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DISTRIBUTION OF BORON IN PROCESSING
OF CARNOTITE CONCENTRATE

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DISTRIBUTION OF BORON IN PROCESSING
OF CARNOTITE CONCENTRATE

I. INTRODUCTION

It was desired to determine the distribution of boron in the various steps of the processing of domestic ore concentrates containing high percentages of boron. The experiments described in this report were directed toward that end.

II. DISCUSSION

A typical lot of high boron material, containing 350 p.p.m. boron, was given the conventional plant treatment, and samples were taken at each step in the process for boron analysis.

III. EXPERIMENTAL

One hundred and twenty five pounds of the high boron material were digested with one hundred and forty nine pounds of 66° Be. H_2SO_4 and seventy five gallons of water (final pH 0.8). Cooling water (87.5 gallons) was added, and the slurry was neutralized with two hundred and twenty five pounds of soda ash and 16.8 pounds of $NaHCO_3$ (final pH 9.0). The slurry was filtered, and then was washed with 5% soda ash solution. The pH of the composite liquors was adjusted to 8.5-8.7, and 6 pounds of copperas ($FeSO_4$) and 8.5 pounds of ferrisul ($Fe_2(SO_4)_3$) were added to precipitate the vanadium and phosphorus. After filtering and washing the iron cake, the U_3O_8 in the combined solution was precipitated with $NaOH$, washed on a filter, and treated with $(NH_4)_2SO_4$ and H_2SO_4 to form acid leach cake. The final black sample was prepared by calcining this cake at 1000°C.

Samples were taken from each operation. These were analysed for boron. Results are tabulated below:

<u>Step</u>	<u>Material</u>	<u>Boron Assay, ppm.</u>	<u>Distribution in Step, %</u>	<u>% of Total</u>
Digestion	Tails	60-80	26	
	Liquors	9	74	60-70
Iron Step	Iron Cake	23	1.1	
	Liquors out	7	98.9	69
Soda Salt Step	Filtrate	6.8	98.65	
	Wash	1.2	0.6	
	Soda Salt	13	0.75	0.55
Acid Leach Step	Filtrate	0.6	71	
	Wash	nil	0	
	Acid Leach Cake	3	29	0.1
Black Oxide	Final Sample	0.6	-	0.02

IV. SUMMARY

1. A black oxide containing 0.6 ppm. of boron was prepared from material containing 350 ppm. b
2. Less than 0.02% of the boron in the original material appeared in the black oxide.
3. The iron step did not remove appreciable amounts of boron.
4. The bulk of the extracted boron was removed in the soda salt precipitation.
5. Some of the boron was removed in the acid leach and calcination steps.

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