

136-10-12/13

Extraction of Tellurium from Some Lead-Industry Products.

stannate and antimonate. Personnel from the Institute of Metallurgy and Beneficiation of the AN Kaz SSR (Institut metallurgii i obogashcheniya AN Kaz SSR) and the Mintsvetmetzoloto organization participated in this work. There are 3 figures, 5 tables and 2 Slavic references.

ASSOCIATION: Chimkent Lead Works (Chimkentskiy Svintsovy Zavod)

AVAILABLE: Library of Congress.

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MALKIN / V. Ya. Z.

AUTHORS: Koslovskiy, M. T., Zabotin, P. I., Ilyushchenko, V. M., Bukhman, S. P., Nosek, M. V., Sergiyenko, V. Ya., and Malkin, Ya. Z.

136-1-7/20

TITLE: Use of an Amalgam Methods for Extracting Thallium from Chimkent Lead Works Dust (Primeneniye amal'gannogo metoda khizvlecheniyu talliya iz pyley chimkentskogo svintsovogo zavoda)

PERIODICAL: Tsvetnyye Metally, 1958, NPo. 1, pp. 30 - 41 (USSR).

ABSTRACT: The work described was based on theoretical and applied work on amalgam methods of separating and producing metals at the chemical-sciences Institute of the AC. SC. KazakSSR (Institut Khimicheskikh Nauk AN KasSSR) and the Kazakhsk State University imeni S. M. Kirov (Kazakhskiy gosudarstvennyy universitet im. S. M. Kirova) under the direction of M. T. Koslovskiy (Refs. 1-8). The following participated in the work; A. Zebreva, Candidate of Chemical Sciences, V. Gladyshev of the University and M. Lev'anov, V. Prachev, Ye. Rubanova, M. SHalaginova, G. NOsov and Yu. Stolyarov of the Chimkentsk Lead Works. K. Simakov and L. Ushkov of thw works helped to organise the semi full-scale trials and I. Yudevich and N. Karpenko analysed spectroscopically for thallium and N. Popova did chemical and polarographic analyses with O. Orsa

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Lead Works Dust

of the Chemical-sciences Institute of the AN KazSSR. Sintering dust analyses for different periods are tabulated (Table 1) and laboratory-scale experiments with the dust are described. Here, roasting of 20-25 kg batches was carried out at $400 - 500^{\circ} \text{C}$, showing (Fig. 1) that an appreciable part of the sulphide sulphur and thallium is eliminated within the first hour at 400°C . Four-fold leaching of the dust (two 250-g samples) with water at $80 - 90^{\circ} \text{C}$ showed (Table 3) that 80-90% of the thallium was extracted in the water, the extraction increasing with temperature. Cementation of thallium with zinc amalgam was carried out on the acidulated extract which was continuously circulated (Fig. 3): the results (Table 4) showed that 98-99% extraction of thallium from the solution could be obtained. It was shown that the amalgam (originally 0.36 - 0.40 g/litre Zn .127 g/litre Cd and 108 mg/litre Tl) could be decomposed by anodic oxidation with special electrolytes at current densities of $100 - 50 \text{ A/m}^2$, the density being gradually reduced as the appropriate metal was removed from the amalgam. The flow-sheet based on the laboratory results (Fig. 4) was put into practice in a larger scale plant (Fig. 5) at the Chinkensk Works, where it

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treated several tons of dust from April to October, 1956, and was used for balance experiments in October of that year. The article gives details of the different stages and balances for the different metals. These show that with the proposed method pure metallic thallium can be obtained with a yield of 65%, about 30% being in returns and 5% being lost. An editorial note invites discussion on the amalgam method. There are 5 figures, 13 tables and 10 Russian references.

ASSOCIATION: Institute of Chemical Sciences of the Ac. of Sc. KazSSR
(Institut khimicheskikh nauk AN KazSSR and
Chimkent Lead Works (Chimkentskiy svintsovyi zavod)

AVAILABLE: Library of Congress

SOV/136-58-8-8/27

AUTHORS: Malkin, Ya.Z., Sergiyenko, V.Ya., Bovtuta, N.V., and Yudelevich, I.G.

TITLE: Extraction of Tellurium and Indium from Antimony Slags (Iz vlecheniye tellura i indiya iz sur'myanistykh shlakov).

PERIODICAL: TsvetnyyeMetally, 1958, Nr.8, pp.34-39 (USSR)

ABSTRACT: The authors have previously shown (Ref.1) that at the Chimkent lead smelters the tellurium-content of the slag from re-smelting of sodium antimonate can reach 0.2-0.8%. Since these slags also contain indium the authors carried out work to determine the nature of the distribution of this element in the various products of the lead industry (Table 1) as a preliminary to the development of a process to recover it and tellurium. It was found that the indium tends to concentrate in the dry dross during de-coppering of crude lead. This dross, dusts from the shaft smelting of sinter or circulating materials or antimony slag could be used for indium recovery. The last material, obtained from a pilot-plant, was chosen, its composition being 9.6% Sb; 0.29% Pb, 0.05% Cu, 0.55% As, 0.65% Sn, 0.67% Fe, 0.99% Al,

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Extraction of Tellurium and Indium from Antimony Slags.

1.4% S (total), 0.5% S (sulphide), 5.64% SiO₂, 10.87% NaOH, 54.65% Na₂CO₃, 0.3-0.9% Te, 0.01-0.02% In. It was found that tellurium and indium stay in the solid residue (Table 2). After a sulphatizing roast at 250-300°C the indium can be leached out by water at 85-90°C but the tellurium is practically insoluble. Based on this a flowsheet (Fig.) has been devised which gives elementary tellurium (by caustic-soda leaching of the insoluble residue from the indium leaching, followed by electrolysis) and an indium concentrate from which metallic indium can be obtained. There is 1 figure, 5 tables and 4 Soviet references.

ASSOCIATION: Chimkentskiy svintsovyy zavod (Chimkent lead smelters).

1. Slags--Properties
2. Indium--Separation
3. Tellerium --Separation
4. Electrolysis

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MALKIN, Ya.Z.

KOZLOVSKIY, M.T.; ZABOTIN, P.I.; ILYUSHCHENKO, V.M.; BUKHMAN, S.P.;
NOSEK, M.V.; SERGIYENKO, V.Ya.; MALKIN, Ya.Z.

Using the amalgamation method for the recovery of thallium from
dusts of the Chimkent Lead Refinery. TSvet.met. 31 no.1:30-41
Ja '58. (MIRA 11:2)

1. Institut khimicheskikh nauk AN KazSSR i Chimkentskiy svintsovyi
zavod.

(Thallium) (Chimkent--Lead ores)

AUTHOR: Malkin, Ya.Z.

SOV/136-59-1-4/24

TITLE: The First Works of the Lead Industry is 25 Years Old
(Perventsu svintsovoy promyshlennosti - 25 let)

PERIODICAL: Tsvetnyye Metally, 1959, Nr 1, pp 11-13 (USSR)

ABSTRACT: The Chimkentskiy svintsovyy zavod (Chimkent Lead Works) was built in the first five-year plan and produces lead, copper, bismuth, antimony, noble and rare metals as well as lead objects. The works was reconstructed in 1949-1955 without production delays; eg sinter handling was modernised, the shaft furnaces reconstructed, a hydro-metallurgical plant was built and the works pioneered in the use of high-velocity turbulent dust-catchers (which proved very successful but are still being improved). Teams from the Giprotsvetmet, Gintsvetmet and Institutes of the AN Kaz SSR (AS Kaz SSR) as well as A.K. Simakov, formerly works director and now president of the Vostochno-Kazakhstanskiy sovnarkhoz (East Kazakhstan economic-council), participated. Extensive work is now proceeding on mechanization and automation: compressed air is used to prevent hanging of materials in the

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The First Works of the Lead Industry is 25 Years Old

bunkers, the sinter-plant transportation control system has been improved and trials of an electro-vibro conveyor for finished sinter have given promising results. The works was the first in the USSR to adopt continuous tapping of products from the smelting furnace and up-draught sintering, pre-pelletizing of the sinter mix, semi-automatic smelting furnace charging, slag treatment by the pulverized-coal injection method and continuous refining are to be adopted in the next few years. The author names some noteworthy personnel and the honours which the works has received.

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S/136/60/000/05/007/025
E071/E235

AUTHORS: Smirnov, M. P., Malkin, Ya. Z., Tarkhov, N. G., and
Sergienko, V. Ya.

TITLE: Industrial Tests of the Vacuo Method of Distilling Zinc²⁷.
From Silvery Foam

PERIODICAL: Tsvetnyye metally, 1960, Nr 5, pp 31-38 (USSR)

ABSTRACT: In 1955 on the Chimkent lead works, pilot plant tests of vacuo distillation of zinc from silvery foam (60.3% Pb, 26.3% Zn, 99.564 kg/t of noble metals, including a little gold; 0.3% Cu) were successfully completed (Ref 2). Later, an industrial plant was designed, testing of which during 1958 to 1959 is described. A sketch of the side view and the longitudinal cross-section of the vacuo furnace is shown in Fig 1 and a schematic diagram of the whole installation in Fig 2. The operating principle of the furnace is similar to vacuo-separating furnaces used in the titanium industry for distilling off magnesium and magnesium chloride from titanium sponge. During testing, the installation was somewhat modified; its final design is outlined. The capacity of the furnace is 1.0 to 1.5 tons per charge, 2.7 to 3.6 tons per day,

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the power consumption is 97 kW. At a temperature of the process of 920°C and a residual pressure in the retort of 1 to 2 mm Hg, the following results were obtained. The yield of products, %: lead 58, condensate 25, dross 12.5. The distribution of metals, %: zinc in condensate - 89.3, in dross - 8.7, in silvery lead - 2; lead and noble metals in silvery lead - 82.9 and 81.6, in dross - 11.8 and 14.1 and into condensate 5 and 4 respectively. Metal balances of some heats are given in Tables 1, 2 and 3; a comparison of the yields of products obtained by the usual and vacuo distillation is given in Table 4; a similar comparison of the chemical composition of distillation products is given in Table 5 and of the recovery of metals, in Table 6. A comparison of the results previously obtained on the pilot plant with the results obtained on the present installation is given in Table 7. It is concluded that in comparison with the usual process, the vacuo distillation has the following advantages: (a) an increase in the recovery of zinc in metal

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(20%) at the expense of producing lead and dross, with a lower zinc content, the further processing of which will involve lower losses of noble metals; (b) a decrease in the yield of dross by a factor of 1.5 and a decrease in the transfer of noble metals and lead into the dross; (c) an increase in the recovery of noble metals and lead into silvery lead; (d) an improvement in sanitary-hygienic conditions of working. The branch of Gintsvetmet for technical and economic investigations carried out a comparative evaluation of the existing, vacuo and electro-thermal (used in UKSTsK) methods of distillation of zinc from silvery foam which indicated that the vacuo method is the most economical. An order was placed with OKB Electropech and Works producing electro-thermal equipment for the design and construction of electrovacuo furnaces capable of dealing with the whole throughput of the Chimkent Works. In addition to the authors the following works personnel participated in the work:

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E071/E235

Industrial Tests of the Vacuo Method of Distilling Zinc From
Silvery Foam

S. A. Batyrbenkova, Engineer, and V. N. Prachev,
Technician. There are 2 figures, 7 tables and 2 Soviet
references. ✓

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MALKIN, Ye.Z.; SMIRNOV, M.P.; SERGIYENKO, V.Ya.; KOZHEVNIKOVA, G.I.;
KALNIN, Ye.I.; TARKHOV, N.G.; *Prinimali uchastiye:* MURSAITOV, Kh.I.;
ABDUGAPAROV, Sh.A.; BOVGUTA, I.D.; TKACHEV, S.P.; FILATOV, N.V.;
SVISTEL'NIKOV, A.M.; PRACHEV, V.N.; SHEYMAN, V.I.; ANTROPOV, A.D.;
SOBOLEV, Ye.D.; POPOVA, N.T.

Industrial testing of a new continuous method of copper removal
from crude lead. TSvet. met. 34 no.2:15-22 Mr '61. (MIRA 14:3)

1. Eksperimental'nyy tsekh Chimkentskogo svintsovogo zavoda (for
Mirsaitov, Abdugaparov, Bovguta, Tkachev, Filatov, Svistel'nikov,
Prachev, Sheyman, Antropov, Sobolev, Popova).
(Lead--Metallurgy) (Copper)

POLIVYANNYY, I.R., kand.tekhn.nauk; MALKIN, Ya.Z.

Theory of the leaching of arsenic from arsenous dusts by
sodium sulfate solutions. Vest.AN Kazakh.SSR 18 no.11:3-18
N '62. (Arsenic) (Leaching) (MIRA 15:12)

MALKIN, Ya.Z.; BULGAKOV, V.I.

Shaft furnace lead smelting. TSvet.met. 35 no.12:1-7 D '62.
(MIRA 16:2)
(Lead--Metallurgy)

SMIRNOV, M.P.; TARKHOV, N.G.; MALKIN, Ya.Z.; SERGIYENKO, V.Ya.;
KOZHEVNIKOVA, G.I.

Pilot plant development of a new method of copper removal from
crude lead. Sbor. nauch. trud. Gintsvetmeta no.19;432-452 '62.
(MIRA 16:7)

1. Gosudarstvennyy nauchno-issledovatel'skiy institut tsvetnykh metallov
(for Smirnov, Tarkhov). 2. Chimkenskii svintsovyy zavod (for
Malkin, Sergiyenko, Kozhevnikova).
(Lead--Metallurgy)

POLTYVYANNYY, I. R.; MALKIN, Ya.M.

Studying the separation of arsenic from alkaline sulfide solutions.
Vest. AN Kazakh. SSR. 19 no. 3: 11-12, 1983. (CIA 1987)

POLYVIANNYY, I.R.; MALKIN, Ya.Z.; PONOMAREV, V.D.; SOLOV'YEVA, V.D.;
SOSNIN, A.P.; DENCHENKU, R.S.

Leaching arsenic from arsenic dust by sodium sulfide solutions.
Trudy Inst.met.i obog. AN Kazakh.SSR 11:90-100 '64.

(MIRA 18:4)

POLYVYANNYY, I.R.; ANAN'YEV, N.I.; MALKIN, Ya.Z.

Pilot plant testing of a combined method for processing antimony concentrates and intermediate products. TSvet. met. 38 no.5:29-33
My '65. (MIRA 18:6)

MALKIN, Ya.Z.; SUKHOV, V.P.

Drying lead dust in a fluidized bed. TSvet. met. 38 no.6:
28-33 Je '65. (MIRA 18:10)

SMIRNOV, M.P., kand. tekhn. nauk; MALKIN, Ya.Z.; TARKHOV, N.G.;
SERGIYENKO, V.Ya.

Developing a continuous method for the alkali softening of
lead. Sbor. nauch. trud. Gintsvetmeta no.23:201-216 '65.
(MIRA 18:12)