NECHIPORENKO, O. M.

Determining sulfates in natural waters by the volumetric method.
Gidrokhim. mat. 26:207-217 '57.   (MLRA 10:8)

1. Gidrokhimicheskiy institut Akademii nauk SSSR, Novocherkassk.
    (Water--Analysis)   (Sulfates)   (Volumetric analysis)

NECHIPORENKO, G.N.: Master Chem Sci (diss) -- "New methods of volumetric determination of sulfate ions in natural waters". Novocherkassk, 195_. 15 pp (Acad Sci USSR, Hydrochemical Inst), 120 copies (KL, No 1, 195_, 111)

AUTHOR: Nechiporenko, G. N.   62-58

TITLE: The Determination of Sulfate Ions by Means of the Method of
                 Direct Titration by Lead Nitrate With Dithiazone as Indica-
                 tor (Opredeleniye sul'fatnykh ionov metodom pryamogo titr
                 vaniya azotnokislym svintsom s ditizonom v kachestve indi
                 katora)

PERIODICAL: Izvestiya Akademii Nauk SSSR,Otdeleniye Khimicheskikh Nauk
                 1959, Nr 3, pp. 359 - 361 (USSR)

ABSTRACT: In the methods of the direct titration lead salts are to be
                 preferred, for, in comparison to barium salts they possess
                 some advantages. Analytical reagents exist which are much
                 more sensitive to lead ions than to barium. The solubility
                 of $PbSO_4$ can, however, be considerably reduced by addition
                 of a SO_4 - 40 % alcohol or acetone. In this paper the authors
                 suggest a method for the determination of SO_4^{--}. Dithiazone
                 is a weak two-basic acid (see scheme). When dithiazone is
Card 1/2   designated with DH_2 , then it would read

62-58-3-18/30

The Determination of Sulfate Ions by Means of the Method of Direct Titration by Lead Nitrate With Dithiazone as Indicator

$DH_2 \rightleftarrows DH^- + H^+ \rightleftarrows D^{2-} + H^+$. The ions of lead react with DH_2 under the simultaneous formation of an inner-complex compound $Pb^{2+} + 2DH \rightleftarrows Pb(DH)_2$. (The conclusions: see equations (1) and (2), (3)). The suggested method offers the possibility to determine in the sample of 50 to 0,5 mg sulfate ions with a precision of 1 - 2 %. This method is usable for the rapid and exact determination of sulfates in natural waters but only when the chlorides do not more than seven-fold exceed the quantity of the sulfates. There are 3 tables and 3 references, 1 of which is Soviet.

ASSOCIATION: Gidrokhimicheskiy institut Akademii nauk SSSR
               (Hydrochemical Institute, AS USSR)

SUBMITTED: October 7, 1957

Card 2/2

NECHIPORENKO, G.N.

Role of organic matter in the determination of trace elements in natural waters. Gidrokhim.mat. 28:165-169 '59. (MIRA 12:9)

1. Gidrokhimicheskiy institut Akademii nauk SSSR, g.Novocherkassk.
(Organic matter) (Water—Analysis) (Trace elements)

NECHIPORENKO, G.N.; KRIVENTSOV, M.I.

Trilonometric determination of small quantities of sulfate ions
in water. Gidrokhim.mat. 29:211-213 '59.
(MIRA 13:5)

1. Gidrokhimicheskiy institut Akademii nauk SSSR, Novocherkassk.
(Mineral waters--Analysis) (Sulfates)

NECHIPORENKO, O.N.

Determining sulfate ions by direct titration with lead nitrate in the presence of diphenylcarbazone as the indicator. Gidrokhim.mat. 29:214-218 '59.   (MIRA 13:5)

1. Gidrokhimicheskiy institut Akademii nauk SSSR, Novocherkassk.
     (Water--Analysis) (Sulfate) (Lead nitrate)

NECHIPORENKO, G. V.

Horse Breeding

Results of the State stud stables in 1951, and the quota for 1952.
Konevodstvo 22 No. 6, 1952

9. **Monthly List of Russian Accessions**, Library of Congress, September 195Ø. Unclassified.

NACHIPORENKO, Ivan, Yeliseyevich

[Efficient use of sugar beet harvesting combines; work practices of the Khorol-Machine Tractor Station] Vysokoproduktyvno vykorystovuvaty buriakovi kombainy; z dosvidu roboty kombaineriv Khorols'koi MTS. Kyiv, Dersh. vyd-vo sil's'kohospodars'koi lit-ry Ukrainskoi RSR. 1956. 62 p.   (MLRA 10:6)
         (Sugar beets--Harvesting)

NECHIPORENKO, Ivan Yeliseyevich,; KOBYLYAKOV, L.M., red.; PAVLOVA, M.M., tekhn.
        red., GUREVICH, M.M., tekhn. red.

[Experience in operating beet harvesters] Opyt ispol'zovaniia
sveklokombainov. Moskva, Gos. izd-vo sel'khoz. lit-ry, 1957. 54 p.
                                              (MIRA 11:10)

                (Harvesting machinery)
            (Sugar beets--Harvesting)

NECHIPORENKO, I.Ye. [Nechyporenko, I.IE.], inzn.-meknanik

Equipment for snarpening bladec of the SK-2,6 combine. Mekn. sil!
noap. 9 no. 7:7 Jl '58.   (MIRA 11:8)
                    (Maintenance and repair)
              (Combines(Agricultural machinery))

NECHIPORENKO, I.Ya.[Nechyporenko, I.IE], inzh.-mekhanik

Remodeling the SKEM-3 combine. Mekh. sil'. hosp. 9 no. 8:12-13
Ag '58.   (MIRA 11:8)
                    (Harvesting machinery)

AMINOVA, M.G.; MECHINGENK , L.L., SMICH I, L.I.; TRIFONIV, P . .
        PERELYGIN, V M., kand. med. nauk, otv. red.

        [Bibliography of the scientific papers of the Institute from
        1938 to 1961] Bibliografiia nauchnykh rabot instituta za pe-
        riod 1938-1961 gg. Frunze, 1961. 97 p.

        1. Kirgizskiy nauchno-issledovatel'skiy institut epidem-
        logii, mikrobiologii i gigiyeny. 2. Direktor Kirgizskogo
        nauchno-issledovatel'skogo instituta epideriologii, mikro-
        biologii i gigiyeny (for Perelygin).

THITKOVSKIY, B.I., kand. tekhn. nauk; [illegible] L.I., [illegible]
[illegible], V.I., [illegible]; [illegible], Ye..., [illegible]; [illegible];
rinimali uchastiye: [illegible], [illegible]; [illegible]
G.D.; GAPITH, V.I.; FATEYEVA, A.P; DYN'KC, M.M.; [illegible]
DEM'YANOV, M.; [illegible]; PETRCHNYEP, I.Yu.

Investigating the possibility of manufacturing [illegible]
blanks for cold forming. [illegible] no.:16[illegible]

NECHIPORENKO, M.M., inzhener.

Improve working conditions in underground transportation. Bezop.truda
v prom. 1 no.3:9-10 Mr '57.   (MIRA 10:4)
                    (Coal mines and mining--Safety measures)
                              (Mine haulage)

SAVOSTIN, G.A.,inzh.; TERESHCHENKO, F.P.,inzh.; NECHIPORENKO, M.M.; SAMOTEYEV,
        O.V.; DEMIKHOV, I.,inzh.

        Concerning the article "Increase cross sections of raulageways"
        Bezop.truda v prom. ? no.4:22-24 Ap '58.   (MIRA 11:4)

        1. Institut "Krivbassproyekt" (for Savostin, Tereshchenko). 2.Uprav-
        leniye Tul'skogo okruga Gosgortekhnadzora SSSR (for Nechiporenko,
        Samoteyev).
                (Mining engineering)

NECHIPORENKO, M.M.

Preparing for examinations in safety regulations. Bezop.truda
v prom. 3 no.10:11 O '59.   (MIRA 13:2)

1. Nachal'nik upravleniya Tul'skogo okruga Gosgortekhnadzora
RSFSR.
          (Safety education, Industrial)

NECHIFORENKO, M.M., inzh.; DOLOTOV, N.P., inzh.

Safety measures in mines of the Moscow Basin. Bezop.truda. v prom.
4 no.6:25-27 Je '60.   (Mira 14:3)

1. Upravleniye Tul'skogo okruga Gosgortekhnadzora RSFSR.

  (Moscow Basin--Coal mines and mining--Safety measures)

NECHIPORENKO, M.M., inzh.

Gassiness of the Movcov Basin mines. Bezop.truda v prom. 4
no.10:10-11 O '60.   (MIRA 13:11)

1. Machal'nik Upravleniya Tul'skogo okruga Gosgortekhadzora
RSFSR.
        (Moscow Basin--Mine gases)

NECHIPORENKO, M.M.; DOLOTOV, N.P., inzh.; SUBBOTIN, A.A., Geroy Sotsialisticheskogo truda; PERMYAKOV, P.N., laureat Leninskoy premii

Effective methods for improving work sanitation in mining. Bezop.truda
v prom. 6 no.7:4-6 Jl '62.   (MIRA 15:7)

1. Nachal'nik Upravleniya Tul'skogo okruga Gosudarstvennogo komiteta
pri Sovete Ministrov RSFSR po nadzoru za bezopasnym vedeniyem rabot
v promyshlennosti i gornomu nadzoru (for Nechiporenko). 2. Nachal'nik
Tul'skogo kombinata ugol'noy promyshlennosti Podmoskovskogo basseyna
Ministerstva ugol'noy promyshlennosti SSSR (for Subbotin). 3. Glavnyy
inzh. Tul'skogo kombinata ugol'noy promyshlennosti Podmoskovskogo
basseyna Ministerstva ugol'noy promyshlennosti SSSR (for Permyakov).
            (Tula Province—Coal mines and mining—Safety measures)

SUBBOTIN, A.A., Geroy Sotsialisticheskogo Truda; PERMYAKOV, P.N.,
    laureat Leninskoy premii; NECHIPORENKO, M.M.; DOLOTOV, N.P.

Mechanization and automation in mines of the Priokskiy Economic
Council. Bezop. ruda v prom. 7 no.4:2-3 Ap '63.
                                    (MIRA 16:4)

1. Nachal'nik Tul'skogo kombinata ugol'noy promyshlennosti
Podmoskovnogo basseyna Ministerstva ugol'noy promyshlennosti
SSSR (for Subbotin). 2. Glavnyy inzh. Tul'skogo kombinata
ugol'noy promyshlennosti Podmoskovnogo basseyna Ministerstva
ugol'noy promyshlennosti SSSR (for Permyakov). 3. Nachal'nik
Upravleniya Tul'skogo okruga Gosudarstvennogo komiteta pri
Sovete Ministrov RSFSR po nadzoru za bezopasnym vedeniyem rabot
v promyshlennosti i gornomu nadzoru (for Nechiporenko). 4. Glav-
nyy inzh. Upravleniya Tul'skogo okruga Gosudarstvennogo komiteta
pri Sovete Ministrov RSFSR po nadzoru za bezopasnym vedeniyem
rabot v promyshlennosti i gornomu nadzoru (for Dolotov).
              (Tula Province—Coal mines and mining)
                    (Automation)

NECHIPORENKO, A.Z.; NECHIPORENKO, N.A.

Diagnosis of vesical rupture. Urologiia 24 no.2:63-64 Mr-Ap '59.

(MIRA 12:12)

(BLADDER, rupt.
diag. (Rus))

1. NECHIFORENKO, N. A.

2. USSR (600)

4. Siberia, Eastern-Agriculture

7. Achievements of agricultural science applied on the collective farm. Dost. sel'khoz.
No. 2, 1952.

9. **Monthly List of Russian Accessions**, Library of Congress, **January** 1953. Unclassified.

1. TSEDIK-TOMASHEVICH, Z. F.; NECHIPORENKO, N. A.

2. USSR (600)

4. Agriculture - Experimentation

7. Work results in scientific research institutes on agriculture for 1951.
   Dost. sel'khoz. no. 5, 1952

9. Monthly List of Russian Accessions, Library of Congress, ___January___ 1953. Unclassified.

BIYASHEV, G.Z., akademik; NECHIPORENKO, N.A., FEDOROV, P.F., kand.sel'-
skokhosyaystvennykh nauk; AMANTAYEV, Ye.A., kand.sel'skokhozyay-
stvennykh nauk

Most important problems in the agriculture of southern and
southeastern Kazakhstan. Zemledelie 23 no.4:8-14 Ap '61.   (MIRA 14:3)

1. Kazakhskaya akademiya sel'skokhozyaystvennykh nauk (for Biyashev).
2. Chlen-korrespondent Kazakhskoy akademii sel'skokhozyaystvennykh
nauk (for Nechiporenko).
                (Kazakhstan—Agriculture)

AMANTAYEV, Yerkesh Amantayevich, kand. sel'khoz. nauk; NECHIPORENKU,
Nikolay Andreyevich, kand. sel'khoz. nauk; MERKULOV, O.,
red.

[Corn as our treasure; biology, farming practices, and
mechanization] Kukuruza - nashe bogatstvo; biologiia, agro-
tekhnika i mekhanizatsiia. Alma-Ata, Ob-vo po raspr. polit.
i nauchn. zanii Kazakhskoi SSR, 1962. 54 p. (Seriia: Za vyso-
kuiu kul'turu zemledeliia, no.3)   (MIRA 16:6)
         (Kazakhstan—Corn (Maize))

NECHIPORENKO, N.D. [Nechyporenko, N.D.]

Analysis of the cost of industrial production. Visnyk AN URSR
29 no.9:16-28 S '58.   (MIRA 11:11)
              (Costs, Industrial)

NECHIPORENKO, N.N.

Thermal conductivity of fused coal-tar pitches. N. N. Nechiporenko and A. S. Epshtein. *J. Appl. Chem.* U.S.S.R. 26, 505-7(1953)(Engl. translation).—See C.A. 48, 6466i.   H. L. H.

NICHIPORENKO, N. N.

Chemical Abst.
Vol. 48 No. 9
May 10, 1954
Fuels and Carbonisation Products

Catalysts

Thermal conductivity of the fused coal-tar pitches. N. N. Nichiporenko and A. B. Epshtein. Zhur. Priklad. Khim. 26, 547-6 (1953).—These data are absent in tech. literature, however, they find an important practical application for calcg. the heat-exchange processes in coal-tar distn. There are 2 methods detg. the thermal cond. of finely namely (1) method of coaxial cylinders, and (b) method of fine liquid film. The latter one was adopted for this detn. The specially constructed app. with elec. heating by d.c. and the method used are described and illustrated. Thermal cond. detd. by this method for 4 different kinds of pitch (fusing points range from 78° to 180°; free carbon: 21.53–48.25%; volatile matter 67.48–81.08%) produced by certain coal-tar distn. plants in the Donets Basin, representing values between 0.08 and 0.166 kcal./m./°C./hr. increasing in accordance with temp. of pitch which varies from 60° to 280°. It is possible that the values obtained were subject to the influence of change occurring in the pitch sample compn. during heating. The fusing points of the same pitch sample detd. before and after the expt. were different. It was not possible to ascertain a relation between the thermal cond. of fused pitches and their chem. compn. or their fusing points.
                                                        W. Parafinow

NECHIPORENKO, N.N.

MINENKO, V.I.; TSARIKHIN, D.A.; NECHIPORENKO, N.N.; PUSTOVALOV, V.I.;
SPRISHEVSKIY, A.I.

Method of insulating suspension devices for galvanizing parts.
Avt.trakt.prom. no.10:29 O '54.   (MLRA 7:10)

1. Khar'kovskiy velosipednyy zavod.
   (Galvanizing)

Translation from Referativnvy zhurnal. Metallurgiya, 1957, Nr 10, p 208 (USSR)

AUTHORS   Minenko, V.I., Nechiporenko, N.N.

TITLE   A Method of Insulating Suspension Fixtures for Nickel, Chrome,
            Copper, Zinc, and Other Plating Procedures (Sposob izolyatsii
            podvesnykh prisposobleniy dlya nikelirovaniya, khromirovaniya,
            medneniya, tsinkovaniya i drugikh gal'vanopokrytiy detaley)

PERIODICAL   Tr Khar'kovsk inzh. ekon in-ta 1957 Vol 7 pp 135-138

ABSTRACT   A paste (P) consisting of a polychlorvinyl resin - igelite -
             with added plasticizers and stabilizers is applied to the surface
             of the suspension (S) device. The P is then polymerized by heat
             treatment in a drying cabinet. To improve the strength of the
             bond of the insulating P and the surface of the S, the latter are
             covered with chemically stable primer before the application of
             the insulating P. The raw materials used for insulation may be
             igelite, tech.dibutylphthalate, Pb or Zn stearate, and a chem-
             ically resistant primer KhSG-26 The insulation process pro-
Card 1/2   ceeds via the following stages   a) Degreasing the S by the

SOV/137-57-10-19418

A Method of Insulating Suspension Fixtures (cont)

method used to prepare the parts for plating; b) coating with KhSG-2b
primer, c) drying the primer in a drying cabinet, d) application of the P, e)
heat treatment of the P. f) dressing the contact ends. After priming and
drying, the S are immersed in a pan with the insulating P. The P is pre-
pared as follows The components are weighed out on a basis of 6 parts
dibutylphthalate and 0.16 parts Pb or Zn stearate per weight to 10 parts
igelite The pulverized substances are thoroughly mixed, the dibutyl-
phthalate is added, and the mixture is ground until a homogeneous P of
creamy consistency is obtained. After standing for 30 to 50 minutes (to
ripen) at room temperature, it is applied to the S. The insulating P is pre-
pared in small quantities calculated for use in the next 2 or 3 hours After
the excess P has flowed off, the S, hung from racks, are placed in the dry-
ing cabinet and kept there for 20-30 min at 130-200°C.

G K

Card 2/2

NECHIPORENKO, N. N.

5417.   ELECTROCHEMICAL DESULPHURIZATION OF BENZENE.   Nechiporenko, N.N.
(Zh. prikl. khim. (J. appl. Chem., Moscow), 1956, vol. 29, 1377-1582).   The
bromine number of crude benzene is greatly reduced by anode oxidation of its
emulsions in 36% sulphuric acid containing 1% of ammonium sulphate (lead
electrodes;   c.d. 22-68 amp./sq. dm. at 30-35°;   0.5-11.4 amp. h per 150 ml
benzene).   The effect is ascribed to oxidation of organic sulphur compounds by
persulphates or peroxides.   S.C.I.

MINENKO, V.I., kandidat khimicheskikh nauk; TSARIKHIN, D.A., kandidat
tekhnicheskikh nauk, dotsent; NECHIPORENKO, N.N., kandidat
tekhnicheskikh nauk, dotsent; PUSTOVALOV, V.I., inzhener;
SPRISHEVSKIY, A.I., kandidat tekhnicheskikh nauk.

Insulated hooks for electroplating machine-parts. Vest. mash.
36 no.8:62-63 '56.   (MLRA 9:10)

1. Khar'kovskiy velosipednyy savod.
                    (Electroplating)

S/068/60/000/003/001/003
E071/E233

AUTHORS: Nechiporenko, N. N. and Manoylenko, B. R.

TITLE: Oxidative Desulphurisation of Benzole

PERIODICAL: Koks i khimiya, 1960, No. 3, pp. 37-42

TEXT: The possibility of desulphurising benzole by oxid-
ation of sulphurous compounds to oxygen derivatives of sulphur by
active or activated oxygen, obtained electrochemically or catalyt-
ically was investigated. The results of this investigation are
described in the paper. The experiments were made with pure
benzene to which either 0.91 or 0.50% of thiophene were added.
The diagram of the apparatus for the anodic oxidation of thiophene
in benzole is shown in Fig. 1. The anode and cathode were separa-
ted by a porous diaphragm made from Schott filter. The anode and
cathode were made from platinum strip of a surface area of 12.6
and 15.5 cm^2 respectively. The anode current density was varied
from 0.2 to 0.94 A/cm^2 and the electrolytic temperature 25-27 and
29-30°C respectively. The sulphur containing benzole was fed
continuously (through the bottom of the vessel) into the anode
section while the electrolyte (340 g/l of $(NH_4)_2SO_4$ and 80 g/l of

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E071/E233

Oxidative Desulphurisation of Benzole

H2SO4) was fed from the top into the cathode section of the elect-
rolyser. The benzole and electrolyte in the anode section were
continuously stirred. The gas evolved during the electrolysis
together with benzole vapours was passed through a condenser,
where benzene was condensed and returned into the electrolyser.
The electrolytically treated benzene was washed with a 20%
solution of sodium hydroxide and redistilled. The degree of
desulphurisation obtained was measured by the bromine number (Ref.
11). The experimental results are given in Table 1. The best
results were obtained at a current density of 0.47 A/cm² when up
to 50% desulphurisation was obtained. A further increase in the
current density (0.94 A/cm²) leads to a decrease in the effective-
ness of the process. An addition of 5 g/l of sodium chloride
(experiments 11-13) improved considerably the desulphurising
effect. In the experiments 14 and 15 an electrolyte containing
100 g/l of $(NH_4)_2SO_4$, 550 g/l of H_2SO_4 and 50 g/l of $MnSO_4$ also
gave good desulphurising results. However, in the latter case the
formation of manganic acid was observed, so that a partial

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3/0 8/4 ./ 00/003/001/003
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Oxidative Desulphurisation of Benzole

oxidation of thiophene due to secondary reactions is possible.
Oxidation of thiophene in benzole by oxidants at 85°C was also
tried. The experimental procedure consisted of bubbling benzole
vapours through a layer of (165 mm high) acid solutions of
ammonium persulphate, potassium bichromate, potassium permanganate
and hydrogen peroxide. The experimental results confirm that, in
principle, the desulphurisation of benzole by this method is
possible. Oxidising catalytic desulphurisation of benzole was
tested by passing air-benzole mixture through a furnace heated to
250-380°C filled with various catalysts. As catalysts the follow-
ing substances were used: 1) Pretreated activated carbon. The
pretreatment consisted of extraction of silica with fluoride
compounds, saturation with a solution of ferrous sulphate, precip-
itation of ferrous hydroxide with ammonia and ignition of the
contact mass at 600°C. The product obtained contained about 1% of
Fe_2O_3. 2) The second type of catalyst was made from Chasov-Yar
clay by saturation with ferric nitrate and ferric hydroxide
precipitated with ammonia, washed from alkali ions and ignited at

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Oxidative Desulphurisation of Benzole

600°C. The catalyst contained about 10% of ferric oxide. This catalyst was also made in two additional modifications: a) containing phosphates and b) phosphates and a homogeneous oxygen transferring medium (not specified). In all experiments 25 ml of the catalyst was placed into the furnace; velocity of air stream - 500 ml/min, and of benzole (containing 0.5% of thiophene) 75 ml/hr. The experimental results are given in Table 3. The best results (practically complete elimination of thiophene) were obtained with the clay catalyst activated with phosphates and containing some homogeneous oxygen transferring agents. It was also confirmed that on catalytic oxidation thiophene is completely oxidised to sulphuric acid. It is concluded that the possibility of oxidising resistant sulphurous organic compounds was proved in principle and that the catalytic method is most effective. The process however, requires further studies on a larger scale. There are 3 figures, 3 tables and 13 references: 11 Soviet and 2 non-Soviet.

ASSOCIATION: Khar'kovskiy politekhnicheskiy institut
                (Kharkov Polytechnical Institute)

Card 4/4

NECHIPORENKO, N. N.

Distr: 4E2c(m)/4E3b/4E3d

Investigation of the anodic process in the electrolysis of sodium chloride solutions. N. N. Nechiporenko, P. Kh. Voroshilov, N. V. Sivokon, and V. K. Beldin. Zhur. Priklad. Khim. 33, 1818-28 (1960).—The electrochem. processes occurring on graphite and C anodes were studied. To obtain a material balance of products formed in the anode space, the electrodes were sepd. by 2 glass diaphragms. The electrolyte flowed between these diaphragms and was sucked up into the anode space by a partial vacuum which also removed the Cl evolved. The current efficiency of the evolution of Cl, ν_{Cl}, and that of O (consumed in the oxidn. of the anode), ν_O, decreased, at 1st rapidly, as the concn. of NaCl in the soln., C, increased from 50 to 305 g./l. The break in the $d\nu/dC$ occurred at $C = 150$ g./l.: increasing C from 50 to 305 g./l. increased ν_{Cl} from 82.0 to 90.14% and decreased ν_O from 12.07 to 6.15%, whereas increasing C from 150 to 305 g./l. increased ν_{Cl} to 92.53 and decreased ν_O to 4.97% (the corresponding current efficiencies of free O and of NaClO$_3$ were 3.10, 2.21, 1.51% and 1.73, 0.4, 0.0%, resp.). ν_{Cl} increased and ν_O decreased as the c.d. increased from 250 to 4000 amp./sq. cm. Increasing the temp. from 30 to 70° (c.d. 1000 amp./sq. cm., $C = 305$ g./l.) lowered ν_{Cl} from 99.4 to 97.6% and increased ν_O from 0.35 to 1.47-2.5%. In a cell with diaphragms the current efficiency of NaOH was, within a wide range, independent of C and of the temp. The ratio of Cl⁻ to OH⁻ discharged on graphite and on C anodes was about the same. The deterioration of the anode decreased as the c.d. increased. This was ascribed to the increase in ν_{Cl} and decrease in ν_O as the c.d. increased.   Mowitz,

7

1 BW (BW)
1 JAJ (JK)
2 MJC (JD)(JG)
1 JRt (JC)

3

S/068/62/000/012/001/001
F071/E436

AUTHORS: Nechiporenko, N.N., Kakulin, G.P., Fedorchenko, I.G.,
            Manoylenko, B.R.

TITLE: An investigation of the process of chlorination of
            thiophene

PERIODICAL: Koks i khimiya, no.12, 1962, 43-45

TEXT: In view of the possibility of applying chlorine for the
production of a high purity benzene, the authors investigated the
process of chlorination of thiophene dissolved in benzene in order
to establish the necessary amount of chlorine for a complete
purification of benzole from thiophene.   In addition, the influence
of temperature and velocity of supply of chlorine to the reactor on
the degree of purification of benzole with a given thiophene content
was studied.   The apparatus consisted of a reactor fitted with a
mercury sealed stirrer, thermometer and inlet and outlet for
chlorine.   The outlet gases (air and traces of chlorine) were
scrubbed in a solution of potassium iodide, crystalline sodium
hydroxide (for HCl) and activated carbon (for benzene vapours).
A cryoscopic benzene with an addition of 1% of thiophene was used
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An investigation of the process ...   S/C68/62/000/012/001/C01
E071/E436

for experiments.   The purification process was followed by the
bromine number, determined by the bromide-bromate method.   It was
established that the degree of purification of benzole depends
mainly on the amount of the reagent used and is practically
independent of temperature (7 to 40°C) and rate of supply of
chlorine.   Refining with chlorine can produce a product practically
free from thiophene.   For a complete purification of benzole from
thiophene, it is necessary to use 1.5 to 2.0 weight units of
chlorine per 1 weight unit of thiophene.   There are 1 figure and
3 tables.

ASSOCIATION: Khar'kovskiy politekhnicheskiy institut
             (Khar'kov Polytechnic Institute)

Card 2/2

AUTHOR: Klochkov, ...

TITLE: Analysis . . . .
               Trust Anal. . . . .

PERIODICAL: Gornyy zhurnal, ...

ABSTRACT: The auth . . . . all . . . . .
               in the mine . . . .
               time-saving measures. . . . .
               underground tranit that . . . .
               type is subjected . . . .
               the loading . . . .
               time of transp . . . .
               of transport . . . . .
               There are . . tables.

ASSOCIATION: Trest . . . .

               1. Ores--Handling--Effectiveness . . M . . . .
               --Effectiveness

Card 1 1

NECHIPORENKO, P.I., podpolkovnik meditsinskoy sluzhby; BEDER, G.S.,
mayor meditsinskoy sluzhby

Military medical training of the personnel of a military hospital.
Voen.-med.zhur. no.10:63-65 '64.   (MIRA 18:5)

NECHIFORENKO, P.O. [Nechyporenko, P.O.]

Specialization in action. Mekh. sil'. hosp. 14 no.11:15-17 N'63.
(MIRA 17:2,

1. Predsedatel' Zhitomirskogo oblastnogo ob"yedineniya
"Sil'gosptekhnika."

NECHIPORENKO, V. [Nechyporenko, V.], inzh.

        Conditioning the running wheels of the DT-54 tractor. Mekh.
sil'. hosp.   0 '61.   (MIRA 17:2)

NECHIPORENKO, V.A.

Device for experimental study of sliding journal bearings. Trudy
LKI no.31:95-104 '60.   (MIRA 15:2)

1. Kafedra detaley mashin i pod"yemno-transportnykh mashin
Leningradskogo korablestroitel'nogo instituta.
(Marine engineering)

18 8100   1413 1418 2808 2208   S/185/60/005/003/012/020
                           26597   D274/D303

AUTHORS: Gridnyev, V.N. and Nechyporenko, V.G.

TITLE: Phase transformations during electrical heating of
               manganese-vanadium steels

PERIODICAL: Ukrayins'kyy fizychnyy zhurnal, v. 5, no. 3, 1960,
               402-406

TEXT: The position of the critical points was investigated as a
function of the rate of heating and initial structure of low-carbon
and high-carbon manganese-vanadium steels. The investigations were
carried out over a range of 80 - 30,000 deg/sec; (the first time
that such a range was investigated). The alloying constituents
were chosen in such a way so as to reduce as much as possible the
influence of the carbon on the phase transition process. The method
of investigation is discussed. The specimens were in the form of
wires 0.8 x 1.5 mm. The composition of the specimens is given in
a table; the constituents are: C, V, Mn, Si, Cr, W. The steels

Card 1/4

Phase transformations...

26597

S/185/60/005/003/012/020
D274/D303

were investigated in three initial states: annealed, tempered, and
cold deformed. Annealing was carried out at 1050°C for 60 minutes;
tempering at 1230°C for 45 min. The specimens were directly heated
by alternating current of 1000 cy in a setup for the complex inves-
tigations of phase transitions as per V.N. Gridnyev and V... Chere-
pin (Ref. 1: Zavodskaya laboratoriya, no. 3, 1957). A figure shows
the oscillograms for specimen no. 3 in the annealed state at rates
of 500, 7000 and 30,000 deg/sec respectively. It is noted that the
position of the Curie point can be very clearly distinguished on
the dilatometric curves, and to a lesser degree - on the thermal
curves. It was established by a special investigation that, with
the given method of registration, reliable results in determining
the position of critical points can be obtained for rates of heat-
ing which do not exceed 3000 - 4000 deg/sec. At higher rates, the
readings are affected by the inertia of the system. It was found
possible, however, to correct the position of the critical points
at ultrahigh rates of heating by means of the position of the Curie
point; such a correction can be carried out only if the Curie point

Card 2/4

Phase transformations... 26597

S/185/60/005/003/012/020
D274/D303

ljes below the temperature of phase transition. In all cases (ir-
respective of initial state) the position of the critical points
becomes higher with increasing rate of heating. The displacement
of the critical points is especially pronounced in the case of
annealed steels. Some of the curves show a stabilization of phase-
transformation temperature at very high rates of heating. The pos-
ition of the critical points of tempered steels changed so show un-
expectedly; whereas, according to earlier results, the critical
points of tempered steels lie below those of annealed steels, the
present investigation showed that at relatively low rates of heat-
ing (up to 2000 - 3000 deg/sec) the critical points of tempered
steels lie above those of annealed steels; at high rates of heating,
the present results do not disagree with the earlier results. The
temperature of phase transformation of cold-deformed steels is con-
siderably lower than that of tempered and annealed steels; this
agrees with earlier results. For high-carbon steels, the tempera-
ture of phase transformations of tempered steels is considerably
higher than that of annealed steels. Cold-deformed steels show

Card 3/4

S/185/60/005/003/012/020
D274/D303

26597

...ase transformations...

stabilization of phase-transformation on temperature. .empered steels show no noticeable stabilization. There are 4 figures, 1 table and 3 Soviet-bloc references.

ASSOCIATION: Kyyivs'kyy politekhnichnyy instytut (Kiyev Polytech-nical Institute)

SUBMITTED: July 16, 1959

Card 4/4

8/137/62/000/004/089/201
A052/A101

/187500

AUTHOR: Nechiporenko, V. O.

TITLE: Magnetometric investigation of the residual austenite decomposition
             at electric heating

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 4, 1962, 15, abstract 4I93
             ("Sb. nauchn. tr. aspirantov Kiyevsk. politekhn. in-ta. Kiyev",
             1961, 203-211)

TEXT: Wire samples of steel containing 1.19% C, 1.86% V, 1.74% Mn and
0.70% Si were water hardened at 1,230°C; a part of the samples was cold treated
at -78°C. The effect of tempering at the rates of heating of 30 - 5,000 degree/
sec on the behavior of residual austenite was investigated by the magnetometric
dilatometric and thermal methods. At all rates of heating volume effects corre-
sponding to the first and third temper transformations are observed on dilato-
metric curves. Absolute values of these effects are considerably lower than for
carbon steel. The dilatometric effect of the residual austenite decomposition
is not observed. As the rate of heating increases, the first and third trans-
formations shift into the region of higher temperatures. At heating to the

Card 1/2

18 7500   26583   S/148/61/000/006/007/013
                                                          E071/E480

AUTHORS·   Gridnev, V.N. and Nechiporenko, V.G.

TITLE·   Transformations in vanadium-manganese steel during
               electric annealing

PERIODICAL·   Izvestiya vysshikh uchebnykh zavedeniy, Chernaya
               metallurgiya, 1961, No.6, pp.111-118

TEXT   As not many data on the behaviour of alloy steels during
electric annealing are available, the authors investigated the
influence of alloying elements on the mechanism and kinetics of
processes taking place during electric annealing of vanadium-
manganese steel within a wide range of heating rates (20 to
6000°C/sec).   It was expected that the presence of the carbide
forming element would slow down the decomposition of martensite,
particularly at high heating rates   The addition of manganese
would have facilitated the observation of intermediate structural
states. The experimental steel (0.71% C, 1.79% V, 1.46% Mn and
50% Si) was melted from Armco iron in a high frequency furnace.
The ingot (3 kg) was forged and drawn into wires of 0.6 and 1.5 mm
diameter.   Wire specimens 120 mm long were hardened from 1220°C in
card 1/4

Transformations in vanadium ...   26583   S/148/61/000/006/007/013
E071/E480

from high temperatures.   There are 6 figures and 10 references:
9 Soviet and 1 non-Soviet.   The reference to an English language
publication reads as follows: K.Seal, R.W.K.Honeycombe,
Journal of the Iron and Steel Inst.. v.188, p.1, 1958.

ASSOCIATION: Kiyevskiy politekhnicheskiy institut
(Kiyev Polytechnical Institute)

SUBMITTED: May 12, 1960

Card 4/4

26583

S/148/61/000/006/007/013
Transformations in vanadium ...   E071/E480

subsequent quenching in water.   After such treatment, the
coercive force and Vickers hardness (P = 10 kg) of the specimens
were measured.   The phase composition of the annealed product was
studied by X-ray analysis and by the differential magnetic method
in saturation fields.   It was found that: 1) Volume effects,
corresponding to effects I and III of martensite decomposition
were observed on the dilatometric curves at all heating rates
investigated.   Thus the process of martensite decomposition could
not be supressed.   2) With increasing heating rate, the
temperature of I and III transformations are shifted to higher
ranges.   With increasing heating rate, a continuous decrease of
the volume effect of transformation I and an increase of the
volume effect of transformation III take place.   3) During
electric heating, the formation of austenite takes place in the
temperature range of transformation III.   On the basis of the
dilatometric, magnetic and X-ray data, a partial reverse
transformation of martensite into austenite was postulated.
On reheating, the austenite formed decomposed at lower
temperatures than the residual austenite obtained after hardening
Card 3/4

Transformations in vanadium ...   **26583**   S/148/61/000/006/007/013
E071/E480

from high temperatures.   There are 6 figures and 10 references:
') Soviet and 1 non-Soviet.   The reference to an English language
publication reads as follows: K.Seal, R.W.K.Honeycombe,
Journal of the Iron and Steel Inst., v.188, p.1, 1958.

ASSOCIATION: Kiyevskiy politekhnicheskiy institut
(Kiyev Polytechnical Institute)

SUBMITTED: May 12, 1960

Card 4/4

PRIKHODCHENKO, P.P. [Prykhodohenko, P.P.]; TURENKO, I.Ya.; NECHIPORENKO,
    V.G. [Nechyporenko, V.H.], kand. tekhn. nauk

    Pneumatic vacuum molding of large sized thin-walled parts from
    epoxy glass reinforced plastics. Khim. prom. no.4:33-35 O-D '64.
                                                    (MIRA 18:3'

ACCESSION NR: AP4009590   S/0148/64/000/001/0157/0161

AUTHORS: Gridnev, V.N.; Nechiporenko, V.O.

TITLE: Electric tempering of low carbon vanadium-manganese steels

SOURCE: IVUZ. Chernaya metallurgiya, no. 1, 1964, 157-161

TOPIC TAGS: vanadium manganese steel, low carbon steel, electric tempering, tempering, coercive force, Vickers hardness, mechanical properties, rate of heating, martensite decomposition

ABSTRACT: The effects of tempering in a furnace (where desired temperature is maintained for 1 hour and sample is water cooled) and electric tempering (sample is heated at rate of 1800-2000C C./ sec. and rapidly water cooled) on the properties of the steel were compared. Vanadium (about 1.3%)-manganese (about 1.28%) steels containing different amounts of carbon were studied: alloy 1, 0.054% C; alloy 2, 0.11%C; alloy 3, 0.23%C. The coercive force, Vickers hardness and mechanical properties resulting from different tempering temperatures up to 1000C were determined (fig. 1). Alloy

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ACCESSION NR: AP4009590

3 was heated at rates from 80-30,000C C/sec. to determine the temperature interval of martensite decomposition (fig. 2). The study shows that in conventional furnace tempering the most favorable combination of hardness and strength is attained at about 600C. Similar or somewhat better properties are obtained with electric tempering at 700-750C than with conventional tempering at 600C. Orig. art. has: 4 figures.

ASSOCIATION: Kievskiy politekhnicheskiy institut (Kiev Polytechnical Institute)

SUBMITTED: 19May61   DATE ACQ: 14Feb64   ENCL: 03

SUB CODE: ML   NO REF SOV: 008   OTHER: 001

Card 2/3²

NECHIPORENKO, V.G., kand.tekhn.nauk; PRIKHODCHENKO, P.P., inzh.; ZAYTSEV,
    V.A., inzh.; TSAPOV, V.P., inzh.; VERKHOTUROV, A.D., inzh.

Cutting worm spiral with a variable pitch and profile height
of the turn. Mashinostroenie no.6:82-84 N-D '65.

(MIRA 18:12)

NECHIPORENKO, Vladimir Ivanovich, kand. tekhn. nauk; KAZIMIRCHAK,
V.V., dots., retsenzent;

[Functionally reliable electronic circuits; design
methods] Funktsional'no nadezhnye elektronnye skhemy;
metody postroeniia. Izd.2., stereotipnoe. Kiev, Izd-
vo "Tekhnika," 1964. 103 p.   (MIRA 17:6)

GREBENIK, V. M.; LEONOVA, A. V.; STOROZHIK, D. A.; NECHIPORENKO, V. N.

Investigating regularities of the gas flow and the wear of coupled
parts in blast furnace charging arrangements. Izv.vys.ucheb.zav.;
chern.met. 7 no. 4:182-185 '64.   (MIRA 17:5)

1. Dnepropetrovskiy metallurgicheskiy institut.

OL'GINA, F.P., dotsent; KOSHIK, T.F.; NECHIPORENKO, V.P.

Dissecting aortic aneurysm as a result of physical over-
exertion. Vrach. delo no.11:121-122 N'63   (MIRA 17:1.)

1. Kafedra gospital'noy terapii (zav. - prof. Ya.V.Bern.) i
patologicheskoy anatomii (zav. - prof. A.V.Sosunov) Ivan.-
Frankovskogo meditsinskogo instituta.

NKCHIPORENKC, V.P., inzh.; KANARSKIY, N.A., inzh.

Reconditioning guiding wheel rims of the DT-54 tractor
Mashinostroenie no. 2:89-90 Mr-Ap '64.   (MIRA 17:5)

PALIYCHUK, N.Yu.; NECHIFORENKO, V.F.

Cancer of the stomach accompanied with the development of miliary carcinomatosis of the lungs in conjunction with miliary tuberculosis of the lungs. Vest. rent. i rad. 40 no.1:66-67 Ja-F '65.   (MIRA 18:6)

1. Rentgenovskoye otdeleniye (zav. N.Yu. Paliychuk) Ivano-Frankovskoy oblastnoy klinicheskoy bol'nitsy (glavnyy vrach V.Ye. Khokhryakov) i kafedra rentgenologii i radiologii (zav. V.I. Vetoshchuk) Ivano-Frankovskogo meditsinskogo instituta.

S/137/62/000/004/049/201
A006/A101

AUTHORS: Nechiporenko, Ye.P.; Zmiy, V.I.

TITLE: New high-temperature heaters for electric furnaces which do not re-
quire shielding atmosphere

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 4, 1962, 45, abstract 4G300
("Poroshk. metallurgiya", 1961, no. 5, 92 - 94, English summary)

TEXT: For high-temperature furnaces (1900°C), the use of Mo-rods is pro-
posed. The rods are 6 mm in diameter, 230 mm long, with a protective $MoSi_2$ and
refractory enamel coating. The rise of temperature in the furnace operating in
air atmosphere can be brought about rapidly. The heaters were tested for 100 h
at 1,750°C. A deficiency of the described heaters is the necessity of using
high-power trnasformers due to the low electric resistivity of Mo.

                                                                R. Andriyevskiy

[Abstracter's note: Complete translation]

Card 1/1

IR 3,000   (/.x] 1/ 6,8, M.4

AUTHORS: Ul'yanov, R.A., Nechiporenko, Ye.P and Tarasov, N.D.

TITLE: Vacuum Refining of Niobium

PERIODICAL: Fizika metallcv i metallovedeniye 1961 Vol 11, No.3,
pp.461-464

TEXT: Results on refining experiments, the preparation of compact
metal and data on the structure and mechanical properties are given.
Commercially-pure niobium powder (98.7% containing 0.08% iron,
0.2% lead, 0.04% silicon and 0.18% carbon) was used. The powder
also contained moisture, oxygen, nitrogen and hydrogen. Hydrogen
and hydrides were removed by heating in vacuo to 700°C. Oxygen
and oxides were removed at 1900 to 2000°C. The powder was dried
to constant weight and pressed at 5 to 6 t/cm^2. Sintering was
carried out in vacuo at 1400°C for 4 to 6 hours. Fig.1 shows
samples after this treatment. Further refining is carried out by
a high temperature treatment (2300 to 2500°C) in a vacuum of
10^{-5} mm mercury for eight hours, in a special water cooled chamber.
The samples are placed between tungsten electrodes and heated by
passing a current. The appearance of the samples after treatment
is shown in Fig.2 The purity was followed by spectrographic
Card 1/4

21224

S/126/61/011/003/012/017
E021/E435

Vacuum Refining ...

analysis, the results show how the lines corresponding to lead, silicon and iron disappear after refining. The refined metal is subjected to arc melting in an atmosphere of carefully purified argon. The ingots after melting are silver white in colour without any trace of oxidation and they have a hardness of 80 to 100 kg/mm^2. The metal can be vacuum rolled at 1100 to 1200°C; the structure of the metal is shown in Fig.4 (a - as cast, б - hot rolled in vacuo at 1250°C, ғ - annealed at 1700°C for 10 hours). After annealing at 1700 to 1730°C in vacuo, the hardness is 80 to 90 kg/mm^2 (Brinell) and the tensile strength 30 to 40 kg/mm^2 with elongation of 30%. There are 4 figures, 1 table and 9 references: 3 Soviet and 6 non-Soviet.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN UkrSSR g. Khar'kov
(Physicotechnical Institute AS UkrSSR, Khar'kov)

SUBMITTED: August 2, 1960

Card 2/4

Vacuum Refining ...

S/126/61/011/003/012/017
E021/E435
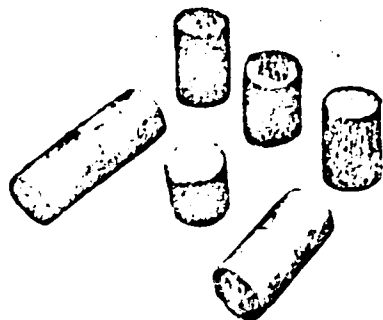
Fig.1.

Fig.2.

Card 3/4

Vacuum Refining ...

21224
S/126/61/011/003/012/017
E021/E435
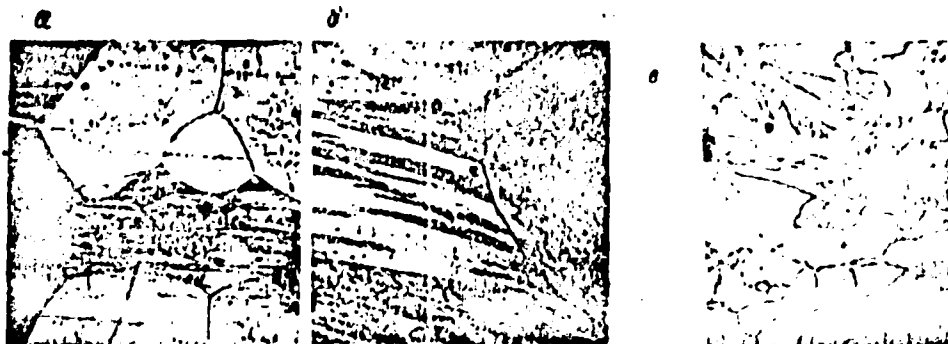
Fig. 4

Card 4/4

AUTHOR: Verkhorobin, L..., Ivanov, A.V..., Ne...
Nechiporenko, Yu..., Pisachev, N.S., and ...

TITLE: Diffusion reactions in the molyb..., w...
systems

PERIODICAL: Fizika metallov i metallovedeniye, v... , no...
77-81

TEXT: The processes of dif... in... the...
molybdenum, tungsten and tantalum by silicon on t...
were studied. Metallic samples were heated in si...
a vacuum of 10^{-5} mm mercury in the range 1150-1...
silicide layer, formed on the surface of the metals, w...
by metallographic and X-ray analysis. The results s...
saturated layer was produced, in the main, through th...
phase. The first stage was the formation of lower s...
Afterwards, higher silicides are formed. At 1250...
disilicide appears after 0.5, 1 and 5 hours on W, T...
respectively. Once the disilicide has appeared, fur...
occurs largely by this phase, and only after a defin...
has been attained is there a retardation in growth of di...
Card 1/2

Diffusion reaction ...

... increased ... in the layer of lower ... ...
shown from x-ray analysis ... of the samples ...
samples during diffusion that preferential diffusion ...
through the silicide layer occurred, and the reaction ...
the formation of the phase takes place mainly at ...
boundary of the layer. There are ... figures and ...

ASSOCIATION: Fiziko-tekhnicheskiy institut ...
                 (Physicotechnical Institute AN ...)

SUBMITTED: April ... , 19 ...

Card 2/2

S/126/62/013/006/012/018
E111/E352

AUTHORS: Glushko, P.I., Dorokhov, V.I. and Nechiporenko, Ye.P.

TITLE: Contribution to the kinetics of the oxidation of molybdenum disilicide

PERIODICAL: Fizika metallov i metallovedeniye, v. 13, no. 6, 1962, 923 - 924

TEXT: The results of a study of the kinetics of the oxidation of molybdenum disilicide in air at 900 - 1 300 °C are given. Specimens were prepared by heating molybdenum plates with silicon powder at a pressure of 10^{-3} mm Hg and a temperature of 1 350 °C. After metallographic and diffraction analysis for $MoSi_2$ the oxidation kinetics were studied in the interval of 900 - 1 200 °C and a duration of 6 h. The rate of oxidation per unit surface was determined from the gain in weight. The activation energy was found to be 82 ± 2.5 kcal/mole and the process followed the equation:

$$W = K\tau^n .$$

where W is the change in weight, τ the time, K the rate constant (1.998×10^{-4} at 900 - 2.590×10^{-2} at 1 200 °C)
Card 1/2

Contribution to ....

S/126/62/013/006/012/018
E111/E352

and n a kinetic parameter (0.72 at 900 - 0.42 at 1 200 $^{\circ}$C).
There are 3 figures and 1 table.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN UkrSSR
                 (Physicotechnical Institute of the AS UkrSSR)

SUBMITTED: November 28, 1961

Card 2/2

IVANOV, V. Ye.; NECHIPORENKO, Ye. P.; OSIPOV, A. D.; ZMIY, V. I.

Effect of stresses on defects in silicide layers on molybdenum.
Fiz. met. i metalloved. 14 no.4:574-577 O '62.
                                                (MIRA 15:10)

        (Metallic films—Defects)
         (Thermal stresses)

L 14954-63   EPF(n)-2/EWP(q)/EWT(m)/BDS/T-2   AFFTC/ASD/SSD   Pu-4
GH/JD/HW/JG
ACCESSION NR: AP3004264   8/0131/63/000/007/0327/0331

AUTHOR: Ivanov, V. I.; Pletenetskiy, G. Ye.; Nechiporenko, Ye. P.

TITLE: Effect of high-temperature oxide refractories on the thermal emf of tungsten, molybdenum, and tantalum in vacuum at 1500C

SOURCE: Ogneupory, no. 7, 1963, 327-331

TOPIC TAGS: thermocouple, high temperature, high-temperature thermocouple, insulating ceramic material, ceramic insulator, magnesia, alumina, beryllia, zirconia, tungsten, molybdenum, tantalum, tungsten wire, molybdenum wire, tantalum wire, high-temperature oxide refractory, thermal emf, vacuum apparatus, tungsten-molybdenum thermocouple, annealing, annealed wire, vacuum furnace

ABSTRACT: The stability of operation of high-temperature thermocouples made from annealed or unannealed W, Mo, or Ta wires after prolonged contact at 1500C with an insulating ceramic material — MgO, BeO, Al_2O_3, and ZrO_2 — has been studied in the vacuum apparatus shown in Fig. 1 of Enclosure. W, Mo, and Ta unannealed standard wires were heat-treated in contact with the pure powdered oxides for 15, 30, and 45 hr at 1500C in a vacuum (2×10^{-5} mm Hg). Wires of the same metals but annealed in vacuum at 2000—2200C, were similarly treated. Temperature in

Card 1/3

L 14954-63
ACCESSION NR: AP3004264   O

the vacuum furnace was controlled with reference thermocouples; a VR-5/20 thermo-
couple and a platinum-platinum-rhodium thermocouple. Thermocouples were made by
joining the heat-treated wire with the untreated, as a reference metal. Thermal
emf generated between the hot and cold junctions of such thermocouples was measured
in the vacuum apparatus. The cold junctions of the reference thermocouple and of
the thermocouples under study were maintained in wet ice. It was shown that ex-
perimental thermal emf of the W, Mo, and Ta wires annealed and subsequently heated
for 45 hr in the oxides was not significantly different from that of the unan-
nealed wires, except in the case of W preheated in ZrO_2. Diameter of the wires
in the 0.2 to 1.0 mm range has no effect upon thermal emf stability. For each
metal the changes in thermal emf due to preheating in oxides were plotted against
preheating time at 1500C with each of the oxides or against temperature (in the
0—1500C range) at 45 hr of preheating. The data indicated that the thermal emf
of tungsten remains stable after contact with Al_2O_3, MgO, or BeO, but increases
considerably with ZrO_2; molybdenum thermal emf is stable after contact with
Al_2O_3, MgO, or ZrO_2 and changes slightly after 5-hr contact with BeO; and tantalum
thermal emf changes significantly after preheating in all the oxides. It was
noted that small changes in the thermal emf of W and Mo after contact with MgO

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L 14954-63
ACCESSION NR: AP3004264

are identical in magnitude and sign, so that the readings of a W-Mo thermocouple
would remain constant. Structural changes coincident with the changes in thermal
emf were revealed by photomicrographic analysis. Presumably, the dark parallel
bands observed on the tantalum grains are caused by oxidation. Tantalum becomes
brittle and is therefore not recommended for thermocouples. Orig. art. has: 6
figures and 1 table.

ASSOCIATION: none

SUBMITTED: 00   DATE ACQ: 20Aug63   ENCL: 01

SUB CODE: PH, MA   NO REF SOV: 001   OTHER: 007

Card 3/3

ACCESSION NO: AP4009390   S/0126/63/016/006/0931/0933

AUTHORS: Yefimenko, L. N.; Nechiporenko, Ye. P.; Pavlov, V. N.

TITLE: Oxidation of tungsten disilicide

SOURCE: Fizika metallov i metallovedeniye, v. 16, no. 6, 1963, 931-933

TOPIC TAGS: tungsten disilicide, oxidation, thermocouple, PtRh PtkRh thermocouple,
oxidation curve

ABSTRACT: Oxidation of tungsten disilicide has been investigated. The process
was conducted in air at a temperature range of 650-1500C. Samples 20 x 10 x 0.1 mm
were produced in a vacuum of 5 x 10⁻⁵ mm Hg by filling tungsten plates with
powdered silicon. Nichrome elements were used to produce temperatures up to 1000C,
and silicon carbide elements were used for higher temperatures. The temperatures
were measured with a PtRh-PtkRh thermocouple and were kept constant. In the course
of oxidation the samples were weighed with an accuracy of ±0.01 mg. Below 1000C
the experiments were conducted uninterruptedly; above 1000C they were interrupted
due to the formation of dense film on the surface of the plates. As can be seen
from Fig. 1 of the Enclosure the rate of oxidation curves changed shape at various

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ACCESSION NO: AP4009390

temperatures. Up to 1000C the weight increase followed the formula $W = kt^m$, where W is the weight change per unit area (in mg/cm^2), and t is the time of oxidation (in minutes). At 1150-1250C the curves assume a descending trend because at these temperatures WO_x becomes extremely volatile. A dense, glassy coating of SiO_2 forms at 1300C, and the process of oxidation progresses logarithmically. The formation of such a coating is described by R. Kiffer and F. Benesovsky (Symposium on Powder Metallurgy, Iron. a. Steel Inst. prep. gr., IV, 1953, 40). The logarithmic prog- ress follows the expression $W = k_1 \ln(k_2 t + k_3)$, where k_1, k_2, and k_3 are determ- ined by the method described by A. Champion and T. White (J. Inst. Metals, 1949, 75, 375). Metallographic and x-ray investigation disclosed the presence of W_5Si_3 under the glassy coating on WSi_2 oxidized for a long time at high temperatures. Orig. art. has: 2 graphs, 3 formulas, and 2 tables.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN UkrSSR(Institute of Physics and Technology AN UkrSSR)

SUBMITTED: 20Mar63   DATE ACQ: 03Feb64   ENCL: 01

SUB CODE: PH, CH   NO REF SOV: 002   OTHER: 003

Card 2/3

IVANOV, V.I.; PLETENETSKIY, G.Ye.; NECHIPORENKO, Ye.P.

Effect of highly refractory oxides on the thermoelectromotive
force of tungsten, molybdenum, and tantalum, in vacuum at
1,500° C. Ogneupory 28 no.7:327-331 '63.   (MIRA 16:9)

ACCESSION NR: AP4013097   S/0126/64/017/001/0094/0099

AUTHOR: Ivanov, V. Ye.; Nechiporenko, Ye. P.; Zmiy, V. I.

TITLE: Study of reaction diffusion in the Mo - Si system

SOURCE: Fizika metallov i metalloved., v. 17, no. 1, 1964, 94-99

TOPIC TAGS: metal diffusion, reaction diffusion, silicon diffusion, molybdenum silicide, molybdenum silicon system, silicide phase formation, vacuum silication

ABSTRACT: Previously published papers of the first two authors and others on various aspects of the reaction diffusion of silicon-saturated molybdenum, tungsten, and tantalum in vacuum have led to the conclusion that in the Mo - Si system the predominant role is played by diffusion of the silicon through the silicide layer; that is, the phase formation reaction takes place primarily on the internal bound- ary of the layer. The present article confirms this conclusion. The kinetic aspects of the vacuum silication of the molybdenum were also studied. The authors found that the growth of diffusion layers of Mo_5Si_3 and $MoSi_2$, as a function of time, obeys a parabolic law. From the parabolic growth of the silicide layers the authors computed the silicon diffusion factors in Mo_5Si_3 and $MoSi_2$ at 1250C. Used in the diffusion study were flat molybdenum samples 40x10x1 millimeter in size. The

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ACCESSION NR: AP4013097

silicon employed in the tests was in the form of powder with a grain size of
5-7 microns (purity factor: 99.99%). The samples were located in a molybdenum
bath and thoroughly sprinkled with the powder. The bath with the samples was in-
serted, through a precombustion chamber, into a furnace with a molybdenum heater
set at the proper temperature. Orig. art. has: 6 figures, 2 formulas, and 1 table.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN USSR (Physicotechnical Institute,
AN UkrSSR)

SUBMITTED: 03Mar63   DATE ACQ: 26Feb64   ENCL: 00

SUBCODE: ML, PH   NO REF SOV: 009   OTHER: 000

Card   2/2

ACCESSION NR: AP4013101   S/0126/64/017/001/0142/0144

AUTHOR: Ivanov, V. Ye.; Nechiporenko, Ye. P.; Zmiy, V. I.; Glushko, P. I.;
Aleksandrov, O. M.; Dorokhov, V. I.

TITLE: High-temperature oxidation of molybdenum disilicide

SOURCE: Fizika metallov i metalloved., v. 17, no. 1, 1964, 142-144

TOPIC TAGS: molybdenum, silicon, molybdenum disilicide, molybdenum disilicide
oxidation, molybdenum disilicide microhardness

ABSTRACT: Molybdenum disilicide is a metal with great promise for use in structures
designed to withstand high temperatures. In the technical literature there are
data on the oxidation of $MoSi_2$ achieved by various methods: hot pressing, sintering,
etc. The authors of this short article conducted a study of the kinetics of $MoSi_2$
oxidation in a temperature interval of 1400-1700C using a high-temperature resist-
ance furnace. The heater was a spiral 5mm in diameter made from a molybdenum rod.
For oxidation, samples of molybdenum disilicide 25X10X0.15 mm in size were used;
these samples were obtained by the vacuum method. The temperature was controlled
by a thermocouple (Pt - Rh 7%) center: Pt-Rh 20%) and an optical pyrometer, the
latter placed directly on the heater. The temperature gradient between the heater

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ACCESSION NR: AP4013101

and the sample was not more than 30C. A metallographic analysis of the sample was carried out with an MIM-7 microscope, with microhardness tested on a PMT-3 instrument. Oxidation time was 10 hours. It was found that with increasing time and temperature the oxidizability of $MoSi_2$ increases, the rate of oxidation obeying a parabolic law. No transition from a parabolic law of oxidation to a logarithmic one was detected in the tests. X-ray analysis in the temperature range indicated (1400-1700C) revealed an amorphous oxide film on the surface of the oxidized samples. Preliminary analysis showed that this film, in addition to SiO_2, contains unknown components. These are, apparently, lower molybdic oxides, the vapor tension of which is lower than that of MoO_3. The microhardness of the molybdenum disilicide, which did not change during the oxidation process, was 1200 kg/mm^2. Orig. art. has: 3 figures.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN USSR (Physicotechnical Institute, AN UkrSSR)

SUBMITTED: 03Mar63   DATE ACQ: 26Feb64   ENCL: 00

SUB CODE: ML   NO REF SOV: 005   OTHER: 003

Card 2/2

L 17642-65   ENP(e)/ENT(m)/EPF(n)-2/EPR/ENP(b)/ENP(t)   Ps-4/Pu-4   IJP(c)/SSD/
ASD(m)-3/ESD(t)/AEDC(b)   JD/JG/AT/WH
ACCESSION NR: AP4042042   S/0126/64/017/006/0862/0865

AUTHOR: Ivanov, V. Ye.; Nechiporenko, Ye. P.; Krivoruchko, V. M.; Mitrofanov, A. S.

TITLE: Some peculiarities of vacuum siliconizing refractory metals

SOURCE: Fizika metallov i metallovedeniye, v. 17, no. 6, 1964, 862-865

TOPIC TAGS: Mo, W, Ta, siliconizing, vacuum siliconizing, refractory metal, silicon, vapor deposition, vacuum

ABSTRACT: The authors investigate the siliconizing of W, Mo, and Ta specimens 20 x 20 x 0.2 mm in saturated silicon vapors at 1200 and 1250C and under a vacuum of 1×10^{-5} mm Hg. Eliminating all contact between the Si powder and the metal, the authors observed the behavior of the vapor phase. The formation of $MoSi_2$, WSi_2, and $TaSi_2$ was identified on the surface of the specimens. The effects of time on layer thickness were plotted, and parabolas were obtained. Consequently, diffusion is a limiting factor in the process. The layer growth is defined by the equation $h^2 = D(c_2 - c_1) \times t$, where D is the Si diffusion coefficient in silicide, c_1 is Si concentration on the inner silicide/layer boundary, c_2 is Si concentration on the outer boundary, and t is time. W and Ta give an analogous picture. In the $TaSi_2$ phase, Ta_5Si_3 inclusions were found which can contribute to pinpointing

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ACCESSION NR: AP4042042   /

corrosion of siliconized tantalum. Siliconizing in a cell with a temperature grad-
ient causes the rate of siliconizing to decrease as temperature of the specimen
rises. The time dependence of the siliconizing at a predetermined gradient is des-
cribed by a parabola. Orig. art. has: 5 figures.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN SSSR (Physicotechnical Institute,
AN SSR)

SUBMITTED: 15Jun63   ENCL: 00   SUB CODE: MM

NO REF SOV: 002   OTHER: 002

Card 2/2

ACCESSION NR: AP4015327

S/0032/64/030/001/0098/0099

AUTHORS: Nechiporenko, Ye. P.; Osipov, A. D.

TITLE: Apparatus for determing the modulus of elasticity of sheet materials at high temperatures

SOURCE: Zavodskaya laboratoriya, v. 30, no. 1, 1964, 98-99

TOPIC TAGS: modulus of elasticity, sheet material, high temperature apparatus, molybdenum disilicide, resonant frequency measurement

ABSTRACT: Apparatus is described for determining the modulus of elasticity of light, fragile samples by measuring the vibrational resonant frequency. The sample (in the form of a thin strip) was held at its nodal points by two metal filaments, one of which was vibrated by a solenoid. Resonance was measured by a differential capacitance device between the plates of which the sample was located. The sample and supports were enclosed by an oven. With this apparatus the modulus of elasticity at different temperatures of molybdenum disilicide was found to be 34×10^{-3} kg/mm^2 at 0C. It decreased linearly to 29×10^{-3} kg/mm^2 at 1100C (accuracy of 5%). Orig. art. has: 1 equation and 2 diagrams.

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ACCESSION NR: AP4015327

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk UkrSSR(Institute of Physics and Technology AN UkrSSR)

SUBMITTED: 00

SUB CODE: MA

DATE ACQ: 03Feb64

NO REF SOV: 001

ENCL: 00

OTHER: 000

Card 2/2

L 15749 :6   EWT(m)/ETC(f)/EPF(n)-2/EWG(m)/EWA(d)/EWP(t)/EWP(z)/EWP(b)
ACC NR: AT5027941
IJP(c)   JD/JG/GS   SOURCE CODE: UR/0000/65/000/000/0055/0056
AUTHOR: Kashimarcho, Ya. P. (Doctor of technical sciences); Krivorushko, V. N.;
Mitrofanov; L. V.; Poltavtsev, N. S.

ORG: none

TITLE: Siliconizing of refractory metals

SOURCE: Seminar po sharostoykim pokrytiyam. Leningrad, 1964. Zharostoykiye
pokrytiya (Heat-resistant coatings); trudy seminara. Leningrad, Izd-vo Nauka,
1965, 55-56

TOPIC TAGS: molybdenum, tantalum, tungsten, heat diffusion

ABSTRACT: The kinetics and the mechanism of siliconizing of refractory metals in a
vacuum under stabilized conditions (5-50 hrs) were studied previously by K. E.
Ivanov and the authors (FMM, 17, 6, 862, 1964). The purpose of the present work
was to study the initial stages of siliconizing and to determine the parameters
controlling the rate of this complex process. A foil plate (0.1 x 10 x 20 mm) and
cylindrical (0.5 mm diameter and 20 mm long) samples of Mo, Ta, and W were covered

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ACC NR: AT5027941

by powdered (grain size 5-10μ) silicon, containing (in %) 99.9206, Si, 0.0009 Fe, 0.02 Al, 0.004 Mg, 0.04 Ca, 0.004 Cu, 0.0012 Zn, 0.0012 Cr, 0.0001 Mn, 0.0013 Sn, and 0.0025 Fe, placed into a molybdenum vessel and carried into a preheated vacuum electrical furnace (1 x 10⁻⁵ mm Hg) through a special forechamber. The study was made at 1200, 1250, and 13000, which were registered by a Pt-PtRh thermocouple and an EPP-09-type automatic potentiometer. The increases in weight (in mg km²) of siliconized samples were determined after various exposures (t in minutes). The curves for weight increase versus time were plotted for 1200, 1250, and 13000, and the samples were subjected to an X-ray diffraction study. During siliconizing of Mo at 12500, the Mo₃Si phase was formed first, then (after 25 minutes) the Mo₅Si₃ phase appeared, and the MoSi₂ was formed after 150 minutes. The intervals between the formation of various phases decreased with increasing temperatures; the Mo₅Si₃ phase at 12000 appeared after 110 minutes, at 12500 after 25 minutes, and the MoSi₂ phase was formed at 13000 after 5-6 minutes. The process was a similar one during siliconizing of Ta and W except for the fact that some phases, which should have been present according to the phase diagram, did not appear at all. Only Ta₅Si and TaSi₂ were formed during siliconizing of Ta (Ta₅Si₃ and Ta₃Si were absent); the W₃Si phase appeared first and WSi₂ later during the siliconizing of W. After establishing the phase equilibrium, the chemical composition of the layer

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ACC NR: AT5027941

did not change. The points of inflection on the curves indicated the formation of a subsequent, new, higher phase. The Mo_3Si and Mo_5Si_3 phases grew according to the parabolic law. The rate of siliconizing was thus controlled by diffusion, even during the initial stages of the process. Orig. art. has: 2 figures.

SUB CODE: /// SUBM DATE: 20Jul65/ ORIG REF: 009/ OTH REF: 001

3/3

BORISENKO, A.I., doktor tekhn. nauk, otv. red.; TOROPOV, N.A.,
     red.; IVANOV, V.Ye., r-d.; APPEN, A.A., doktor khim.
     nauk, red.; GORBUNOV, N.S., doktor khim. nauk, red.;
     KLEVTSUR, S.A., doktor tekhn. nauk, red.; NECHIPORENKO,
     Ye.P., doktor tekhn. nauk, red.

     [Heat-resistant coatings; transactions] Zharostoikie po-
     krytiia; trudy. Leningrad, Nauka, 1965. 233 p.
                                              (MIRA 18:9)

     1. Seminar po zharostoykim pokrytiyam, Leningrad, 1964.
     2. Chlen-korrespondent AN SSSR (for Toropov, Ivanov).

L 3434-66   EWT(m)/ETC/EPF(n)-2/EWG(m)/EWP(t)/EWP(b)   IP(c)   JD/JG/GS

ACCESSION NR: AT5024871   UR/0000/65/000/000/0045/0055

AUTHOR: Ivanov, V. Ye.; Nechiporenko, Ye. P.; Zmiy, V. I.; Krivoruchko, V. M.

TITLE: On the vacuum siliconizing of refractory metals

SOURCE: AN UkrSSR. Institut problem materialovedeniya. Diffusionnyye pokrytiya na metallakh (Diffusion coatings on metals). Kiev, Naukova dumka, 1965, 45-55

TOPIC TAGS: metal diffusion plating, silicon, refractory metal, silicide, activation energy

ABSTRACT: The kinetics and mechanism of case-formation were investigated for Mo specimens measuring 40x10x1 mm vacuum-siliconized at $1 \cdot 10^{-3}$ mm Hg by being covered with Si powder and heated at 1200-1350°C. Metallographic and radiographic examination established that the formation of molybdenum silicides occurs in the follow-ing sequence :.

$$Mo + Si \rightarrow Mo_3Si + Si \rightarrow Mo_5Si_3 + Si \rightarrow MoSi_2$$

at the corresponding phase interfaces, i.e. the formation of $MoSi_2$ is due to the

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ACCESSION NR: AT5024871

lower silicides. Plotting of the curves of isothermal growth of the layers of
Mo_5Si_3 and $MoSi_2$ at 1250°C revealed that the increase in their thickness with time
follows a parabolic law. This was verified by vacuum-siliconizing specimens of Mo,
W, and Ta in saturated Si vapors. The resulting curves also proved to follow a pa-
rabolic law of growth in layer thickness as a function of time, thus confirming
that the diffusion of Si is the determining factor in the rate of siliconizing.
On this basis, the activation energies for the diffusion of Si in Mo_5Si_3 and
$MoSi_2$ were calculated to be $Q_{Mo_5Si} = (126,000 \pm 12,000)$ cal/mole and $Q_{MoSi_2} =$
$(57,600 \pm 6,000)$ cal/mole, respectively. Experiments to determine the effect of
the presence of a temperature gradient between the box (1250°C) and the specimen
(1200°C) on the growth rate of the $MoSi_2$ layer (see Fig. 1 of the Enclosure) re-
vealed that, if the metals are siliconized in a box with a temperature gradient,
the siliconizing rate decreases with increase in temperature of the specimen and in-
creases with decrease in this temperature as compared with the temperature of the
box, while the growth in case-thickness follows a parabolic curve. Orig. art. has:
10 figures.

ASSOCIATION: none

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L 3434-66

ACCESSION NR: AT5024871

SUBMITTED: 00

NR REF SOV: 006

ENCL: 01

OTHER: 003

SUB CODE: MM, IE

Card 3/4

L 3434-66

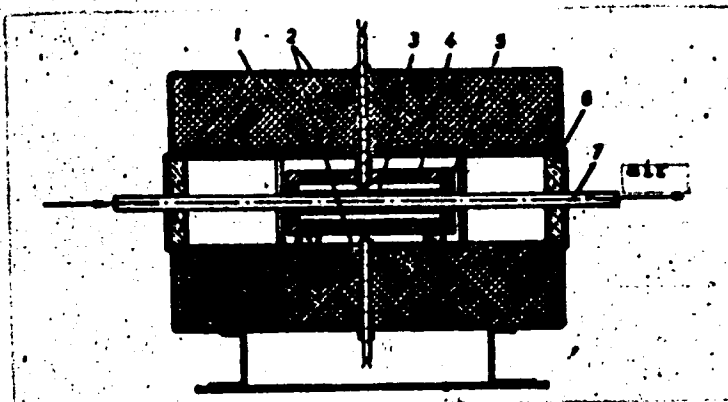ACCESSION NR: AT5024871   ENCLOSURE: 01

Fig. 1. Diagram of setup

1 - furnace; 2 - thermocouple; 3 - specimen; 4 - box; 5 - Al_2O_3 ring;
6 - furnace lid; 7 - stainless-steel cooling pipe

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