VERIGIN, B.V.; SYSOYEVA, T.K.

Parasites - Fishes

Some data on the biology of Livoneca anurensis Gerstfeldt (Crustaces, Isopoda), Zool. Zhur., 31, No. 4, 1952.

9. Monthly List of Russian Accessions, Library of Congress, October 1952 ~~1953~~. Unclassified.

SYSOYEVA, T. K.

"The Biology of the Young of Some Commercial Fish in the Amur Basin in Relation to Reproductivity in Their Schools." Cand Biol Sci, Moscow State U, Moscow, 1953. (RZhBiol, No 1, Sep 54)

SO: Sum 432, 29 Mar 55

BARANENKOVA, A.S.; BARSUKOV, V.V.; PONOMARENKO, I.Ya.; SYSOYEVA, T.K.; KHOKHLINA, N.S.

Morphological characteristics, distribution, and feeding of young wolf fishes (Anarchichas lupus L., A.minor Olafsen, A.latifrons Steenstrup et Hallgrimsson) in the Barents Sea. Zool. zhur. 39 no.8:1186-1200 Ag '60. (MIRA 13:8)

1. Polar Institute of Marine Fisheries and Oceanography, Murmansk, and Zoological Institute of the U.S.S.R. Academy of Sciences, Leningrad. (Barents Sea--Wolf fish)

LEYTES, Z., inzhener; SYSOYEVA, V., inzhener.

Manual of track development and organization of shunting operations.
Mast.ugl. 5 no.6:24-26 Je '56. (MLRA 9:8)
(Donets Basin--Mine railroads)

LEYTES, Zakhar Moiseyevich; SYSOYEVA, Valentina Aleksandrovna; RATNIKOVA, A.P., redaktor izdatel'stva; SABITOV, A., tekhnicheskiy redaktor

[Improving work organization of underground transportation in mines of the Donets Basin] Uluchshenie organizatsii raboty podzemnogo transporta na shakhtakh Donbassa. Moskva, Ugletekhizdat, 1957. 70 p. (MIRA 10:7)

(Donets Basin--Mine haulage)

LEYTES, Z.M., SYSOYEVA, V.A.

Field of efficient use of conveyer transportation in the extraction sector. Nauch. trudy MGI no. 20:38-44 '58. (MIRA 11:8)
(Mine haulage)
(Conveying machinery)

BUCHNEV, V.K., prof., doktor tekhn. nauk; KALININ, R.A., dotsent; KORABLEV, A.A., kand. tekhn. nauk; MONIN, G.I., inzh.; BELYAYEV, V.S., kand. tekhn. nauk; MERKULOV, V.Ye., inzh.; ALEKSEYENKO, V.D., inzh.; IL'SHTEYN, A.M., kand. tekhn.nauk; GELESKUL, M.N., kand. tekhn.nauk; KOBISHCHANOV, M.A., kand. tekhn.nauk; DOBROVOL'SKIY, V.V., kand. tekhn. nauk; MALYSHEV, A.G., inzh.; VOROPAYEV, A.F., prof., doktor tekhn. nauk; LIDIN, G.D., prof., doktor tekhn.nauk; TOPCHIYEV, A.V., prof.; VEDERNIKOV, V.I., kand. tekhn.nauk; KUZ'MICH, I.A., kand. tekhn. nauk; LEYTES, Z.M., inzh.; SYSOYEVA, V.A., kand. tekhn. nauk; MELAMED, Z.M., kand. tekhn.nauk; CHERNAVKIN, N.N., inzh.; KARPILOVICH, M.Sh., inzh.; MEL'KUMOV, L.G., inzh.; BOGOPOL'SKIY, B.Kh., inzh.; FROLOV, A.G., doktor tekhn.nauk; KHVOSTOV, F.K., inzh.; BAGASHEV, M.K., kand. tekhn. nauk; KAMINSKIY, I.N., inzh.; PETROVICH, T.I., inzh.; ZHUKOV, V.V., red. izd-va; LOMILINA, L.N., tekhn. red.; PROZOROVSKAYA, V.L., tekhn. red.

[Mining engineers' handbook]Spravochnik gornogo inzhenera. Moskva, Gos.nauchno-tekhn. izd-vo lit-ry po gornomu delu, 1960. (MIRA 14:1)

(Mining engineering--Handbooks, manuals, etc.)

LESIN, Konstantin Konstantinovich; SYSOYEVA, V.A., otv. red.; ABARBARCHUK, F.I., red. izd-va; SUKHININA, N.D., tekhn. red.

[Safety problems connected with underground transportation in coal mines] Voprosy bezopasnosti na podzemnom transporte ugol'nykh shakht. Moskva, Gos. nauchno-tekhn.izd-vo lit-ry po gornomu delu, 1961. 39 p. (MIRA 15:3)
(Mine haulage--Safety measures)

SYSOYEVA, V.A., kand. tekhn. nauk; LEYTES, Z.M., kand. tekhn. nauk

Analysis of the length and volume of transportation in underground haulage by electric locomotive. Vop. rud. transp. no.5: 210-226 '61. (MIRA 16:7)

1. Institut gornogo dela im. A.A. Skochinskogo.
(Mine haulage)
(Electric locomotives)

LEYTES, Z.M., kand.tekhn.nauk; SYSOYEVA, V.A., kand.tekhn.nauk

Technical and economic comparison of electric locomotives with storage batteries and diesel locomotives. Ugol' 36 no.12:45-48 D '61. (MIRA 14:12)

1. Institut gornogo dela im. A.A.Skochinskogo.
(Mine railroads)
(Locomotives)

LEYTES, Z.M., kand. tekhn. nauk; SYSOYEVA, V.A., kand. tekhn. nauk; VAYNSHTEYN, I.A., kand. fiz.-matem. nauk

Establishing optimum flow-sheets for underground transportation with the help of graphic methods. Ugol' 38 no.8:53-57 Ag '63. (MIRA 17:11)

1. Institut gornogo dela im. A.A. Skochinskogo (for Leytes, Sysoyeva). 2. Moskovskiy gosudarstvennyy universitet (for Vaynshteyn).

SYSOYEVA, [illegible], kand. tekhn. nauk; ANTONOVSKAYA, M.A., inzh.

An analysis of the systems and technical means of underground transportation in mines of the Soviet Union. Nauch. soob. IGD 26:5-20 '65. (MIRA 18:9)

LEYTES, Z.N., kand. tekhn. nauk; SYSOYEVA, V.A., kand. tekhn. nauk; CHERNENKO, Ye.B., inzh.

Cost parameters of underground transportation in mines working steeply pitching seams. Nauch. soob. IGD 26:21-32 '65. (MIRA 18:9)

LEVTNS, Z.M., kand.tekhn.nauk; SYSOYEVA, V.A., kand.tekhn.nauk; GUDALOV, V.P., kand.tekhn.nauk; ANTONOVSKAYA, M.A., inzh.

Method of modeling underground transportation. Ugol' 40 no.9:35-38 S '65. (MIRA 18:10)

1. Institut gornogo dela im. A.A.Skochinskogo.

L 18320-65 EWT(m)/EWA(d)/T/EWP(t)/EWP(b) ASD(m)-3 MJW/JD

ACCESSION NR: AR4047534 S/0277/64/000/008/0009/0009

SOURCE: Ref. zh. Mashinostr. mat., konstr. i raschet detal. mash. Ctd. vy*p., Abs. 8.48.58

AUTHOR: Astaf'yeva, Ye. V.; Sy*soyeva, V. S.; Tsy*pkina, Ye. D.; Chumak, G. A.

TITLE: The problem of the use of high strength steels

CITED SOURCE: Sb. Legirovaniye staley. Kiyev, Gostekhizdat USSR, 1963, 14-20

TOPIC TAGS: high strength steel, heat treatment, work hardening/ steel 45KhNMFA, steel 40KhNVA, steel 37KhNZA

TRANSLATION: Methods for increasing the static and cyclical strength of high strength steels by heat treatment and work hardening are surveyed. An investigation of the effect of thermomechanical treatment (austenitizing at 930-950°C, partial cooling to 470-600°C, deformation of 25-50%, hardening, tempering at 100°C) on the strength of 45KhNMFA, 40KhNVA, and 37KhNZA steels showed that strength was

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ACCESSION NR: AR4047534

increased by 25-30 kg/mm^2 compared to conventional heat treatment.

SUB CODE: MM ENCL: 00

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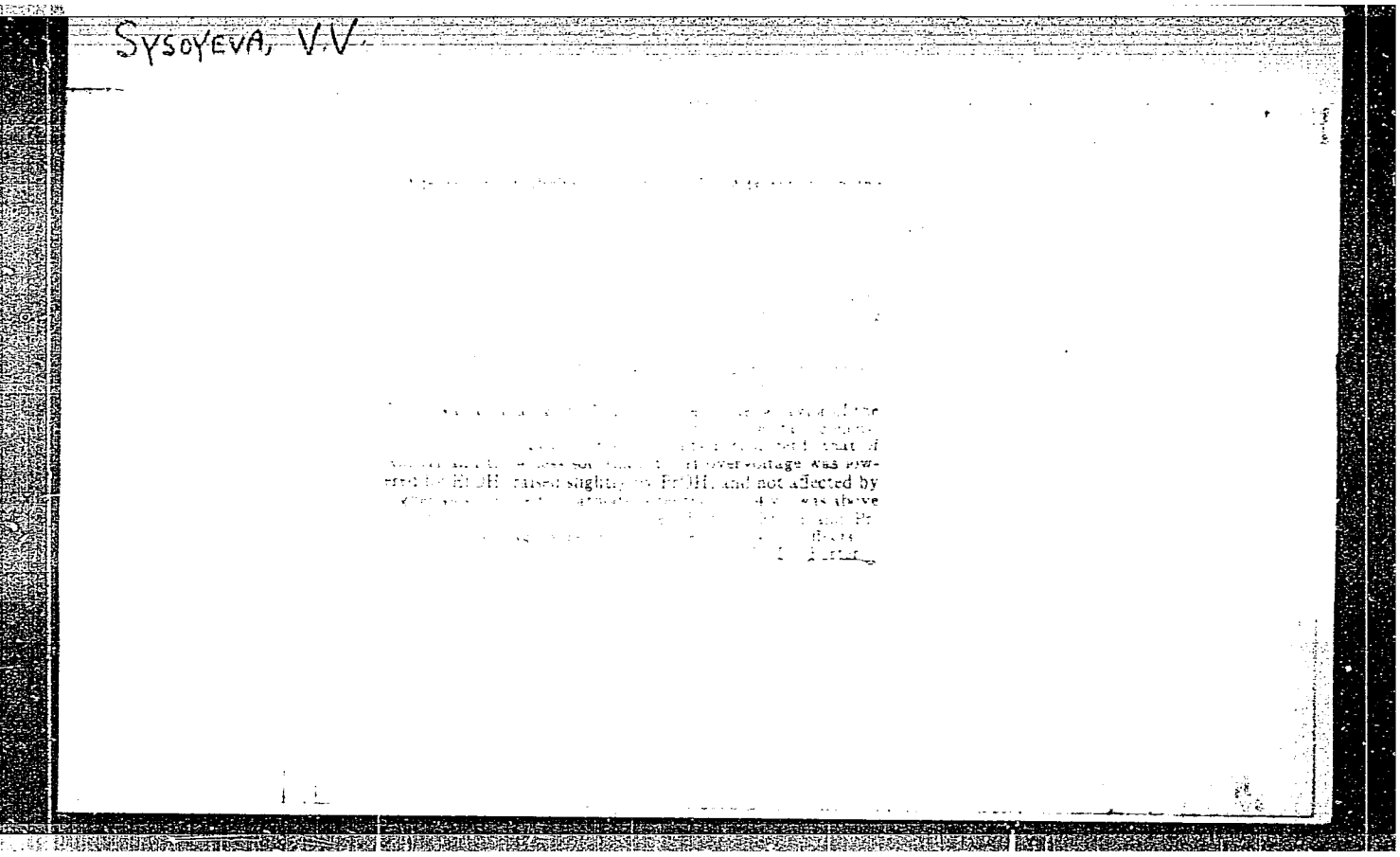
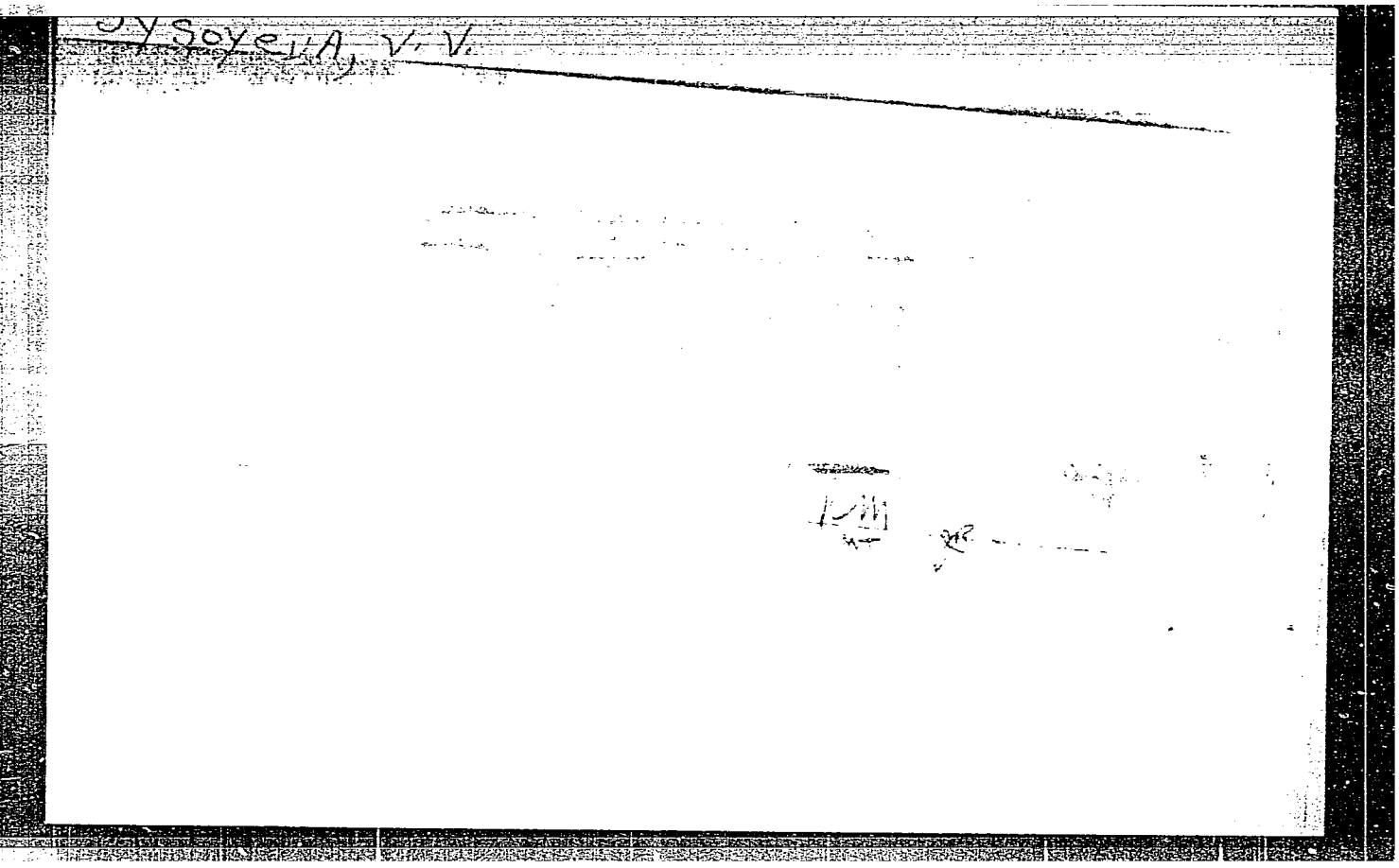


SYSOYEVA, V.V.



SYSOYEVA, V. V.

KHEYFETS, V.L.; KRASIKOV, B.S.; SYSOYEVA, V.V.; GUSEVA, I.V.

Investigating the adsorption of aliphatic alcohols. Part 3: Adsorption at the passage from aqueous solutions to alcohol solutions [with summary in English]. Vest. LGU 12 no.22:148-151 '57. (MIRA 11:2)
(Adsorption) (Aliphatic compounds)

SYSOYEVA, V. V.

AUTHORS: Kheyfets, V. L., Krasikov, P. S., Sysoyeva, V. V., 54-1-17/20
Guseva, I. V.

TITLE: Investigation of Adsorption of Aliphatic Spirits. III. Adsorption at the Transit From Aqueous to Alcoholic Solutions (Issledovaniye adsorbtsii alifaticheskikh spirtov. III. Adsorbtsiya pri perekhode ot vodnykh rastvorov k spirtovym).

PERIODICAL: Vestnik Leningradskogo Universiteta Seriya Fiziki i Khimii, 1957, Vol. 22, Nr 4, pp. 148-151 (USSR).

ABSTRACT: Examined was the adsorption of ethanol, n-propanol and iso-propanol in a concentration of 16 to 5.10^{-3} mol/l on the Hg-electrode, by measurement of the voltage, which originated from the capacity of the double layer and the electrode potential. The presence of the alcohol-hydrates in the solution can be explained by the fact that part of it is to be found in the double layer even if there is no tendency to specific adsorption. Consequently the capacity of the double layer goes down. The desorption of the alcohol from the double layer can only be effected, if there are free water molecules present in the solution (no hydrates of the type $R.CH_2OH.H_2O$). There are 4 figures, 1 table, and 5 references, 4 of which are Slavic.

Card 1/2

Investigation of Adsorption of Aliphatic Spirits. III. Submitted 7/26
Adsorption at the Transit From Aqueous to Alcoholic Solutions.

SUBMITTED: February 22, 1956.

AVAILABLE: Library of Congress.

Card 2/2

AUTHORS: Krasikov, B. S., Sysoyeva, V. V. 20-114-4-40/63

TITLE: The Zero Charge Points of Some Metals and Alloys (Tochki nulevogo zaryada nekotorykh metallov i splavov)

PERIODICAL: Doklady Akademii Nauk SSSR, 1957, Vol. 114, Nr 4, pp. 826-828 (USSR)

ABSTRACT: It was revealed in the investigation of the Zero-charge potentials of metals ($\varphi_{n.z}$) that this value is dependent on a number of factors, including composition and state of the metallic phase. In the case of the mercury-thallium system it was shown that this value varies according to the proportion of the components in the amalgam. The research was carried out in order to measure the potentials of the zero-charge, in order to obtain some new knowledge on the dependence of $\varphi_{n.z}$ on the composition and state of the metallic phase. Objects of the experiment were monocrystalline nickel and ferronickel alloys. Fig.1 records the curves: capacity-potential of the zinc electrode. They indicate that the zero-charge potential changes according to metal structure. Apparently the energy of emission of the electron from the metal changes also , in dependence on the compactness of the atom-packing in the crystal lattice of the metal, and therewith $\varphi_{n.z}$ of the metal changes as well. Poor

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compactness of the packing facilitates the emission of the electron and thereby the displacement of $\varphi_{n.z}$ in the direction of negative values. The measurements of $\varphi_{n.z}$ of pure metals, which were also obtained by electro-sedimentation, are in good agreement with published data. In the case recorded here (fig. 3) there a rather abrupt change of $\varphi_{n.z}$ was observed due to an alteration of the content of that metal in the alloy which possesses a stronger negative value than $\varphi_{n.z}$. The uniformity of the dependence-curve of the zero-charge potential of an alloy proves, according to the authors, that the ferronickel alloys obtained by electro-sedimentation form solid solutions. Thus it may be said that in the absence of factors capable of disturbing the uniformity of the change in zero-charge potential in dependence of the alloy composition, the zero-charge potential of the alloy could be determined already at a comparatively low concentration of iron by the energy of the electron emission out of the iron- a metal which possesses a stronger negative $\varphi_{n.z}$ value. The results reported in this paper emphasize the necessity to take into account the composition and the state of the metallic phase at measurements of the zero-charge potential. There are 3 figures and 10 references, 9 of which are Soviet.

The Zero Charge Points of Some Metals and Alloys 20-114-4-40/63

ASSOCIATION: Leningrad State University imeni A. A. Zhdanov and Scientific Research Institute for Telecommunication (Leningradskiy gosudarstvennyy universitet im. A. A. Zhdanova i Nauchno-issledovatel'skiy institut telefonnoy svyazi)

PRESENTED: January 2, 1957 by A. N. Frumkin, Member, Academy of Sciences, USSR

SUBMITTED: December 11, 1956

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SYSOYEVA, V. V.

5(4) PHASE I BOOK EXPLOITATION SOV/2216

Soveshchaniye po elektrokhimii. 4th, Moscow, 1956.

Trudy...; [sbornik] (Transactions of the Fourth Conference on Electrochemistry; Collection of Articles) Moscow, Izd-vo AN SSSR, 1959. 868 p. Errata slip inserted. 2,500 copies printed.
Sponsoring Agency: Akademiya nauk SSSR. Otdeleniye khimicheskikh nauk.

Editorial Board: A.N. Frumkin (Resp. Ed.) Academician, O.A. Yesin, Professor; S.I. Zhdanov (Resp. Secretary), B.N. Kabanov, Professor, S.I. Zhdanov (Resp. Secretary); B.N. Kabanov, Professor, Ya. M. Kolotyrkin, Doctor of Chemical Sciences; V.V. Losev, P.D. Lukovtsev, Professor; Z.A. Solov'yeva; V.V. Stender, Professor; and G.M. Florianovich; Ed. of Publishing House: N.G. Yegorov; Tech. Ed.: T.A. Prusakova.

PURPOSE: This book is intended for chemical and electrical engineers, physicists, metallurgists and researchers interested in various aspects of electrochemistry.

COVERAGE: The book contains 127 of the 138 reports presented at the Fourth Conference on Electrochemistry sponsored by the Department of Chemical Sciences and the Institute of Physical Chemistry, Academy of Sciences, USSR. The collection pertains to different branches of electrochemical kinetics, double layer theories and galvanic processes in metal electrodepositon and industrial electrolysis. Abridged discussions are given at the end of each division. The majority of reports not included here have been published in periodical literature. No personalities are mentioned. References are given at the end of most of the articles.

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Card 32/34

AUTHOR: Sysoyeva, V.V.

SOV/80-59-1-20/44

TITLE: Production of Alloys of Iron With Nickel by Settling from Chlorous Electrolytes (Polucheniye splavov zheleza s nikelem elektrosazhdeniyem iz khloristykh elektrolitov)

PERIODICAL: Zhurnal prikladnoy khimii, 1959, Nr 1, pp 128-132 (USSR)

ABSTRACT: The author presents the results of a series of experiments showing the practical possibility of using the chlorous electrolyte for coating with the Fe - Ni alloy with various concentrations of its components. The temperature of the electrolyte was maintained with an accuracy of ± 0.2°C. Electrodes used were iron ones (of Armco-iron) and nickel ones of the N-000 grade. Certain relations were found between the composition of the alloy obtained on the one hand and the temperature of electrolyte, the ratio of components in the electrolyte, and different correlations of densities of current on the iron and nickel anodes, on the other hand, and these relations are presented in graphical form. The following conditions are recommended: the concentration of the sum of iron and nickel in the electrolyte should be 100 g/l; the density of current = 40 amp per square decimeter; temperature = 70°C. The thickness of

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Production of Alloys of Iron With Nickel by Settling From Chlorous Electrolytes

coating can attain 0.5 mm and even higher.
There are 4 graphs and 18 references, 4 of which are Soviet, 3 English, 1 Japanese, 7 American, 2 German and 1 unidentified.

SUBMITTED: April 17, 1957

25(1) SOV/119-59-6-7/18

AUTHORS: Daniyel'-Bek, V. S., Candidate of Technical Sciences, Sysoyeva, V. V., Engineer

TITLE: Electrolytic Coatings of Iron - Nickel Alloys (Elektroliticheskiye pokrytiya zhelezonikelevymi splavami)

PERIODICAL: Priborostroyeniye, 1959, Nr 6, pp 17-18 (USSR)

ABSTRACT: The utilization of the coatings mentioned in the title is based on the consideration that with a content of from 30 - 40% iron they are not inferior to nickel with respect to their protection against corrosion. The authors worked out a procedure, by which an iron - nickel alloy is precipitated from a mixture of iron- and nickel chlorides at high current density (40 - 60 a/dm^2). Electrolysis occurs at 70°C. The anode is an iron and a nickel anode each. The electrolyte contained 25 g/l Fe and 0.75 g/l Ni. The noxious influence of trivalent iron was eliminated by the addition of citric acid. There are 2 figures and 1 Soviet reference.

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8(5) SOV/[illegible]

AUTHORS: Daniyel'-Bek, V.S., Mints, M.Z., Sysoyeva, V.V., Filimonov, M.V.

TITLE: On the Application of Hydrocarbon Fuel in Elements With Solid Electrolytes (O primenenii uglevodorodnogo topliva v elementakh s tverdymi elektrolitami)

PERIODICAL: Zhurnal prikladnoy khimii, 1959, Vol XXXII, Nr 3, pp 649-655 (USSR)

ABSTRACT: The possibility of using fuel elements for feeding communications and broadcasting apparatuses in areas without electricity is investigated here. The use of gas generators is not convenient, so liquid fuels, like gasoline, are employed for this purpose. Thermodynamic calculations made by Davtyan [Ref. 7] and others lead to the conclusion that mixtures of hydrocarbons like those in gasoline ensure theoretical efficiency factors of 95-100% and an emf of 1.10-1.15 v if the temperature is 500-1,000°C. The gasoline elements develop an emf and when the circuit is closed produce electric current obtaining electric energy from the electrochemical process of the burning of gasoline. An experiment shows that the optimum temperature is 700-750°C, the emf 0.8-0.9 v, the current density 1.0-1.5 a/dm^2.

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On the Application of Hydrocarbon Fuel in Elements With Solid Electrolytes

After several hours the electric indicators are declining. This is explained by the reduction of various parts of the electrodes by gas permeability etc.
There are 5 graphs, 1 set of diagrams, 2 tables, and 15 references, 8 of which are Soviet, 5 German, 3 American, and 2 English.

SUBMITTED: June 25, 1957

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SOV/80-33-1-25/49

AUTHOR: Sysoyeva, V. V.

TITLE: Investigation of Polarization Curves in Chloride Electrolytes

PERIODICAL: Zhurnal prikladnoy khimii, 1960, Vol 33, Nr 1, pp 147-153 (USSR)

ABSTRACT: This is the second article of a series on the electrodeposition of iron-nickel alloys from chloride electrolytes. Polarization curves of electrodeposition from $FeCl_2$ and $NiCl_2$ solutions and also from mixed ($FeCl_2$ + + $NiCl_2$) electrolytes of different concentration at 20-70° were obtained and investigated. From the capacity values of the double layer were calculated the current densities per cm^2 of the true surface (D_k), using data on current density, related to 1 cm^2 of the geometrical surface (I_k). In Figs. 1 and 2 polarization curves are given in $\frac{\psi}{\log I_k}$ and $\frac{\psi}{\log D_k}$ coordinates;

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Investigation of Polarization Curves
In Chloride Electrolytes

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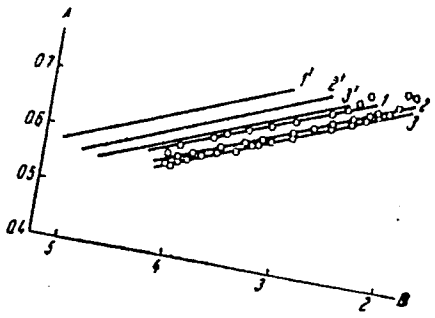

Fig. 1. ψ /log I curves of electrodeposition of iron from chloride electrolytes. (A) electrode potential ψ (in v); (B) value of log I (in amp/cm^2). (1, 1') electrolyte Nr 4; (2,2') electrolyte Nr 5; (1,2,3) at I for 1 cm^2 of the geometrical surface; (1', 2', 3') at I for 1 cm^2 of the true surface; t = 20° C.

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77516, SOV/80-33-1-25/49

Table 1: Values for a and b constants in the Taffel's equation for chloride electrolytes (pH = 2.9) in Ni and Fe ions discharge: (1) electrolyte Nr; (2) composition of electrolyte (in g/liter); (3) citric acid; (4) temperature (in ° C); (5) C measured (in μF/cm^2); (6) a (in mv); (7) b (in mv).

(1)	(2) Me	(3)	(4)	(5)	(6)	(7)	α
1	25 Ni	15	20	44.8	908	112	0.26
			40	42.0	808	100	0.31
			70	67.8	724	102	0.33
2	50 Ni	15	20	60.4	876	108	0.27
			40	60.4	766	96	0.32
			70	91.4	696	104	0.33
3	100 Ni	15	20	79.7	810	100	0.29
			40	105.0	722	88	0.35
			70	200.0	648	94	0.36
4	25 Fe	15	20	136.0	954	75	0.39
			40	122.0	915	79	0.39
			70	102.0	847	82	0.37
5	50 Fe	15	20	132.0	936	77	0.38
			40	110.0	889	79	0.38
			70	94.0	821	82	0.36
6	100 Fe	15	20	79.6	907	75	0.39
			40	66.4	868	80	0.39
			70	59.7	797	82	0.36

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Table 2. Dependence of double layer capacity on the conditions of electrodeposition of Fe,Ni, and Fe-Ni alloys: (1) electrolyte Nr (according to Tables 1 and 3); (2) temperature (in °C); (3) capacity (in $\mu F/cm^2$) of the double layer on the samples, obtained at the following I_k (in amp/cm^2).

(1)	(2)	(3)							
		$1 \cdot 10^{-3}$	$2.5 \cdot 10^{-3}$	$1 \cdot 10^{-2}$	$2.5 \cdot 10^{-2}$	$1 \cdot 10^{-1}$	$2.5 \cdot 10^{-1}$	$1 \cdot 10^{0}$	$2.5 \cdot 10^{0}$
1	20	46.9	45.1	44.2	45.3	49.6	70.4	90.0	—
1	70	—	68.4	67.8	67.2	67.7	68.0	71.4	98.0
4	40	—	139.4	125.2	122.4	121.3	127.0	136.3	180.0
6	70	—	69.0	63.4	60.6	59.3	59.6	60.5	73.0
7	20	—	44.0	41.7	40.4	40.4	40.9	41.0	49.7
9	70	—	49.0	40.0	36.2	34.4	34.2	34.3	34.9

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Investigation of Polarization Curves in Chloride Electrolytes

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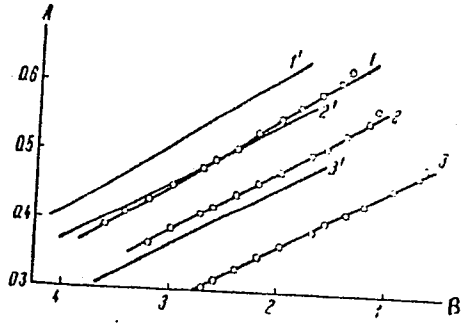

Fig. 2. ψ/log I curves in electrodeposition of Ni from chloride electrolytes. (A) and (B) are the same as in Fig. 1. Electrolyte Nr 3 at temperatures (in °C): (1, 1') 20°; (2, 2') 40°; (3, 3') 70°. (1,2,3) at I on 1 cm^2 of geometrical surface; (1', 2', 3') at I on 1 cm^2 of the true surface.

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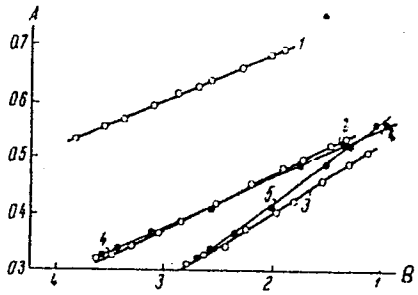

Fig. 3. Comparison of ψ/log I curves for the individual components of the Fe-Ni alloy in electrodeposition at 70°. Electrolyte: (1) Nr 4; (2) 75 g/liter of Ni and 15 g/liter of citric acid, pH = 2.9; (3) Nr 7; (4) Nr 7 (partial polarization curve, corresponding to the iron precipitation); (5) the same for Ni. All curves at I on 1 cm^2 of the true surface.

in Fig. 3-5 all curves are given in $\frac{}{\log D_K}$ coordinates.

From the data obtained, the following conclusions were made. The true current densities can be calculated by measuring the capacities of the double layers on the Fe, Ni, and Fe-Ni electrodes. The ions-discharge phase in the process of electrodeposition of Fe-Ni alloy from chloride electrolytes (in a considerably wide range of current densities) is a retarding phase. The author expresses his gratitude to Ya. V. Durdin for his permission to conduct a series of experiments in the Laboratory of Electrochemistry of the Leningrad, Order of Lenin, State University. There are 4 tables; 5 figures; and 15 references, 1 U.S., 1 U.K., 13 Soviet. The U.S. and U.K. references are: E. A. Ollard, Ind. Finishing, L., 8, 84, 152 (1955); M. K. Thompson, Trans. Am. Electroch. Soc., 44, 359 (1923)

Investigation of Polarization Curves in Chloride Electrolytes

77516
SOV/[illegible]-33-1-25/49

ASSOCIATION: Scientific Research Institute of Telephone Communication (Nauchno-issledovatel'skiy institut telefonnoy svyazi)

SUBMITTED: July 1, 1958

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Investigation of Polarization Curves in Chloride Electrolytes

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Table 3: Value of a and b constants in the Taffel equation for electrodeposition of Fe-Ni alloys from chloride electrolytes (pH = 2.9): (a) electrolyte Nr; (b) electrolyte composition (in g/liter); (c) citric acid; (d) temperature (in °C); (e) $C_{measured}$ (in $\mu F/cm^2$).

(a)	(b)			(d)	(e)	a (in mV)	b (in mV)	α
	Fe	Ni	(c)					
7	25	75	15	20	40.6	793	108	0.27
				40	62.8	738	113	0.27
				70	50.2	649	123	0.27
8	50	50	15	20	48.0	916	130	0.22
				40	42.8	836	132	0.21
				70	48.0	728	142	0.21
9	75	25	15	20	43.7	984	113	0.26
				40	48.0	945	128	0.24
				70	34.8	865	135	0.26

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S/080/62/035/011/003/011
D287/D307

AUTHORS: Sysoyeva, V.V., and Rotinyan, A.L.

TITLE: The effect of chlorine ions on the kinetics of the cathodic deposition of an iron - nickel alloy

PERIODICAL: Zhurnal prikladnoy khimii, v. 35, no. 11, 1962, 2430 - 2435

TEXT: The present investigation was carried out because of the absence of information regarding the effect of Cl' ions on the kinetics of cathodic deposition of an Fe-Ni alloy during gradual transition from the sulphate to the chloride electrolyte. Sulphate, sulphate - chloride and chloride electrolytes, containing 1.06 mole Ni/1 and 0.19 mole Fe/1, were used. The experiments were carried out in a 200 ml glass cell, in a water bath maintained at 25°C. The pH of the solutions was controlled with a glass electrode and maintained at pH 3 (± 0.2). Total and partial polarization curves were plotted for each electrolyte. The alloys were analyzed for their Fe-content and, if required, for the Ni-content (using Trilon B). It was found that the Fe-content in the alloy increased (under the

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given experimental conditions) with increasing D_c (cathodic current density) at low current densities; it reached a maximum and then started to decrease slightly. On transition from the sulphate to the chloride electrolytes the layer and, consequently, also the coefficient of coarseness of the surface were found to increase. Substitution of SO_4'' ions by Cl' in the electrolyte resulted in a displacement of the total as well as of the partial polarization curves of the Fe and Ni separation. The partial polarization curves were used for calculating the adsorption potential which is observed during the deposition of the alloy from the chloride electrolyte. The calculated value is in good agreement with literature data determined by other methods. There are 8 figures and 3 tables.

ASSOCIATION: Kafedra elektrokhimii Leningradskogo tekhnologicheskogo instituta imeni Lensoveta (Department of Electrochemistry of the Leningrad Technical Institute imeni Lensovet)

SUBMITTED: February 16, 1962

Card 2/2

S/080/62/035/012/004/012
D444/D307

AUTHORS: Sysoyeva, V.V. and Rotinyan, A.L.

TITLE: Depolarization and overpolarization effects in the formation of an Fe-Ni electrodeposited alloy

PERIODICAL: Zhurnal prikladnoy khimii, v. 35, no. 12, 1962, 2653-2661

TEXT: The present investigation was devoted to the study of the mechanism of electrodeposition of iron-nickel alloys from sulphate electrolytes. Electrolysis was carried out under various conditions, the alloys produced being analyzed and polarization curves being obtained (both by the ordinary and the potentiostatic method). Mixed electrolytes contained 1.25 moles (Fe^{2+} + Ni^{2+}) per liter. For a given electrolyte and temperature the potential was a linear function of the logarithm of current density. The slope of the line is given by $1/\alpha$: for the mixed deposition this is equal to the sum of half the slopes for the separate depositions. With high nickel and very low iron concentration nickel is deposited

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preferentially: as iron concentration rises the polarization curves first merge and then reverse their position. With increasing temperature the partial polarization curves of nickel and iron move in the direction of electro-positive potential; at 25-40°C the movement is about equal, but on increasing temperature to 70°C the nickel curve moves more and the alloy is enriched in nickel. For iron, depolarization occurs on discharge into the alloy, and this increases with rising temperature. For nickel, overpolarization occurs, but this practically disappears as the temperature rises to 70°C. These effects are associated with the alloy crystal-lattice structure and when two crystal lattices exist the values of overpolarization for nickel and depolarization for iron are independent of alloy composition. However, the effects cannot be fully explained solely by the change in crystal-lattice structure depending on alloy composition. There are 10 figures and 3 tables.

ASSOCIATION: Kafedra elektrokhimii LTI im. Lensoveta (Department of Electrochemistry of the LTI im. Lensovet)

SUBMITTED: January 8, 1962

SYSOYEVA, V.V.; ROTINYAN, A.L.

Calculation of depolarization and superpolarization effects in the formation of a galvanic alloy. Dokl. AN SSSR 144 no.5: 1098-1099 Je '62. (MIRA 15:6)

1. Leningradskiy tekhnologicheskiy institut imeni Lenosoveta. Predstavleno akademikom A.A.Grinbergom.
(Alloys) (Polarization (Electricity))

ROTINYAN, A. L.; SYSOYEVA, V. V.

Cathodic polarization in iron electrodeposition. Izv. vys. ucheb. zav.; khim. i khim. tekh. 5 no.5:782-787 '62. (MIRA 16:1)

1. Leningradskiy tekhnologicheskiy institut imeni Lensoveta, kafedra elektrokhimii.

(Iron plating) (Polarization(Electricity))

SYSOYEVA, V.V.; ROTINYAN, A.L.

Effect of chlorine ions on the kinetics of cathodic deposition of an iron-nickel alloy. Zhur.prikl.khim. 35 no.11:2430-2435 N '62. (MIRA 15:12)

1. Kafedra elektrokhimii Leningradskogo tekhnologicheskogo instituta imeni Lensoveta.
(Iron-nickel alloys) (Electroplating) (Chlorine)

SYSOYEVA, V.V.; ROTINYAN, A.L.

Effects of depolarization and superpolarization in the formation of Fe-Ni galvanic alloys. Zhur.prikl.khim. 35 no.12:2653-2661 D '62. (MIRA 16:5)

1. Kafedra elektrokhimii Leningradskogo tekhnologicheskogo instituta imeni Lensoveta.
(Iron-nickel alloys--Electric properties)
(Polarization (Electricity))

ROTINYAN, A.L.; OVCHINNIKOVA, T.M.; SIMONOVA, M.V.; SYSOYEVA, V.V.

Dependence of the degree of alkalization of the cathode electrolyte layer on the current density. Zhur. fiz. khim. 38 no.12: 2966 D '64. (MIRA 18:2)

1. Leningradskiy tekhnologicheskiy institut imeni Lensoveta.

GRILIKHES, M.S.; SYSOYEVA, V.V.

Effect of a chlorine anion on the kinetics of a simultaneous discharge of iron and nickel. Zhur. prikl. khim. 38 no.4:823-828 Ap '65. (MIRA 18:6)

SYSOYEVA, YE.S.

PHASE I BOOK EXPLOITATION SOV/4563

Metody polucheniya i izmereniya radioaktivnykh preparatov; sbornik statey (Methods for the Production and Measurement of Radioactive Preparations; Collection of Articles) Moscow, Atomizdat, 1960. 307 p. Errata slip inserted. 6,000 copies printed.

General Ed.: Valeriy Viktorovich Bochkarev; Ed.: M.A. Saguro; Tech. Ed.: N.A. Vlasova.

PURPOSE: This collection of articles is intended for scientific and technical personnel working in the production of radioactive isotopes.

COVERAGE: The collection contains original studies on methods of obtaining and measuring radioactive preparations. According to the foreword, the articles contain new data, and are of theoretical or practical interest to the extent that they discuss methods or give process information. In addition to several survey articles the collection contains discussions on the production of radioactive isotopes and inorganic radioactive preparations, including a number of carrier-free isotopes and several colloidal and other therapeutic preparations. Also discussed are methods for preparing a number of tagged organic compounds, problems in the analysis of tagged organic compounds, the absolute and relative measurement of activity, and the radiometric analysis of preparations. New instruments and equipment are described and instructions concerning measurement methods and technique are included. V.I. Levin, Candidate of Chemical Sciences, V.P. Shishkov, Candidate of Technical Sciences, I.N. Bukharov, Candidate of Biological Sciences, and V.I. Shostak, Candidate of Chemical Sciences, are mentioned as having helped directly in the selection and preparation of the material for publication. References accompany each article.

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REVIS, I.A.; LEVINSON, A.M.; MOROZIK, Ye.P.; Prinimali uchastiye: ZHUKOBORSKIY, S.L., inzh.; BAYEV, A.A., inzh.; SOLOMAKHIN, S.I., inzh.; VESHCHEV, Ye.V., tekhnik; SYSOYEVA, Ye.Ya., laborant

Effect of the technology of the manufacture of the disk knives for paper cutting on their strength. Bumagodel. mash. no.12: 176-206 '64. (MIRA 17:11)

1. Leningradskiy tekhnologicheskiy institut tsellyulozno-bumazhnoy promyshlennosti (for Zhukoborskiy, Bayev, Solomakhin, Veshchev, Sysoyeva).

KOVALEVSKAYA, I.L.; EPSHTEYN-LITVAK, R.V.; DMITRIYEVA-RAVIKOVICH, Ye.M.; KURNOSOVA, N.A.; SHCHEGLOVA, Ye.S.; FERDINAND, Ya.M.; KHOMIK, S.R.; MAKHLINOVSKIY, L.P.; PETROVA, S.S.; GOLUBOVA, Ye.Ye.; GONCHAROVA, Z.I.; SARMANEYEV, A.P.; SIZINTSEVA, V.P.; Prinimali uchastiye: MEDYUKHA, G.A.; OSOKINA, L.A.; RACHKOVSKAYA, Yu.K.; OSOVTSEVA, O.I.; DEDUSENKO, A.I.; KOVALEVA, P.S.; KARASHEVICH, V.P.; CHEBOTAREVICH, N.D.; CHIGIR', T.R.; SKUL'SKAYA, S.D.; KECHETZHIYEV, B.A.; DEMINA, A.S.; ZUS'MAN, R.T.; YESAKOV, P.I.; SYSOYEVA, Z.A.; ZINOV'YEVA, I.S.; FAL'CHEVSKAYA, A.A.; DENISOVA, B.D.; TIMOFELEVA, R.G.; SYRKASOVA, A.V.; LYANTSMAN, S.G.

Reactivity and immunological and epidemiological effectiveness of alcoholic typhoid and paratyphoid fever vaccines in school children. Zhur. mikrobiol., epid. i immun. 33 no.7:72-77 Jl '62. (MIRA 17:1)

1. Iz Moskovskogo, Rostovskogo, Omskogo institutov epidemiologii i mikrobiologii, Stavropol'skogo instituta vaktsin i syvorotok i Ministerstva zdravookhraneniya RSFSR. 2. Rostovskiy institut epidemiologii i mikrobiologii (for Kovaleva). 3. Stavropol'skiy institut vaktsin i syvorotok (for Sysoyeva). 4. Kuybyshevskiy institut epidemiologii i mikrobiologii (for Zinov'yeva). 5. Saratovskaya gorodskaya sanitarno-epidemiologicheskaya stantsiya (for Lyantsman).

1. SYSTAR, I. P.

2. USSR (600)

4. Poultry - Estonia

7. Practice of leading poultry raisers on collective farms of the Estonian S. S. R. Ptitsevodstvo no. 6, 1952.

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

SYSUYEVA, A.F. [Sysuieva, A.F.]

Nitrogen-fixing microorganisms in the water and bottom soils of Kremenchug Reservoir during the first year after its filling. Mikrobiol. zhur. 25 no.2:10-15 '63. (MIRA 17:10)

1. Institut gidrobiologii AN UkrSSR.

FAVORIN, N.N., kand. tekhn. nauk; POPOVA, K.L., kand. tekhn.nauk; GONCHAROVA, N.Ya.; SYSUYEV, G.B.; ZVONKOV, V.V., otv. red.; GORSHKOV, G.B., red. izd-va; NOVICHKOVA, N.D., tekhn. red.; MATYUKHINA, L.I., tekhn. red.

[Brief survey of the research on the water resources of the U.S.S.R. performed in 1959 and 1960] Kratkii obzor nauchnykh issledovanii po vodnomu khoziaistvu SSSR 1959-1960 gg. Moskva, 1963. 125 p. (MIRA 16:7)

1. Akademiya nauk SSSR. Sovet po problemam vodnogo khozyaystva. 2. Predsedatel' Soveta po problemam vodnogo khozyaystva AN SSSR chlen-korrespondetn AN SSSR (for Zvonkov). 3. Nauchnyye sotrudniki Soveta po probemam vodnogo khozyaystva AN SSSR (for Favorin, Popova, Goncharova, Sysuyev).

(Water supply)

ISHCHUK, Yu.L.; SYSUYEV, I.A.; LEONT'YEVA, L.S.

Improvement of the technological process for preparing lead stearate. Trudy BONMZ no.1:16-19 '63. (MIRA 16:6)

(Lead salts) (Stearic acid)

SOV/177-58-4-20/32

17

AUTHORS: Sysuyev, L.N., Major of the Medical Corps; Tyurin, V.T., Lieutenant-Colonel of the Medical Corps, and Osipov, S.S.

TITLE: Some Problems of Protecting Divers From Radiant Temperature Losses (Nekotoryye voprosy zashchity vodolazov ot luchistykh teplopoter')

PERIODICAL: Voyenno-meditsinskiy zhurnal, 1958, Nr 4, pp 67-71 (USSR)

ABSTRACT: Based on their own tests and those of N.K Vitte, A.Ye. Malysheva (1954), Letavet, Slonim, Margolina, Brandt (1949) and Professor Kondrat'yev, the authors concluded that: 1) the temperature losses during diving depend on the temperature difference of the skin surface and the surface of the diving suit and mostly result from radiation; 2) the usual diving underwear is permeable for human radiation in intensive temperature losses; 3) the aluminum-coated outer coats and overalls serve

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Some Problems of Protecting Divers From Radiant Temperature Losses

as reflecting screens, thus reducing the diver's temperature loss and preserving the temperature of the body and the skin on a higher level. There are 4 tables.

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SYSUYEV, M.

Let's take an active part in preparations for the sports tournaments of the peoples of the U.S.S.R. Prom.koop. no.12:52-55 D '55. (MLRA 9:5)

(Athletics)

SYSUYEV, M.

After the Spartakiada. Prom.koop. no.10:34-35 O '56. (MLRA 9:11)

1. Starshiy inspektor Vsesoyuznogo Soveta obshchestva "Spartak."
(Sports)

SYSUYEV, M.

In the struggle for gold medals. Prom.koop.no.11:35 N '56.
(Moscow--Soccer) (MLRA 9:12)

SYSUYEV, M.

Members of the Spartak Society at the sixteenth Olympic games. Prom. koop. no.1:36 Ja '57. (MLRA 10:4)
(Melbourne--Olumpic games)

SYSUYEV, M.

Gold medal of the champion. Prom.koop. no.11:38-39 N '57.
(MIRA 10:12)

(Sports)

SYSUYEV, M.

Improve the work of physical culture groups. Prom. koop. no.5: 36-37 My '58. (MIRA 11:4)

1. Starshiy inspektor Vsesoyuznogo soveta obshchestva "Spartak." (Physical education and training)

SYSUYEV, M.

In anticipation of the Second Spartakiad of the Peoples of the U.S.S.R. Prom.koop. 12 no.11:38 N '58. (MIRA 11:11)

1. Starshiy inspektor Vsesoyuznogo soveta obshchestva "Spartak." (Sports)

SYSUYEV, M.

On all continents. Prom.koop. 14 no.7:38 Jl '60.
(MIRA 13:8)

(Sports)

SYSUYEV, M.; DLUGACH, A.

They love sports. Mest.prom.i khud. promys. 2 no.1:38 Ja '61.
(MIRA 14:4)
(Physical education and training)

DLUGACH, A.; SYSUYEV, N.

Basis of good health. Mest. prom. i khud. promys. 2 no.6:39 Je '61. (MIRA 14:7)
(Physical education and training)

SYSUYEV, V., inzh. (Penzenskaya obl.); KRIVENKO, V., inzh. po ratsionalizatsii i izobretatel'stvu (Zaporozh'ye); KRIVOSHEYEV, V., inzh. (Khar'kov); KOSAREV, S.; SIDORKIN, G., mekhanik (Ashkhabad)

Conceived and realized. Izobr. i rats. no.12:24-25 '63. (MIRA 17:2)

1. Upravlyayushchiy trestom "Grazhdanstroy" Udmurtskogo soveta narodnogo khozyaystva (for Kosarev).

SYSUYEV, V.A.; PAVLOVICH, G.A.; GERTSEN, P.P., kand.tekhn.nauk

Preventing dust and poison gases by using water stemming in blasting operations. Bor'ba s sil. 5:147-150 '62. (MIRA 16:5)

1. Permskiy nauchno-issledovatel'skiy ugol'nyy institut.
(Blasting--Equipment and supplies) (Mine dusts—Prevention)
(Mine gases)

OSIPOV, Yu.A.; SYSUYEV, V.A.; KOLEVATOV, P.A.; ZHANDAROV, O.V.; DOBRYNIN, A.V.; ULITENOK, V.P.

Mining a seam subject to bumps using the method of water injection into the seam. Ugol' 39 no.8:65-67 Ag '64. (MIRA 17:10)

1. Permskiy nauchno-issledovatel'skiy ugol'nyy institut (for Osipov, Sysuyev, Kolevatov). 2. Shakhta im. Kalinina kombinata Kizelugol' (for Zhandarov, Dobrynin, Ulitenok).

AUTHORS: Apayev, B. A., Sysuyev, Yu. A. SOV/163 -58-2-38/46

TITLE: The Changes in Cementite Caused by Cold Plastic Deformation (Izmeneniya v tsementite pod deystviyem kholodnoy plasticheskoy deformatsii)

PERIODICAL: Nauchnyye doklady vysshey shkoly. Metallurgiya, 1958, Nr 2, pp. 209 - 213 (USSR)

ABSTRACT: The increase of magnetization in iron-carbon alloys at temperatures above 270°C as a result of the deformation and the increase of the α-solid solution quantity. The investigations were carried out with steel samples of the type 45 in hardened and annealed state. The increase of the magnetism may also be caused by the phase χ-Fe_xC. The change of the magnetism in the steel samples 45 and U-10 was investigated as dependent on the degree of deformation. When comparing the curves plotted with one another a quantitative relation between the carbon of the steel and the amount of the χ-Fe_xC-phase formed was found. The course of the phase transformation in cementite under the effect of cold deformation shows that it is

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necessary to take into account this phenomenon when investigating the mechanical properties as well as the mechanism of the plastic deformation in heterogeneous systems. There are 4 figures and 12 references, 6 of which are Soviet.

ASSOCIATION: Issledovatel'skiy fiziko-tekhnicheskiy institut Gor'kovskogo gos. universiteta (Physico-Technical Research Institute of Gor'kiy State University)

SUBMITTED: October 1, 1957

67672
SOV/126-8-6-20/24

18.7500

AUTHORS: Apayev, B.A. and Sysuyev, Yu.A.

TITLE: Influence of the Original Structure and Temperature of Deformation on Phase Transformations During Plastic Deformation

PERIODICAL: Fizika metallov i metallovedeniye, 1959, Vol 8, Nr 6, pp 915-921 (USSR)

ABSTRACT: This paper is devoted to questions similar to those published earlier (Ref 11 and 12) and also to the study of the influence of the deformation temperature and original structure on the nature of phase transformations and hardening during deformation. The production types of steel U12 and U10 were used as materials for investigation. Prior to deformation, specimens of 4 x 40 mm cross section were subjected to a series of heat treatments, the conditions of which are indicated in Fig 1, in order to obtain structures with different shapes of cementite. Deformation was carried out by universal non-uniform compression in rings (Ref 13). During deformation in a medium of liquid nitrogen, the specimens, compressed in the ring, were preliminarily cooled in nitrogen in a Dewar flask. As soon as the nitrogen was off the boil, they were

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Influence of the Original Structure and Temperature of Deformation on Phase Transformations During Plastic Deformation

placed in a die accommodated in a retort which was also filled with nitrogen. The retort size was selected so that the specimen should be covered by liquid nitrogen during deformation. Upsetting was carried out in a 60 ton Gagarin press. The degree of deformation (~40%) was determined according to the change in length of the specimen and was between 25 and 27%. The magnetic phase analysis method was chosen as the method of investigation. Determination of the phase composition was carried out according to magnetographs (curves $J_s(t)$), which were constructed with a ballistic magnetometer in a field of 10,000 oersted. The phase composition of the specimens after the above heat treatments is represented by magnetographs in Fig 1. In Fig 2 magnetographs of the same specimen after deformation at room temperature are illustrated. In order to prevent heating of the specimens in the second series of experiments, the deformation was carried out in liquid nitrogen. It has been found that the nature of the mechanism of deformation is preserved at a temperature of -196°C (Fig 3). In Fig 4, magnetographs

Influence of the Original Structure and Temperature of Deformation on Phase Transformations During Plastic Deformation

are shown of the original specimen and of specimens which had been compressed by 46.6 and 86.85% (curves 2, 3 and 4). The magnetograph of the original normalized specimen is represented by curve 1. The increase in the total magnetization of the specimen and in the magnetization in the ferrite portion of the curve $J_s(t)$ (Fig 5) with increase in degree of deformation shows that an ever-increasing quantity of the cementite phase is taken into solution during transformation and that this transformation leads to an increase in the quantity of the α-phase. The curves 1, 2 and 3 in Fig 6 characterize the volume change of ferrite, cementite and χ-carbide, respectively, in relation to degree of deformation. In Fig 7 the change in hardness in relation to degree of deformation is illustrated for steel with granular and plate-like cementite. The work carried out shows that the more distinctly the plate-like shape of cementite is outlined, the more rapidly does its decomposition proceed with formation of χ-carbide and α-iron. As the plate-like

Card 3/5 form decreases, this process becomes less distinct and

Influence of the Original Structure and Temperature of Deformation on Phase Transformations During Plastic Deformation

when the cementite acquires a granular shape, this process does not take place at all. In the light of these facts, it must be assumed that steel which has been annealed so as to exhibit granular cementite is more stable than that annealed to give plate-like cementite. Lowering the deformation temperature does not change the general nature of transformation and the relationship with the structure. As long as the carbide phase $\chi Fe_x C$ forming differs in carbon content from cementite, there is a possibility of diffusion processes as the result of deformation at low temperatures. The mechanism of formation of this carbide is not understood. It originates either from austenite formed due to local heating or as the result of a crystallographic rearrangement of cementite under the action of stress.

Gratitude is expressed to S.V.Vonsovskiy for his interest in the discussion of preliminary experimental results and for his offer to study the nature of phase transformations during deformation in liquid nitrogen. There are 7 figures and 21 references, 18 of which are Soviet,

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SOV/126-8-6-20/24

Influence of the Original Structure and Temperature of Deformation on Phase Transformations During Plastic Deformation

2 English and 1 Japanese.

ASSOCIATION: Gor'kovskiy issledovatel'skiy fiziko-tekhnicheskiy institut (Gor'kiy Physico-Technical Research Institute)

SUBMITTED: January 1, 1959

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82341

18.7500

S/139/60/000/03/038/045
E073/E335

AUTHORS: Sysuyev, Yu.A., Vasil'yeva, Ye.V. and Krasil'nikova, M.A.

TITLE: Influence of Plastic Deformation on Phase Transformations in Silicon and Nickel Steels

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika, 1960, No 3, pp 218 - 222 (USSR)

ABSTRACT: In earlier work of one of the authors and his team (Refs 1-3) it was shown that in simple carbon steels the cementite decomposes during plastic deformation and a metastable carbide χFe_xC forms on the basis of the reaction:

$$Fe_3C \rightarrow \chi Fe_xC + m\,Fe .$$

It is obvious that in steel in which a new phase forms the change in the mechanical properties as a function of the degree of deformation differs from that of steel where there is no such transformation. In this paper, the authors attempt to elucidate the influence of plastic deformation on the changes in the cementite of steels

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S/139/60/000/03/038/045
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Influence of Plastic Deformation on Phase Transformations in Silicon and Nickel Steels

alloyed with Si and Ni. The specimens studied were Ni and Si steels quenched from 1 150 °C and tempered for two hours at 600 °C (silicon steel) and 650 °C (nickel steel), respectively. The chemical analyses of the seven steels used in the experiments are given in a table, p 218. The phase transformations under the effect of plastic deformation were studied by means of a magnetic method. It was found that during plastic deformation steels alloyed with Si and Ni with an initial structure consisting of $\alpha + Fe_3C$ phase transformations may take place. As a result of the deformation, the cementite becomes transformed into an intermediate carbide χFe_xC (the Curie point being 260-265 °C), which becomes unstable on heating above 400 °C and ceases to exist at 600 °C. Comparison of the processes of graphitisation on the example of a Si steel after deformation and quenching confirms the conclusion that there is

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APAYEV, B.A.; SYSUYEV, Yu.A.

Phase transformations during the mechanical testing of ordinary carbon steel. Izv.vys.ucheb.zav.; chern.met. no.5:91-92 '60. (MIRA 13:6)

1. Gor'kovskiy issledovatel'skiy fiziko-tekhnicheskiy institut.
(Steel--Metallography) (Phase rule and equilibrium)

S /139/60/000/005/025/031
E /073/E135

AUTHORS: Sysu'yev, Yu.A., Apayev, B.A., and Balakina, L.M.

TITLE: Investigation of the Phase Composition and of the Fine Crystal Structure of a Plastically Deformed Steel

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika, 1960, No. 5, pp 148-152

TEXT: Since the nature of the transformations in the cementite phase depends on the shape of its particles, it was interesting to elucidate the character of the changes of the fine structure of the α-phase during plastic deformation of steel with cementite particles of various shapes and to what extent the changes in the cementite affect the process of strengthening. Steel У-10 (U 10) was chosen for the investigations after normalisation annealing at 1000 °C and annealing to obtain granular cementite. Specimens of 12 mm dia., 20 mm in length, were deformed to various extents by means of a hydraulic press. To determine the phase composition of the steel after plastic deformation, magnetometric investigations were carried out. From deformed templates specimens were cut (along the diameter) with a length to cross-section ratio equal or larger than 4. From the specimens magnetograms $I_s,(t)$ were plotted by

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S/139/60/000/005/025/031
E073/E135

Investigation of the Phase Composition and of the Fine Crystal Structure of a Plastically Deformed Steel

means of a ballistic circuit magnetometer in fields of 10 000 Oe. For determining the quantitative ratio of the phases the sections of the magnetograms of the phase components were extrapolated to room temperature, using the approximation of Heisenberg (Ref. 12). To detect the nature of the dependence of the stressed state and the crystal structure on the degree of deformation, X-ray measurements were made by means of iron radiation with an ion tube after removing the surface layer by etching. For the investigations the lines (220) of the α-phase and (222) of copper were used. Photometering of all the X-ray diffraction patterns was effected by means of a microphotometer with an amplification of 9 X. The results show that plastic deformation of steels with lamellar and granular cementite leads to differing results. The basic difference consists in the fact that phase transformations are caused in steel with lamellar cementite, whilst in the case of granular cementite this has not been observed. The character of the changes of the fine structure as a result of plastic deformation of steel U 10 in both states is qualitatively equal.

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S/139/60/000/005/025/031
E073/E135

Investigation of the Phase Composition and of the Fine Crystal Structure of a Plastically Deformed Steel

A high level of type II distortions and the smaller size of blocks in the normalized steel can probably be explained by a change in the coherent bond between the α-phase and the cementite as a result of phase reconstruction in the latter. In a number of papers, the change in strength is attributed to changes in the fine structure of the phase components. On the example of single phase systems and satisfactorily annealed multiphase alloys, changes in type II stresses and in the size of blocks have indeed been found to determine the strengthening during plastic deformation (Refs 4, 16, 17). The experimental data given in the present paper indicate that this analogy also applies to steel with granular cementite. Since during deformation of such structures the cementite phase is not subjected to any changes, the changes in hardness can only be due to the state of the α-phase. The higher hardness of the normalised steel both in the initial state and after plastic deformation can also be attributed to the difference in the fine structure. The change in the fine structure is similar for both states of the steel;

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S/139/60/000/005/025/031
E073/E135

Investigation of the Phase Composition and of the Fine Crystal Structure of a Plastically Deformed Steel

however, the character of the strengthening differs. This indicates that the changes in the fine structure of the α-phase do not reflect the law of strengthening during plastic deformation of steel with lamellar cementite.
There are 5 figures and 17 references: 11 Soviet, 5 English and 1 Japanese.

ASSOCIATION: Issledovatel'skiy fiziko-tekhnicheskiy institut Gor'kovskogo gosuniversiteta imeni N.I. Lobachevskogo (Physics and Engineering Research Institute, Gor'kiy State University imeni N.I. Lobachevskiy)

SUBMITTED: December 19, 1959

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S/148/60/000/010/011/018
A161/A030

AUTHORS: Sysuyev, Yu.A.; Myasnikov, V.G.

TITLE: Stability of Austenite in Steel Which Has Been Heated After Deformation

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Chernaya metallurgiya, 1960, No. 10, pp. 122 - 125

TEXT: The purpose of the subject investigation was to find the decomposition temperature of residual austenite in Cr and Mn containing steel after deformation. Two steel grades were studied: Х8 (Kh8), with 0.98% C and 7.26% Cr, and Г5 (G5) with 0.86% C and 4.73% Mn. Billets of 4 mm diameter were worked into 100% austenite, ground to powder, and screened; portions of 3.5 g powder were pressed into a pipe from molybdenum glass; titanium was put into the tube to prevent oxidation, and an asbestos plug between titanium and the steel sample. Air was evacuated from the pipe, and the end sealed. Decomposition of initial austenite in both grades started at 560°C. Magnetic measurements proved that the quantity of residual austenite was about 50%. The behavior of the initial and deformed austenite in heating was different: non-deformed and hardened austenite

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decomposed at t > 550°, and the deformed austenite transformed in two separate temperature ranges, 175 - 280°C and at >500°C. Decreased heat resistance of residual austenite after deformation appears to be caused by redistribution of the alloying elements in the metal under the effect of applied and residual stresses with the formation of austenite with varying composition. The redistribution in chromium and manganese steel was different despite identical deformation. Chromium steel contained two austenite kinds: high-alloyed austenite similar to austenite before deformation, and low-alloyed of the type forming in plain carbon steel and decomposing at the 200 - 280°C range. Austenite in manganese steel seems to have a gradually changing composition and decomposes in a wide temperature range between 200 and 650°. There are 4 figures and 6 Soviet references.

ASSOCIATION: Gor'kovskiy issledovatel'skiy fiziko-tekhnicheskiy institut (Gor'kiy Physics and Technics Research Institute)

SUBMITTED: November 5, 1959

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S/148/60/000/010/011/018
A161/A030

Stability of Austenite in Steel Which Has Been Heated After Deformation

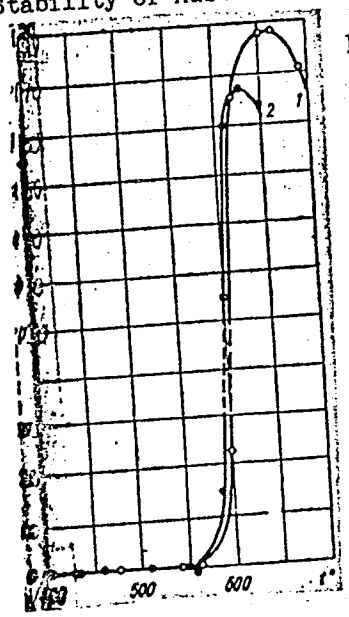

Figure 1: Curves of austenite decomposition in hardened sample being heated. 1 - Kh8 steel; 2 - G5 steel.

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Stability of Austenite in Steel Which Has Been Heated After Deformation

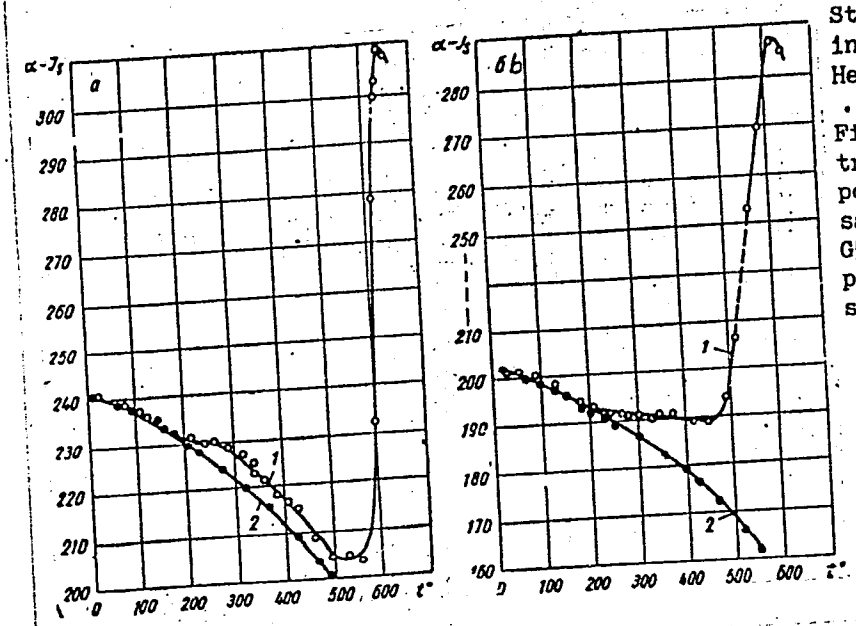

Figure 3: Curves illustrating austenite decomposition in deformed samples. a - Kh8; b - G5 steel. 1 - the sample; 2 - the reference specimen.

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Stability of Austenite in Steel Which Has Been Heated After Deformation

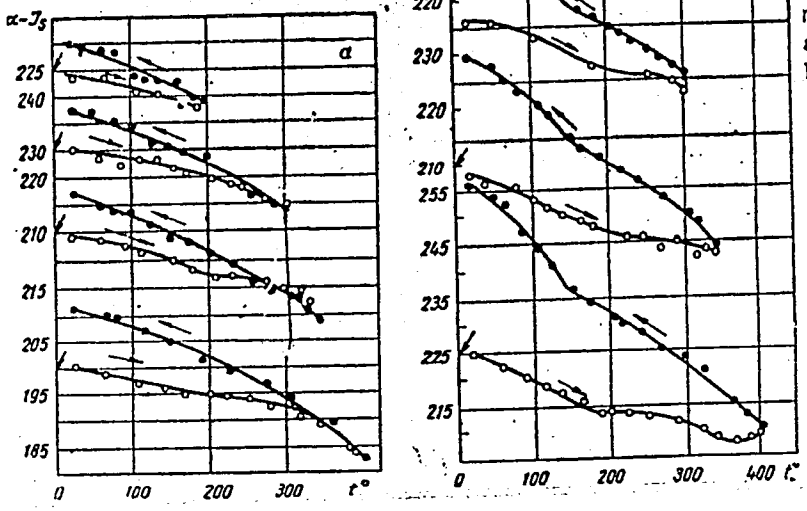

Figure 4: Variations of magnetization in heating and cooling. a - Kh8; b - G5.

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S/126/60/010/005/021/030
E111/E452

AUTHORS: Apayev, B.A. and Sysuyev, Yu.A.

TITLE: Influence of Plastic Deformation on Changes in the Phase Composition of Steels Alloyed with Cr and Mn

PERIODICAL: Fizika metallov i metallovedeniye, 1960, Vol.10, No.5, pp.767-771

TEXT: The authors have previously shown (Ref.1,2) that plastic deformation of carbon steels produces transformation of the cementite phase. The object of the present work was to find the results of plastic deformation of alloyed cementite. Types ШХ15 (ShKh15) and 10Г2 (10G12) (1.01% C and 1.11% Mn) steel were used. After suitable heat treatment to give the required alloying of cementite, blanks were rolled on a laboratory mill and made into test pieces 2.4 ± 0.01 mm in diameter and 36 ± 0.1 mm long. Saturation magnetization was measured in a field of 10000 Oersted at temperatures up to 350°C: results for ShKh15 and 10G12 are plotted in the left hand graphs in Fig.1 and 2 respectively for the undeformed, heat treated state; the corresponding plots for the deformed steels being shown in the right-hand graphs. The work shows that plastic deformation of tempered steel alloyed with

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Influence of Plastic Deformation on Changes in the Phase Composition of Steels Alloyed with Cr and Mn

chromium and manganese leads to phase-composition changes depending on the initial structure. If this consists of unalloyed cementite and alpha phase the phase change is similar to that in carbon steels (Ref.2): deformation produces redistribution of iron and carbon, giving a new iron carbide. Deformation of alloyed cementite leads to redistribution of chromium and manganese within the cementite phase. Deformation of structures formed by tempering in the narrow temperature range corresponding to initial stages of alloying, or after prolonged tempering at 650°C, does not produce phase composition changes. From Apayev's previous work (Ref.8) the authors conclude that the alloying-element redistribution phase takes place in two stages, this providing an explanation for the different deformation effects obtained. Cementite grain shape can not be a factor. There are 2 figures and 8 references: 7 Soviet and 1 Non-Soviet.

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S/126/60/010/005/021/030
E111/E452

Influence of Plastic Deformation on Changes in the Phase Composition of Steels Alloyed with Cr and Mn

ASSOCIATION: Gor'kovskiy issledovatel'skiy fiziko-tekhnicheskiy institut (Gor'kiy Physical-Technical Research Institute)

SIBMITTED: December 17, 1959

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S/126/60/010/006/018/022
E111/E452

AUTHOR: Sysuyev, Yu.A.

TITLE: Tempering Deformed Steels Alloyed With Cr and Mn

PERIODICAL: Fizika metallov i metallovedeniye, 1960, Vol.10, No.6, pp.907-911

TEXT: This is a continuation of the author's previous work (with B.A.Apayev, Ref.1) which showed that deformation of steels alloyed with Cr and Mn can produce changes in the cementite phase. The object of the present work was to find how such deformed structures change on heating; 24% deformed specimens of type 10Г12 (10G12) steel (1.01% C, 1.11% Mn) and ШХ15 (ShKh15) steel were tempered at 300 to 650 - 700°C at 25 to 50°C intervals. After each tempering, curves of saturation magnetization vs temperatures were taken in a field of 10000 oersted; on some specimens coercive force and hardness measurements were also made. Fig.1, 2 and 3 show the magnetic curves, the left hand graphs relating to type 10G12 and the right hand to type ShKh15 steels (Fig.2 relates only to the former). Curves 1 and 2 relate to hardened and tempered specimens before and after deformation respectively, the others to specimens tempered for 30 min after deformation (increasing curve numbers relate to

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Tempering Deformed Steels Alloyed With Cr and Mn

increasing tempering temperatures). In Fig.4, coercive force is shown as a function of tempering temperature for 10G12 steel for a structure deformed after hardening and tempering at 420°C for 1 hour (Curve 1) and for that obtained by deformation after hardening and tempering at 650°C for 7 hours (curve 2). Curve 1 has a minimum at about 400 and a maximum at about 550°C; Curve 2 falls continuously with increasing temperature. In Fig.5, giving hardness as a function of tempering temperature, Curves 1 to 4 relate to deformation after hardening and tempering for 1 hour at 420, 475, 575 and 650°C (7 hours) respectively. The author concludes that deformation produces several peculiarities in the behaviour of the cementite phase when the steels studied are heated. Changes in cementite depend to a considerable extent on the initial structure of the steel and sometimes on the nature of the alloying element. In the temperature range of these changes breakdown of blocks of the alpha-phase mosaic occurs, reducing loss of hardness up to about 550 to 600°C. There are 5 figures and 8 references: 7 Soviet and 1 non-Soviet.

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E111/E452

Tempering Deformed Steels Alloyed With Cr and Mn

ASSOCIATION: Gor'kovskiy issledovatel'skiy fiziko-tekhnicheskiy institut (Gor'kiy Physicotechnical Research Institute)

SUBMITTED: March 23, 1960

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S/148/61/000/012/007/009
E193/E583

AUTHORS: Apayev, B.A., Sysuyev, Yu.A. and Balakina, L.M.

TITLE: The effect of carbide transformations on the variation of structure and properties of cold-worked and hardened carbon steels during tempering

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Chernaya metallurgiya, no. 12, 1961, 117 - 124

TEXT: Other workers (Ref. 1: V.K. Babich, K.F.Starodubov - IVUZ, Chernaya metallurgiya, 1958, no.2; Ref. 2: A.P.Gulyayev, N.I. Burova - Metallovedeniye i obrabotka metallov, no. 1, 1955) who have studied changes occurring during tempering of steel at temperatures above 300 °C have found that similar changes take place in both cold-worked and hardened specimens. Starting from the assumption that plastic deformation does not bring about any phase transformations, these workers concluded that the changes observed during tempering could not be caused by transformation of the carbide phases. Results of more recent studies of this problem (Ref. 3: B.A. Apayev, FMM, v.4, no.2, 1957; Ref. 4: B.A. Apayev, Yu.A. Sysuyev - Nauchnyye doklady vysshey shkoly,

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E193/E383

The effect of ....

Metallurgiya, no. 2, 1958; Ref. 5: B.A. Apayev, Yu.A. Syutayev FMM, v.8, no.6, 1959) indicate, however, that this conclusion is not quite correct. It has been found that plastic deformation of steel with lamellar cementite is accompanied by the formation of carbide χFe_2C and by an increase in the proportion of the α-phase; as the proportion of lamellar cementite decreases, the plastic deformation-induced transformation diminishes and ceases completely when granular cementite only is present in a given steel. The behaviour of cold-worked steel during tempering should therefore depend on the form of cementite it contains and the object of the present investigation was to check the validity of this postulate. The experiments were carried out on specimens of steel Y10 (U10), annealed under conditions which ensured the formation of granular cementite, normalized (i.e. containing lamellar cementite) and hardened. The annealed and normalized specimens were cold-worked (by forging and drawing) after which both the cold-worked and hardened (quenched) specimens were tempered for 30 min at progressively higher temperatures in the

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The effect of ....

300 - 700 °C range. After each tempering operation, the constitution of the specimen was determined by a magnetometric method, its coercive force H_c was measured to provide information on the changes in the state of stress, the size of blocks in the α-phase grains was determined and the Rockwell hardness R_A was measured. The results can be summarized as follows. No change in the constitution during tempering was observed in cold-worked specimens of steel containing granular cementite. In contrast, the constitution of cold-worked steel containing lamellar cementite changed during tempering in a manner similar to that observed in hardened specimens. This is demonstrated by the results presented in Fig. 1, where the proportion (p_v, %) of the α-phase (Curves 1), cementite (Curves 2) and χ-carbide (Curves 3) is plotted against the tempering temperature (°C), Curves a and b relating, respectively, to plastically-deformed (50% reduction) and hardened steel specimens. The temperature range at which the transformation of the χ-carbide took place during tempering of cold-worked

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The effect of ....

steel (with lamellar cementite) depended on the degree of preliminary deformation, being shifted towards the lower temperatures in heavily deformed material. The variation of other properties is illustrated in Fig. 3, where the coercive force (H_c, erg - graph a) and hardness (R_A - graph 6) are plotted against the tempering temperature (^oC), Curves 1-3 relating, respectively, to hardened specimens, cold-worked steel with lamellar cementite and cold-worked specimens of steel with granular cementite. The results described above confirmed the findings reported in Ref. 1 on the similar nature of changes occurring during annealing in the properties of hardened and cold-worked steel with lamellar cementite and showed that this similarity was absent when the cold-worked specimens contained granular cementite. In the same way, the form of the cementite affected the changes in the width B, of X-ray diffraction lines of the α-phase, as illustrated in Fig. 4, where B(mm) is plotted against the tempering temperature (^oC), Curves 1 and 2 relating, respectively, to deformed specimens of steel with lamellar and granular cementite. On the other hand neither the

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The effect of ....

variation in the X-ray diffraction-lines width of the α-phase nor the H_c curve (Fig. 3a) obtained for the cold-worked specimens of steel with granular cementite resembled those obtained for hardened specimens. The cause of these differences and similarities becomes clear if the tempering-induced changes in the constitution of cold-worked and hardened specimens are compared. As can be seen in Figs 1, 3a and 4, anomalous variation in the coercive force and the X-ray diffraction-lines width takes place in the same temperature range in which the χ-carbide undergoes a transformation. In cold-worked steel with granular cementite in which no phase-transformation occurs, no anomalies in the variation of these two properties were observed. Consequently, the changes in the fine structure which occur during tempering at temperatures above 350 °C and which cause anomalous variation of H_c and B in hardened and cold-worked steel with lamellar cementite are associated with the

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