

7R1-71-72
R. 299

MOINA TUNGSTEN TIN MINING CO.
MAGNETIC RESIDUE

Sample

A sample weighing 25 lbs. was received for examination. The material is a mill magnetic residue and contained 7.7 per cent of tin, and 41.2 per cent of tungstic oxide.

Sizing

B.S. Fraction	Per cent
+ 22	3.9
+ 30	1.3
+ 44	17.1
+ 52	21.9
+ 60	11.1
+ 72	16.1
+ 85	8.2
+ 100	6.6
+ 150	11.0
+ 200	1.6
- 200	1.2

Investigation

An investigation was desired to determine whether improved separation of the material could be obtained by sizing and electro-magnetic separation.

No responsibility is accepted for the results shown in this report except in so far as they apply to the sample tested. Screen sizes shown refer to British Standard screens, and I.S. fractions 1 to 7 refer to Haultain Infrasizer fractions.

Summary

1. Favourable marketing conditions demand a tin content in wolfram concentrates of less than two per cent, and by segregating the highly and feebly magnetic portions in this sample 84.7 per cent

of the tungstic oxide reported in a feebly magnetic product amounting to 53 per cent with assays of 65.8 per cent of tungstic oxide and only 0.4 per cent of tin. The highly magnetic fraction amounted to 46.8 per cent, and contained 96.9 per cent of the tin, with assay values of 15.9 per cent of tin and 13.4 per cent of tungstic oxide.

2. The highly magnetic product was digested in hydrochloric acid to remove possible causes of the magnetic property, but the cassiterite remains highly magnetic. An acid residue product containing 66 per cent of tin and 6 per cent of WO_3 has been submitted to mineragraphic examination to determine the cause of the phenomenon.

3. Much of the pyrite was magnetic and reported with the wolfram. This could be removed by grinding and flotation, or by table flotation which obviates the loss caused by fine grinding.

Results

Magnetic separation after sizing using a two disc rapid electro-magnetic separator. Magnetic products "1 + 2" are very highly magnetic and are removed with a large gap and minimum amperage and product "4" is feebly magnetic.

Product	Per cent			Per cent Dist.	
	Wght.	Sn	WO_3	Sn	WO_3
Magnet "1 + 2" + 60 mesh	18.2	20.7	7.25	48.9	3.2
Magnet "1 + 2" -60 + 100 mesh	20.1	13.3	18.4	34.7	8.9
Magnet "1 + 2" -100 + 150 mesh	8.5	12.0	14.8	13.3	3.1
Magnet "4" + 60 mesh	36.8	0.43	68.6	2.1	61.3
Magnet "4" -60 + 100 mesh	10.6	0.25	67.5	0.3	17.4
Magnet "4" -100 + 150 mesh	2.8	0.17	63.6	0.1	4.3
Untreated -150	2.8	1.0	25.3	0.4	1.7
Non-magnetic	0.2	8.74	17.6	0.2	0.1
Composite Feed	100.0	7.69	41.2	100.0	100.0
Total magnetic "1 + 2"	46.8	15.9	13.4	96.9	15.2
Total magnetic "4" plus -150 mesh untreated	53.0	0.4	65.8	2.9	84.7

The mineragraphic examination showed that the magnetic properties of the cassiterite were caused by inclusions of magnetite.