POPOV, K.S.

Present and future of the iron mining industry of Belgorod Province. Shakht. stroi. 4 no.12:1-3 D '60. (MIRA 13:12)

1. Sekretar' Belgorodskogo obkoma Kommunisticheskoy partii Sovetskogo Soyuza.

(Belgorod Province—Iron mines and mining)

INDENBAUM, Veniamin Solomonovich, inzh.; LEBEDEV, Mikhail Vasil'yevich, inzh. [deceased]; LIBERMAN, Grigoriy Romanovich, inzh.; OL'-SHANSKIY, Ya.A., inzh., red.; POPOV, K.S., inzh., red.; TAYTS, A.A., inzh., red.; SHNEYEROV, S.A., red.izd-va; BARANOV, M.V., tekhn.red.

[Operation of small steam turbine electric power plants] Ekspluatatsiia paroturbinnykh elektrostantsii maloi moshchnosti. Pod obshchei red. G.R.Libermana. Moskva, Izd-vo M-va kommun. khoz.RSFSR, 1959. 483 p. (MIRA 13:5)
(Electric power plants)

POPOV, K. S.

USSR

Application of ultraviolet spectrophotometry in the study of fats. K. S. Popov, L. A. Grauerman, and L. G. Karantsevich. *Uchenye Zapiski Leningrad. Univ.* 1950, No. 3, 87–97.—A method of analysis has been developed for long-chain unsatd. acids. The method is based on the distribution of the double bonds in the mol., since the no. of C—C single bonds sepg. double bonds governs the region in which they absorb. As an example, linoleic acid (I), linolenic acid (II), and arachidonic acid (III) have the following double-bond distribution: C:C.C.C:C, C:C.C.C:C.C.C:C, C:C.C.C:C.C.C:C.C.C:C, resp. The coeffs. of absorption, g./l./cm., are: I 86 at 234 mμ; II 60.9 at 234 mμ, 52.2 at 268 mμ; III 59.3 at 234 mμ, 53.4 at 268 mμ, 22.6 at 316 mμ. By using this method it is shown that a quant. spectrophotometric procedure for detg. I in sunflower and cottonseed oil is feasible. A study was made of solns. of vitamin A and β-carotene in heptane. The analysis of carotene was correct to 3.5%.

R. D. Kross

PAPOV, K. S.

Batishcheva, M. G., Grauerman, L. A., Karantsevich, L. G., Mironova, A. N. and Papov, K. S. Application of the methods of molecular spectral analysis to the investigation of fats. Pages 458 - 465.

Scient. Research Inst. of
Physics of the A. A.
Zhdanov Leningrad State
Uni. and The All Union Scient.
Research Inst. of Fats.

SO: Bulletin of the academy of Sciences, Izvestia, (USSR) Vol. 14, No. 4.
(1950) Series on Physics.

1. POPOV, K. S.; KARANTSEVICH, L. G.

2. USSR (600)

4. Acids, Fatty

7. Spectroscopic method for quantitative determination of linoleic and linolenic acids in linseed and soybean oils, Masl. zhir. prom., 17, No. 3, 1952.

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

POPOV, K.S.

AGABAL'YANTS, G.G., professor, doktor sel'skokhozyaystvennykh nauk; NILOV, V.I., doktor khimicheskikh nauk, retsenzent; POPOV, K.S., kandidat tekhnicheskikh nauk, retsenzent; UNGURYAN, P.N., kandidat tekhnicheskikh nauk, retsenzent; VECHER, A.S., professor, doktor biologicheskikh nauk, spetsredaktor; MASLOVA, Ye.F., redaktor; GOTLIB, E.M., tekhnicheskiy redaktor

[Chemical and technological control in Soviet champagne production; manual for plant laboratories] Khimiko-tekhnologicheskii kontrol' proizvodstva Sovetskogo shampanskogo; rukovodstvo dlia zavodskikh laboratorii. Moskva, Pishchepromizdat, 1954. 383 p. (MLRA 7:11)
(Champagne (Wine))

RZHEKHIN, V.P., starshiy nauchnyy sotrudnik; BODYAZHINA, Z.I.; VENGEROVA, N.V.; VISHNEPOL'SKAYA, F.A.; GALUSHKINA, N.A.; GAVRILENKO, I.V.; GRAUERMAN, L.A.; IRODOV, M.V.; KARANTSEVICH, L.G.; KREYSINA, R.A.; KUPCHINSKIY, P.D.; LEVIT, M.S.; LEONT'YEVSKIY, K.Ye.; LITVINENKO, V.P.; LYUBCHANSKAYA, Z.I.; MAZYUKEVICH, V.A.; MAN'-KOVSKAYA, N.K.; NEVOLIN, F.V.; POGONKINA, N.I.; POPOV, K.S.; PREMET, G.K.; SARKISOVA, V.G.; SEMENOV, Ye.A.; STERLIN, B.Ya.; SERGEYEV, A.G., kand.tekhn.nauk, obshchiy red.; PRITYKINA, L.A., red.; TARASOVA, N.M., tekhn.red.

[Technical and chemical production control and accounting in the oils and fats industry] Tekhnokhimicheskii kontrol' i uchet proizvodstva v maslodobyvaiushchei i zhirorerabatyvaiushchei promyshlennosti. Moskva, Pishchepromizdat. Vol.1. 1958. 403 p. (MIRA 13:1)
(Oil industries)

POPOV, K.S.; GRAUERMAN, L.A.; TOVBIN, I.M., spetsred.; VASIL'YEVA, G.N., red.; TARASOVA, N.M., tekhn.red.

[Production and use of vegetable phosphatides in the food industry] Proizvodstvo i primenenie rastitel'nykh fosfatidov v pishchevoi promyshlennosti. Moskva, Pishchepromizdat, 1958. 41 p. (MIRA 11:12)

(Phosphatides)

POPOV, K.S., kand. tekhn. nauk; BEZUGLOV, M.I., inzh.; MEYEROV, Ya. S., inzh.

Purification of raw vegetable phosphatides. Masl.-zhir. prom. 24 no. 6:3-7 '58. (MIRA 11:7)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut zhirov(for Popov).
2. Krasnodarskiy maslozhirnovoy kombinat(for Bezuglov, Meyerov).
(Phosphatides)

BODYAZHINA, Z.I.; VENGEROVA, N.V.; GEYSHINA, K.V.; GRAUERMAN, L.A.; IRODOV, M.V.; KARANTSEVICH, L.G.; KRAL'-OSIKINA, G.A.; KUPCHINSKIY, P.D.; LEONT'YEVSKIY, K.Ye.; LITVINENKO, V.P.; LYUBCHANSKAYA, Z.I.; MAZYUKEVICH, V.A.; MAN'KOVSKAYA, N.K.; NEVOLIN, F.V.; POGONKINA, N.I.; POPOV, K.S.; PREMET, G.K.; RZHEKHIN, V.P., starshiy nauchnyy sotrudnik; SARKISOVA, V.G.; SEMENOV, Ye.A.; STERLIN, B.Ya.; TIPISOVA, T.G.; SERGEYEV, A.G., kand.tekhn.nauk, red.; PRITYKINA, L.A., red.; GOTLIB, E.M., tekhn.red.

[Technochemical control and production accounting in the oils and fats industry] Tekhnokhimicheskii kontrol' i uchet proizvodstva v maslodobyvaiushchei i zhirorererabatyvaiushchei promyshlennosti. Moskva, Pishchepromizdat. Vol.2. [Special methods in the analysis of raw material and semiprocessed and finished products] Spetsial'nye metody analiza syr'ia, polufabrikatov i gotovoi produktsii. 1959. 495 p. (MIRA 13:5)
(Oil industries) (Oils and fats--Analysis)

OGORODNIK, S.T.; POPOV, K.S.

[Vermouth making in the U.S.S.R. and abroad] Proizvodstvo vermuta v SSSR i za rubezhom. Moskva, TSentr. in-t nauchno-tekhn. informatsii pishchevoi promyshl., 1964 23 p. (MIRA 18:5)

POPOV, K.S.; SEMENENKO, G.F.

Regions of production of wine materials and grape varieties for the making of champagne. Trudy VNIIViV "Magarach" 13: 84-107 '64. (MIRA 17:12)

POPOV, K.S., kand. tekhn. nauk; GAYVORONSKAYA, Z.I.; UMANETS, V.P.; NILOV, V.I.; VALUYKO, G.G.; OKHREMENKO, N.S.; ZHDANOVICH, G.A.; DATUNASHVILI, Ye.N.; SERBINOVA, N I.; MARCHENKO, G.S.; KURAKSINA, N.K.; TYURIN, S.T.; TYURINA, L.V.; KRIMCHAR, M.S.; RAZUVAYEV, N.I.; OGORODNIK, S.T.; MIKHAYLOV, S.M.; ZHILYAKOVA, O., red.; GLIKMAN, N., red.; FISENKO, A., tekhn. red.;

[Wine making; manual for the workers of wineries on state and collective farms in the Crimea] Vinodelie; rukovodstvo dlia rabotnikov vinodel'cheskikh zavodov sovkhozov i kolkhozov Kryma. Simferopol', Krymizdat, 1960. 415 p. (MIRA 16:3)
(Crimea--Wine and wine making)

KATAR'YAN, T.G., glav.red.; BLAGONRAVOV, P.P., red.[deceased]; GOLIKOVA, Z.I., red.; GOLODRIGA, P.Ya., red.; MOROZOVA, G.S., red.; NILOV, V.I., red.; OKHREMENKO, N.S., red.; PALAMARCHUK, G.D., red.; POPOV, K.S., red.; SKVORTSOV, A.F., red.; ROSSOSHANSKAYA, V.A., red.; ANTONOVA, N.M., tekhn. red.

[Problems of viticulture and wine making; abstracts for work for 1959-1960] Voprosy vinogradarstva i vinodeliia; sbornik referatov nauchnykh rabot za 1959-1960 gody. Moskva, Sel'khozizdat, 1962. 363 p. (MIRA 15:7)

1. Yalta. Vsesoyuznyy nauchno-issledovatel'skiy institut vinodeliya i vinogradarstva "Magarach."
(Viticulture) (Wine and wine making)

MOSIN, M.I.; KATS, G.I.; SHEVYAKOV, L.D., akademik, red.; SHUKHARDIN, S.V., red.; AGOSHKOV, M.I., red.; BORISOV, S.F., red.; BYSTROV, N.M., red.; KISLOV, V.M., red.; KRAKHMALEV, M.K., red.; KUZNETSOV, N.A., red.; MAN'KOVSKIY, G.I., red.; MEL'NIKOV, N.V., red.; POLKOVNIKOV, A.A., red.; POPOV, K.S., red.; CHAYKIN, S.I., laureat Leninskoy premii, red.; GONCHAROVA, Ye.A., tekhn. red.

[Kursk Magnetic Anomaly; history of the discovery study, and commercial development of iron-ore deposits. Collection of documents and materials in two volumes, 1742-1960] Kurskaia magnitnaia anomaliia; istoriia otkrytiia, issledovanii i promyshlennogo osvoeniia zhelezorudnykh mestorozhdenii. Sbornik dokumentov i materialov v dvukh tomakh, 1742-1960. Belgorod, Belgorodskoe knizhnoe izd-vo. Vol.1. 1742-1926. 1961. 417 p. (MIRA 15:3)

(Kursk Magnetic Anomaly--Iron ores)
(Magnetic prospecting)

POPOV, Konstanin Viktorovich.

Hydraulic engineering installations; a textbook Moskva, Gos. izd-vo sel'khoz. lit-ry, 1950. 494 p. (51-16890)

TC160.P75

POPOV, Konstantin Viktorovich, professor; LEBEDEV, Yu.D., redaktor; BALLOD, A.I., tekhnicheskiy redaktor.

[Hydraulic structures] Gidrotekhnicheskie sooruzheniia. Izd. 2-oe, perer. i dop. Moskva, Gos.izd-vo sel'khoz. lit-ry, 1956. 519 p. (Hydraulic structures) (MLRA 9:6)

TOTOV, K. V.

"Investigation of Carbide Phasis in the Iron-Chromium Carbon System," Cand. Technical Sci. Sub 30 Jun 49, Moscow Order of the Labor Red Banner Inst of Steel imeni I. V. Stalin

Summary 82, 18 Dec 52, Dissertations Presented For Degrees in Science and Engineering in Moscow in 1949. From Vechernyaya Moskva, Jan-Dec 1949.

IGROV, K. V.

Feb 50

USSR/Engineering - Thermomagnetic Effect Carbides, Analysis

"Employment of Thermomagnetic Method in Carbide Analysis," B. G. Livshits, K. V. Igrov, Moscow Inst of Steel imeni I. V. Stalin, 4 pp

"Zavod Lab" Vol XVI, No 2

Introduces new method for thermomagnetic analysis of isolated carbides, used for investigating carbide phases of chromium steels, which permits, to a certain extent, compensation for deficiency in chemical and X-ray investigations. Investigated thermomagnetic properties of carbides isolated from steels with chromium contents up to 4.34%. Analysis revealed carbide phases present in chromium steels after holding at supercritical temperature. This was impossible by any other method.

PA 159T20

POPOV, K. V. and LIVSHITZ, B. G.

"Modifications in the Phase Diagram of the System Fe-Cr-C," Dokl. AN SSSR, 60, No.4, 1950

Evaluation B-62231

Popov, K. V.

62

*The More Accurate Determination of the Equilibrium Diagram of the System Iron-Chromium-Carbon. B. G. Livshits and K. V. Popov (*Doklady Akad. Nauk S.S.S.R.*, 1950, 73, (4), 633–635).—[In Russian]. The equilibrium diagram of the Fe-Cr-C system has been more accurately determined. Chem. and X-ray methods were applied to the carbides separated from the steels by an electrolytic method. The steels were melted in an induction furnace and annealed at 700° C.; those with high Cr content were very slowly cooled, especially in the region 600°–400° C. An isothermal cross-section of the diagram below the critical temp. is given.—Z. S. B.

(1)

Popov, Konstantin Viktorovich

PANCHENKO, Yelena Vasil'yevna; SKAKOV, Yuriy Aleksandrovich; POPOV, Konstantin Viktorovich; KRIMER, Boris Isaakovich; ARSENT'YEV, Petr Pavlovich; KHORIN, Yakov Davidovich; LIVSHITS, B.G., doktor tekhn.nauk, prof., red.; GORDON, L.M., red.izdatel'stva; KARASEV, A.I., tekhn.red.

[Metallographic laboratory] Laboratoriia metallografii. Pod red. B.G.Livshitsa. Moskva, Gos.nauchno-tekhn.izd-vo lit-ry po chernoi i tsvetnoi metallurgii, 1957. 695 p. (MIRA 10:12)
(Metallography)

SOV/123-59-16-64519

Translation from: Referativnyy zhurnal. Mashinostroyeniye, 1959, Nr 16, p 123 (USSR)

AUTHOR: Popov, K.V.

TITLE: The Effects of Heat Treatment on the Tendency of Steel to Cold Brittleness. The Cold Brittleness of Steel (Lit. Review)

PERIODICAL: Tr.Vost.-Sib. fil. AN SSSR, 1957, vyp 6, 5 - 29

ABSTRACT: The effects of heat treatment of steel on its tendency to cold-brittleness were investigated. On the basis of literature data the conclusion is drawn that there is a connection between the tendency of steel to cold brittleness, the properties depending on the alloy structure and the changes of its phases on the one hand, and the test conditions on the other. The following steels were studied: rimmed steel St.3; St. 4 and St. 5, deoxidized by ferrosilicon; and steels marked by SA and SK. It is stated that tempering at temperatures, exceeding somewhat the upper critical point, is a heat treatment which increases the tendency of low-carbon steels to cold brittleness. Hardening with high tempering is considered to be a better method of heat treatment, as it reduces the tendency of steel to cold brittleness and

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SOV/137-59-1-1433

Translation from: Referativnyy zhurnal. Metallurgiya, 1959, Nr 1, p 188 (USSR)

AUTHOR: Popov, K V

TITLE: On Methods of Metallographic Investigation of Steel Employed in Steam Boilers (O metodike metallograficheskogo issledovaniya metalla parovykh kotlov)

PERIODICAL: Tr. Vost. Sib. fil. AN SSSR, 1957, Nr 6, pp 135-142

ABSTRACT: A discussion of various methods of investigating the quality of boiler steel; for purposes of performing large-scale investigations of boilers which are in operation it is proposed that metallographic methods be employed in combination with chemical analysis and with methods of mechanical testing of annular specimens. The author emphasizes the need for a method permitting the utilization of metallographic analysis data in evaluating the quality of boiler steels and welded joints, and he outlines the requirements which would have to be met by such a method. It is proposed that tension testing of annular specimens, as well as micromechanical testing, be substituted for the standard method of mechanical testing of flat specimens.

Z. F.

Card 1/1

POPOV, K.V.; KHVOROSTUKHINA, N.A.

Effect of hydrogen on carbon-low steel during its cathodic polarization in the electrolyte. Izv. Sib. otd. AN SSSR no.8:39-42 '58.
(MIRA 11:10)

1.Vostochno-Sibirskiy filial AN SSSR.
(Steel--Hydrogen content)
(Polarization (Electricity))

SOV/129-58-9-13/16

AUTHORS: Gayvoronskiy, L. A., Shustitskaya, Ye. V. and Popov, K. N.

TITLE: Investigation of the Low Temperature Stability of the Steel SKhL-4 After Various Types of Heat Treatment (Issledovaniye khladostoykosti stali SKhL-4 posle razlichnoy termicheskoy obrabotki)

PERIODICAL: Metallovedeniye i Obrabotka Metallov, 1958, Nr 9, pp 54-55 (USSR)

ABSTRACT: 20 mm thick steel sheet was investigated in the heat treated state. The composition of the steel was: 0.12% C; 0.77% Mn; 0.9% Si; 0.022% S; 0.024% P; 0.84% Cr; 0.56% Ni. The influence of the heat treatment on the low temperature stability was evaluated on the basis of the change of the critical temperature of transformation of the steel into the brittle state during impact bending of notched specimens. As the critical temperature, the upper boundary of the brittleness temperature range was chosen. In cases when the decrease in the impact strength was continuous the critical temperature was considered arbitrarily that temperature for which the impact strength was 40% below the respective value at room temperature. For determining the tendency of the specimen to ageing in

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the as delivered state it was subjected to an extension by 10% with subsequent two hour tempering at 200°C. The properties of the steel after various types of heat treatment are entered in the Table, p 54. It can be seen that hardening from the optimum temperature of 920°C, followed by high temperature tempering, brought about almost no change in the low temperature stability compared to the as delivered state. However, overheating during hardening by only 40°C brought about an increase in the critical brittleness temperature from -90 to -50°C. In Fig.1 the changes are graphed of the impact strength at various test temperatures for the as delivered state and after deformation ageing. Deformation ageing brought about a considerable reduction of the impact strength at the investigated temperatures but the coefficient of sensitivity to ageing was 0.3, which justifies the assumption that this steel has a low sensitivity to deformation ageing. Annealing of the steel affected the low temperature stability in the same

 way as deformation ageing. Application for the steel

Investigation of the Low Temperature Stability of the Steel SKhL-4 After Various Types of Heat Treatment

SKhL-4 of this widely used softening as the final heat treatment is not recommended in cases in which the manufactured components should have a high low temperature stability. After normalisation annealing at 920°C a certain decrease was observed in the impact strength and an increase in the critical temperature; after normalisation without over-heating, the steel maintains a high impact strength down to -70°C (Fig.2). It is recommended that this type of heat treatment should be tried in industry for certain components in cases in which a better heat treatment (hardening followed by high temperature tempering) cannot be effected for technological reasons or where such a treatment would be difficult to carry out. In the case of heat treatment, and particularly of welding of the steel SKhL-4, it is necessary to bear in mind that over-heating to 1100°C followed by cooling in air (see Fig.2) is capable of increasing appreciably the tendency of steel to brittle fracture.

SOV/129-58-9-13/16

Investigation of the Low Temperature Stability of the Steel SKhL-4 After Various Types of Heat Treatment

There are 2 figures and 1 table.

(Note: This is a complete translation except for the figure captions and table)

ASSOCIATION: Vostochno-Sibirskiy filial AN SSSR
(East Siberian Branch of the Ac.Sc., USSR)

1. Steel--Mechanical properties 2. Steel--Heat treatment
3. Steel--Test methods

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POPOV, K.V.

PHASE I BOOK EXPLOITATION SOV/3559

Akademiya nauk SSSR. Institut metallurgii. Nauchnyy sovet po probleme zharoprochnykh splavov

Issledovaniya po zharoprochnym splavam, t. 5 (Investigations of Heat-Resistant Alloys, Vol 5) Moscow, Izd-vo AN SSSR, 1959. 425 p. Errata slip inserted. 2,000 copies printed.

Ed. of Publishing House: V.A. Klimov; Tech. Ed.: I.F. Kuz'min; Editorial Board: I.P. Bardin, Academician, G.V. Kurdyumov, Academician, N.V. Ageyev, Corresponding Member, USSR Academy of Sciences (Resp. Ed.), I.A. Oding, I.M. Pavlov, and I.F. Zudin, Candidate of Technical Sciences.

PURPOSE: This book is intended for metallurgical engineers, research workers in metallurgy, and may also be of interest to students of advanced courses in metallurgy.

COVERAGE: This book, consisting of a number of papers, deals with the properties of heat-resisting metals and alloys. Each of the papers is devoted to the study of the factors which affect the properties and behavior of metals. The effects of various elements such as Cr, Mo, and W on the heat-resisting properties of various alloys are studied. Deformability and workability of certain metals as related to the thermal conditions are the object of another study described. The problems of hydrogen embrittlement, diffusion and the deposition of ceramic coatings on metal surfaces by means of electrophoresis are examined. One paper describes the apparatus and methods used for growing monocrystals of metals. Boron-base metals are critically examined and evaluated. Results are given of studies of interatomic bonds and the behavior of atoms in metal. Tests of turbine and compressor blades are described. No personalities are mentioned. References accompany most of the articles.

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PHASE I BOOK EXPLOITATION SOV/3559

Akademiya nauk SSSR. Institut metallurgii. Nauchnyy sovet po probleme zharoprochnykh splavov

Issledovaniya po zharoprochnym splavam, t. 5 (Investigations of Heat-Resistant Alloys, Vol 5) Moscow, Izd-vo AN SSSR, 1959. 425 p. Errata slip inserted. 2,000 copies printed.

Ed. of Publishing House: V.A. Klimov; Tech. Ed.: I.F. Kuz'min; Editorial Board: I.P. Bardin, Academician, G.V. Kurdyumov, Academician, N.V. Ageyev, Corresponding Member, USSR Academy of Sciences (Resp. Ed.), I.A. Oding, I.M. Pavlov, and I.F. Zudin, Candidate of Technical Sciences.

PURPOSE: This book is intended for metallurgical engineers, research workers in metallurgy, and may also be of interest to students of advanced courses in metallurgy.

COVERAGE: This book, consisting of a number of papers, deals with the properties of heat-resisting metals and alloys. Each of the papers is devoted to the study of the factors which affect the properties and behavior of metals. The effects of various elements such as Cr, Mo, and W on the heat-resisting properties of various alloys are studied. Deformability and workability of certain metals as related to the thermal conditions are the object of another study described. The problems of hydrogen embrittlement, diffusion and the deposition of ceramic coatings on metal surfaces by means of electrophoresis are examined. One paper describes the apparatus and methods used for growing monocrystals of metals. Boron-base metals are critically examined and evaluated. Results are given of studies of interatomic bonds and the behavior of atoms in metal. Tests of turbine and compressor blades are described. No personalities are mentioned. References accompany most of the articles.

SOV/126-7-1-19/28

AUTHORS: Savitskiy, V.G., Popov, K.V. and Gayvoronskiy, L.A.

TITLE: Investigation of Dynamic Bending of Steels by Deformation Diagrams (Issledovaniye dinamicheskogo izgiba staley po diagrammam deformatsii)

PERIODICAL: Fizika Metallov i Metallovedeniye, 1959, Vol 7, Nr 1, pp 133-136 (USSR)

ABSTRACT: A comparative study of static and dynamic bending of a number of steels has been carried out and full deformation diagrams have been constructed. A pendulum impact testing machine of the type PSVO-1000, provided with an oscillographic instrument, was used for the recording of deformation during impact testing. This impact testing machine has a maximum energy of 10 kg-m. The oscillograph has a double-beam cathode tube permitting accurate recording of the deformation process during impact bend testing or during extension, within the co-ordinates force - path (deformation) and force - time. In Fig. 1 a typical full oscillogram for an impact bend obtained for the steel St.3 is shown. The deformation diagram abde occupies the middle portion of the oscillogram. Below it there is a vertical line P, representing the

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force scale. The length of this line is proportional to a force of 500 kg acting on the pendulum knife. Above is situated a sine-like curve of the time scale with a period of 10^{-3} sec. The deformation curve scale can be seen in the lower portion of the oscillogram. Its period corresponds to a shift of the pendulum knife by 2 mm. A straight line, representing the traces of the ray on its return to the initial position, is superimposed on this curve after applying the deformation scale. The essential results of tests with specimens of steel 30KhMA in various conditions, obtained by heat treatment and contact butt welding, are shown in Table 1. In Table 2 a comparison of the mechanical characteristics of a few steels, found from deformation diagrams for static and dynamic bending, is given. In Figs. 2-4 diagrams for static and dynamic bending for three types of steel, for which three characteristic different shapes of static and impact deformation curves are observed, are represented on the same scale. The authors conclude that the work of fracture during dynamic bending may be either greater or less than the work of fracture during static bending. The maximum stress

Investigation of Dynamic Bending of Steels by Deformation Diagrams

withstood by the specimen in testing is always greater during impact application of the load than during its static application. The onset of yield is particularly sensitive to increase in deformation rate. No definite connection between the plasticity of the steel and the nature of the relationship between the mechanical properties during static and dynamic bending of notched specimens was observed. There are 4 figures, 2 tables and 1 Soviet reference.

ASSOCIATION: Irkutskiy filial giproneftemasha, Vostochno-Sibirskiy filial AN SSSR (Irkutsk Branch of the Giproneftemash, East Siberian Branch of the Ac. Sc. USSR)

SUBMITTED: March 5, 1957

SOV/126-8-2-6/26

AUTHORS: Popov, K.V. and Yagunova, V.A.

TITLE: Directed Diffusion of Hydrogen in Solid Solution Produced by Deformation, and the Strength of the Metal

PERIODICAL: Fizika metallov i metallovedaniye, 1959, Vol 8, Nr 2, pp 187 - 192 (USSR)

ABSTRACT: Among hypotheses of hydrogen embrittlement of steel is that this is due to internal pressure produced in micro-voids as a result of directed diffusion of hydrogen during plastic deformation (Ref 1). The authors describe their work aimed at testing this hypothesis. Test pieces 8 mm in diameter of Type 20 steel were subjected to saturation in a normal aqueous solution of sulphuric acid with added arsenic. During saturation, blisters appeared on the surface, cracks being found underneath them (showing the incorrectness of the view (V.F. Loshkarev - Ref 6) that hydrogen could never produce enough pressure to disrupt the metal). Treating the blisters (Figure 1)

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Directed Diffusion of Hydrogen in Solid Solution Produced by Deformation, and the Strength of the Metal

as the walls of a thick-walled hemispherical vessel (Figure 2), the authors estimate the minimum pressure for the blister to rise to be about 2 500 atm. The coefficient of diffusion of hydrogen in the steel at room temperature was found, using two series of test pieces, the first being subjected to cathodic polarization for one and the second for two hours. The hydrogenated test pieces were turned to diameters of 6, 4 and 2.5 mm, while two were left intact. In the cylinders thus obtained, hydrogen was determined by hot-vacuum extraction. The results represented the distribution of hydrogen across the cross-section of the test pieces (Table 3), the value of the coefficient being 2.3×10^{-6} cm^2/sec. The authors also calculate the least width of a crack which can, in a deformation

Directed Diffusion of Hydrogen in Solid Solution Produced by Deformation, and the Strength of the Metal

time of 60 seconds, become filled with hydrogen to a pressure of 2 500 atm. by diffusion from solid-solution grains bounding the crack. They assumed the width to be considerably less than the other dimensions and that its walls are parallel (Figure 4). They deduce equations which, together with empirical values for the diffusion coefficient, the hydrogen concentration and the pressure produced by diffusion, give a crack width of 0.6×10^{-5} cm. The authors consider, on the basis of the observed (H. Schumann - Ref 10) higher rate of diffusion in deformed metals and of the fact that deformation-time frequently exceeds their assumed 60-second value, that their estimates of pressure are probably low. They conclude that directed diffusion into structural defects during plastic deformation may be one cause of hydrogen brittleness of steel.

Directed Diffusion of Hydrogen in Solid Solution Produced by Deformation, and the Strength of the Metal

There are 4 figures, 1 table and 10 references, 6 of which are Soviet, 1 English, 2 French and 1 German.

ASSOCIATION: Vostochno-sibirskiy filial Sibirskogo otdeleniya AN SSSR (East Siberian Branch of the Siberian Department of the Ac.Sc.USSR)

SUBMITTED: July 7, 1958

MOROZ, V.G.; STARTSEVA, I.Ye.; POPOV, K.V.

Cast steels for operation at low temperatures. Metalloved. i term. obr. met. no.7:31-35 Jl '64. (MIRA 17:11)

POPOV, K.V.; SOLUYANOV, V.M.

Dependence of the cold brittleness of cast steel on the ratio between the manganese content and that of carbon. Metalloved. i term. obr. met. no.7:35-37 Jl '64. (MIRA 17:11)

L 01115-66 EWT(m)/EWP(w)/EPF(c)/EWA(d)/T/EWP(t)/EWP(z)/EWP(b)/EWA(c) IJP(c) JD

ACCESSION NR: AP5019652 UR/0369/65/001/003/0289/0292

AUTHOR: Grigor'yeva, G. M.; Mamneva, O. G.; Nechay, Ye. P.; Popov, K. V.; Chipcheyeva, E. A.

TITLE: Effect of temperature and straining speed on the mechanical properties of iron that has absorbed hydrogen from air atmosphere

SOURCE: Fiziko-khimicheskaya mekhanika materialov, v. 1, no. 3, 1965, 289-292

TOPIC TAGS: hydrogen absorption, armco iron, hydrogen absorbing metal, mechanical strength tensile test, straining speed, yield point

ABSTRACT: Corrosionless penetration of hydrogen into steel has been observed in steel equipment in contact with petroleum during drilling as well as in the equipment in contact with air during grinding. The source of hydrogen in such cases is presumably water vapors. In this connection, the authors observed a change in the hydrogen content of iron during its exposure to air following vacuum annealing. A thorough investigation of this effect was carried out. The material investigated was armco iron in the form of flat specimens 50 mm long, 5 mm wide, die-stamped from a 1 mm thick sheet and vacuum-annealed at 930°C and cooled in a vacuum to room temperatures. The hydrogen content of the specimens was determined immediately after their removal from the vacuum furnace and at specific intervals of time following exposure to air. The findings (Fig. 1) show that in time the hydrogen content

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of the metal increases. The effect of the hydrogen absorbed from air on the mechanical properties of metal was investigated. To this end, tensile tests at strain rates of 60, 20, and 0.22 mm/min were performed in the temperature range of from +20 to -196°C. The hydrogen content of the tested specimens was approximately 3 ml/100 g. It was found that the position of the maximum yield point (i.e. the yield point higher than predicted by theory) depends on the rate of straining in the tensile tests: at rates of 20 and 60 mm/min it occurs at a temperature of about -120°C; as the speed decreases by two orders (0.22 mm/min) the maximum is displaced 20°C in the direction of low temperatures. The plasticity minimum shifts in the direction of low temperatures when the speeds of straining decrease, and thus it also changes nonmonotonically. In general, the mechanical properties of the metal that has absorbed hydrogen from the air atmosphere change in the same way as those of the metal that has absorbed hydrogen electrolytically, chemically, or through exposure in a hydrogen medium at high temperatures and pressures. However, in this case the stress-strain diagram has a certain distinguishing and previously not observed feature: double yield points, present for every investigated rate of straining, and attributable to the presence of hydrogen in the metal, which changes the normal course of dislocations. Orig. art. has: 4 figures, 1 table.

L 01115-66
ACCESSION NR: AP5019652

2

ASSOCIATION: Institut nefte- i uglekhimicheskogo sinteza, Angarsk (Institute of Petro- and Coal-Chemical Synthesis)

55

SUBMITTED: 17Feb65 ENCL: 01 SUB CODE: MM

NR REF SOV: 006 OTHER: 007

Card 3/4

L 01115-66

ACCESSION NR: AP5019652

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ENCLOSURE: 01

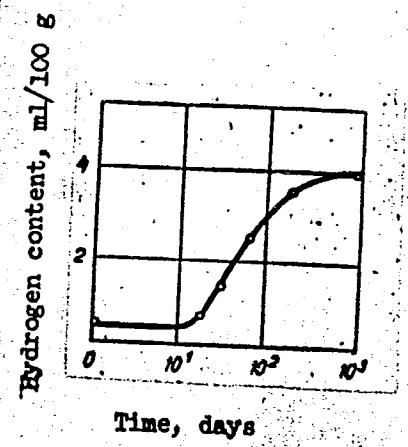

Fig. 1. Hydrogen content of iron as a function of the time of exposure to air atmosphere (circles on curve correspond to the arithmetic mean of 2-3 measurements).

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L 6127-65 EWT(d)/EWT(m)/EWP(b)/T/EWA(d)/EWP(w)/EWP(t) EM/JD
ACCESSION NR: AP5019429 UR/0020/65/163/003/0628/0630

AUTHOR: Popov, K. V.; Kiselev, Yu. V.

TITLE: Effect of cyclic loading on cold brittleness of technical iron

SOURCE: AN SSSR. Doklady, v. 163, no. 3, 1965, 628-630

TOPIC TAGS: iron, cold brittleness, cyclic loading

ABSTRACT: An attempt was made to determine empirically the correlation between the parameters of cyclic loading (repeated stretching and compression) and the transition temperature of technical iron into a brittle state. Cylindrical samples of technical iron (11 mm in diameter) were treated in vacuum for 1 hr at 950°C, cooled, and then subjected to cyclic loading at 20 kilocycles in an ultrasonic device. Cyclic loadings were conducted at the following tensions (σ): 18, 19.7 (fatigue limit), 22.5, 25, and 27.5 kg/mm^2. At 22.5, 25, and 27.5 kg/mm^2 the fatigue limits occured at frequencies $2.03 \cdot 10^6$, $8.48 \cdot 10^5$, and $2.18 \cdot 10^5$, respectively. The dependence of the critical temperature of brittleness of technical iron upon loading frequency (N) at several tensions (σ) is shown in the diagram in fig. 1 of the Enclosure. The empirical expression for critical temperature of brittleness of technical iron (T in °K) as a function of loading conditions is:

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L 64127-65

ACCESSION NR: AP5019429 3

$$\frac{1}{T}=\frac{1}{270}-\frac{2.2(\sigma-11.2)^{3.5}\ln(N/5\cdot10^4)}{10^8}$$

where: σ is actually applied tension in kg/mm^2, and N is frequency used for loading treatment in kilocycles. Orig. art. has: 1 table, 3 figures, 4 formulas.

ASSOCIATION: Institut nefti- i uglekhimicheskogo sinteza pri irkutskom gosudarstvennom univercitete im. A. A. Zhdanova (Institute of Synthesis of Petroleum and Carbon-Based Chemicals, Irkutsk State University)

44,55

SUBMITTED: 14Dec64 ENCL: 01 SUB CODE: MM

NO REF SOV: 006 OTHER: 002

Card 2/3

L 64127-65
ACCESSION NR: AP5019429

ENCLOSURE: 01

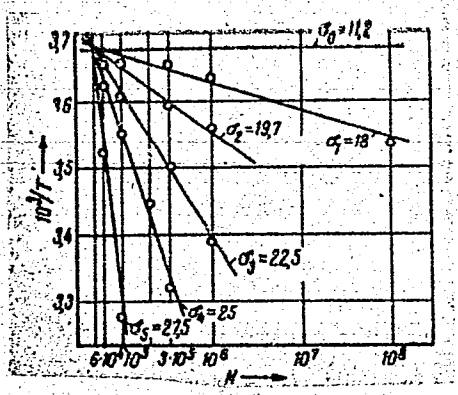

Fig. 1.

Card 3/3

POPOV, K.V.; GRIGOR'YEVA, G.M.

Distribution of deformations during tension in the yield area.
Fiz. met. i metalloved. 19 no.6:943 Je '65. (MIRA 18:7)

1. Institut nefte- i uglekhimicheskogo sinteza.

POPOV, K.V.; CHUKREYEV, V.K.

Evaluating the thermal conditions of the Siberian winter as related to the cold resistance of technical equipment. Dokl. Inst. geog. Sib. i Dal'. Vost. no.3:20-28 '63.
(MIRA 18:12)

L 10732-66 EWT(m)/EWP(w)/EWA(d)/T/EWP(t) IJP(c) JD/HW

ACC NR: AP6005143 (N) SOURCE CODE: UR/0126/66/021/001/0111/0115

AUTHOR: Nechay, Ye. P.; Popov, K. V.

ORG: Institute of Petro- and Coal-Chemical Synthesis under the Irkutsk State University im. A. A. Zhdanov, Angarsk (Institut nefte- i uglekhimicheskogo sinteza pri Irkutskom gosuniversitete)

TITLE: Effect of hydrogen on the temperature dependence of the yield point of nickel and stainless austenitic steel

SOURCE: Fizika metallov i metallovedeniye, v. 21, no. 1, 1966, 111-115

TOPIC TAGS: yield stress, nickel, stainless steel, hydrogen, crystal lattice dislocation / N-3 nickel, 1Kh18N9T austenitic stainless steel

ABSTRACT: The study of the temperature dependence of yield point in the hydrogen-metal system may contribute to the knowledge of the mechanism of the effect of impurity atoms on the process of slip in solid solutions. In this connection, the authors investigated specimens of two metals with face-centered lattice: Ni and stainless austenitic steel 1Kh18N9T saturated with hydrogen (to the extent of 0.005%) at high temperatures (400-500°C) and pressure of 600 atm. The specimens were stretched in a special machine at straining rates of $1.67 \cdot 10^{-4}$ sec^{-1} for Ni and $1.10 \cdot 10^{-4}$ sec^{-1} for stainless steel (i.e. deformations of 0.2 and 20% for both metals), with oscillo-

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UDC: 620.17

L 18732-66

ACC NR: AP6005143

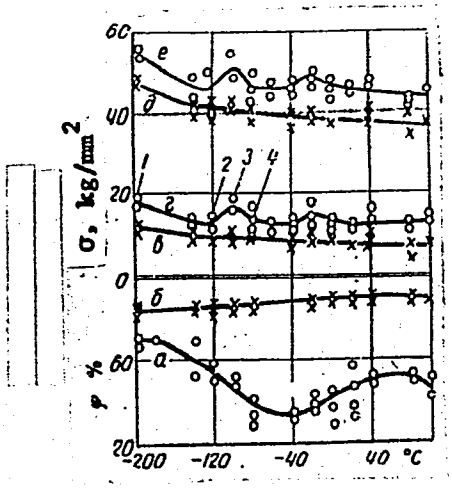

Fig. 1. Temperature dependence of yield point σ and reduction in area ψ of specimens of nickel with hydrogen (curves a, d, f) and without hydrogen (b, c, e). Curves c and d are plotted with respect to 0.2% deformation and e, f -- 20% deformation.

Card 2/4

L 18732-66
ACC NR: AP6005143

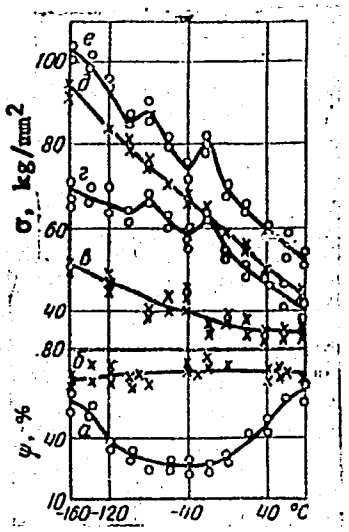

Fig. 2. Temperature dependence of yield point σ and reduction in area ψ of specimens of 1Kh18N9T steel with hydrogen (curves a, d, f) and without hydrogen (b, c, e). Curves c and d are plotted with respect to 0.2% deformation and e, f -- 20% deformation

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L 18732-66
ACC NR: AP6005143

2

graphic recording of the deformation curves. For comparison, hydrogen-free specimens were similarly tested. It is established that hydrogen enhances the straining stresses of these metals during every stage of deformation throughout the temperature range investigated (-200 to +90°C). In the presence of hydrogen the course of the curves of the temperature dependence of deforming stresses becomes greatly complicated. At certain temperatures the curves display anomalies -- maxima of yield points (-100 and -20°C for N-3 nickel i.e. in the temperature range where the embrittling effect of hydrogen is the greatest) (Fig. 1). These findings are explained from the standpoint of the dislocation theory of plastic deformation, i. e. attributed to the effect of the strong elastic interaction between the diffusing H atoms and the slipping dislocations newly generated in the process of the slow deformation of the metal: the introduction of hydrogen reduces the packing-defect energy of Ni, and hence increases the spacing between dislocations, thus complicating the slip of dislocations, because of the increase in the activation energy of the process. This is indicated by the increase in stress corresponding to the transition from elastic to plastic deformation. A similar pattern is observed for hydrogen-treated specimens of austenitic steel 1Kh18N9T. As in Ni, the anomaly effect in the steel becomes intensified with increasing degree of deformation -- the maxima of the curves are the more distinct the greater the deformation of the metal is. In fact, for steel this pattern is even more pronounced than for Ni; this is probably due to the special features of the crystal lattice structure of stainless steel, associated with the presence of atoms of alloy elements. Orig. art. has: 2 figures, 3 formulas.

SUB CODE: 11, 13, 20/ SUBM DATE: 17Feb65/ ORIG REF: 006/ OTH REF: 013

Card 4/4 SM

ACC NR: AP7004181 (A,N) SOURCE CODE: UR/0369/66/002/006/0635/0636

AUTHOR: Nosyreva, Ye. S.; Popov, K. V.; Chipcheyeva, E. A.

ORG: Institute of Petro- and Coal-Chemical Synthesis, Angarsk (Institut nefto- i uglekhimicheskogo sinteza)

TITLE: Effect of manganese on proneness to hydrogen brittleness in steel

SOURCE: Fiziko-khimicheskaya mekhanika materialov, v. 2, no. 6, 1966, 635-636

TOPIC TAGS: manganese, low carbon steel, hydrogen embrittlement, rupture strength

ABSTRACT: The absorption of atmospheric hydrogen by metal may in some cases involve anomalous changes in properties. This effect was investigated by means of tensile tests at from -100 to +20°C of notched specimens of two low-carbon steels, one containing 0.1% Mn and the other, 1.2% Mn, with hydrogen contents of 7 and 6 cc, respectively, per 100 g of metal. Findings: for the steel containing the minimal amount of manganese (0.1%) the variation in maximum breaking stress with temperature is anomalous: at from -80 to -60°C the maximum breaking stresses are lower than at the other temperatures. By contrast, the steel containing 1.2% Mn displays a monotonic increase in stresses with decrease in temperature. These findings indicate that the activity of hydrogen is in some manner suppressed by manganese. This phenomenon requires further investigation. Orig. art. has: 1 fig., 1 table.

SUB CODE: 13, 11/ SUBM DATE: 25Jan66/ ORIG REF: 004

Card 1/1

L 44306-66 EWT(m)/EWP(w)/T/EWP(t)/ETI IJP(c) JD/HW

ACC NR: AP6019840 SOURCE CODE: UR/0370/66/000/001/0172/0177

AUTHOR: Popov, K. V. (Angarsk); Nechay, Ye. P. (Angarsk)

ORG: none

TITLE: Hydrogen brittleness of metals with face-centered cubic lattice

SOURCE: AN SSSR. Izvestiya. Metally, no. 1, 1966, 172-177

TOPIC TAGS: austenitic steel, loop oscillograph, hydrogen, brittleness, crystal theory, crystal lattice vacancy / 1Kh18N9T austenitic steel, N700 loop oscillograph

ABSTRACT: The effect of hydrogen on the properties of metals with fcc lattice has so far been relatively uninvestigated and so there is no common consensus in the literature on the effect of hydrogen on, e.g. the plasticity of austenitic steels, or on the question of whether these steels are subject to hydrogen embrittlement at all. To resolve this question, the authors investigated the effect of hydrogen on the plasticity and strength of metals with fcc cubic lattice (such as 1Kh18N9T austenitic steel and technical nickel). To this end, specimens of the metals were exposed to H_2 at 400-500°C and 600 atm so that the H_2 concentration of the steel specimens reached 0.001-0.009% and that of Ni specimens, 0.003-0.01%. After this, the specimens were subjected to tensile tests in the temperature range of from -196 to +80°C at straining rates of $1.67 \cdot 10^{-4}$ sec^{-1} for Ni and $1.33 \cdot 10^{-4}$ and $4.1 \cdot 10^{-4}$ sec^{-1} for 1Kh18N9T steel. The de-

UDC: 669.018:620.198

Card 1/3

formation diagram was recorded with the aid of an N700 loop oscillograph connected to the circuit of a tensometric DC bridge. Findings: For Ni with H_2 concentrations of 0.003-0.005% and austenitic steel with H_2 concentration of 0.001-0.009% the temperature dependence of the plasticity of these metals displays an anomalous behavior within a specific temperature range (-160 to +40°C); this anomaly is similar to that observed for metals with bcc lattice. The specimens of both austenitic steel and Ni display considerable proneness to hydrogen brittleness, which is the more pronounced the higher the H_2 content of the metal (Fig. 1).

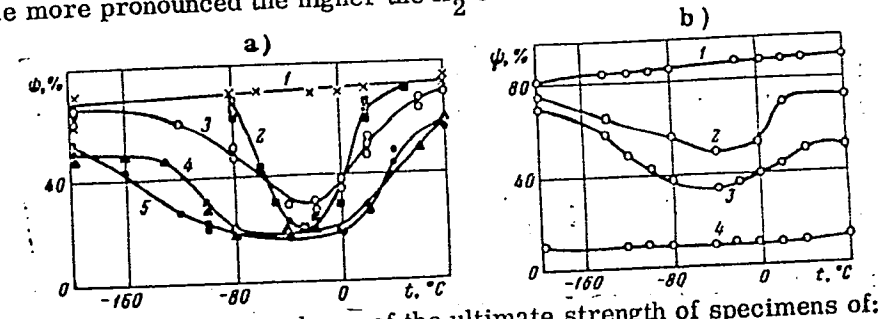

Fig. 1. Temperature dependence of the ultimate strength of specimens of: a - Ni without H_2 (1) and Ni with various concentrations of H_2: 2 - 0.003%, 3 - 0.005% and 4 - 0.01%; b - 1Kh18N9T austenitic steel without H_2 (1) and with 0.005% H_2 (curve 2).

L 44306-66

ACC NR: AP6019840

prove that the hydrogen brittleness of metals with fcc lattice is indeed an universal phenomenon
Orig. art. has: 5 figures.

SUB CODE: 11,13/ SUBM DATE: 29Jun65/ ORIG REF: 009/ OTH REF: 007/

Card 3/3 UCA

L 34357-66 EWT(d)/EWT(m)/EWP(w)/EWP(c)/EWP(v)/T/EWP(t)/ETI/EWP(k)/EWP(z)/EWP(b)

ACC NR: AT6009031 (A) SOURCE CODE: UR/2925/65/000/009/0121/0129

AUTHOR: Popov, K. V.

ORG: Institute for the Synthesis of Petrolium and Coal, Angarsk (Institut nefte- i uglekhimicheskogo sinteza)

TITLE: Problems of cold-resistant technical facilities in Siberia and the extreme north

SOURCE: AN SSSR. Komissiya po problemam Severa. Problemy Severa, no. 9, 1965. Ekonomika (Economics), 121-129

TOPIC TAGS: low temperature research, industrial development, economic development

ABSTRACT: The author discusses certain problems encountered in the operation and maintenance of mining, construction, and transport facilities, as well as the general area of building technology, under the geographical and climatic conditions prevalent in the northernmost regions of the Soviet Union. The effect of extremely low temperatures (from -40° to -60°, for example, in Yakutiya) on mechanical devices and components, labor productivity, and overall economic efficiency is analyzed in some detail. The problem of cold-induced brittleness and premature breakdown of various materials and equipment

Card 1/2

L 34357-66
ACC NR: AT6009031

categories is discussed on the basis of real data, obtained both by the author and from other published sources. Certain broad causal classes are distinguished, which account for the majority of material and equipment failures in the extreme northern environment. So-called "operational oversights" are primarily responsible for most of the problems encountered. Particular attention is directed at the area of machine-building and at the economic considerations involved in the development of northern versions for the most commonly employed types of equipment. Rational step-by-step procedures for the working up of adequate technical specifications for new equipment intended for use in northern areas are proposed. The general problem area of far-north technical operations is so vast, and the need for different and detailed studies so great, that far more efficient organizational planning for the systematic investigation of this area is essential. In this connection it is necessary to establish a scientific-research institute for the study of technical problems of the north. Certain other aspects of this problem are discussed and a number of recommendations are advanced for both technical and economic planning.

SUB CODE: 05 / SUBM DATE: none / ORIG REF: 014

Card 2/2

KACHMAR, M.G., inzh.; POPOV, K.V., kand. tekhn. nauk

Increasing the resistance of welded dredge poles to brittle fracture at low temperatures. Svar. proiz. no.3:32-33 Mr '64. (MIRA 18:9)

1. TSentral'nyye remontnyye masterskiye tresta "Lenzoloto" (for Kachmar). 2. Institut nefte- i uglekhimicheskogo sinteza Sibirskogo otdeleniya AN SSSR (for Popov).

ZAKHAROV, V.F.; POPOV, K.V.; SAVITSKIY, V.G.

Effect of certain climatic features of Siberia on the operating efficiency of machinery. Dokl. Inst. geog. Sib. i Dal'. Vost. no.7:37-41 '64. (MIRA 18:10)

POPOV, K.V., kand. tekhn. nauk; SAVITSKIY, V.G., inzh.

Studying the resistance to cold shortness of excavator parts operating under severe climatic conditions. Stroi. i dor. mash. 8 no.3:31-33 Mr '63. (MIRA 18:5)

NOSYREVA, Ye.S.; POPOV, K.V.

Effect of the manganese-carbon ratio on the cold brittleness of steel. Izv. vys. ucheb. zav.; chern. met. 8 no.2:131 '65.
(MIRA 18:2)

1. Institut nefte- i uglekhimicheskogo sinteza pri Irkutskom gosudarstvennom universitete.

NECHAY, Ye.P.; POPOV, K.V.

Jumplike deformation of nickel with a high hydrogen content. Fiz. met. i metalloved. 19 no.4:612-618 Ap '65.

(MIRA 18:5)

1. Institut nefte- i uglekhimicheskogo sinteza pri Irkutskom gosudarstvennom universitete imeni Zhdanova.

AZIZOV, I.A.; MOSYREVA, Ye.S.; POPOV, A.V.

Characteristics of the low-temperature peak of internal friction in steel in the presence of manganese. Fiz. met. i metalloved. 19 no.4:629-631 Ap '65. (MIRA 18:5)

1. Institut nefte- i uglekhimicheskogo sinteza pri Irkutskom gosudarstvennom universitete imeni Zhdanova.

L 56999-65 EWT(m)/EWP(w)/EWA(d)/T/EWP(t)/EWP(b)/EWA(c) JD

ACCESSION NR: AP5012499 UR/0032/65/031/005/0598/0602

620.178.2

AUTHORS: Nosyreva, Ye. S.; Popov, K. V.

TITLE: On the criteria of steel cold shortness in ductility testing

SOURCE: Zavodskaya laboratoriya, v. 31, no. 5, 1965, 598-602

TOPIC TAGS: ductile material, steel, cold deformation, brittle state, temperature, structure analysis

ABSTRACT: The relation of fracture type to impact strength was studied in 24 specimens of annealed and hardened steel. Some of the specimens had constant carbon and variable Mn content, the others—constant Mn and variable C contents. The experiments were performed at temperature intervals from -100 to +100C for steel, and up to +140C for some alloys. The results were plotted showing the relation of impact strength to temperature for steels with different composition and physical states. Fractures were studied under the microscope, their areas of the brittle component were measured, and the curves showing the relation of the fracture type to temperature were plotted. Temperature relations of the ductility component in fractures and impact strength did not coincide in all cases.

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L 56999-65

ACCESSION NR: AP5012499

It was noted by evaluating cold-brittleness according to the appearance of the brittle component in steels with variable carbon content that 1.2% of Mn improved steel ductility, but 2.3% had a sudden negative effect. A different relation was observed with the evaluation according to the temperature at which the brittle component in the fracture amounted to 50%: at 0.13% of carbon 1.2% of Mn raised the critical temperature. Another evaluation--according to the temperature of steel transition into a brittle state at 100% brittle component in the fracture--showed no definite regularities with the variation of C and Mn content. Cold shortness evaluated according to different criteria varied unevenly with respect to the chemical composition. According to the simultaneous analysis of ductility curves and the fracture types, all the specimens were separated into two groups: 1) those with curves with identical alignment, and 2) the ones with curves of different shapes--characteristic of 2.25-2.4% Mn in steel. Orig. art. has: 1 table and 4 figures.

ASSOCIATION: Institut nefte- i uglekhimicheskogo sinteza pri Irkutskom gosudarstvennom (Institute of Oil and Coal Chemical Synthesis, Irkutsk State University)

SUBMITTED: 00 ENCL: 00 SUB CODE: MM

NO REF SOV: 003 OTHER: 001

Card 2/2

GRIGOR'YEVA, G.M.; POPOV, K.V.

Observing traces of prismatic dislocations in iron. Fiz. met. i metalloved. 19 no.1:144-145 Ja '65. (MIRA 18:4)

1. Institut nefte- i uglekhimicheskogo sinteza pri Irkutskom gosudarstvennom universitete.

L 63733-65 EWT(m)/EWP(w)/EWA(d)/T/EWP(t)/EWP(z)/EWP(b)/EWA(c) IJP(c) JD/JH
ACCESSION NR: AP5011756 UR/0126/65/019/004/0629/0631

AUTHOR: Azizov, I. A.; Nosyreva, Ye. S.; Popov, K. V.

TITLE: Properties of the low temperature internal friction peak in steels containing Mn

SOURCE: Fizika metallov i metallovedeniye, v. 19, no. 4, 1965, 629-631

TOPIC TAGS: manganese steel, internal friction, metallography, carbon steel, normalization

ABSTRACT: In studies of carbon steels with Mn additions, a single internal friction peak is generally observed in the region of 40°C and at a frequency of about 1 cycle/sec. In the present article this peak is studied in Fe-C-Mn alloys containing 0.05-0.26% C and 0.1-2.4% Mn. It was found that the normal carbon peak was split into two peaks in alloys with 1.2% Mn. The alloys were prepared in an induction furnace and poured into ingots weighing 20 kg. These were worked into rods of 14 × 14 mm cross section. The samples were then annealed at temperatures 50°C above the upper transformation temperature and furnace cooled at 100°C/hr. Internal friction was measured by the free torsional vibration method at frequencies of 3.13

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L 53733-65
ACCESSION NR: AP5011756

2

and 1.355 cycles/sec on 5 mm samples in the -196-450°C temperature range. The curves (see fig. 1 of the Enclosure) show an assymetric peak which can be resolved into two symmetric peaks *A* and *B*, corresponding to simple relaxation processes. By changing the frequency, shifts in peaks *A* and *B* could be related to activation energies (17.1 kcal/mol for peak *A*, and 17.7 kcal/mol for peak *B*). Besides these two peaks, a third peak (*C*) was found. The calculated activation energy was 2.0 kcal/mol. Special experiments showed that the rate of cooling from the annealing temperature influenced only the height of peak *B*. It was found that peak *B* is also affected by the normalizing temperature. Its height for samples normalized at about 50°C above the upper transformation temperature was higher than for normalization below Ac_3. The size of the peaks was not changed by natural aging of the annealed samples for 10,000 hrs. Peak *C* is apparently unaffected by the presence of Mn. This peak may be connected with the presence of oxygen (which cannot be determined by chemical analysis in the given alloys). Metallographic analysis shows an increased amount of oxide. The splitting of peaks *A* and *B* is explained by new atomic positions in the lattice resulting from addition of the alloying element. Orig. art. has: 1 figure, 1 table.

ASSOCIATION: Institut nefte- i uglekhimicheskogo sinteza pri Irkutskom

Card 2/4

L 53732-65

ACCESSION NR: AP5011756

gosuniversitete im, A. A. Zhdanova (Institute of Coal Chemistry and Petrochemical Synthesis at the Irkutsk State University)

SUBMITTED: 09Jun64 ENCL: 01 SUB CODE: MM

NO REF SOV: 005 OTHER: 001

Card 3/4

NOSYREVA, Ye.S.; CKHAPKINA, L.L. ; POPOV, K.V.; SUVOROVA, A.G.

Phase composition of iron alloys with carbon and manganese.
Zhur. neorg. khim. 9 no.6:1393-1396 Je '63 (MIRA 17:8)

L 13050-65 EWT(m)/EWP(w)/EWA(d)/EWP(t)/EWP(k)/EWP(b) Pf-4/Pad JD/HW/
MLK
ACCESSION NR: AT4046846 S/0000/64/000/000/0227/0229

B

AUTHOR: Nechay, Ye. P., Popov, K. V.

TITLE: Effect of hydrogen on the plasticity and strength of nickel during stretching

SOURCE: AN SSSR. Nauchny*y sovet po probleme zharoprochny*kh splavov. Issledovaniya staley i splavov (Studies on steels and alloys). Moscow, Izd-vo Nauka, 1964, 227-229

TOPIC TAGS: nickel plasticity, nickel strength, hydrogen inclusion

ABSTRACT: Cylindrical (4 x 40 mm) nickel samples annealed at 760 C, were saturated with hydrogen at 400C and a pressure of 600 atm to a concentration of occluded hydrogen of 35 to 125 ml/g and stretched at a rate of 0.4 mm/sec. at temperatures from - 196 to 95C. As can be seen from Figs. 1 and 2 of the Enclosure, the plasticity of hydrogenized samples, in contrast to that of control samples, is a nonmonotonic function of temperature, is lower at all temperatures than the plasticity of the control samples, and has a minimum between 0 and -40C. The brittle strength of samples with 125 ml/g H_2 remains essentially unchanged at all temperatures while the plasticity drops by about 80%. The strength of samples with a lower hydrogen content is 15% higher on the average throughout the

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L 13050-65
ACCESSION NR: AT4046846

temperature range than that of the control samples, but drops to about 40% of the control sample strength for samples with 125 ml/g H_2. The theories suggested to explain this phenomenon hold greater amounts of the pore and microcavity-segregated hydrogen responsible for the irreversible brittleness occurring in the latter case. Orig. art. has: 3 figures and 1 table.

ASSOCIATION: None

SUBMITTED: 16Jun64 ENCL: 01 SUB CODE: MM

NO REF SOV: 003 OTHER: 001

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L 13050-65

ACCESSION NR: AT4046846

ENCL: 01

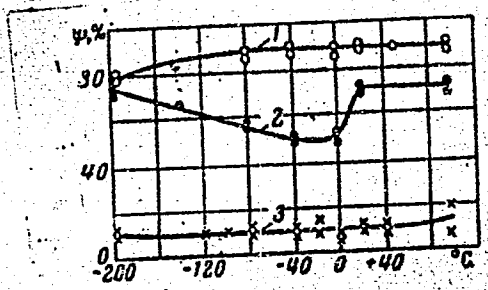

Fig. 1 - Temperature dependence of plasticity for nickel.
1. without hydrogen
2. 0.003% hydrogen
3. 0.01% hydrogen

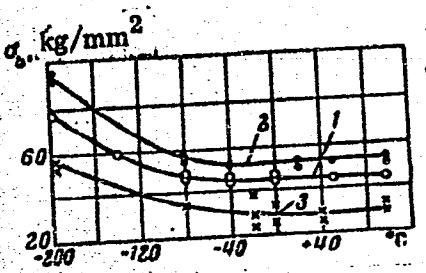

Fig. 2 - Temperature dependence of ultimate strength for nickel.
1. without hydrogen
2. 0.003% hydrogen
3. 0.01% hydrogen

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ACCESSION NR: AP4039263 S/0078/64/009/006/1393/1396

AUTHOR: Nosy*reva, Ye. S.; Okhapkina, L. L.; Popov, K. V.; Suvorova, A. G.

TITLE: Study of the phase composition of iron alloys with carbon and manganese.

SOURCE: Zhurnal neorganicheskoy khimii, v. 9, no. 6, 1964, 1393-1396

TOPIC TAGS: steel, manganese steel, carbon steel, phase equilibria, phase composition, iron alloy

ABSTRACT: In connection with the study of the nature of the effect of different elements on the brittleness of steel at low temperatures, the authors investigated the phase composition of 15 alloys of the iron-carbon-manganese system. These alloys were produced in an induction furnace. The critical points of the alloys were determined dilatometrically, while the determination of phase composition was done by carbide analysis. The specimens from each batch were dissolved anodically at a current density of 0.02 - 0.03 a/cm^2 in a period of 4 - 6 hours. The carbide deposit produced was subjected to analysis for iron and manganese. Iron was determined with trilon and manganese by persulfate-silver method. The specimens were weighed before and after electrolysis and the elements determined in

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carbide were reported with respect to the weight of the dissolved specimen. The content of carbon was determined by the difference. The results of the analysis indicated that under given cooling conditions of alloys the amount of carbide phase, its composition, and the composition of ferrite depend on the content of carbon and manganese. Orig. art. has: 1 table and 4 figures.

ASSOCIATION: None

SUBMITTED: 03Jul63 ENCL: 00

SUB CODE: MM NO REF SOV: 007 OTHER: 001

Card 2/2

ACCESSION NR: AP4042347 S/0129/64/000/007/0031/0035

AUTHOR: Mosoz, V. G., Startseva, I. Ye., Popov, K. V.

TITLE: Cast steels for low temperature operations

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 7, 1964, 31-35, and insert facing p. 25

TOPIC TAGS: cast steel, steel alloy, cold resistant steel, steel 12N9L, steel 20KhN3ML, steel 12N5L, steel 15N3ML, steel 15N3FL, steel 12KhN2ML, steel 20N3L, steel 20G2N2ML, steel 20Kh2D3L, steel 15DKhGSL, steel 10KhS2N2DML, impact toughness, heat treatment, structural uniformity, fine-grained structure, transition point determination

ABSTRACT: Experimental castings form 11 steel alloys (compositions given) were tested for resistance to low temperatures in a cast or variously heat treated state to formulate recommendations on the use of pearlite and ferrite steels for castings operating at temperatures as low as - 100C. The temperature corresponding to an impact toughness of 2.0 kg/cm^2 was accepted as the transition point. Heat treatment involved normalizing (900 or 1050C) and tempering (650, 660 or 720C). Transition points for the optimal heat

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ACCESSION NR: AR4041613 S/0137/64/000/005/1053/1054

SOURCE: Ref. zh. Metallurgiya, Abs. 51314

AUTHOR: Savitskiy, V. G.; Popov, K. V.

TITLE: Role of relaxation phenomena in mechanism of deformation of metals at low temperatures

CITED SOURCE: Sb. Relaksats, yavleniya v met. i splavakh. M., Metallurgizdat, 1963, 300-302

TOPIC TAGS: metal, deformation, metal deformation, deformation mechanism, relaxation phenomenon

TRANSLATION: Interaction between process of external load and internal relaxation processes caused by it is analyzed. For metals inclined to cold brittleness, lowering of test temperature hampers course of plastic flow. Stress necessary for work of Frank-Read sources is increased due to decrease of role of thermal fluctuations.

Card 1/2

ACCESSION NR: AR4036265 S/0137/64/000/003/I090/I090

SOURCE: Referativnyy zhurnal. Metallurgiya, Abs. 3I546

AUTHOR: Azizov, I. A.; Popov, K. V.

TITLE: Some aspects of the technique of determining the durability of pearlitic steels

CITED SOURCE: Sb. Polzuchest' i dlitel'n. prochnost'. Novosibirsk, Sib. otd. AN SSSR, 1963, 152-154

TOPIC TAGS: Pearlitic steel durability, steel durability determination

TRANSLATION: Results are given of tests of EI579 steel at 510°, carried out on three different melts in the usual manner with IP-4 machines (maximum duration of tests, 5000 hr), and curves of the durability at 580° of 12KhMF steel used in boiler construction are presented (the metals were from the same melt, but had different hardnesses). It is concluded that the durability of pearlitic steel may be related to the hardness of the metal, so that it is necessary to test metals with

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ACCESSION NR: AR4036265

three different hardnesses: minimum, moderate, and maximum hardness according to the Technical Specifications; the maximum allowed hardness limit must be clearly defined because of the danger of embrittlement and of the high instability of the structure of a very hard metal. V. Ferenets.

DATE ACQ: 17Apr64 SUB CODE: ML ENCL: 00

2/2
Card

YAGUNOVA, V.A.; POPOV, K.V.

Certain diffuculties connected with the theory of the hydrogen brittleness of steel. Issl.po zharopr.splav. 8:199-204 '62. (MIRA 16:6)

(Steel—Brittleness)

POPOV, K.V., inzh.

Rail welding on the track. Put' i put. khoz. 8 no.1:28-30 '64. (MIRA 17:2)

KHAGANOV, Ye.I., otv. red.; FISHER, L.B., red.; POPOV, K.V., red.; STENNIKOV, M.G., tekhn. red.

[Materials for the conference of young scientists; on the tenth anniversary of the East-Siberian Branch of the Academy of Sciences of the U.S.S.R.] Materialy k konferentsii molodykh nauchnykh sotrudnikov; k 10-letiiu Vostochno-Sibirskogo filiala AN SSSR. Blagoveshchensk. No.3. [Chemistry and metallurgy] Khimiia i metallurgiia. 1960. 93 p. (MIRA 17:2)

1. Akademiya nauk SSSR. Vostochno-Sibirskiy filial, Irkutsk.

SAVITSKIY, V.G.; POPOV, K.V.

Analysis of certain characteristics of the plasticity of solid solutions. Issl. po zharopr. splav. 9:150-153 '62. (MIRA 16:6)
(Steel alloys—Testing) (Dislocations in metals)

POPOV, Khristo V., prof. inzh.

Stresses in the vertical sections of large chimneys and water towers, caused by wind, earthquake, uneven radial water pressure, and temperature. Stroitelstvo 10 no.1:12-21 Ja-F '63.

NECHAY, Ye.P.; POPOV, K.V.

Tendency of austenitic steel toward hydrogen embrittlement depending on hydrogen content, speed of deformation and temperature. Fiz. met. i metalloved. 14 no.2:271-274 Ag '62. (MIRA 15.12)

1. Institut nefte-i uglekhimicheskogo sinteza Sibirskogo otdeleniya AN SSSR.

(Steel--Hydrogen content)

40987

18.8200

S/659/62/009/000/021/030
I003/I203

AUTHORS: Savitskiy, V. G., and Popov, K. V.

TITLE: On the investigation of some peculiarities of the plasticity of solid solutions

SOURCE: Akademiya nauk SSSR. Institut metallurgii. Issledovaniya po zharoprochnym splavam. v. 9. 1962. Materialy Nauchnoy sessi po zharoprochnym splavam (1961 g.),150–153

TEXT: The nonlinear relationship between the yield point and the temperature for different rates of deformation cannot be fully explained by the dislocation theory of the flow of metals. This relationship was investigated for low-carbon steel for the temperature range from −196° to 600°C and for rates of deformation from 5.10^{-4} mm/sec to 5.10^{-3} mm/sec. The results show that the irregularities are due to small dislocation changes in the structure of the grains which take place during deformation and which the dislocation theory does not take into account. There are 2 tables.

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YAGUNOVA, V.A.; POPOV, K.V.

Hydrogen embrittlement of iron-chromium alloys depending on temperature and the speed of testing. Fiz. met. i metalloved. 12 no.2:176-182 Ag '61. (MIRA 14:9)

1. Vostochno-sibirskiy filial Sibirskogo otdeleniya AN SSSR.
(Iron-chromium alloys--Hydrogen content)
(Dislocations in metals)

NECHAY, Ye.P.; POPOV, K.V.

Hydrogen brittleness of austenitic steel. Fiz. met. i metalloved. 11 no. 2:224-228 F '61. (MIRA 14:5)

1. Vostochno-Sibirskiy filial Sibirskogo otdeleniya AN SSSR.
(Steel—Brittleness)

26552

188200 (1413, 1416, 2808)

S/126/61/012/002/001/019
E073/E335

AUTHORS: Yagunova, V.A. and Popov, K.V.

TITLE: Hydrogen Embrittlement of Alloys of Iron With Chromium as a Function of the Temperature and the Testing Speed

PERIODICAL: Fizika metallov i metallovedeniye, 1961, Vol. 12, No. 2, pp. 176 - 182

TEXT: The aim of the work was to elucidate the causes of the non-monotonous dependence of the plasticity of hydrogen-saturated metal on the test temperature. According to published views, the degree of hydrogen embrittlement depends to a considerable extent on the speed of hydrogen diffusion. Therefore, in addition to varying the temperature, the diffusion speed was influenced by using steels with differing chromium contents (0.5 and 5%). Chromium was chosen as an alloying addition in view of the fact that it reduces the diffusion speed of hydrogen in iron. Forged rods, 3 mm in diameter and 15 mm long were chosen for the mechanical tests. These were

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annealed under conditions ensuring approximately equal grain size in both alloys. The plasticity was estimated from the contraction in tensile tests at temperatures between +20 and -196 °C and deformation speeds between 20 and 0.045 mm/min. The specimens were saturated with hydrogen electrolytically in a molar solution of sulphuric acid, adding sodium arsenate (3 mg arsenic per litre of solution). The hydrogen content determined by heating in vacuum at 600 °C was about 2 ml./100 g. Down to -120 °C tests were carried out in propanol, cooled with solid carbon dioxide or liquid nitrogen. The tests were carried out in liquid nitrogen at -196 °C. A temperature minimum of the plasticity was detected which was most pronounced at low strain rates. The minimum is in the temperature range -60 to -100 °C and with decreasing rates of deformation it shifts towards the lower boundary of this temperature range. Cold brittleness was detected at -196 °C; the plasticity dropped sharply both for hydrogen-saturated

Hydrogen embrittlement ....

as well as hydrogen-free specimens. Alloys with 5% chromium showed a cold-brittleness threshold at a higher temperature than alloys with 0.5% Cr. The minimum plasticity shifts towards lower temperatures with decreasing speeds of deformation. Chromium had no influence on the hydrogen embrittlement at high rates of deformation; at low rates of deformation embrittlement was more pronounced in the alloy with 5% chromium than in the alloy containing 0.5% Cr. This difference was the more pronounced the lower the test speed. The presence of a minimum on the curves of contraction versus test temperature can be explained by the occurrence of additional barriers impeding movement of dislocations. These additional barriers are dislocations made immobile by clouds of hydrogen atoms. Disappearance of the barriers may be the consequence of displacement of dislocations that have been stopped earlier, together with hydrogen clouds surrounding them.
There are 5 figures, 1 table and 20 references: 9 Soviet and 11 non-Soviet. The four latest English-language references quoted are: Ref. 1 - J.T. Brown, W.M. Baldwin - J. Metals, 1954, Sec. 2, 6, No. 2, 298; Ref. 12 - N.J. Petch and

Hydrogen embrittlement ... 26552

S/126/61/012/002/001/019
E073/E335

P. Stables - Nature, 1952, 169, 842; Ref. 14 - F. Kazinczy - J. Iron and Steel Inst., 1954, 177, 85; Ref. 18 - F. Kazinczy - Engineers Digest, 1956, 17, No. 1, 11.

ASSOCIATION: Vostochno-sibirskiy filial SO AN SSSR
(East-Siberian Branch of SO AS USSR)

SUBMITTED: May 9, 1960 (initially)
April 18, 1961 (after revision)

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18.8200 1138, 1418, 4016

S/058/61/000/005/032/050
A001/A101

AUTHORS: Savitskiy, V.G., Popov, K.V.

TITLE: The determination of temperature at which the actual course of temperature dependence of the yield point deviates from the course predicted by the Cotrell (Kotrell) theory

PERIODICAL: Referativnyy zhurnal. Fizika, no 5, 1961, 277, abstract 5E311 ("Izv. Sibirsk. otd. AN SSSR", 1960, no 8, 138 - 142)

TEXT: The authors determine temperature T_1 above which changes of yield point with temperature can not be explained by the Cotrell theory. The observed deceleration in the rate of the lowering of the yield point is considered as a result of interaction of moving dislocations, causing deformations, with dislocations braked by the impurity atoms. T_1 depends on the time of formation of a cloud, diffusion coefficient of impurity in the main substance lattice, a number of constants which are estimated in this work, and also on the rate of stresses growth during deformation ($\dot{\sigma}$). The latter factor affects T_1 less essentially

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The determination of temperature ... S/058/61/000/005/032/050
A001/A101

than the other ones. Estimates show that in the case of steel (C-concentration in ferrite 0.003%) at $\dot{\sigma} = 10^{-2}$ kg/mm^{2}sec, $T_1 = 285^{\circ}$K, and at $\dot{\sigma} = 3.5$ kg/mm^{2}sec; $T_1 = 350^{\circ}$K. The T_1 values obtained agree well with experimentally established magnitudes.

V. R.

[Abstracter's note: Complete translation.]

Card 2/2

S/126/61/011/002/007/025
E111/E452

18.8260 1418

AUTHORS: Nechay, Ye.P. and Popov, K.V.

TITLE: Hydrogen Embrittlement of Austenitic Steel

PERIODICAL: Fizika metallov i metallovedeniye, 1961, Vol.11, No.2, pp.224-228

TEXT: Published opinions differ on whether austenitic steels are subject to hydrogen embrittlement (Ref.1,2). The present authors describe their experiments to find the influence of hydrogen on the mechanical properties of austenitic stainless steel type 1Kh18N9T (1Kh18N9T). Cylindrical (5 mm diameter) tensile test-pieces in the as-rolled state were used: after hydrogenation they were subjected to static extension at various deformation speeds (0.075 to 10.0 mm/minute) and the hydrogen content was determined by vacuum heating at 600°C. The brittleness was taken as the ratio of the difference between the reduction in cross sectional area of a test piece in the original and hydrogenated states to the original value. The following methods of hydrogenation were used: 1) for 40 hours in gas at 500°C and 300 atm pressure (brittleness 28 to 60%, 30.8 to 35 ml hydrogen/100 g); 2) for 14 hours (giving limiting hydrogen content)

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S/126/61/011/002/007/025
E111/E452

Hydrogen Embrittlement ...

electrolytically (brittleness 0 to 2%, 18.5 to 20 ml hydrogen/100 g); 3) for 14 hours electrolytically, followed by copper plating and annealing at 450 to 500 °C to cause hydrogen diffusion (10 to 12%, 9.3 to 10 ml/100 g); 4) 300 to 350 hours electrolytically (18 to 20%, 15 to 16.3 ml/100 g); 5) 800 hours electrolytically (50 to 54%, 29.7 to 30 ml/100 g). Decreases in plasticity are particularly marked at low deformation speeds. The tensile strength is hardly affected. Treatment 1 gave the highest brittleness; 2 had little effect; the hydrogen being confined to the surface. Treatment 3 allowed diffusion of hydrogen into the depth of the specimen but much hydrogen was lost in spite of the copper coating. With longer hydrogenation with periodical replacement of electrolyte (treatment 3) better hydrogen penetration was obtained and it was noticed that the resulting specimens became more sensitive to hydrogen embrittlement at a given deformation speed the higher their hydrogen content. To check this an even longer period, 800 hours, was used. Further tensile tests at 0.175 mm/min deformation speed were made at 20, 50, 70 and 100 °C on specimens hydrogenated for

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E111/E452

Hydrogen Embrittlement ...

200 hours, specimens for the two highest temperatures being copper plated (0.05 mm thick layer) to reduce hydrogen loss: the relative decrease in cross-sectional area falls almost linearly from about 71% at 20°C to about 66 at 100°C. The research included studies of hydrogen evolution from treated specimens during storage. At both room temperature and in vacuum at 600°C, the rate of evolution was highest for treatment 1, less for 2 and still less for 4. There are 4 figures, 1 table and 5 references: 1 Soviet and 4 non-Soviet.

ASSOCIATION: Vostochno-Sibirskiy filial SO AN SSSR
(East Siberian Branch SO AS USSR)

SUBMITTED: June 20, 1960

Card 3/3

S/126/60/010/006/007/022
E201/E491

18 7530

AUTHORS: Nechay, Ye.P., Popov, K.V. and Panenkova, L.S.

TITLE: The Effect of the Tempering Temperature on the Diffusion and Solubility of Hydrogen in Hardened Steel

PERIODICAL: Fizika metallov i metallovedeniye, 1960, Vol.10, No.6, pp.838-840

TEXT: The rate of diffusion of hydrogen in steel and its solubility are known to be affected by the structure and internal stresses in steel but the published results are contradictory. The present paper reports a study of the effect of the tempering temperature on the diffusion and the solubility of hydrogen in hardened У7А (U7A) steel at room temperature (hydrogen was introduced by cathodic polarization in an electrolyte). It is known that the structure becomes fine-grained and internal stresses are lowered in the α-phase of steel on increasing the tempering temperature; consequently the tempering temperature should affect the diffusion and the solubility of hydrogen. The authors used steel strips of 0.7 mm thickness which were worked with emery paper, degreased and cleaned. The permeability of steel to

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