S/128/61/000/002/006/009
A054/A133

AUTHORS: Essen, M.A.; Tavadze, F.I.

TITLE: On the solubility of magnesium in iron

PERIODICAL: Liteynoye proizvodstvo, no. 2, 1961, 31 - 34

TEXT: Tests were carried out to study the diffusion of magnesium in iron and to establish the effect of the iron composition on the transformation of nodular graphite. Magnesium was used as a reagent, the test ladles were made of Ст. 30 (St. 30) and У-10А (U-10A) steel, while 9 different kinds of iron were tested containing silicium in the range of 0.72 - 5.25%. It was found that a carbon content of 2.61 - 4.67%, an S-content of 0.015 - 0.225% and a manganese content of 0.29 - 0.7% have no marked effect on the transformation of nodular graphite, whereas the effect of the structure of the metal base and that of the silicon content are considerable. To compare the behavior of the specimens, two of them were each time put in the test ladles in a rising order of their silicium content. The structural analysis of the specimens shows that in specimens with a low silicium content the iron is highly saturated with magnesium. Upon increasing the silicium content from 0.72 to 5.25% the amount of magnesium diffused decreased

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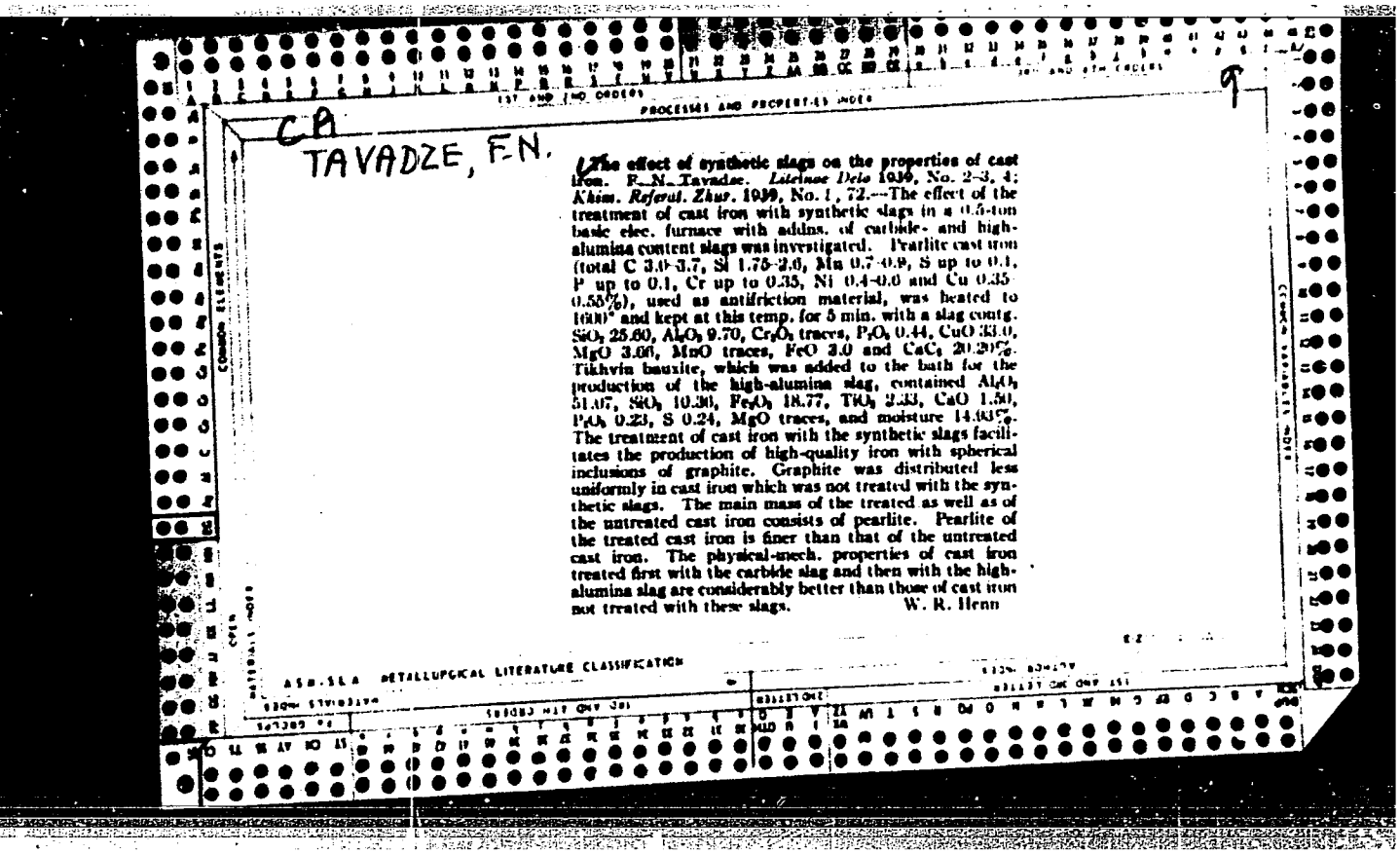
On the solubility of magnesium in iron

from 3 to 1% in the outer layers of the specimen. Moreover, it was found that besides silicium, the concentration of magnesium in the peripheral layers only depends on the carbon content of the iron. The tests (at a temperature of 1,100°C for about 15 h) established the relationship between the change in the shape of graphite inclusions and the magnesium and silicium content of iron. Optimum results with regard to the transformation of graphite inclusions into nodules were obtained for a magnesium content of 1.2 - 1.8% and a silicium content of 2 - 3.8%. Tests carried out at various holding times showed that the time also has an effect on graphite transformation. Tests under high pressure, in order to intensify the diffusion process, produced in 5 hours' holding time a composition of 2.22% C, 1.27% Mg, 3.57% Si with flake-shaped graphite, whereas a holding time of 20 h resulted in a composition of 0.93% C, 1.59% Mg and 2.46% Si with nodular graphite. When the magnesium content of iron is raised above the optimum value, the graphite inclusions do not transform. This must be put down to a deceleration of carbon diffusion, caused by a high magnesium content. Upon increasing the silicium content, the magnesium concentration of the specimen decreases, starting at the peripheral layers and becoming more and more pronounced towards the centre. It may, therefore, be assumed, that the optimum ratio between magnesium and silicium is attained, in the first place, in the core of the specimen, promoting the dif-

On the solubility of magnesium in iron

fusion of carbon to such an extent that the carbon atoms can carry out the transformation caused by magnesium. The optimum content of magnesium results in the transformation of graphite inclusions into nodules. Upon increasing the silicium content, three zones are formed in the specimen: an outer layer with excess magnesium content, a second layer with optimum magnesium content and a third layer where the magnesium content is below the optimum. Upon a further increase in the silicium content, only two layers are formed: a peripheral layer with optimum magnesium content with small and medium-size graphite nodules and an inner layer with compact film and nodule graphite. A further increase in silicium content, however, results in the rapid deterioration of the graphite shape. Part of the tests were carried out in the Tula mekhanicheskiy institut im. E.P. Rikman (Tula Mechanical Institute im. E.P. Rikman). There are 9 figures and 9 Soviet-bloc references.



CA

TAVADZE, F.N.

The effect of synthetic slags on the properties of cast iron. F. N. Tavadze. *Liteinoe Delo* 1939, No. 2-3, 4; *Khim. Referat. Zhur.* 1939, No. 1, 72.—The effect of the treatment of cast iron with synthetic slags in a 0.5-ton basic elec. furnace with addns. of carbide- and high-alumina content slags was investigated. Pearlite cast iron (total C 3.0-3.7, Si 1.75-2.0, Mn 0.7-0.9, S up to 0.1, P up to 0.1, Cr up to 0.35, Ni 0.4-0.6 and Cu 0.35-0.55%), used as antifriction material, was heated to 1600° and kept at this temp. for 5 min. with a slag contg. SiO_2 25.60, Al_2O_3 9.70, Cr_2O_3 traces, P_2O_5 0.44, CuO 33.0, MgO 3.06, MnO traces, FeO 3.0 and CaC_2 20.20%. Tikhvin bauxite, which was added to the bath for the production of the high-alumina slag, contained Al_2O_3 51.07, SiO_2 10.30, Fe_2O_3 18.77, TiO_2 2.33, CaO 1.50, P_2O_5 0.23, S 0.24, MgO traces, and moisture 14.83%. The treatment of cast iron with the synthetic slags facilitates the production of high-quality iron with spherical inclusions of graphite. Graphite was distributed less uniformly in cast iron which was not treated with the synthetic slags. The main mass of the treated as well as of the untreated cast iron consists of pearlite. Pearlite of the treated cast iron is finer than that of the untreated cast iron. The physical-mech. properties of cast iron treated first with the carbide slag and then with the high-alumina slag are considerably better than those of cast iron not treated with these slags. W. R. Henn

TAVADZE, F. N.

TAVADZE, F.N.; TSKITISHVILI, M.D.

High alloy malleable manganese cast iron [in Georgian with summary in Russian]. Trudy Inst. met. i gor. dela AN Gruz. SSR 2:101-122 '49. (MIRA 11:1)

(Iron-manganese alloys)

TAVADZE, F. N. -

27120. TAVADZE, F. N. - SHENGELI YA N. A. - O Pri rode allotrode allotrop i cheski kh prevrasheni y zheleza. Trudy (Gruz. Poli tekhn. i n-t i m. ki rova), No 18, 1949 c. 81-98-Rezyume na gruz. Yaz.- Bi. Bll Ogr: 19 Nazv.

SO: Letopis' Zhurnal'nykh Statey, Vol. 36, 1949

AGLADZE, R.I.; MOKHOV, V.M.; TOPCHIASHVILI, L.I.; GVARAMADZE, M.D.; TAVADZE, F.N., redaktor; NINUA, K.V., tekhnicheskiy redaktor.

[Alloys of manganese with copper, nickel and zinc; a collection of papers] Splavy margantsa s med'iu, nikelem i tsinkom; sbornik rabot. Tbilisi, Izd-vo Akademii nauk Gruzinskoi SSR, 1954. 121 p. (MLRA 9:5)
(Manganese alloys)

TAVADZE, F.N.; DOLIASHVILI, K.A.

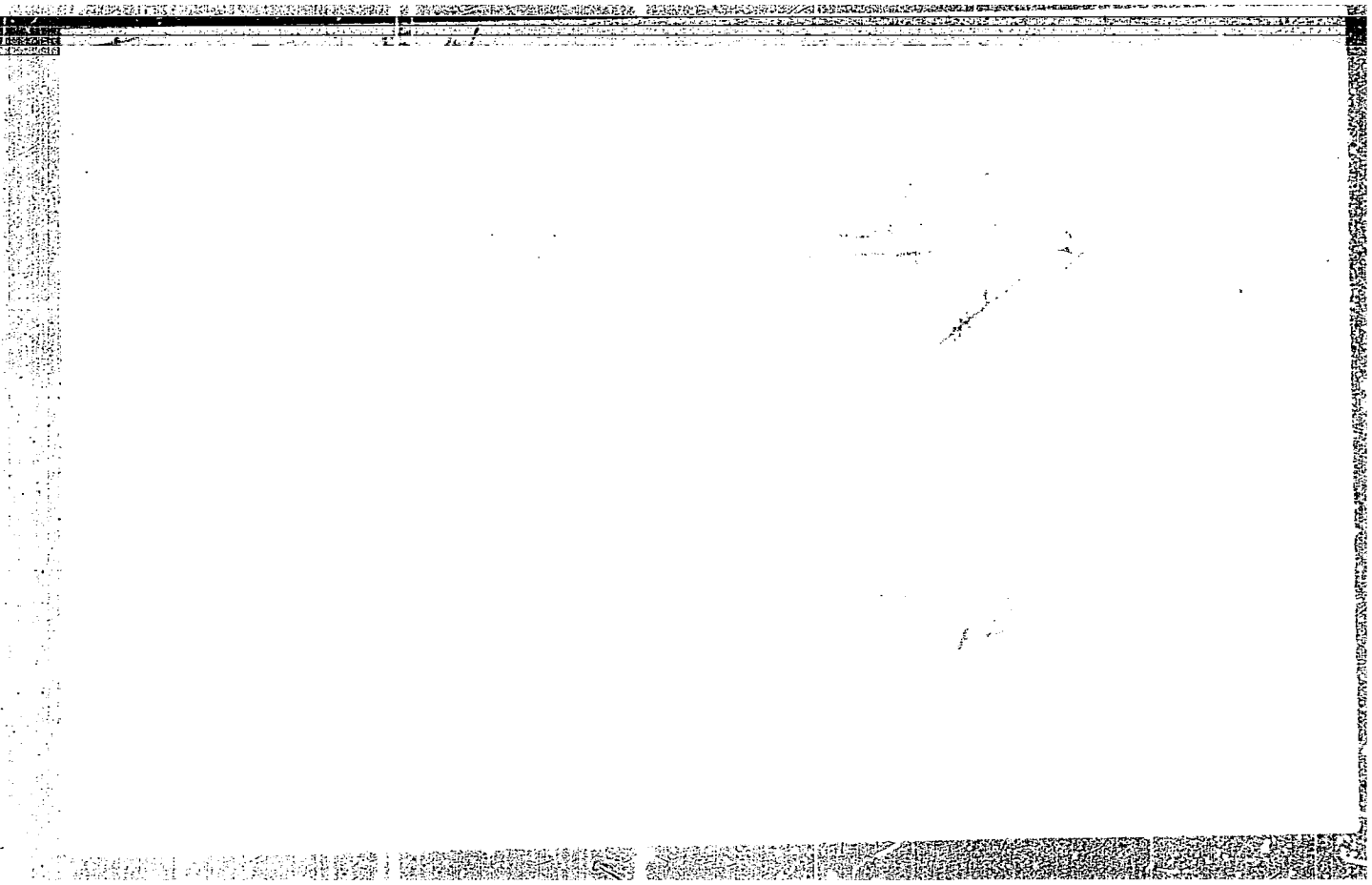
Decomposition of manganese-carbon alloys. Soob. AN Gruz. SSR 15 no.5:275-279 '54. (MLRA 8:6)

1. Akademiya nauk Gruzinskoy SSR, Institut metalla i gornogo dela, Tbilisi. Predstavleno chlenom-korrespondentom Akademii G.K. Gelevanishvili.

(Manganese alloys)

TAVADZE, F.N.; DZHAPARIDZE, P.N.

On the article of M.E. Posin and A.M. Ginstling "Philosophical principles of the "classical" theory of "solid phase" processes." Zhur.prikl.khim. 27 no.9:992-995 S '54. (MLRA 7:10)
(Solids) (Posin, M.E.) (Ginstling, P.N.)

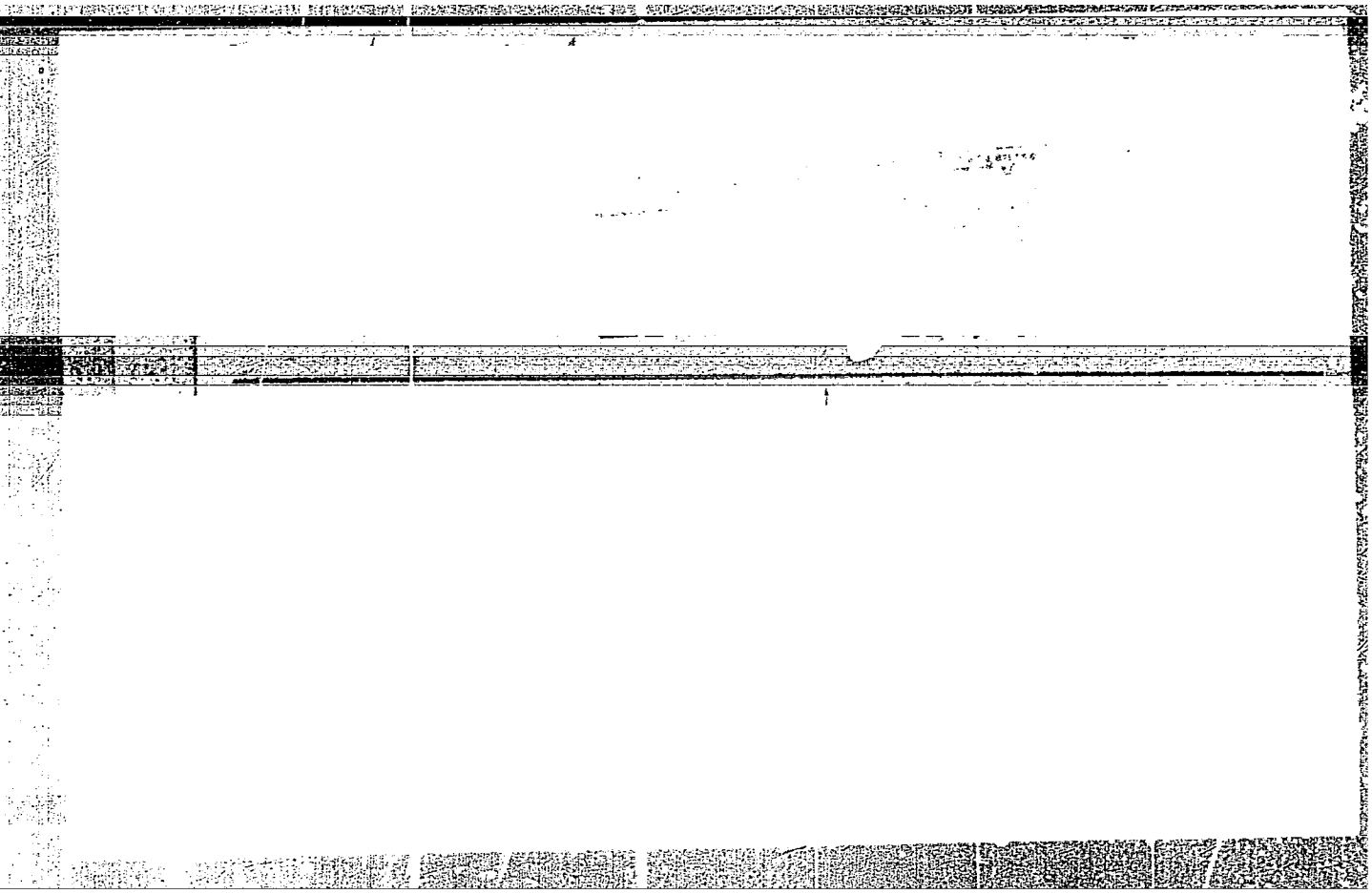


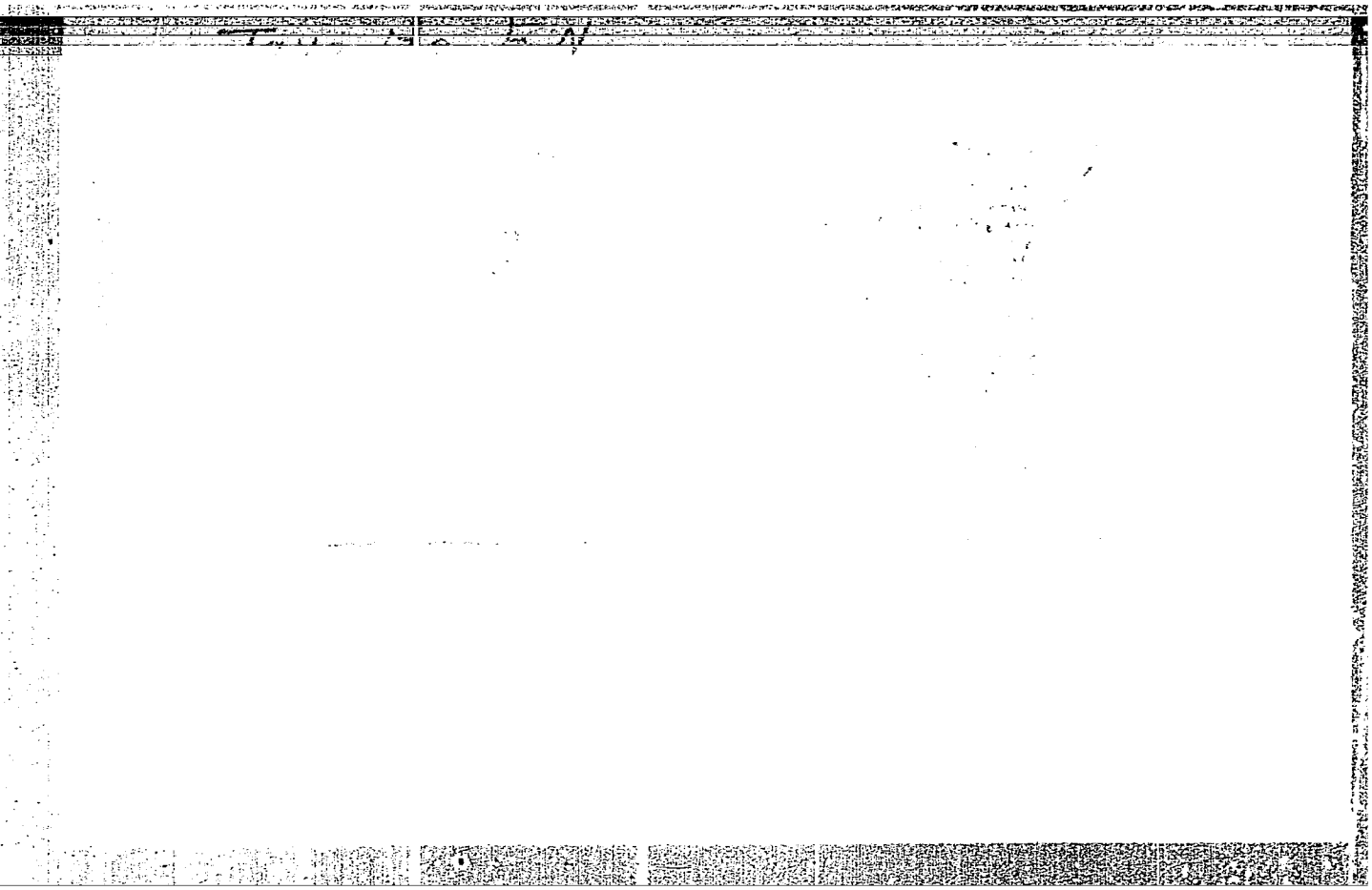
APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755120013-6"

TAVADZE, F.N.

Influence of vacuum melting on growth of cast iron. F. N. Tavadze and T. A. Bairamashvili. *Liteinoe Proizvod*

parently connected with the changes in graphite structure





APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755120013-6"

TAVADZE, F. N.

USSR/Corrosion - Protection From Corrosion. J.

Abs Jour : Referat Zhur - Khimiya, No 9, 1957, 33151

Author : Tavadze, F.N., Mandzhgaladze, S.N.

Inst : Institute of Metals and Mining, Academy of Sciences Georgian SSR

Title : Determination of Irreversible Electrode Potentials of Metals in Tbilisi Mineral Waters.

Orig Pub : Tr. In-ta metalla i gorn. dela. AN GurzSSR, 1956, 7, 195-213

Abstract : A determination was made of the irreversible electrode potentials (IEP) of 14 metals in Tbilisi mineral waters of 2 drilled wells the composition of which includes up to 0.544 g/liter salts, N_2, CH_4, CO_2, H_2S. On the basis of the nature of the potential versus time curves the metals are subdivided in 3 groups:

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USSR/Corrosion - Protection From Corrosion. J.

Abs Jour : Ref Zhur - Khimiya, No 9, 1957, 33151

1) Fe, Cu, brass, IX13 steel, Zn -- acquire more negative potentials, 2) IX18N9T and EI533 steel, crude iron grey cast and sheet -- the potentials undergo almost no change with time; 3) Sn, Al, AMTs alloy -- acquire more positive potentials. IEP depended on composition of mineral water and the conditions of determination, in flowing water the IEP are more negative. Concerning the nature of IEP the assumption is made that Fe, stainless steels, Pb, Sn, Al, AMTs alloy, constituted, under the conditions of the experiment, complex electrodes of the film-pore type; Zn -- crude iron -- electrodes of the type metal-admixture of metal. The low value of the potential of Cu is attributed to formation of electrode of second kind -- Cu/CuS. Data are presented concerning the stability to corrosion of the investigated metals, after remaining for 6 months in the water of the above-stated wells.

Card 2/2

TAVADZE, F. N.

USSR/Corrosion - Protection From Corrosion. J.

Abs Jour : Referat Zhur - Khimiya, No 9, 1957, 33154

Author : Tavadze, F.N., Mandzhgaladze, S.N.

Inst : Institute of Metals and Mining, Academy of Sciences Georgian SSR

Title : Study of Polarisation of Metals in Tbilisi Mineral Waters

Orig Pub : Tr. In-ta metalla i gorn. dela AN GruzSSR, 1956, 7, 215-227

Abstract : Curves were recorded of anodic and cathodic polarization of 14 technical metals: S-3 steel, cast grey crude iron, crude sheet iron, stainless steels of brands IX13, 1Kh18N9T, EI533, M3 Cu, L68 brass, Al, of alloy AMTsl, ZnTs2, NiHI, PbC2, SnO2 in the mineral waters of 2 Trilisi springs (No 6 and No 7) having slightly different saline composition (0.458-0.544 g/liter) and containing H_2S, CO_2, and Cl-ions. Temperature of the springs 27-42°, pH value

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USSR/Corrosion - Protection From Corrosion. J.

Abs Jour : Ref Zhur - Khimiya, No 9, 1957, 33154

7.2-8.2. The investigated metals, with a few exceptions showed slight anodic polarization. The cathodic process occurs more readily in the mineral water of spring No 6, having a somewhat higher content of H_2S, CO_2 and Cl-ions. In the opinion of the authors the corrosion of most of the investigated metals in the mineral waters of spring No 6 and No 7 takes place under cathodic limitation by the stage of O_2 ionization.

Card 2/2

TAVADZE, T.N.

KAKUSHADZE, T.I.; TAVADZE, T.N., professor, redaktor; PATARAIA, L., redaktor izdatel'stva

[Transitional metals and alloys] Perekhodnye metally i splavy. Tbilisi, Izd-vo nauchno-metodicheskogo kabineta, 1957. 241 p. (MLRA 10:9)

1. Chlen-korrespondent Akademii nauk Gruzinskoy SSR (for Tavadze) (Metals) (Alloys)

KASUMZADE, Nadir Gadzhi Yusuf ogly, dotsent, kand.tekhn.nauk; TAVADZE, F.N., prof., doktor tekhn.nauk, red.; GONCHAROV, I.A., red.izd-va.

[Modification of the structure and properties of steel under the influence of physical and chemical factors active in casting] Izmenenie struktury i svoistv stali pod vliianiem fiziko-khimicheskikh faktorov, deistvuiushchikh pri razlivke. Baku, Azerbaidzhanskoe gos. izd-vo neft.i nauchno-tekhn.lit-ry, 1957. 363 p. (MIRA 11:1)

1. Chlen-korrespondent AN Gruzinskoy SSR (for Tavadze).
(Steel--Metallography)

137-58-2-4019

TAVADZE, F.N.

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 2, p 251 (USSR)

AUTHORS: Tavadze, F.N., Bayramashvili, I.A.

TITLE: The Effect of Low Pressures on the Graphitization of Gray Iron (Vliyaniye nizkikh davleniy na grafitizatsiyu serogo chuguna)

PERIODICAL: Tr. Gruz. politekhn. in-t, 1957, Nr 3 (51), pp 97-105

ABSTRACT: The graphitization rate at low residual pressures exceeds that in atmospheric air because of the elimination of the hydrogen. After a certain exposure time the growth curve for air intersects the growth curve for vacuum and goes on upward. This is attributed to the fact that in the case of long exposures the oxidation process starts to predominate over the graphitization process.

A.S.

1. Iron--Graphitization--Pressure factors

Card 1/1

137-58-4-7737

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 4, p 198 (USSR)

AUTHORS: Tavadze, F. N., Galinkin, B. Ye.

TITLE: Effect of Heat Treatment on the Corrosion Resistance of Iron (Vliyaniye termicheskoy obrabotki na korrozionnuyu stoykost' chuguna)

PERIODICAL: Tr. Gruz. politekhn. in-t, 1957, Nr 3 (51), pp 123-127

ABSTRACT: The results of a study of the effect of heat treatment (HT) in the 200-700°C temperature interval on the resistance of iron to corrosion (CR) are presented. Corrosion tests were made on gray iron with lamellar graphite, high-strength iron with spheroidal graphite, sheet irons with flake graphite, without Cu and with 0.25 percent Cu. The tests were run in 5 percent HCl, HNO_3, NaOH, and NaCl solutions (with intermittent and constant immersion) and under atmospheric conditions. It was found that under full immersion in NaOH and NaCl solutions, and under atmospheric conditions, the CR of iron is independent of HT. HT also fails to affect the CR of iron containing Cu in all mediums. HT significantly affects the CR of iron only in solutions of acids and in NaCl (on alternating immersion and withdrawal). The CR of iron under these conditions

Card 1/2

137-58-4-7737

Effect of Heat Treatment on the Corrosion Resistance of Iron

increases as the tempering temperature or the isothermic treatment temperature of iron is increased to 450°, regardless of the form and nature of the graphite inclusions. Further increase in temperature of HT in the 500-700° interval induces a reduction in the CR of iron. Irons of martensitic structure have the highest CR.

1. Iron--Corrosion--Temperature factors

M. K.

Card 2/2

TAVADZE, F. N.

137-58-5-10527

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 5, p 235 (USSR)

AUTHORS: Tavadze, F.N., Doliashvili, K.A.

TITLE: Microstructure and Certain Properties of Alloys of the FeSi-MnSi-C System (Mikrostruktura i nekotoryye svoystva splavov sistemy FeSi-MnSi-C)

PERIODICAL: Soobshch. AN GruzSSSR, 1957, Vol 18, Nr 2, pp 211-216 (in Georgian)

ABSTRACT: To prepare alloys of the MnSi-FeSi system, their base components - MnSi and FeSi - were smelted first, employing electrolytic Mn, Armco Fe and metallic Si. This was done under a layer of cryolite in a high-frequency furnace, using corundum crucibles. The specimens for measurement of resistivity were made by taking up liquid metal by suction into 3 or 4 mm ceramic tubes preheated to 800°C. The alloys were subjected to stepped annealing at 1000-500° for 315 hours. Alloys of the MnSi-FeSi-C ternary system were obtained by smelting alloys of the MnSi-FeSi system under a layer of powdered graphite. It was found that alloys of the MnSi-FeSi system form a continuous series of solid solutions. The solubility of C in alloys of the MnSi-FeSi system is $\leqslant 0.08\%$. The microstructures of

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Inst. Metals + Mining Acad Sci Geo SSR

Microstructure and Certain (cont.)

alloys of the MnSi-FeSi-C system are analogous to the microstructures of alloys of the MnSi-Fe-Si system. The identical nature of the changes in the resistivity and microhardness curves of solid solutions of carburized and non-carburized alloys testifies to the fact that the C content of the solid solution is insignificant.

Z. Kh.

1. Alloys--Properties 2. Alloys--Microstructure

Card 2/2

TAVADZE, F.N., otv. red.; AGLADZE, R.I., red.; ARCHVADZE, Sh.R., red.; VACHNADZE, N.D., red.; GVELESIANI, G.G., red.; GUDZHEDZHIANI, B.I., red.; DZHANELIDZE, A.I., red.; DZOTSENIDZE, G.S., red.; DURMISHIDZE, S.V., red.; KETSKHOVELI, N.N., red.; MIKELADZE, I.S., red.; RUBINSHTEYN, M.M., red.; TVALCHRELIDZE, A.A., red.,[deceased],; TSITSISHVILI, G.V., red.; SHENGELIYA, P.G., red.; FEODOT'YEV, K.M., red. izd-va,; GUSEVA, A.P., tekhn. red.

[Natural resources of the Georgian S.S.R.] Prirodnye resursy Gruzinskoi SSR. Moskva. Vol. 1.[Metalliferous minerals] Metallicheskie poleznye iskopaemye. 1958. 230 p. (MIRA 11:11)

1. Akademiya nauk Gruzinskoy SSR, Tiflis. Sovet po izucheniyu proizvoditel'nykh sil. 2. Chlen-korrespondent AN Gruz. SSR (for Tavadze). (Georgia--Ore deposits)

SOV/30-58-9-8/51

AUTHOR: Tavadze, F. N., Corresponding Member, Academy of Sciences, Gruzinskaya SSR

TITLE: Application of Chemical and Metallographical Methods to the Investigation of Archaeologic Monuments (Primeneniye khimicheskikh i metallograficheskikh metodov k izucheniyu arkheologicheskikh pamyatnikov) Manufacture of Metallurgic Products in the Territory of **Georgia** in Antiquity (O proizvodstve metallurgicheskikh izdeliy na territorii Gruzii v drevnosti)

PERIODICAL: Vestnik Akademii nauk SSSR, 1958, Nr 9, pp. 53-56 (USSR)

ABSTRACT: Chemical and metallographical investigations of many metal products were carried out in the Institut metallurgii Akademii nauk Gruzinskoy SSR (Institute of Metallurgy of the AS **Georgian** SSR); these metal products were found in archaeological excavations in the territory of **Georgia** . These investigations render possible to trace all stages of development of metallurgic manufacturing in the ancient epochs of the history of **Georgia** . The epoch of bronze metallurgy in **Georgia**

Card 1/4

Application of Chemical and Metallographical Methods to the Investigation of Archaeologic Monuments. Manufacture of Metallurgic Products in the Territory of **Georgia** in Antiquity

was preceded by a period in which native copper was used, from which in the beginning the simplest instruments were manufactured. In the early bronze age man became acquainted with the properties of metal in hot and liquid condition and unintentionally obtained copper containing arsenic, that is bronze. He began producing simple casting moulds from stone and clay. Also the manufacture of wire began in this period, at first it was produced by forging and then by drawing through hard pierced stones as e.g. jasper. At the end of the early bronze age, bronze is produced with a content of arsenic up to 6 %, which gives evidence of an addition of minerals containing arsenic. In the middle bronze age in **Georgia** the founder's, smith's and jeweller's crafts are developed and working methods such as stamping and pressing of metal are invented. In the first part of this period antimony-containing bronze is obtained and in the second part tin bronze (in Trialeti). The products originating from these times permit to conclude that at this stage the craftsmen used different complicated equipment and tools. It must also be assumed that groups of craftsmen were engaged in this work. In this period also [illegible] of

Card 2/4

Application of Chemical and Metallographical Methods to the Investigation of Archaeologic Monuments. Manufacture of Metallurgic Products in the Territory of Georgia in Antiquity

weight and measure must have been used. In the late bronze age metal weapons were already generally required mass-articles, which gives evidence of a high number of qualified workmen engaged in production. The metal is melted near the ore-deposits and the workmen are supplied with hardware. Tin bronze is produced and for this purpose tin ore is used, which is partly found in Georgia and partly is imported. For the manufacture of castings molding batches, wax patterns, sandstone- and metal forms are used. In the late bronze age the use of sulfide ores becomes known. At the beginning of the late bronze age melting of iron ores is come into use and iron is obtained and processed. From the gradual development of metal-working it can be seen that the ancient tribes of Georgia have passed through all stages of their historical development and that always the same tribes have been living here which continually raised their level of civilization which was of a peculiar nature. The abundance in natural resources and the

geographical situation of the country were promoting the cultural uplift of the tribes. Georgia carried on trade with the countries of the Near East. Classifying the monuments of the Georgian bronze age into certain periods requires a precise investigation. For this purpose similar investigations of the archaeological material and of the ore-deposits in other republics in the Trans-Caucasus and the countries of the Near East ought to be carried out. In 1955 the Institute together with the Gosudarstvennyy muzey Gruzii im. S. Dzhanashia (Georgian State Museum imeni S. Dzhanashia) has started research work on the development of iron working in ancient Georgia.

SOV/137-59-5-10709

Translation from: Referativnyy zhurnal, Metallurgiya, 1959, Nr 5, p 179 (USSR)

AUTHORS: Tavadze, F.N., Tskitishvili, M.D.

TITLE: The Structure and Some Properties of Alloys of the Mn_3Si - Fe_3Si_2 System

PERIODICAL: Tr. In-ta metallurgii, AS GeorgianSSR, 1958, Vol 9, pp 71 - 75 (Georgian, Russian résumé)

ABSTRACT: Alloys of the Mn_3Si-Fe_3Si_2 system consist mainly of solid solutions. In an alloy with 70% Fe_3Si_2, the presence of a chemical compound of $Fe_{12}Si_{11}Mn_5$ composition can be assumed according to the decrease in hardness and electric resistance. The alloys investigated become brittle after heating and cooling off within a range of 200° - 500°C.

L.V.

Card 1/1

SOV/137-59-5-10747

Translation from: Referativnyy zhurnal, Metallurgiya, 1959, Nr 5, p 183 (USSR)

AUTHORS: Tavadze, F.N., Tskitishvili, M.D.

TITLE: The Structure and Some Properties of Alloys of the Mn_3Si - Fe_3Si_2 System

PERIODICAL: Tr. In-ta metallurgii AS GeorgianSSR, 1958, Vol 9, pp 77 - 81 (Georgian, Russian résumé)

ABSTRACT: The solubility of C in alloys of the Mn_3Si - Fe_3Si_2 system decreases from 2.15% to 0.43% with increasing content of Fe_3Si_2. The microstructure of triple alloys is similar to the microstructure of alloys of the Mn_3Si_2 - Fe_3Si_2 system, but it contains more eutectic components which remain in a coagulated state also after homogenization. C increases electric resistance and microhardness of alloys. Introduction of C does not entail the formation of a new structural component. Apparently C replaces Si in silicides and other phases.

Card 1/1 L.V.

TAVADZE, F.N.; NABICHVRISHVILI, M.A.

Solubility of carbon in manganese silicide. Trudy Inst.met. AN Gruz.SSR 9:83-88 '58. (MIRA 12:8)
(Manganese silicide) (Carbon) (Solutions, Solid)

SOV/137-59-3-5352

Translation from: Referativnyy zhurnal. Metallurgiya, 1959, Nr 3, p 62 (USSR)

AUTHORS: Tavadze, F. N., Nikolayev, O. B.

TITLE: On the Study of Stresses in Molds (K voprosu izucheniya naprya-zheniy v izlozhnitsakh)

PERIODICAL: Tr. In-ta metallurgii. AN GruzSSR, 1958, Vol 9, pp 103-105

ABSTRACT: In the open-hearth division of the Zakavkazskiy (Transcaucasian) metallurgical plant an investigation was carried out on the stresses in solid-bottom molds for 6-ton ingots. The mechanical tensometer method with an arrow indicator was used for studying the stresses. A brace 300 mm long with one end connected to the indicator was set on the outer face of the mold 70 mm from the upper end. A second metal brace with a set screw for linking to the indicator was placed in the same horizontal plane with the first brace. After the mold had been filled with liquid steel a recording was made every 30 sec of the overall deformation (OD) which was determined by the sum of the values for the mechanical-expansion deformation (MD) due to the internal heating of the walls of the mold and the deformation resulting from the rise in temperature of the outer surface of the mold (TD). The TD

Card 1/2

On the Study of Stresses in Molds

was established by means of an Fe-constantan thermocouple placed on the surface of the mold between the braces underneath the indicator. The MD from the expansion of the mold was determined by the difference OD - TD. The values for MD due to the expansion of the mold were plotted on a graph on the basis of the results of the OD and TD measurements. The stress formula is rendered more precise through making allowances for the modulus-of-elasticity reduction factor. It is pointed out that in order to combat the formation of cracks in the molds the following measures should be taken: a) Casting the molds of iron with high heat conductivity which would accelerate the decrease in the modulus of elasticity and simultaneously increase the degree of plasticity of the metal and (b) impeding D by fitting cast-steel bands over the ends of the molds.

V. P

Card 2/2

TAVADZE, F.N.; NIKOLAYEV, O.B.; NABICHVRISHVILI, M.A.; TSURKAVA, G.A.

Increasing the durability of molds by means of cast steel bands. Trudy Inst.met. AN Gruz.SSR 9:107-116 '58. (MIRA 12:8)

(Molding (Founding))

AUTHORS: Tavadze, F.N., Bayramashvili, I.A. SOV/128-58-11-11/24

TITLE: On the Nature of the X-Phase (O prirode X-fazy)

PERIODICAL: Liteynoye proizvodstvo, 1958, Nr 11, pp 18-20 (USSR)

ABSTRACT: The X and X^1 phase in heat resistant grey cast iron were investigated. To obtain the large inclusions of the X-phase, which is a result of oxidation processes, specimens of cast iron with varying silicon and manganese content, and specimens of wrought and magnesium iron were subjected to 20 hrs of isothermal treatment at 730° C. It was found that the X-phase formation did not take place in cast iron with a 6.25 % silicon content. In all other cast iron specimens, the X-phase was observed. The X^1-phase depends on the manganese content, it is reduced with an increased silicon content and rises with a higher manganese content. It also depends on the shape of graphites. There are 5 sets of microphotos, 1 table, 1 graph and 7 Soviet references.

1. Cast iron--Phase studies 2. Cast iron--Heat treatment
3. Silicon--Metallurgical effects 4. Manganese--Metallurgical effects

Card 1/1

TAVADZE, F.N.; PIRTSKHALAYSHVILI, V.A.

Effect of high carbon content in the austenite field of the system iron-chromium-manganese. Soob. AN Gruz.SSR 21 no.6:727-733 D '58. (MIRA 12:4)

1. AN GruzSSR, Institut metallurgii, Tbilisi. 2. Chlen-korrespondent AN GruzSSR (for Tavadze).
(Iron alloys)

TAVADZE, F.N.; SELIMKHANOV, I.R., kand. khim. nauk.

Use of chemical and metallographic methods in the study of archeological monuments. Pt. 1: Manufacture of metallurgical articles in Georgia in ancient times. Pt. 2: History of the development of metal work and mining in Azerbaijan. Vest. AN SSSR 28 no. 9:53-57 S '58. (MIRA 11:10)

1. Chlen-korrespondent AN Gruzinskoy SSR (for Tavadze)
(Georgia--Metallurgy)
(Azerbaijan--Alloys--Spectra)
(Archaeology)

TAVADZE, F.N., otv.red.; FEODOT'YEV, K.M., red.izd-va; GUSEVA, A.P., tekhn.red.

[Natural resources of the Georgian S.S.R.] Prirodnye resursy Gruzinskoi SSR. Moskva. Vol.2. [Nonmetalliferous ores] Nemetallicheskie poleznye iskopaemye. 1959. 379 p. (MIRA 12:7)

1. Akademiya nauk Gruzinskoy SSR, Tiflis. Sovet po izucheniyu proizvoditel'nykh sil. 2. Chlen-korrespondent AN Gruz.SSR (for Tavadze).

(Georgia--Ore deposits)

S/137/60/000/011/035/043
A006/A001

Translation from: Referativnyy zhurnal, Metallurgiya, 1960, No. 11, p. 251, # 27246

AUTHORS: Tavadze, F.N., Tskitishvili, M.D., Doliashvili, K.A., Mandzhgaladze, S.N., Cvaliya, T.M., Nabichvrishvili, M.A.

TITLE: The Effect of Carbon and Silicon on Heat and Scale Resistance of Alloys of the Iron-Chrome-Manganese System

PERIODICAL: Dokl. Nauchno-proizv. konferentsii mashinostroiteley i priborostroiteley, Leningrad, Sudpromgiz, 1959, pp. 169 - 180

TEXT: The authors studied the joint effect of C and Si on heat and scale resistance in cast and heat treated states of 2 series of alloys containing (in %): C 1.04 - 3.92; Mn 13.19 - 15.61; Cr 12.90 - 15.40; Si 0.66 - 4.46; P 0.028 - 0.147 (I); C 0.25 - 3.82; Mn 14.14 - 15.38; Cr 24.03 - 25.90; Si 0.21 - 6.82; P 0.04 - 0.25 (II); Heat treatment was conducted in vacuum quartz tubes by the following two ways: 1) stabilizing at 700 and 750°C for 500 hrs; 2) homogenizing at 1,050 - 500°C (stepped) for 350 hrs. It was established that during stabiliza-

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S/137/60/000/011/035/043
A006/A001

The Effect of Carbon and Silicon on Heat and Scale Resistance of Alloys of the Iron-Chrome-Manganese System

tion an increased C and Si content reduced heat resistance due to the formation of non-stable phases, namely austenite and carbides. During homogenization the alloys I show increased heat resistance, if their C content is 3.5 - 3.8%; the alloys II have 2 maxima of heat resistance: at 1.8 - 2.3% C; 0.3 - 1.0% Si and at 0.4 - 1.0% C and 6.0 - 7.0% Si. The alloys II show higher heat resistance after homogenization. The alloys investigated show satisfactory resistance to oxidation up to 750°C and are not subjected to "growth" up to 950°C. C impairs scale resistance of II and has no effect on I. Si impairs scale resistance of II. There are 9 references.

A.S.

Translator's note: This is the full translation of the original Russian abstract.

Card 2/2

S/137/60/000/011/033/043
A006/A001

Translation from: Referativnyy zhurnal, Metallurgiya, 1960, No. 11, p. 250, # 27240

AUTHORS: Tavadze, F.N., Essen, M.A.

TITLE: New Experiments in the Field of Obtaining Cast Iron With Spheroidal Graphite

PERIODICAL: Dokl. Nauchno-proizv. konferentsii mashinostroiteley i priborostroiteley, Leningrad, Sudpromgiz, 1959, pp. 180 - 184

TEXT: The method of diffusion metallizing can be used to obtain a higher Mg content in cast iron than by treatment of liquid metal with Mg. At an extended contact with the cast iron a diffusion transition of C from cast iron into Mg takes place; thus conditions are created which entail the formation of graphite inclusions of nodular shape. Impoverishment in C of the surface layer causes the formation of a film around the specimen; the film consists of a

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S/137/60/000/011/033/043
A006/A001

New Experiments in the Field of Obtaining Cast Iron With Spheroidal Graphite

material which contains from 1.4 to 1.5% C, resembling graphitized steel. A high content of Mg in the peripherial layer proves the possibility of Mg dissolving in graphite and in the metallic base of the cast iron.

A.S.

Translator's note: This is the full translation of the original Russian abstract.

Card 2/2

S/137/60/000/011/034/043
A006/A001

Translation from: Referativnyy zhurnal, Metallurgiya, 1960, No. 11, p. 251, # 27245

AUTHORS: Tavadze, F.N., Pirtskhalayshvili, V.A.

TITLE: Investigating the Structure of Cast-Iron of the Chrome-Manganese System

PERIODICAL: Dokl. Nauchno-proizv. konferentsii mashinostroiteley i priboro-stroiteley, Leningrad, Sudpromgiz, 1959, pp. 184 - 194

TEXT: It was revealed that in alloys of the Fe-Cr-Mn system at a C content of 0.12%, C widens considerably the range of alloys with an austenite base, shifting it toward the side of higher Cr concentrations. At C 2.2 - 2.4% this range includes alloys containing > 25% Cr. The austenite of Cr-Mn-cast irons with Mn 15 - 20%, Cr from 0 to 6 - 8%, decomposes partially into perlite starting from 675 - 700°C; austenite, however, does not undergo perlite decomposition. In low-chromium alloys, in the range of austenite-base Cr-Mn-system of cast-irons, a part of Mn is bound in $(F,Mn,Cr)_3C$ carbides. In high chromium alloys, Cr is

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A006/A001

Investigating the Structure of Cast-Iron of the Chrome-Manganese System

mainly bound in carbides and its ferrite-forming capacity vanishes. Si affects the stability of the austenite of the Cr-Mn system. In the Cr-Mn system of cast irons C is bound in carbides rich in Cr and Mn. Free C is present in the structure only in alloys with a low Cr and Mn content. There are 18 references.

A.S.

Translator's note: This is the full translation of the original Russian abstract.

Card 2/2

S/137/62/000/006/002/163
A006/A101

AUTHORS: Tavadze, F. N., Katsitadze, Sh. S.

TITLE: On the flow mechanism of molten metals

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 6, 1962, 8, abstract 6A48 ("Tr. Gruz. politekhn. in-t", 1959, no. 3 (64), 77 - 80)

TEXT: The velocity of metal flow (Al-alloy and steel) in quartz tubes of different diameters was determined by filming (24 frames per second). The length of the metal flow was determined by instrumental and binocular microscopes on a negative film. It was established that the velocity of metal flow changes in time constantly (a time-velocity curve is presented).

T. Kolesnikova

[Abstracter's note: Complete translation]

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18(7) SOV/128-59-6-6/25

AUTHOR: Tavadze, F.N., Doctor of Technical Sciences, Essen, M.A., Engineer

TITLE: Transformation of Graphite Inclusions in Cast Iron During its Saturation with Magnesium

PERIODICAL: Liteynoye Proizvodstvo, 1959, Nr 6, pp 15-18 (USSR)

ABSTRACT: Apart from the interest in a theoretical clarification of the question on the formation of spheroidal graphite, there is no uniform opinion among scientists about this problem. During the last 10 years, Soviet and foreign literature has published many scientific treatments covering this problem. Despite the different theoretical concepts, all authors agree about the methods necessary for the elaboration of this problem on liquid cast iron. Exceptions are only the following articles published by their author: (Publication of the Gruzinskiy Politechnical Institute, Nr 6, 1955, Nr 7 1956, Nr 3, 1958) and the article by Stepin, P.J. (Liteynoye Proizvodstvo, Nr 11, 1958). These publica-

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Transformation of Graphite Inclusions in Cast Iron During its Saturation with Magnesium

tions contain data gained by experiments on the transformation of graphite inclusions in chill type sulphuric cast iron during its saturation with magnesium until the formation of nodular graphite. In this article the methods for separation of graphite in chilled cast iron improved by the authors is described. For these experiments, the authors have put cylindrical samples of uniform weight, but of different types of cast iron with and without magnesium under pressure after heating the samples from 400° up to 1.100°C. The results showed that cast iron can be saturated with magnesium either by pressure or by temperature, but in a different manner than that for molten cast iron. Magnesium in its larger percentage is found on the outside of the shape, less in the inside. The test samples were treated by an additional process to separate the carbon share of the material. A chemical analysis did not show any carbon in the magnesium but an acetylene

Transformation of Graphite Inclusions in Cast Iron During its Saturation with Magnesium

type smell indicated such possibility. The authors maintain that the separation process of carbon plays an important role in the formation of nodular type graphite. The tests with aluminum demonstrated that it bears only a weak influence on the formation of spheroidal graphite. Several microphotos show the various phases of the formation of spheroidal graphite. The experiments made by the authors have not been verified by the experiments of P.J. Stepin despite the fact that he used the same type of methods. The authors assume that Stepin did not make his experiments under sufficient pressure. Likewise his statement that the graphite separation occurs always in spheroidal shape could not be proven. There are 6 photographs, 1 table, 1 diagram and 7 Soviet references

18(2,3) SOV/128-59-9-13/25

AUTHOR: Tavadze F.N., Doctor of Technical Sciences and Sba-
~~ndidze D.D.~~, Engineer

TITLE: Influence of Lithium on Transformation of Graphite Inclusions in Solidified Irons

PERIODICAL: Liteynoye proizvodstvo, 1959, Nr 9, p 38 (USSR)

ABSTRACT: Cast iron containing globular graphite inclusions finds on many occasions application as a constructive material. However, it has not been yet definitely established, under what conditions the globular graphite structure is formed. A number of Soviet and foreign experts, among them K.P. Bunin, K.I. Vashchenko, N.G. Girshovich, D.P. Ivanov, B.S. Mil'man, and P.I. Stepin have worked on this problem, but in each case formation of globular graphite was researched in liquid, non-solidified irons. In recent years, research revealed the possibility of obtaining cast irons with globular graphite inclusions by means of an adequate treating of irons already solidified. The authors of this article have carried out their experiments on solidified irons applying the method of diffusion provoked by lithium. To this end, the

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Influence of Lithium on Transformation of Graphite Inclusions in Solidified Irons

methods that were at one time worked out by E.N. Tavadze, Ye.S.Kartoziya and M.A. Essen were partly used. Cast iron test-pieces were placed together with lithium in steel cylinders and heated up to 1100°C; thereafter, they stayed 15 hours and gradually cooled down. It was established that during the process of heating graphite inclusions, independently of their initial form, have taken the globular structure. A specific feature of this process is the appearance of ferrite structure in cast iron. There are 1 table, 2 photographs and 2 Soviet references.

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TAVADZE, F.N.; BAYRAMASHVILI, I.A.; TSAGAREYSHVILI, G.V.

Effect of manganese on the removal of sulfur from cast iron smelted under vacuum. Soob. AN Gruz. SSR 22 no.3:329-336 Mr '59. (MIRA 12:8)

1.Gruzinskiy politekhnicheskiy institut im. S.M. Kirova. 2.Chlen-korrespondent AN GruzSSR (for Tavadze)
(Manganese) (Cast iron--Metallurgy)

TAVADZE, F.N., KATSITADZE, Sh.S.

Effect of calcium on shape changes of graphite in cast iron.
Lit. proizv. no.6:29-30 Je '60. (MIRA 13:8)
(Cast iron--Metallography)

TAVADZE, F.N.

New type of attachment for the I.I. Kornilov centrifugal machine to clamp the specimens and measure their deformation during heat-resistance tests. Trudy Inst. met. AN Gruz. SSR 10:49-52 '60.
(MIRA 13:12)

(Centrifuges--Attachments)
(Heat resistant alloys--Testing)

TAVADZE, F.N.; MAIDZHGALADZE, S.N.

Complex effect of carbon and silicon on the corrosion of iron-chromium-manganese alloys. Trudy Inst. met. AN Gruz. SSR 10:53-68 '60. (MIRA 13:12)

(Iron-chromium-manganese alloys--Corrosion)

S/129/60/000/010/008/009
E193/E483

AUTHORS: Tavadze, F.N., Doctor of Technical Sciences, Professor and Kovshikov, Ye.K., Engineer

TITLE: Modernization of the Technology of Thermal Treatment of Forging Dies

PERIODICAL: Metallovedeniye i termicheskaya obrabotka metallov, 1960, No.10, pp.54-57

TEXT: The authors investigated various methods of heat-treating of forging dies made of Soviet developed Mo-free steels with the following compositions: 5ХНВ (5KhNV) 0.5 - 0.6 C, 0.5 - 0.8 Mn, 0.15 - 0.35 Si, 0.5 - 0.8 Cr, 1.4 - 1.8 Ni, 0.6 - 1 W. 5ХНТ (5KhNT) 0.52 - 0.60 C, 0.5 - 0.8 Mn, 0.15 - 0.35 Si, 1.0 - 1.4 Cr, 1.4 - 1.8 Ni, 0.08 - 0.15 Ti. 5ХНС (5KhNS) 0.5 - 0.6 C, 0.3 - 0.6 Mn, 0.6 - 0.9 Si, 1.3 - 1.6 Cr, 0.8 - 1.2 Ni. 5ХНСВ (5KhNSV) 0.5 - 0.6 C 0.3 - 0.6 Mn, 0.6 - 0.9 Si, 1.3 - 1.6 Cr, 0.8 - 1.2 Ni, 0.4 - 0.6 W. 5ХН2СВФ (5KhN2SVF) 0.45 - 0.55 C, 0.5 - 0.8 Mn, 0.8 - 1.2 Si, 0.5 - 0.8 Cr, 2.0 - 2.5 Ni, 0.6 - 1 W, 0.15 - 0.30 V. Usually, to protect the working face of the die against oxidation and decarburization, it is placed face-downwards in a tray filled

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Modernization of the Technology of Thermal Treatment of Forging Dies

with a mixture of carbon and sodium carbonate (5 wt.-%), after which the whole is inserted in a furnace at 600°C. The die is then heated gradually to the final (quenching) temperature, depending on the composition of the steel, as shown in Table 2. The holding time at the temperature is determined by the height of the die (see Table 3). Thus, for instance, in the case of a die 250 mm high, it is held at 600°C for 35 min, brought up to the final temperature (about 850°C) in 8 h 25 min, and held at the temperature for 1 h 50 min; in the case of a die 700 mm high, the corresponding times are 2 h 25 min, 23 h and 5 h. After removing from the furnace, the die is allowed to cool in air to about 750 to 780°C and is then quenched in oil maintained at a temperature not higher than 70°C. The die is cooled in oil to about 200 to 300°C and is then transferred to a tempering furnace at a temperature not exceeding 350°C. The final temperature reached during the tempering treatment depends on the material and dimensions of the die (see Table 4), the duration of the tempering treatment depending on the size of the die (Table 5). After tempering, the dies are air- or oil-cooled. This is a lengthy procedure which,

Modernization of the Technology of Thermal Treatment of Forging Dies

in the case of a large 700 mm high die, may take up to 60 h. To reduce the heat treatment time, a modified method of tempering was proposed in which both the working face and the tail end of the die was tempered simultaneously. The modified method consisted in placing the die (working face upwards) on an electrically heated plate, and covering it with a metal hood, thermally insulated by an asbestos sheet lining; the hole in the top part of the hood accommodated a thermocouple with its hot junction resting on the working face of the die. When the temperature of the working face reached 500 to 520°C, the temperature of the tail end of the die was considerably higher. Although this method ensured that the tail end of the die had the required mechanical properties, it did not solve the problem of imparting the right combination of mechanical properties and stability to the working face of the die. The present authors have developed another time-saving method of heat treatment which consists in the following: the tail end of the die, pre-heated for quenching, is enclosed in an airtight box (see sketch on p.56). Ribs, welded on the inside walls of the box, ensure that there is an air gap of 25 to 40 mm between the box walls and the die. Rods, passing through holes in the side walls of the

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E193/E483

Modernization of the Technology of Thermal Treatment of Forging Dies

die and fitting into a groove in the die, are provided to facilitate hoisting. The die is then immersed in the oil bath and, since the air contained in the box prevents oil from entering it, the tail end of the die is not in direct contact with the cooling medium. Hence, while the working face of the die is being quenched, its tail end is subjected to a normalizing and self-tempering treatment, so that no subsequent heat treatment is necessary. As a result of adopting this method, a 60 kW electric tempering furnace was freed for other uses, the total heat-treating time was reduced by 30% and the man-hours by 25%. There are 1 figure, 5 tables and 4 Soviet references.

ASSOCIATION: Institut metallurgii AN Gruzinskoy SSR
(Institute of Metallurgy, AS Georgian SSR)

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18 1210

25450

S/137/61/000/006/082/092
A006/A101

AUTHORS: Tavadze, F.N., Barbakadze, A.

TITLE: The complex effect of manganese and antimony on antifriction properties of aluminum

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 6, 1961, 24-25, abstract 6I172 ("Tr. In-ta metallurgii AN GruzSSR", 1960, v. 10, 69-85, Georgian, Russian summary)

TEXT: The authors investigated the effect of Mn and Sb on the antifriction properties of Al in the following alloys: Al-Mn (0.5-3.5%), Al-Sb (1-6%), Al-Mn-Sb (0.5-3.5% Mn and 0.9-6.0% Sb). It was established that alloys containing 3-3.5 and 0.5-3.5% Mn at a constant amount of 1.0% Sb, meet the metallographical requirements of antifriction properties. An addition of > 3% Sb sharply reduces the ductility of Al alloys. Addition of Sb up to 2% into Al alloys containing 0.5-3.5% Mn, raises wear resistance of the alloys. At temperatures elevated from 20 to 200°C, the hardness of the alloys is slightly reduced. Optimum antifriction

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S/137/61/000/006/082/092
A006/A101

The complex effect ...

properties are shown by alloys which contain in %: Mn 3.0, Mn 0.5 + Sb 1.0, and Mn 3.5 + Sb. 1.0. There are 13 references.

T. Rumyantseva

[Abstracter's note: Complete translation]

Card 2/2

TAVADZE, F.N.; LASHKHI, T.A.; DASHNIANI, T.S.

Irreversible electrode potentials of different materials in champagne. Soob. AN Gruz. SSR 25 no. 3:311-318 S '60. (MIRA 14:1)

1. Akademiya nauk Gruzinskoy SSR, Institut metallurgii, Tbilisi.
2. Chlen-korrespondent AN Gruzinskoy SSR (for Tavadze).
(Metals--Electric properties)

TAVADZE, F.N.; LASHKHI, T.A.; DASHNIANI, T.S.

Changes in certain characteristics of champagne related to the corrosion of different materials in it. Soob. An Gruz. SSR 25 no. 4:433-440 O '60. (MIRA 14:1)

1. Akademiya nauk Gruzinskoy SSR, Institut metallurgii, Tbilisi.
2. Chlen-korrespondent Akademii (for Tavadze).
(Champagne (Wine)) (Corrosion and anticorrosives)

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B/020/60/130/06/032/059

AUTHORS: Agayev, N. A., Corresponding Member B011/B015
AS USSR, Tavadze, F. N., Kartvelishvili, Yu. M.

TITLE: On the Production of Pure Chromium Chlorides

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol 130, Nr 6, pp 1294 - 1297 (USSR)

ABSTRACT: To obtain chromium in the highest possible degree of purity the authors recommend the production of pure chromium chlorides from electrolytic chromium by chloride distillation in a chlorine current, and subsequent reduction with alkali metals or alkaline-earth metals. In this paper they deal with the production of pure chromium chlorides. The following reactions are possible between metallic chromium and chlorine: $2Cr + 3Cl_2 \rightarrow 2CrCl_3$ (1); $Cr + Cl_2 \rightarrow CrCl_2$ (2); $2CrCl_3 +$ $+ Cr \rightarrow 3CrCl_2$ (3). The authors calculated the free energies and equilibrium constants of these reactions from standard data. The results (temperature dependence of the free energies and constants) are graphically shown on figures 1 and 2. The thermodynamic determination shows that in the temperature range

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On the Production of Pure Chromium Chlorides

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B011/B015

investigated reaction (1) is most likely to occur whereas reaction (3) is most unlikely. Metallic chromium was supplied by the Institut prikladnoy khimii i elektrokhimii AN GruzSSR (Institute of Applied Chemistry and Electrochemistry of the Academy of Sciences of the Gruzinskaya SSR). Figure 3 shows the apparatus for the production of pure chromium chlorides. The procedure may be divided into three sections: (a) degasification of chromium; (b) chlorination of chromium; (c) purification of the chlorides produced by sublimation. These three stages are discussed in detail. Degasification at 400-450° in a vacuum of 10^{-4}mm during 1.0-1.5 h was sufficient to eliminate the entire hydrogen. Chlorination is effective at 595-605°. The chlorination time is to a considerable extent determined by the rate of chlorine addition and the amount of weighed chromium portion. Chlorination took about 50 minutes at a chromium quantity of 20-30 g. At a slow chlorine passage $CrCl_2$ is produced. It is necessary to purify the chromium chlorides under the exclusion of air and steam in vacuum or in pure chlorine because the chromium trichloride vapors oxidize easily in the air. $CrCl_3$ dissociates above 1300°, signs of dissociation are, however,

On the Production of Pure Chromium Chlorides

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B011/B015

noticeable at 355° already. Sublimation is effective at 900-950°. Large crystals were obtained by maintaining 400-450° in the condensation vessel. The chromium chlorides produced in the above way had a high degree of purity. Only in a few experiments it was possible to prove traces of aluminum and bismuth spectroscopically. The chromium used, however, contained: Cu, Ni, Fe, Cd, Sn, Pb, Bi, P, Ti, Al, Si, Mn, Sb, O_2, H_2, and N_2. The Cr content was 99.23065. There are 3 figures and 4 references, 3 of which are Soviet.

ASSOCIATION: Institut metallurgii im. A. A. Baykova Akademii nauk SSSR (Institute of Metallurgy imeni A. A. Baykov of the Academy of Sciences, USSR)

SUBMITTED: November 2, 1959

CHIKHELIDZE, S.S.; TAVADZE, F.N., akademik, otv. red; AGLADZE, R.I., red.; ARCHVADZE, Sh.R., red.; VACHNADZE, N.D., red.; GVELISIANI, G.G., red.; GUDZHEDZHIANI, B.I., red.; DZHAHELIDZE, A.I., red.; DZOTSENIDZE, G.S., red.; DURMISHIDZE, S.V., red.; KETSKHOVELI, N.N., red.; MIKELADZE, I.S., red.; RUBINSHTEYN, M.M., red.; TVALCHRELIDZE, A.A., red.[deceased]; TSITSISHVILI, G.V., red.; SHENGELIYA, P.G., red.; FEDOT'YEV, K.M., red.izd-va; DOROKHINA, I.N., tekhn. red.

[Natural resources of the Georgian S.S.R.] Prirodnye resursy Gruzinskoi SSR. Moskva, Izd-vo Akad.nauk SSSR. Vol.3. [Mineral water] Mineral'nye vody. 1961. 438 p. (MIRA 14:12)

1. Akademiya nauk Gruzinskoy SSR, Tiflis. Sovet po izucheniyu proizvoditel'nykh sil. 2. Akademiya nauk Gruzinskoy SSR (for Tavadze). (Georgia--Mineral water)

GUDZHEDZHIANI, B.I.; CHICHUA, B.K.; PETROVSKIY, G.D.; KOMETIANI, G.A.; AZMAYPARASHVILI, M.V.; AVALISHVILI, E.Ye.[deceased]; MIRZIASHVILI, T.M.; SHCHERBAKOV, D.I., glav.red.; ARCHVADZE, Sh.R., red.; BOGOLYUBOVA, L.I., red.; VAL'TS, I.E., red.; TAVADZE, F.N., red.; YABLOKOV, V.S., red.; PEVZNER, G.Ye., red.izd-va; MAKUNI,Ye.V., tekhn. red.

[Coal atlas of the Caucasus] Atlas uglei Kavkaza. By B.I.Gudzhedzhiani i dr. Moskva, Izd-vo Akad.nauk SSSR, 1961. 167 p. (MIRA 14:12)

1. Akademiya nauk Gruzinskoy SSR, Tiflis. Sovet po izucheniyu proizvoditel'nykh sil.

(Caucasus--Coal geology)

S/129/61/000/001/007/013
E073/E135

AUTHORS: Tavadze, F.N., Corresponding Member, AS Georgian SSR, Kartoziya, Ye.S., Engineer, and Shinyayev, A.Ya., Candidate of Technical Sciences

TITLE: Solubility of Magnesium in Iron

PERIODICAL: Metallovedeniye i termicheskaya obrabotka metallov, 1961, No. 1, pp. 33-35

TEXT: The results are described of determining the solubility of magnesium in iron of high purity at elevated pressures. As starting materials, electrolytic iron (99.87%) and magnesium (99.9%) were used. The iron was saturated with magnesium in cylindrical containers of commercially pure iron with 5 mm thick walls. The working part was 20 mm high with a diameter of 20 mm. Iron discs of 19.5 mm dia and 4 mm thick were charged into the container together with magnesium, the volume of which was approximately equal to the volume occupied by the iron specimens. The container was hermetically closed with a threaded stopper and a lid. Following that, the container was sealed in vacuum into quartz ampoules and annealing was effected at 1120 °C for a duration

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E073/E135

Solubility of Magnesium in Iron

which was sufficient for producing appreciable diffusion layers. The duration of the annealing depended on the hermeticity of the container, i.e. on the pressure. The pressure in the container was produced by the considerable differences in the coefficients of expansion of the magnesium and the iron. According to calculations, pressures between 500 and 1500 atm can be produced by this means. For such pressures no appreciable solubility of magnesium in iron was detected below 1000 °C. Above this temperature the solution was due to the hermeticity of the system. No microstructural changes in the surface layer of the specimens was observed after annealing for 18 hours at 1120 °C. However, chemical analysis by deposition on the mercury cathode of a 0.4 mm thick surface layer showed a content of 0.17-0.19 wt.% of magnesium. In specimens annealed for 40 hours at the same temperature microstructure changes in the surface layer were detected; a zone of columnar crystals, orientated perpendicular to the surface of the specimen and having an average thickness of 0.5 mm was observed. The magnesium content in a 0.4 mm thick layer was about 0.6%. Outside this layer the

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E073/E135

Solubility of Magnesium in Iron

structure was the ordinary polyhedric one. X-ray structural investigations by the powder method showed that the lattice period tends to decrease on transition to layers that are saturated with magnesium (2.858 compared to 2.861 Å for the pure iron). The X-ray diffraction patterns showed only pure iron lines. The self-diffusion power of the iron was studied by depositing on the magnesium-containing layer the isotopes Fe^{59} and Fe^{55} and subjecting these specimens as well as reference specimens of pure iron to vacuum annealing in quartz ampoules at temperatures controlled within ± 2 °C. The self-diffusion was determined by electrolytic removal of layers and measuring the radioactivity of each layer. It was found that magnesium brings about an increase in the self-diffusion of iron; at 1080 °C the diffusion in the magnesium-containing surface layer was about 25 times as high as in pure iron. Particularly noticeable is the increase in the self-diffusion coefficient for iron that has been subjected to microstructure changes as a result of magnesium dissolution. Autoradiographic investigations have shown that volume diffusion of iron takes place

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S/129/61/000/001/007/013
E073/E135

Solubility of Magnesium in Iron

throughout the entire depths of the diffusion zone, which indicates that the magnesium which is dissolved in the iron is uniformly distributed throughout the grain body; the diffusion depth in pure iron was 80-90 μ and over 200 μ in the magnesium-containing iron layers. This contributed to the formation of a large number of defects in the crystal lattice of the solvent metal during the process of dissolution. Indeed, in almost all cases the micro-photographs of magnesium-containing iron show pores; these coagulate, depending on the conditions of interaction between the magnesium and the iron (temperature, pressure). Magnesium dissolves in iron only at high pressures and temperatures (above 1000 °C). According to Bulloy and Human (Ref.2) dislocations can become centres of accumulation of dissolved admixtures. In the zone surrounding the dislocations the migration of atoms is considerably accelerated. Formation of vacancies should reduce the lattice period of the iron. This is in good agreement with data obtained by X-ray investigations. There are 1 figure, 1 table and 2 references: 1 Soviet and 1 English.
This is a condensed translation.
Card 4/4

22697
S/128/61/000/003/007/008
A054/A127

18.7500

AUTHOR: Tavadze, F. N.

TITLE: Some theoretical problems of the heat-resistance of iron grades

PERIODICAL: Liteynoye proizvodstvo, no. 3, 1961, 31 - 34

TEXT: Modern engines, machine parts etc. made of chromium-manganese cast iron grades have a high resistance to heat-creep, expansion and oxidation. These properties of the alloy largely depend on the content of alloying elements, relation and transformation of phases. Investigations were carried out to establish the relation between the structure of chrome-manganese iron and its heat resistance, as well as to ascertain the mechanism of changes which take place in a multi-phase alloy subjected to high temperatures. In the tests the iron, chrome and manganese content were changed (Cr: 0 - 26%, Mn: 0 - 21%) while the carbon and silicium content remained practically constant. The alloys were produced in a high frequency furnace, (corundum crucibles), with a smelting temperature of 1,350°C. The actual length of the specimens was 67 mm, their diameter 4 mm. The tests were

Some theoretical problems of the...

partly carried out with stabilized alloys, stabilization took place by annealing for 50 hours at the temperature at which the heat resistance was to be tested. A part of the alloys was intended for studies in equilibrium condition, which was obtained by 430 hours stepwise annealing, from 1,050° to 550°C, followed by cooling in a furnace. Loading for both types of samples (stabilized and in equilibrium) was identical: 5 kg/sq mm for 50 hours, then for the same interval 10 and for another fifty hours 15 kg/sq mm. The tests with stabilized alloys proved that the increase in chrome content raised the heat resistance of the alloy, whereas the increase in manganese content from 0.4 to 5.0% had the opposite effect. A minimum heat resistance was observed in alloys with a manganese content of 3 - 4%. When manganese content reached 11%, the heat resistance of the alloy suddenly increased, most probably due to the phase-transformation that took place in the iron. When comparing the behaviour of stabilized samples and those in equilibrium condition, it was found that the stabilized samples with a chrome content of over 10% and a manganese content of more than 12% had a greater heat resistance than samples in equilibrium condition, containing the same amount of elements. The relationship between heat resistance of the alloy and the

Some theoretical problems of the...

phase-conditions are plotted in Figure 8, in which the deviation of the specimen from the vertical axis (expressed in millimeters) was taken to indicate heat resistance. The steep rise in chrome content from 0 to 26% resulted in a sudden increase in heat resistance, most probably due to a decrease in the intensity of the diffusion processes. Stable carbides are not easily soluble in austenite. The dispersed carbides form some kind of reinforcement, localizing plastic deformations. The changes in heat resistance at 700°C both for stabilized samples and those in equilibrium condition, are plotted in Figures 4 - 7, in which the relationship between chrome and manganese content and heat resistance can be followed closely. There are 10 figures, 1 table and 27 references: 18 Soviet-bloc, 9 non-Soviet-bloc.

Card 3/8

S/129/61/000/004/001/012
E073/E535

AUTHORS: Tavadze, F. N., Corresponding Member of the AS, Georgian SSR, Kovshikov, Ye. K., Engineer

TITLE: Automatic Signalling of the Beginning of Martensitic Transformation

PERIODICAL: Metallovedeniye i termicheskaya obrabotka metallov, 1961, No.4, pp.2-5

TEXT: The authors developed an instrument for automatic signalling of the beginning of martensitic transformation during quenching of components. The device consists of two equal coils (Fig.2), the primary windings 1 and 2 of which are series connected to an a.c. supply. The secondary windings 3 and 4 are series connected to a galvanometer via selenium rectifiers 6 and 7. The ends of the secondary windings are connected in such a way that the induced currents should be opposite to each other and if the coils do not contain ferromagnetic masses, the galvanometer will produce no deflection. One of the coils is mounted in the quenching water tank. If a ferromagnetic component is placed into it, the current intensity induced in the secondary winding changes and the difference in the current intensities produces a

Card 1/3

deflection of the galvanometer reading. Depending on the mass of the component, the sensitivity can be varied by varying the current intensity in the primary windings by means of the autotransformer 5. The stand on which the apparatus is mounted is made of plastic, the bodies of the coils, 650 mm high and 500 mm diameter, are made of vinyl. The windings of the coils, which are in the water tank, are enclosed in a hermetic vinyl jacket and embedded in paraffin. The primary windings consist of 600 turns of 0.74 mm diameter wire. The secondary windings consist of 3000 turns of 0.5 mm thick wire. The zero position of the galvanometer is established by means of the rheostats R_1 and R_2. The component to be quenched is held by tongs of nonmagnetic steel and submerged into the water inside the coil. As soon as the temperature of the beginning of martensite transformation is reached, i.e. as soon as the first sections of the ferromagnetic phase appear, the pointer of the galvanometer is deflected and a light and sound signal 6 is switched on, which indicates to the operator the exact time when the component should be thrown into oil. The signalling equipment can signal not only the beginning but also an intermediate position and the end of the martensitic transformation. The advantage of the apparatus

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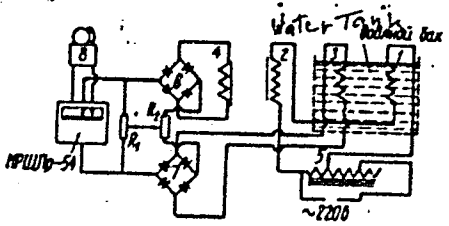
E073/E535

is that the percentage of rejects due to hardening cracks is sharply reduced and a uniform hardness of the component is ensured and also that semi-skilled operators can be employed. The automatic signalling equipment can also be fitted into an oil bath for determining the time when forging dies should be taken out of the oil for tempering. Thereby, it is possible to prevent cracks forming as a result of holding the dies too long in the cooling oil. Furthermore, the apparatus can be used in mass production of components of the same type made of high carbon steel. There are 2 figures and 3 references: all Soviet.

ASSOCIATION: Institut metallurgii AN Gruzinskoy SSR
(Institute of Metallurgy, AS, Georgian SSR)

Fig.2

Vodyanoy bak - water tank
220 V - 220 V



Фиг. 2. Схема автоматического сигнализатора.

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TAVAIZE, F. N.; SAKVARELIDZE, T. N.; ABESADZE, TS. N.; DVALI, T. A.

Making iron in ancient Georgia by bushelling. Trudy Inst. met. AN Gruz. SSR 11:95-108 '61. (MIRA 14:10)
(Georgia—Wrought iron)

TAVADZE, F.N.; PETRENKO, V.A.

Diagram of isothermal sections and phase transformations in alloy systems of iron - chromium - manganese containing up to 2.5 percent of carbon and silicon. Trudy Inst. met. i Gruz. SSR 11:111-114 '61. (MIRA 14:10)
(Iron-chromium-manganese alloys--Metallography)
(Phase rule and equilibrium)

TAVADZE, F.N.; NABICHVRISHVILI, M.A.

Some properties of alloys of the system Fe - Cr- Ni-Si-C.
Trudy Inst. met. AN Gruz. SSR 11:125-130 '61. (MIRA 14:10)
(Iron-chromium-nickel alloys)

S/808/61/011/000/003/006

AUTHORS: Tavadze, F.N., Nabichvrishvili, M.A.

TITLE: The refractoriness of alloys of the system Fe-Cr-Ni-Si-C.

SOURCE: Akademiya nauk Gruzinskoy SSR. Institut metallurgii. Trudy, v.11, 1961, 131-152.

TEXT: The paper reports the results of an experimental investigation of the refractory properties of cast irons of the Cr-Ni systems, with contents of Ni and Cr from 0 to 30% each. 40 alloys were tested. Compositions are tabulated. All contained 0.3% Mn, 1.5% P and [illegible]. The alloys were [illegible] refractoriness (fusion-temperature) characteristics were investigated, as well as the microstructure of the alloys. Tests were made on alloys which had undergone 350 hrs of homogenizing stepwise anneal and alloys which had undergone a short-term stabilizing anneal at test temperature for 50 hrs. The fusion-temperature tests were performed by the centrifugal method of Prof. I. I. Kornilov at T = 700, 750, and 800° and loadings of 5, 10, and 15 kg/mm^2. The deflections measured are graphed versus % Ni content with the testing time as a parameter. It is concluded that the refractoriness (fusion temperature) increases with an increase in Cr and Ni content.

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The highest fusion temperature is exhibited by cast irons of which the parent metal exhibits the character of a γ solid solution at the testing T. With increasing T the austenite regions expand toward the smaller Ni contents. Specimens which have undergone a short-term anneal at the testing T exhibit a greater refractoriness than specimens subjected to the stepwise anneal. The Cr-containing [illegible] possess the highest refractoriness are those containing 15% Cr. There are 11 figures, 2 tables, and 6 Russian-language Soviet references.

Card 2/2

18 1235
18.1275

39507
S/123/62/000/014/001/020
A004/A101

AUTHORS: Tavadze, F. N., Tskitishvili, M. D.

TITLE: The effect of small niobium, tungsten and molybdenum additions on the heat-resisting properties of chrome-manganese alloys

PERIODICAL: Referativnyy zhurnal, Mashinostroyeniye, no. 14, 1962, 20, abstract 14A119 ("Tr. In-ta metallurgii. AN GruzSSR", 1961, v. 11, 153 - 165, Georgian; Russian summary)

TEXT: As a result of investigating the heat resistance at 700 and 750°C with a load of 15 kg/mm^2, microstructure, micro- and macro-hardness, electric resistance and dilatometric analysis, corrosion resistance and scale resistance, it was found that the best heat-resisting properties are shown by low-carbon alloys (up to 1% C) with small Nb-additions (up to 0.4%) having an austenitic structure with network-like distribution of the carbide phase. Nb-additions to medium-carbon low-chromium (up to 15%) alloys do not ensure an improvement of their heat resistance because of the coagulation of the carbide phase at high temperatures. Tungsten improves the heat resistance of alloys only insignificantly.

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S/123/62/000/014/001/020
A004/A101

The effect of...

Mo-additions cause a nonhomogeneity of the structure in the cast state and abrupt changes in the structure under the effect of the heat-treatment and test temperature, as a result of which the heat resistance of the alloys is reduced, which is particularly the case with high-carbon alloys. Mo-modified high-chromium alloys with an austenitic-carbide structure possess a high corrosion resistance in a 5% H_2SO_4 solution. There are 9 references.

[Abstracter's note: Complete translation]

Card 2/2

S/808/61/011/000/004/006

AUTHORS: Tavadze, F.N., Mandzhgaladze, S.N., Tskitishvili, M.D., Dashniani, T.S., Lordkipanidze, I.N.

TITLE: The effect of small additions of Niobium, Molybdenum, Tungsten, Titanium, and Aluminum on the corrosion resistance of Chromium-Manganese alloys.

SOURCE: Akademiya nauk Gruzinskoy SSR. Institut metallurgii. Trudy, v 11, 1961, 177-190.

TEXT: The paper describes an experimental investigation of the effect obtained by inoculation and alloying with Nb, Ti, Mo, W, and Al on the corrosion resistance of alloys of the Fe-Cr-Mn-C-Si system. The alloys subjected to inoculation and alloying were the following: (a) Cast iron containing 25% Cr, 15% Mn, 1.8% Si, 2.2% C; (b) cast iron containing 15% Cr, 15% Mn, 2.4% Si, 2.2% C; (c) steel containing 25% Cr, 15% Mn, 1.3% Si, and 0.8% C. The additions introduced [illegible] are listed in 3 tables. Corrosion tests were made in 5% H_2SO_4 and in a 5% solution of NaCl. The results of the corrosion tests are shown in the form of tables and graphs. The graphs show the % addition along the x-axis and either the corrosion rate in a NaCl solution or the amount of H emitted by the specimen in the acid along the y-axis.

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The alloys tested had been heat-treated as follows: The steel by a low-T anneal at 700° and 750°C, the cast iron with a high-T stepwise anneal at T from 1,350 to 360°C (sic!). It was found that Nb, Ti, and Al improved the corrosion resistance of Cr-Mn steels and cast irons. The introduction of Mo (0.09-1.25%) causes a sharp improvement of the corrosion resistance of Cr-Mn steel and an impairment of the corrosion resistance in Cr and Cr-Mn cast irons with 15% Cr. An addition of W (0.13-4.25%) impairs the corrosion resistance of Cr-Mn cast irons in a 5% solution of H_2SO_4. The findings of the investigation resulted in the making of a steel which is completely resistant to a 5% solution of H_2SO_4 (composition: 25.0% Cr, 17% Mn, 1.1% Si, 0.8% C, 0.2-0.3% Mo). There are 14 figures, 5 tables and 14 references (13 Russian-language Soviet references and a Russian translation of F. N. Speller's "Corrosion, cause and prevention," 3d ed., New York, McGraw-Hill, 1951).

TAVADZE, F.N., akademik, otv. red.; PEVZNER, G.Ye., red. izd-va; ASTAF'YEVA, G.A., tekhn. red.

[Natural resources of the Georgian S.S.R.]Prirodnye resursy Gruzinskoi SSR. Moskva, Izd-vo Akad. nauk SSSR. Moskva, Izd-vo Akad. nauk SSSR. Vol.4.[Water power resources]Gidroenergeticheskie resursy. 1962. 307 p. (MIRA 15:11)

1. Akademiya nauk Gruzinskoy SSR, Tiflis. Sovet po izucheniyu proizvoditel'nykh sil. 2. Akademiya nauk Gruzinskoy SSR (for Tavadze).

(Georgia—Water power)

TAVADZE, F.N.; MANDZHGALADZE, S.N.; ERISTAVI, D.I., red.; GIORGADZE, O.N., red. izd-va; DZHAPARIDZE, N.A., tekhn. red.

[Corrosion and the protection of metals in mineral waters of Georgia]Korroziia i zashchita metallov v mineral'nykh vodakh Gruzii. Tbilisi, Izd-vo Akad. nauk Gruzinskoi SSR. Pt.2. 1962. 270 p. (MIRA 15:12)

1. Chlen-korrespondent Akademii nauk Gruzinskoy SSR (for Eristavi).

(Corrosion and anticorrosives)
(Georgia--Mineral waters)

S/598/62/000/007/034/040
D217/D307

12.1285

AUTHORS: Tavadze, F. N., Mandzhgaladze, S. N., Dashniani, T. S. and Lordkipanidze, I. N.

TITLE: Corrosion resistance of new titanium alloys in a number of industrial solutions

SOURCE: Akademiya nauk SSSR. Institut metallurgii. Titan i yego splavy. no. 7, Moscow, 1962. Metallokhimiya i novyye splavy, 246-252

TEXT: The corrosion resistance of new Ti alloys AT3(AT3), AT4, AT6 and AT8 was tested under various industrial conditions at the Institut metallurgii AN GruzSSR (Institute of Metallurgy, AS GSSR) during the last few years. In this work, the authors extend corrosion testing of these alloys to solutions encountered in the food industry, beneficiation plant and to tartaric acid solutions. It was found that the alloys resist the following solutions associated with the food industry: sweet, dry and strong wines, canned

V/B

Card 1/2

Corrosion resistance of ...

S/598/62/000/007/034/040
D217/D307

solutions containing cooking salt as well as those free from it, and tea solutions with or without tannin. The corrosion resistance of these alloys to solutions similar in composition to flotation and hydrometallurgical electrolytes of the Tyrny-auzskiy beneficiation plant, is satisfactory. The above four alloys and the alloys $AT8_2$ and $AT6_2$ are resistant to industrial solutions of tartaric acid. Titanium alloys containing 3 - 4% Al possess the optimum resistance. Further increase in Al content reduces the corrosion resistance in purified solutions. Commercially pure Ti BT1 (VT1), whose mechanical properties are inferior to those of the alloys AT3 and AT4, is attacked twice as rapidly in the above media than these alloys. There are 2 figures and 5 tables.

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S/598/62/000/007/035/040
D217/D307

18.1295

AUTHORS: Tavadze, F. N., Mandzhgaladze, S. N., Lordkipanidze, I. K. and Dashniani, T. S.

TITLE: Corrosion of new high-strength titanium alloys in mineral acids

SOURCE: Akademiya nauk SSSR. Institut metallurgii. Titan i yego splavy. no. 7, Moscow, 1962, Metallokhimiya i novyye splavy, 253-262

TEXT: The six-component α-titanium-base alloys AT3 (AT3), AT4, AT6, AT8, AT9 and AT10 were tested for their resistance to various mineral acids at various concentrations and temperatures. Besides, special tests were carried out in order to select alloys resistant to acids at their boiling points. Three specimens were suspended from hooks in a flask provided with a condenser. One of the test specimens was tested in the gaseous phase, the second in the liquid phase and the third in an intermediate position. A water-line formed on the latter between the boiling acid and its vapors. The

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Corrosion of new ...

specimens were then removed, cleaned and weighed, and the acid solutions containing the dissolved metal ions, chemically analyzed. It was found that at room temperature the alloys are completely resistant to HCl and HNO_3 at all concentrations, and to H_2SO_4 of up to 15% concentration. They also resist the action of aqua regia and 30% H_3PO_4 at that temperature. Their resistance to boiling HCl is comparable with that of the steel 1Kh18N9T (1Kh18N9T) and to boiling H_2SO_4 with that of Pb. They possess a better resistance to boiling HNO_3 than the above steel, but HF rapidly attacks them. The corrosion products of the above alloys consist essentially of Ti and Al, the quantity of the latter being proportional to its content in the alloy. Besides, small quantities of Si and Fe go into solution. Chromium changes to soluble corrosion products only in HCl. The above alloys can be recommended for the manufacture of plant for the chemical industry, designed for service in contact with various acids. There are 7 figures and 6 tables.

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S/598/62/000/007/036/040
D217/D307

IP. 1285

AUTHORS: Tavadze, F. N., Mandzhgaladze, S. N., Dashniani, T. S. and Lordkipanidze, I. N.

TITLE: Corrosion of the titanium alloys AT3(AT3), AT4, AT6 and AT8 in waters of various compositions and in the atmosphere

SOURCE: Akademiya nauk SSSR. Institut metallurgii. Titan i yego splavy. no. 7, Moscow, 1962. Metallokhimiya i novyye splavy, 263-273

TEXT: Tests were carried out in distilled and in tap water at 20, 100 and 170°C. The tests at 170°C corresponded to a pressure of approximately 10 atm, and hence they had to be carried out in an autoclave. Besides, Ti and its alloys, together with other metals, were subjected to field tests in mineral waters and their vapors. In order to study the kinetics of the electrode processes and to obtain data on the possibility of using these alloys in contact with other metals, the irreversible electrode potentials were mea-

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sured and polarization curves plotted. A series of corrosion tests of the Ti alloys under various atmospheric conditions was also carried out. It was found that AT3, AT4, AT6, $AT6_1$, AT8, $AT8_1$ and AT10 possess a good resistance to distilled water at room temperature, and to tap water at 100 and 170°C. The above alloys are resistant to mineral waters of the Borzhomskiy ore deposits in 5% NaCl solution. Their resistance to waters of various compositions is due to inhibition of the anode reactions. Titanium and its α-base alloys will be cathodic to all metals, except Ni and Ag, in 0.5 N NaCl solution, and will cause rapid destruction of the anodes. After 5000 hours' exposure to atmospheres containing H_2S, nitric oxides, SO_2, ammonia, carbonic acid and other gases, polished alloys retain their reflective properties. The corrosion resistance of AT3 and AT4 under most atmospheric conditions is superior to that of the other alloys, and they are recommended as a material for memorials and decorative articles designed for service in industrial atmospheres and under tropical conditions. There are 3 figures and 8 tables.

Card 2/2

ACCESSION NR: AR4036261 S/0137/64/000/003/I044/I044

SOURCE: Referativnyy zhurnal. Metallurgiya, Abs. 3I255

AUTHOR: Tavadze, F. N.

TITLE: Effect of nitrogen on the high-temperature strength of chromium-manganese austenite

CITED SOURCE: Tr. Gruz. politekhn. in-t, no. 2(82), 1962, 13-25

TOPIC TAGS: Austenite strength, nitrogen austenite, carbon austenite, austenite heat resistance

TRANSLATION: Relationships governing the change in high-temperature strength with composition were established for the alloys of individual sections of the following Fe-Cr-Mn systems: Fe--Cr--Mn--N, Fe--Cr--Mn--Mo--N, Fe--Cr--Mn--Mo--W--N, Fe--Cr--Mn--Mo--W--Nb--N, and Fe--Cr--Mn--Ni--Mo--W--Nb--N. The following diagrams were constructed: (a) composition vs. change in the bending deflection, and (b) composition vs. time required for the band per mm at 700° and a stress of 15 kg/mm^2.

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ACCESSION NR: AR4036261

It was shown that the high-temperature strength of different systems with the same N content increases with the number of the components in the γ solid solution. In order to find the most heat resistant composition of Cr-Mn steel, it is not enough to use multicomponent alloying of the solid solution. Components must be present which produce a prolonged precipitation hardening without removing the alloy elements from the matrix and which hinder the diffusion processes and the coagulation of the dispersed phases. Nb and Mo, or Nb and Mo in combination with W are recommended as such components. It was shown that multicomponent alloyed Cr-Mn carbon austenite has a greater tendency toward decomposing and is less heat resistant than austenite containing N, for the same content of the other elements. At 700-750° and stresses of 15 kg/mm^2, the greatest high-temperature strength was exhibited by steels containing (in %) Cr 15-20, Mn 12-16, Mo 0.5-1, W 0.5-1, Nb 0.5-1, and N 0.35-0.5. Author's summary.

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

Card 2/2

TAVADZE, F.N.; PETRIASHVILI, B.V.; LANCHAVA, M.D.

Overheating of cupola iron. Lit.proizv. no.3:10-12 Mr '62.
(MIRA 15:3)

(Cupola furnaces) (Electric heating)

TAVADZE, F.N.; DZHANELIDZE, I. Sh.

Effect of vacuum treatment on structural transformations in cast iron. Trudy GPI [Gruz.] no.4:51-56 '62 (MIRA 17:8)

TAVADZE, F.N.; KARTOZIYA, Ye.S.

Surface saturation by lithium of iron, cobalt, and nickel.
Trudy GPI [Gruz.] no.4:57-63 '62 (MIRA 17:8)

S/129/62/000/004/010/010
E193/E383

AUTHORS: Tavadze, F.N., Academician of AS Georgian SSR and Kovshikov, E.K., Engineer

TITLE: Conference on metallography and heat-treatment

PERIODICAL: Metallovedeniye i termicheskaya obrabotka metallov, no. 4, 1962, 61 - 62

TEXT: A conference devoted to new developments in metallography and heat-treatment of metals was convened in Tbilisi from December 7 - 10, 1961, by the governing bodies of administrative, technical and scientific organisations. The following 25 papers were delivered:
"High-temperature strength of chromium-manganese austenite with various alloying elements as a function of the nitrogen content" by Academician of the AS Georgian SSR F.N. Tavadze (Tbilisi);
"New methods of producing high-strength steels" by Doctor of Technical Sciences Professor S.M. Baranov;
"Alloying of steels with nitrogen and some data on the physico-

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