License

Cette première page a été ajoutée
au document et ne fait pas partie du
rapport tel que soumis par les auteurs.

Énergie et Ressources naturelles
Québec

2nd (Part 1)

NOTES ON APATITE

PUBLIC

QUEBEC DEPARTMENT OF MINES
29 JUN 1961
MINERAL DEPOSITS BRANCH
No G M- 1219

GENERAL

MINERALOGY

A calcium phosphate $Ca_5(F,Cl)(PO_4)_3$, hexagonal, hardness-5, gravity 3.15, vitreous to subresinous lustre, transparent to translucent, colour usually green or brown.

GEOLOGY

Largest deposit is on Kola peninsula U.S.S.R. associated with nepheline. ~~as~~ Accessory minerals in igneous, sedimentary and metamorphic rocks, also in pegmatites and veins. North of Ottawa, apatite is found in irregular pockety masses in pyroxene formed by alteration of crystalline limestone. Also found in titaniferous magnetite bodies v.g. Degrosbois in Beresford township.

GRADE

Phosphate Rock at Florida mine grades 72 to 74% B.P.L. - costs $6.00/ton. Same material at Varennes costs $16 to $17.00/ton - enters Canada duty-free B.P.L. Bone phosphate of lime = $Ca_3(PO_4)_2$.

1% P = 5% apatite

2% P = 10.8% apatite

1% B.P.L. = .458% P_2O_5

ECONOMIC GEOLOGY

Very few deposits of economic interests because of strong competition from phosphate rock.

Apatite in veins and pegmatite mined in Russia and Kiruna,

Sweeden. Extract from: "The Geology of Canadian Industrial Mineral Deposits" (1957) p. 1.

"Prior to the discovery of the extensive and cheaply mined pebble phosphate deposits of Florida, the then infant fertilizer industry of this continent and Great Britain depended on Canada for a large proportion of its supplies of phosphate. This phosphate was supplied from the apatite deposits of the Lievre River valley, north of Buckingham, Quebec, and from those in Frontenac and Lanark counties in Ontario. Between 1878 and 1892 apatite mining was most active reaching its peak in 1890 when over 31,000 tons was shipped. Since 1895, there have been few years when production has exceeded 1,000 tons, and since 1951 there has been no production".

"The apatite deposits in both Quebec and Ontario are of Precambrian age. In both areas they occur in belts in gneissic rocks. The belts vary greatly in width and are interrupted by pegmatite intrusions. The apatite is of various colours - green, blue, grey and red. It is associated with pyroxenite, diopside, phlogopite, calcite, hornblende, tourmaline, feldspar, scapolite and other minerals. It occurs in narrow veins and stringers and also as masses up to eight feet in diameter. Individual crystals of apatite also occur in the calcite. Some of these crystals are large, others are small and intimately mixed with the calcite. This latter type is known as "sugar apatite". All of the apatite is fluor-apatite. The apatite has seemingly originated from the metamorphism of Grenville crystalline limestone."

"Most of the apatite workings were open pits and adits but there were a few underground mines, one of which in Templeton township, Quebec, went to a depth of over 600 feet."

"The industry came to an end when competition from the more cheaply mined phosphate deposits of Florida and Tennessee became too keen. It is claimed that the apatite deposits were not by any means exhausted when the mines closed."

"Apatite occurs in small grains associated with magnetite in the vicinities of St. Charles, Bourget township, Quebec, and Nemegos, Ontario. If these deposits are worked for their magnetite content, the apatite would be available as a by-product."

USES

Used in manufacture of superphosphate fertilizer, phosphorus, phosphoric acid. Transparent variety of apatite occasionally used for gem material.

PRODUCTION

Canadian production affected by competition from cheap foreign sources.

All mines now closed.

Now a little produced as by-product of mica mining. Canadian production in 1941 about 2,500 tons was the largest for many years: none has been produced since 1951 when output was 6 tons.

DEPOSITS

OUTSIDE OF P. OF QUEBEC

World's largest deposit on the Kola peninsula U.S.S.R. Another large deposit at Kiruna, Sweeden (with magnetite ore), northeast of Kingston, Ontario.

PROVINCE OF QUEBEC - MONTREAL DISTRICT

1-	Brazeau Property	Bowman twp.	4 reports
2-	Barry Lake Mining Co.	Portland twp.	1 report
3-	Commercial Mineral Products (Little Union Mine)	Portland twp.	1 report
4-	High Rock Mine (Quebec Smelting & Refining)	Portland twp.	25 reports

5- Degrosbois Property in Beresford township has estimated ore reserves of 6,600,000 tons of magnetite-ilmenite - apatite analysing on the average 38.5% Fe, 10.3% TiO_2 and 3.5% P_2O_5.

RECENT DEVELOPMENT IN MONTREAL DISTRICT

In 1959, it was announced that Quebec Smelting & Refining proposed to form a new company to carry out further development of apatite properties in the Buckingham district. In cooperation with the laboratories of the Department of Mines and Technical Surveys in Ottawa, the company has been working on two different processes: one to make a marketable concentrate, the other to produce fuzed phosphate fertilizer.

During the fall of 1959, Chess Mining drilled on Mount St. Hilaire to outline an apatite orebody. 8 holes totalling

2,000 feet were bored. Grade is from 0 to 10% apatite.

In the summer of 1960, The Luckridge Phosphate Mines Ltd. investigated an apatite occurrence about 3 miles north of Buckingham. Seven holes totalling 1,500 feet were bored by that company. No results were available at the end of 1960.

Considerable quantities of apatite are found associated with the Columbium ores at Oka.

REFERENCE

P.R. Quebec #178

QUEBEC DEPARTMENT OF MINES
Office of the resident geologist
MONTREAL

Montreal, December 1960