L 36198-65 EPA(s)-2/EWT(m)/EWA(d)/EWP(v)/T/EWP(t)/EWP(k)/EWP(b)/EWA(c)
Pf-4 IJP(c) JD/HM/HW/JG/WB S/0129/64/000/010/0039/0040
ACCESSION NR: AP4047509

AUTHOR: Shapiro, M. B. ; Volikova, I. G.

TITLE: The titanium-carbon ratio in stainless steels

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 10, 1964, 39-40

TOPIC TAGS: intercrystalline corrosion, titanium carbide, carbide dissociation, chromium carbide, titanium carbon ratio

ABSTRACT: The hardening temperature greatly affects the tendency of steel to intercrystalline corrosion. The dissolution of titanium carbide in a solid solution is accompanied by a complete temperature-dependent carbide dissociation, its degree increasing at elevated temperatures which, in turn, promotes carbon and titanium concentrations in the solid solution. The titanium content in the solid solution increases as carbon decreases. If the entire carbon were to be bound into titanium carbide, the Ti-C ratio must be the greater, the higher the hardening temperature (see Fig. 1 of Enclosure). In 25% Cr steel, intercrystalline

Card 1/3

L 36198-65
ACCESSION NR: AP4047509

3

corrosion is absent after hardening from 1150C and holding for 5 minutes with a Ti-C ratio exceeding 7. An increase in the temperature to 1200C requires a higher Ti-C ratio. Stabilizing annealing within the 870 to 900C range is recommended since the dissociation of titanium carbide is smaller than the dissociation of chromium carbide; within this temperature range a stoichiometric Ti: C ratio prevents a tendency to intercrystalline corrosion. However, in large-profile weld joints intercrystalline corrosion is prevented with a maximum Ti-C ratio in the steel. Orig. art. has: 1 figure and 3 equations.

ASSOCIATION: NIIKhIMMASh

SUBMITTED: 00 ENCL: 01 SUB CODE: MM

NR REF SOV: 004 OTHER: 001

Card2/3

L 36198-65
ACCESSION NR: AP4047509

ENCLOSURE: 01

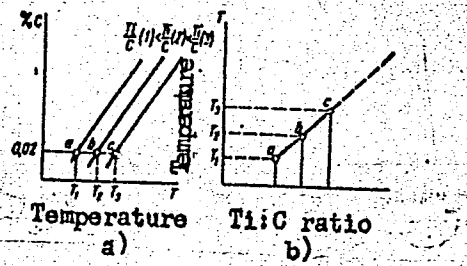


Fig. 1
The effect of the Ti-C ratio on the stabilizing annealing temperature

Card 3/3

SHAPIRO, M.B.

Intergranular corrosion of austenitic steels and alloys. Metalloved. i term.obr.met. no.1:55 Ja '65. (MIRA 18:3)

SHAPIRO, M., slushatel' Vysshikh inzhenernykh kursov.

How the cutter-loader was created. ("The biography of a machine" by I.Vasil'kov, M.TSeitlin. Reviewed by M.Shapiro.) Mast.ugl.5 no.12: 27 D '56. (MLRA 10:2)

1. Donetskiy industrial'nyy institut.
(Coal mining machinery) (Vasil'kov, I.) (TSeitlin, M.)

SHAPIRO, M.D., kandidat tekhnicheskikh nauk; AL'TERMAN, L.S.; KEYTEL'GISSER, S.R.

Coals of western Donets Basin as a raw material for coking. Koks i khim. no.6:3-8 '56. (MLRA 9:10)

1.Dneprepetrovskiy khimiko-tekhnologicheskiy institut.
(Donets Basin--Coal)

AUTHORS: Dal', V.I., Dr.Tech.Sc., Shapiro, M.D., Cand.Tech.Sc. and Gubergrits, M.Ya. (Dnepropetrovsk Institute of Chemical Technology).

TITLE: The production of coarse crystalline ammonium sulphate of rounded shape on coke oven works. (Polucheniye krupnokristallicheskogo sul'fata ammoniya okruglennoy formy na koksokhimicheskikh zavodakh).

PERIODICAL: "Koks i Khimiya" (Coke and Chemistry), 1957, No.3, pp.38-43 (U.S.S.R.)

ABSTRACT: Basic principles of operating saturators which must be fulfilled in order to obtain coarse grain sulphate crystals are stated. These were to some extent confirmed on an industrial scale by the operation of a saturator according to the above principles, namely: increased circulation of mother liquor, constant, optimum acidity (4-5%); number of washing of saturator (during which the acidity sharply rises) was reduced to 1 per day (instead of one per shift); diluted acid was constantly supplied together with "returned" solution; a small stream of make-up water was constantly supplied; and the temperature was maintained at a constant level. A considerable improvement in the quality of the salt was obtained. Chemical composition of mother liquors from a number of works was investigated and the variation in the concentraions of some "strange" ions was established: $Fe^{\bullet\bullet}$ -

AUTHOR: Shapiro, M.D., Candidate of Technical Sciences.

TITLE: Caking and the Formation of Coke. (Sprkaniye i koksoobrazovaniye)

PERIODICAL: Koks 8 Khimiya, 1957, No.6, pp. 16 - 20 (USSR)

ABSTRACT: The formation of the plastic layer on the heating of coal is discussed. The plastic layer is considered as a colloidal system, the stability of which and surface properties of components (phases) has a deciding influence on the caking process. The quality of solid and liquid decomposition products and their proportions are determined by the nature of coal and in particular by the amount of "free hydrogen" present. By "free hydrogen" is understood, that proportion of the total hydrogen in the initial raw material which during the redistribution between thermal decomposition products can be used for the formation of hydro-carbons and oxygen- and nitrogen-containing compounds forming the main mass of the liquid decomposition products. Therefore, the content of "free hydrogen" is the main factor determining the yield of liquid decomposition products. The amount of "free hydrogen" equals the total hydrogen content less the amount of hydrogen used in the combination with oxygen, sulphur and nitrogen into water, hydrogen sulphide, ammonia and other compounds

temperatures which leads to an increase in the caking ability of the coal. An increase in the coking velocity has a similar effect as it increases the amount of liquid decomposition products involved in a high-temperature cracking. The influence of various additions on the stability of the colloidal system (plastic coal) was studied. The stabilising effect of additions on the plastic mass of various coals was evaluated on the basis of changes in the kinetics of decomposition of the coal substance, gas permeability and plastometric prameters. It was established that up to 1% additions of oxyderivatives of naphthalene, captax (rubber accelerator) and some others increase the thermal stability of the colloidal system. Other substances e.g. diphenylamine, decrease this stability. Bitumens A and spore elements have a stabilising effect. Characteristics of a П✱ coal before and after the removal of bitumen are given. Judging from preliminary experimental results the stability of the colloidal system decreases with increasing content of oxygen-and nitrogen-containing compounds in the liquid phase. It is concluded that the formation of the colloidal system and its thermal stability are the basic factors determining the caking ability of coals.

 There are 1 table, 2 figures and 11 Slavic references.

65-12-9/9

AUTHORS: Shapiro, M.D., Al'terman, L.S. and Raskina, L.S.

TITLE: Kinetics of Thermal Decomposition of Coal (Kinetika termicheskogo razlozheniya uglya)

PERIODICAL: Khimiya i Tekhnologiya Topliva i Masel, 1957, No.12, pp. 64-69 (USSR).

ABSTRACT: Kinetics of the evolution of tar and gas on thermal decomposition of coal with and without additions of organic and inorganic substances were studied. The experimental technique and the apparatus used (Fig.1) are described. Donbas coals D, G, PZh, K and PS and some of their blends were investigated. The experimental results are shown in the form of graphs. It is pointed out that studies of the kinetics of evolution of tar and gas during thermal decomposition of coal can provide qualitative characteristics of the plastic mass formed on the heating of coals. Plastic mass is considered as a colloidal system, the stability of which determined the caking properties of coals. With increasing temperature of decomposition of the plastic mass of a given coal, its caking ability improves. Properties of plastic mass can be modified by small additions of some substances and in this way the caking ability of coals can be also modified. Bitumen A of caking coals as well as a certain proportion of fusain and

Card1/2

SHAPIRO, M.

We are producing new machines. Mast. ugl. 7 no.11:7-8 N '58.
(MIRA 11:12)

1.Nachal'nik tsekha Gorlovskogo mashinostroitel'nogo zavoda imeni Kirova.

(Coal mining machinery)

SHAPIRO, M.

New cutter-loader. mast.ugl. 8 no.6:8 Je '59. (MIRA 12:10)

(Coal mining machinery)

NILUS, S.G.; SHAPIRO, M.D.

Improving the quality of brown coal briquets by means of admixtures.
Trudy DKHTI no.10:161-165 '60. (MIRA 14:1)
(Lignite)

NILUS, S.G.; SHAPIRO, M.D.

Effect of bitumens on the quality of brown coal briquets. Trudy DKHTI no.10:167-173 '60. (MIRA 14:1)
(Lignite) (Bitumen)

SHAPIRO, M.D., kand.tekhn.nauk; ZHOKH, M.P., kand.tekhn.nauk

Corrosion of stills at the tar-rectification sections of by-product coking plants produced by salts of organic bases. Koks i khim. no.11: 54-56 '60. (MIRA 13:11)

1. Dnepropetrovskiy khimiko-tekhnologicheskiy institut.
(Distillation apparatus--Corrosion)
(Coal tar)

C/081/60/005/001/004/004
F031/F004

AUTHOR: Huang, Chih-yüan (7806/1807/3220); Wei, Yü-hsiu (7614/3768/4423) and Shapiro, M. D.

TITLE: The gas-phase medium-pressure fixed hot process for hydrogenation of low temperature coal tar

PERIODICAL: Jan Liao Hsüeh Pao, v. 5, no. 1, 1960, 21-33

TEXT: To obtain gasolines, diesel oils, and phenols from 370° or 350°C fractions of coal tar, a gas-phase, medium-pressure fixed hot hydrogenation process was used and a type 5871 catalyst with distillates of Fushun coal tar made by the authors was employed. Experiments were made on the hydrogenation and purification activities of the catalyst and on the hydrogenation of coal tar by fractional distillation at different temperatures. Hydrogenation products of coal tar distillates were analyzed and identified and the life span and regeneration of the catalyst and the conversion effect of the catalyst were investigated. Experiments were made in 25 ml and 200 ml high-pressure hydrogenation fixed installations. Industrial hydrogen used contained H_2—

Card 1/4

The gas-phase medium-pressure ...

90.6%, CO—2.9%, CO_2 — 0.6%, N_2 —4.1%, O_2 — 0.1%, CH_4 — 0.9%. Results of separate experiments are as follows: 1. The experiment on hydrogenation and purification activities of type 5871 catalyst showed that the catalyst has good purification function in regard to Fushun shale and crude benzene from oil refineries. 2. The experiment on the hydrogenation of coal tar distillates made under 100 mm Hg pressure on both 2.5 l and 3.5 l hydrogenation installations showed that 420° is the temperature most suitable for the experiment and that at 400°C. the product gasoline contains 10-12 mg/100 ml of colloid. The consumption of 100% hydrogen for each ton of coal tar is 0.733% and the production of hydrocarbon gas is 2.7% of the total distillate. 3. Analysis of the hydrogen products of coal tar (gasoline, diesel oil, phenols, and pyridine) purified by 15% NaOH and 15% H_2SO_4 in their composition, characteristics, production, etc., showed that there exist reactions of inverting high boiling point phenols to hydrocarbons in the hydrogenation of coal tar distillates obtained before 500°C. The inversion rate at 440° is 42-54% and at 460°, 63-58%. The recovery of oil is about 85%. The best condition for the hydrogenation is 70 atm of pressure, 1.0 of air speed,

The gas-phase medium-pressure ...

and 420° for distillates obtained before 300°, and 70 atm, 0.8/hr. air speed and 440° temperature for distillates at 300-370°. 4. Investigation of the life span and regeneration of the catalyst was made at 70 atm pressure, 400°C temperature, 1.0/hr air speed and 1000 : 1 H_2-oil ratio. Results showed that for 504 hrs of functioning, activity of the catalyst remained unchanged, however, after 504 hrs, it will lower suddenly and cannot be restored. Regeneration of catalyst activity can be made by air at less than 550° temperatures for 156 hrs. Nitrogen adsorption capability of the catalyst is low. 5. Experiment on the inversion of CO in industrial hydrogen showed that if type 5871 catalyst is used the inversion is low but if MoS_2, WS_2 etc., are used as catalysts, the inversion may be almost as high as 100%. The catalyst is low in CO inversion capability at high temperatures. Conclusions: (1) The gas-phase, medium-pressure, fixed installation hot process for the hydrogenation of low temperature coal tar is considered a feasible process. (2) Type 5871 catalyst was successfully prepared with Fushun coal tar. (3). Gasoline, diesel oil, and phenols can be obtained directly through hydrogenation from fractional distillation of coal tars below 300°, between

Card 3/4

The gas-phase medium-pressure ...

300-370° and at 350°C. The products have higher nitride content and lower stability. It is believed that if the material distillates are preliminarily treated with a 15% NaOH solution to extract the phenols and with H_2SO_4 to remove some nitrides, higher quality fuels can be obtained. (4) Type 587l catalyst is easy to make, low in material cost, good in hydrogenation capability, high in antinitrogen ability and high in catalytic activity. The catalyst has a long life span of some 500 hrs and will lower the consumption of hydrogen. There are 2 figures and 22 tables. The English-language reference reads as follows: H. Clough. IEC vol. 49, no. 4, 673 (1957).

ASSOCIATION: Pei-ching Shih Yu Hsüeh Yüan Ku T'i Jan Liao Chia Kung Yen Chiu Shih (Solid Fuel Processing Laboratory, Peking Petroleum College)

SUBMITTED: September 8, 1959

PETRENKO, D.S.; GORITSKAYA, O.D.; SHAPIRO, M.D.

Efficient utilization of tar water ammonia in the production of light pyridine bases. Koks i khim. no.2:31-33 '62. (MIRA 15:3)

1. Krivorozhskiy metallurgicheskiy zavod (for Petrenko, Goritskaya). 2. Dnepropetrovskiy khimiko-tekhnologicheskiy institut (for Shapiro).
(Pyridine) (Coke industry--By-products)

SHAPIRO, M.D.; AL'TERMAN, L.S.

Development of the plastometric method for the evaluation of coking properties of coals and coal charges. Koks i khim. no.10:5-11 '62. (MIRA 16:9)

1. Dnepropetrovskiy khimiko-tekhnologicheskiy institut.
(Coal—Testing)

SHAPIRO, M.D., kand.tekhn.nauk; AL'TERMAN, L.S.; KEYTEL'GISSER, S.R.

Effect of the degree of fineness of crushing on the properties of the plastic mass of coals and charges. Koks i khim. no.9:10-14 '63. (MIRA 16:9)

1. Dnepropetrovskiy khimiko-tekhnologicheskiy institut.
(Coke) (Coal preparation)

SHAPIRO, M.D., kand. tekhn. nauk

Mechanism for the trapping of pyridine bases from coke gas (in connection with the review by G.D. Kharlampovich and V.M. Kagasov). Koks i khim. no.10:62-64 '63. (MIRA 16:11)

1. Dnepropetrovskiy khimiko-tekhnologicheskiy institut.

SHAPIRO, M.D., kand.tekhn.nauk; YEVSTYUKHIN, V.I., inzh.

Analyzing the performance of the automatic feeders of circular sawing, milling, and jointing machines. Der. prom. 12 no.10: 15-17 O '63. (MIRA 16:10)

1. Byvsheye spetsial'noye konstruktorskoye byuro Upravleniya mebel'noy i derevoobrabatyvayushchey promyshlennosti Leningradskogo soveta narodnogo khozyaystva.

L 54554-65 EWT(m)/EPF(c) Pr-4 RM

ACCESSION NR: AP5016714 UR/0286/65/000/010/0016/0017

AUTHORS: Shapiro, M. D.; Artem'yeva, L. N.; Nalesnaya, Zh. M. 14 B

TITLE: A catalyst for hydraulic refining of the raw benzene fraction and petrochemicals. Class 12, No. 170911

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 10, 1965, 16-17

TOPIC TAGS: catalyst, benzene, petroleum, iron compound, molybdenum compound

ABSTRACT: This Author Certificate presents a catalyst for hydraulic refining of raw benzene fraction and petrochemicals. The catalyst contains an active phase coated on aluminum oxide. To lower its cost and to prolong its usefulness, the active phase consists of iron compounds and molybdenum compounds. The composition of the catalyst may be 4-10% of iron, 5-8% of molybdenum.

ASSOCIATION: none

SUBMITTED: 03Mar64 ENCL: 00 SUB CODE: GC, OC

NO REF SOV: 000 OTHER: 000

Card 1/1

GLEZER, G.A., kand med nauk; Prinimali uchastiye: MYASOYEDOVA, N.V., med. sestra; SHAPIRO, M.G., meditsinskaya sestra

Usefulness of Starr's formula for calculating the stroke and minute volume of the blood. Kardiologiia 2 no.2:88-90 Mr-Ap '62. (MIRA 15:4)

1. Iz Instituta terapii (dir. - deystvitel'nyy chlen AMN SSSR A.L. Myasnikov) AMN SSSR.

(BLOOD--CIRCULATION)

SOMOV, G.P., SHAPIRO, M.I., PETROV, A.A.

Studies on an island focus of North Asiatic tick-born typhus.
Zhur.mikrobiol.epid. i immun. 29 no.5:94-99 My '58 (MIRA 11:6)
(TYPHUS, epidemiology
in Russia, focus of North Asia tick-borne infect.
on island (Rus))

SHAPIRO, M.I.

Experimental studies on strains of tick-borne rickettsial diseases isolated in the southern part of the Maritime Territory. Zhur. mikrobiol. epid. i immun. 29 no.10:123-129 O '58. (MIRA 11:12)
(RICKETTSIA,
isolation & exper. studies on various strains from tick-borne typhus (Rus))

SHAPIRO, M. I. Cand Med Sci -- (diss) "The tickborne exanthematic typhus in one of the islands of southern Primor'ye." Mos, 1959. 16 pp (Inst of Epidemiology and Microbiology im Gamaleya, Acad Med Sci USSR), 200 copies (KL,43-59, 128)

[illegible], [illegible] I., [illegible], [illegible], [illegible], [illegible], [illegible], [illegible], [illegible], [illegible] I., [illegible], [illegible], [illegible]

"Further observations of tick-borne rickettsiosis in the Primorye region."
p. [illegible]

Desyatoye soveshchaniye po parazitologicheskim problemam i prirodnoochagovym boleznyam. 22-29 Oktyabrya 1959 g. (Tenth Conference on Parasitological Problems and Diseases with Natural Foci 22-29 October 1959), Moscow-Leningrad, 1959, Academy of Medical Sciences USSR and Academy of Sciences USSR, No. 1 254pp.

Inst. of Epidemiology and Microbiology, AMS USSR/Moscow and Vladivostock

KULAGIN, S.M.; SOMOV, G.P.; SILICH, V.A.; FEDOROVA, N.I.; SHAPIRO, M.I.; SUVOROVA, L.V.; BOBROVSKIY, V.N.

Further observations on tick-borne rickettsiosis in the Maritime Territory. Zhur.mikrobiol.epid.i immun. 31 no.9:64-71 S '60. (MIRA 13:11)

Iz Instituta epidemiologii i mikrobiologii imeni Gamalei AMN SSSR, Vladivostokskogo instituta epidemiologii, mikrobiologii i gigiyeny i meditsinskoy sluzhby Tikhookeanskogo flota.
(MARITIME TERRITORY--TYPHUS FEVER)

SOMOV, G.P.; SHAPIRO, M.I.; PETROV, A.A.

Gamasid mites in murine rodents on the islands of the southern part of the Maritime Territory. Trudy VladIEMG no.2:94-104 '62. (MIRA 18:3)

SOMOV, G.P.; SHAPIRO, M.I.; LEGKODIMOVA, K.V.

Study of the reproduction of the rickettsia Dermacentroxenus sibericus in human embryo renal tissue culture using the method of fluorescent antibodies. Zhur. mikrobiol., epid. i immun. 42 no.8:39-43 Ag '65. (MIRA 18:9)

1. Vladivostokskiy institut epidemiologii, mikrobiologii i gigiyeny.

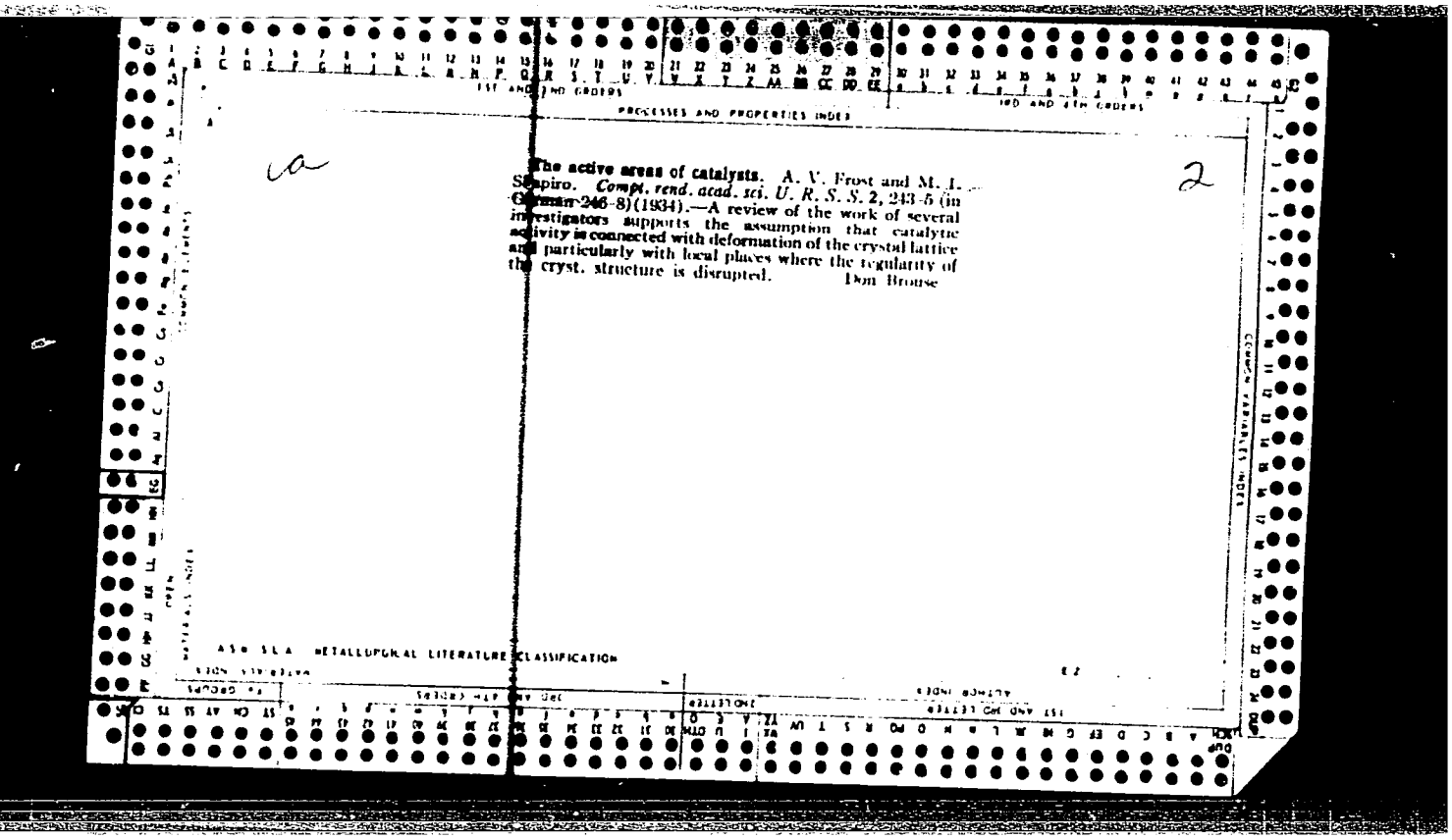
YUDINA, L.P.; SHAPIRO, M.I.

Automation of electroplating of zinc-alloy automobile parts.
Avt.prom. 27 no.11:43-44 N '61. (MIRA 14:10)

1. Gor'kovskiy avtozavod.
(Electroplating) (Automation)

SHAPIRO, M.I.; [illegible], G.N., red.

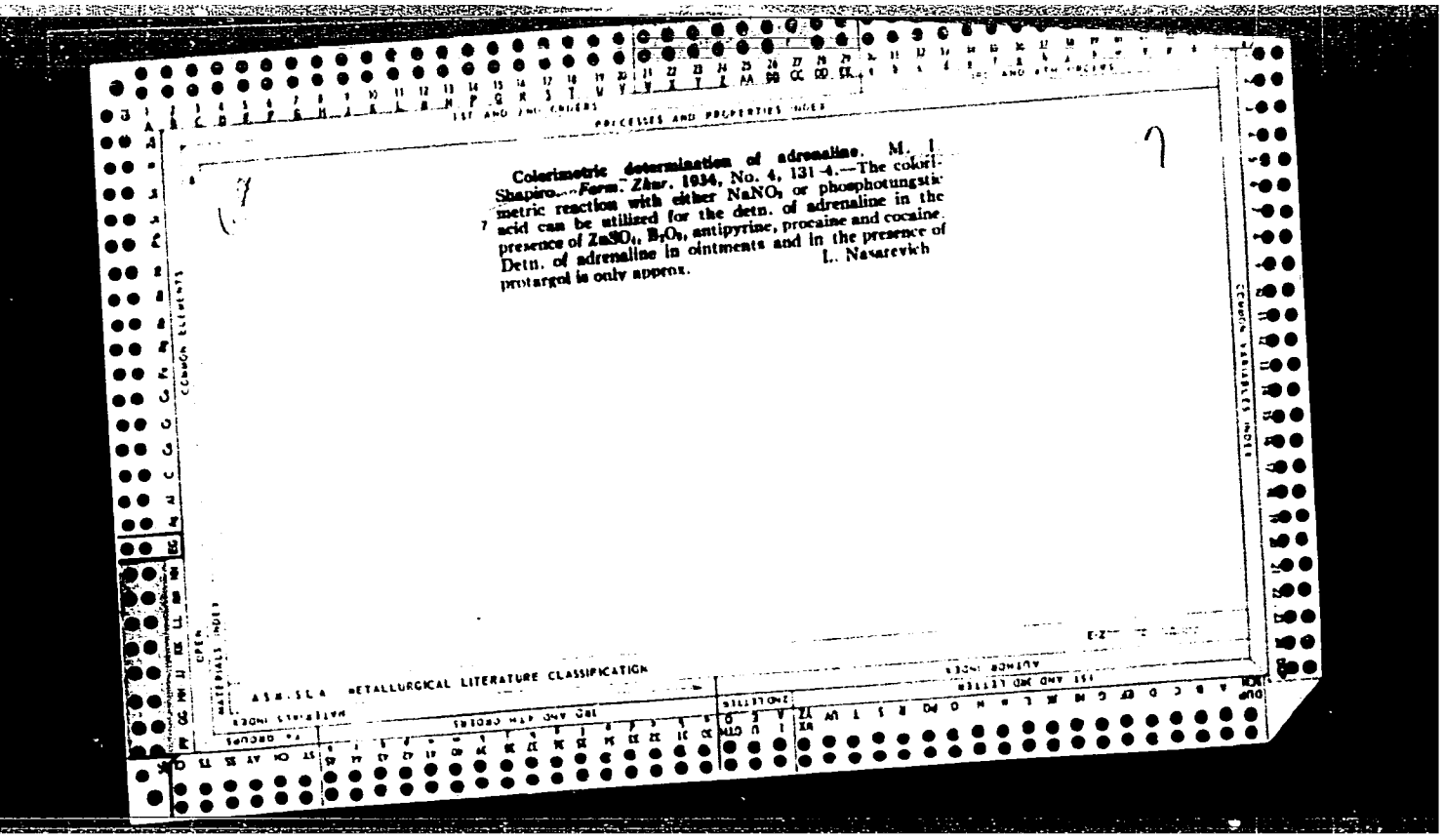
[Manual on a course in the design of radio transmitting systems; for students of radio engineering departments] Posobie po kursovomu proektirovaniiu radioperedaiushchikh ustroistv; dlia studentov radiotekhnicheskogo fakul'teta. Voronezh, Izd-vo Voronezhskogo univ., 1964. 58 p. (MIRA 17:10)



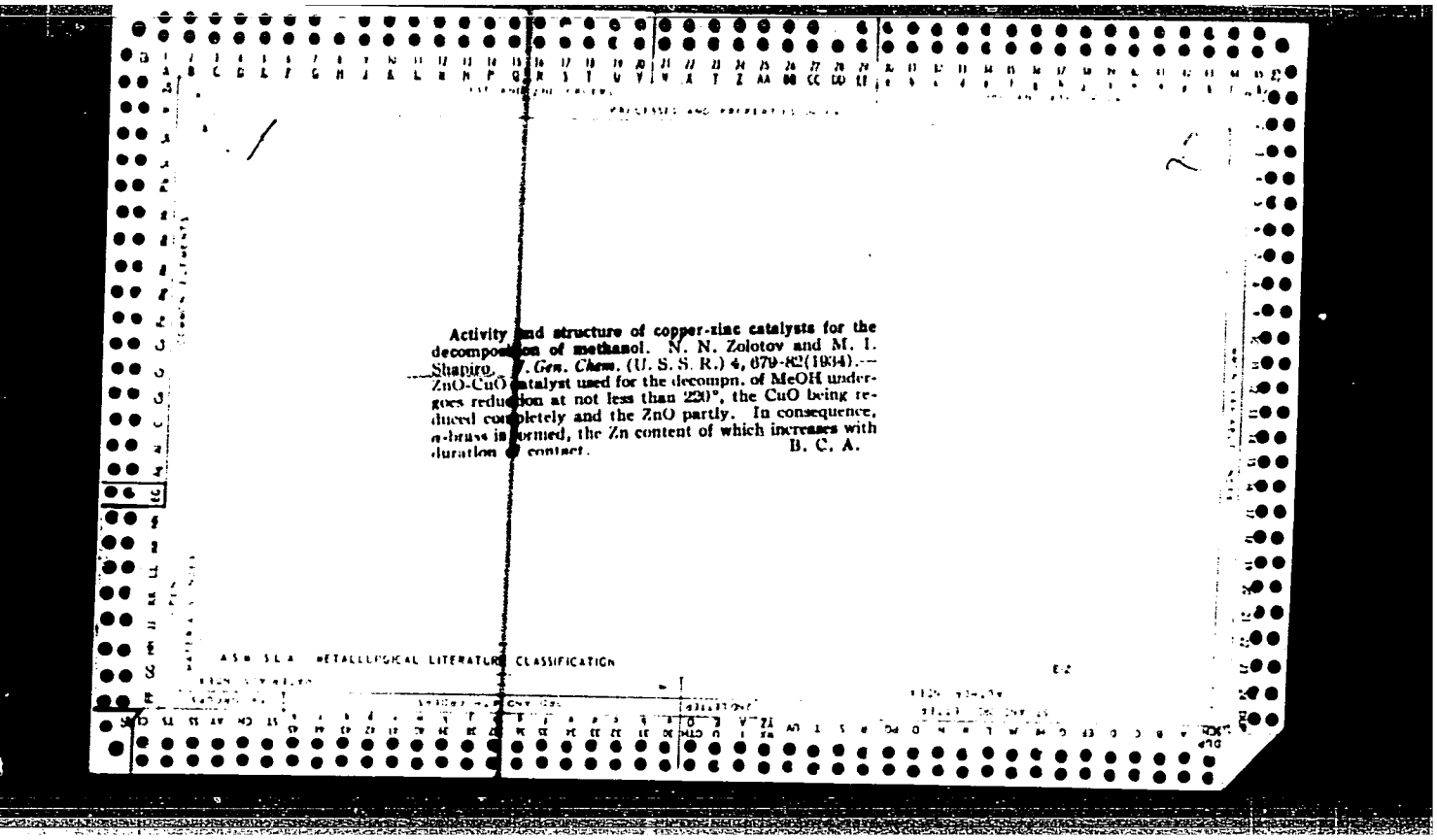
PROCESSES AND PROPERTIES INDEX

The active areas of catalysts. A. V. Frost and M. I. Shapiro. *Compt. rend. acad. sci. U. R. S. S.* 2, 243-5 (in German 246-8)(1934).—A review of the work of several investigators supports the assumption that catalytic activity is connected with deformation of the crystal lattice and particularly with local places where the regularity of the cryst. structure is disrupted. Don Brouse

A5e SLA METALLURGICAL LITERATURE CLASSIFICATION

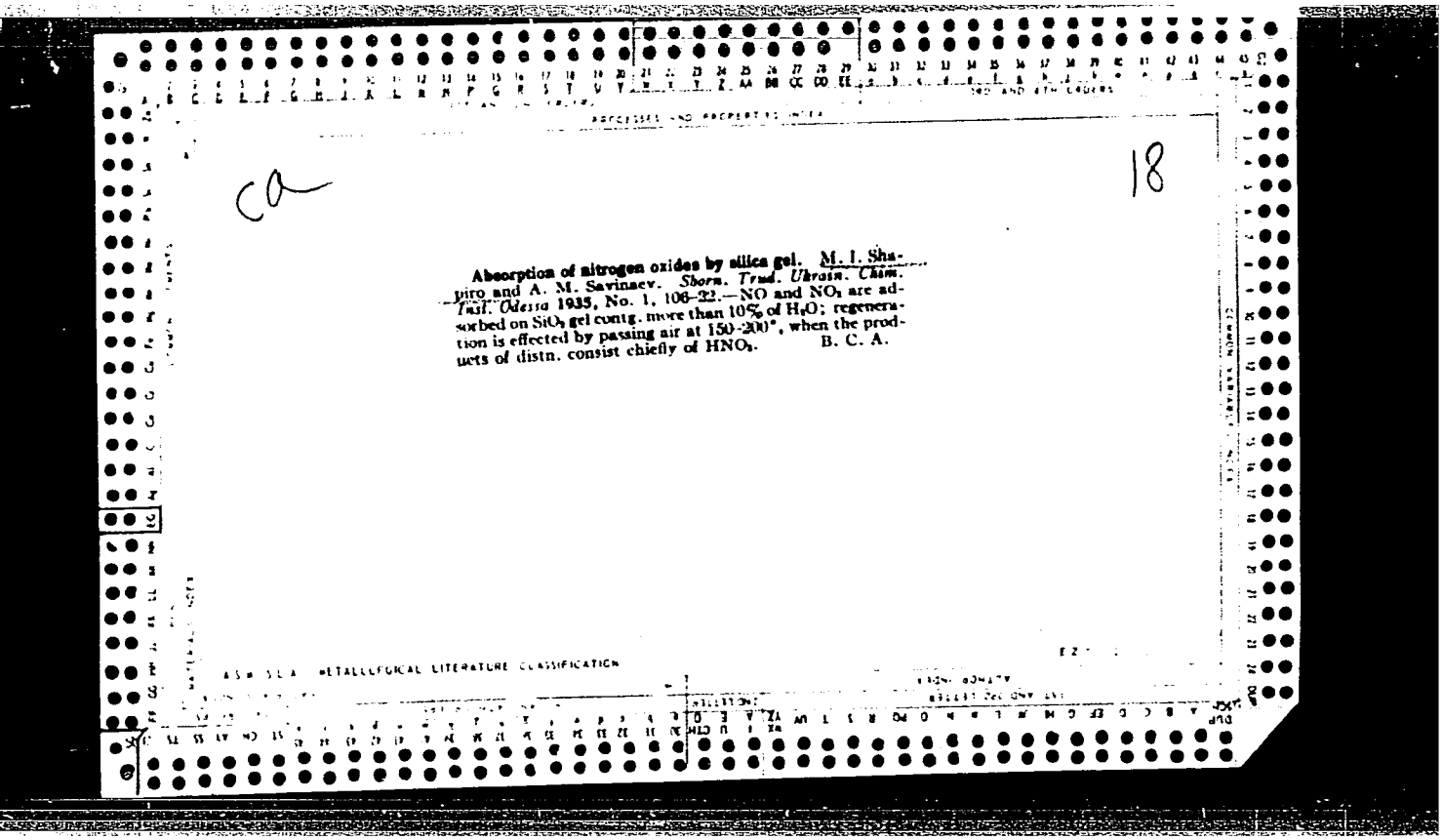


Colorimetric determination of adrenaline. M. I. Shapiro. *Farm. Zhur.* 1934, No. 4, 131-4.—The colorimetric reaction with either $NaNO_2$ or phosphotungstic acid can be utilized for the detn. of adrenaline in the presence of $ZnSO_4$, B_2O_3, antipyrine, procaine and cocaine. Detn. of adrenaline in ointments and in the presence of protargol is only approx. L. Nasarevich



Activity and structure of copper-zinc catalysts for the decomposition of methanol. N. N. Zolotov and M. I. Shapiro. *J. Gen. Chem.* (U. S. S. R.) 4, 879-82(1934).—ZnO-CuO catalyst used for the decompn. of MeOH undergoes reduction at not less than 220°, the CuO being reduced completely and the ZnO partly. In consequence, α-brass is formed, the Zn content of which increases with duration of contact. B. C. A.

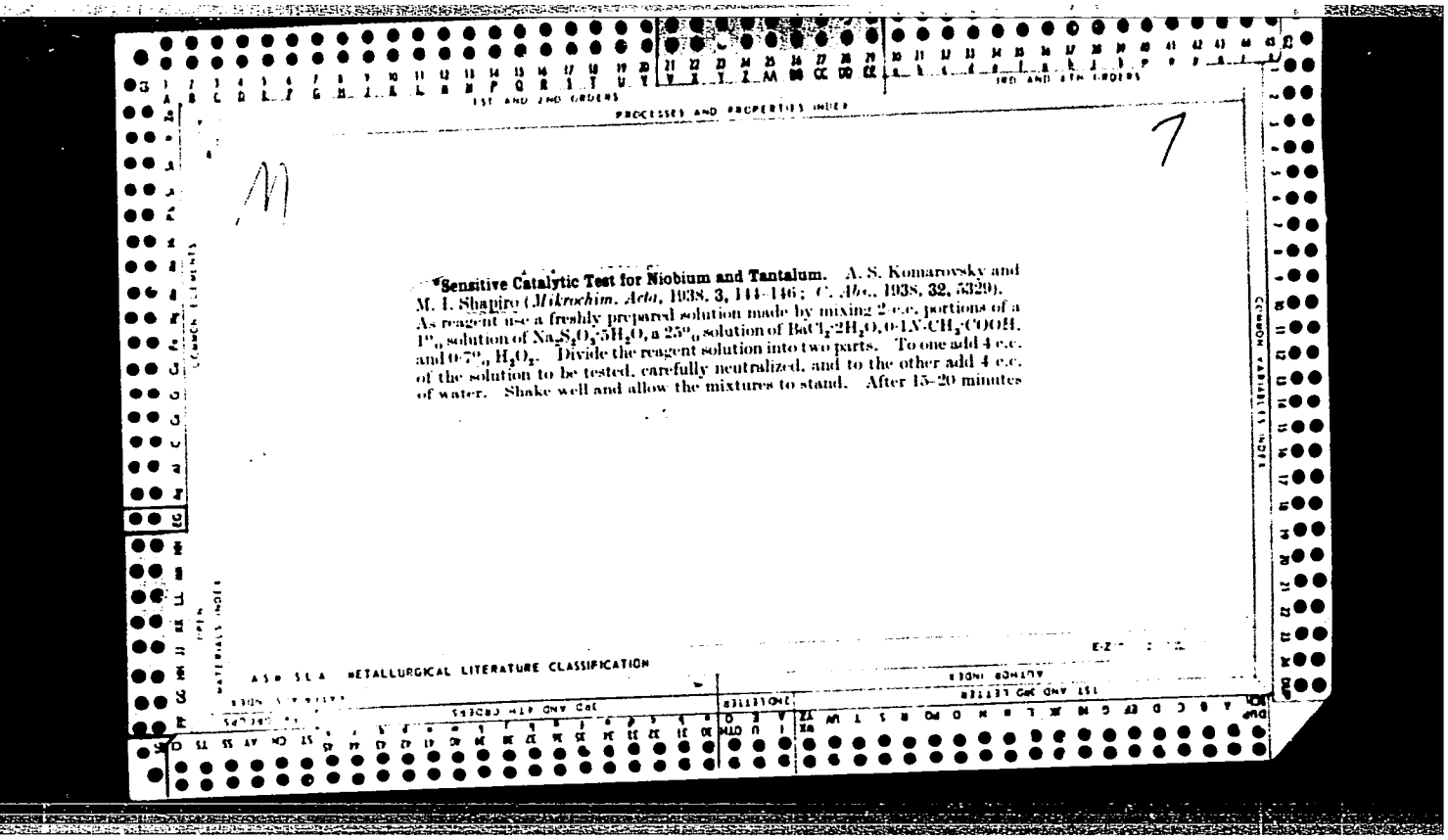
ASM SLA METALLURGICAL LITERATURE CLASSIFICATION



CA

18

Absorption of nitrogen oxides by silica gel. M. I. Shapiro and A. M. Savinaev. *Sborn. Trud. Ukrain. Chim. Inst. Odessa* 1935, No. 1, 106–22.—NO and NO_2 are adsorbed on SiO_2 gel contg. more than 10% of H_2O; regeneration is effected by passing air at 150–200°, when the products of distn. consist chiefly of HNO_3. B. C. A.



Sensitive Catalytic Test for Niobium and Tantalum. A. S. Komarovsky and M. I. Shapiro (*Mikrochim. Acta*, 1938, 3, 144–146; *C. Abs.*, 1938, **32**, 5329). As reagent use a freshly prepared solution made by mixing 2 c.c. portions of a 1% solution of $Na_2S_2O_3{\cdot}5H_2O$, a 25% solution of $BaCl_2{\cdot}2H_2O$, 0·1*N*-CH_3COOH, and 0·7% H_2O_2. Divide the reagent solution into two parts. To one add 4 c.c. of the solution to be tested, carefully neutralized, and to the other add 4 c.c. of water. Shake well and allow the mixtures to stand. After 15–20 minutes

SHAPIRO, M. I.

Nickel plating of zinc alloys. B. F. Danilov, L. P. Yudin, and M. I. Shapiro. U.S.S.R. 101,100, Oct. 25, 1955. The Ni layer is applied to a Cu interlayer. Prior to application of the Cu interlayer, the Zn alloy is anodically passivated in a $Na_4P_2O_7$ soln. with a concn. of 50–60 g./l. M. Hosch

L 62496-65 EWA(j)/EWA(b)-2/EWT(1) JK

ACCESSION NR: AP5020090 UR/0016/65/000/008/0039/0043
576.851.71.095.6

AUTHOR: Somov, G. P.; Shapiro, M. I.; Legkodimova, K. V.

TITLE: Reproduction of the rickettsia *D. sibiricus* in human embryo kidney tissue studied by the fluorescent antibody method

SOURCE: Zhurnal mikrobiologii, epidemiologii i immunobiologii, no. 8, 1965, 39-43

TOPIC TAGS: rickettsial disease, fluorescence, microbiology, antibody, biologic reproduction

ABSTRACT: The authors used the method of fluorescent antibodies to study the reproduction of *D. sibiricus* in monolayer trypsinized human embryo kidney cells. They found the technique superior to the ordinary staining methods chiefly because it facilitates the identification of even solitary rickettsias in cells. They recommend combining the tissue culture method with fluorescent microscopy as a means of investigating certain aspects of the pathogenesis of rickettsioses and of quickly determining the species of rickettsias isolated from various objects. Orig. art. has: 1 figure.

Card 1/2

L 62496-65

ACCESSION NR: AP5020090

ASSOCIATION: Vladivostokskiy institut epidemiologii, mikrobiologii i gigiyeny (Vladivostok Institute of Epidemiology, Microbiology, and Hygiene)

SUBMITTED: 30Jul64 ENCL: 00 SUB CODE: LS

NO REF SOV: 004 OTHER: 002

Card 2/2

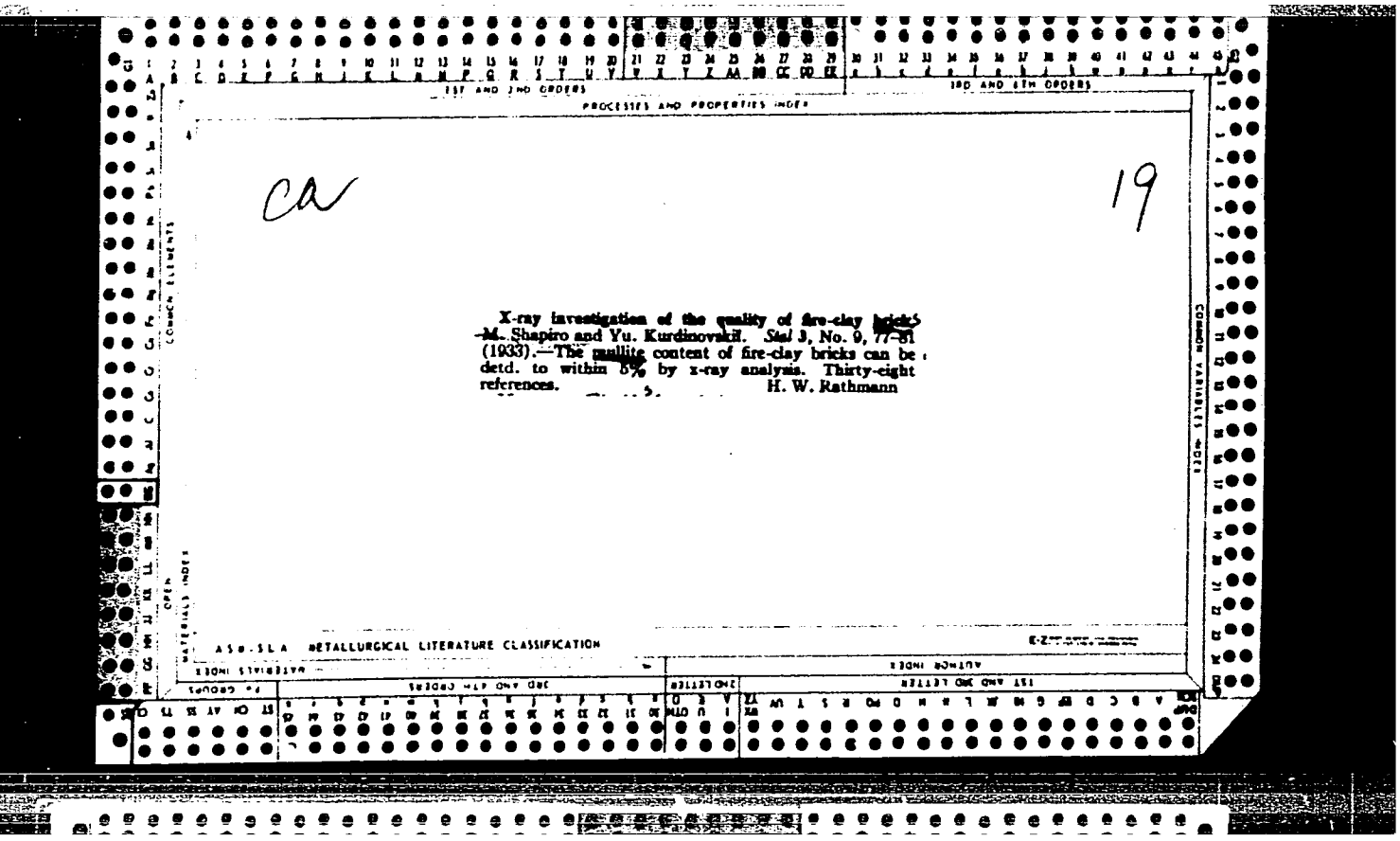
SHAPIRO, M.L., inzh.

Stamping and coining forgings without burrs. Mashinostroenie no.4:38-39 Jl-Ag '62. (MIRA 15:9)

1. Gorlovskiy mashinostroitel'nyy zavod imeni S.M.Kirova. (Forging)

SHAPIRO, M.L.

Made by the branch planning and construction department.
Mashinostroitel' no.10:43 O '63. (MIRA 16:12)



CA

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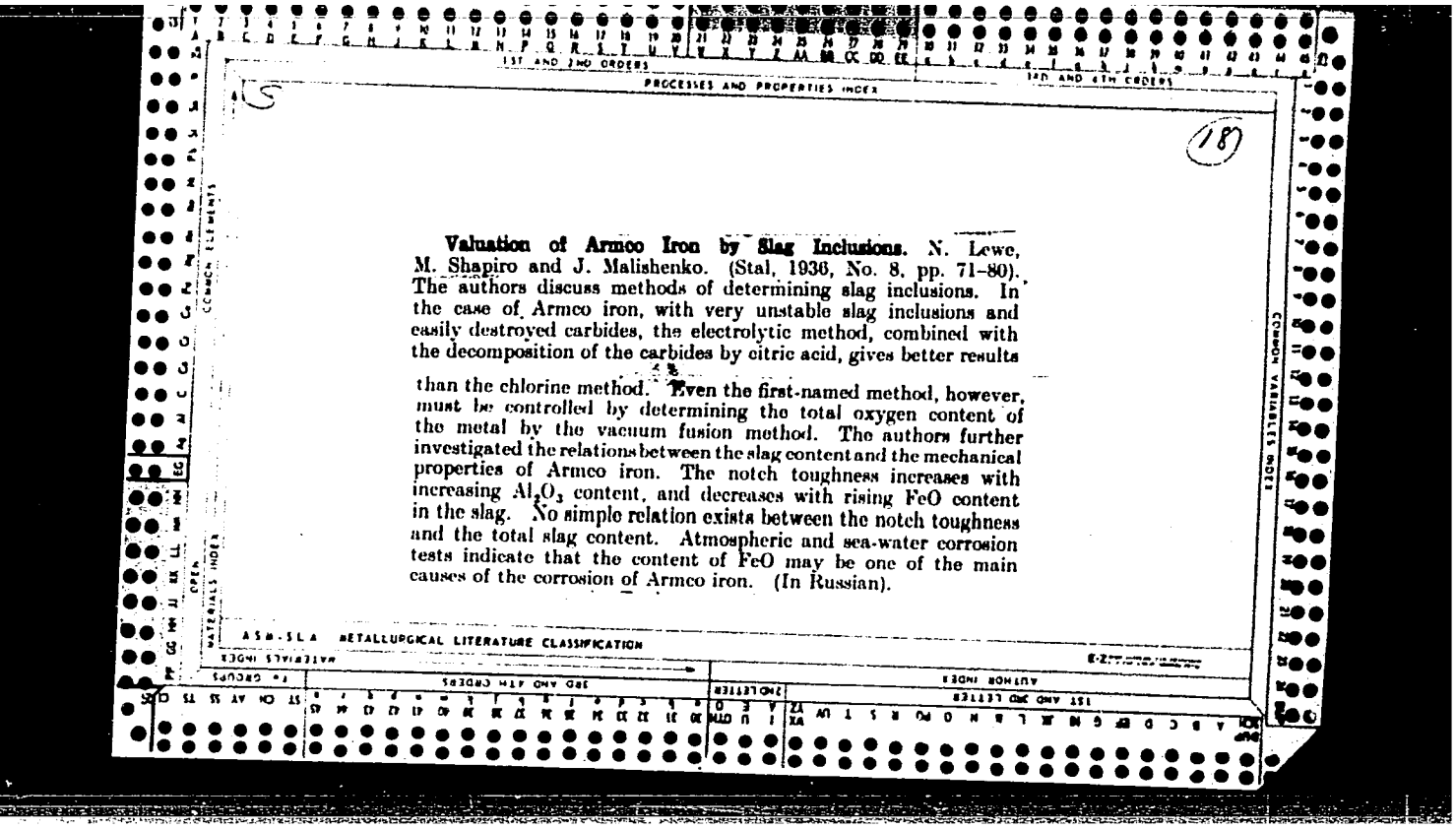
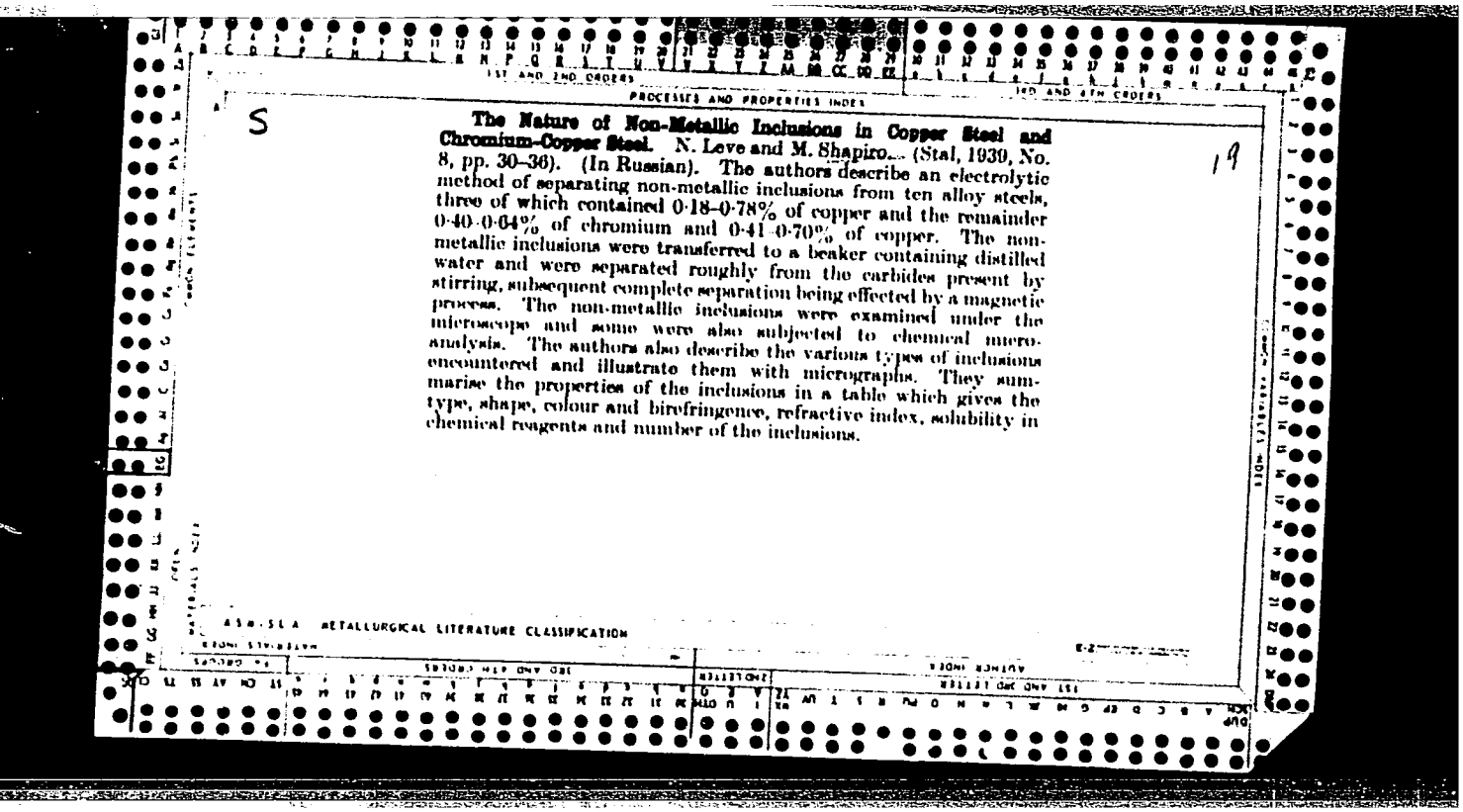
X-ray investigation of the quality of fire-clay bricks
M. Shapiro and Yu. Kurdinovskiĭ. *Stal'* 3, No. 9, 77–81 (1933).—The mullite content of fire-clay bricks can be detd. to within 5% by x-ray analysis. Thirty-eight references. H. W. Rathmann



Valuation of Armco Iron by Slag Inclusions. N. Lewe, M. Shapiro and J. Malishenko. (Stal, 1936, No. 8, pp. 71–80). The authors discuss methods of determining slag inclusions. In the case of Armco iron, with very unstable slag inclusions and easily destroyed carbides, the electrolytic method, combined with the decomposition of the carbides by citric acid, gives better results than the chlorine method. Even the first-named method, however, must be controlled by determining the total oxygen content of the metal by the vacuum fusion method. The authors further investigated the relations between the slag content and the mechanical properties of Armco iron. The notch toughness increases with increasing Al_2O_3 content, and decreases with rising FeO content in the slag. No simple relation exists between the notch toughness and the total slag content. Atmospheric and sea-water corrosion tests indicate that the content of FeO may be one of the main causes of the corrosion of Armco iron. (In Russian).



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The Nature of Non-Metallic Inclusions in Copper Steel and Chromium-Copper Steel. N. Leve and M. Shapiro. (Stal, 1939, No. 8, pp. 30–36). (In Russian). The authors describe an electrolytic method of separating non-metallic inclusions from ten alloy steels, three of which contained 0·18–0·78% of copper and the remainder 0·40–0·64% of chromium and 0·41–0·70% of copper. The non-metallic inclusions were transferred to a beaker containing distilled water and were separated roughly from the carbides present by stirring, subsequent complete separation being effected by a magnetic process. The non-metallic inclusions were examined under the microscope and some were also subjected to chemical micro-analysis. The authors also describe the various types of inclusions encountered and illustrate them with micrographs. They summarise the properties of the inclusions in a table which gives the type, shape, colour and birefringence, refractive index, solubility in chemical reagents and number of the inclusions.

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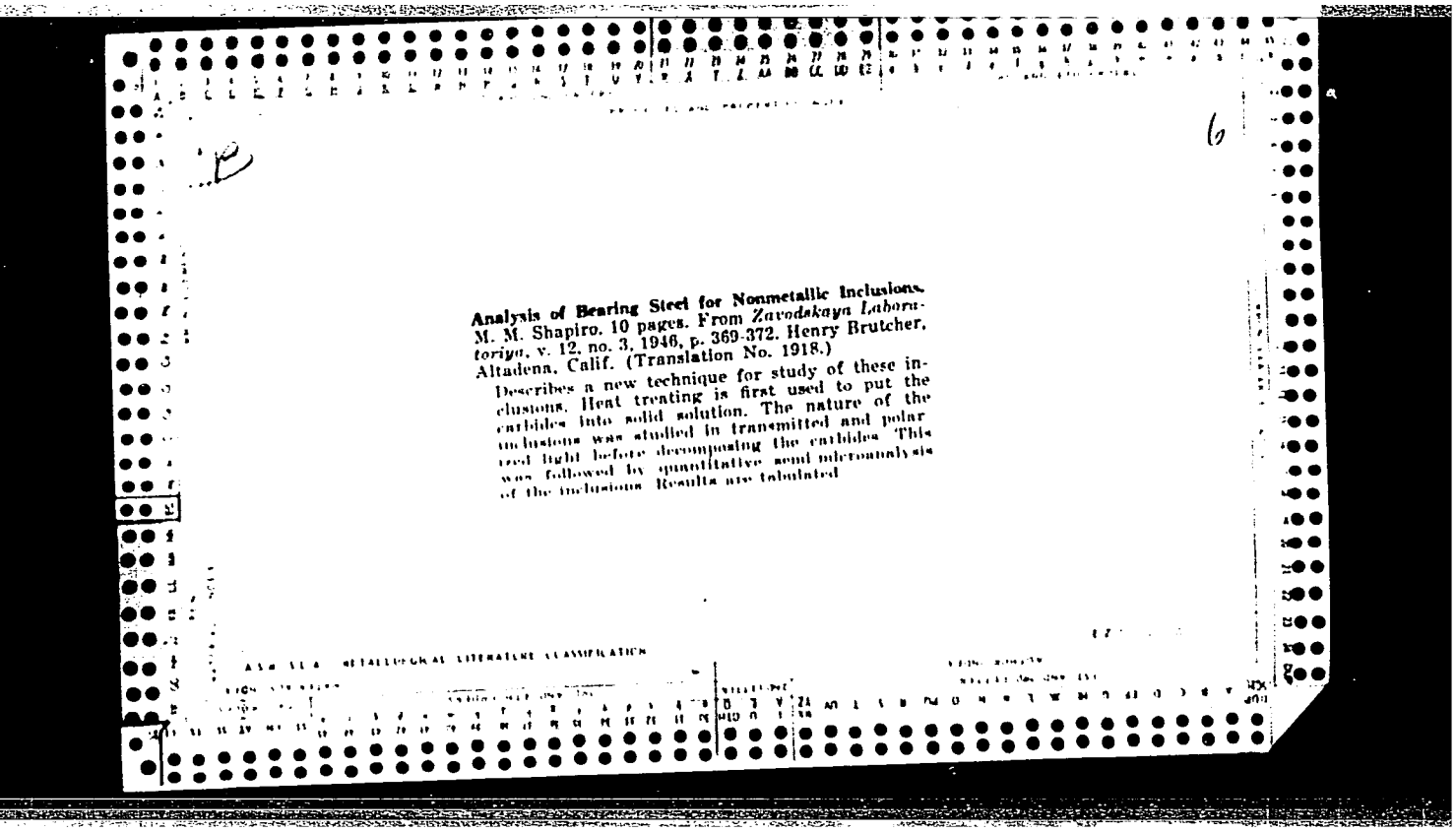
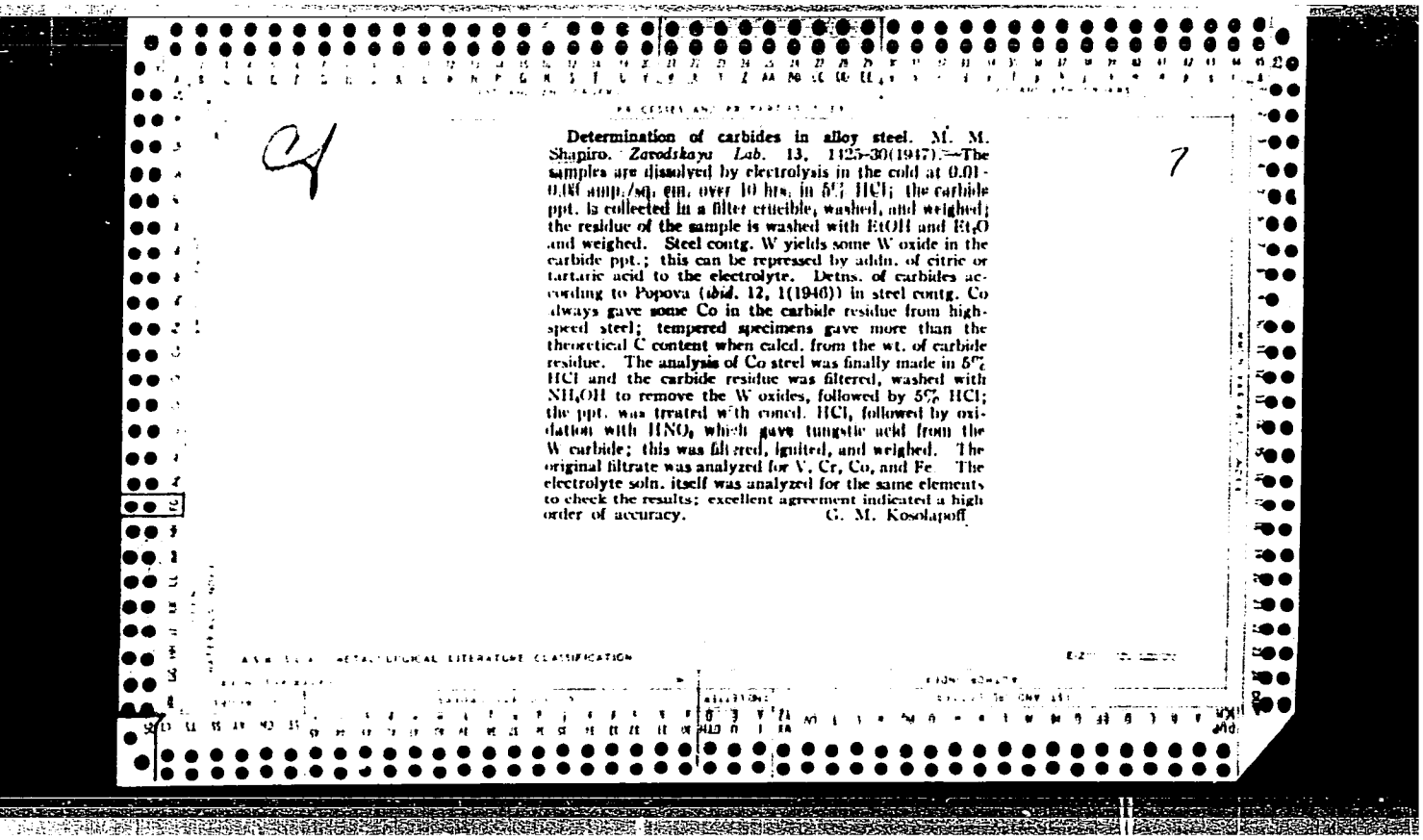
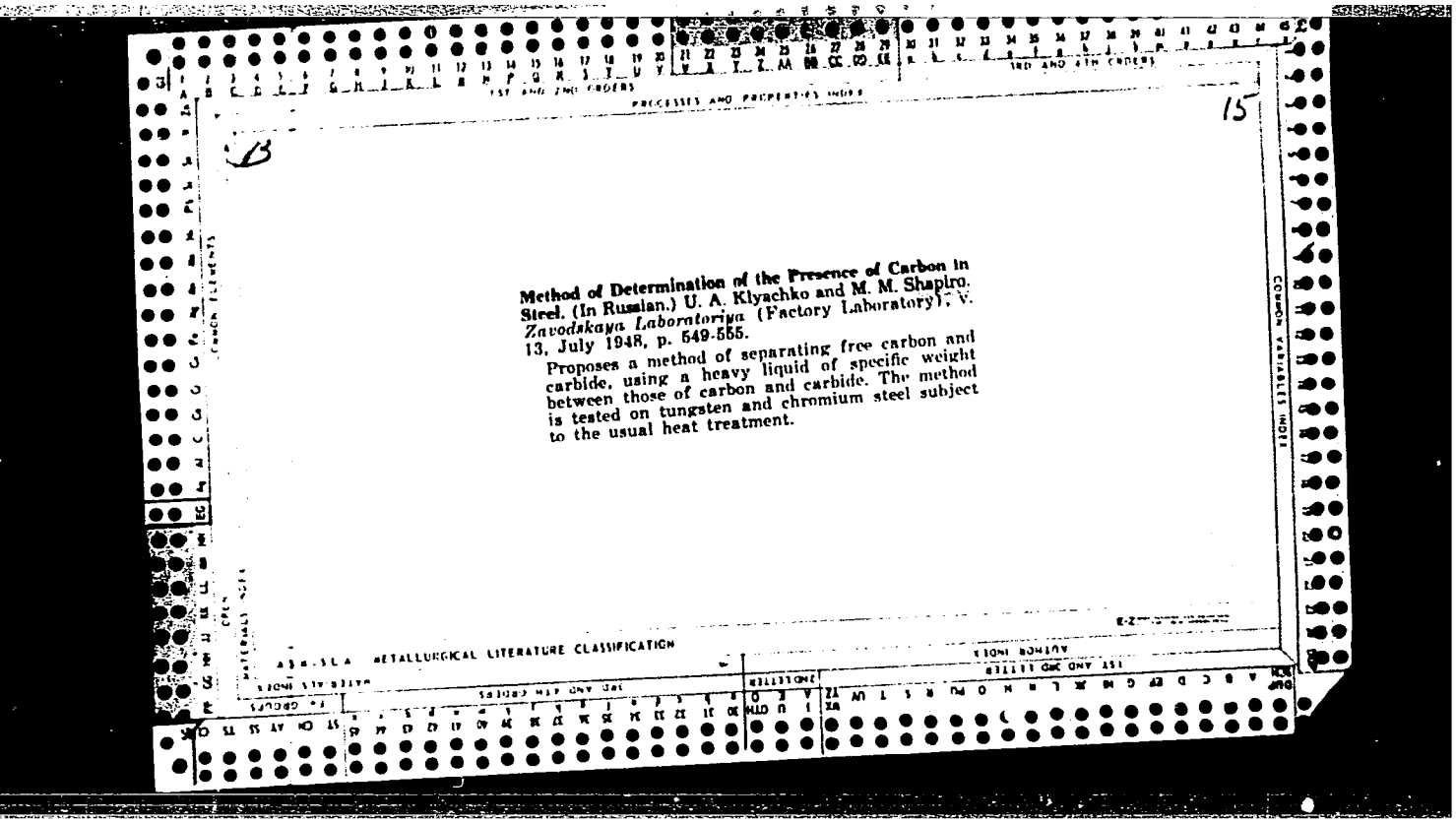


Analysis of Bearing Steel for Nonmetallic Inclusions. M. M. Shapiro. 10 pages. From *Zavodskaya Laboratoriya*, v. 12, no. 3, 1946, p. 369-372. Henry Brutcher, Altadena, Calif. (Translation No. 1918.)

Describes a new technique for study of these inclusions. Heat treating is first used to put the carbides into solid solution. The nature of the inclusions was studied in transmitted and polarized light before decomposing the carbides. This was followed by quantitative semi microanalysis of the inclusions. Results are tabulated.

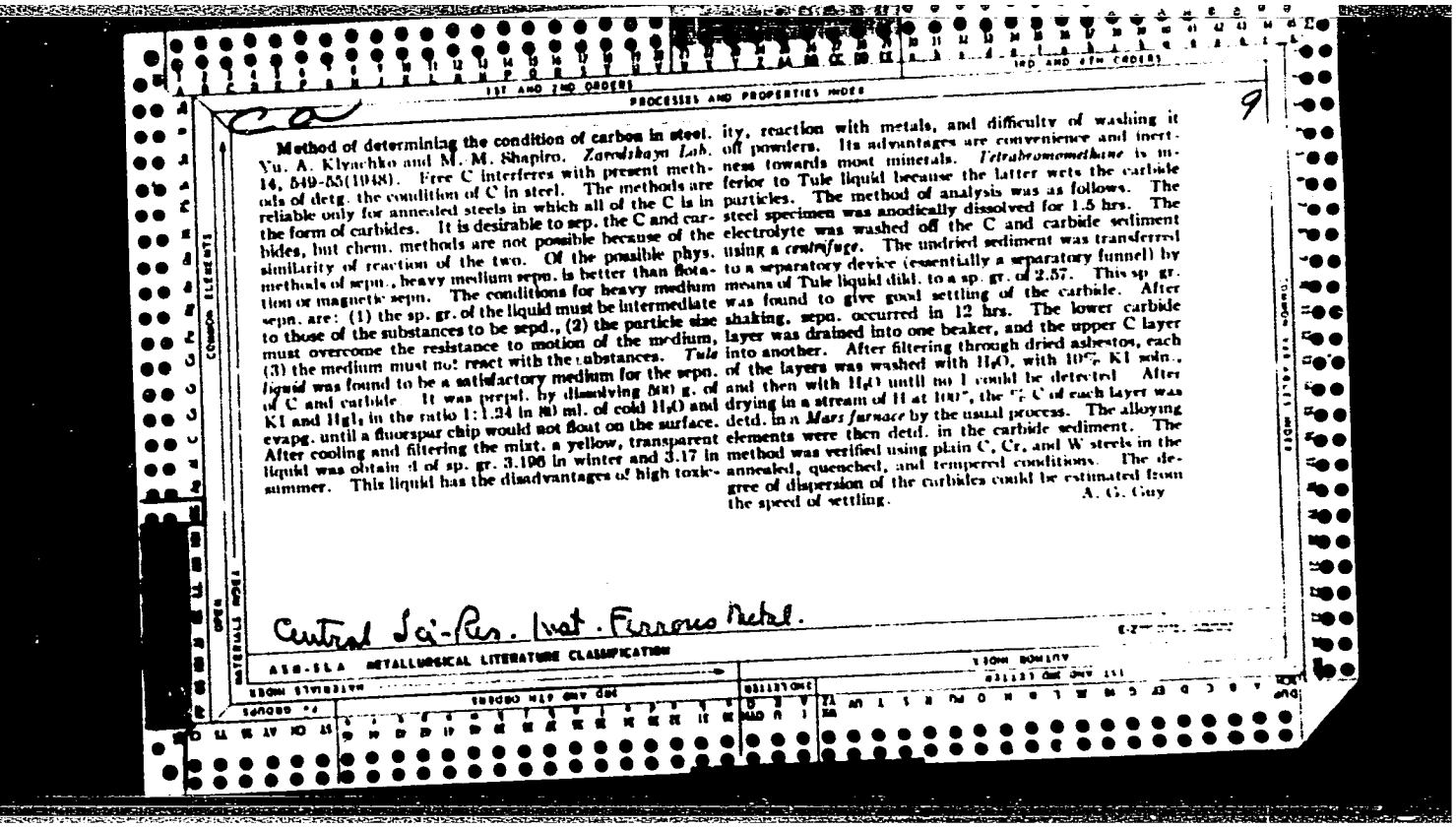


Determination of carbides in alloy steel. M. M. Shapiro. *Zavodskaya Lab.* 13, 1425-30(1947).—The samples are dissolved by electrolysis in the cold at 0.01-0.05 amp./sq. cm. over 10 hrs. in 5% HCl; the carbide ppt. is collected in a filter crucible, washed, and weighed; the residue of the sample is washed with EtOH and Et_2O and weighed. Steel contg. W yields some W oxide in the carbide ppt.; this can be repressed by addn. of citric or tartaric acid to the electrolyte. Detns. of carbides according to Popova (*ibid.* 12, 1(1946)) in steel contg. Co always gave some Co in the carbide residue from high-speed steel; tempered specimens gave more than the theoretical C content when calcd. from the wt. of carbide residue. The analysis of Co steel was finally made in 5% HCl and the carbide residue was filtered, washed with NH_4OH to remove the W oxides, followed by 5% HCl; the ppt. was treated with concd. HCl, followed by oxidation with HNO_3 which gave tungstic acid from the W carbide; this was filtered, ignited, and weighed. The original filtrate was analyzed for V, Cr, Co, and Fe. The electrolyte soln. itself was analyzed for the same elements to check the results; excellent agreement indicated a high order of accuracy. G. M. Kosolapoff



Method of Determination of the Presence of Carbon in Steel. (In Russian.) U. A. Klyachko and M. M. Shapiro. *Zavodskaya Laboratoriya* (Factory Laboratory), v. 13, July 1948, p. 549-555.

Proposes a method of separating free carbon and carbide, using a heavy liquid of specific weight between those of carbon and carbide. The method is tested on tungsten and chromium steel subject to the usual heat treatment.



PROCESSES AND PROPERTIES INDEX

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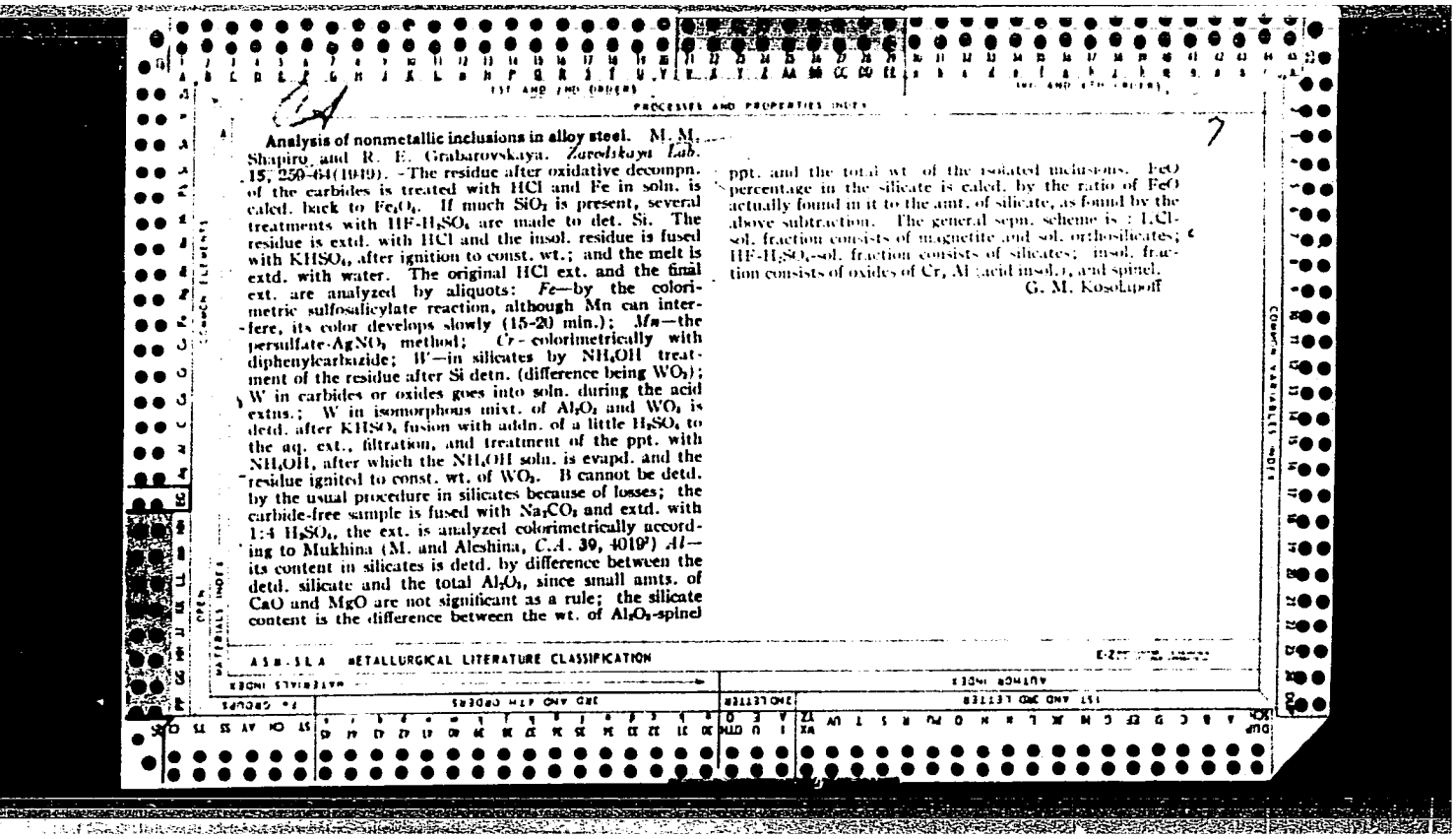
Method of determining the condition of carbon in steel. Yu. A. Klyachko and M. M. Shapiro. *Zavodskaya Lab.* 14, 549-55(1948). Free C interferes with present methods of detg. the condition of C in steel. The methods are reliable only for annealed steels in which all of the C is in the form of carbides. It is desirable to sep. the C and carbides, but chem. methods are not possible because of the similarity of reaction of the two. Of the possible phys. methods of sepn., heavy medium sepn. is better than flotation or magnetic sepn. The conditions for heavy medium sepn. are: (1) the sp. gr. of the liquid must be intermediate to those of the substances to be sepd., (2) the particle size must overcome the resistance to motion of the medium, (3) the medium must not react with the substances. *Tule liquid* was found to be a satisfactory medium for the sepn. of C and carbide. It was prepd. by dissolving 500 g. of KI and HgI_2 in the ratio 1:1.24 in 80 ml. of cold H_2O and evapg. until a fluorspar chip would not float on the surface. After cooling and filtering the mixt. a yellow, transparent liquid was obtained of sp. gr. 3.196 in winter and 3.17 in summer. This liquid has the disadvantages of high toxicity, reaction with metals, and difficulty of washing it off powders. Its advantages are convenience and inertness towards most minerals. *Tetrabromomethane* is inferior to Tule liquid because the latter wets the carbide particles. The method of analysis was as follows. The steel specimen was anodically dissolved for 1.5 hrs. The electrolyte was washed off the C and carbide sediment using a *centrifuge*. The undried sediment was transferred to a separatory device (essentially a separatory funnel) by means of Tule liquid dild. to a sp. gr. of 2.57. This sp. gr. was found to give good settling of the carbide. After shaking, sepn. occurred in 12 hrs. The lower carbide layer was drained into one beaker, and the upper C layer into another. After filtering through dried asbestos, each of the layers was washed with H_2O, with 10% KI soln., and then with H_2O until no I could be detected. After drying in a stream of H at 110°, the % C of each layer was detd. in a *Mars furnace* by the usual process. The alloying elements were then detd. in the carbide sediment. The method was verified using plain C, Cr, and W steels in the annealed, quenched, and tempered conditions. The degree of dispersion of the carbides could be estimated from the speed of settling.

A. G. Guy

Central Sci-Res. Inst. Ferrous Metal.

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION



PROCESSES AND PROPERTIES INDEX

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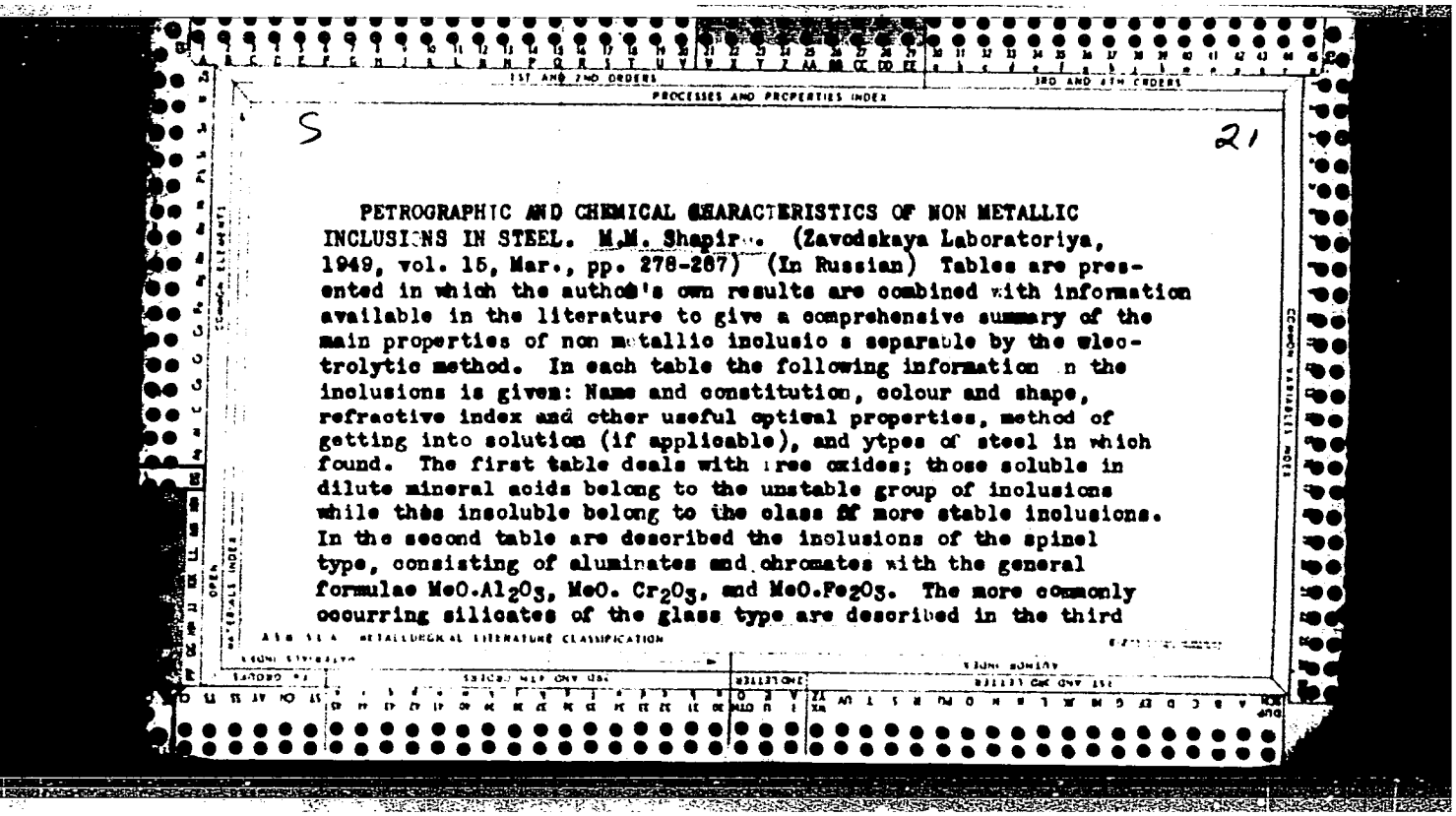
Analysis of nonmetallic inclusions in alloy steel. M. M. Shapiro and R. E. Grabarovskaya. *Zavodskaya Lab.* 15, 259-64(1949). —The residue after oxidative decompn. of the carbides is treated with HCl and Fe in soln. is calcd. back to Fe_3O_4. If much SiO_2 is present, several treatments with HF-H_2SO_4 are made to det. Si. The residue is extd. with HCl and the insol. residue is fused with $KHSO_4$, after ignition to const. wt.; and the melt is extd. with water. The original HCl ext. and the final ext. are analyzed by aliquots: *Fe*—by the colorimetric sulfosalicylate reaction, although Mn can interfere, its color develops slowly (15-20 min.); *Mn*—the persulfate-$AgNO_3$ method; *Cr*—colorimetrically with diphenylcarbazide; *W*—in silicates by NH_4OH treatment of the residue after Si detn. (difference being WO_3); W in carbides or oxides goes into soln. during the acid extns.; W in isomorphous mixt. of Al_2O_3 and WO_3 is detd. after $KHSO_4$ fusion with addn. of a little H_2SO_4 to the aq. ext., filtration, and treatment of the ppt. with NH_4OH, after which the NH_4OH soln. is evapd. and the residue ignited to const. wt. of WO_3. B cannot be detd. by the usual procedure in silicates because of losses; the carbide-free sample is fused with Na_2CO_3 and extd. with 1:4 H_2SO_4, the ext. is analyzed colorimetrically according to Mukhina (M. and Aleshina, *C.A.* **39**, 4019[2]) *Al*—its content in silicates is detd. by difference between the detd. silicate and the total Al_2O_3, since small amts. of CaO and MgO are not significant as a rule; the silicate content is the difference between the wt. of Al_2O_3-spinel ppt. and the total wt. of the isolated inclusions. FeO percentage in the silicate is calcd. by the ratio of FeO actually found in it to the amt. of silicate, as found by the above subtraction. The general sepn. scheme is: 1. Cl-sol. fraction consists of magnetite and sol. orthosilicates; HF-H_2SO_4-sol. fraction consists of silicates; insol. fraction consists of oxides of Cr, Al (acid insol.), and spinel.

G. M. Kosolapoff

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



PROCESSES AND PROPERTIES INDEX

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PETROGRAPHIC AND CHEMICAL CHARACTERISTICS OF NON METALLIC INCLUSIONS IN STEEL. M.M. Shapir... (Zavodskaya Laboratoriya, 1949, vol. 15, Mar., pp. 278-287) (In Russian) Tables are presented in which the author's own results are combined with information available in the literature to give a comprehensive summary of the main properties of non metallic inclusio s separable by the electrolytic method. In each table the following information n the inclusions is given: Name and constitution, colour and shape, refractive index and other useful optical properties, method of getting into solution (if applicable), and ytpes of steel in which found. The first table deals with free oxides; those soluble in dilute mineral acids belong to the unstable group of inclusions while thes insoluble belong to the class of more stable inclusions. In the second table are described the inclusions of the spinel type, consisting of aluminates and chromates with the general formulae $MeO.Al_2O_3$, $MeO.Cr_2O_3$, and $MeO.Fe_2O_3$. The more commonly occurring silicates of the glass type are described in the third

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table. The silicates form the largest group and their constitution varies widely, the form in which they occur in inclusions being most frequently globular. The fourth table describes the crystalline silicates such as the orthosilicates. The fifth table deals with the sulphide inclusions. These include the sulphide of monovalent copper, of manganese (containing dissolved sulphides of chromium, copper, and iron), and of iron as well as some oxy-sulphides. The sixth (and last) table gives information on two phase inclusions, e.g., inclusions consisting of an outer envelope of FeO, enclosing a silicate which itself surrounds a mass of silica.

S.K.

SHAPIRO, M.M.

14611 Study of the Buoyancy Method of Phase Analysis for Carbon in Steels. Yu. A. Klyachko and M. M. Shapiro. Henry Brutcher Translation No. 3526, 16 p. (Abridged from Zavodskaya laboratoriya, v. 16, no. 10, 1950, p. 1179-1182.) Henry Brutcher, Altadena, Calif.

Prevention of changes in C content of carbide residue obtained by electrolytic solution; changes in Fe content of the residue during preparation and separation of heavy liquids; nature of reaction of cementite with solution, and formulas expressing it. Tables, X-ray diffraction patterns, graphs, micrographs. 6 ref.

Cent. Sci. Res. Inst. Ferrous Metallurgy

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SHAPIRO, M.M.

MG Klyachko, Yu. A.; Atlasov, A. G., and Shapiro, M. M.: Analiz gazov, nemetallicheskikh vklyucheniĭ i karbidov v stali (Analysis of Gas, Non-Metallic Inclusions and Carbides of Steel). Moscow: Gosudarst. Nauch.-Tekh. Izdatel'stvo Lit. po Chernoĭ i Tsvetnoĭ Met. 1953. 503 pp.

(2)

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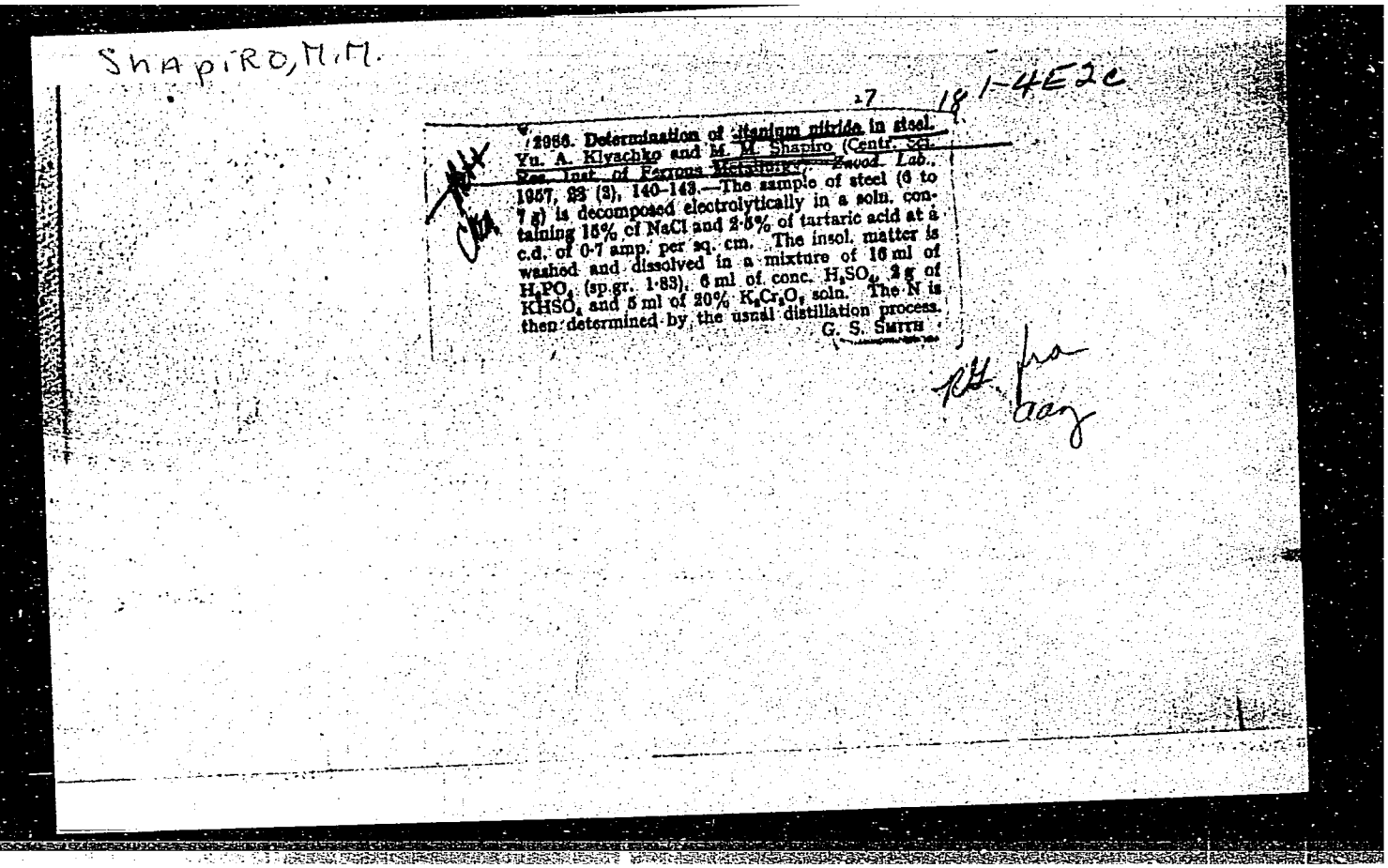
[Physical metallurgy and the heat treatment of steel and iron; a reference book] Metallovedenie i termicheskaia obrabotka stali i chuguna; spravochnik. Pod red. N.T.Dudtsova, M.L.Bernshteina, A.G. Rakhshtadta. Moskva, Gos. nauchno-tekhn. izd-vo lit-ry po chernoi i tsvetnoi metallurgii, 1956. 1204 p. (MLRA 9:9)

1. Chlen -korrespondent Akademii nauk USSR (for Bunin)
(Steel--Heat treatment) (Iron--Heat treatment)
(Physical metallurgy)



SHAPIRO, M.M.

27 18 1-4E2c

/2956. Determination of titanium nitride in steel. Yu. A. Klyachko and M. M. Shapiro (Centr. Sci. Res. Inst. of Ferrous Metallurgy, Zavod. Lab., 1957, 23 (2), 140–143.—The sample of steel (6 to 7 g) is decomposed electrolytically in a soln. containing 15% of NaCl and 2·5% of tartaric acid at a c.d. of 0·7 amp. per sq. cm. The insol. matter is washed and dissolved in a mixture of 15 ml of H_3PO_4 (sp.gr. 1·83), 6 ml of conc. H_2SO_4, 2 g of $KHSO_4$ and 5 ml of 20% $K_2Cr_2O_7$ soln. The N is then determined by the usual distillation process.

G. S. SMITH

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Sha p.R.4, M.M.

AUTHORS Shapiro, M.M., Levit-Gurevich, G.Ye. 32-8-4/61

TITLE The Phase Analysis of Iron-Nickel-Titanium Alloys. (Fazovyy analiz zhelezonikel'titanovykh splavov .)

PERIODICAL Zavodskaya Laboratoriya, 1957, Vol. 23, Nr 8, pp. 904-905 (USSR)

ABSTRACT It was recently found that the composition of the electrolyte exerts an influence in the anode solution for the purpose of separating dispersion phases in various alloys. It has also to be taken into account that other factors, e.g. temperature, influence the quantitative separation of disperse and especially of the intermetallic phases. The paper describes the effect produced by temperature on the separation of the intermetallic phase in Fe-Ni-Ti alloys with different content of titanium. It is pointed out in this connection that the effect of temperature on the maintenance of the intermetallic phase of the electrolysis has not yet been investigated. By means of the tables the chemical structure of the intermetallic phase in Fe-Ni-Ti alloys with different content of titanium is treated. The result of the chemical analysis of the carbide precipitation of the

CARD 1/2 solution which contains the intermetals shows that the

The Phase Analysis of Iron-Nickel-Titanium Alloys.

precipitation contains titanium carbide and iron carbide, while the solution contains nickel, iron and titanium. In the roentgenogram only the lines of the hexagonal phase ε -Ni_3Ti were determined beside carbides, but no lines of Fe_3Ti. Therefore it may be concluded that the iron is included in the Ni_3Ti phase, while the intermetallic binding $(NiFe)_3Ti$ is contained in the solution.
(2 tables and 1 illustration)

ASSOCIATION: Central scientific research institute for ferrous metals. (Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii)

AVAILABLE: Library of Congress.

Shapiro, M.M.

AUTHOR: Shapiro, M.M. 32-11-6/60

TITLE: The Determination of Carbides in Stainless Steel by Means of Electrolysis (Opredeleniye karbidov v nerzhaveyushchey stali metodom elektroliza)

PERIODICAL: Zavodskaya Laboratoriya, 1957, Vol. 23, Nr 11, pp.1292-1294 (USSR)

ABSTRACT: In the introduction it is said that the well-known methods of electrolysis are not applicable in the case of stainless steel because the smooth surface of steel becomes passive in such a manner that dissolution takes place either under the passive part of the surface in the manner of interorystalline corrosion or locally. The passivated metal parts come with others into the precipitation and cannot be separated from the carbides so that the experiment is considerably disturbed. E.E.Chebushkova found that electrolysis of stainless steel can be carried out perfectly well in the case of a high current density (5 A/cm^2). Yalt-steel was used as a sample on this occasion. N.A.Saverina also worked with a current density of 1 A/cm^2 in the same case for the X18H9 and X30 steels, but he used a solution of potassium chloride and hydrochloric acid as electrolyte. The ends of the sample were in this case insulated with rubber. N.M. Popova suggested an electrolyte solution containing sodium thioantimoniate for chromium steels, but this solu-

Card 1/3

The Determination of Carbides in Stainless Steel by Means of Electrolysis

tion cannot be used for titanium steels. After checking these methods it was found that the method developed by Chebushkova is not quite reliable; by the Saverina method dangerous experiments would have to be carried out; therefore a new method is recommended in this paper which is described as follows: A steel sample of 50 mm length and 10 mm diameter is provided in its upper part with a hole by which it can be suspended. As the phenomenon of the passivity of the solution usually occurs in the upper part (near the atmosphere), this upper part is covered by a rubber tube so that only the lower part of the sample is subjected to the influence of the solution. The sample is first etched in the same manner as in the case of an elextrolysis, after which it is washed and cleaned; it is only then that the analysis is carried out. A copper sleeve is used as cathode, which rests against the inner wall of the vessel. The electrolyte solution consists of 15% of sodium chloride and 2.5% tartaric- or citric acid with a total volume of 4 l. The current density is kept at a level of 0.6-0.7 A/cm^2. Electrolysis takes 30 - 45 minutes (the further process is as usual). This method is furthermore compared with those described previously, and

32-11-6/60

The Determination of Carbides in Stainless Steel by Means of Electrolysis

the advantages offered by the last-mentioned method are pointed out. There are 3 tables, and 5 Slavic references.

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AVAILABLE: Library of Congress

Card 3/3

18(7), 5(4) SOV/32-24-11-3/37

AUTHORS: Klyachko, Yu. A., Shapiro, M. M., Mal'tseva, V. S., Mil'chev, V. A.

TITLE: Investigations Concerning the Theory of the Electrochemical Phase Analysis of Alloys (Issledovaniya po teorii elektrokhimicheskogo fazovogo analiza splavov)

PERIODICAL: Zavodskaya Laboratoriya, 1958, Vol 24, Nr 11, pp 1308-1314 (USSR)

ABSTRACT: It has been shown (Ref 1) that the basis of this analysis is the relative polarizability of the phases. Koch (Kokh) et al. (Ref 2) were later able to obtain interesting results, but only for steel. In the work reported here only nickel alloys were investigated. Already existing methods (Ref 3) which were developed by N. I. Blok et al.(Ref 4) were used in the experiments. The samples used underwent a preliminary thermal treatment (three kinds), according to the advice of G. V. Estulin. The separation of phases took place in the following ways: 1) Separation of the inter-metallic compounds from the carbides by the TsNIIChM method (Ref 3) - anodic dissolution of the sample in the electrolyte: 3% $FeSO_4 \cdot 7H_2O$ + 3.5% NaCl +

Card 1/3

Investigations Concerning the Theory of the Electrochemical Phase Analysis of Alloys

5% H_2SO_4, using a current density of 0.025-0.05 Ampere/cm^2 over a period of 1-1.5 hours; 2) according to the method of N. I. Blok et al. (Ref 4) - 0.9% $(NH_4)_2SO_4$ + 0.9% citric acid, 0.05 Ampere/cm^2. 3) The Blok method - 1150 ml methanol + 50 ml HCl (d=1.19), 0.05 Ampere/cm^2, cooling; 4) new method - 15% NaCl + 2.5% tartaric acid, 1.0 Ampere/cm^2. The measurement of the anode potential was carried out using a LP-5 tube voltmeter. The measuring apparatus (diagram) was used jointly with a TsNIIChM-2 electrolyzer. The dissolution occurred at almost the same potential in all cases, apparently at the dissolution potential of the passivated, anodically polarized metallic primary phase. This potential varies with the concentration of the alloy elements in the solid solution. A temperature increase leads to a decrease in potential, apparently because of a depassivation. An increase in current density leads to a marked, periodic fluctuation of the potential. The use of the VIAM carbide electrolyte, which exhibits a greater electrical resistance, allowed the carbide separation to take place at a decreased current density

Investigations Concerning the Theory of the Electrochemical Phase Analysis of Alloys

(0.05 Ampere/cm^2). Especially important was the observation that with aqueous chloride electrolytes an increase in current density decreases the polarization potential. On the basis of the experimental results obtained, which are stated in seven points, detailed explanations are given and corresponding conclusions are drawn. There are 6 figures, 3 tables, and 4 references, 3 of which are Soviet.

ASSOCIATION: Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii (Central Scientific Research Institute for Ferrous Metallurgy)

28(4), 18(0) SOV/32-25-2-50/78

AUTHORS: Labut'yev, Yu. D., Mil'chev, V. A., Shapiro, M. M.

TITLE: An Apparatus for the Phase Analysis of Metals (Ustanovka dlya fazovogo analiza metallov)

PERIODICAL: Zavodskaya Laboratoriya, 1959, Vol 25, Nr 2, pp 227-228 (USSR)

ABSTRACT: A portable apparatus for the analysis of phases by the electrochemical method has been designed (Fig 1). It consists of an A.C.rectifier with semiconductors DGTs-26, a bridge unit in which the current density is controlled by an automatic transformer RNO-0.25, a step-down transformer, and an ammeter M-340. The electrolytic cell (Fig 2) consists of a rotating anode, the sample, and a cooling coil for cooling the electrolyte. The potential is controlled by means of an electrolytic bridge connected with a calomel electrode. The unit may be used, besides for controlling changes in the anode potential, to record polarization curves, to study electrochemical processes, and to determine the pH of electrolytes. The apparatus has proved its value in serial phase analyses. There are 2 figures.

Card 1/2

An Apparatus for the Phase Analysis of Metals

SOV/32-25-2-50/78

ASSOCIATION: Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii (Central Scientific Research Institute of Iron Metallurgy)

Card 2/2

SHAPIRO, M.M.

PHASE I BOOK EXPLOITATION SOV/4443

Akademiya nauk SSSR. Komissiya po analiticheskoy khimii

Metody opredeleniya primesey v chistykh metallakh (Methods of Determining Admixtures in Pure Metals) Moscow, 1960. 411 p. (Series: Its: Trudy, 12) 3,500 copies printed.

Resp. Eds.: A.P. Vinogradov, Academician, and D.I. Ryabchikov, Doctor of Chemical Sciences; Ed. of Publishing House: M.P. Volynets; Tech. Ed.: T.V. Polyakova.

PURPOSE: This collection of articles is intended for chemists, metallurgists, and engineers.

COVERAGE: The articles describe methods for detecting and determining various admixtures and their traces in pure metals. Also discussed are many chemical, physicochemical, electrochemical, spectrochemical and luminescence methods of analyzing materials of high purity. The editors state that these methods have been developed within the last five or six years by various Soviet scientific institutes, and are now widely used in research and factory laboratories of the Soviet Union. No personalities are mentioned. References, mostly Soviet, accompany each article.

Card 2/[illegible]

SHAPIRO, M.M.

PHASE I BOOK EXPLOITATION SOV/4415

Akademiya nauk SSSR. Komissiya po analiticheskoy khimii

Metody opredeleniya primesey v chistykh metallakh (Methods of Determ[illegible] Admixtures In Pure Metals) Moscow, 1960. 411 p. (Series: Its: Trudy, 12) [illegible] copies printed.

Resp. Eds.: A.P. Vinogradov, Academician, and D.I. Ryabchikov, Doctor of Chemical Sciences; Ed. of Publishing House: M.P. Volynets; Tech. Ed.: T.V. Polyakova.

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Levshin, V.L., E.Ya. Arapova, and Ye.G. Baranova. Determination of Small Quantities of Gadolinium, Samarium, and Europium in Metallic Thorium 393

AVAILABLE: Library of Congress

KLYACHKO, Yu.A.; SHAPIRO, M.M.

Determination of nonmetallic chemically bound oxygen inclusions in titanium. Trudy Kom. anal. khim. 12:117-120 '60. (MIRA 13:8)
(Titanium--Analysis) (Titanium oxide)

KLYACHKO, Yu.A.; SHAPIRO, M.M.

Phase analysis of nickel-base alloys. Trudy Kom. anal. khim. 12:383-392 '60. (MIRA 13:8)

(Nickel alloys—Analysis)
(Phase rule and equilibrium)

S/081/62/000/006/038/117
B101/B110

AUTHOR: Shapiro, M. M.

TITLE: Method of quantitatively determining aluminum nitride in steel

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 6, 1962, 141, abstract 6D152 (Sb. tr. Tsentr. n.-i. in-t chernoy metallurgii, no. 19, 1960, 141 - 145)

TEXT: In carbon steels, alloys and Ti steels only one Al nitride was detected which had the composition AlN, which was hexagonally crystallized and birefringent. AlN can be completely separated by anodic dissolution of the sample in an electrolyte containing 15 % NaCl and 25 % tartaric acid at a current density of 0.7 a/cm^2. To determine AlN the electrolytic residue was boiled with alkali in an apparatus for the determination of nitrogen and the NH_3 distilled off was titrated with H_2SO_4 solution. When Al and Ti nitride occur jointly a portion of the electrolytic residue is dissolved in acid and the total nitrogen content is determined, another portion is treated with alkali, and the nitrogen of AlN is determined.

Card 1/2

SHAPIRO, M.M.; BOBKOVA, O.S.

Determination of nonmetallic inclusions in carbon-free ferrochromium. Zav.lab. 26 no.9:1056-1060 '60. (MIRA 13:9)

1. TSentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii im. I.P.Bardina.
(Iron-chromium alloys)

S/032/60/026/011/007/035
B015/B066

AUTHORS: Klyachko, Yu. A., Shapiro, M. M., and Yakovleva, Ye. F.

TITLE: Phase Analysis of Nitrided Low-carbon Steels Which Also Contain Niobium

PERIODICAL: Zavodskaya laboratoriya, 1960, Vol. 26, No. 11, pp. 1219-1223

TEXT: The problem of niobium distribution among the phases in nitrided steels is complicated, and publications contain contradictory data (Ref. 1) regarding the phases in the binary systems Nb - C and Nb - N. Brauer and Lessor (Ref. 2) found that in the system Nb - NbC - NbN the NbC has a cubic lattice of the NaCl type. The present authors investigated the composition of the phase components of niobium in steel alloys with low carbon content, but of three different composition, i.e. the steel types ЭИ 694 (EI694), ЭИ 847 (EI847), and ЭИ 851 (EI851). They used two methods of anodic dissolution: once in an electrolyte of the TsNIITChM (15% NaCl, 2.5% tartaric acid) at a current density of 1.2 a/cm^2 and a temperature not exceeding 20°C, and, in parallel, with the same

Card 1/2

Phase Analysis of Nitrided Low-carbon Steels Which Also Contain Niobium

S/032/60/026/011/007/035
B015/B066

samples in an anhydrous electrolyte of VIAM (50 ml HCl and 1150 ml methanol) at 0.025 a/cm^2 and -10°C. The results obtained in both experimental series were in good agreement. It was found (by means of X-ray structure analyses made by S. B. Maslenkov and V. A. Belyayeva) that a phase with cubic lattice (4.428 - 4.435 A) occurs in the anode deposits. A chemical analysis revealed that the phase contains nitrogen, and it may be seen from the X-ray analysis that no hexagonal lattice occurs which is characteristic of niobium nitride. Thus the compound deposited is niobium nitrocarbide. The nitrogen and carbon contents in the nitrocarbide phase were determined by means of a chemical analysis especially devised for this purpose, and it was found that at lower nitrogen content in the steel the nitrocarbide phase has the composition $Nb(C, N)_{1.00}$ and at the usual nitrogen content (~0.07%) the composition $Nb(C, N)_{1.10}$. There are 5 tables and 8 references: 5 Soviet, 1 German, 1 French, and 1 British.

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

Card 2/2

SHAPIRO, M.M.

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PHASE I BOOK EXPLOITATION SOV/5994

Akademiya nauk Ukrainskoy SSR. Institut metallokeramiki i spetsial'nykh splavov. Seminar po zharostoykim materialam.
Kiyev, 1960.

Trudy Seminara po zharostoykim materialam, 19-21 aprelya 1960 g. Byulleten' no. 6: Khimicheskiye svoystva i metody analiza tugoplavkikh soyedineniy (Transactions of the Seminar on Heat-Resistant Materials of the Institute of Powder Metallurgy and Special Alloys of the Academy of Sciences of the Ukrainian SSR. Held 19-21 April, 1960. Bulletin no. 6: Chemical Properties and Methods of Refractory Compound Analysis). Kiyev, Izd-vo AN UkrSSR, 1961. 124 p. 1500 copies printed.

Sponsoring Agency: Akademiya nauk Ukrainskoy SSR. Institut metallokeramiki i spetsial'nykh splavov.

Editorial Board: I. N. Frantsevich; G. V. Samsonov, Resp. Ed.; I. M. Fedorchenko, V. N. Yeremenko, V. V. Grigor'yeva, and T. N. Nazarchuk; Tech. Ed.: A. A. Matveychuk.

Card 1/5

PURPOSE: This collection of articles is intended for chemists, engineers, workers at scientific research institutes and plant laboratories, senior students, and aspirants at chemical and metallurgical schools of higher education.

COVERAGE: Articles of the collection present the results of studies of the chemical properties of refractory compounds (carbides, borides, nitrides, phosphorides, silicides), refractory and rare metals, and their alloys, and some original methods of analyzing these materials, which are now being utilized in the new fields of engineering. No personalities are mentioned. Each article is accompanied by references, mostly Soviet.

TABLE OF CONTENTS:

S/137/62/000/008/050/065
A006/A101

AUTHORS: Klyachko, Yu. A., Shapiro, M. M., Yakovleva, Ye. F.

TITLE: Phase analysis of nitrides in steel and alloys

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 8, 1962, 113, abstract 8I763 ("Byul. In-t metallokeram. i spets. splavov AN UkrSSR", 1961, no. 6, 59 - 63)

TEXT: To carry out phase analyses of nitrides and carbonitrides of steel, the method of electrolytical dissolving is used with subsequent determination of N by the Kjeldahl method. Electrolysis of Ti-containing steels is performed in an electrolyte of 15% NaCl + 2.5% tartaric acid at 0.6 - 0.7 amp/cm^2 current density. The electrolytic deposit is dissolved in a $H_2SO_4 + KHSO_4 + K_2Cr_2O_7$ mixture and N_2 is sublimated in the form of NH_3. If carbonitrides are absent, TiN is dissolved in aqua regia and Ni_2 is determined from Ti. Al-nitrides are separated out by the chloride method. After disintegrating of the carbides by the nitric-acid method, AlN is dissolved by heating in 5% NaOH and Al is determined from the filtrate. The separation of Nb nitrocarbide is performed in the same electrolyte at 1.2 amp/cm^2 current density. After washing, evaporation and roasting,

Card 1/2

S/137/62/000/008/050/065
A006/A101

Phase analysis of nitrides in steel and alloys

H_2SO_4 (15 ml, spec. weight 1.34), $CuSO_4$ (1 g), Na_2SO_4 (10 g) are added to the electrolytic Nb deposit (N, C), and the latter is dissolved during heating. Furthermore, N_2 is determined from the solution by sublimation in the form of NH_3. Nb is determined from the electrolytic deposit of nitrocarbides by processing with HF. C is determined by the barytic method. In the same electrolyte Cr, Zr, V nitrides are separated out at 0.02 amp/cm^2 current density.

V. Zhuravska

[Abstracter's note: Complete translation]

Card 2/2

S/700/61/000/006/010/018
D267/D304

AUTHORS: Klyachko, Yu. A., Shapiro, M. M. and Yakovleva, Ye. F.

TITLE: Separation of phase components from the nickel-base alloys and modern methods of their chemical analysis

SOURCE: Akademiya nauk Ukrainskoy SSR. Institut metallokeramiki i spetsial'nykh splavov. Seminar po zharostoykim materialam. Kiyev, 1960. Trudy no. 6: Khimicheskiye svoystva i metody analiza tugoplavkikh soyedineniy. Kiyev, Izdvo AS UkrSSR, 1961, 80-87

TEXT: The authors investigated by the method of phase analysis the multi-component refractory nickel-base alloys. The electrolytic separation of intermetallic compounds and carbides in Ni alloys containing Al, Ti, Mo, W, Nb and Co was carried out by methods developed at TsNIIChM(I) and at VIAM (II). Flowsheets of the two procedures are given and described. It was found that the differences between the quantities of electrolytic deposits, obtained with me-

Card 1/3

Separation of phase ...

-hod I and II electrolytes from the same sample were small. It was also found that in the alloys under consideration, the phase separation is determined by the magnitude of the potential which is established during dissolution. Both I and II electrolytes used for separating intermetallic compounds have similar dissolution potentials (1.3 - 1.4 V), whereas the corresponding potentials for the electrolytes used for separating carbides amount to 0.4 - 0.7V. The separation of phases is apparently independent of pH, electrical conductivity or current density. The following phases were disclosed by X-ray analysis in the anode residues: 1) Intermetallic phase Ni_3Al (γ' phase with a face-centered cubic lattice (a = 3,56 kX)); this phase can dissolve Ti, Mo, W, Cr and also Co. 2) Intermetallic phase Ni_3 (Ti, Al) with a face-centered cubic lattice (a = 3,58 kX); this appears either with or without the γ' phase and dissolves W, Cr, Mo and other elements. 3) Intermetallic phase Ni_3Ti, separated from alloys of the XH80T (KhN80T) type after aging at 850°C for 300 - 2000 hours. It has a dense hexagonal la-

Card 2/3

Separation of phase ...

tite ($a = 5.11$ kX, $c = 8.31$ kX, $c/a = 1.63$). These phases contained MeC and $Me_{23}C_6$ (only one multi-component alloy disclosed a carbide of the Me_6C type). It was shown that some carbides can be completely separated. The authors used colorimetric methods to determine Al, Nb, Ti, Mo, Co etc. It was possible to obtain reproducible and stable results in analyzing intermetallic compounds, nitrides and non-metallic inclusions. For Al content range 0.001 - 0.01% the accuracy of the method was ± 0.0001 - 0.003%. For Nb the absolute accuracy of the method was ± 0.01 - 0.1%, ± 0.0035 - 0.02% for Ti in the range 0.05 - 2% and ±0.0001% for Co. Experimental details are given. There are 4 figures, 2 tables and 6 Soviet-bloc references.

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

ASSER, Ya. Ye.; SHAPIRO, M.M.

Rapid roll changing on a continuous small shape mill. Metallurg 6 no.3:30-32 Mr '61. (MIRA 14:5)

1. Krivorozhskiy metallurgicheskiy zavod.
(Rolling (Metalwork))

S/081/62/000/019/013/053
B144/B180

AUTHORS: Klyachko, Yu. A., Shapiro, M. M., Yakovleva, Ye. F.

TITLE: Separation of phase components from nickel-base alloys and modern methods for their chemical analysis

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 19, 1962, 120, abstract 19D105 (Byul. In-t metallokeram. i spets. splavov AN USSR, no. 6, 1961, 80 - 87)

TEXT: The intermetallic and carbide phases in Ni alloys containing Al, Ti, Mo, W, Nb, and Co are separated electrochemically. The elements above are determined photometrically in the resulting mixture of carbides and intermetallic compounds: Al with Aluminon after reducing Fe^{3+} by ascorbinic acid (Al is separated from large quantities of Ti, Cr, V, Nb, and other components by precipitating as cryolite from weak sulfate solutions); Nb with arsenazo or by photometering a hexaniobate solutions at 234.5 mμ; Ti by the peroxide method without separating the accompanying components; Mo by the rhodanide method after reducing Mo^{6+} to Mo^{5+} by thiourea in the presence of $CuSO_4$; and Co with nitroso R-salt (the disturbing effect of Ni^{2+} and Fe^{2+}

Card 1/2

S/081/62/000/019/013/053
B144/B180

Separation of phase components ...

is eliminated by decomposing the relevant complexes by boiling with HNO_3).
[Abstracter's note: Complete translation.]

KLYACHKO, Yu.A.; SHAPIRO, M.M.; YAKOVLEVA, Ye.F.

Analysis of nonmetallic inclusions in stainless steel. Sbor. trud. TSNIICHM no.24:64-74 '62. (MIRA 15:6)
(Steel, Stainless—Inclusions)
(Nonmetallic materials—Analysis)

KLYACHKO, Yu.A.; SHAPIRO, M.M.; YAKOVLEVA, Ye.F.

Analysis of nonmetallic inclusions in carbon steel. Sbor. trud. TSNIICHM no.24:75-81 '62. (MIRA 15:6)
(Steel--Inclusions)
(Nonmetallic materials--Analysis)

S/776/62/000/024/002/007
E111/E135

AUTHORS: Vinograd, M.I., Rozenberg, V.M., and Shapiro, M.M.

TITLE: Modern methods for phase analysis of steel and alloys

SOURCE: Moscow. Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii. Sbornik trudov. no.24, 1962. Novyye metody ispytaniy metallov. 191-203.

TEXT: Phase analysis is important in developing new materials with special properties and in improving existing materials. The authors outline the characteristics of four main groups of methods available: metallographic, X-ray, chemical and electrochemical, physical. As examples of their application to the solution of currently important problems the authors discuss the following: low strength of weld in tubes of type 1Х18Н9Б (1Kh18N9B) steel; formation of sigma-phase in high-silicon steels and alloys, leading to loss of ductility; low plasticity in tensile tests on some heats of type Х25 (Kh25) steel; excessive inclusion content in type 0Х18Н9Т (0Kh18N9T) steel; estimation of inclusion content in high-purity steels, e.g. type ШХ15 (ShKh15); failure of steel in hot mechanical deformation.

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Modern methods for phase analysis... S/776/62/000/024/001/007
E111/E135

In addition, outside the U.S.S.R. electron microscopic investigation of grain boundaries as well as local X-ray spectrum analysis are widely used. Because methods are so numerous and complicated, teams of experts working together are needed. There are 7 figures and 4 tables.

Card 2/2

KLYACHKO, Yu.A.; SHAPIRO, M.M.; YAKOVLEVA, Ye.F.

Phase analysis of chromium steels alloyed with tungsten, molybdenum, vanadium, and niobium. Sbor. trud. TSNIICHM no.24:45-51 '62. (MIRA 15:6)

(Chromium steel--Analysis)

SHAPIRO, M.M.

Planning and accounting for rolling mill operations. Metallurg 8 no.3: 31-32 Mr '63. (MIRA 16:3)

1. Nachal'nik byuro organizatsii truda sortoprokatnogo tsekha Krivorozhskogo metallurgicheskogo zavoda.
(Rolling mills--Accounting)

LEONOVICH, B.N.; ALEKSEYEV, Ye.Ye.; IVANOV, A.I.; KOTSYUBNYAK, A.V.; KACHALKIN, A.P.; TUZHILKIN, A.P.; KUDRYAVSKIY, R.T., mashinist; SHAPIRO, M.M.

Brief resumé of the speeches made at the conference of the representatives of the collectives and shock workers of communist labor engaged in the operation and maintenance of locomotives. Elek. i tepl. tiaga 7 no.9:1-7 S '63. (MIRA 16:10)

1. Nachal'nik depo Grebenka Yuzhnoy dorogi (for Leonovich). 2. Nachal'nik depo kommunisticheskogo truda Moskva-Sortirovochnaya (for Alekseyev). 3. Nachal'nik depo kommunisticheskogo truda Liski Yugo-Vostochnoy dorogi (for Ivanov). 4. Obshchestvennyy mashinist-instruktor, sekretar' partiynogo byuro depo Mukachevo L'vovskoy dorogi (for Kotsyubnyak). 5. Zaveduyushchiy otdelom zarabotnoy platy i proizvodstvenno-massovoy raboty TSentral'nogo komiteta professional'nogo soyuza rabochikh zheleznodorozhnogo transporta (for Kachalkin). 6. Master tsekha kommunisticheskogo truda po remontu toplivnoy apparatury depo Rtishchevo Privolzhskoy dorogi (for Tuzhilkin). 7. Depo Irkutsk-Sortirovochnyy Vostochno-Sibirskoy dorogi (for Kudryavskiy). 8. Starshiy master depo Tashkent Sredneaziatskoy dorogi (for Shapiro).

L 52081-65 EWT(m)/EPF(c)/EWA(d)/EPF(n)-2/EPR/EWP(t)/EWP(z)/EWP(b) IJP(c)
MJW/JD/WW/JG

ACCESSION NR: AT5012937 UR/2776/64/000/037/0150/0154

27
23
B+1

AUTHOR: Klyachko, Yu. A.; Shapiro, M.M.

TITLE: Differential analysis of nitrides 27

SOURCE: Moscow. Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii. Sbornik trudov, no. 37, 1964. Novyye metody ispytaniy metallov; khimicheskiy kontrol' v metallurgii (New methods in the analysis of metals; chemical control in metallurgy), 150-154

TOPIC TAGS: nitride determination, steel analysis, Kjeldahl method, steel electrolysis, Beeghly halogenation, alloy steel

ABSTRACT: To analyze nitrides in steel, the authors used a modification of the Kjeldahl method: the nitrides were converted into ammonium salts, and nitrogen was driven off in the form of ammonia, which was titrated with 0.01 N H_2SO_4. The nitrides were isolated from steel by the three known methods: electrolysis in an aqueous solution, Beeghly halogenation, and electrolysis in a nonaqueous electrolyte (1150 ml methanol and 50 ml HCl). Steel 18G2AF containing 0.02% Al and 0.055% V or 0.02% Al and 0.07% V was used. It was found that the most complete separation of the nitrides (AlN + VN) from vanadium steel is achieved by electrolytic dissolution of the sample

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ACCESSION NR: AP5012937

4

in an aqueous chloride solution (15% NaCl). Nitrides were also determined in alloy Kh20N80, containing 0.04-0.08% Al, 0.12-0.36% Ti, and 0.09-0.49% Zr. AlN was determined by dissolving the sample in the nonaqueous electrolyte, and TiN and ZrN were analyzed by electrolysis in the aqueous chloride electrolyte. Orig. art. has: 3 tables and 1 formula.

ASSOCIATION: Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii, Moscow (Central Scientific Research Institute for Ferrous Metallurgy)

SUBMITTED: 00 ENCL: 00 SUB CODE: MM, IC

NO REF SOV: 007 OTHER: 002

Card 2/2

GETMANETS, Veniamin Vasil'yevich; SATSKIY, Vitaliy Antonovich; AL'MEN, Iosif Abramovich; SHAPIRO, Mikhail Mironovich

[Operation of continuous small-section mills] Ekspluatatsiia nepreryvnykh melkosortnykh stanov. Moskva, Metallurgiia, 1965. 142 p. (MIRA 18:11)

SHAPIRO, M.N., professor

A little known symptom of successful reduction of congenital dislocation of the hip. Ortop.,travm. i protez. 18 no.1:62-63 Ja-F '57. (MLRA 10:6)

1. Iz Minskogo nauchno-issledovatel'skogo instituta ortopedii i vosstanovitel'noy khirurgii (dir. - prof. R.M.Minina).
(HIP, disloc.
congen., method for determ. of successful reduction in child.)