

Recovery of metallic sodium ...

3/020/61/140/003/020/020  
B103/B101

ASSOCIATION: Institut metallurgii Ural'skogo filiala Akademii nauk SSSR  
(Institute of Metallurgy of the Ural Branch of the Academy  
of Sciences USSR)

PRESENTED: April 4, 1961, by S. I. Vol'fkovich, Academician

SUBMITTED: April 4, 1961

Card 3/3

KHODAK, L.P.; VARLAMOVA, N.N.; KOZHEVNIKOV, G.N.

Extraction of alumina and alkali from sinters obtained in the  
reduction smelting of red muds. Izv. Sib. otd. AN SSSR no.7:  
64-70 \*62

1. Ural'skiy filial AN SSSR, Sverdlovsk.

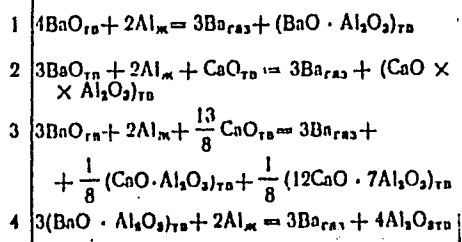
S/136/63/000/002/003/006  
E193/E383

AUTHOR: Kozhevnikov, G.N.

TITLE: Aluminium reduction of barium and strontium oxides

PERIODICAL: Tsvetnyye metally, no. 2, 1963, 53 - 56

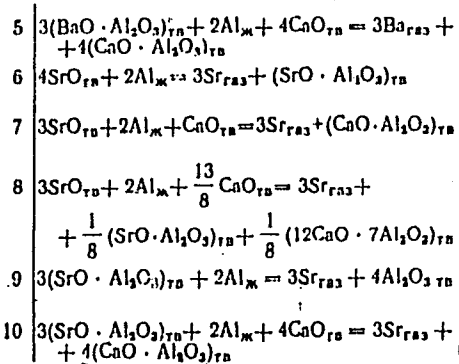
TEXT: Using published data on the temperature-dependence of the isobar-isothermal potential,  $\Delta z_T^0$  of various reactions between Al, O, BaO, SrO and  $Al_2O_3$ , the present author derived expressions describing the temperature-dependence of  $\Delta z_T^0$  for the following reactions: (The subscript "TB" = solid, "L" = liquid and "G" = vapour)



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Aluminium reduction ....

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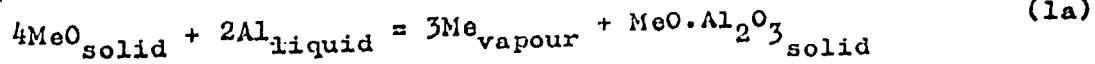
These expressions were used to calculate the partial vapour pressure of Ba and Sr at 1500-1700 °C. The results are reproduced in Figs. 1 and 2, where the partial vapour pressure (mm Hg) of Ba and Sr is plotted against temperature (°C), the numbers ascribed to the curves corresponding to the number of the reactions given above; the curves marked "Ba" and "Sr" relate to the equilibrium vapour pressure of these metals in the respective Me<sub>liquid</sub>/Me<sub>vapour</sub>

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Aluminium reduction ....

systems. The results obtained indicate that, in principle, it should be possible to increase the yield of metallic Ba and Sr over that attained in the standard process by either of the following methods: a) reduction at atmospheric pressure of Ba and Sr aluminates formed according to the reaction:



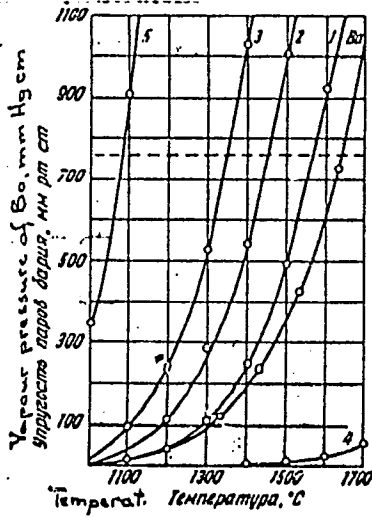
which leads to the formation of an alloy and pure metal; b) direct reduction of the Ba and Sr oxides with Al in the presence of lime, which yields pure metal. There are 2 figures and 2 tables.

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Aluminium reduction ....

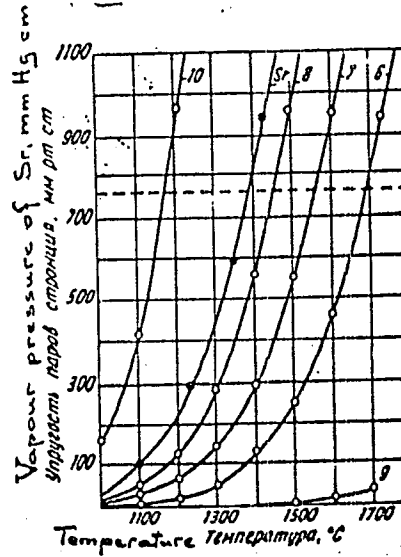
S/136/63/000/002/003/006  
E193/E383

Fig. 1:



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Fig. 2:



MIKULINSKIY, A.S.; KOZHEVNIKOV, G.N.; BAKHIREVA, L.D.; VULIKH, A.I.

Vacuum-thermal separation of cesium and potassium fluorides. Izv.  
SO AN SSSR no.7 Ser.khim.nauk no.2:105-107 '63. (MIRA 16:10)

1. Ural'skiy filial AN SSSR, Sverdlovsk.

L 63556-65 EWT(m)/EWP(L)/EWP(b) IJP(a) JD/JW

ACCESSION NR: AT5015891

UR/2975/64/000/010/0129/0137

AUTHOR: Mikulinskiy, A. S.; Kozhavinikov, G. N.

22  
21  
B1

TITLE: Production of metallic sodium in a vacuum electric furnace

SOURCE: AN SSSR, Ural'skiy filial, Institut metallurgii, Trudy, no. 10, 1964, Protsessy rudnoy elektrotermii (Processes of mining electrothermics), 129-137

TOPIC TAGS: sodium, metal purification

ABSTRACT: The reduction of sodium carbonate by carbon in a vacuum electric furnace was studied to develop economic sodium extraction methods. Three general categories were considered: (1) the theoretical prerequisites for the reduction process (including a thermodynamic analysis of the Na-C-O, Na-O, and Na-C systems); (2) a general discussion of the furnace construction; and (3) the results of actual laboratory scale production. In the first part, free energy data was combined with the equilibrium constant for the reaction,



The result gave the log of the partial pressure of Na as a function of temperature.

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L 63556-65

ACCESSION NR: AT5015091

This equation was plotted and used to determine the equilibrium phase of Na at the furnace temperatures. The stability of  $\text{Na}_2\text{O}$ , and the interaction of Na with carbonaceous materials was also analyzed. Previous x-ray studies (Boydilo, M. K., Trudy Kirgizskogo sel'skokhozyaystvennogo instituta, Frinze, Vyp. 10, No. 3, 1957, 203) on the Na-C system are tabulated, showing the effect of Na on the lattice parameter of graphite. In the second part, the principal aim was a more efficient design for the vacuum furnace. A cross-sectional figure is given which outlines the important details, along with a textual explanation. The final experimental portion summarizes the actual use of the furnace in the production of Na, including procedures for charge preparation, and the experimental results. Appropriate transformer settings and heating schedules are given; in general, the heating time is 3.5-4 hrs, and the pressure after initial heating falls from 5 to 1 mm of Hg. The Na vapor was condensed and a compact mass of metal was produced. The authors conclude that further work is necessary in order to establish optimum electrical conditions for production. Orig. art. has: 2 figures, 2 tables.

ASSOCIATION: none

SUBMITTED: 00

ENCL: 00

SUB CODE: RM, GC

NO REF SOV: 011

OTHER: 011

Card 2/2

L 59626-65 ENT(m)/EPF(n)-2/ENP(t)/EWP(b) Pg 4 IJP(c) JD/JM/JG  
ACCESSION NR: AT5015892 UR/2975/64/000/G10/G138/G143

AUTHOR: Kozhevnikov, G. N.; Mikulinskiy, A. S.

TITLE: Production of alkali-metal oxides 1

SOURCE: AN SSSR, Ural'skiy filial, Institut metallurgii. Trudy, no. 10, 1964, Protsessy rudnoy elektrottermii (Processes of mining electrothermics), 138-143

TOPIC TAGS: alkali metal, chemical decomposition, thermochemistry, oxide, aluminate, hydroxide

ABSTRACT: A thermal method, based on the decomposition of alkali metal carbonates, aluminates and hydroxides, was studied. The dissociation processes of the above compounds were analyzed both chemically and thermodynamically. Experiments were done to test the feasibility of the processes, and data were collected for the percentage output as a function of temperature. The compounds were placed in crucibles and heated to various temperatures; the resulting products were analyzed for oxide content. The carbonates did not give a high enough yield to be considered for processing either Na<sub>2</sub>O or K<sub>2</sub>O. However, these oxides could be usefully produced by dissociation of aluminates at 1100-1350°C and at pressures of 0.05-2.5 mm Hg, for a

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ACCESSION NR: AT5015892

40-45% yield. The chemical reaction for this process was presented as  $He_2CO_3 + Al_2O_3 = He_2O \cdot Al_2O_3 + CO_2$  for temperatures in the 1100-1300°C range, and at atmospheric pressure, in order to eliminate the carbon dioxide gas; after this the aluminate was allowed to dissociate in a vacuum of 0.05-1 mm Hg at 1300-1400°C, according to the reaction  $He_2O \cdot Al_2O_3 = He_2O + Al_2O_3$ . It was also established that for 500-700°C and residual pressures of 2-11 mm Hg, lithium hydroxide could be dehydrated and a yield of 85-91%  $Li_2O$  obtained. When the temperature is reduced to 1000-1200°C, dehydrogenation of lithium hydroxide takes place at atmospheric pressure in the form of thin layers, leaving behind a surface of the residual lithium oxide. Orig. art. has: 6 tables

ASSOCIATION: none

SUBMITTED: 00

ENCL: 00

SUB CODE: MM, GC

NO REF SOV: 007

OTHER: 008

*Jm*  
Card 2/2

L 51841-65 ENI(m)/ENP(t)/ENP(b) LJP(c) JD/JR/JG

ACCESSION NR: AP5011808

UR/0080/65/038/001/0713/0717  
661.32AUTHOR: Kozhevnikov, G. N.; Mikulinskiy, A. S.; Bakhireva, L. D.

TITLE: Preparation of metallic sodium by reduction of its silicate with carbon in a vacuum

SOURCE: Zhurnal prikladnoy khimii, v. 38, no. 4, 1965, 713-717

TOPIC TAGS: sodium, silicate, reduction, carbon

ABSTRACT: On the basis of a thermodynamic calculation and experimental data, it is shown that sodium metal can be obtained by reducing its silicate with carbon. The reaction  $(Na_2SiO_3 + C + 2CaO \rightarrow 2Na + 2CaOSiO_2 + CO)$ , carried out at 1100-1200°C at a residual pressure of 0.2-5 mm Hg in the presence of lime, produces a 88-75% yield of sodium. In order to obtain high yields of sodium, the amount of CaO added to the initial mixture should correspond to the optimum molar ratio  $CaO:SiO_2 = 2$ . Without the addition of CaO, the sodium yield is only 20-25%. A study of the yield of sodium as a function of the reducing agent (for a 1-hr reaction at 1100°C) showed that the optimum amount of carbon (100 mesh) is twice as much as the theoretical

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ACCESSION NR: AP5011808

amount. The stoichiometric amount is insufficient because reduction takes place between solid phases, and the starting reagents become separated from one another by the reaction products as the process continues. On the other hand, a large excess of carbon (12-fold or greater) decreases the yield of sodium. As the duration of the reaction is increased to 3 hr, the yield rises from 68 to 95%. Orig. art. has: 4 figures, 1 table, and 3 formulas.

ASSOCIATION: none

SUBMITTED: 09Feb62

ENCL: 000

SUB CODE: CC, MM

NO REF SOV: 009

OTHER: 003

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L 48578-65 EPA(s)-2/EWP(m)/EPP(r)-2/ZPR/EWP(t)/EWP(b) Ps-4/Pt-7/Fu-1

ACCESSION NR: AP5008800 IAP(c) JD/JW/JG UR/0080/65/038/003/0465/0471

AUTHOR: Kozhevnikov, G. N.

TITLE: Obtaining alkali metals by carbon reduction

SOURCE: Zhurnal prikladnoy khimii, v. 38, no. 3, 1965, 465-471

TOPIC TAGS: alkali metal, electrolysis, metal refining, vacuum refining

ABSTRACT: The importance of alkali metals hardly needs to be emphasized. The expansion of their output depends primarily upon finding cheaper ways of production. The main industrial method of producing sodium and lithium is electrolysis of their molten chlorides. In recent years, however, an increasing number of investigations have been aimed at vacuum-thermal methods of production.

The advantages of vacuum-thermal methods over electrolysis are well known. Laboratory and pilot-plant reduction of potassium chloride with calcium carbide and ferrosilicon under vacuum was shown to be economically desirable. It is felt that production costs for alkali metals can

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ACCESSION NR: AP5008800

be lowered even further by reducing their oxides with carbon, which is a cheaper reducing agent. The opinion prevalent in the literature was that on the reduction of alkali metal oxides with carbon, even under vacuum, the condensing phase consisted partly or even entirely of metal oxide. The reversibility of such reduction led to the opinion that such processes are disadvantageous.

The most probable course of reaction in the carbon reduction of alkali and alkaline earth metal oxides leads to formation of the corresponding metal and carbon monoxide. Thermodynamic analysis by the author shows that the equilibrium temperature of these reactions is more pressure dependent at lower pressures (below 100 mm Hg); at higher pressures the T vs P curve is almost parallel to the coordinate axis. These data also reflect the different affinities for oxygen of the metals in question (Na, K, Li, Mg, and Ca) and indicate that while magnesium and calcium vapor in the process of cooling will be oxidized by carbon monoxide, the same will not necessarily be true for sodium, potassium, and lithium. It becomes evident that it is necessary to maintain the metal vapor between the reaction zone and the condensation site at temperatures no lower than the equilibrium

zone and the condensation site at temperatures no lower than the equilibrium  
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ACCESSION NR: AP5008800

temperature (at 2 mm Hg,  $>850^{\circ}\text{C}$  for Na,  $>500^{\circ}\text{C}$  for K,  $>1200^{\circ}\text{C}$  for Li). Literature data show that alkali metals can form a number of carbides and solid solutions with carbon. The author's experiments showed, however, that on reduction of lithium oxide with carbon at  $1200\text{--}1300^{\circ}\text{C}$  and 0.1--2 mm Hg, no lithium carbide could be found in the reaction products. Similarly, the action of sodium vapor on graphite particles (0.1--0.2 mm) at  $800\text{--}1000^{\circ}\text{C}$  and 0.3--0.5 mm Hg did not result in the formation of any product. On lowering the temperature to  $400\text{--}500^{\circ}\text{C}$ , alkali metal can be found in the graphite. It was demonstrated that formation of alkali metal carbonyls cannot take place under the conditions of this process:  $1000\text{--}1200^{\circ}\text{C}$ , at 0.5--10 mm Hg.

When sodium hydroxide and coke were heated for 1 hr at  $1100^{\circ}\text{C}$  and 0.7--3 mm Hg, a compact metal deposit was collected on the water-cooled condenser. The activity of the metal was 99--100%. The condenser was located in the part of the gas flow with a temperature of  $1000^{\circ}\text{C}$ . Similar results were obtained when the condenser was located at sites with  $T = 950^{\circ}\text{C}$  and  $T = 1100^{\circ}\text{C}$ . In all cases when the condenser was exposed to gas flows at 900, 800, and  $700^{\circ}\text{C}$ , the yield and activity of the collected

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ACCESSION NR: AP5008800

to 60% and 40%, respectively. The metal was grainy, less compact, and less active. To avoid oxidation of the metal vapor by carbon monoxide, it is desirable (in addition to maintaining the vapor between the reaction zone and the condenser above equilibrium temperature) to maximize the surface/volume ratio of the condenser in order to prevent excessive cooling of the vapor on approach to the condenser. In light of the above data, carbon reduction of alkali metal oxides shows promise of practical applicability.

COMMENT: Although the paper indicates considerable experimental effort by the author supported by extensive reference to published data, there is a conspicuous lack of description of experimental detail.

Orig. art. has 4 equations, 1 graph, and 1 table.

ASSOCIATION: none

SUBMITTED: 01Mar63

ENCL: 00

SUB CODE: MM

NO REF SOV: 011

OTHER: 017

FSB, v.1, no. 6

Card 4/4

KOZHEVNIKOV, G.N.; MIKULINSKY, A.S.; BAKHIREVA, L.D.

Preparation of metallic sodium by a reduction of its silicate  
by carbon in a vacuum. Zhur. prikl. khim. 38 no.4:713-717  
Ap '65. (MIRA 18:6)

KOZHEVNIKOV, G.N.

Production of alkali metals by a carbothermal method.  
Zhur. prikl. khim. 38 no.3:465-471 Mr '65.

(MIRA 18:11)

1. Submitted March 1, 1963.

KOZHEVNIKOV, G. P.

*Сроки и характер нерестовой миграции невожской кORYUSHKI*

32631. Sroki i kharakter nerestovoy migratsii nevskey koryushki. Izvestiya vsesoyuz. Nauch-issled. In-ta ozer. i rech. Ryb. Khoz-va, T. xxix, 1949, s. 165-71

SO: Letopis' Zhurnal'nykh Statey, Vol. 44, Moskva, 1949

KOZHEVNIKOV, G. P.

32632. Sroki podkhodov salaki v beregovuyu zonu v r-ne koyvisto. Izvestiya vsesoyuz. Nauch-issled. In-ta ozer. i rech. Ryb. Khoz-va, T. xxix, 1949, s. 172-76

SO: Letopis' Zhurnal'nykh Statey, Vol. 44, Moskva, 1949

КОЗЕВНИКОВ, Г. П.

КОЗЕВНИКОВ, Г. П.

Ecological characteristics of Neva smelt. Vop. ikht. no. 3:126-128 '55.  
(MLRA 8:11)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut ozerogo i rechnogo  
khozyaystva --VNIORKh  
(Neva River--Smelt)

KOZHEVNIKOV, G.P.

Estuary lavaret (*Coregonus lavaretus pidschian*) from the Ob' Bay.  
Vop. ikht. no.11:48-52. '58. (MIRA 12:1)

1.Vsesoyuznyy nauchno-issledovatel'skiy institut ozernogo i  
rechnogo rybnogo khozyastva.  
(Ob' Bay--Whitefishes)

KOZHEVNIKOV, G.P.

*Coregonus tugen lenensis* Berg. of the Vilyuy River. Vop. ikht.  
no. 14:22-28 '60. (MIRA 13:8)

1. Gosudarstvennyy nauchno-issledovatel'skiy institut ozernogo  
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(Vilyuy River--Whitefishes)



*КОЗНЕВНИКОВ, И.А.*

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Device for loading rails. Put' i put.khoz. no.9:16 S '57.

(MIRA 10:10)

(Railroads--Rails--Transportation)

KOZHEVNIKOV, I. A.

Kozhevnikov, I. A. "Low temperature metalworking", Sbornik soob. dokladov  
Srat. ger. nauch.-tekhn. konf-tsi predpriyatiy mashinostroit. i metalobrabot.  
prom-sti, Saratov, 1949, p. 60-[illegible].

SO: U-3241, 10 April 59, (Leto is 'Zhurnal 'nykh Stroy, No. 11, 1949).

*Kozhevnikov, I.A.*

BELYAYEV, N.M.; ALEKSANDRIN, I.P.; BELYAVSKIY, L.A.; KACHURIN, V.K.; KIP-  
NIS, Ya.I.; KOZHEVNIKOV, I.A.; MONAKHOV, N.I.; MOROZOV, S.M.; MORO-  
ZOV, Yu.N.; STEPKIN, S.A.; FIGURNOV, N.M.; KACHURIN, V.K., redaktor;  
SNITKO, I.K., redaktor; GAVRILOV, S.S., tekhnicheskij redaktor.

[Laboratory testing of the strength of materials] Laboratornye raboty  
po soprotivleniyu materialov. Izd. 5-e, perer. Moskva, Gos. izd-vo  
tekhniko-teoret. lit-ry, 1954. 286 p. (MLEA 7:12)  
(Materials--Testing) (Metals--Testing) (Strength of materials)

*KOZHEVNIKOV, I.A.*

KOZHEVNIKOV, I.A., kandidat tekhnicheskikh nauk, dotsent

Brief survey of the scientific work in the N.A.Belediubskii  
Laboratory after the Great October Socialist Revolution.  
Sbor. LIIZHT no.148:46-56 '55. (MLRA 8:10)  
(Testing laboratories)

BELYAYEV, Nikolay Mikhaylovich [deceased]. Prinimali uchastiye: BELYAVSKIY, L.A.; KACHURIN, V.K.; KIPNIS, Ya.I.; KOZHEVNIKOV, I.A.; KUSHELEV, N.Yu.; SINITSKIY, A.K.. SNITKO, I.K., red.; TOMARKINA, N.A., tekhn.red.

[Collection of problems on the strength of materials] Sbornik zadach po soprotivleniiu materialov. Pod obshchei red. V.K. Kachurina. Izd.6., stereotipnoe. Moskva, Gos.izd-vo fiziko-matem.lit-ry, 1958. 346 p. (MIRA 12:9)  
(Strength of materials)

SHALAMOV, N.P., kand.tekhn.nauk; KOZHEVNIKOV, I.A., inzh.

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Prom.stroi. 41 no.3:15-19 Mr '64. (MIRA 17:3)

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L.A.; KACHURIN, V.K.; KIPNIS, Ya.I.; KOZHEVNIKOV, I.A.;  
KUSHELEV, N.Yu.; SINITSKIY, A.K.; SNITKO, I.K., red.

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FRIDMAN, V.M., inzh.; ZAGORODNAYA, G.A., inzh.; KOZHEVNIKOV, I.F.,  
inzh.; KURILOVICH, L.V., inzh.

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frames. Elektrotehnika 34 no.10:47-51 0 '63.  
(MIRA 16:11)



*Kozhevnikov, I. G.*

KOZHEVNIKOV, I.G.

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'57. (MIRA 10:12)

1. Voronezhskaya oblastnaya stantsiya yunikh naturalistov.  
(Voronezh Province--Botany--Study and teaching)

KOZHEVNIKOV, I. G., Cand. Agri. Sci. (diss) "Ecological-biological Features of Yellow Fodder Lupine," Voronezh, 1961, 21 pp (Volgograd Agri. Inst.) 170 copies (KL Supp 12-61, 279).

SOKOLOV, V.; KOZHEVNIKOV, I.

Gas- and oil-bearing prospects in the Serdobsk District, Penza  
Province. Nov.neft.tekh.:Geol. no.4:5-6 Ja '56. (MIRA 9:5)  
(Serdobsk District--Petroleum geology)

KOZHEVNIKOV, I.I.; MESHCHERYAKOV, Yu.A.

Geomorphological methods of prospecting for mineral deposits.  
Priroda 45 no.11:25-37 N '56. (MLRA 9:11)  
(Geology, Structural) (Prospecting--Geophysical methods)

KOZHEVNIKOV, I.I.

Geology, and oil and gas potentials of southern regions of Orenburg Province and adjacent regions in Kazakhstan. Trudy VNIIGI no.22: 67-83 '59. (MIRA 13:11)

1. Soyuznaya geologoposkovaya kontora Glavgaza SSSR.  
(Orenburg Province--Petroleum geology)  
(Orenburg Province--Gas, Natural--Geology)  
(Kazakhstan--Petroleum geology)  
(Kazakhstan--Gas, Natural--Geology)

KOZHEVNIKOV, I. I.

Tectonics, and oil and gas potentials of the northern part of  
the northern Caspian Depression. Geol. nefti i gaza 3 no. 1:18-25  
Ja '59. (MIRA 12:4)

1. SOFK Glavgaz SSSR.

(Caspian Depression--Petroleum geology)

(Caspian Depression--Gas, Natural--Geology)

KOZHEVNIKOV, I.I.; EVENTOV, Ya.S.

Trends in areal geological prospecting in the Caspian Lowland and its  
margins. Trudy SGPK no.1:91-117 '60. (MIRA 13:10)  
(Caspian Lowland---Geology)

KOZHEVNIKOV, I.I.; BASHLYKOVA, Ye.P.; DREYSIN, A.G.

Lower Cretaceous sediments of the trans-Ural syrts. Trudy SGPk  
no.2:170-182 '61. (MIRA 14:11)  
(Obshchiy Syrt--Geology, Stratigraphic)



GRACHEV, N.V.; KOZHEVNIKOV, I.I.

Boundary layers of the Cretaceous and Paleogene systems of the  
northern Caspian Sea region. Trudy SGPK no.2:183-192 '61.  
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BUTKOVSKIY, Yu.M.; KOZHEVNIKOV, I.I.

Method of studying salt-dome tectonics of the northern margin of  
the Caspian Lowland. Trudy SGPK no.2:193-199 '61. (MIRA 14:11)  
(Caspian Lowland--Salt domes)

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A.M.

Lower Cretaceous sediments of Obshchiy Syrt and their  
division based on the general correlation of electric logs  
of boreholes and macro- and microfauna. Trudy VNIGNI  
no.29.35-46 vol.3 '61. (NIRA 14:9)  
(Obshchiy Syrt--Geology, Stratigraphic)

BAPIAN, A.I.; VISHI-POLNAYA, N.I.; KOZHEVNIKOV, I.M.

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is obtained in relation to vaccination with late poliovirus  
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1. In Izvestiya Gosstatiznava SSSR, 1974, No. 11, p. 115.  
abstr.

1. Flavor and texture of Holland (goats) cheese. <sup>11</sup>  
Kozhevnikov, A. Proceedings of the 7th Int. Symp. (1964)  
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making process by the temp. the water retained, pH, amt.  
of added salt and its distribution, and the temp. of curing  
are reviewed and discussed. Vladimir N. Kozhevnikov

USSR / Microbiology. Industrial Microbiology.

F-3

Abs Jour : Ref Zhur - Biol., No 20, 1958, No. 90798

Author : Gibshman, M. R.; Kozhevnikov, I. N.; Belousova, N. N.  
Inst : All-Union Scientific Institute for the Milk and Cheese  
Producing Industries

Title : Investigation of Biological Methods for the Control of  
Early Fermentation of Cheese

Orig Pub : Sb. ref. nauchn. rabot. Vses. n.-i. in-t maslodel'n. i  
syrodel'n. prom-sti, 1957m vyp. 4, 39-46

Abstract : For control of cheese fermentation caused by intestinal  
bacilli it is recommended that strains of lactic acid  
streptococci, which suppress the intestinal bacillus but  
do not inhibit development of the lactic acid bacteria,  
be introduced into the composition of the ferment. Strains  
of Streptococcus lactis and S. diacetylactis should be  
resistant to bacteriophage and possess equal energy for

Card 1/2

ALEKSEYEV, V.N.; KOZHEVNIKOV, I.N.; LEBEDEVA, K.S.; MAKAR'IN,  
A.M.; MANENKOVA, A.I.; NIKOLAYEV, A.M.; ROZANOV, A.A.

[Technological instructions for the production of cheese]  
Tekhnologicheskie instruktsii po proizvodstvu syra. Ut-  
verzhdeny VSNKh. 2. izd. Moskva, TSintipishcheprom,  
1963. 161 p. (MIRA 18:5)

1. Tsentral'nyy nauchno-issledovatel'skiy institut maslodol'-  
noy i syrodol'noy promyshlennosti.

GROZDOV, D. M.; ABDULLAYEV, N. M.; KOZHEVNIKOV, I. N.

"Tactics of transfusion therapy in surgery of haemophillic patients."

report submitted for 10th Cong, Intl Soc of Blood Transfusion, Stockholm,  
3-8 Sep 64.

Cent Inst of Hematology & Blood Transfusion, Moscow.



SECRET, A.M.: [Illegible]

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KALITEYEVSKIY, R.Ye., kand. tekhn. nauk; KOZHEVNIKOV, I.P., inzh.

[Automatic lines with narrow-gauge frame saws] Avtomatizirovannye potoki s uzkoprosvetnymi lesopil'nymi ramami. Moskva, Mtdrevmash, 1963. 45 p. (MIRA 16:8)  
(Sawmills)

*KOZHEVNIKOV*

**KOZHEVNIKOV, I.V., (stantsiya Petrovskiy Zavod); SIGAYEV, I.I.**

Achievements of the trackwalkers of the Petrovski-Zavod section.  
Put' i put.khoz. no.9:8-10 S '57. (MIRA 10:10)

1. Nachal'nik Petrovsko-Zavodskoy distantcii puti (for Kozhevnikov).
2. Inzhener Petrovsko-Zavodskoy distantcii (for Sigayev).  
(Petrovsk, Chita Province--Railroads--Maintenance and repair)

Kozhevnikov, I. Yu.

USSR

2394. New rapid method of analysis of slag for phosphorus, with a radioactive indicator. A. I. Osipov, I. Yu. Kozhevnikov, V. R. Iudin, A. I. Sazonov, M. G. Burak, A. G. Alimov, A. M. Skrentsov and A. P. Ryabenko (Zavod. Lab., 1958, 21 (4), 391-395).—The addition of a controlled amount of radioactive phosphorus, with a specific activity of 220 to 420 mC per g. to the melt in the manufacture of high-phosphorus (0.0 to 1.5 per cent.) cast iron, and measurement of the activity of portions of the slag after cooling in water to 30° to 40° C, permits the phosphorus content of the slag to be determined rapidly (within 5 to 7 min.) at any time during the course of the melt. To attain efficient mixing without loss of the radioactive phosphorus, the phosphorus is first mixed with iron powder, and charged into a copper tube (150 mm x 18 mm), the ends of which are then sealed. The tube is placed in the liquid cast-iron. By the time the copper has melted, combination between the phosphorus and the iron has occurred, and uniform distribution throughout the mass of the metal takes place. Under the conditions of working, a proportionality factor for the distribution of phosphorus from the chemical analysis of a slag sample and its radioactivity is found and used for subsequent analyses. The error (average square error 0.2 per cent.) is less than that of normal chemical determinations. G. S. SMITH

BSH

KOZHEVNIKOV, I. Yu. Cand Tech Sci -- (diss) "Study of the Thermodynamics of ~~the REACTION~~ Iron Dephosphorization Reaction." Mos., 1957. 14 pp 22 cm. (Academy of Sciences USSR, Inst ~~in~~ of Metallurgy im A. A. Baykov), 100 copies (KL, 18-57, 96)

KOZHEVNIKOV, I.Yu., SHVARTSMAN, L.A.

"Thermodynamics of Dephosphorization of Iron by Slags of the System:  $\text{CaO-FeO-SiO}_2$   
- $\text{P}_2\text{O}_5$ ,"  
lecture given at the Fourth Conference on Steelmaking, A.A. Baikov Institute of  
Metallurgy, Moscow, July 1-6, 1957

KOZHEVNIKOV, I.Yu., KULIKOV, I.S.

"Some Questions of the Theory of Metallurgical Slags,"  
lecture given at the Fourth Conference on Steelmaking, A.A. Baikov Institute of  
Metallurgy, Moscow, July 1-6, 1957

*KOZHEVNIKOV, I. Yu.*

137-58-1-2109

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 1, p 286 (USSR)

AUTHORS: Osipov, A. I., Kozhevnikov, I. Yu., Iudin, V. Ye., Sazanov, M. L., Bul'skiy, M. T., Alimov, A. G., Skrebtsov, A. M., Rebenko, A. P.

TITLE: A New Method for Speedy Analysis of Slag for Phosphorus by Means of Radioactive Tracers (Novyy metod ekspress-analiza shiaka na fosfor s primeneniym radioaktivnykh indikatorov)

PERIODICAL: V sb.: Fiz., -khim. osnovy proiz-va stali, Moscow, AN SSSR, 1957, pp 82-93. Diskus. pp 160-187

ABSTRACT: A method has been developed for speedy analysis of slag for  $P_2O_5$  by means of radioactive P (I). The analysis requires 5-7 min. The method is accurate to within 5-6 percent (rel.). The consumption of material is 0.04-0.05 millicurie per t of metal. To determine  $P_2O_5$ , I is introduced into the heat in a mixture with powdered Fe. The mixture is placed in a Cu ampoule and the I with the Fe form ferrophosphorus during the period of heating and fusion. This then undergoes uniform dissemination throughout the volume of the heat. Determination of  $P_2O_5$  by radiometry requires one tagged sample in which the  $P_2O_5$  is

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137-58-1-2109

A New Method for Speedy Analysis of Slag for Phosphorus (cont.)

determined chemically. A graph showing determination of  $P_2O_5$  by radiometry as compared with the data of chemical analysis is presented. The employment of radiometric analysis of slag for  $P_2O_5$  makes it possible to take and analyze a large number of samples of slag in the course of a heat.

K. K.

1. Slag analysis--Processes

Card 2/2

*Kozhevnikov I Yu.*

137-1958-2-2431

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 2, p 33 (USSR)

AUTHOR: Kozhevnikov, I. Yu.

TITLE: On the Oxidation of Phosphorus During Fusion (Ob usloviyakh okisleniya fosfora v periode plavleniya)

PERIODICAL: V sb.: Fiz.-khim. osnovy proiz-va stali Moscow, AN SSSR, 1957, pp 143-159. Diskus., pp 160-187

ABSTRACT: The possibility of dephosphorizing during the early part of the fusion process was studied on melts in 350-ton tilting furnaces with 70% phosphorous pig iron in their charges. Two types of melt had been prepared: 1) with the upper layer of loose material in the charge consisting of lime and 60-70% ore; at the end of the melting process 10-14 tons of cinder was given off as slag; 2) with part of the ore in the charge replaced by cinder; the yield of cinder at the end of the melting process decreased to 2-4 tons. It was noted that the cinder, when free of  $\text{SiO}_2$ , caused the easily fusible compound  $2\text{CaO} \cdot \text{Fe}_2\text{O}_3$  to form on the pieces of lime, and was also conducive to the early formation, at the time of the charging, of a considerable quantity of slag containing 15-20% CaO (and the remainder in Fe oxides). By contrast, any  $\text{SiO}_2$  contained in an ore

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137-1958-2-2431

On the Oxidation of Phosphorus (cont.)

would, by forming a layer of  $3\text{CaO} \cdot \text{SiO}_2$ , inhibit the slagging of the lime. Melts of the first type, from the start of the melting process, boiled vigorously and splashed, a slag containing 10-12%  $\text{P}_2\text{O}_5$  came out of the furnace by gravity. Melts of the second type boiled less vigorously, because the  $\text{Fe}_3\text{O}_4$  of the cinder was harder to reduce; in this connection it was found to be possible to soak the slag in the furnace and bring its  $\text{P}_2\text{O}_5$  up to 12-15%, which resulted in a more thorough dephosphorization at the beginning of the melting process and a shortening of the melting and finishing times by 1.5 hours. It is recommended that 70-80% of the ore of the charge be replaced by readily fusible briquets of cinder and limestone, which would make it possible to recover all of the primary 12-18%  $\text{P}_2\text{O}_5$  slag, to reduce the melting and finishing time, to empty the furnace completely after each melt, to increase the durability of the hearths, and to cut down cinder losses during charging.

Bibliography: 11 references.

G.S.

1. Phosphorus--Fusing--Oxidation

Card 2/2

KOZHEVNIKOV I. Yu.

24-11-30/31

AUTHORS: Kozhevnikov, I. Yu. and Kulikov, I. S. (Moscow)

TITLE: On the theory of metallurgical slags. (K teorii metallurgicheskikh shlakov).

PERIODICAL: Izvestiya Akademii Nauk SSSR, Otdeleniye Tekhnicheskikh Nauk, 1957, No.11, pp. 196-198 (USSR)

ABSTRACT: As regards the theory of metallurgical slags, three points of view can be distinguished, namely: consideration of the slags as solutions consisting of chemical compounds and of free oxides (Refs.1,2); consideration of the slags as pure ionic solutions (Refs.3 and 7) and consideration of the slags as solution of chemical compounds and ions into which the free oxides decompose (Refs. 8,9). So far, there is a lot of controversy and no single theory has been accepted and the people concerned with accumulation of experimental data for evolving a theory have no possibility of calculating the equilibrium of metallurgical reactions. Therefore, the authors considered it important to generalise the investigations aimed at elucidation of the physico-chemical nature of metallurgical slags and in this paper an analysis is presented of the experimental data of one of the authors and of Shvartsman (Refs.12,13) relating to the study of the thermodynamic functions of the reaction of desulphuring iron with slags of various

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On the theory of metallurgical slags.

24-11-30/31

compositions, synthetic as well as open hearth. Analysis of the experimental data on the heats of formation

$PO_4^{3-}$  in various slag melts indicates that in the case of high  $P_2O_5$  concentrations in the slag and absence of  $SiO_2$  calcium phosphates are formed which dissociate on lowering the  $P_2O_5$  content. Therefore, it can be assumed that the theory of metallurgical slag should take into consideration the chemical compounds in the slag as well as the dissociation of these compounds into ions at various concentrations of the components from which these form. Thus, the theory of metallurgical slags should be similar to the theory of concentrated electrolytes. For developing further the theory of slag melts it is necessary to determine experimentally the thermodynamic constants of Si, Al, Cr and S, both in diluted and in concentrated slag solutions and also to carry out investigations relating to phosphorus. There are 1 table and 18 references, 12 of which are Slavic.

SUBMITTED: May 30, 1957.

AVAILABLE: Library of Congress.

Card 2/2

KOZHEVNIKOV, I. Yu.

"Investigation of the Thermodynamic Reaction of the Dephosphorization of Iron."

dissertation defended for the degree of Candidate of Technical Sciences at the Inst. for Metallurgy Im. A. A. Baykov.

Defense of Dissertation (Jan-Jul 1957)

Sect. of Tech. Sci.

Vest. AN SSSR, 1957, v. 27, No. 12, pp. 120-122

AUTHOR  
TITLE

KOZHEVNIKOV I.Yu., SHVARTSMAN L.A.

~~20-2-38/67~~ 20-2-38/67

On the Thermodynamics of the Dephosphoration of Iron.

(O termodinamike reaktsii defosforatsii zheleza -Russian)

Doklady Akademii Nauk SSSR, 1957, Vol 113, Nr 2, pp 376-379 (U.S.S.R.)

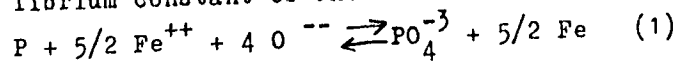
Reviewed 7/1957

PERIODICAL

Received 6/1957

ABSTRACT

Many papers dealt with the phosphorus distribution in the system: metal-slag. On account of difficulties in the experiments, however, the exact values of thermodynamic functions of dephosphorization reactions of iron by slag of different composition are lacking. In the present paper a new investigation method of the distribution equilibrium of phosphorus is applied. Its fundamental idea is an effective saturation of the metal with radioactive phosphorus introduced into the slag at the very beginning at a constant temperature. This method makes it possible to compute the values both of the thermal effect and of the reaction entropy of the dephosphorization for slag of a certain composition from the temperature dependence of the exponent of the phosphorus distribution  $L_p$ . Assuming any molecular composition of molten slag the equilibrium constant of the reaction



can be described in a general form

$$K_a = L_p \varphi(\sum C_i) f(\sum \gamma_i) \quad (2) \text{ where } \varphi(\sum C_i) \text{ denotes the relation}$$

of the equilibrium concentrations of the reaction participants with

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On the Thermodynamics of the Dephosphoration of Iron. ~~SECRET~~ 20-2-38/67  
 the exception of phosphorus, and  $f(\sum \gamma_i)$  denotes the relation of the activity coefficients of all reaction participants. The character of these functions is unknown. However,  $\varphi(\sum C_i)$  does not depend on temperature. After further computations the authors obtain the value  $\Delta H$  which denotes the sum of the reaction heat  $\Delta H^0$  between the pure substances and the heat of the mixtures  $\sum \Delta H_{CM}$ .  $\Delta S^0$  is the entropy modification at the transition of the phosphorus from a 1 per cent solution in iron into a 1 per cent solution in the slag. As the simplest standard system ferruginous slag was selected, in which cations in form of oxides:  $Ca^{++}$ ,  $Sr^{++}$  and  $Ba^{++}$  were introduced, which differ considerably by the radius value. The results obtained about phosphorus distribution between iron and ferruginous slag are described by the equation

$$\lg L_p = \frac{10900}{T} - 6,41, \text{ from which the value } \Delta H \text{ is equal to } 50.000 \text{ kal/g-pressure gauge. In this case } K_a = A L_p \frac{\sqrt[3]{PO_4}}{\sqrt[3]{P}}, \text{ where } A$$

-is the transition coefficient from weight percents to molar shares. From the temperature dependency  $K_a$  it can be obtained:  $\Delta H^0 = \Delta H + \Delta H_{CM}^{PO_4^3} - \Delta H_{CM}^P$ . For slag of complicated compositions

$H_{CM}^P$  remains invariable. The results of the investigation show that the entropic component of the free energy which depends on the charge magnitude and the mutual position of the ions in the fused mass of the slag has an important influence on the equilibrium of the dephosphorization reaction. This influence



On the Thermodynamics of the Dephosphoration of Iron. 20-2-38/67  
anionical. ~~XXXXXXXXXX~~  
(With 4 illustrations, 2 citations from Slav publications).

ASSOCIATION Institute for Metallography and Metallic Physics of the Central  
Scientific Research Institute for Iron-Metallurgy.  
PRESENTED BY KURDYUMOV G.V.  
SUBMITTED 25.10.1956  
AVAILABLE Library of Congress  
Card 3/3

KOZHEVNIKOV, I. YU

SOV/1728

TABLE I BOOK EXPLANATION

18(0)

Abstraktya nauk SSSR. Institut metallurgii  
Sovremennyye problemy metallurgii (Modern Problems in Metallurgy)  
Moscow, Izd-vo AN SSSR, 1958. 840 p. 3,000 copies printed.

Resp. Ed.: A.M. Samarin, Corresponding Member, USSR Academy of  
Sciences; Eds. of Publishing House: V.S. Kishavnikov, and  
A.M. Derzov; Tech. Ed.: P.V. Polyakova.

PURPOSE: This book is intended for scientists and technical per-  
sonnel in the field of metallurgy.

CONTENT: This is a collection of articles on certain aspects of  
Soviet metallurgy. The book is dedicated to Academician  
Ivan Pavlovich Bardin on the occasion of his 75th birthday. The  
book is divided into seven parts. The first part consists of  
two articles presenting a brief account of the biography and  
professional activity of the Soviet metallurgist. It includes an  
article by John Chipman, Richard Grant, and John Elliott (M.I.T.,  
U.S.) describing their meeting with Bardin in Moscow and also his  
visit to the United States. The second part consists of three  
articles and deals with the materials and fuels for the Soviet  
metallurgical industry. The third part represents the major  
portion of the book. It consists of 25 articles dealing with  
the various aspects of the metallurgy of pig iron and steel.  
The fourth part consists of two articles treating the metallur-  
gy of non-ferrous metals. The fifth part consists of three  
articles on the forming of metals. The sixth part consists of  
eight articles discussing certain aspects of physical metal-  
lurgy. The last part deals with general problems in the field  
of metallurgy. References are given after each article. No  
personnel are mentioned.

TABLE OF CONTENTS:

Modern Problems in Metallurgy	SOV/1728
Andreev, A.V. (Candidate of Geological and Mineral Sciences), Kochetov, and M.L. Zhilo (Candidates of Technical Sciences) and I.I. Gulyay (Junior Scientific Assistant, Metallurgical Institute Lenin A.A. Baykov, AS USSR). Effect of Alkalies on Phase Composition and Viscosity of Primary Blast Furnace Slags	136
Kalikov, I.S., I.Yu. Kozhevnikov, and L.M. Tsylya (Metal- lurgical Institute Lenin A.A. Baykov, AS USSR). Equilibrium Distribution of Sulfur Between Pig Iron and Blast Furnace Slags	149
Ermak, M.D. (Doctor, Engineer, Corresponding Member of the East German Academy of Sciences, Berlin). Some Problems in Ferrous Metallurgy in the GDR (German Democratic Republic)	163
Lidman, K.P., and G. von Struve (Institute of Ferrous Metallurgy of the Freiberg Academy of Mining). The Problem of Metallurgical Processes in Low-shaft Furnaces	169

Card 5/13

SOV/24-58-10-17/34

AUTHORS: Kozhevnikov, I. Yu., Shvartsman, L. A. (Moscow)

TITLE: Thermodynamics of the Dephosphorization Reaction of Liquid Iron with Four-Component Open-Hearth Type Slags (Termo-dinamika reaktsii defosforatsii zhidkogo zheleza chetyrekh-komponentnymi shlakami martenovskogo tipa)

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, 1958, Nr 10, pp 104-109 (USSR)

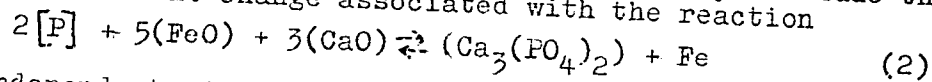
ABSTRACT: In many steel melting processes the dephosphorization reaction approaches equilibrium. Favourable conditions for the reaction are produced in the open-hearth when phosphoric iron is being treated by the scrap-ore process during melt down and the thermodynamics of the dephosphorization of iron by slags of the system  $\text{CaO} - \text{FeO} - \text{SiO}_2 - \text{P}_2\text{O}_5$  are therefore of interest for improving melting conditions. The authors now describe an investigation which had the object of determining the influence of  $\text{SiO}_2$  and  $\text{P}_2\text{O}_5$  when present together in basic slags on the change in the thermodynamics functions of the phosphorus reaction. The successive saturation method previously described by the authors (Refs. 5 and 6) was used, which enables the temperature dependence of the phosphorus partition coefficient for a slag of a given composition to

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Thermodynamics of the Dephosphorization Reaction of Liquid Iron with  
Four-Component Open-Hearth Type Slags

be determined. The distribution was found by using the radioactive phosphorus isotope  $P^{32}$ . Both synthetic and melting slags were investigated. Fig.1 shows the influence of temperature and duration of heating of the slag/metal system on the transfer of phosphorus and Fig.2 the dependence of the logarithm of the partition coefficient on the reciprocal of the temperature for the various slags investigated (compositions tabulated). The results of calculations of  $\Delta H$  and  $\Delta S^\circ$  are shown in Fig.3 as functions of the  $SiO_2$  - percentage. The authors discuss the results and show (Fig.4) that the data of various investigators agree with the relation found by them for the entropy-change. They conclude that the heat content change associated with the reaction



is independent of slag composition over a wide range of concentration; this indicates the existence of stable ionic

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SOV/24-58-10-17/34

Thermodynamics of the Dephosphorization Reaction of Liquid Iron with  
Four-Component Open-Hearth Type Slags

groupings which can be considered as silicophosphates. The partition of phosphorus between metal and slag for the system investigated is almost entirely determined by the entropy change of the phosphorus reaction, which depends on the slag composition; when slag and metal temperatures differ it is the latter that determines the phosphorus partition equilibrium. There are 5 figures, 1 table and 13 references, 7 of which are Soviet, 3 English and 3 German.

SUBMITTED: September 30, 1957.

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SOV/133-58-12-5/19

AUTHOR: Kozhevnikov, I.Yu. (Candidate of Technical Science)  
TITLE: Thermodynamics of the Dephosphorisation of Liquid Iron  
with Ferrous-Calcereous Slags (Termodinamika reaktsii  
defosforatsii zhidkogo zheleza zhelezisto-izvestkovymi  
shlakami)

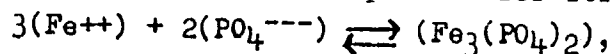
PERIODICAL: Stal', 1958, Nr 12, pp 1078-1088 (USSR)

ABSTRACT: The results of published investigations on the thermo-  
dynamics of the dephosphorisation of iron with slag are  
discussed. It is concluded that: 1) At low phosphorus  
concentrations (below 0.1%P) in the system metal-slag the  
product of the reaction is phosphate ion  $PO_4^{---}$ , --- the sta-  
bility of which in the slag is determined by the  
surrounding cations and the type of quasicrystalline  
structures  $Me^{++} - PO_4^{---}$ . 2) Alkaliearth oxides have  
a beneficial influence on the dephosphorisation of iron  
by ferrous slag due to an increase in the heat effect  
and the entropy of the reaction. For relatively large  
cations of  $Sr^{++}$  and  $Ba^{++}$  the influence of the entropy  
factor in comparison with the energy factor is larger  
than for  $Ca^{++}$  ion. At equal molar concentrations of  
Card 1/3  $MgO$ ,  $MnO$ ,  $CaO$ ,  $SrO$  and  $BaO$  in a ferrous slag the

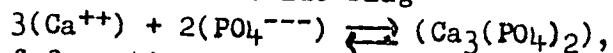
SOV/133-58-12-5/19

Thermodynamics of the Dephosphorisation of Liquid Iron with  
Ferrous-Calcereous Slags

dephosphorising ability of these oxides increases with increasing radius of the cation. 3) The quantitative influence of CaO on the dephosphorisation of iron with a pure ferrous-lime slag can be expressed by equation (51). 4) With increasing concentration of P<sub>2</sub>O<sub>5</sub> the formation of corresponding phosphates takes place: for ferrous slag



the heat of formation of which is about - 110000 cal/mol, and for ferrous-calcium oxide slag



the heat of formation of which is about - 56000 cal/mol. Between iron and slags of the system CaO-FeO-P<sub>2</sub>O<sub>5</sub>, reaction (56) takes place; for slags saturated with CaO the equilibrium constant of the above reaction is expressed by relationship (58) and the free energy change by equation (61). On the introduction of silica into slags of the CaO-Fe-P<sub>2</sub>O<sub>5</sub> system the activities of calcium oxide

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SOV/133-58-12-5/19  
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and calcium phosphate should be introduced into the equation of the equilibrium constant (56). 5) In liquid slags molecules should be considered as stable groupings of ions, corresponding in their composition to chemical compounds - silicates, phosphates, silicophosphates without further order in the position of the molecules. There are 12 figures, 4 tables and 27 references (10 Soviet, 9 English and 8 German)

ASSOCIATION: Institut metallurgii AN SSSR (Institute of Metallurgy, Ac.Sc. USSR)

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5(4)

SOV/26-120-4-27/57

AUTHORS: Kozhevnikov, I. Yu., Travin, O. V., Yarkho, Ye. N.

TITLE: The Influence of  $\text{CaF}_2$  on the Distribution of Phosphorus Among Liquid Iron and Ferrous-Calcareous Slags (Vliyaniye  $\text{CaF}_2$  na raspredeleniye fosfora mezhdurazhidkim zheleznom i zhelezisto-izvestkovymi shlakami)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 122, Nr 4, pp 635-638 (USSR)

ABSTRACT: Calcium fluoride in a melt of oxides gives a singly charged anion  $\text{F}^-$  ( $R_{\text{F}^-} = 1,33 \text{ \AA}$ ) the radius of which differs hardly from the radius of the oxygen ion ( $R_{\text{O}^{2-}} = 1,32 \text{ \AA}$ ). Thus, there are 2 elementary anions of equal dimensions, but of different charge in the slags of the system  $\text{CaO-FeO-CaF}_2$ . The influence of  $\text{F}^-$  on the distribution of phosphorus, therefore, is in principle different from the influence of the complex anions

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$\text{SiO}_4^{4-}$ ,  $\text{PO}_4^{3-}$ , and  $\text{AlO}_2^-$ .

SOV/20-122-4-27/57

The Influence of  $\text{CaF}_2$  on the Distribution of Phosphorus Among Liquid Iron and Ferrous-Calcareous Slags

In this paper, the method of successive saturation was applied. The idea of this method consists of the saturation of iron with radioactive phosphorus  $\text{P}^{32}$  (which was previously introduced into the slag) at a constant temperature. The method of successive saturation permits 1) the establishing of isothermic conditions for the system metal-slag, 2) a reliable fixation of the equilibrium state, 3) the determination of the temperature dependence of the distribution index of phosphorus  $L_p$  for a slag of constant composition. The data for the system  $\text{CaO-FeO-CaF}_2$  can be compared with the values of the thermodynamic functions of the dephosphorization of iron by ferrous-calcareous slags and in this way, the influence of  $\text{CaF}_2$  can be found in a pure form. The replacing of  $\text{CaO}$  by  $\text{CaF}_2$  diminishes the indices of the phosphorus distribution. The introduction of  $\text{CaF}_2$  into ferrous-calcareous slags (even at low concentrations of  $\text{P}_2\text{O}_5$ ) causes the formation of stable ionic groupings the composition of which corresponds to the chemical compound

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SOV/26-122-4-27/57

The Influence of  $\text{CaF}_2$  on the Distribution of Phosphorus Among Liquid Iron and Ferrous-Calcareous Slags

(fluor-apatite). According to the above-discussed data, the theory of the real metallurgic slags must rely on the following fact: Oxides of stable ion groupings the composition of which corresponds to definite chemical compounds are formed in the oxide melts. The use of  $\text{CaF}_2$  in the treatment of phosphoric iron is not advantageous. There are 3 figures, 1 table, and 13 references, 11 of which are Soviet.

PRESENTED: May 24, 1958, by G. V. Kurdyumov, Academician

SUBMITTED: May 24, 1958

Card 3/3

Kozhevnikov, I. Yu.

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: Itz: Stornik trudov, 6) Errata slip inserted. 3,500 copies printed.

Additional Sponsoring Agency: USSR, Gosudarstvennaya planovaya komissiya.

Ed. of Publishing House: Ye. M. Berlin; Tech. Ed.: P. G. Isent'yeva; Editorial Board: D. S. Kamenetskaya, S. Ya. Lybov (Resp. Ed.), Ye. Z. Spector, L. M. Uteviskiy, 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

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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.

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PART II. PHYSICAL CHEMISTRY OF METALLURGICAL PROCESSES

Tomilin, I. A.; Candidate of Technical Sciences, and L. A. Shvartsman, Doctor of Chemical Sciences. Effect of Silica, Calcium Phosphate, and Sodium Oxide on the Kinetics of the Solution of Sulfur and Phosphorus from Iron and Ferruginous-Silicate Slags 199

It was found that the heat of transfer of sulfur from iron to slag in the system FeO-SiO<sub>2</sub> 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<sub>2</sub>O into the slag changes the same phenomenon to take place, but in a greater degree. These 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 found 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 Na<sub>2</sub>O 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

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SHNEYEROV, Ya.A.; LEPORSKIY, V.V.; KAZARNOVSKIY, D.S.; KOTIN, A.G.; KURMANOV,  
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F.F.; SIDEL'KOVSKIY, M.P.; KOZHEVNIKOV, I.Yu., red.; BORODAVKIN, M.L.,  
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foristykh chugunov v martenovskikh pechakh. Moskva, Gos. nauchno-  
tekhn. izd-vo po cherno i tsvetnoi metallurgii, 1961. 256 p.

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(Open-hearth process)

RUDNEVA, A.V. (Moskva); KOZHEVNIKOV, I.Yu. (Moskva)

Phase constitution of open-hearth and synthetic phosphate slags.

Izv. AN. SSSR. Otd. tekhn. nauk. Met. i topl. no.3:10-16 My-Je

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(MIRA 14:7)

(Slag--Testing)

KOZHEVNIKOV, I.Yu., kand.tekhn.nauk; ALIMOV, A.G., inzh.; TIKHOMIROVA, K.A., inzh.

Temperature conditions of the molten metal in the conversion of phosphorous cast iron. Stal' 21 no.3:228-250 Mr '61. (MIRA 14:6)

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Investigating the kinetics of the reduction of ore-coal  
pellets. Izv. AN SSSR. Otd. tekhn. nauk. Met. 1 topl. no.6:  
12-26 N-D '62. (MIRA 16:1)

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Yulianovich; SPEKTOR, Aleksandr Nutovich; YAKHIN,  
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{Iron production in foreign countries without the use of  
blast furnaces} Vvedomennoe poluchenie zheleza za rubeshom.  
[by] A.N. Fokhv snev i dr. Moskva, Izd-vo Metallurgiya,  
1964. 367 p. (MIRA 17:7)

Ko ZHEVNIKOV I. Z

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I.P.; SOLOV'YEV, N.A.; YAS'KO, N.G.. GREBTSOV, P.P., red.; ZUBRILINA,  
Z.P., tekhn.red.

[Our farms in 1965] Nashi khoziaistva v 1965 godu. Moskva, Gos.  
izd-vo sel'khoz.lit-ry, 1959. 230 p. (MIRA 13:2)  
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KOZHEVNIKOV, K.I.

Using reusable metal angle gauges in laying out roadbeds.  
Transp.stroi. 10 no.2:30-32 F '60. (MIRA 13:5)  
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embankments of regulation structures] Tablitsy dlia razbivki  
zheleznodorozhnogo zemlianogo polotna i zemlianykh damb regu-  
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izdatel'sko-poligr, ob"edinenie M-va putei soobshchenia, 1962.  
178 p.

(MIRA 15:3)

(Railroads--Earthwork)

KOZHEVNIKOV, K. I.

Electrical Engineering Abstracts  
May 1954  
Machines.

*E. E. E.*  
1480. Method of assessing the suitability of a f.e.  
motor at a speed higher than the rated one. K. I.

KOZHEVNIKOV. Elektrichstvo, 1953, No. 11, 52-3.

In Russian.

The suitability of a type of motor for an automatic drive may be based on the full use of its overload capacity. The difficult calculations of the transient conditions for such a drive may thus be avoided. This, however, applies only for drives in which the speed is not expected to exceed the rated value. The author shows that the problem can be solved where speeds greater than rated have to be considered. There are no essential difficulties in solving the equations of motion of the drive for transient conditions, the starting times or overspeed factors being assumed, the relation between these two quantities being easily determined from graphs. B. F. KRAUS

9-21-54

KOZHEVNIKOV, K. I., Cand of Tech Sci — (diss) "Productivity of auxiliary mechanisms of rolling mills, the diagram of the wiring of the armature of a motor and the transmission ratio of a decelerator." Moscow, 1957, 22 pp, (Moscow Power Engineering Institute in V. M. Molotov), 125 copies (KL, 29-57,91)

*Kozhevnikov, K.I.*

AUTHOR  
TITLE

KOZHEVNIKOV, K.I., Lecturer  
Auxiliary Mechanism Drive

105-7-4/29

PERIODICAL

(Vybor peredatochnogo chisla reduktora privodov vspomogatel'nykh mekhanizmov prokatnykh stanov. Russian)  
Elektrichestvo, 1957, Nr 7, pp 14 - 19 (U.S.S.R.)

ABSTRACT

Drives with high control precision are investigated. They are driven by d.c. motors. In an earlier work of the author the problem of the selection of the current-diagrams form of the armature was dealt with. Here the principles of the selection of a transmission ratio for the gear is formulated. The new part of this method consists of the following: Driving with an armature-current-diagram of any kind are investigated; analytical relations are deduced by means of which the analysis of the influence of the transmission ratio of the gear to the motor operation is carried out; its heating, the maximum current and the maximum velocity (of the motor). A formula is deduced for the transmission figure  $u_n$  where the power reaches its maximum. The selection of a transmission figure which differs from that where the power reaches its maximum by only from  $\pm 15 - 25 \%$  leads to the reduction of the limiting output of  $10 - 15 \%$ . A formula for  $u_T$  where the armature current reaches its minimum is deduced. The author shows that it is directly proportional to the motor-velocity of the transmission figure. Formulae and diagrams are shown to prove the efficiency of the transmission figure chosen by

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Auxiliary Mechanism Drive

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means of which the reduction of the limiting output and the increase of the maximum current in comparison to the extreme values can be determined. The selection of the transmission figure and the control calculation of the previously chosen motor have to be carried out in parallel. (With 4 illustrations, 1 table and 4 Slavic references).

ASSOCIATION

Novocherkassk Polytechnical Institute  
(Novocherkasskiy politekhnicheskiy institut)

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25.2.1957  
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Card 2/2



SOV/144-58-7-13/15

AUTHOR: Kozhevnikov, K.I., Cand.Tech.Sci., Docent  
TITLE: On the Selection of a Current Diagram of Motors for  
Driving Rolling Mill Mechanisms (O vybore diagrammy toka  
dvigateley mekhanizmov prokatnykh stanov)  
PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy,  
Elektromekhanika, 1958, Nr 7, pp 120-122 (USSR)  
ABSTRACT: Kozhevnikov considers that Vinogradov is in error in  
attempting to obtain a rectangular time/current curve.  
Kozhevnikov states the reasons why he thinks  
Vinogradov's circuit is not suitable for driving  
manipulators on steel mills and similar devices.  
However, Vinogradov's circuit may be useful when a  
rectangular current drive diagram is the best, which is  
the case when it is necessary to minimise heating of the  
motor if the motor is started from rest and fully  
stopped in each cycle. Kozhevnikov states that the

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SOV/144-58-7-13/15

On the Selection of a Current Diagram of Motors for Driving  
Rolling Mill Mechanisms

practical importance of Vinogradov's circuit consists  
in reducing the number of contact devices.  
There are no figures, no references.

ASSOCIATION: Nevskoye Mashinostroyeniye Institut (Nevskoye Mashinostroyeniye  
Polytechnical Institute)

Card 2/2

L 9992-63

BDS

ACCESSION NR: AP3001382

8/0144/63/000/003/0350/0361

AUTHOR: Kozhevnikov, K. I.

46

TITLE: Extremum program control with a self-resetting system for optimum fulfilment of task

SOURCE: IVUZ. Elektromekhanika, no. 3, 1963, 350-361

TOPIC TAGS: rolling mill program control, extremum program control

ABSTRACT: Theoretical considerations are submitted about possible advantages of an "extremum" control over the "ordinary" on-off automatic control of the upperroll position in a type 1150 reversible hot-rolling blooming-slabbng mill. The extremum control includes: on-off switching; optimum duration of roll positioning; and optimum duration of acceleration, sustained run, and deceleration of the upper-roll motors. Computer algorithms are determined, as well as "rational" operating conditions for the motors. It is claimed that the output can be considerably increased and motor temperature decreased by adopting the extremum control. Orig. art. has: 5 figures, 32 formulas, and 3 tables.

Card 1/2/

KOZHEVNIKOV, K.I. (Rostov-na-Donu)

Effective parameters of the electric drive of program controlled  
machine tools. Elektrichestvo no.118-23 Ja '64. (MIRA 17:6)

KOZHEVNIKOV, K.I., kand. tekhn. nauk, dotsent (Rostov-na-Donu)

Optimizing program control of a mechanism for moving the top  
roller of a rolling mill. Elektrichestvo no. 6:32-38 Js '65. (MIRA 18:7)

L 42931-65 EWT(a)/EWA(a)/EWP(v)/EWP(k)/EWP(h)/EWP(l) PF-4

ACCESSION NR: AP5006816

S/0144/65/000/001/0083/0094

AUTHOR: Kozhevnikov, K. I. (Candidate of technical sciences, Docent of the department of automation of production processes in machine construction)

TITLE: Checking the interphase transformer and smoothing reactor for the intermittent operation of rectifiers in an electronic drive system

SOURCE: IVUZ. Elektromekhanika, no. 1, 1965, 83-94

TOPIC TAGS: electronic drive, interphase transformer, smoothing reactor, power drive

ABSTRACT: A high-power nonreversible adjustable electronic drive is considered which is often used for rolling mills and frequency changers. Ionic discharge devices operate only as rectifiers. To preclude the possibility of intermittent rectifier operation, inductances of both the interphase transformer and smoothing reactor must have definite values. The article offers a specially

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ACCESSION NR: AP5006816

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developed method for checking the interphase transformer and smoothing reactor; the method also permits selecting the combination of inductances most suitable for the drive automatic control. An equivalent circuit is set up, and formulas for instantaneous values of the rectified voltage and interphase-transformer emf are developed. Currents in the motor armature and in the interphase transformer are investigated. On the basis of these data, simple curves are plotted which can be used for checking interphase transformers and smoothing reactors in the above sense. A numerical example illustrates the method. Orig. art. has: 7 figures, 43 formulas, and 1 table.

ASSOCIATION: Rostovskiy institut sel'khoz mashinostroyeniya (Rostov Institute of Farming Machinery)

SUBMITTED: 12Dec63

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NO REF SOV: 006

OTHER: 000

808  
Card 2/2

KOZHEVNIKOV, K. K.

36757. Boprosu Khimicheskoy Otsenki Pochv Dlya Tseley Melioratsii. Iz Rabot Syrdar'in. Ekspeditsii An Kaz SSR. Vestnik Akad. Nauk Kazakh. SSR, 1949, No. 8, c. 92-95

SO: Letopis' Zhurnal'nykh Statey, Vol. 50, Moskva, 1949



TSEYKO, Anatoliy Iosifovich; ~~KOZHEVNIKOV, Konstantin Timofeyevich;~~  
~~ZHILYAKOVA, O., red.; FISENKO, A., tekhn. red.~~

[Irrigation of vineyards] Oroshenie vinogradnikov. Simfe-  
ropol', Krymizdat, 1961. 93 p. (MIRA 15:4)

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vinogradarstva "Magarach" (for Tseyko). 2. Krymskaya opytno-  
meliorativnaya stantsiya (for Kozhevnikov).  
(Crimea--Grapes--Irrigation)

KOZHEVNIKOV, K. Ya.

"The Water-Salt Regime of the Basic Types of Soils of the Kzyl-Ordin Massif, Appraisal of Soil Improvement and Prospects for Their Utilization Through Irrigation." Cand Agr Sci, Inst of Soil Sciences Acad Sci Kazakh SSR, Alma-Ata, 1953. (RZhBiol, No 8, Dec 54)

Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (12)  
SO: Sum. No. 556, 24 Jun 55

USSR/Soil Science. Soil Genesis and Geography

J-2

Doc Jour : Ref Zhur - Biol., No 20, 1958, No 91369

Author : Kozhevnikov K.Ya.

Inst : -

Title : Cause of Irregularity in Salinity of Stratified Soils and Grounds

Orig Pub : Pochvovedeniye, 1957, No 4, 40-45

Abstract : Experiments in artificial salting of stratified soils through capillary trickle feeding, with NaCl and  $\text{Na}_2\text{SO}_4$  salt solutions showed that the irregularity of the salinity of the stratified soils and grounds is connected with the mechanical composition. The unequal distribution of salts in the layers lies in close connection to their moisture capacity. The layers with heavy mechanical composition were distinguished by higher moisture capacity and salinity. The moisture capacity of clay amounts to 36.3 percent of volume, and of sand to 14.5 percent. With attainment of maximal moisture

Cont : 1/2

USSR/Soil Science. Soil Genesis and Geography

J-2

Abs Jour : Ref Zhur - Biol., No 20, 1958, No 91369

content, 1 cubic meter of clay can hold 363 liters of water and 1 cubic meter of sand - 145 liters. With 40 gr/litre mineralization of the water, the 363 liters held by the clay will bring along 18.1 kg. of salts into 1 cu.m. of clay, and the 145 liters held by sand will bring in 7.25 kg. If the weight of 1 cu.m. of clay and sand be taken as equal to 1450 kg., in the first will be 18.1 kg. of salts or 1.2 percent and in the same quantity of sand there will be 7.25 kg. of salts or 0.41 percent. In proportion to the drying of a clay layer, some quantity of moisture and the salts contained in it can be sucked out from the sandy layer. As a consequence of this process, the salt content in the clay is increased above 1.2 percent while in the same it is decreased. Owing to higher water extraction, the layers of sand, deposited on a slope, will contain less salts. The investigations were made at test stations in the Lowlands of the Syr-Darya river.  
-- S.S. Nikitin

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