DEPARTMENT
OF
MINES

DIVISION OF
ORE DRESSING AND
METALLURGY

CANADA

MINES BRANCH

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REPORT
of the
ORE DRESSING AND METALLURGICAL LABORATORIES

The concentration of the radio-active minerals in a shipment of pegmatite from Kearney, Ont.

by

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Test No. 171

A shipment of 251 bags of pegmatite supposed to contain radio-active minerals, gross weight 19,019 pounds, was received on October 9th. 1922, at the Ore Dressing and Metallurgical Laboratories, from Messrs. Ryan and Mann, Kearney, Ont.

The pegmatite is composed of coarsely crystallized red feldspar quartz and black mica. No radio active mineral could be seen in hand specimens of the pegmatite.

Tests were desired to determine if the pegmatite contained sufficient radio-active minerals to make it a commercial source of supply of radium, and to determine if the radio-active minerals could be recovered by concentration with the production of a marketable concentrate.

The shipment as received was divided into two lots marked No. 1 and No. 2. Lot no. 1 consisted of 220 bags, net weight 16,449 pounds and Lot no. 2 contained 31 bags, net weight 2,372 pounds.

LOT NO. 1

The whole lot was crushed by a breaker and rolls to ½" and a 177 pound sample cut out by means of a Vezin sampler. The 177 pounds was crushed to -40 mesh by means of a small breaker and a small set of rolls. In screening on 40 mesh a lot of mica was obtained as

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oversize. The -40 mesh and the +40 mica products were cut by means of a Jones riffle into the following:

Head sample	-40	.672	pound
	+40 mica	.012	"
		.684	"
Test portion	-40	20.5	pounds
	+40 mica	.375	"
		20.875	"
Remainder	-40	151.5	"
	+40 mica	2.75	"
		154.25	"

The 20.5 pounds of -40 of the test portion was run on a small Wilfley table making a concentrate, middling, and tailing. The middling was re-run 3 times. In the last re-run any middling produced was put with the tailing. This gave only three products from the tabling - a concentrate, a tailing, and a slime product. These products were dried. The table concentrate was treated by a hand magnet to remove any very magnetic material, and then put through an Ullrich magnetic separator, making a concentrate and tailing The table tailing was put through the Ullrich magnetic separator also making a concentrate and tailing. Samples of the feed and all products of the test work were tested for radio-activity, and the following table shows the results obtained:

Product	Weight lb.	Radio-activity
+40 mica	.375	nil
Magnetic from table concentrate	.009	nil
Ullrich conc. from table conc.	.030	1.52
Ullrich tailing " " "	.062	0.46
Ullrich conc. from table tailing	.187	nil
Ullrich tailing " " "	17.000	nil
Table slime	1.718	nil
Loss	1.494	
Feed	20.875	nil

In testing the radio-activity of the above products, the standard used was a sample of low grade carnotite ore containing about 2% uranium oxide. This standard has a radio-activity of 6.90

LOT NO. 2

This lot after the removal of a few specimens, was crushed to ½" and a sample of 240.5 pounds cut out by means of a Vezin sampler.

The sample was crushed to -40 mesh and a test portion of 15 pounds was cut out by a Jones riffle. This test portion was tabled in the same way as described under lot no. 1. The table concentrate and tailing were each run through the Ullrich magnetic separator. Samples of the feed and all products of the test work were tested for radio-activity. The results are shown in the following table:

Product	Weight lb.	Radio-activity
Ullrich conc. from table conc.	0.095	0.56
Ullrich tailing " " "	0.086	0.23
Ullrich conc. from table tailing	0.123	0.04
Ullrich tailing " " "	12.500	0.01
Table slime	1.312	0.08
Loss	0.884	
Feed	15.000	0.01

The same standard was used to test the radio-activity of the products of the test work on lot no. 2 as was used in testing the products of the test work on lot no. 1

CONCLUSIONS

The best product obtained in testing lot no. 1 is less than one-fourth as radio-active as a low grade carnotite ore containing 2% uranium oxide, and represents 0.14% of the sample treated.

The best product obtained in treating lot no. 2 is less than one-twelfth as radio-active as a low grade carnotite ore containing 2% uranium oxide, and represents 0.63% of the sample treated.

From the above it is evident that neither of the lots submitted can be considered as ores of radium.

W. B. Timm,
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