

TANTALUM PRODUCERS INTERNATIONAL STUDY CENTER

QUARTERLY BULLETIN

FEBRUARY 1975

FIRST QUARTER

This is the first issue of a quarterly bulletin, published by the Tantalum Producers International Study Center. The bulletin will diffuse statistical information gathered from the various members and will provide the members with general information regarding Tantalum raw materials.

This issue introduces the Tantalum Producers International Study Center, abbreviated « T.I.C. », and then gives a brief resume of past, present and future Tantalum production and consumption. The final section consists of some items of information of general interest concerning the Tantalum world.

- to represent the Tantalum source materials producing industry to regional, national or international authorities, organisations or agencies, public or private;
- in general to do any and all lawful things necessary in connection with, or incidental to, the accomplishment of any of the purposes above said, without pecuniary profit to the Association or any member thereof.

I. Introducing the T.I.C.

1. AIMS OF THE T.I.C.

The foundation of the Tantalum Producers International Study Center as a non profit making Association, was given official recognition under Belgian legislation and granted legal capacity by the Royal Decree of 24th October 1974.

The general aim of the T.I.C. is to become a well established organisation diffusing statistical, geological, technical and other information on Tantalum and more specifically on the Tantalum raw material market.

Although the main object is to provide full and general data on Tantalum raw material production, the Center will also provide the opportunity for members to meet, discuss and eventually co-ordinate Tantalum raw material production on a basis of general statistics and information.

2. STATUTES.

The following are extracts from the Statutes of the T.I.C. as published in the « Moniteur Belge » of 24th. October 1974 :

Art. 1. - There is hereby established under the Belgian law of

October 25th 1919, an international association with scientific purposes under the name « TANTALUM PRODUCERS INTERNATIONAL STUDY CENTER », abbreviated T.I.C.

Art. 2. - The registered seat shall be in the City of Brussels. At present its headquarters are at 1, rue aux Laines, 1000 Brussels. This seat may be transferred to any other place in Brussels by resolution of the Executive Committee.

Art. 3. - The purposes of the Association shall be :

- to promote and further the co-operation between members on matters of research in, and studies of, all aspects of the Tantalum source materials industry and of collecting, disseminating and maintaining statistics and information on any matters affecting that industry, excluding price and related information and any other proprietary information;
- to promote common interests and welfare of the Tantalum source materials industry such as producing, processing, engineering, safety, pollution, packaging, transportation, etc.;

Art. 5. - The membership of the Association shall consist of producers of Tantalum source materials, being companies or individual persons, engaged in Tantalum raw materials production.

The admission of new members shall be made by the General Assembly. Application for membership shall be submitted in writing to the President, at least three months before the Annual General Assembly, and accompanied by a statement of support of the application by two members. Admission of members shall be decided at the General Assembly by a two-thirds majority of the votes of the members present or represented.

Members shall by written notice to the President appoint an individual person to act as their duly authorised sole representative. The representative shall be an executive officer or an expert in the field of Tantalum source materials. The credential letter shall state name, nationality, titles, office held, term of office and authority. If a member appoints a new representative, previous appointments shall be automatically revoked. The General Assembly may, for reasons to be notified to the represented member, suggest the replacement of the representative in office.

Art. 13. - The Association shall be managed by an Executive Committee composed of the President and two administrators. At least one of them shall be of Belgian nationality. The President shall have the casting vote.

Art. 14. - The Secretary shall be appointed by the General Meeting for such term as they may think fit. The Secretary shall be chosen from outside the members and shall be completely independent from all members. The Secretary's task is to prepare documents with a view to decisions of the General Assembly, and to execute these decisions. He shall keep the minutes of all meetings and properly keep and file all books, certificates, accounts and other documents and records required by law. The Secretary shall be in charge of the daily administration of the business, properties and staff of the Association and of the administration of all activities undertaken by the Association in fulfillment of its purposes. The Secretary may delegate his powers in matters of relations with post offices, banks, etc. but he remains responsible for all decisions made. The Secretary is responsible to the President and reports to the General Assembly.

3. THE SECRETARIAT.

Simultaneously with the foundation of the T.I.C., the Secretariat was created. The function fulfilled

at present by this office is to collect and structure information from all members of the T.I.C., so that without disclosing in any way « private » information pertaining to any particular company, it will be possible to have a better idea of the present and future situation of Tantalum raw material production.

The second aim of the T.I.C. Secretariat is to select and distribute all information which may be of interest to the members. The first stage of this will take the form of bibliographical research. At a later stage more scientific work could be carried out.

For this purpose it is planned to publish a quarterly Bulletin giving all selected information. An annual issue will give all the statistical information of the past year — the results and highlights of the information.

Resume of the five major points of the general work to be carried out by the T.I.C. secretarial team :

At present

- Collect and verify data.
- Diffuse general information on Tantalum raw materials.
- Provide specific data for the members.

Later

- To make Tantalum materials better known.
- To co-ordinate the whole market.

from 5 % to 15 % of Ta205 for rich slags. The Tantalite from primary deposits is shipped as concentrates and treated in the Tantalum producing areas, mostly Western countries. The same goes for Tantalite in slags, which go mostly to the U.S.A.

The Tantalite content in slags has been constant during the last five years at, on average, 1,100,000 lb. Ta205. In the past production of Tantalite from concentrates has fluctuated, due primarily to the introduction on to the market of new producing entities, and in recent years to the low prices on the market.

The T.I.C., through its members, accounts for over 90 % of total Tantalite production, not including Russia and China.

The demand for Tantalum bearing source materials has increased rapidly from 1,500,000 lb. in 1971, up to 2,600,000 lb. contained Ta205 in 1973. Although a recession in the electronic industry late in 1974 has decreased current consumption, the total demand in 1974 should be near 2,900,000 lb. Deepening of the recession during the first half of 1975, with a gradual improvement late in the year, should result in a consumption of about 2,500,000 lb. After 1975, continued growth in the capacitor market will result in annual demand reaching 3,750,000 lb. by 1977 or 1978.

During 1974 current production of Tantalites and tin slags resulted in an output of about 1,800,000 lb. contained Ta205. The deficit was made up by supply from producers' inventories and G.S.A. sales from the National Stockpile. During 1975 remaining producers' inventory plus current production should result in a new balance of supply and demand. There may even appear to be a small surplus in early 1975 as some processors and fabricators seek to reduce their inventories. An improvement in general economic conditions, however, will quickly re-establish need and remaining inventories will be reduced to minimum working levels. Present political and economic difficulties in Central Africa, (Zaire and Mozambique),

II. General summary of Tantalite-Tantalum market

Discovered at the beginning of the 19th Century, Tantalum did not find a real use before World War I. The first use of Tantalum was in ferro-alloys; later, the electronics industry consumed an increasing part of the Tantalum available. Now more than 60 % of Tantalum is absorbed by the electronics industry. The proportion of Tantalum consumption by ferro-alloys has decreased steadily. The other users of Tantalum are the tool industry, the chemical, optical and aerospace industries.

World production is widely located, in Africa, South East Asia, Canada, Brazil and Australia. Until a few years ago, the tin producing countries were the big suppliers of Tantalite, but for the last decade new types of deposit (microlite) have been discovered and brought into production. This is the case for Mozambique, Brazil and Canada.

The first type of Tantalite is mainly found and extracted from tin slags, the grade of these slags can vary

may cause a drop in the production of Tantalite and Tantalite associates.

During the 1960's published estimates indicate adequate reserves to meet the expected increased demand in the later years of the 1970 decade. To bring out enough supply, however, may require extensive development of Tantalum production. Since tin slag production is directly related to tin production, very little increase in this supply can be expected. The increased demand, potentially 50 % greater than 1975, must be met from primary deposits.

The following table demonstrates the estimated share of the market for each application of Tantalum :

<u>Application</u>	<u>1972</u>	<u>1975</u>	<u>1978</u>
Electronics	52 %	56 %	60 %
Cutting Tools	27 %	24 %	22 %
Chem. Equipment	13 %	12 %	11 %
Misc. Use	8 %	8 %	7 %
	<hr/> 100 %	<hr/> 100 %	<hr/> 100 %

Realisation of the forecasts appears to be associated with stability in the price of Tantalum. Should the price become too high, aluminium capacitors could be used to substitute the Tantalum

capacitors in many applications and titanium carbide coated cutting tools will gain inroads into the market for those tools containing Tantalum carbide. There is also a cut-off point at which chemical equipment cost becomes too high for continued growth in use. The economic limits of application have not been established.

A Bill to release more Tantalite from the National Stockpile has been introduced into the United States Congress. Government agencies have recommended a limit of 750,000 lb. Ta2O5. Enactment of legislation probably will not occur before mid-1975. Thus, sales by the government will be delayed until at least late 1975 and early 1976. If the limit is imposed,

the quantity provided will only be adequate to offset the expected deficit in 1976. It would however provide the time of one more year to increase supply to meet the demands of 1977 and later.

III. General Information

TANTALUM USES THROUGH PATENTS

Production of improved anodes for use in the electrolytic production of aluminium from fused alumina-containing baths of alkali aluminium fluoride. The anodes are produced by pre-burning, shaping, and firing a mixture of oxides analyzing preferably about 94 % by weight of tin oxide, 1.5 % each of antimony oxide and ferric oxide, 1.75 % of tantalum pentoxide, 1.0 % of zinc oxide, and 0.25 %

of chromic oxide. The resulting anode is chemically resistant to the fused fluoride bath, is an oxidic semi-conductor, and has an operational life of several months. Assigned to Swiss Aluminium Ltd. Nov. 1, 1972. British 1,295,117. *E./M.J. March 1973.*

RECOVERY OF RAW MATERIALS.

Jig for Alluvial Mining.

IHC-Holland has developed a new type of dish-shaped jig for alluvial

mining where the screens of the 2.5 to 7.5 m diameter jigs are formed of rigid stainless steel perforated plate, 2 mm thick, covered with a 2.5 mm layer of perforated wear-resistant Vrebrub rubber from Vredestein. Perforations in the plate are 8 mm in diameter, and 5 mm in the rubber cover. This gives an elastic, « self-cleaning » opening where pieces of mineral do not easily lodge. Less clogging results in higher screen efficiency. A rubber-clad screen reportedly requires maintenance only about once every six months.

MM. September 1974.

The MOLYBDENUM Corporation of America in B.P. 1339471 discuss recovering niobium from liobite and pyrochlore, using a cheaper process than the hydrofluoric process and several others which are considered. The suggestion is to bake the ore concentrate with sulphuric acid at 350 °C for 12 h, and fixed ammonia at a pH above 7. This is then mixed to a paste with caustic soda and heated to give a water soluble product roasted for four hours at 550 °C. A set of leaching stages with recovery with acid giving 99.5 per cent pure pentoxide. Many examples are given for Araxa ore.

MM. October 1974.

PIERREFITE Aubry of Paris in B.P. 1343957 discuss improved flotation of niobium oxide ores, containing slimes such as pyrochlore, microlite and perowskite giving higher efficiency than normal, with an aliphatic amine of 6 to 22 carbons atoms, as a flotation collector. For example St. Lawrence Columbian Corp. ore had 80 per cent calcite, 5 per cent of mica and 3 per cent pyroxene, 2 per cent magnetite and sulphides, 1 per cent pyrochlore. This was ground to 315 microns and about 3.5 per cent magnetic material removed, with the several stages including electrostatic sorting perhaps. About 100 per cent of the niobium is recovered as a 3.6 per cent concentrate.

MM. October 1974

General News

KAWECKI'S CHEMALLOY INTEREST.

CHEMALLOY Minerals Ltd. has come to an agreement with Kawecky Berylco Industries Inc. for the latter to acquire a 24.9 per cent interest in Tantalum Mining Corp. of Canada Ltd. The terms were not disclosed. Chernalloy will retain a 50.1 per cent interest in Tantalum Mining following the transaction. The Manitoba Government has possession of a 25 per cent interest in Tantalum Mining through its provincial development agency.

Kawecky has agreed to assist in the engineering, construction and financing of the proposed \$ 10 million lithium plant at Bernic Lake in Manitoba, and in marketing the resulting lithium chemicals. The mine produces tantalum, lithium, caesium and rubidium, along with other related minerals.

The proposed lithium plant, which is expected to be in production during the second half of 1976, would have a capacity of between

8 and 10 million lb./year of lithium carbonate or its equivalent.

The agreement also calls for Kawecky to transfer title of its lithium mining rights in North Carolina to Tantalum Mining. Kawecky is to provide technical assistance to develop markets for the caesium ore reserves at the Bernic Lake Mine. It is expected that the company will produce 450,000 lb. of tantalum derivative in 1974, and 500,000 the following year.

Kawecky is the largest single customer of Chernalloy's tantalum division and will purchase more than 200,000 lb. of tantalum this year. Chernalloy has reported that all of the division's 1974 production has been sold.

MM. July 1974.

THAI SETBACKS.

Demands by Communist guerrillas for large sums of protection money have caused some tin mines in southern Thailand to cease operation, the Thai Mining Association president, Mr. V. Sethabutr announced. Two or three mines in the Narathivas and Yala provinces have been closed and more

are reportedly facing shutdown because of guerrilla harassment. The guerrillas have been forcing the mine owners to pay as much as Baht 2 million in protection money for each mine.

MM. July 1974.

Figure I will give an idea of the structure of the Tantalite and Tantalum market from production of raw materials (Tantalite - Slags) to consumption of Tantalum, i.e. finished products.

It should be noted that if European countries appear as producing Slags; these Slags come from the processing of raw material imported from overseas producing areas. Also, all semi-finished products at all stages are marketable products contributing to the Import and Export figures. The same applies for Scrap, which is exported from the U.S. to Europe, due to a lack of this kind of primary material.

This figure is based on those issued by « Mineral Facts and Problems » (1970) — « Supply — Demand Relationships for Tantalum » and E./M.J. March 1973 — « Structure of the Tantalum Industry ».

WORLD PRODUCTION
RAW MATERIALS

Structure of the Tantalum Industry

