TR8-196-201 R. 427, 428, 429

4. TABLE CONCENTRATION OF THREE SAMPLES OF TIN ORE FROM GREAT PYRAMID MINE, UPPER SCAMANDER

Samples

Three samples of cassiterite bearing quartzite were taken from the Great Pyramid Mine, Upper Scamander, by the leaseholders Messrs. R. D. L. Palmer and L. Price, under the supervision of Mr. L. Morris, Inspector of Mines. These samples were delivered by Mr. Palmer on the 21st December, 1962.

Locations of the samples were as follows:—

Sample No. 1 (R.427) was taken from the trench on the surface, near the end of the crosscut from the North Adit.

Sample No. 2 (R.428) was taken along the walls of the North Adit, and included 18 feet of the 25 feet which is said (Twelvetrees, 1911, p. 36) to assay 0.8 per cent tin.

Sample No. 3 (R.429) was taken of the remaining 7 feet of the 25 feet section mentioned above.

Sample No.	Research No.	Gross Weight lbs.	Assay Per Cent Sn
1	R.427	1216	2.17
2	R.428	1316	0.76
3	R.429	676	0.47

The samples consist essentially of quartzite with thin veinlets of brownish-red cassiterite. Brownish iron oxides also occur and can be confused with the cassiterite.

Investigation

The investigation was carried out to determine the recovery of tin attainable by tabling. The ores were initially ground to minus 40 mesh and the coarse tailings from tabling were later reground to determine the additional recovery of tin possible with finer grinding.

Summary

Recoveries by table concentration of the ores ground to minus 40 mesh are tabulated below. The tabulation also shows the overall recoveries obtained by regrinding—

(a) the plus 60 mesh primary tailings

(b) the plus 100 mesh primary and plus 100 mesh regrind tailings.

Sample	Combined Concentrates	Per Cent		
		Weight	Tin	Recovery of Tin
R.427	From initial grind	2.78	61.6	79.26
	From initial grind plus regrinding plus 60 mesh tailings	3.06	59.7	84.55
	From initial grind plus regrinding plus 60 and plus 100 mesh tailings	3.19	59.0	87.05
R.428	From initial grind	1.09	50.5	73.81
	From initial grind plus regrinding plus 60 mesh tailings	1.18	48.9	77.25
	From initial grind plus regrinding plus 60 and plus 100 mesh tailings	1.27	46.9	79.76
R.429	From initial grind	0.62	46.9	60.59
	From initial grind plus regrinding plus 60 mesh tailings	0.73	43.8	66.61
	From initial grind plus regrinding plus 60 and plus 100 mesh tailings	0.83	41.3	71.37

Research

During assay sample preparation, portions of the three samples had been reduced to minus 6 or minus 10 mesh size by jaw crushing and roll grinding. This material was used as head samples for the present investigation.

Sample R.427

The head sample had been crushed minus 10 mesh.

The sample was then stage ball mill ground to minus 40 mesh, using small time intervals to minimize production of slimes. The minus 40 mesh product was then sized on 60, 100 and 200 mesh screens and the four fractions tabled separately using sand or slime decks as required.

During tabling a middling was produced for each fraction and these middlings were re-tabled to give a concentrate and tailing only for each fraction.

Tabling results were:—

Product	Per Cent		
	Weight	Tin	Distribution of Tin
Plus 60 mesh concentrate	0.71	63.5	20.86
Plus 100 mesh concentrate	0.79	60.8	22.22
Plus 200 mesh concentrate	0.54	59.7	14.92
Minus 200 mesh concentrate	0.74	62.1	21.26
Plus 60 mesh tailing	27.43	0.60	7.57
Plus 100 mesh tailing	21.65	0.29	2.90
Plus 200 mesh tailing	14.12	0.10	0.66
Minus 200 mesh tailing	34.02	0.61	9.61
Calculated head	100.00	2.16	100.00

The plus 60 mesh tailing was batch ball mill ground minus 60 mesh, sized on 100 and 200 mesh screens and the three products tabled separately as above.

Product	Per Cent		
	Weight	Tin	Distribution of Tin
Plus 100 mesh regrind concentrate	0.09	43.1	1.79
Plus 200 mesh regrind concentrate	0.11	40.5	2.06
Minus 200 mesh regrind concentrate	0.08	39.0	1.44
Plus 100 mesh regrind tailing	10.76	0.22	1.10
Plus 200 mesh regrind tailing	8.96	0.11	0.46
Minus 200 mesh regrind tailing	7.43	0.21	0.72
Plus 60 mesh tailing	27.43	0.60	7.57

The plus 100 mesh tailings from the original grind and from regrinding of the plus 60 mesh tailing from the previous stage were combined in proportion and were stage ground minus 100 mesh, sized on a 200 mesh screen and the fractions tabled as before.

Product	Per Cent		
	Weight	Tin	Distribution of Tin
Plus 100 mesh second regrind concentrate	0.06	45.2	1.25
Minus 100 mesh second regrind concentrate	0.07	38.5	1.25
Plus 200 mesh second regrind concentrate	16.78	0.10	0.72
Minus 200 mesh second regrind concentrate	15.50	0.10	0.72
Combined plus 100 mesh tailings	32.41	0.27	4.00

These data may be summarized as follows:—

Product	Per Cent		
	Weight	Tin	Distribution of Tin
Combined concentrates from initial 40 mesh grind	2.78	61.6	79.26
Combined concentrates from regrinding plus 60 mesh tailing	0.28	40.9	5.29
Combined concentrates from initial grind plus regrinding plus 60 mesh tailing	3.06	59.7	84.55
Combined concentrates from regrinding plus 100 mesh tailings	0.13	41.6	2.50
Combined concentrates from initial grind plus regrinding plus 60 and plus 100 mesh tailings	3.19	59.0	87.05

Sample R.428

Procedure was as for R.427, with the exception that the head sample was a mixture of minus 6 mesh and minus 10 mesh fractions.

Initial tabling results were:—

Product	Per Cent		
	Weight	Tin	Distribution of Tin
Plus 60 mesh concentrate	0.25	49.1	16.44
Plus 100 mesh concentrate	0.33	42.3	18.70
Plus 200 mesh concentrate	0.20	62.8	16.83
Minus 200 mesh concentrate	0.31	52.6	21.84
Plus 60 mesh tailing	17.16	0.25	5.67
Plus 100 mesh tailing	20.94	0.17	4.88
Plus 200 mesh tailing	15.62	0.14	2.93
Minus 200 mesh tailing	45.19	0.21	12.71
Calculated head	100.00	0.75	100.00

The plus 60 mesh tailing was ground as R.427, except that it was ground minus 100 mesh and not minus 60 mesh as were samples R.427 and R.429.

Product	Per Cent		
	Weight	Tin	Distribution of Tin
Plus 200 mesh regrind concentrate	0.05	25.3	1.69
Minus 200 mesh regrind concentrate	0.04	32.6	1.75
Plus 200 mesh regrind tailing	7.12	0.08	0.76
Minus 200 mesh regrind tailing	9.95	0.11	1.47
Plus 60 mesh tailing	17.16	0.25	5.67

The plus 100 mesh tailing from the original tabling was ground minus 100 mesh, sized and tabled.

Product	Per Cent		
	Weight	Tin	Distribution of Tin
Plus 200 mesh second regrind concentrate	0.05	20.6	1.38
Minus 200 mesh second regrind concentrate	0.04	21.1	1.13
Plus 200 mesh second regrind tailing	10.12	0.09	1.22
Minus 200 mesh second regrind tailing	10.73	0.08	1.15
Plus 100 mesh tailing	20.94	0.17	4.88

These data may be summarized as follows:—

Product	Per Cent		
	Weight	Tin	Distribution of Tin
Combined concentrates from initial grind	1.09	50.5	73.81
Combined concentrates from regrinding plus 60 mesh tailing	0.09	28.5	3.44
Combined concentrates from initial grind plus regrinding plus 60 mesh tailings	1.18	48.9	77.25
Combined concentrates from regrinding plus 100 mesh tailings	0.09	20.8	2.51
Combined concentrates from initial grind plus regrinding plus 60 and plus 100 mesh tailings	1.27	46.9	79.76

Sample R.429

Procedure was as for R.427. Head sample was minus 10 mesh material.

Initial tabling results were:—

Product	Per Cent		
	Weight	Tin	Distribution of Tin
Plus 60 mesh concentrate	0.08	45.0	7.50
Plus 100 mesh concentrate	0.22	52.2	23.91
Plus 200 mesh concentrate	0.16	39.1	13.02
Minus 200 mesh concentrate	0.16	48.5	16.16
Plus 60 mesh tailing	19.87	0.23	9.33
Plus 100 mesh tailing	24.00	0.17	8.50
Plus 200 mesh tailing	16.00	0.08	2.66
Minus 200 mesh tailing	39.51	0.23	18.92
Calculated head	100.00	0.48	100.00

The plus 60 mesh tailing was ground, sized and tabled as R.427.

Product	Per Cent		
	Weight	Tin	Distribution of Tin
Plus 100 mesh regrind concentrate	0.03	31.4	1.96
Plus 200 mesh regrind concentrate	0.05	23.3	2.43
Minus 200 mesh regrind concentrate	0.03	26.1	1.63
Plus 100 mesh regrind tailing	8.32	0.13	2.25
Plus 200 mesh regrind tailing	6.02	0.04	0.50
Minus 200 mesh regrind tailing	5.42	0.05	0.56
Plus 60 mesh tailing	19.87	0.23	9.33

The plus 100 mesh tailings from the original grind and from regrinding of the plus 60 mesh tailing from the previous stage were combined in proportion and were stage ground minus 100 mesh, sized on a 200 mesh screen and the fractions tabled.

Product	Per Cent		
	Weight	Tin	Distribution of Tin
Plus 200 mesh second regrind concentrate	0.04	27.2	2.26
Minus 200 mesh second regrind concentrate	0.06	20.0	2.50
Plus 200 mesh second regrind tailing	15.02	0.10	3.13
Minus 200 mesh second regrind tailing	17.20	0.08	2.86
	32.32	0.16	10.75

These data may be summarized as follows:—

Product	Per Cent		
	Weight	Tin	Distribution of Tin
Combined concentrates from initial grind	0.62	46.9	60.59
Combined concentrates from regrinding plus 60 mesh tailing	0.11	26.3	6.02
Combined concentrates from initial grind plus regrinding plus 60 mesh tailing	0.73	43.8	66.61
Combined concentrates from regrinding plus 100 mesh tailings	0.10	22.9	4.76
Combined concentrates from initial grind plus regrind plus 60 and plus 100 mesh tailings	0.83	41.3	71.37

REFERENCE

TWELVETREES, W. H., 1911.—The Scamander Mineral District. *Bull. Geol. Surv. Tas.*, 9.