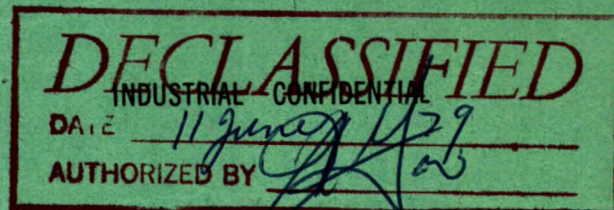


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CANADA



DEPARTMENT OF MINES AND TECHNICAL SURVEYS

OTTAWA

MINES BRANCH INVESTIGATION REPORT IR 58-32

MINERALOGY OF A BULK SAMPLE OF URANIUM ORE
FROM RAYROCK MINES LTD.,
YELLOWKNIFE MINING DISTRICT, N. W. T.

REFERENCE NO.12/57-19

by

M. R. HUGHSON

RADIOACTIVITY DIVISION

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SUMMARY

This medium-to-fine-grained siliceous rock contains pitchblende finely disseminated or in minute veinlets. Secondary radioactive minerals are rare. The average area of pitchblende is around 65 mesh; the veinlets, however, are much finer.

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INTRODUCTION

A 931 lb sample of lump ore was received from Rayrock Mines Limited on December 26, 1957. The sample was reported to be from the company's property in the Marian River area, Yellowknife Mining District, N. W. T. The sample was said to represent lower grade ore from the mine, and the Mines Branch was asked to investigate the possibility of preconcentration ahead of leaching. A separate report will be issued on the preconcentration tests.

Chemical assays of a prepared head sample gave the following results:

Uranium (U_3O_8) = 0.20%

Thorium (ThO_2) = 0.004%

Probable secondary U_3O_8 = 0.057%

The specific gravity of the minus 100 plus 150 mesh fraction of the head sample was 2.68. The mineralogical investigation was carried out with randomly selected hand specimens and a minus 10 mesh head sample.

ROCK COMPOSITION

This is a light coloured, fine-to-medium-grained rock, composed chiefly of quartz. Ferromagnesian minerals present in

small amounts are chlorite and amphibole. Together they make up less than 10 per cent of the rock. Minor feldspar and calcite are also present. Metallic minerals include traces of specular hematite and the copper-iron sulphides chalcopyrite and bornite. The uranium-bearing mineral is pitchblende. Diffusely disseminated earthy hematite colours parts of the rock reddish-brown.

URANIUM MINERALOGY

Pitchblende, the uranium-bearing mineral in this rock, occurs either as finely disseminated, anhedral grains or as fine veinlets. The disseminated grains may be fairly solid (Figure 1), or matted intergrowths with gangue (Figure 2). The pitchblende veinlets (Figure 2) may contain quartz in the centre, and in places show colloform outlines. Diffusely disseminated earthy hematite is occasionally intergrown with the pitchblende, while one grain of pitchblende forms an intergrowth with chalcopyrite and bornite. Calcite, which was found to be associated with pitchblende in a previous sample (Ref. No. 8/56-4; see Radioactivity Division Report SR-455/56), shows little, if any, association with the pitchblende in this sample.

Secondary uranium-bearing minerals are rare, but yellow radioactive material is contained in fractures and small cavities of one rather weathered ore specimen.

CONCLUSIONS

This sample is similar to previous samples described in Radioactivity Division reports SR-367/55¹, SR-403/56² and SR-455/56³. In each case finely disseminated pitchblende occurs in a fine-to-medium-grained siliceous rock. Reddish-brown, earthy hematite is usually associated with the pitchblende and acts as a marker. As in previous samples from this property, described in reports SR-403/56 and SR-367/55, and unlike sample 8/56-4 described in report SR-455/56, the present sample shows little association of calcite with pitchblende.

REFERENCES

1. "Mineralogical Report on a Bulk Sample from Rayrock Mines Ltd., Yellowknife Mining District, N. W. T., Reference No. 8/55-13", Special Report No. SR-367/55, Oct. 18, 1955;
2. "Mineralogy of a Bulk Sample from Rayrock Mines Ltd., Yellowknife Mining District, N. W. T., Reference No. 1/56/19", Special Report No. SR-403/56, Mar. 2, 1956;
3. "Mineralogical Report on a Pilot Plant Sample from Rayrock Mines Ltd., Yellowknife Mining District, N. W. T., Reference No. 8/56-4A", Special Report No. SR-455/56, Nov. 28, 1956;

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(Figures 1 and 2 follow,
(on page 4.))

Photomicrographs

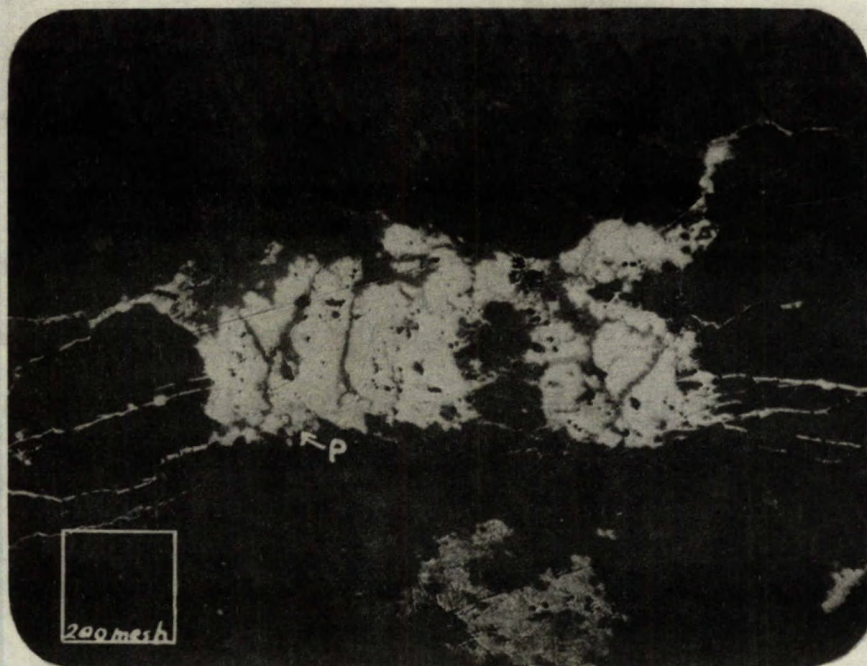


Figure 1 - Pitchblende (p) in quartz gangue. 200X.

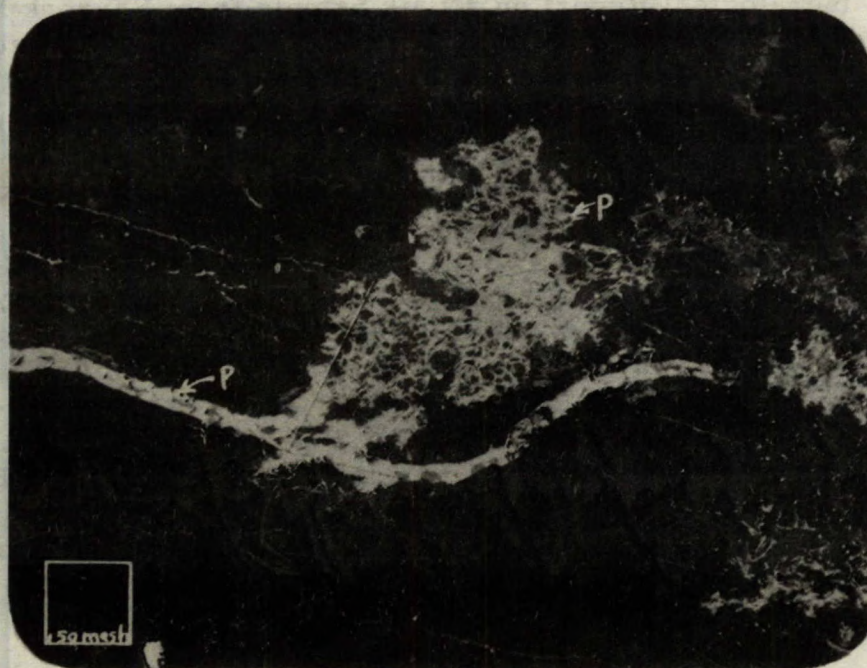


Figure 2 - A matted grain of pitchblende (p) adjacent a fine veinlet of pitchblende. 150X.

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