

SOV/32-24-10-65/70

News in Brief
(Berds Wireless Factory)

Card 3/3

SOURCE: *Avtomaticheskaya svarka*, no. 11, 1964, 44-46

TOPIC TAGS: low voltage arc, static characteristic, current, voltage, cathode, anode, welding technology

ABSTRACT: The effect of the individual arc areas (cathode, anode and column) on the formation of its static characteristic is virtually unknown. The authors used a method which involves a local change of the current between the cathode and the anode while the arc column current was constant. The length of the basic arc remained invariable, the assigned current was stable whatever the voltage changes and the cathode spots of the basic and indirect arc were combined on the electrode. The cathode area was found to exert a decisive influence on the formation of the static characteristic within the 0.5 to 15 amp range while the anode drop changed negligibly, its effect being minor. The authors conclude that in

Card 1/2

MALKIN V.I.

DANILOV, V.I.; MALKIN, V.I.

Experimental verification of the crystal growth theory. Probl.
metalloved. i fiz. met. no.2:25-30 '51. (MIRA 11:4)

1. Chlen-korrespondent ~~EN~~ USSR.
(Crystallization) (Salol)

Malkin, V.I.

USSR/Chemistry - Crystallography

Card 1/1 Pub. 147 - 19/25

Authors : Danilov, V. I., and Malkin, V. I.

Title : Experimental testing of the theory of crystal growth and the connection between equilibrium and growth forms

Periodical : Zhur. fiz. khim. 28/10, 1837-1844, Oct 1954

Abstract : The theory of crystal growth was experimentally confirmed through the formation of two-dimensional crystal nuclei. This was attained because the measurements of the rate of growth were carried out in the zone of very-low supercoolings where the effect of factors usually distorting the effect of the growth mechanism can be practically eliminated through proper selection of the substance investigated. The experimentally derived dependence of the linear rate of growth upon the supercooling has a clearly expressed exponential character which is indicated by the presence of a temperature close to that of the melting point where the linear rate of growth equals zero. Eight references: 3-USSR; 1-USA and 4-German (1926-1949). Graphs; drawing; illustration.

Institution : Central Scientific Research Institute of Ferrous Metals, Institute of Metallurgy and Physics of Metals, Moscow

Submitted : March 16, 1954

MAIKIN, V. I.

USSR/Chemistry - Physical chemistry

Card 1/1 : Pub. 147 - 13/22

Authors : Malkin, V. I.

Title : Rate of growth of salol crystals in the zone of the vitreous state

Periodical : Zhur. fiz. khim. 28/11, 1966-1968, November 1954

Abstract : An analysis of results obtained during the measurement of the linear rate of growth of salol crystals in relation to the temperature in the zone of the vitreous state is presented. It was established that the temperature during the linear rate of growth in the vitreous zone is determined mainly by the mobility of the molecules. The activation energy value at the salol crystal growth at -25°C was determined. Three USSR references (1932-1954). Table; graphs.

Institution : Central Scientific Research Institute of Ferrous Metallurgy, Institute of Metallurgy and Physics of Metals

Submitted : March 15, 1954

MALKIN, V. I.

USSR/Crystals.

B-5

Abs Jour : Referat Zhur - Khimiya, No 6, 1957, 18371

Author : V.I. Malkin.

Title : ~~To The Question~~ Concerning The Dependence of The Crystal Growth Shape on The Growth Speed.

Orig Pub : Probl. metallovei. i fiz. metallov, sb.4, 1955, 113-120

Abstract : The dependence of the growth shape on the growth speed v of a solid crystal growing in a melt and the connection between v and the structure in an ingot of Sn were studied. The transition to an acicular growth shape is observed, when v of the crystal increases. When undercooling is decreased, v decreases also, and the growth of crystals of acicular shape is replaced by the growth of crystal of regular shape. The same transition to an acicular structure with the increase of v was observed also in an ingot of Sn. It is pointed out that, besides the thermal and "geometrical" factors, an essential part in

Card 1/2

- 120 -

USSR/Crystals.

B-5

Abs Jour : Referat Zhur - Khimiya, No 6, 1957, 18371

producing the acicular growth shape belongs to the growth mechanism. It is surmised that the crystal growth by two-dimensional nuclei is replaced with the growth by dislodgement in proportion to the receding from the melting point.

Card 2/2

- 121 -

Malkin, V. I.

SHVARTSMAN, L. A.; MALKIN, V. I.

On O.A.Esin and P.V.Gel'd's book: "Physical chemistry of pyro-
metallurgical processes." Part 2. Reviewed by L.A.Shvartsman,
V.I.Malkin. Zhur.fiz.khim.29 no.5:946-949 My'55. (MLRA 8:12)
(Chemistry, Metallurgic) (Esin, O.A) (Gel'd, P.V.)

MALKIN, V. I.

USER/Chemistry - Physical chemistry

Card 1/2 Pub. 22 - 29/54

Authors : Malkin, V. I., and Shvartsman, L. A.

Title : Measurement of the Ca^{++} transference number in a $\text{CaO-P}_2\text{O}_5$ fusion

Periodical : Dok. AN SSSR 102/5, 961-963, Jun 11, 1955

Abstract : The difficulties involved in measuring the transference number of a Ca ion in a $\text{CaO} - \text{P}_2\text{O}_5$ fusion are analyzed. It was found that the loss in weight of the fusion, which occurs during the passing of the current, is lower than the value required by the Faraday law. It was also established that the entire amount of Ca forming on the cathode does not abandon the fusion and that at least a part of it reacts with the fusion and remains in it. The calculated transference number values indicate the existence of a mono-cation conductivity in $\text{CaO} - \text{P}_2\text{O}_5$ fusion.

Institution : Centr.Sc.Res.Inst. of Ferrous Metallurgy, Inst. of Metallography and Phys. of Metals

Presented by : Academician G. V. Kurdyumov, January 31, 1955

Card 2/2 Pub. 22 - 29/54

Periodical : Dok. AN SSSR 102/5, 961-963, Jun 11, 1955

Abstract : Six references: 4 USSR, 1 German and 1 USA (1904-1952). Table.

RAYSKIY, S.M., nauchnyy sotrudnik; SMIRNOV, V.F., nauchnyy sotrudnik;
SHVARTSMAN, L.A., nauchnyy sotrudnik; WALKIN, V.I., nauchnyy
sotrudnik.

"Radioisotopes in machine-building." P.E. D'iachenko, Reviewed
by S.M. Raiskii and others. Zav.lab. 22 no.6:758-759 '56.

(MLRA 9:8)

1. Fizicheskiy institut Akademii nauk SSSR (for Rayskiy, Smirnov);
2. Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metal-
lurgii.
(Radioisotopes--Industrial applications) (D'iachenko, P.E.)

MALKIN, V.I.

"The Mobility of Cations in Silicate Melts,"
lecture given at the Fourth Conference on Steelmaking, A.A. Baikov Institute of
Metallurgy, Moscow, July 1-6, 1957

MALKIN, V.I.

"Measurements of the Relative Mobility of Cations in Mixtures of Fused Oxides," V.I. Malkin, Shvarzman, L.A., Moscow, USSR

Paper submitted for presentation at the International Conference on Radioisotopes in Scientific Research, Paris, 9-20 Sep 1957

Cent. Research Inst. of Iron Metallurgy, Moscow, USSR

MALKIN, V. I.

137-58-4-6566

Translation from: Referativnyy zhurnal, Metallurgiya. 1958, Nr 4, p 36 (USSR)

AUTHORS: Malkin, V. I., Shvartsman, L. A.

TITLE: Measuring the Ion Transference (Hittorf) Number of the Ca^{2+} in Fused $\text{CaO-P}_2\text{O}_5$ (Izmereniye chisla perenosa iona Ca^{2+} v rasplave $\text{CaO-P}_2\text{O}_5$)

PERIODICAL: V sb. Fiz. -khim. osnovy proiz-va stali. Moscow AN SSSR. 1957 pp 433-437. Diskus. pp 505-512

ABSTRACT: The following method was used to measure the ion transference numbers in oxide melts. A small corundum-coated crucible, having a 1-1.5 mm aperture at its bottom, was placed in a large-diameter crucible of the same materials. The slag (27% CaO , 73% P_2O_5) was charged into the crucibles and weighed. The slag contained Ca^{45} . Graphite electrodes were lowered into the melt on attainment of 1000°C temperature. After current had been passed through it, the electrodes were removed and the crucible weighed with its diaphragm and contents. The loss of weight in the course of the experiment was determined in this way. Then the crucible was broken, and the weights of the catholyte and anolyte were

Card 1/2

137-58-4-6566

Measuring the Ion Transference (cont.)

determined separately. The Hittorf number x_1 of the Ca ion through the anodic space was calculated from the equation:

$$x_1 = \frac{p \cdot q_f}{K \cdot E_1} \left(1 - \frac{I_f}{I_i} + \frac{q_a}{q_f} \right),$$

where q_f was the weight of the anolyte after the experiment, q_a was the weight loss of the anolyte during the experiment, I_i and I_f were the radio-activities of the anolyte before and after the experiment, p was the weight percentage of the Ca^{2+} ion before the experiment, K was the quantity of electricity in farads, and E_1 was the numerical value of a gram-equivalent of the Ca^{2+} ion. Here q_a was computed from the equation $q_a = K (E_1 + E_2) x_1$, where E_2 was the numerical value of a gram-equivalent of the O^{2-} ion. Four experiments yielded the following values of x_1 : 1.06, 1.04, 1.06, 1.02. These data show that the conductivity of the melt is by a single cation.

I. K.

1 Metallurgy 2 Melts--Applications 3 Ion exchange--Measurement

Card 2/2

MALKIN, V. I.

AUTHOR: Malkin, V.I., Khokhlov, S.F., Shvartsman, L.A. 76-11-16/35

TITLE: Determination of the Cation Transport Numbers in the Melt
 $\text{Na}_2\text{O} \cdot \text{K}_2\text{O} \cdot 4\text{SiO}_2$ (Izmereniye ohisel perenosa kationov v rasplave
 $\text{Na}_2\text{O} \cdot \text{K}_2\text{O} \cdot 4\text{SiO}_2$)

PERIODICAL: Zhurnal Fizicheskoy Khimii, 1957, Vol. 31, Nr 11, pp. 2485-2487
(USSR)

ABSTRACT: The relative mobility of the cations Na^+ and K^+ with a charge, the radii of which differed noticeably from each other, was investigated in a silicate melt, the composition of which corresponds to the formula $\text{Na}_2\text{O} \cdot \text{K}_2\text{O} \cdot 4\text{SiO}_2$. For the determination of the transmission numbers for Na^+ and K^+ the method [Ref.2] described already previously was applied by making use of the radio isotopes Na^{24} and K^{42} . The results of the experiments were somewhat surprising. They showed that the mobilities of the Na^+ - and K^+ -ions are nearly equal in the melt investigated here. There are 1 figure and 6 references, 3 of which are Slavic

Card 1/2

76-11-16/35

Determination of the Cation Transport Numbers in the Melt $\text{Na}_2\text{O} \cdot \text{K}_2\text{O} \cdot 4\text{SiO}_2$

ASSOCIATION: Institute for Metallurgy and Metal Physics, Central Scientific Research Institute of Ferrous Metallurgy, Moscow (Institut metallovedeniya i fiziki metallov. Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii, Moskva)

SUBMITTED: July 14, 1956

AVAILABLE: Library of Congress

Card 2/2

Malkin, V. I.

KURDYUMOV, G.V., otvetstvennyy red.; SAMARIN, A.M., red.; SHVARTSMAN, L.A.,
red.; MALKIN, V.I., red.; GOLIKOV, V.M., red.; RABEZOVA, V.A.,
red.; CHERNOV, A.N., red. izd-va; SIMKINA, Ye.B., tekhn.red.;
KASHINA, P.S., tekhn.red.

[Metallurgy and physical metallurgy proceedings of the Conference
on the Use of Radioactive and Stable Isotopes and Radiation in the
National Economy and in Science] Metallurgiya i metallovedenie;
trudy Vsesoiuznoi nauchno-tekhnicheskoi konferentsii po primeneniiu
radioaktivnykh i stabil'nykh izotopov i izluchenii v narodnom
khoziaistve i nauke. Moskva, Izd-vo Akad. nauk SSSR, 1958. 518 p.
(MIRA 11:6)

1. Vsesoyuznaya nauchno-tekhnicheskaya konferentsiya po primeneniyu
radioaktivnykh i stabil'nykh izotopov i izluchenii v narodnom
khozyaystve i nauke. 1957.

(Metallurgy) (Physical metallurgy)

MALKIN, V.I.

24-58-3-13/38

AUTHORS: Malkin, V.I. and Knoznlov, S.F. (Moscow)

TITLE: Measurement of the Transport Numbers for Ca^{++} in Melts in the $CaO-MgO-SiO_2$ and $CaO-MgO-Al_2O_3-SiO_2$ Systems.

(Izmereniye chisel perenosa iona kal'tsiya v rasplavakh sistem okis' kal'tsiya-okis'magniya-kremnezem i okis' kal'tsiya-okis'magniya-okis'alyumniya-kremnezem)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Otdeleniye Tekhnicheskikh Nauk, 1958, Nr 3, pp 108-110 (USSR)

ABSTRACT: Structure studies on multicomponent silicate melts are of substantial interest in metallurgy. The behaviour of the various components in slags, which are ionic melts, can be judged from the relative ionic mobilities, data on which are given by transport number measurements. The behaviour of oxides such as MgO and Al_2O_3 in silicate melts is of interest, since it has been claimed (Refs.1,2) that these oxides are amphoteric in melts in the $CaO-MgO-Al_2O_3-SiO_2$ system.

In relation to the ionic nature of the slag the amphoteric behaviour appears in the metal being present in cation form (in which it has an appreciable mobility) and in complex anion form (where the mobility is very small). The authors of this Card 1/6 paper observed an amphoteric behaviour of Al_2O_3 in $CaO-Al_2O_3-$

24-58-3-13/33

Measurement of the Transport Numbers for Ca^{++} in Melts in the CaO-MgO-SiO_2 and $\text{CaO-MgO-Al}_2\text{O}_3\text{-SiO}_2$ Systems.

-SiO_2 melts in their measurements of the mobility of Ca^{++} in this system (Ref.3). The relative mobility of Ca^{++} ion in melts of the compositions $\text{CaO} \cdot 0.5\text{MgO} \cdot 0.5\text{Al}_2\text{O}_3 \cdot 3 \cdot 25\text{SiO}_2$ and $\text{CaO} \cdot \text{MgO} \cdot 1.5\text{Al}_2\text{O}_3 \cdot 1.75\text{SiO}_2$ (and in one of composition $\text{CaO} \cdot \text{MgO} \cdot 3 \cdot 25\text{SiO}_2$ for comparison) was measured to elucidate the behaviour of Al_2O_3 and MgO . The first of these four-component melts differs from that in the ternary system in having part of the SiO_2 replaced by Al_2O_3 . A method previously described in detail (Ref.4) which used Ca^{45} was employed, but the Ca^{45} was found to be lost at the temperature used (1550°C), so the method had to be changed somewhat. The electrolysis cell (see figure) consisted of a large aluminum crucible containing two small crucibles. One of these had a hole in it and constituted the anode diaphragm, the anode being inserted inside it. The other electrode was inserted in the melt in the large crucible. The other small crucible acted as a check; it had no hole in it, but was used

Card 2/6

24-50-3-13/38

Measurement of the Transport Numbers for Ca^{++} in Melts in the $CaO-MgO-SiO_2$ and $CaO-MgO-Al_2O_3-SiO_2$ Systems.

to determine the Ca^{45} loss from the change in the activity of the slag in it; the activity of the slag in this crucible was used instead of the initial activity in the calculations. Of course, the accuracy of the transport number measurement is thereby reduced, and the results should therefore be taken as somewhat qualitative. But even qualitative estimates of relative mobility give valuable data in relation to the behaviour of cations in melts. The transport number of Ca^{++} was determined from the equation:

$$x_{Ca} = \frac{\frac{p_{Ca}}{\partial_{Ca}} \left[\frac{M}{k} \left(1 - \frac{J_a}{I_a} \right) + \partial_{Al} + \partial_O \right]}{1 - p_{Ca} + p_{Ca} \partial_{Al} / \partial_{Ca}} \quad (1)$$

where p is the fraction by weight of Ca^{++} before the experiment, ∂_{Ca} , ∂_{Al} and ∂_O being the g-equivalent weights of the calcium, aluminium and oxygen ions, M the anolyte weight (g), k the charge passed (faradays), J_a the anolyte

Card 3/6

24-50-3-13/38

Measurement of the Transport Numbers for Ca^{++} in Melts in the CaO-MgO-SiO_2 and $\text{CaO-MgO-Al}_2\text{O}_3\text{-SiO}_2$ Systems.

activity after the experiment, J the activity in the check crucible and x_{Ca} the transport number of Ca^{++} .

Eq.(1), which was derived (Ref.3) assuming a unipolar conductivity for melts with two cations, can be used here since \bar{z}_{Al} and \bar{z}_{Mg} are close together. Tables 1-3 give the results; Table 1 shows that in the $\text{CaO.MgO}.3\text{-}25\text{SiO}_2$ melt the

Ca^{++} is of much higher mobility than the Mg^{++} ; when part of the MgO is replaced by Al_2O_3 the Ca^{++} transport number drops

appreciably, as Table 2 shows. Since there are no suitable radio isotopes of Al and Mg it could not be decisively determined which of the ions from these metals competes with Ca^{++} in conducting the current, but the authors suppose that the main one is Al^{+++} . The appreciable mobility of Al^{+++} in a $\text{CaO-Al}_2\text{O}_3\text{-SiO}_2$ melt indicates this; so does the reduced

MgO content of the $\text{CaO}.0.5\text{MgO}.0.5\text{Al}_2\text{O}_3.3\text{-}25\text{SiO}_2$ melt, relative to the ternary system, since if the Mg^{++} here retained the

Card 4/6

24-58-5-13/38

Measurement of the Transport Numbers for Ca^{++} in Melts in the
 CaO-MgO-SiO_2 and $\text{CaO-MgO-Al}_2\text{O}_3\text{-SiO}_2$ Systems.

same mobility as in the $\text{CaO.MgO}.3.25\text{SiO}_2$ one its transport number should be reduced. So, if the Mg^{++} in the ternary system is in no state to compete with the Ca^{++} , then if the fall in the Ca^{++} transport number in the four-component melt is to be attributed to the Mg^{++} it would be necessary to suppose a very surprising increase in the transport number of the latter, which is highly improbable. The results of Table 3 indicate that when some of the SiO_2 in the ternary system is replaced by Al_2O_3 the Ca^{++} transport number drops still more markedly. This indicates that the current is partially carried by Al in cation form; it is doubtful if it can be supposed that the Mg^{++} is of high mobility in this melt, since when the acid SiO_2 is replaced by amphoteric Al_2O_3 the 'acid' features of ions such as Mg^{++} should be more marked, and the mobility therefore reduced. The results thus indicate that Al exists in cation form in melts in the $\text{CaO-MgO-Al}_2\text{O}_3\text{-SiO}_2$ system, and that MgO has acid properties, so both Al_2O_3 and MgO can be considered as amphoteric oxides in these

Card 5/6

24-58-3-13/38

Measurement of the Transport Numbers for Ca^{++} in Melts in the CaO-MgO-SiO_2 and $\text{CaO-MgO-Al}_2\text{O}_3\text{-SiO}_2$ Systems.

melts. The figure shows a sketch of the electrolysis cell for transport number measurements (schematic). Tables 1-5 give the measured results. (This is a complete translation with the exception of the tables and the references). There are 3 tables, 1 figure and 4 Soviet references.

ASSOCIATION: Institut metallovedeniya i fiziki metallov TsNIChIM (Metallography and Metal Physics Institute of the TsNIChIM)

SUBMITTED: July 3, 1957.

1. Metallurgy 2. Silicate components--Behavior

Card 6/6

MALKIN, V.I.; POKIDYSHEV, V.V.

Change of the transference number of Na^+ ion in $\text{Li}_2\text{O} \cdot \text{Na}_2\text{O} \cdot 0.4\text{SiO}_2$
melt. Zhur. neorg. khim. 3 no.9:2219-2220 S '58. (MIRA 11:10)

1. Institut metallovedeniya i fiziki metallov Tsentral'nogo nauchno-
issledovatel'skogo instituta chernoy metallurgii.
(Ions) (Electrochemical analysis)

SOV/24-58-5-25/31

AUTHORS: Malkin, V. I. and Pokidyshev, V. V. (Moscow)

TITLE: ~~Measuring~~ the Number of Ion Transfers in a Sodium-Cobalt Silicate Melt (Izmereniye chisel perenosy ionov v rasplave natriy-kobal'tovogo silikata)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Otdeleniye Tekhnicheskikh Nauk, 1958, Nr 5, pp 129-131 (USSR)

ABSTRACT: In earlier work of one of the authors and his team (Ref 1), a comparison was made of the mobility of Na^+ and Ca^{++} ions in a silicate melt of the composition $\text{Na}_2\text{O}\cdot\text{CaO}\cdot 4\text{SiO}_2$. Although the two ions have almost equal radii, the mobility of the single charge ion Na^+ is over twice as high as that of the ion Ca^{++} . The authors considered it of interest to compare the mobility of Na^+ with Co^{++} , the radius of which is lower than the radius of the ion Na^+ . For this purpose they measured the number of transfers of the ions Na^+ and Co^{++} in the melt $2\text{Na}_2\text{O}\cdot\text{CoO}\cdot 6\text{SiO}_2$ for which the O:Si ratio is the same as for the melt $\text{Na}_2\text{O}\cdot\text{CaO}\cdot 4\text{SiO}_2$ but the molar concentration is twice as large as the concentration of CoO. Measurement of the number of transfers was carried out by a method which was

Card 1/3

SOV/24-58-5-25/31

Measuring the Number of Ion Transfers in a Sodium-Cobalt
Silicate Melt

described in detail in earlier work (Ref 2) of one of the authors, which is based on measuring by means of radioactive tracers the small changes in the cation and anion concentrations in the case of passing of small quantities of electricity through the melt; Na^{24} and Co^{60} were used. The experiments were carried out at 1200°C and the results are entered in a table, p 130. The number of transfers for the ion Na^+ approaches unity, whilst for the ion Co^{++} they are nearer to zero. Thus, in the investigated melt the ratio of the mobility of the Na^+ ion to that of the Co^{++} ion is larger than the ratio of the mobility of the Na^+ ion to that of the Ca^{++} ion in the melt $\text{Na}_2\text{O}\cdot\text{CaO}\cdot 4\text{SiO}_2$. This is explained by the smaller value of the radius of the Co^{++} ion as compared with the Ca^{++} ion, which brings about a stronger link between Co^{++} ion and the anion grid of the melt.

Card 2/3

SOV/24-58-5-25/31

Measuring the Number of Ion Transfers in a Sodium-Cobalt
Silicate Melt

There are 1 table and 5 references, 4 of which are Soviet,
1 English.

ASSOCIATION: Institut metallovedeniya i fiziki metallov TsNIICHM
(Institute of Metallography and Metal Physics
TsNIICHM)

SUBMITTED: October 17, 1957

Card 3/3

AUTHORS: Malkin, V. I., Pokidyshev, V. V. SOV/78-3-9-37/38

TITLE: The Determination of the Transference Number of the Na⁺ Ion in the Melt of Li₂O.Na₂O.4SiO₂ (Izmereniye chisla perenosy iona Na⁺ v rasplave Li₂O.Na₂O.4SiO₂)

PERIODICAL: Zhurnal neorganicheskoy khimii, 1958, Vol 3, Nr 9, pp 2219-2220 (USSR)

ABSTRACT: The paper under review deals with the analysis of the relative mobility of cations in the melt of Li₂O.Na₂O.4SiO₂. The investigations were carried out by using the radioactive isotope Na²⁴. The results show that the sodium ion in the melt examined is more mobile in comparison with lithium. The electric conductivity of the melt Na₂O.SiO₂ at 150-230°C is considerably higher than that of the glass melt with a composition of Li₂O.2SiO₂. In the case of simultaneous presence of two cations with equal anions the mobility of one cation depends on the properties of the other.

Card 1/2 There are 1 table and 10 references, 5 of which are Soviet.

SOV/78-3-9-37/38
The Determination of the Transference Number of the Na⁺ Ion in the Melt of
 $\text{Li}_2\text{O} \cdot \text{Na}_2\text{O} \cdot 4\text{SiO}_2$

ASSOCIATION: Institut metallovedeniya i fiziki metallov (Institute of
Metallography and Physics of Metals) Tsentral'nogo nauchno-
issledovatel'skogo instituta chernoy metallurgii (of the Central
Scientific Research Institute of Ferrous Metallurgy)

SUBMITTED: March 18, 1958

Card 2/2

SHVARTSMAN, L.A., doktor khim.nauk; MALKIN, V.I., kand.tekhn.nauk;
TOMILIN, I.A., kand.tekhn.nauk

A.N. Morozov's article "Modern slag theory and the theory of
steel smelting processes." Izv. vys. ucheb. zav.; chern. met.
no.7:63-65 J1 '58. (MIRA 11:10)
(Steel--Metallurgy)

32-24-6-43/44

AUTHOR: Malkin, V. I.

TITLE: Conference on the Use of Radioactive Isotopes in Iron Metallurgy
(Soveshchaniye po primeneniyu radioaktivnykh izotopov v chernoy metallurgii)

PERIODICAL: Zavodskaya Laboratoriya, 1958, Vol 24, Nr 6,
pp. 783 - 784 (USSR)

ABSTRACT: From March 25 - 28, 1958 a conference convened by the Central Scientific Research Institute for Iron Metallurgy was held in Moscow in order to discuss the above subject. It was attended by the workers and the staff of the factories and scientific research institutes. 20 metallurgical works and 30 scientific research organizations took part in it, and 35 contributions and reports were made. In the contributions by P.L.Gruzina (Central Scientific Research Institute for Iron Metallurgy), I.G.Polovchenko (works imeni Dzerzhinskiy), Ya.S.Gorbaneva ("Azovstal' " works), Yu.P.Belyayeva ("Il'ich" works), V.A.Smolyak (Dnepropetrovsk metallurgical works) the problems concerning the use of radioactive isotopes in blast furnace industry were discussed, while the lecture by L.A.Shvartsman dealt with the use of isotopes in steel casting. Furthermore,

Card 1/2

Conference on the Use of Radioactive Isotopes in
Iron Metallurgy

32-24-6-43/44

the topics of the contributions by A.M.Skrebtsova, I.G. Gol'dshteyn, V.K.Latyshev and V.S.Tokmakov, O.M.Ignat'yev, P.L.Gruzin, S.V.Zemskiy, A.Ya.Yampol'skiy, N.G.Bogdanova, O.I.Val'ter, Ye.S.Shlyakhovetskiy, A.G.Vasil'yev, L.K. Strelkov, N.I.Volkova, N.G.Gusev, V.A.Korotkova and V.F. Smirnov are mentioned and respective comments are made. At this conference the decision was made that a further development of the use of radioactive isotopes is necessary in order to make it possible to solve problems in metallurgical science.

1. Iron--Metallurgy
2. Radioisotopes--Applications

Card 2/2

AUTHOR: Malkin, V. I., (Moscow) 74-27-3-4/7

TITLE: On the Mobility of Cations in Silicates (O podvizhnosti kationov v silikatakh)

PERIODICAL: Uspekhi Khimii, 1958, Vol. 27, Nr 3, pp. 306-315 (USSR)

ABSTRACT: At the beginning the author discusses the physical and chemical properties of the silicates. Facts concerning the mobility of the ions in simple systems: the basic oxide is silicon dioxide. Due to the small ionic radius and the great charge the silicon deforms the electron cloud of oxygen. The binding between silicon and oxygen is covalent to 50%. Moreover, the author discusses the special polarizability of silicon dioxide. Two generally known concepts exist on the structure of the silicate glasses. The second is of interest because it is assumed that the glass contains certain chemical compounds. It is of interest that silicate glass consists of anion complexes and metal cations and that it has short-range order. This makes possible to utilize some rules which are characteristic of the crystalline state on the observation of the

Card 1/3

On the Mobility of Cations in Silicates

74-27-3-4/7

migration process of the particles in the glasses. According to Frenkel (Reference 10), the translocation of the particles in the crystal lattice is caused by the transition of these particles into the interstitial sites of the lattice. In order to reach the interstitial site the ion must overcome the potential barrier. The ion gets the energy necessary for it at the cost of the energy fluctuation of the thermal oscillation. The experiment proved the assumption that the cations are the most mobile particles in the silicates. It was demonstrated in the measuring of auto-diffusion (with Ca and Si) in crystals of CaSiO_3 by means of radioactive isotopes of Ca and Si that mobility of Si is approximately by three orders of magnitude smaller than that of Ca. Conductivity increases with the decrease of the silicon content in the binary glass. In measuring the electric conductivity in binary silicate batches it was found that conductivity increases with simultaneous decrease of the silicon acid content. In this connection the intensity of the Coulomb interaction between cation and anion plays an important rôle. The author discusses in detail the re-

Card 2/3

On the Mobility of Cations in Silicates

74-27-3-4/7

relative mobility of the cations in the complex silicate system. At the end it is stressed that at present a collection of experimental data on the mobility of the particles in the silicate systems is very important in order to make possible a future generalization on a wide basis. There are 1 table and 36 references, 14 of which are Soviet.

1. Silicates--Physical properties

Card 3/3

76-32-4-18/43

AUTHOR:

Malkin, V. I.

TITLE:

Measurement of the Transport Numbers of Cations in the
 $K_2O.CaO.4SiO_2$ Melt (Izmereniye chisel perenosa kationov
v rasplave $K_2O.CaO.4SiO_2$)

PERIODICAL:

Zhurnal Fizicheskoy Khimii, 1958, Vol. 32, Nr 4,
pp. 838 - 840 (USSR)

ABSTRACT:

From results of earlier investigations in this field it can be concluded that the mobility of cations in silicate melts of this kind is essentially greater than that of anions. In the present work the transport numbers of the ions K^+ and Ca^{+2} in the melt mentioned in the title were measured, with the radioisotopes K^{42} and Ca^{45} being used. The radioactivity of K^{42} was measured with a β -2 counter and that of Ca^{45} with a $\beta\Phi\Lambda$ -25 counter. The equations for the calculation of the transport numbers are mentioned just as well as a table with the results of seven examinations. It is noticed

Card 1/2

76-32-4-18/43

Measurement of the Transport Numbers of Cations in the $K_2O.CaO.4SiO_2$ Melt

that the mobility of K^+ ions exceeds essentially that of Ca^{+2} ions, from which fact can be concluded that an interaction of the cations is present also in sufficiently acidous silicate melts. A comparison of the obtained results with those of an earlier work with Na^+ and Ca^{+2} ions shows that the ratio Na^+ and K^+ is not equal to that of Na^+ and Ca^{+2} ; thus we have here a proof for the interaction of cations. The relative mobility of the cations would have to be a function of the cation radii as well as of the ratios in magnitude between cation valence and radii. There are 1 table, 5 references, 4 of which are Soviet.

ASSOCIATION: Institut metallovedeniya i fiziki metallov TsNIICHM, Moskva
(Moscow Institute for Metallography and Metal Physics TsNIICHM)
SUBMITTED: December 28, 1956
AVAILABLE: Library of Congress
Card 2/2 1. Silicate ions--Motion 2. Potassium isotopes (Radioactive)--Applications 3. Calcium isotopes (Radioactive)--Applications

18(0)

PHASE I BOOK EXPLOITATION

SOV/2125

Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii.
Institut Metallovedeniya i fiziki metallov

Problemy metallovedeniya i fiziki metallov (Problems in Physical
Metallurgy and Metallophysics) Moscow, Metallurgizdat, 1959.
540 p. (Series: Its: Sbornik trudov, 6) Errata slip inserted.
3,600 copies printed.

Additional Sponsoring Agency: USSR. Gosudarstvennaya planova komissiya.

Ed. of Publishing House: Ye.N. Berlin; Tech. Ed.: P.G. Islent'yeva;
Editorial Board: D.S. Kamenetskaya, B.Ya. Lyubov (Resp. Ed.),
Ye.Z. Spektor, L.M. Utevskiy, L.A. Shvartsman, and V.I. Malkin.

PURPOSE: This book is intended for metallurgists, metallurgical
engineers, and specialists in the physics of metals.

COVERAGE: The papers in this collection present the results of
investigations conducted between 1954 and 1956. Subjects

Card 1/18

Problems in Physical Metallurgy (Cont.)

SOV/2125

covered include crystallization of metals, physical methods of influencing the processes of crystallization, problems in the physical chemistry of metallurgical processes, development of new methods and equipment for investigating metals, and production control. References follow each article.

TABLE OF CONTENTS:

PART I. CRYSTALLIZATION OF METALS

Dukhin, A.I., Candidate of Physical and Mathematical Sciences. Crystallization of Metals and Alloys in Small Volumes 9

Dukhin, A.I., and V.Ye. Neymark, Candidate of Physical and Mathematical Sciences. Effect of Boron and Titanium on the Supercooling of Steel 34

The results of measuring the supercooling of steels lead to the conclusion that the energy of nucleation in type-Kh18N9 austenitic steel is much greater than in type-Kh27 ferritic steel. This explains the difficulty of refining the grain of ingots of Kh18N9 steel by means of additions of titanium and boron, as well as the ease of refining the gain of Kh27

Card 2/18

Problems in Physical Metallurgy (Cont.)

SOV/2125

steel with the aid of seed crystals. It was shown that modifying additions of titanium and boron diminish the capacity of Kh23N18 steel for significant supercooling. Titanium and boron, at concentrations which produce minimum supercooling of the melt, refine the dendritic structure at rapid rates of solidification.

Neymark, V.Ye., and A.I. Dukhin. Effect of Modifying Agents on the Structure, Skin Deformation, and Solidification Rate of Steel Ingots

39

Skin defects were revealed in ingots of four types of steel (St. 3, Kh27, Kh23N18, and Kh18N9) by the vacuum-crystallization method. It was found that modifying agents (titanium, zirconium, and boron) reduce skin deformation and accelerate the skin-solidification rate of these steels in varying degrees. The results obtained suggest that it would be advisable to investigate the possibility of using modifying agents for lessening skin deformation and increasing the skin-solidification rate in the continuous casting of steel.

Card 3/18

Problems in Physical Metallurgy (Cont.)

SOV/2125

Kamenetskaya, D.S., Candidate of Physical and Mathematical Sciences; E.P. Rakhmanova; Ye.Z. Spektor; and V.I. Shirayev.
The Mechanism of the Effect of Aluminum on the Formation of Crystallization Centers in Liquid Iron

63

Liquid primary iron (electrolytic and direct-reduction) containing no active undissolved impurities or surface-active dissolved impurities can easily be supercooled 260-270° C, below the melting point. Nonactivated particles of Al_2O_3 have little effect on the development of crystallization centers in iron. But the start of the crystallization process in iron containing particles of Al_2O_3 has an activating effect on the particles and results in a decrease in supercooling capacity. The introduction of small quantities of aluminum into iron sharply reduces the supercooling capacity. The small degree of supercooling in such cases is in accord with the fact that additions of aluminum to steel act to refine the grain. In view of the results of this investigation and others, this effect may be explained by the fact that small additions of aluminum decrease the energy of nucleation in liquid iron. Because of the surface activity of aluminum, nucleation can take place spontaneously with but slight supercooling, as a result of which a fine-grained cast structure is obtained.

Card 4/18

Problems in Physical Metallurgy (Cont.)

SOV/2125

Malkin, V.I., Candidate of Technical Sciences. Mechanism of the Growth of Crystals From the Liquid Phase 76

Lyubov, B.Ya., Doctor of Physical and Mathematical Sciences, and D.Ye Temkin. On the Theory of Crystallization in Large Volumes 84

Leont'yev, V.I. Effect of Ultrasonic Waves on the Crystallization of Ingots

For effective passage of ultrasonic waves through molten metal it is necessary to establish a definite limit of specific ultrasonic power. The time necessary for action of the waves on the molten metal must exceed a certain minimum, but at the same time need not be as great as that required for complete solidification. Better results are obtained with the use of wider ingot molds and slower cooling. Ultrasonic waves induce intensive crystallization in all directions from numerous nuclei, the formation of which is aided by the action of the waves.

Card 5/18

Problems in Physical Metallurgy (Cont.)

SOV/2125

Gurevich, Ya.B., Candidate of Technical Sciences; V.I. Leont'yev; and I.I. Teumin, Candidate of Physical and Mathematical Sciences. Effect of Elastic Vibrations During Crystallization on the Structure, Mechanical Properties, and Deformability of Kh27 and Kh25N20 Steel

117

The application of elastic vibrations during crystallization results in a marked refinement of the grain. The linear dimensions of the grains are 3-5 times smaller than those of ordinary grains. Columnar crystals are almost entirely lacking. In addition, nonmetallic inclusions are relatively small and uniformly distributed. The mechanical properties of both types of steel are improved.

Neymark, V.Ye. Application of the Vacuum-Crystallization Method for Producing Hollow High-alloy Steel Ingots for Rolling Into Tubes

137

This method is recommended for the production of high-quality thin-walled ingots (blanks). In cases where the blanks are long and thick-walled, or short and thin-walled, the centrifugal-casting method is preferred. The vacuum-crystallization method is still in the experimental stage,

Card 6/18

Problems in Physical Metallurgy (Cont.)

SOV/2125

but is already being used at several Soviet machine-building plants for producing hollow cylindrical blanks from nonferrous metals and alloys.

Yemyashev, A.V.; A.M. Zubko, Candidate of Physical and Mathematical Sciences; and V.Āe. Neymark. On the Effect of Vacuum Melting and Teeming on Metal Properties and Ingot Quality 169

Zelenov, A.N., and D.S. Kamenetskaya. Effect of Inert Gas Pressure in the Furnace on Gas Content in the Metal 187

The content of nitrogen and hydrogen in metal melted in an atmosphere of argon at a pressure of 1-450 mm. Hg has little relationship to the pressure of the argon and is considerably lower than in the original charge. The inert gas must be purified of oxygen if a pressure is used at which the partial pressure of oxygen would exceed 0.01 mg. Hg. The same applies to nitrogen contained in the inert gas, provided the nitrogen reacts with the metal.

Card 7/18

Problems in Physical Metallurgy (Cont.)

SOV/2125

Gorbatenko, A.K., and D.S. Kamenetskaya. On the Shape of
Equilibrium Curves of Binary Alloys

191

PART II. PHYSICAL CHEMISTRY OF METALLURGICAL PROCESSES

Tomilin, I.A., Candidate of Technical Sciences, and L.A. Shvarts-
man, Doctor of Chemical Sciences. Effect of Silica, Calcium
Oxide, and Sodium Oxide on the Distribution of Sulfur and
Phosphorus in Iron and Ferruginous Slag

199

It was found that the heat of transfer of sulfur from iron to slag in the system FeO-SiO_2 , saturated with silica, is decreased by the addition of CaO to the slag. At a concentration of about 20 percent CaO the heat of reaction amounts to some 13,000 cal./g. atom, which coincides with the heat of transfer of sulfur from iron to ferruginous slag. Further, on increasing the content of CaO in the slag, a certain increase in entropy takes place. An overall result of these processes is a reduction in the value of the coefficients of sulfur distribution in comparison with acid slag not containing CaO . The introduction of Na_2O into the slag causes the same phenomenon to take place, but in a greater degree. These

Card 8/18

Problems in Physical Metallurgy (Cont.)

SOV/2125

facts may be explained by the specific interaction of ions in the acid fusion. The free energy of solution of solid iron sulfide in ferruginous and ferruginous-silicate slags was calculated. It was shown that the heat of transfer of phosphorus from iron to acid slag does not differ from the corresponding figure in the case of ferruginous slag. The coefficients of diffusion of phosphorus, however, are considerably less in the first case than in the second. This can be explained by the presence of a "structure" of silicate polymers in the acid slag. Additions of CaO and Na₂O to acid slag increase the heat of reaction of dephosphorization, and at the same time the values of the coefficients of distribution rise.

Kozhevnikov, I.Yu., Candidate of Technical Sciences, and
L.A. Shvartsman. Effect of Oxides of Alkali Earth Metals on
the Equilibrium of the Dephosphorization Reaction of Iron

221

Card 9/18

Problems in Physical Metallurgy (Cont.)

SOV/2125

Petrova, Ye.F., and L.A. Shvartsman. Effect of Alloying Elements on the Thermodynamic Activity of Carbon in Gamma Iron 259
It is shown that the activity of carbon in gamma iron containing additions of Mn, Cr, V, and Ti is considerably higher than in non-alloyed austenite. This would indicate that the bond strength of carbon dissolved in gamma iron is substantially increased by the introduction of carbide-forming elements.

Vintaykin, Ye.Z. Methods of Determining Vapor Pressure Over Metals and Alloys 293

Malkin, V.I. Measurement of Crystallization Rates in Slags of the System $\text{CaO-Al}_2\text{O}_3\text{-SiO}_2$ 306

For two slags of this system a determination was made of the relationship between temperature and rate of crystallization in the temperature range of the vitreous state. Within a narrow temperature range this relationship can be described by a simple exponential law. Determinations were also made of the energy of activation of the rate of crystallization. The high value of the energy of activation

Card 10/18

Problems in Physical Metallurgy (Cont.)

SOV/2125

for slag consisting of 23 percent CaO, 18 percent Al_2O_3 , and 59 percent SiO_2 (66,000 k cal./mol) as compared with that for slag consisting of 23 percent CaO, 32 percent Al_2O_3 , and 45 percent SiO_2 indicates the presence of cationic aluminum in these slags.

Malkin, V.I., and L.A. Shvartsman. Change in the Transport Number of the Na^+ Ion in Fused Sodium Silicate 311

Malkin, V.I., V.V. Pokidyshev, S.F. Khokhlov, and L.A. Shvartsman. The Effect of an Electric Current Passed Through the Slag-Metal Boundary in the Desulfurization Process of Pig Iron 314

Osipov, A.I., L.A. Shvartsman, V.Ye. Iudin; and M.L. Sazonov. On the Uniform Distribution of a Small Addition in the Slag During the Production of Steel in a 350-ton [Open-hearth] Furnace 318

Card 11/18

Problems in Physical Metallurgy (Cont.)

SOV/2125

The distribution process was studied with the use of a radioactive isotope (Ca^{45}). It was shown that the process of diffusion of a substance in slag takes place at a considerably slower rate than in metal.

Shvartsman, L.A., A.I. Osipov,, V.I. Alekseyev, V.F. Surov, M.L. Sazonov, M.T. Bul'skiy, S.A. Telesov, A.M. Skrebtsov, A.M. Ofengenden, L.G. Gol'dshteyn, and F.F. Sviridenko. An Investigation of the Kinetics of Scrap Melting in the Scrap-Ore Process

326

A method for determining the speed of melting scrap in an open-hearth furnace in the scrap-ore process was developed on the basis of this investigation. The method is based on "isotopic dilution" using radioactive cobalt. It was shown that the melting speed depends on the duration of the pig iron pouring process and carbon content in the bath.

Stupar', S.N. Investigation of the Transfer of Sulfur from the Gas Phase to the Bath in the Basic Open-hearth Furnace

344

The transfer of sulfur from the gas phase to the bath takes place most intensively during the loading of the

Card 12/18

Problems in Physical Metallurgy (Cont.)

SOV/2125

metallic portion of the charge. The speed of sulfur absorption during this period is 17-25 percent per hour, during pre-heating 8-11 percent, and during final melting 3-7.5 percent. Percentage is based on the sulfur content in the metal.

PART III. METHODS AND EQUIPMENT

Perkas, M.D., Candidate of Technical Sciences. Determination of the Depth of Decarburized and Carburized Layers by the X-ray Method

363

The maximum carbon content in the specimen was found to be not of the surface but at some depth (0.1-0.2 mm.) from the surface.

Zubko, A.M., Candidate of Physical and Mathematical Sciences, and Ye.Z. Spektor. A Quantitative Method for Determining the Graphitization of Coke in the Blast Furnace

372

Card 13/18

Problems in Physical Metallurgy (Cont.)	SOV/2125	
Lyashchenko, B.G. On the Possibility of Localizing Carbon Atoms in the Austenite Crystal Lattice by the Neutron Diffraction Method		378
Litevskiy, L.M., Candidate of Technical Sciences. Some Problems Concerning the Semidirect Investigation of Multiphase Alloys by the Electron Microscope Method		381
Zakharov, A.I. Determining the Integral Neutron Flux During the Bombardment of Materials in a Nuclear Reactor		389
Felinger, A.K. Controlling the Output Current of a Photoelectric Multiplier		394
It is possible to control the output current and amplification coefficient of an electric multiplier (FEU) by varying the voltage of one of the diodes.		
Afanas'yev, V.N. One Possible Method of Constructing a Multichannel Amplitude Analyzer		397

Card 14/18

Problems in Physical Metallurgy (Cont.)	SOV/2125	
Pliskin, Yu.S. Method of Designing Installations for Levitation Melting of Metals..		401
Methods of levitation melting of metals are compared, and a simple method of designing an inductor sufficiently accurate for practical purposes is proposed.		
Teumin, I.I. Principles of Designing Magnetostrictive Vibrators		412
Basic principles of designing magnitostriuctive vibration for untrasonic industrial equipment are presented. Special attention is given to the analysis of operating conditions in machining crystallizing metals and alloys		
Latyshev, V.K., and A.K. Felinger. Logarithmic Electron Converter for Type MF-4 Microphotometer		453
Tatochenko, L.K., Yu-V. Moysh, V.V. Lyndin, and B.S. Tokmakov. Magnetic Particle Inspection Method Used in Metallurgy		460

Card 15/18

Problems in Physical Metallurgy (Cont.)

SOV/2125

Zakharov, A.I. Proportional Neutron Counters Utilizing Boron Trifluoride 466

The author states that, ordinarily, gas obtained from the composition of a salt by heating is used in proportional neutron counters. However, he further states, BF_3 obtained from glass containers is also effective.

Kornev, Yu.V., Candidate of Physical and Mathematical Sciences. A Simple Electronic Magnetic Spectrometer for Identifying Radioactive Isotopes 481

A simple portable design of a beta-spectrometer based on focusing electrons by means of a transverse uniform magnetic field is described.

Tatochenko, L.K., and V.V. Lyndin. Instrument for Rapid Determination of the Curie Point 485

The instrument described is successfully being used at the TsNIICM for investigating properties of ferromagnetic alloys.

Card 16/18

Problems in Physical Metallurgy (Cont.)	SOV/2125	
Afanas'yev, V.N. Remote-control Radiometers for Radiometric Investigation of Certain Blast Furnace Production Processes		492
Latyshey, V.K. Use of Radioactive Isotopes for Measuring Levels [of liquids]		499
Latyshev, V.K., Yu.S. Pliskin, and L.K. Tatoshenko. Automatic Level Regulator for a Continuous Steel-casting Installation		512
Spasskiy, M.N., and L.M. Utevskiy. High-frequency Vacuum Melting Furnace		520
Gurevich, Yu.V., and V.Ye. Neymark. Selection of Conditions for Deformation of EI530 and EI533 Steels in the Cast State		527
The strength and plasticity of high-alloy steels, types EI533 and EI530, are sharply reduced with an increase in temperature. Mechanical properties of these steels were investigated in order to determine the possibility of improving their strength and plasticity at elevated temperatures by means of alloy treating or by diffusion annealing.		
Card 17/18		

Problems in Physical Metallurgy (Cont.)

SOV/2125

It was found that a substantial increase in plasticity results from the addition of 0.1-0.2] percent Al and 0.2-0.3 percent Ba-Al alloy. Addition of Titanium greatly reduces the plasticity.

Tokmakov, V.S. Experience Gained in the Use of Gamma-ray Flaw-detection Method in Metallurgy

537

Experience gained in the use of radioactive isotopes for the purpose of flaw detection has shown that it is possible to use this method in checking castings and welded structures.

AVAILABLE: Library of Congress

Card 18/18

GO/jmr
9-4-59

MALKIN, V.I.; POKIDYSHEV, V.V.

Svyazi mezhdru otnositel'noy podvizhnostyyu kationov v
silikatnykh rasplavakh i ikh zaryadami i radiusami.

report submitted for the 5th Physical Chemical Conference on
Steel Production.

MOSCOW

30 JUN 1969

5(2)

AUTHORS:

Malkin, V. I., Pokidyshev, V. V.

05895

SOV/78-4-11-48/50

TITLE:

Measurement of the Transference Number of Na^+ - and Ba^{2+} -Ions in the Melt $\text{Na}_2\text{O} \cdot \text{BaO} \cdot 4\text{SiO}_2$

PERIODICAL:

Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 11, pp 2645-2646 (USSR)

ABSTRACT:

In order to determine the relative mobility of a bivalent ion the radius of which is larger than that of Ca^{2+} , a melt was prepared from Na_2CO_3 , BaCO_3 and rock crystal, and the transference number was computed by means of the radioactive isotopes Na^{24} (5 experiments) and Ba^{140} (3 experiments) according to the equations derived in reference 4. As had been expected, the transport of electricity in the melt $\text{Na}_2\text{O} \cdot \text{BaO} \cdot 4\text{SiO}_2$ takes place only by cations (sum of transference numbers ~ 1). The fraction

Card 1/2

05895

SOV/78-4-11-48/50

Measurement of the Transference Number of
Na⁺ and Ba²⁺-Ions in the Melt Na₂O.BaO.4SiO₂

of Ba in the transport is much smaller than that of Ca²⁺ in the melt Na₂O.CaO.4SiO₂ which is assumed to be due to the lower mobility of Ba²⁺ caused by the larger radius. There are 1 table and 7 references, 6 of which are Soviet.

ASSOCIATION: Institut metallovedeniya i fiziki metallov (Institute of Metallography and Metal Physics) - Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii (Central Scientific Research Institute of Ferrous Metallurgy)

SUBMITTED: February 23, 1959

Card 2/2

MALKIN, V.I., kand.tekhn.nauk

Mechanism of crystal growth from melts. Probl.metall^oed.i fiz.
met. no.6:76-83 '59. (MIRA 12:8)
(Crystals--Growth) (Liquid metals)

MALKIN, V.I., kand.tekhn.nauk

Measuring crystallization rates in slags of the $\text{CaO} - \text{Al}_2\text{O}_3 - \text{SiO}_2$
system. Probl.metalloved.i fiz.met. no.6:306-310 '59. (MIRA 12:8)

(Crystallization--Speed) (Slag--Testing)

MALKIN, V.I., kand.tekhn.nauk; SHVARTSMAN, L.A., doktor khim.nauk

Measuring the number of Na^+ ion transfer in sodium silicate
melts. Probl.metalloved.i fiz.met. no.6:311-313 '59.
(MIRA 12:8)

(Ions) (Sodium silicates)

MALKIN, V.I., kand.tekhn.nauk; POKIDYSHEV, V.V.; KHOKHLOV, S.F.;
SHVARTSMAN, L.A., doktor khim.nauk

Effect of electric current passed through a metal-slag boundary
on the process of iron desulfuration. Probl.metallorod. i fiz.
met. no.6:314-317 '59. (MLBA 12:8)
(Cast iron--Electrometallurgy)
(Desulfuration)

5(4)

AUTHORS:

Malkin, V. I., Pokidyshev, V. V.

SOV/20-127-6-30/51

TITLE:

Determination of the Relative Mobility of Alkali Metal
Ions in Silicate Melts

PERIODICAL:

Doklady Akademii nauk SSSR, 1959, Vol 127, Nr 6, pp 1253-1255
(USSR)

ABSTRACT:

The present investigation was intended to explain the relation between ionic radius and mobility for alkali cations. The analysis was made by measurement of the Hittorf number in silicate melts consisting of $\text{Me}_2^{\text{I}}\text{O} \cdot \text{Me}_2^{\text{II}}\text{O} \cdot 0.4\text{SiO}_2$ (Me = Li, Na, K, Rb, Cs), and the concentration change of the one cation was observed by means of Na^{24} , K^{42} , Rb^{86} , or Cs^{134} marking. The experiments were performed at 1200° by using a corundum cell. Table 1 shows the measured Hittorf numbers, the radii as calculated according to Pauling, and the coordination numbers. It was discovered that with increasing radius of the cation there is a tendency to raise the Hittorf number according to the lessened strength of the linkage of the cation to the anion of the melt. The raise of the Hittorf number does not proceed

Card 1/2

Determination of the Relative Mobility of Alkali
Metal Ions in Silicate Melts

SOV/20-127-6-30/51

monotonously. Not always does a great difference between two radii of the cations correspond to a great difference of the Hittorf numbers. The relative mobility of the cation is not only influenced by the strength of the linkage to the anion but mainly also by a geometric factor that is caused by repulsive forces. This factor complicates the migration of a big cation more than that of a small one. The interaction of both these factors (strength of the linkage and repulsive forces) causes a zigzag shape of the ionic mobility curve. There are 1 figure, 1 table, and 12 references, 8 of which are Soviet.

ASSOCIATION: Institut metallovedeniya i fiziki metallov Tsentral'nogo nauchno-issledovatel'skogo instituta chernoy metallurgii (Institute of Metallography and Metal Physics of the Central Scientific Research Institute of Ferrous Metallurgy)

PRESENTED: April 24, 1959, by G. V. Kurdyumov, Academician

SUBMITTED: April 22, 1959

Card 2/2

MALKIN, V.I.; POKIDYSHEV, V.V. (Moscow)

Measurement of cation transference numbers in $\text{Na}_2\text{O}\cdot\text{MgO}\cdot 4\text{SiO}_2$ and
 $\text{Na}_2\text{O}\cdot\text{SrO}\cdot 4\text{SiO}_2$ melts. Zhur. fiz. khim. 34 no.4:805-808 Ap 1960.
(MIRA 14:5)

1. Institut metallovedeniya i fiziki metallov Tsentral'nogo nauchno-
issledovatel'skogo instituta chernoy metallurgii.
(Ions--Migration and velocity)

MALKIN, V.I.; MOGUTNOV, B.M.

Self-diffusion of alkali ions in silicate melts. Dokl. AN
SSSR 141 no.5:1127-1130 D '61. (MIRA 14:12)

1. Tsentral'nyy nauchno-issledovatel'skiy institut chernoy
metallurgii im. I.P. Bardina. Predstavleno akademikom G.V.
Kurdyumovym.

(Alkali metal silicates) (Diffusion)

MALKIN, V.I. (Moscow)

Dependence of the relative mobility of cations on their
coordinate number ratios in three-component silicate melts.
Zhur. fiz. khim. 35 no.2:336-341 F '61. (MIRA 16:7)

1. Institut metallovedeniya i fiziki metallov Tsentral'nogo
nauchno-issledovatel'skogo instituta chernoy metallurgii.
(Silicates) (Cations)

MALKIN, V.I., kand.tekhn.nauk

Mobility of ions and the acid-basic interaction in silicate melts.
Probl. metalloved. i fiz. met. no. 7:522-532 '62. (MIRA 15:5)
(Silicates) (Ions--Migration and velocity)

MALKIN, V.I.; MOGUTNOV, B.M.

Measurement of the transfer number of cations in a $\text{Na}_2\text{O} \cdot \text{K}_2\text{B}_2\text{O}_3$
melt. Zhur.neorg.khim. 7 no.9:2277-2278 S '62. (MIRA 15:9)

1. Institut metallovedeniya i fiziki metallov i Tsentral'nyy
nauchno-issledovatel'skiy institut chernoy metallurgii imeni
I.P. Bardina.

(Alkali metal borates)
(Ions—Migration and velocity)

S/032/62/028/003/004/017
B101/B138

AUTHORS: Malkin, V. I., and Mogutnov, B. M.

TITLE: Methods of measuring the diffusion coefficient in silicate melts

PERIODICAL: Zavodskaya laboratoriya, v. 28, no. 3, 1962, 291 - 296

TEXT: This is a survey of methods published for determining the diffusion coefficient in slags and other silicate melts. Tagging with radio-isotopes and investigations of electroic processes are mentioned. Equations are given for calculating the diffusion coefficient. The following Soviet authors are mentioned: Han Ch'ih-yung, V. A. Grigoryan, A. A. Zhukhovitskiy (Izvestiya Vysshikh uchebnykh zavedeniy. Chernaya metallurgiya, 5, 5 (1961), I. A. Novokhatskiy, O. A. Yesin, S. K. Chuchmarev (Doklady AN SSSR, 136 (4), 868 (1961), and Yu. P. Nikitin, O. A. Yesin, Ye. S. Vorontsov (Zhurnal fizicheskoy khimii, 32 (6), 1420 (1958)). There are 1 figure and 39 references: 20 Soviet and 19 non-Soviet. The four most recent references to English-language publications read as follows: T. Saito, K. Maruya. Sci. Rep. Research Inst. Tohoku

Card 1/2

S/032/62/028/003/004/017
B101/B138

Methods of measuring the...

Univ., 10A (4), 306 (1958); T. B. King and P. J. Koros, Kinetics of high
Temperature Processes. Reports of the Conference, New York, 80 - 85
(1959); L. Yang and M. T. Simnad, Physico-Chem. Measurements at High
Temperature. Butterworth's Sci. Publications, London, 295 (1959);
J. Henderson, L. Yang, Trans. of Metallurgical Soc. of AIME, 221 (1), 56
(1961).

Card 2/2

L 7903-66 EWT(m)/EWP(t)/EWP(z)/EWP(b) IJP(c) JD/JW/HW/JG
ACC NR: AP5027932 SOURCE CODE: UR/0363/65/001/010/1747/1757

AUTHOR: Malkin, V. I.; Pokidyshev, V. V. 46
B

ORG: Central Scientific Research Institute of Ferrous Metallurgy im. I. P. Bardin
(Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii)

TITLE: The nature of the interaction of the components in the gamma and gamma' phase of the systems Ni-Al, Ni-Al-Cr, Ni-Al-Co, and Ni-Al-Fe

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 1, no. 10, 1965, 1747-1757

TOPIC TAGS: nickel alloy, aluminum alloy, chromium alloy, cobalt alloy, iron alloy

ABSTRACT: The emf method is used to determine the thermodynamic activity of aluminum in the binary system nickel-aluminum (0 - 25 at. % Al), in the ternary system Ni-Al-Cr (0 - 21 at. % Al), and in sections of Ni-Al-Co and Ni-Al-Fe with a constant ratio of atomic fractions $N_{Ni}/N_{Co} = 9$ and $N_{Ni}/N_{Fe} = 9$ (0 - 26 at. % Al). The experiments were carried out at 770 - 900C in an argon-filled closed cell. The measurements showed a strong negative deviation from ideality in the alloys studied. The magnitude of these deviations decreases from the binary system to ternary ones in the order Ni-Al, Ni-Al-Co, Ni-Al-Fe, Ni-Al-Cr. Correspondingly, the work of formation of the γ' phase decreases. These results are based on concepts of donor-acceptor interaction. The data are in good agreement with those obtained by measuring the vapor pressure and with calorimetric measurements. Orig. art. has: 8 figures

Card 1/2

UDC: 669.017.3

L 7903-66

ACC NR: AP5027932

4 tables, and 10 formulas.

SUB CODE: MM, TD, IC / SUBM DATE: 05Jul65 / ORIG REF: 007 / OTH REF: 005

Card

2/2

35968-66 EWT(m)/EWP(t)/ETI IJP(c) JD/WW/JW/IW/JG

ASSIGN: AP6013372

SOURCE CODE: UR/0370/66/000/002/0166/0173 ⁵⁹

AUTHOR: Malkin, V. I. (Moscow); Pokidyshev, V. V. (Moscow) ⁵⁸

ORG: none

TITLE: Determination of the thermodynamic activity of aluminum in Ni-Al and Ni-Al-Cr alloys by the electromotive force method ^{16 27 27 27}

SOURCE: AN SSSR. Izvestiya. Metally, no. 2, 1966, 166-173

TOPIC TAGS: nickel alloy, aluminum alloy, chromium containing alloy, free energy

ABSTRACT: In order to determine the influence of chromium on the interaction of nickel and aluminum, the emf method was used to determine the activity of aluminum in alloys of the binary system Ni-Al in the concentration range from 0 to 25 at.% Al and in the α -Al section of the ternary system Ni-Al-Cr (8.38 at.% Cr, 91.62 at.% Ni - 100 at.% Al) in the concentration range from 0 to 21 at.% Al. The experiments were performed at 1045, 1090, 1135, and 1180°K. A pronounced negative deviation from ideality was observed in the alloys of both systems. The work of formation of the alloys and the magnitude of these deviations decrease as chromium is added to the alloys of the binary system. The observed decrease in the interaction of nickel and aluminum in the presence of chromium may be due to the competition between aluminum and chromium in giving up their electrons to nickel. The results obtained by the emf

Card 1/2

UDC: 669.245*71*26

L 38968-06

ACC NR: AP6013372

method are in good agreement with data on chromium vapor pressure measurements and with the results of calorimetric measurements. Orig. art. has: 5 figures, 3 tables, and 10 formulas. ———

SUB CODE: 11/ SUBM DATE: 26Feb64/ ORIG REF: 004/ OTH REF: 003

Card 2/2 MLP

U 18224-66 EAF(m) C/WP(1) / 100 10P(1) SH/AD/HA

ACC NR: AP6009427

SOURCE CODE: UR/0020/66/166/006/1390/1392

AUTHOR: Malkin, V. I.; Pokidyshev, V. V.

1.2
1.1
0

ORG: Central Scientific Research Institute of Ferrous Metallurgy im. I. P. Bardin
(Tsentral'nyy nauchno-issledovatel'skiy institut chernoy)

TITLE: Effect of a third component added to nickel-aluminum alloys on the thermo-
dynamic properties of the γ - and γ' -phases

SOURCE: AN SSSR. Doklady, v. 166, no. 6, 1966, 1390-1392

TOPIC TAGS: thermodynamic property, nickel alloy, high temperature alloy

ABSTRACT: The activity of aluminum in the γ - and γ' -phases of the Ni-Al binary system and the Ni-Al-Cr, Ni-Al-W, Ni-Al-Co and Ni-Al-Fe ternary systems was studied by the emf method in the 1045-1180°K temperature interval. The sum of emf of the cobalt-aluminum reference electrode (containing 55-70% Al) and the test alloy characterizes the work required for the transfer of aluminum from the aluminum melt into this alloy. If solid aluminum at the temperature of the experiment is taken as the standard state then the isobaric-isothermal potential of the dissolution of aluminum in the alloy, where N_{Al} is the atomic fraction of aluminum, is defined by the

Card 1/3

UDC: 536.777

L 38224-66

ACC NR: AP6009427

expression

$$\Delta Z_{Al} = RT \ln a_{Al} = RT \ln \gamma_{Al} + RT \ln N_{Al} = -nEF - \Delta S_{f,Al}(T - T_{f,Al}), \quad (1)$$

where n is the charge of aluminum ion, E is emf in volts, $F = 23,060$ (if ΔZ_{Al} is expressed in calories), a_{Al} is the activity of aluminum in the alloy, γ_{Al} is the activity coefficient of aluminum, ΔS_f is the entropy of the fusion of aluminum, T_f is the melting point of aluminum in $^{\circ}K$, T is the temperature of the experiment in $^{\circ}K$. In all of the systems investigated, extremely large negative deviations from the ideal behavior were observed. These deviations decrease with an increase in temperature, which indicates a strong interatomic interaction. This interaction is greatest in the Ni-Al system, where the added third component increases the activity of aluminum in the following order: Co, Fe, Cr, W. A similar sequence, characterized by the interatomic interaction in the systems upon the addition of the third component, was also observed in the partial heats of solution of aluminum in alloys of γ - and γ' -phases. The effect of the third component on the thermodynamic activity of aluminum is related to the difference in the electronegativity of nickel and of the added component. The greater this difference, the more effective is the added third component in increasing the activity of aluminum. As the solubility of the third component decreases in the γ' -phase the activity of aluminum in this phase

Card 2/3

L 38224-66
ACC NR: AP6009427

increases. Orig. art. has: 2 figures, 1 table.

SUB CODE: 11,²⁰~~07~~ / SUBM DATE: 01Jul65/ ORIG REF: 005/ OTH REF: 001

Card 3/3 *HB*

SOV/137-59-3-4928

Translation from: Referativnyy zhurnal. Metallurgiya, 1959, Nr 3, p 4 (USSR)

AUTHORS: Nosov, G. L., Malkin, V. M.

TITLE: Heating a Two-layer Plate (Nagrev dvukhsloynoy plastiny)

PERIODICAL: Tr. Ural'skogo politekhn. in-ta, 1958, Nr 73, pp 198-206

ABSTRACT: The analytical solution of the heating of an unbounded plate (P) consisting of two layers with different thermal characteristics is adduced. The heat transfer onto one of the P surfaces proceeds according to Newton's law. The ambient space has a constant temperature. No heat is lost on the reverse side of the P (adiabatic surface or plane of symmetry). The thermal characteristics of the layers and the heat transfer coefficient are assumed to be at their medium values and independent of the temperature. Cases are examined when the temperatures of P are either equal at all points at the initial moment or when each layer has its own initial temperature.

G. G.

Card 1/1

MALKIN, V.M., inzh.

Accurate and efficient shaping of grinding wheels on flat-surface
grinding machines. Vest.mash. 40 no.2:60-64 F '60.

(MIRA 13:5)

(Grinding wheels)

76

Report presented at the Conference on Heat and Transfer.
Minsk, USSR, 5-13 June 61.

RN-2852
54

- 253. S. I. Givinsky, T. I. Perekhin, Diffusion of Charged Particles at the Presence of Recombination
- 254. T. L. Perekhin, On Heat Transfer in Laminar Flow in the Inlet Part of a Tube
- 255. I. G. Portnov, Solution of Some Problems with Phase Conversions by Operational Calculus
- 256. L. M. Stams, Numerical Solution of Some Problems of Motion of a Liquid with Variable Viscosity
- 257. S. I. Derkov, On Conformal Transformation of Radiations Fields in Vacuum
- 258. Yu. A. Semolovich, Calculation of Heating of Rectangular Bodies According to Technological Conditions
- 259. I. R. Mikh, emissivity of Cylindrical Radiating Volume
- 260. V. S. Timofeev, V. M. Volkov, F. R. Shalyar, Theory of Regeneration Heat Exchanger Design
- 261. E. I. Tikhonov, On Calculation Method of Heat Transfer Through the Wall at Change of the Aggregation State of One or Both Heat Agents
- 262. A. V. Kuvshinov, Yu. A. Semolovich, V. M. Kalugin, Regularities of Heating of the Coolest Shapes by Radiation and Convection
- 263. G. L. Babitskiy, Peculiarities and Some Results of Thermal Treatment Investigations of Polydisperse Finited Material
- 264. L. S. Klyuchikov, Heat and Mass Transfer in Joint Free and Forced Convection
- 265. Yu. V. Ipatov, Heat and Mass Transfer at Turbulent Flow of Gases and Liquids at Pressure Substance Supply
- 266. A. S. Gerasimov, E. E. Solovkin, Influence of Transversal Curvature of the Surface on Heat Transfer Rate of Axisymmetrical Bodies and Walls
- 267. A. A. Gerasimov, On the Heat and Mass Transfer Theory at Convective Motion of Liquid
- 268. V. I. Subbotin, M. Kh. Ibragimov, B. I. Monofilov, Mass Transfer of Temperature Turbulent Pulsations in a Liquid Film
- 269. A. A. Ponomarev, On the Theory of Fusion and Burning of a Body (The Stephan Problem)

MARKIN W.A.

MALKIN, V. M.; TIMOFEYEV, V. N.; SHKLYAR, F. R.

Temperature field of a plate during the regenerative heat
exchange process. Sbor. nauch. trud. VNIIMT no.8:5-15 '62.
(MIRA 16:1)

(Heat—Transmission)

TIMOFEYEV, V. N.; MALKIN, V. M.; SHKLYAR, F. R.

Theory of regenerative heat exchanger design. Sbor. nauch.
trud. VNIIMT no.8:16-32 '62. (MIRA 16:1)

(Heat exchangers—Design and construction)

MALKIN, V. M.; TIMOFEYEV, V. N.; SHKLYAR, F. R.

Developing methods for the calculation of regenerative heat
exchangers. Sbor. nauch. trud. VNIIMT no.8:41-67 '62.
(MIRA 16:1)

(Heat—Transmission)
(Heat regenerators)

MALKIN, V. M.

Unsteady heat exchange in a fluid with laminar flow. Sbor. nauch.
trud. VNIIMT no.8:106-118 '62. (MIRA 16:1)

(Heat--Transmission) (Laminar flow)

SHKLYAR, F. R.; TIMOFEYEV, V. N.; MALKIN, V. M.

Experimental investigation of heat exchange coefficients α
during the regenerative heat exchange process. Sbor. nauch.
trud. VNIIMT no.8:162-177 '62. (MIRA 16:1)

(Heat regenerators—Testing)
(Heat—Transmission)

SHKLYAR, F. R.; MALKIN, V. M.

Calculations of a blast furnace air preheater with variable
air flow. Sbor. nauch. trud. VNIIMT no.8:178-196 '62.
(MIRA 16:1)

(Blast furnaces) (Air preheaters)

TIMOFFEYEV, V. N.; SHKLYAR, F. R.; KASHTANOVA, S. P.; MALKIN, V. M.

Methods of calculating heat regenerators for industrial
furnaces. Sbor. nauch. trud. VNIIMT no.8:197-228 '62.
(MIRA 16:1)

(Heat regenerators)

SHKLYAR, F. R.; TIMOFEYEV, V. N.; MALKIN, V. M.

Methods of calculating blast furnace air preheaters. Sbor.
nauch. trud. VNIIMT no.8:229-245 '62. (MIRA 16:1)

(Blast furnaces) (Air preheaters)

MALKIN, V. M.; SHKLYAR, F. R.

Simultaneous blowing operation of two air preheaters. Sbor.
nauch. trud. VNIIMT no.8:259-277 '62.

(MIRA 16:1)

(Blast furnaces) (Air preheaters)

SHKLYAR, F. R.; TIMOFEYEV, V. N.; MALKIN, V. M.

Selecting optima thermal rates for air preheater operations.
Sbor. nauch. trud. VNIIMT no.8:278-288 '62. (MIRA 16:1)

(Air preheaters)

MALKIN, V. M., SHKLYAR, F. R.

Temperature distribution in solids of rectangular shape
under linear boundary conditions and internal over-all
sources of heat. Sbor. nauch. trud. VNIIMT no.8:495-524 '62.
(MIRA 16:1)

(Solids) (Heat--Conduction)

MALEIN, Ya.

Verifying range finders of cameras. Sov. foto 18 no.9:44
S '58. (MIRA 11:10)
(Cameras)

MALKIN, Ya. I.

137-58-4-6769

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 4, p 66 (USSR)

AUTHOR: Malkin, Ya. I.

TITLE: Anniversary Note on the Personnel of the Chimkent Lead Works
(Rabotniki Chimkentskogo svintsovogo zavoda k yubileyu)

PERIODICAL: Byul. tsvetn. metallurgii, 1957, Nr 19-20, pp 61-62

ABSTRACT: The achievements scored by the personnel of the plant on the occasion of the anniversary are noted.

1. Metallurgy--USSR 2 Personnel--Citations

G. G.

Card 1/1

M B L 4 11, 70 P

INSTRUMENTATION: CLOUD CHAMBERS

"Method of Scanning and Measuring Cloud-Chamber Tracks", by Ya.P. Malkin, Tbilisi State University, Pribory i Tekhnika Eksperimenta, No 3, November-December 1956, pp 42-43.

The advantage of the method proposed in this article is the possibility of viewing a stereoscopic image simultaneously by several investigators, using three-dimensional projection in polarized light. Apparatus and a measurement procedure are described and results are cited.

Card 1/1

Smelting of lead in electric furnaces. Ya. Z. Malin, A. P. Vyshny, and A. V. Vukov. *Trudny Metal.* No. 11, 36-42 (1957). Experiment. scale elec. furnace smelting tests on a roasted concentrate contg. Pb 35.6, Cu 1.6, and Zn 8.45% resulted in 83% Pb recovery in a product contg. Pb 97.6, Cu 4.54, and Zn 0.97%. Optimum results were obtained with 37% electrode submergence equal to 1/2 depth of bath, 5.5-6.5% S in the concentrate, and 6-7% coke in the charge. Power consumption was 600-700 kw. hrs./metric ton concentrate. H. W. Hartmann

MALKIN, Ya. Z.

136-8-9/21

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

TITLE: Production of High Purity Lead (Polucheniye svintsa vysokoy chistoty)

PERIODICAL: Tsvetnye Metally, 1957, Nr 8, pp.44-51 (USSR)

ABSTRACT: The authors describe a systematic investigation to secure the industrial production of high-purity lead in which the concentration of 25 elements is controlled so as not to exceed 10^{-4} to 10^{-5} %, the maximal concentration of silver, copper and cadmium being 2×10^{-5} , 10^{-4} and 10^{-4} %, respectively. They give analyses of lead after repeated electrolysis in an industrial (Table 1) and a purified electrolyte (Table 2), and describe the scheme used for removing silver and copper (Fig.1). Changes in process conditions and impurities-concentrations during the refining of lead are shown graphically (Fig.2) and impurity levels in lead obtained by pyrometallurgical refining of cathodic lead with and without repeat electrolysis are compared (Table 3). Rapid analytical methods developed for production control are described. It was shown that by using pyrometallurgical refining of

Card 1/2

136-8-9/21

Production of High Purity Lead.

cathodic lead with and without repeat electrolysis , lead of the required purity could be obtained in an industrial installation. The experiments also showed that for removing silver and copper it is better to use metallic zinc and elementary sulphur simultaneously than separately. Sh.I. Peyzulayev, A.T.Shamova, N.V.Vovtuta and T.V.Dembnitskaya participated in the work.

There are 2 figures, 4 tables and 5 references, 3 of which are Slavic.

ASSOCIATION: Chimkent Lead Works.
(Chimkentskiy Svintsovy Zavod)

AVAILABLE: Library of Congress.

Card 2/2

MALKIN, YA. Z.

136-10-12/13

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

TITLE: Extraction of Tellurium from Some Lead-Industry Products
(Izвлеcheniye tellura iz nekotorykh produktov svintsovogo
proizvodstva)

PERIODICAL: Tsvetnyye Metally, 1957, Nr 10, pp.80-87 (USSR)

ABSTRACT: The authors describe results of work carried out at the Chimkent lead works with the object of finding the concentration of tellurium in various materials involved in lead production and of determining methods for its recovery. The concentrates received at the works have 0.005-0.700% Te and the distribution of the element in different products (Tables 1 and 2) showed that some contained increased concentrations, particularly alkali skimmings from the oxygen refining of bismuth. A method for recovering elementary tellurium from these is described; and it is shown that the element can also be recovered from slag from the melting of sodium antimonate. Details are given of two new spectroscopic methods developed for determining tellurium in lead (1-0.006%), bismuth (1-0.003%), tin(1-0.01%) and antimony (1-0.005%) and also in

Card 1/2