



INDUSTRIAL ZEOLITES AND RUTILE

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RUTILE (Titanium Minerals in Porphyry Copper/Molybdenum Tailings)

Recent studies on alternative sources and relevant occurrences of titanium minerals (for example, Force, 1976; Williams and Cesbron, 1977; Force, *et al.*, 1979) indicate that porphyry copper/molybdenum deposits could potentially supply a significant amount of byproduct titanium. Llewellyn and Sullivan (1980) investigated the feasibility of recovering rutile from mill tailings from the San Manuel copper deposit of Arizona; they contain 0.75 per cent titania. In view of these studies and as part of an industrial minerals assessment in British Columbia, a systematic examination of tailings from porphyry copper/molybdenum mines was initiated in 1982. Fourteen mines were chosen for the study. Cursory TiO_2 analyses are shown in the accompanying table. Most carry interesting amounts of titania; that is, employing an arbitrary cutoff grade of 0.50 per cent TiO_2 ; about half of these mines are of potential interest. Close examination of a high titania sample from the Ingerbelle orebody of Newmont Mines Limited revealed little variation in titania content in various size fractions; host minerals for titanium include ilmenite, sphene, magnetite, and mica. Similar detailed work is in progress for the other interesting deposits. If rutile, the most desirable titanium mineral for industrial purposes, is identified as a major titanium-containing species in a deposit, a feasibility test of mineral recovery will also be attempted.

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**TiO_2 CONTENT OF TAILINGS
FROM SELECTED PORPHYRY COPPER/MOLYBDENUM DEPOSITS
IN BRITISH COLUMBIA**

NAME OF MINE	NO OF SAMPLES	RANGE	PER CENT	
			TiO_2 MEAN	STANDARD DEVIATION
Afton	8	0.54 – 0.68	0.62	0.05
Bell	10	0.34 – 0.64	0.49	0.08
Bethlehem	2	0.35 – 0.43	0.39	0.06
Boss Mountain	6	0.14 – 0.34	0.23	0.07
Brenda	7	0.30 – 0.43	0.38	0.05
Equity Silver	4	0.81 – 0.97	0.84	0.03
Gibraltar	5	0.43 – 0.43	0.43	0.00
Granby	2	0.51 – 0.61	0.56	0.03
Granisle	8	0.40 – 0.78	0.56	0.13
Highmont	7	0.30 – 0.43	0.31	0.05
Island Copper	6	0.49 – 0.87	0.57	0.15
Kitsault	4	0.49 – 0.57	0.56	0.04
Lornex	12	0.30 – 0.43	0.35	0.05
Newmont	9	0.33 – 0.97	0.67	0.21

ZEOLITES

PRINCETON AREA (49° 26' – 120° 33'; 92H/7)

A random sampling program for industrial zeolites in volcanic sedimentary rocks has been underway since 1980; this year produced the first reported British Columbia locations of substantial zeolite content in these rocks in the Allenby Formation of the Middle Eocene Princeton Group. Results of previous sampling of tuffaceous deposits from the Penticton area, the vicinity of Kamloops and near Burns Lake, have been negative. High zeolite content in the Allenby Formation occurs in pale grey to yellow to yellowish grey volcanic ash beds. Clinoptilolite (approximately 25 to 35 per cent) together with similar quantities of stilbite form the main component of this fine to coarse-grained devitrified ash. Three samples with high zeolite content are part of the sequence of volcanic sandstones and tuffs exposed in a road cut on Highway 3 approximately 5 kilometres southwest of Princeton.

REFERENCES

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