PALANT, V.I., tekhnolog; KUROCHKIN, B.N.

The use of natural gas in open-hearth furnaces. Metallurg no.7:14-17 Jl '56. (MLRA 9:9)

1.Martenovskiy tsekh No.2 zavoda "Krasnyy Oktyabr'" (for Palant).
2.Starshiy nauchnyy sotrudnik Vsesoyuznogo nauchno-issledovatel'skogo instituta topliveispol'zovaniya.
(Open hearth furnaces) (Gas, Natural)

137-58-6-11706

Translation from Referativnyy zhurnal, Metallurgiya, 1958, Nr 6, p 70 (USSR)

AUTHOR: Kurochkin, B.N.

TITLE: Heating Open-hearth Furnaces by Cold Gas With Elevated Heat Value (Otoplenıye martenovskikh pechey kholodnym vysokokaloriynym gazom)

PERIODICAL Tr. Nauchno-tekhn. o-va chernoy metallurgii, 1957, Vol 18, pp 331-339

ABSTRACT: A description is offered of the results of conversion of three 50-t open hearths at the "Red October" plant to heating by cold natural gas (NG) of 8500 kcal/nm^3 heat capacity, carburetted with heavy oil, with a partial reconstruction of the ports. The best results are obtained with the VNIIMT internal-blending burners. The following approximate minimum parameters are established for the use of NG for low-capacity furnaces: gas at 1-3 atm excess pressure, consumption of heavy oil in the gas-and-heavy-oil mixture $\sim$30% of the whole (measured in terms of heat released), heavy-oil pressure 4-6 atm excess, pressure of atomizing component (air) 4-6 atm excess when the air used for this purpose was 10% of the total air consumption. Under

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137-58-6-11706

Heating Open-hearth Furnaces by Cold Gas With Elevated Heat Value

proper conditions of heating, the output and life of the furnaces and the nominal consumption of fuel correspond to the indices for furnaces fueled by heavy oil. In view of the high heating of the ports due to incomplete combustion of gas in the uptakes it will be necessary to develop a rational port design for NG combustion.

A.D.

1. Open hearth furnaces--Heating 2. Natural gas--Effectiveness 3. Natural gas --Properties 4. Gas burners--Equipment 5. Fuel oil--Applications

Card 2/2

KUROCHKIN, B.N

137-58-5-9094

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 5, p 49 (USSR)

AUTHOR: Kurochkin, B.N

TITLE: Thermal Insulation of the Crown of a Basic Open-hearth Furnace (Opyt teplovoy izolyatsii osnovnogo svoda martenovskoy pechi)

PERIODICAL: Tr. Nauchno-tekhn. o-va chernoy metallurgii, 1957, Vol 18, pp 524-531

ABSTRACT: The heat lost through the basic crown of a furnace constitutes about 30% of the total amount of heat which escapes through the lining of the furnace. Positive results were obtained in experiments in which the basic crown of a furnace at the Verkh-Isetskiy plant was thermally insulated. This was accomplished by covering 75-80% of the crown surface (made of Satka brick 380 mm thick) with light-weight, fireclay brick BL-1.3. Furnaces with insulated crowns (IC) operated at higher temperatures. The output increased by 5-6%, while the fuel consumption was reduced by 6-12%. Owing to their greater temperature stability and their decreased tendency to absorb iron oxides on their internal surfaces, the IC's serve longer than

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Thermal Insulation of the Crown of a Basic Open-hearth Furnace

furnace crowns which have not been insulated. Chipping and peeling of the crown brick proceeds more uniformly; the wear of the crown during the experiments amounted to 0.42 mm per smelting (as compared to the average shop value of 0.43 mm). The employment of IC's increases the weldability of the crown brick.

1. Open hearth furnaces--Insulation 2. Refractory material--Applications

Ye, T.

Card 2/2

KOROLEV, A.I.; BLINOV, S.T.; LUBENETS, I.A.; KOBURNEYEV, I.M.; TURUBINER, A.L.; VASIL'YEV, S.V.; CHERENKO, M.A.; BELOV, I.V.; TELESOV, S.A.; MAZOV, V.F.; MEDVEDEV, V.A.; MAL'KOV, V.G.; BUL'SKIY, M.T.; TRUBETSKOV, K.M.; SHNEYEROV, Ya.A.; SLADKOSHTEYEV, V.T.; PALANT, V.I.; KUROCHKIN, B.N.; ZHDANOV , A.M.; BELIKOV, K.N.; SABIYEV, M.P.; GARBUZ, G.A.; PODGORETSKIY, A.A.; ALFEROV, K.S.; NOVOLODSKIY, P.I.; MOROZOV, A.N.; VASIL'YEV, A.N.; MARAKHOVSKIY, I.S.; MALAKH, A.V.; VERKHOVTSEV, E.V.; AGAPOV, V.F.; VECHER, N.A.; PASTUKHOV, A.I.; BORODULIN, A.I.; VAYNSHTEYN, O.Ya.; ZHIGULIN, V.I.; DIKSHTEYN, Ye.I.; KLIMASENKO, L.S.; KOTIN, A.S.; MOLOTKOV, N.A.; SIVERSKIY, M.V.; ZHIDETSKIY, D.P.; MIKHAYLETS, N.S.; SLEPKANEV, P.N.; ZAVODCHIKOV, N.G.; GUDEMCHUK, V.A.; NAZAROV, P.M.; SAVOS'KIN, M.Ye.; NIKOLAYEV, A.S.

Reports (brief annotations). Biul. TSNIICHM no.18/19:36-39 '57. (MIRA 11:4)

1. Magnitogorskiy metallurgicheskiy kombinat (for Korolev, Belikov, Agapov, Dikshteyn). 2. Kuznetskiy metallurgicheskiy kombinat (for Blinov, Vasil'yev, A.N., Borodulin, Klimasenko). 3. Chelyabinskiy metallurgicheskiy zavod (for Lubenets, Vaynshteyn). 4. Zavod im. Dzherzhinskogo (for Koburneyev). 5. Zavod "Zaporozhstal'" (for Turubiner, Mazov, Podgoretskiy, Marakhovskiy, Savos'kin). 6. Makeyevskiy metallurgicheskiy zavod (for Vasil'yev, S.V., Mal'kov, Zhidetskiy, Al'ferov). 7. Stal'proyekt (for Chernenko, Zhdanov, Zavodchikov). 8. VNIIT (for Belov). 9. Stalinskiy metallurgicheskiy zavod (for Telesov, Malakh).

(Continued on next card)

KOROLEV, A.I.--(continued) Card 2.

10. Nizhne-Tagil'skiy metallurgicheskiy kombinat (for Medvedev, Novolodskiy, Vechar). 11. Zavod "Azovstal'" (for Bul'skiy, Slepkanev). 12. TSentral'nyy nauchno-issledovatel'skiy institit chernoy metallurgii (for Trubetskov). 13. Ukrainskiy institut metallov (for Shneyerov, Sladkoshteyev, Kotin). 14. Zavod "Krasnyy Oktyabr'" (for Palant). 15. Vsesoyuznyy nauchno-issledovatel'skiy institut metallurgicheskoy teplotekhniki (for Kurochkin). 16. Zavod im. Voroshilova (for Sabiyev). 17. Chelyabinskiy politekhnicheskiy institut (for Morozov). 18. Giprostal' (for Garbuz). 19. Ural'skiy institut chernykh metallov (for Pastukhov). 20. Zavod im. Petrovskogo (for Zhigulin). 21. Ministerstvo chernoy metallurgii USSR (for Molochkov, Siverskiy). 22. Glavspetsstal' Ministerstva chernoy metallurgii SSSR (for Nikolayev).

(Open-hearth process)

KUROCHKIN, B. N.

"Testing Natural Gas for Use in Heating Martin (Open-hearth) Furnaces"

(Theory and Practice of Gas Combustion; Transactions of a Scientific and Technical Meeting) Leningrad, Goestoptekhizdat, 1958. 343 p.

KUROCHKIN, B. N. Cand Tech Sci -- (diss) "Use of natural gas for the heating of Martin furnaces." Kiev, 1959. 22 pp (Min of Higher Education USSR. Kiev Order of Lenin Polytechnic Inst), 100 copies (KL, 44-59, 127)

SOV/133-59-5-7/31

AUTHORS: Kurochkin, B.N., Simonov, Ye.I., Kalashnikov, L.A., Yemets, L.K. and Zelenskiy, V.D.

TITLE: Operation of Open-hearth Furnaces on Natural Gas (Rabota martenovskikh pechey na prirodnom gaze)

PERIODICAL: Stal', 1959, Nr 5, pp 407 - 413 (USSR)

ABSTRACT: At the end of 1957, two works were operating open-hearth furnaces on natural gas with a pressure of 1 and 10 atm., respectively. The investigation carried out by VNIIMT on these furnaces indicated that the gas pressure, the nature and pressure of the atomising medium, the rate of consumption of the carburising medium and some other factors have a considerable influence on the efficiency of utilisation of natural gas as an open-hearth fuel. When the Libknekht Works started operation on natural gas, its pressure was fired at 2.5 - 3.0 atm. A study of the thermal operating conditions of a 185-ton furnace with air or steam as atomising agents for the carburising oil (up to 30%) was carried out. For comparison a preliminary investigation of the furnace operation when fired with fuel oil was made. Characteristic features of furnace

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design are given (Figure 1). Standard operating conditions when firing with oil are shown in Table 1 and a comparison of operating indices with oil and natural gas in Tables 2 and 5. The dependence of the mean flame radiation on the rate of consumption of oil (for oil-firing) - Figure 5 and the dependence of the radiation of the oil flame on the type of atomising agent - Figure 6; the above two relationships for gas-oil flame are shown in Figures 7 and 8, respectively. Recommended thermal conditions of furnace operation on firing with natural gas are given in Table 3. It was found that on transferring from oil to natural-gas firing, the productivity of the furnace did not decrease and the consumption of fuel somewhat decreased. In view of a strong influence of the rate of consumption and pressure of the atomising agent on radiation characteristics of the flame, the determination of rational values for the above parameters is necessary in each individual case. On transferring furnaces to natural-gas firing, the above presents the main problem.

Operation of Open-hearth Furnaces on Natural Gas SOV/133-59-5-7/31

There are 8 figures and 5 tables.

ASSOCIATIONS: VNIIMT, Zavod im. K. Libknekhta (imeni Libknekht Works)

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PHASE I BOOK EXPLOITATION SOV/3975

Kurochkin, Boris Nikolayevich

Teplotekhnicheskiye ispytaniya martenovskikh pechey (Heat-Engineering Testing of Open-Hearth Furnaces) Sverdlovsk, Metallurgizdat, 1960. 156 p. Errata slip inserted. 2,700 copies printed.

Ed.: A.S. Nevskiy; Ed. of Publishing House: V.P. Kel'nik; Tech. Ed.: Ye. D. Turkina.

PURPOSE: This book is intended for workers in plant heat-engineering laboratories and departments, for heat engineers of open-hearth furnaces, and for staff members of scientific research institutes.

COVERAGE: This book discusses the methods for testing open-hearth furnaces and investigating their thermal performance. Combustion calculation formulas taking into account the liberation of gas from the bath for various types of fuel for open-hearth furnaces are given. The book also describes methods for heat-engineering testing of open-hearth furnaces and for determining heat losses,

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methods for estimating the completeness of fuel combustion, for setting up the heat balance of a furnace and melting, and for testing air blowers and exhaust fans. The following staff members of open-hearth furnace laboratories contributed to the research: N.V. Karpova, B.N. Kurochkin, A.I. Malysheva, P.A. Myasnikov, A.I. Chernogolovyy, G.I. Shirokov, Candidate of Technical Sciences V.N. Timofeyev and Doctor of Technical Sciences A.V. Kavaderov. The author thanks Doctor of Technical Sciences A.S. Nevskiy. There are 39 Soviet references.

TABLE OF CONTENTS:

Card 2/7

KUROCHKIN, B.N., kand.tekhn.nauk

Use of natural gas for heating open-hearth furnaces. Trudy NTO chern. met. 20:383-390 '60. (MIRA 13:10)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut metallurgicheskoy teplotekhniki.
(Open-hearth furnaces) (Gas, Natural)

BORODIN, V.P.; MARCHENKOVSKIY, G.F.; DARMANYAN, P.E.; YUDSON, A.A.; KUROCHKIN, B.N.

Furnace operations with heat insulated arches. Metallurg 6 no.2: 15-17 F '61. (MIRA 14:1)

1. Zavod "Krasnyy Oktyabr'" i Vsesoyuznyy nauchno-issledovatel'skiy institut metallurgicheskiy teplotekhniki.
(Open-hearth furnaces) (Refractory materials)

KOZLOV, Lev Ivanovich, inzh.; LEVITAN, Solomon Solomonovich, inzh.; KUROCHKIN, Boris Nikolayevich, kand. tekhn.nauk; CHERNENKO, Mikhail Avksent'yevich, inzh.; KUDRIN, Viktor Aleksandrovich, kand.tekhn. nauk; TARSHIS, D.M., red. izd-va; ATTOPOVICH, M.K., tekhn. red.

[Use of natural gas in open-hearth furnaces]Primenenie prirodnogo gaza v martenovskikh pechakh. [By] L.I.Kozlov i dr. Moskva, Metallurgizdat. 1962. 158 p. (MIRA 15:8)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut metallurgicheskoy teplotekhniki (for Kurochkin). 2. Gosudarstvennyy soyuznyy proyektnyy institut Ministerstva chernoy metallurgii (for Kozlov, Levitan, Chernenko, Kudrin).
(Open-hearth furnaces) (Gas, Natural)

KUROCHKIN, B.N., kand.tekhn.nauk

Determining power engineering characteristics of natural gas. Met. i gornorud. prom. no.3:73-76 My-Je '62. (MIRA 15:9)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut metallurgicheskoy teplotekhniki.

(Gas, Natural)

BUYANOV, A.; KUROCHKIN, P., [translator]; PIL'NEN'KIY, A., veduchiy redaktor; NOVIK, O., tekhnichniy redaktor

[Atomic energy. Translated form the Russian] Atomna energiia. Pereklad z rosiis'koho vydannia. Kyiv, Derzh. vyd-vo tekhnichnoi lit-ry, URSR, 1956. 146 p. (MLRA 10:2)
(Atomic energy)

KUROCHKIN, F.I.

AUTHOR: Kazachov, A.I., Kurochkin, F.I., Engineers and 104-2-14/38
Marchenko, E.A., Candidate of Technical Sciences.

TITLE: On the conditions of operation of shunting circuit breakers in series compensating installations. (Ob usloviyakh raboty shuntiruyushchikh vyklyuchateley v ustanovkakh prodolnoy kompensatsii)

PERIODICAL: "Elektricheskie Stantsii" (Power Stations), 1957, Vol. 28, No.2, pp. 56 - 60 (U.S.S.R.)

ABSTRACT: Series capacitors in transmission lines have dischargers to protect them from overvoltages when short circuits occur on the lines. The capacitors are provided with a shunting circuit breaker intended for operational switching and for disconnecting the installation for repair or examination. The operating conditions of these circuit breakers have certain special features. The class of insulation can be lower than that of the rest of the system if the breakers are installed on an insulated platform. The rupturing capacity is not very great as the greatest current to be disconnected is the line current in normal overload conditions with a low rate of rise of restriking voltage because of the large capacitance in parallel with the contacts. There are certain additional requirements in that the breakers must withstand the thermal

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On the conditions of operation of shunting circuit breakers in series compensating installations. (Cont.) 104-2-14/38

and dynamic effects of the discharge currents. However, tests carried out with circuit breakers types BBH-110 and BM-35 on a 220 kV installation show that no damage was done to current carrying parts by electro-dynamic forces after multiple passage of discharge currents the amplitude of which was much greater than the normal permissible maximum short circuit current. Tests that were carried out are described and the results are given in the form of oscillograms. It was found that the de-ion grids took no part in the process of arc suppression and may be removed whilst the contact system must be made in such a way that rigidly mounted parts are not in the way of the explosion wave. The contact system was accordingly reconstructed and the way in which this was done is illustrated. Because of removal of potential screens the discharge voltage between bushings and tank was reduced by 10 - 15 kV.

Apart from the danger of dynamic effects of the explosion wave on the contact system the quantity of energy dissipated in the breaker after a large number of repeated discharges of the condenser battery may greatly exceed the energy dissipated during the heaviest short circuit and so the content of

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On the conditions of operation of shunting circuit breakers in series compensating installations. (Cont.) 104-2-14/38

oil deterioration products is high; the oil had to be changed after shunting a few times a 220 kV condenser installation with a line current of 600 A equal to the rated current of the breaker. Contamination of the oil was insignificant at currents up to 450 A. This contamination can be reduced by increasing the speed of separation of the contacts and increasing the damping resistances in the breaker circuits. It would be advisable to develop circuit breakers of light construction specially intended for operation in series capacitor installations. Circuit breaker BM-35 cannot be used without reconstruction of its contact system.

There are 7 figures and 3 references.

AVAILABLE:

Card 3/3

[redacted], K. I.

Dissertation: "A Weight Calculation of the Major Units of Helicopters with Reciprocating Engines." Cand Tech Sci, Moscow Order of Lenin Aviation Institute imeni Sergo Ordzhonikidze, 21 Jun 54. (Vechernyaya Moskva, Moscow, 16 Jun 54)

SO: Sum 318, 23 Dec 1954

10.1500
26.4110

S/535/61/000/142/001/003
E191/E481

AUTHOR Kurochkin, F.P., Candidate of Technical Sciences

TITLE Aerodynamic investigations of rotors for VTOL aircraft in the hovering condition

SOURCE Moscow. Aviatsionnyy institut. Trudy. No.142. Voprosy aerodinamiki nesushchikh vintov vertoletov. 5-24 - 1961

TEXT The results of tests are reported, wherein models of rotors for VTOL aircraft were tested in a wide range of solidities and blade arrangements. The tests were carried out with an experimental rotor ВП-5 (VP-5). The blades of all tested rotors were identical and had a petal shaped planform, a tapering thickness ratio distribution and a substantial washout twist (nearly 30°). These blades were made up into rotors with two, three, four, six and eight blades, as well as an eight-blade two-row rotor and a four-blade coaxial contra-rotating rotor. The rotor was mounted in a wind tunnel with its axis in line with the wind tunnel axis. The wind tunnel speed was controlled by the tunnel fan, as well as an additional venetian blind grille. The

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Aerodynamic investigations ...

thrust and torque of the rotor, the tunnel speed the rotor rpm and several temperatures and pressures were measured. The test results are presented in terms of the thrust and torque coefficients, the relative wind speed, the figure of merit the specific thrust and other quantities. The main purpose of the test was the study of the effects of the solidity and the arrangement of the rotor on its characteristics the following are among the conclusions reached. The maximum figure of merit in a single rotor is obtained at an effective solidity of 0.175 The pitch setting angles which correspond to the maximum values of the figure of merit vary between 9 and 16° in the entire range of solidities examined (0.1 to 0.35). When the number of blades in reases the optimum pitch angle also increases. The optimum value of the ratio of thrust coefficient to solidity is 0.16. The optimum ratio of thrust to lift coefficients is obtained at an excessive rotor diameter. An example shows that a loss of lift (for equal power) of 15% is the only penalty of reducing the rotor diameter by 47%. In selecting the optimum solidity for take off and level flight conditions the maximum figure of merit in

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hovering should be the criterion. At an effective mean blade pitch exceeding 10°, the single rotor is more efficient than the two-row rotor. Coaxial rotors are more efficient than both under all conditions. The maximum figure of merit (adjusted to a maximum of 100%) of a two-row rotor is 65.2%, of a single rotor it is 71.7% and of a coaxial rotor 77.7%. The coaxial rotor has a clear advantage compared with the single and two row rotors throughout the range of vertical flight speeds.
There are 18 figures and 1 table.

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Card 3/3

KUROCHKIN, G.A.; TRAVKIN, V.S.; VLADISLAVLEV, Yu.Ye.; ANTONOV, N.V.; GUREVICH, E.M.; SHIT, Ye.E.; PETROPAVLOVSKIY, B.P.; ACHKASOV, N.I.; BORMOTIN, I.M.

Inventions. Gor.zhur. no.2:74-75 F '63. (MIRA 16:2)
(Mining machinery—Technological innovations)
(Earthmoving machinery—Technological innovations)
(Railroads—Rails)

KUROCHKIN, G. D.

AA 57T11

USSR/Acad Sci Aug 1947

"Society for Coordination of Scientific Work of the Academies of Sciences of the Union Republics," G. D. Kurochkin, Sci Secy of the Society, 10 pp

"Vest Akad Nauk SSSR" No 8

Short account of work accomplished in various Union Republic Academies of Sciences during 1946. Following Academies submitted reports: Azerbaydzhan SSR, Armenian SSR, Belorussian SSR, Gruziya SSR, Kazakh SSR, Latvian SSR, Lithuanian SSR, Ukrainian SSR, Uzbek SSR, and Estonian SSR. Gives dates (years) when various republics' Academies were officially recognized.

57T11

KUROCHKIN, G.

On the banks of the Ulug-Khem. Vokrug sveta 5:6-12 My '53. (MLRA 6:6)
(Tuva Autonomous Region--Description and travel)

KUROCHKIN, G.D.

Beyond the Sayan Mountains. Priroda 42 no.11:74-81 N '53. (MLRA 6:11)
(Tannu-Tuva--Description and travel)

KUROCHKIN, G.D.

Skarns in the Cambrian porphyrites in the eastern Tannu-Ola Range. Dokl. AN SSSR 95 no.1:153-154 Mr '54. (MLRA 7:3)

1. Sovet po izucheniyu proizvoditel'nykh sil Akademii nauk SSSR. (Tanmu-Ola Range--Porphyrite) (Porphyrite--Tannu-Ola Range)

KUROCHKIN, Grigoriy Danilovich; MANAYEVA, O., redaktor; POLYAKOVA, V. redaktor; PECHNIKOVA, N., redaktor; GOLUBKOVA, O., tekhnicheskiy redaktor

[On the banks of the Ulug-Khem; notes of a geologist] Na beregakh Ulug-Khema; zapiski geologa. (Moskva) Izd-vo TsK VLKSM "Molodaia gvardiia," 1955. 134 p. (MLRA 8:10)
(Yenisey Valley--Description and travel)

KUROCHKIN, Grigoriy Danilovich

[Beyond the Sayan Mountains; notes of a geologist] Za Saianskim khrebtom; zapiski geologa. M, Geografgiz, 1956 116 p. (MLRA 10:4)
(Tuva Autonomous Province)

SOV/26-58-1-32/36

AUTHORS: Kurochkin, G.D., Candidate of Geologo-Mineralogical Sciences; ~~Semenov, L.V.,~~ Candidate of Economic Sciences (Moscow)

TITLE: A Monograph on a Vast and Rich Province (Monografiya ob obshirnom i bogatom krave) M.I. Pomus: West Siberia. An Economico-Geographical Characteristic. State Publishing House of Geographical Literature 1956, 643 pp (M.I. Pomus: Zapadnaya Sibir'. Ekonomiko-geograficheskaya kharakteristika. Gosudarstvennoye izdatel'stvo geograficheskoy literatury 1956, 643 str.)

PERIODICAL: Priroda, 1958, Nr 1, pp 123-124 (USSR)

ABSTRACT: This is a review of the above mentioned book.

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KUROCHKIN, G.D., kandidat geologo-mineralogicheskikh nauk.

In a land of incalculable wealth. Priroda 46 no.3:68-73 Mr '57.
(MLRA 10:3)

1. Krasnoyarskaya kompleksnaya ekspeditsiya Soveta proizvoditel'nykh sil Severa Akademii nauk SSSR.
(Krasnoyarsk Territory--Geography, Economic)

KUROCHKIN, G.D.; FEDOROV, A.M.

Massifs of mineralized serpentinites and pyroxenites in spurs of the Manskoye Belogor'ye in the Eastern Sayans. Izv.AN SSSR Ser.geol.26 no.12:97-102 D '61. (MIRA 14:12)

1. Sovet po izucheniyu proizvoditel'nykh sil AN SSSR, Moskva.
(Sayan Mountains--Serpentinites)
(Sayan Mountains--Pyroxenite)

KUROCHKIN, G.D.

Academician A.P.Karpinskii, founder of Soviet geology. Vop.-ist.est.i tekh. no.12:234-236 '62. (MIRA 15:4)
(Karpinskii, Aleksandr Petrovich, 1846-1936)

KUROCHKIN, G.D., kand.geol.-mineral.nauk

"Natural conditions of Krasnoyarsk Territory." Reviewed by G. D. Kurochkin. Priroda 51 no.4:121-122 Ap '62. (MIRA 15:4)

1. Institut istorii yestestvoznaniya i tekhniki AN SSSR, Moskva.
(Krasnoyarsk Territory--Physical geography)

KUROCHKIN, G.D., kand.geologo-mineral.nauk

"History of the discovery of ore deposits in Russia" by A.A. Kuzin. Reviewed by G.D. Kurochkin. Priroda 51 no.7:99 Jl '62. (MIRA 15:9)

1. Institut istorii yestestvoznaniya i tekhniki AN SSSR, Moskva.
(Ore deposits) (Kuzin, A.A.)

SOLNTSEV-KONDRAT'YEV, Yu.D. (Moskva); KOZLOV, V.V. (Moskva); BANNIKOV, A.G., prof. (Moskva); MENYAYLOV, A.A., doktor geol.-mineral.nauk; KUROCHKIN, G.D., kand.geol.-mineral.nauk (Moskva); SLUTSKIY, M.S. (Moskva); YAKOVLEV, Yu.Ya. (Moskva); LOPASHOV, G.V., doktor biolog.nauk (Moskva)

Books. Priroda 54 no.2:58,71,103,108,123-124 F '65.
(MIRA 18:10)

1. Institut morfologii zhivotnykh AN SSSR (for Lopashov).

KUROCHKIN, I. D.

Contagion and Contagious Diseases

Isolation of the Heidelberg bacillus from sewage waters of the municipal for infectious diseases. Gig. i san, No. 6, 1952.

Monthly List of Russian Accessions, Library of Congress, November 1952. UNCLASS.

BOTVINIK, S.A., dotsent, zavedmyushchiy; POPKOVA, N.F.; KUROCHKIN, I.D.; POSTNOVA, Ye.V.

Early and accelerated methods of laboratory diagnosis of dysentery. Second report. Zhur.mikrobiol.epid.i immun. no.9:34-37 S '53. (MLRA 6:11)

1. Kafedra mikrobiologii Yaroslavskogo meditsinskogo instituta.
(Dysentery)

KUROCHKIN, I.D.

Comparative evaluation of the standard accumulation method and Kichenko's method for isolating Escherichia coli from water. Lab.delo no.6:19-20 N-D '55. (MIRA 12:6)

1. Iz laboratorii Iaroslavskoy oblastnoy sanitarno-epidemiologicheskoy stantsii.

(WATER SUPPLY, bacteriology,
E. coli, determ., Kichenko's technic)
(ESCHERICHIA COLI,
in water, determ., Kichenko's technic)

TSIMBALIST, D.F.; MOTAVKINA, N.S.; KUROCHKIN, I.D.; KAMENNAYA, Z.Kh.

Etiological structure of dysentery in Yaroslavl. D.F. TSimbalist and others. Zhur.mikrobiol.epid. i immun., supplement for 1956:18-19 '57 (MIRA 11:3)

1. Iz Yaroslavskogo meditsinskogo instituta, Oblastnoy i Gorodskiy sanitarno-epidemiologicheskikh stantsiy.
(YAROSLAVL-DYSENTERY)

KALINSKIY, D.N.; KUROCHKIN, I.F.

Induction converter of shaft-turn angle to a discrete value. Sbor. trud TSNIICHM no.30:123-128 '63. (MIRA 16:10)

(Electronic computers)

GALYATIN, V.M.; KALINSKIY, D.N.; Prinimali uchastiye: KUROCHKIN, I.F.; DUVANOV, A.I.; SOLOV'YEV, Yu.F.; GERASIMOV, Yu.V.; GROSVAL'D, V.G.; SHASHKOV, V.N.; VOLKOV, A.A.; ZHILKO, E.I.; MITROPOL'SKIY, Yu.I.; FEDOSEYEV, S.V.; GONCHAROV, F.I., rabotnik; SHEMETOV, P.Ye., rabotnik; CHUPRINA, I.A., rabotnik; DEMIN, P.Ye., rabotnik; GONCHARENKO, P.V., rabotnik; SIMANYUK, G.N., rabotnik

Investigating power and technological parameters of rolling on the 2350 medium sheet mill. [Sbor. trud.] TSNIICHM no.29:138-148 '63. (MIRA 17:4)

1. Sotrudniki TSentral'nogo nauchno-issledovatel'skogo instituta chernoy metallurgii (for Gerasimov, Grosval'd, Shashkov, Volkov, Zhilko, Mitropol'skiy, Fedoseyev). 2. Listoprokatnyy tsekh Magnitogorskogo metallurgicheskogo kombinata (for Goncharov, Shemetov, Demin, Chuprina, Goncharenko, Simanyuk).

ZAYTSEV, M.L.; KALINSKIY, D.N.; KUROCHKIN, I.F.; BURYKIN, A.A.

Design of equal-arm measuring bridges with resistance converters. Sbor. trud TSNIICHM no.30:136-144 '63. (MIRA 16:10)

(Bridge circuits)

AUTHOR: Kurochkin, N.E.

TITLE: The distribution of absorbing matter and the spiral structure of the galaxy. (Raspredeleniye pogloshchayushchey materii i spiral'naya struktura galaktiki).

PERIODICAL: Astronomicheskii Zhurnal, 1957, Vol.34, No.1, pp.31-44 (USSR)

ABSTRACT: The absorption of light in a heterogeneous medium may be represented by $E = -k(r)Edr = -\varkappa\varrho(r)Edr$.

where E is the intensity, $k(r)$ the coefficient of absorption, and $\varkappa$ the coefficient of absorption per unit density $\varrho(r)$. In practice the full photographic absorption is studied so that $k(r)$ may be taken as independent of wavelength λ and equal to some mean value in the given spectral region. If the distribution of matter is studied over extended regions of space $\varkappa$ may be taken as independent of r, which will be approximately true in the Galaxy. Hence,

$$\ln\left(\frac{E}{E_0}\right) = \varkappa\int_{r_1}^{r_2}\varrho(r)\,dr$$

and

$$A(r) = m - m_0 = 1.086\,\varkappa\int_{r_1}^{r_2}\varrho(r)\,dr.$$

Locally, $\varrho(r)$ may be replaced by its mean value $\bar{\varrho}(r)$ when $r_2 - r_1$ is sufficiently small, and hence

$$\varkappa\bar{\varrho}(r) = \frac{A(r_2) - A(r_1)}{1.086\,(r_2 - r_1)}$$

To determine the density distribution of absorbing matter

The distribution of absorbing matter and the spiral structure of the galaxy. (Cont.).

The data of VanRhijn were used in constructing Table 2 and Fig.3. Column headings are the same as for Table 1 and Fig.1 respectively. VanRhijn's data are the more reliable.

From these graphs the following mean distribution of density along the z axis was obtained.

$$(\lambda\bar{\rho})_z = D_Z = 24.38 \cdot 10^{-4} \exp\left(-\frac{Z}{216.5 \pm 15.1}\right) \pm 0.68$$

Assuming circular symmetry, the radial distribution was found to be

$$D_R = 19.28 \times 10^{-4} \exp -\left(\frac{R_{xy} - 7200}{1010}\right)$$

In this, VanRhijn's data, on absorption in six Kapteyn areas (SA 110, 87, 19, 8, 9, 24, with galactic longitudes 0, 17, 80, 92, 107, 128) with $b \leq \pm 3.1$ were used. The distance of the sun from the centre of the Galaxy (R_o) was taken as 7.2 Kps.

Using the expressions for D_R and D_Z the mass of the Galaxy is estimated to be about

$$5 \times 10^8 m_\odot$$

The deviation of densities from the logarithmic law of distribution in low latitude directions agrees with the spiral structure in the solar vicinity, determined from the maxima in the distribution of B stars (Bergedorf Spectral Durchmusterung (7)) and the maxima in the distribution of

The distribution of absorbing matter and the spiral structure of the galaxy. (Cont.)

with the help of the above formulae the data of Kharadze (1) and VanRhijn (2) were used (see also (3) - (6)). These workers give tables of A(r) for different r.

All the areas (SA) were divided into four groups: I (ℓ = 0-59°), II (ℓ = 59-81°), III (ℓ = 81-118°), IV (ℓ = 118-143°). Table 1 indicates the grouping of the material. The first column: Kharadze; second column: VanRhijn. In Table 2 (p.35) are shown: the ranges of Z within which the mean values $\nu\bar{\varsigma}$ were calculated (1st column), the mean Z coordinate (second column), corresponding values of $\nu\bar{\varsigma}$ (third column), their logarithms (fourth column), the number of points (n), and the mean distance from the sun in the galactic plane r_{xy}. There are four groups of these columns.

Fig.1 (p.36) gives a plot of log $\nu\bar{\varsigma}$ versus z using Kharadze's data. For large Z the data are few and not very reliable.

Group IV was then divided into three sub-groups for $b > 20°$, $20° \leq b \leq 40°$, and $b > 40°$, and log $\nu\bar{\varsigma}$ was plotted against Z for the three sub-groups (Fig.2). As can be seen some sort of relation does exist between the density gradient and Z. There is not enough data for quantitative analysis of this relation.

constant configurations in the problem of four bodies, and their stability. (Cont.)

3. The stability of some special circular solutions in the problem of four bodies is considered.
I. Straight line. With a suitable choice of initial conditions this configuration is conditionally stable, and two families of circular orbits exist which are near to the position of relative equilibrium.
II. Square. As in I this configuration is unstable but the instability is not absolute.
II. Rhombus. Configuration is unstable.
III. Equilateral triangle. (three equal masses, fourth mass at the centre) Configuration is unstable.

4. An attempt is made to apply the theory of constant configurations to the stars of the Trapezium of Orion. In this system (Fig.8) it is assumed that E and F are only projected on the general background of the trapezium and their mass is small. Therefore, in the first approximation, the trapezium may be taken as consisting of four bodies A,B,C,D, where $CD \simeq AC$ and $m_D \simeq m_A$. It is shown that within the limits of this model the Trapezium of Orion cannot form a plane constant configuration. It is possible, however, that these stars form a spatial constant configuration. 10 Figs. 1 Table. 10 references, 3 of which are Russian.

State Astronomical Institute
imeni I. K. Shternberg.

Recd. April 18, 1956.

KUROCHKIN, K.I.

Control of stolonate weeds. Zemledelie 24 no.5:66-74 My '62.
(MIRA 15:7)
(Weed control)

BEREZOVICH, Lev Aronovich; KUROCHKIN, Konstantin Mikhaylovich; IVANOV, German Afanas'yevich; NEUSYPIN, A.M., inzh., ved. red. SOROKINA, T.M., tekhn. red.

[Chief operator's switchboard. Modernization of the electric drive of the PD45-2 perforator]Direktorskii kommutator. Modernizatsiia elektroprovoda perforatora PD45-2. [By]G.A.Ivanov. Moskva, Filial Vses.in-ta nauchn. i tekhn.informatsii, 1957. 19 p. (Peredovoi nauchno-tekhnicheskii i proizvodstvennyi opyt. Tema 43. No.O-57-7/2) (MIRA 16:2)
(Telephone switchboards) (Punched card systems)

231T59

USSR/Metallurgy - Ferrochromium May 52

"Solubility of Nitrogen in Iron-Chromium Alloys," K. T. Kurochkin, P. V. Gel'd, V. I. Yavoyskiy, Ural Polytech Inst imeni S. M. Kirov, Sverdlovsk

"Dok Ak Nauk SSSR" Vol 84, No 2, pp 329-332

Investigates soly of N in liquid Fe-Cr alloys, contg 3.56 to 66% Cr, at N pressure of 735 and 512. Tabulates and compares results with those obtained by American investigators R. M. Brick and L. A. Creevy, showing similarity in general dependence of N soly on Cr concn. Certain

231T59

descrepancy in abs values of data is explained by higher N content in solidified metal in which condition Brick and Creevy conducted their investigation. Submitted by Acad S. I. Vol'fkovich 17 Mar 52.

231T59

KUROCHKIN, K. T.

KUROCHKIN, K.T., BAUM, B.A., KONOVALOV, A.C., POSTYK, V.V., TIMOSHENKO, N.F.

"Distribution of Hydrogen and Nitrogen in Steel Castings,"
lecture given at the Fourth Conference on Steelmaking, A.A. Baikov Institute of Metallurgy, Moscow, July 1-6, 1957

KUROCHKIN, K. T.

137-58-4-6669

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 4, p 50 (USSR)

AUTHORS: Kurochkin, K. T., Umrikhin, P. V.

TITLE: Effect of the Gas Content of Transformer Steel on Its Electromagnetic Properties (Vliyaniye soderzhaniya gazov v transformatornoy stali na yeye elektromagnitnyye svoystva)

PERIODICAL: V sb.: Fiz.-khim. osnovy proiz-va stali. Moscow, AN SSSR, 1957, pp 570-585. Diskus. pp 650-655

ABSTRACT: An investigation was made of the gas content of transformer steel in the course of six experimental heats in a 90-95% t basic open hearth furnace heated by heavy oil (5-15% moisture content) and six in a basic 20/25 t electric furnace, during the smelting process and after rolling and annealing of these steels. The charge of the open hearth heats consisted 40% of pig iron, 5% of swarf, and 15% of Fe, the rest being open-hearth department returns and rolling department scrap. 100 kg pig iron were added before tapping. Ferrosilicon (75% Si) was added in the runner simultaneously with the desulfurizer mix and 2.5 kg/t Al. In the electric furnace heats the charge consisted 8% of pig iron, 36% of billets, 45% electric furnace scrap and 10% first-class

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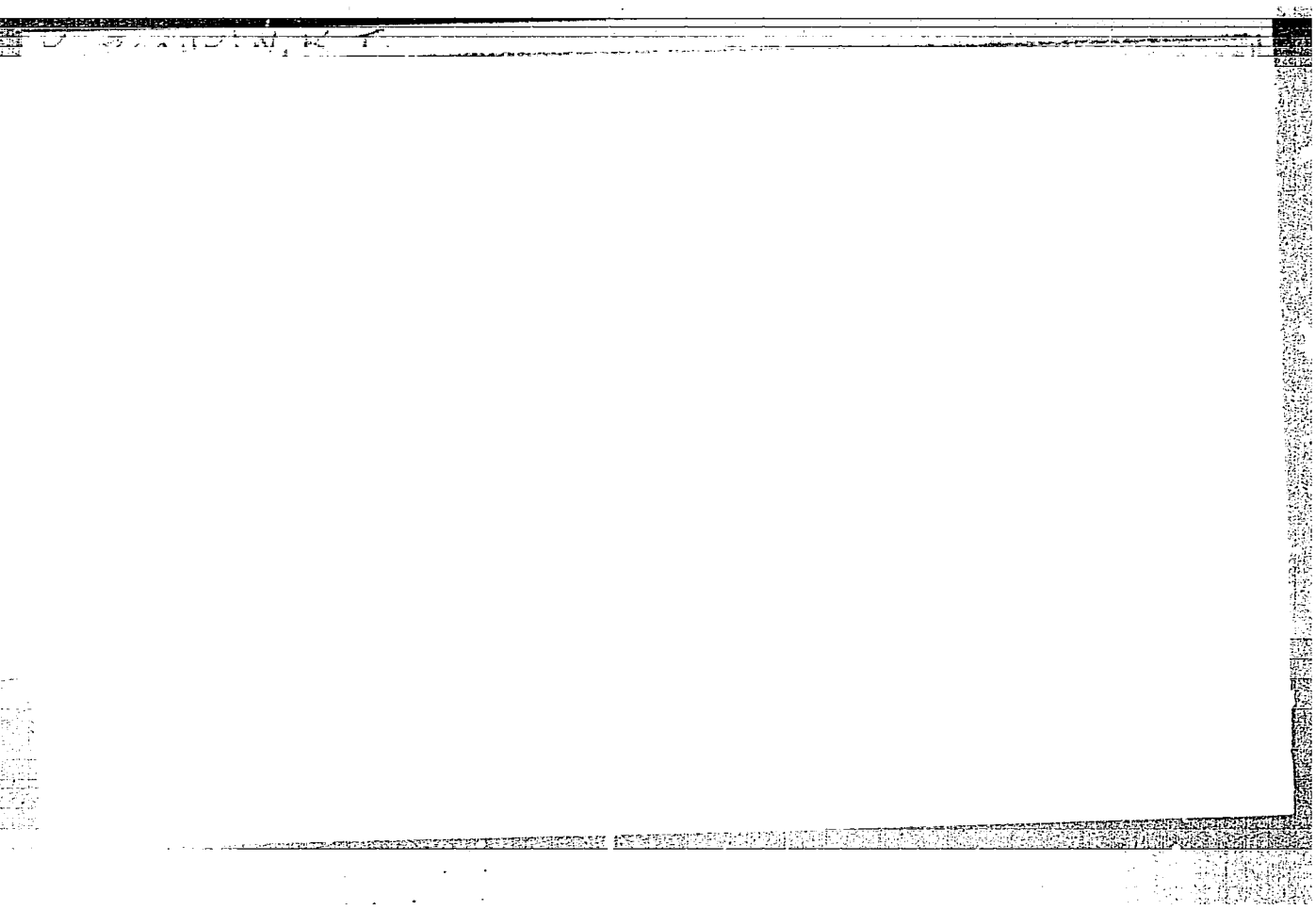
Effect of the Gas Content (cont.)

scrap. Addition of ore and partial slagging-off was performed 40-60 min. before the smelting of the charge. It was found that there is a constant increase in [H] during an open-hearth heat up to the very pouring of the metal while in electric steel making it diminishes even after the oxidizing slag has been removed. The rate of oxidation of C makes for elimination of N and for some increase in [H]. After the addition of the Fe-Si and the Al, [H] rises. [N] diminishes until pouring, but rises during the pour period. The [H] and [N] of steel diminish during rolling and annealing. O and H increase wattage losses, and in addition H dimishes the magnetic induction.

V. M.

1. Steel--Electromagnetic properties 2. Gas--Effects--Applications

Card 2/2



SOV/163-58-1-7/53

AUTHORS: Bogatenkov, V. F., Umrikhin, P. V., Kurochkin, K. T.

TITLE: The Hydrogen Permeability of Liquid Basic Slags (Vodorodopronitsayemost' zhidkikh osnovnykh shlakov)

PERIODICAL: Nauchnyye doklady vysshey shkoly. Metallurgiya, 1958, Nr 1, pp 31-36 (USSR)

ABSTRACT: In the present paper the results of investigations on the hydrogen permeability in slags, in relation to their chemical composition are given. The hydrogen permeability of the slags is influenced by the chemical composition of the slags and by their physical properties. The chemical composition of the slags investigated was divided into 4 groups, and the basicity of the slags was represented by the ratio $\frac{CaO}{SiO_2}$. The basicity of the first group of slags varies between 0,87 - 3,40, the basicity of the second group from 2,12 - 2,20, the basicity of the third group from 2,20 - 2,25 and that of the fourth group from 2,20 - 2,25.

It was found that the hydrogen permeability of the slags

Card 1/3

depends on the content of MnO, FeO and MgO. This dependence was also graphically shown.
The viscosity of the slags increases abruptly according to their increase in basicity.
The process of the transition of hydrogen through the layer of the liquid slag is divided into three stages:

1) The transition of the hydrogen from the gas phase to the slag after the reaction:

$$H_2O_{(gas)} + O^{2-}_{(slag)} = 2OH^-_{(slag)}$$

2) The diffusion of the hydroxyl ion through the layer of the slag metal.

3) The transition of the hydrogen from the slag in the metal after the reaction:

$$2OH^-_{(slag)} + Fe^{2+}_{(slag)} = Fe_{(metal)} + 2O_{(metal)} + 2H_{(metal)}$$

When the content of FeO, MnO and MgO is increased in the slag the binding energy of O^{2-} in the molten slag increases, which decreases the activity; in consequence of this the first stage takes place more slowly. The higher content of FeO in the slag decreases the activity of O^{2-} and the hydrogen

permeability of the slag to a greater extent than MnO. When the MgO content in the slag is increased the viscosity of the slag is increased. An increase in the MgO content of the slag causes a very sharp decrease in the hydrogen permeability of the slag. There are 3 figures, 2 tables, and 4 references, 4 of which are Soviet.

ASSOCIATION: Ural'skiy politekhnicheskiy institut
(Ural Polytechnical Institute)

SUBMITTED: October 7, 1957

SOV/137-58-10-20558

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 10, p 30 (USSR)

AUTHORS: Kurochkin, K.T., Butakov, D.K., Umrikhin, P.V., Baum, B.A.

TITLE: Change in Hydrogen and Nitrogen Contents in the Smelting of High-alloy Chromium-nickel-molybdenum Steel by the Basic Open-hearth Process (Izmeneniye soderzhaniya vodoroda i azota pri vyplavke vysokolegirovannoy khromonikelemolibdenovoy stali osnovnym martenovskim protsessom)

PERIODICAL: Izv. vyssh. uchebn. zavedeniy. Chernaya metallurgiya, 1958, Nr 1, pp 34-40

ABSTRACT: Experimental heats (He) are run in 30, 45, and 65-t open-hearth furnaces. [H] is determined from pre-hardened samples by the method of the Department of Steel Metallurgy of the Urals Polytechnic Institute, while [N] was determined by the method of dissolution. As a rule, [H] rises during the He and, for example, is 3.96 cm^3/100 g fusion, on the average, for a 30-t furnace, while it is 4.05 at the onset of pure boil and 7.20 cm^3/100 g prior to deoxidation. As the metal temperature rises, [H] in the He and the ladle also increases. The minimum [H] is observed at a slag basicity (CaO %/SiO_2 %) of

Card 1/2

Change in Hydrogen and Nitrogen Contents (cont.)

3.1-3.5. As [C] rises, [H] diminishes. The [N] diminishes in the course of the He, increases after deoxidation and during pouring, and in a 30-t furnace comes to 0.00327% upon fusion, 0.00258% at the start of pure boil, and 0.00224 and 0.00264% prior to and after deoxidation, respectively. A.S.

1. Steel--Production 2. Steel--Properties 3. Hydrogen--Effectiveness
4. Nitrogen--Effectiveness

Card 2/2

Kurochkin K.T.

SOV/137-58-8-17855

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 8, p 236 (USSR)

AUTHORS: Kurochkin, K. T., Umrikhin, P. V., Baum, B. A.

TITLE: The Effect of Hydrogen and Nitrogen on the Electromagnetic Properties of Transformer Steel (Vliyaniye vodoroda i azota na elektrotekhnicheskiye svoystva transformatornoy stali)

PERIODICAL: Izv. vyssh. uchebn. zavedeniy. Chernaya metallurgiya, 1958, Nr 2, pp 143-150

ABSTRACT: The effect of H on the magnetic properties of transformer steel (TS) was investigated. It is established that H increases the electrical losses and the magnitude of H_C and reduces the magnetic permeability of the TS. The greatest reduction of the magnetic permeability was observed in weak magnetic fields. The harmful effects of N on the magnetic properties of the TS are not as strongly pronounced as those of the H. At a saturation temperature of 850°C and 950°C, the electrical losses and the H_C reach a maximum when the pressure of N amounts to 200 mm Hg. Since the actual pressure of N during smelting is considerably greater than 200 mm Hg, the influence of N present in TS cannot be eliminated under standard industrial conditions.

Card 1/1

1. Steel--Magnetic properties 2. Hydrogen--Magnetic effects
3. Nitrogen--Magnetic effects

BOGATENKOV, V.F., inzh.; KUROCHKIN, K.T., dots., kand.tekhn.nauk; UMRIKHIN, P.V., prof., doktor tekhn.nauk

Water permeability of basic slags. Izv.vys.ucheb.zav.; chern.met. no.8:13-20 Ag '58. (MIRA 11:11)

1. Ural'skiy politekhnicheskiy institut.
(Slag--Permeability) (Steel--Hydrogen content)

KUROCHKIN, K.T.

BOGATENKOV, N.F.; KUROCHKIN, K.T.; UMRIKHIN, P.V.

Vliyanie osnovnosti i vyazkosti shlakov na ikh vodorodopronitsaemost'.

report submitted for the 5th Physical Chemical Conference on Steel Production.

MOSCOW – 30 JUN 1958

SOV/148-59-2-6/16

1.(3)

AUTHORS: Kurochkin, K.T., **Docent,** Candidate of Technical Sciences, Baum, B.A., Konovalov, A.S., Postyka, V.V., and Timchenko, N.F., Engineers

TITLE: Hydrogen and Nitrogen Distribution in Steel Ingots (Raspredeleniye vodoroda i azota v stal'nykh otlivkakh)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Chernaya metallurgiya, 1959, Nr 2, pp 43-49 (USSR)

ABSTRACT: The existing data on gas behavior in steel during crystallization and cooling presented by Khan, Povolotskiy, Polin, Kreshchanovskiy, **Dubovoy,** Zhlyayev, Kvater, **Sharip** [illegible] Yavoyskiy [Ref 1-6] and [Ref 8] are insufficient. Information is presented on results of experiments carried out on medium-carbon chromo-nickel-molybdenum steel ingots, for the purpose of determining gas distribution after cooling and changes in the gas content during heat treatment. The hydrogen content was determined by vacuum-heating and nitrogen content by means of dissolving. It was stated that hydrogen was separated from the solid metal during crystallization and concentrated in the liquid solution. Hydrogen concentration

Card 1/3

Hydrogen and Nitrogen Distribution in Steel Ingots

in the internal zones of the steel ingots during the transition from the liquid to the solid stage caused bubble formation, friability, porosity and heterogeneous hydrogen distribution. Hydrogen passage from peripherial zones toward the center continued during phase changes in the steel. After cooling the ingots were oversaturated with hydrogen which left the metal by diffusion toward the surface and by desorption into the atmosphere. The diffusion rate increased with higher temperatures. With regard to nitrogen distribution it was only stated that it was non-uniform.
There are 2 diagrams, 3 tables, 2 graphs and 9 references, 7 of which are Soviet and 1 English.

Card 2/3

Hydrogen and Nitrogen Distribution in Steel Ingots SOV/148-59-2-6/24

AUTHORS: Ural'skiy politekhnicheskiy institut (Ural Polytechnical Institute), Kafedra metallurgii stali (Chair of Steel Metallurgy)
Omskiy mashinostroitel'nyy zavod (Omsk Machine-building Plant)

SUBMITTED: May 26, 1958

Card 3/3

KUROCHKIN, K.T., kand.tekhn.nauk, dots.; UMRIKHIN, P.V., doktor tekhn. nauk, prof.; BOGATENKOV, V.F., inzh.; BUTAKOV, D.K., kand. tekhn.nauk, dots.; BAUM, B.A., inzh.

Answer to N.S.Mikhailets. Izv.vys.ucheb.zav.; chern.met. 2 no.7:147-151 Jl '59. (MIRA 13:2)

1. Ural'skiy politekhnicheskiy institut.
(Metals--Hydrogen content)

KUROCHKIN, K.T., kand.tekhn.nauk; BAUM, B.A., inzh.; KONOVALOV, A.S., inzh.; POSTYKA, V.V., inzh.

Gas moisture in open-hearth furnace combustion chambers and hydrogen content in the metal. Metallurg 4 no.3:16-19 Mr '59.
(MIRA 12:4)

1. Ural'skiy politekhnicheskiy institut im. S.M. Kirova i Omskiy zavod transportnogo mashinostroyeniya.
(Open-hearth furnaces)
(Steel-hydrogen contetn)

UMRIKHIN, P.V., doktor tekhn.nauk prof.; KUROCHKIN, K.T., kand.tekhn.nauk, dots.; NIZHEL'SKIY, P.Ye., kand.tekhn.nauk

Effect of early slag formation on hydrogen content in the metal during the open-hearth process. Trudy Ural.politekh. inst. no.75:7-19 '59. (MIRA 13:4)
(Steel--Hydrogen content) (Open-hearth process) (Slag)

BOGATENKOV, V.F., inzh.; UMRIKHIN, P.V., doktor tekhn.nauk prof.;
KUROCHKIN, K.T., kand.tekhn.nauk

Water permeability of liquid basic slags. Trudy Ural.politekh.
inst. no.75:20-25 '59. (MIRA 13:4)
(Slag) (Steel--Hydrogen content)

KUROCHKIN, K.T.; BAUM, B.A.; KOSTYUCHENKO, R.P.

Correlation between the actual and equilibrium concentrations of hydrogen in steel during the open-hearth process. Izv. vys. ucheb. zav.; chern. met. no.2:25-31 '60. (MIRA 15:5)

1. Ural'skiy politekhnicheskiy institut.
(Steel--Hydrogen content)
(Vapor-liquid equilibrium)

[illegible] 85

PHASE I BOOK EXPLOITATION SOV/5556

Moscow. Institut stali.

Novoye v teorii i praktike proizvodstva martenovskoy stali (New [Developments] in the Theory and Practice of Open-Hearth Steelmaking) Moscow, Metallurgizdat, 1961. 439 p. (Series: Trudy Mezhvuzovskogo nauchnogo soveshchaniya) 2,150 copies printed.

Sponsoring Agency: Ministerstvo vysshego i srednego spetsial'nogo obrazovaniya RSFSR. Moskovskiy institut stali imeni I. V. Stalina.

Eds.: M. A. Glinkov, Professor, Doctor of Technical Sciences, V. V. Kondakov, Professor, Doctor of Technical Sciences, V. A. Kudrin, Docent, Candidate of Technical Sciences, G. N. Oyks, Professor, Doctor of Technical Sciences, and V. I. Yavoyskiy, Professor, Doctor of Technical Sciences; Ed.: Ye. A. Borko; Ed. of Publishing House: N. D. Gromov; Tech. Ed.: A. I. Karasev.

PURPOSE: This collection of articles is intended for members of scientific institutions, faculty members of schools of higher education, engineers concerned with metallurgical processes and physical chemistry, and students specializing in these fields.

Card 1/14

COVERAGE: The collection contains papers reviewing the development of open-hearth steelmaking theory and practice. The papers, written by staff members of schools of higher education, scientific research institutes, and main laboratories of metallurgical plants, were presented and discussed at the Scientific Conference of Schools of Higher Education. The following topics are considered: the kinetics and mechanism of carbon oxidation; the process of slag formation in open-hearth furnaces using in the charge either ore-lime briquets or composite flux (the product of calcining the mixture of lime with bauxite); the behavior of hydrogen in the open-hearth bath; metal desulfurization processes; the control of the open-hearth thermal melting regime and its automation; heat-engineering problems in large-capacity furnaces; aerodynamic properties of fuel gases and their flow in the furnace combustion chamber; and the improvement of high-alloy steel quality through the utilization of vacuum and natural gases. The following persons took part in the discussion of the papers at the Conference: S.I. Filippov, V.A. Kudrin, M.A. Glinkov, B.P. Nam, V.I. Yavoyskiy, G.N. Oyks and Ye. V. Chelishchev (Moscow Steel Institute); Ye. A. Kazachkov and A. S. Kharitonov (Zhdanov Metallurgical Institute); N.S. Mikhaylets (Institute of Chemical Metallurgy of the Siberian Branch of the Academy of Sciences USSR); A.I. Stroganov and D. Ya. Povolotskiy (Chelyabinsk Polytechnic Institute); P.V. Umrikhin (Ural Polytechnic Institute); I.I. Fomin (the Moscow "Serp i molot" Metallurgical Plant); V.A. Fuklev (Central Asian Polytechnic Institute)

and M.I. Beylinov (Night School of the Dneprodzerzhinsk Metallurgical Institute). References follow some of the articles. There are 268 references, mostly Soviet.

TABLE OF CONTENTS:

AVAILABLE: Library of Congress (TN740.M58)

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10-4-61

KURCHATOV, K. V.

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PHASE I BOOK EXPLOITATION SOV/5411

Konferentsiya po fiziko-khimicheskim osnovam proizvodstva stali. 5th, Moscow, 1959.

Fiziko-khimicheskiye osnovy proizvodstva stali; trudy konferentsii (Physicochemical Bases of Steel Making; Transactions of the Fifth Conference on the Physicochemical Bases of Steelmaking) Moscow, Metallurgizdat, 1961. 512 p. Errata slip inserted. 3,700 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Institut metallurgii imeni A. A. Baykova.

Responsible Ed.: A. M. Samarin, Corresponding Member, Academy of Sciences USSR; Ed. of Publishing House: Ya. D. Rozentsveyg. Tech. Ed.: V. V. Mikhaylova.

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Physicochemical Bases of (Cont.) SOV/5411

PURPOSE: This collection of articles is intended for engineers and technicians of metallurgical and machine-building plants, senior students of schools of higher education, staff members of design bureaus and planning institutes, and scientific research workers.

COVERAGE: The collection contains reports presented at the fifth annual convention devoted to the review of the physicochemical bases of the steelmaking process. These reports deal with problems of the mechanism and kinetics of reactions taking place in the molten metal in steelmaking furnaces. The following are also discussed: problems involved in the production of alloyed steel, the structure of the ingot, the mechanism of solidification, and the converter steelmaking process. The articles contain conclusions drawn from the results of experimental studies, and are accompanied by references of which most are Soviet.

S/137/61/000/011/019/123
A060/A101

AUTHORS: Kurochkin, K. T., Baum, B. A.

TITLE: Ratio of the actual to the equilibrium concentration of hydrogen in metal from an open-hearth heat

PERIODICAL: Referativnyy zhurnal. Metallurgiya, no. 11, 1961, 29, abstract 11V188 (V sb.: "Novoye v teorii i praktike proiz-va martenovsk. stali", Moscow, Metallurgizdat, 1961, 400 - 409. Discuss., 428 - 439)

TEXT: The values of the mass-transfer coefficients through slag in basic and acid processes are approximately estimated. For the basic process at pure ebullition D = 1.75 cm^2/min. The hydrogen permeability of the slag for this period is 5.22 $cm^2/min\text{-}cm^3/100\ g\ mm^{1/2}$ of mercury. After reduction of the vat D = 0.65 cm^2/min. The hydrogen permeability is 2.24 $cm^2/min\text{-}cm^3/100\ g\ mm^{1/2}$ mercury. For the acid silicon reduction process D = 1.13 cm^2/min. The hydrogen permeability is 2.81 $cm^2/min\text{-}cm^3/100\ g\ mm^{1/2}$ of mercury. The mass transfer coefficient of H_2 for the silicon reduction process is lower by a factor of 1.5, and the hydrogen permeability of the alkalinic slag is greater by a factor of 2 than that

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Ratio of the actual to the equilibrium...

of the acid process. Despite the elimination of H_2 by means of CO bubbles, the process of H_2 absorption by the metal dominates the process of liberation. The higher the V_C, the more H_2 is eliminated and the greater is its quantity absorbed by the vat. An increase in H_2 concentration in the metal during the smelting process indicates the fact that its content tends to some definite quantity, which may be thought of as the equilibrium concentration of H_2. The measurements of H_2 solubility were carried out on a Sieverts-type laboratory apparatus. The equilibrium concentration of H_2 for the conditions of open-hearth steel was calculated from the solubility measured. The interaction reaction of water vapor with molten $Fe \cdot H_{2gas} + FeO_{molten\ in\ Fe} = Fe_{molten} + H_2O_{gas}$, lies at the basis of the calculation of the equilibrium concentration. At temperatures of a steel-smelting vat and at O_2 content equal to 0.02%, the value of the ratio P_{H_2O}/P_{H_2} fluctuates between the limits 0.10 - 0.14, i. e. 90 - 95% of the water vapor is being decomposed. Consequently, into the equation $|H| = k_H \sqrt{P_{H_2}}$, instead of the partial pressure of pure H_2 it is possible to substitute the sum of the partial pressures of water vapor and of H_2 in the gaseous phase in the open-hearth furnace. Ac-

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cording to this equation one calculates the equilibrium concentrations of H_2 in the metal, which are considerably higher than the actual H_2 concentrations; the latter tend toward the equilibrium values. See also Ref. Zhur. Met, 1960, 17057.

Yu. Necnkin

[Abstracter's note: Complete translation]

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YERSHOV, G.S.; UMRIKHIN, P.V.; KUROCHKIN, K.T.

Water permeability of acid open-hearth furnace slags. Izv. vys. ucheb. zav.; chern. met. no. 1:65-72 '61. (MIRA 14:2)

1. Ural'skiy politekhnicheskiy institut.
(Open-hearth furnaces--Equipment and supplies)
(Slag--Permeability)

S/148/61/000/002/001/011
A161/A133

AUTHORS: Baum, B. A., Kurochkin, K. T., Umrikhin, P. V.

TITLE: The process of hydrogen liberation from liquid steel in gas blowing

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Chernaya metallurgiya, no. 2, 1961, 22 - 31

TEXT: The results of an experimental investigation are discussed with references to data of nineteen works partly confirming the authors' conclusions and partly illustrating that the existing opinions on the process are different. Three alloys were melted in the subject experiments: a) Fe - C (0.8 - 1.0% C, 0.10 Mn, 0.01 Si, 0.015 P, 0.004 S, 0.1 - 0.3 Al); b) Fe - S (0.02 C, 0.10 Mn, 0.01 Si, 0.015 P, 0.07 - 0.09 S, 0.1 - 0.3 Al); c) Fe - C - S (0.8 - 1.0 C, 0.10 Mn, 0.01 Si, 0.015 P, 0.07 - 0.09 S, 0.1 - 0.3 Al). The test conditions were the following: 30 - 35 kg of the metal was melted in a laboratory induction furnace; blowing and mixing was effected at a reduced current of 10 - 15 kw; the bath depth was 160 - 180 mm; deoxidization was carried out with aluminum, the gas was blown through one iron pipe with magnesite cylindrical nozzle with closed bottom and four side holes 4 or 6 mm in diameter; the metal was saturated with hydrogen after melting by

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means of bubbling with mixed 10% propane and 90% butane; blowing pure argon and helium (with not more than 0.13% N_2 and 0.006% O_2), nitrogen (N99.0%) and chlorine, at 0.04 - 0.1 atm pressure; the effect of mixing was also studied. The mixing of metal by blowing and stirring did not exceed the usual rimming in shop furnaces. The experimental results are illustrated in graphs and a table. Gas neutral to hydrogen had no effect on its elimination; nitrogen caused an abrupt increase of the hydrogen concentration in the metal; chlorine raised the dehydrogenation rate not only by the $[H]_{surface} + [H]_{surface} \rightarrow [H_2]^{surf}$ reaction, but by the formation of HCl as well that was stable under the test conditions. The obtained data as well as observations in other works made previously indicated pulsations and an unsteady motion of the raising gas bubbles in the metal. It is apparent that no resistant laminal films exist on the boundary between the metal and gas bubbles, the liquid metal layer on the boundary with the gas bubble is being permanently renewed, and the rate of element transfer from the volume to the free surface depends on the rate of turbulent diffusion. Hence if an element liberates from the surface layer into the gaseous phase through a chemical reaction at a limited rate, it is very probable that just this reaction will be limiting the process rate. It may therefore be concluded that the hydrogen liberation process from liquid steel during

rimming in furnaces and during blowing in ladles is kinetic. The stage limiting the process is the stage of hydrogen recombination in the surface layer with simultaneous desorption of the molecule into gaseous phase. Conclusions: 1) The rate of hydrogen elimination in blowing through the induction furnace crucible is limited by the rate of recombination (with simultaneous molecule desorption) on the metal-gas boundary. 2) The factors having the strongest effect on the rate of the process are - the blown gas consumption, the depth to which the blowing pipe is submerged in metal, the metal temperature, and the pipe nozzle holes diameter. Neither the chemical composition of the metal nor the nature of gas being blown (if it does not react with hydrogen) do have any noticeable effect on the rate of hydrogen elimination. 3) The laboratory test results and a comparison of mixing effect lead to the conclusion that the hydrogen elimination process is also kinetic at the rimming of metal in industrial furnaces and during the blowing in ladles. There are 4 figures, 1 table and 19 references: 14 Soviet-bloc and 5 non-Soviet-bloc. The two references to English-language publications read as follows: C. E. Sims. Electric Furnace Steel Conference Proceedings, v. 7, 1949, 302 - 313; L. F. Barnhardt. Electr. Furnace Steel Conf. Proceedings, v. 13, 1955, 58 - 69.

ASSOCIATION: Ural'skiy politekhnicheskiy institut (Ural Polytechnic Institute)
SUBMITTED: June 8, 1960

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KUROCHKIN, K.T.; BAUM, B.A.

Hydrogen in the metal of basic open-hearth smelting. Trudy Ural. politekh. inst. no.116:56-64 '61. (MIRA 16:6)
(Steel—Hydrogen content)

KUROCHKIN, K.T.; BAUM, B.A.; FEDOTOV, G.K.; LIRMAN, A.M.; ROSHCHEKTAYEV, V.I.

Hydrogen in acid steel made from a liquid semifinished product.
Trudy Ural. politekh. inst. no.116:65-75 '61. (MIRA 16:6)
(Steel—Metallurgy) (Steel—Hydrogen content)

BAUM, B.A. (Sverdlovsk); KUROCHKIN, K.T. (Sverdlovsk); USKIKHIN, P.V. (Sverdlovsk)

Effect of hydrogen on the surface tension of iron and its alloys. Izv. AN. SSSR. Otd. tekh. nauk. Met. i topl. no.3:82-89 My-Je '61. (MIRA 14:7)

(Iron--Hydrogen content) (Surface tension)

YERSHOV, G.S.; KUROCHKIN, K.T.; UMRIKHIN, P.V.

Kinetics of the passage of hydrogen in the gaseous phase through slag into the metal. Izv.vys.ucheb.zav.; chern.met. 4 no.6:34-41 '61. (MIRA 14:6)

1. Ural'skiy politekhnicheskiy institut.
(Steel—Hydrogen content)

BAUM, B.A.; KUROCHKIN, K.T.; UMRIKHIN, P.V.

Surface activity of hydrogen in liquid iron. Fiz. met. i metalloved. 11 no.6:960-961 Je '61. (MIRA 14:6)

1. Ural'skiy politekhnicheskiy institut imeni S. M. Kirova.
(Surface tension)
(Iron—Hydrogen content)

YERSHOV, G.S.; KUROCHKIN, K.T.; UMRIKHIN, P.V.

Effect of slag conditions on hydrogen behavior in the metal of an acid open-hearth furnace. Izv. vys. ucheb. zav.; chern. met. 5 no.5:56-62 '62. (MIRA 15:6)

1. Ural'skiy politekhnicheskiy institut.
(Open-hearth furnaces) (Steel—Hydrogen content)

S/032/62/028/012/023/023
B104/B186

AUTHORS: Levin, Ye. S., Kurochkin, K. T., and Umrikhin, P. V.

TITLE: A device for hydrogen sampling of liquid metal samples by vacuum treatment

PERIODICAL: Zavodskaya laboratoriya, v. 28, no. 12, 1962, 1530-1531

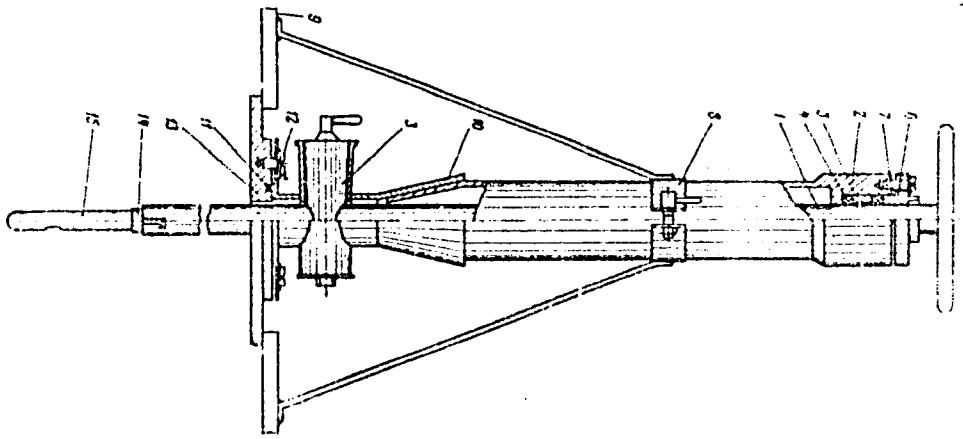
TEXT: With the device shown in the figure, liquid metal is sampled in the following way: the tap (3) is opened and the rod (1) is pushed down until the mouthpiece of the ampoule (15) is immersed in the metal. After the ampoule is filled the rod is pulled out. The ampoule is not completely inside the body (2). The tap (3) is then closed, and the body (2) together with the rod is shifted into its topmost position and fixed by the collar (8). The rod is then lowered, the ampoule with the metal sleeve is taken out and immersed in cold water. After the ampoule has been replaced the device is restored to its initial position. There is 1 figure.

ASSOCIATION: Ural'skiy politekhnicheskiy institut (Ural Polytechnic Institute)

S/032/62/028/012/023/023
B104/B186

A device for hydrogen sampling...

Fig. Diagram of the device. Legend: (4)-(7) sealing, (9) cover of a vacuum induction furnace, (13) flange.



Card 2/2

LEVIN, Ye.S.; KUROCHKIN, K.T.; UMRIKHIN, P.V.

Effect of certain factors on the kinetics of hydrogen removal from liquid steel during its vacuuming. Izv. vys. ucheb. zav.; chern. met. 6 no.10:43-51 '63. (MIRA 16:12)

1. Ural'skiy politekhnicheskiy institut.

L 10820-63 EWP(q)/EWT(m)/BDS AFFTC/ASD JD
ACCESSION NR: AP3004209 S/0193/63/000/006/0010/0011

AUTHOR: Lovin, Yo. S.; Kurochkin, K. T.; Umrikhin, P. V. 58

TITLE: Device for sampling molten metal during the vacuum process without disturbing the vacuum system 16

SOURCE: Byulleten' tekhniko-ekonomicheskoy informatsii, no. 6, 1963, 10-11

TOPIC TAGS: vacuum process, metallurgy, sampling, inspection, analysis, molten metal

ABSTRACT: The Ural Polytechnical Institute has developed a sampler for determining the oxygen, hydrogen, nitrogen, and nonmetallic inclusion contents in metal being processed in a vacuum induction furnace. The device is a steel body with a movable rod passing through a brass vacuum cock into the furnace. The cock is attached to a flange which is welded to the top of the furnace. A quartz test tube is fastened by a metal bushing to the lower end of the rod. The quartz tube has a side opening for spontaneous filling with metal. An aluminum wire is placed into the tube to thicken the sample (approximately 0.5-1.0% aluminum is introduced). To take a sample, the rod

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ACCESSION NR: AP3004209

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is lowered into the metal to fill the tube. Then the tube is raised, removed together with the bushing, and another tube and bushing are attached in their place for the next sampling. The interval between samplings is no more than 30 secs. This sampler has proven reliable and easy to maintain when used on a vacuum induction furnace of the MGP-52V type. Sampling for quick analysis makes it possible to control the vacuum process during operation. Original art. has: 1 figure.

ASSOCIATION: None

SUBMITTED: 00 DATE ACQ: 02Aug63 ENCL: 00

SUB CODE: ML NO REF SOV: 000 OTHER: 000

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L 13347-63 EWP(q)/EWT(m)/BDS AFFTC/ASD JD

ACCESSION NR: AP3002899 S/0148/63/000/006/0058/0067

AUTHOR: Lovin, Ye. S.; Kurochkin, K. T.; Umrikhin, P. V.

TITLE: The kinetics of hydrogen removal during vacuuming of molten steel

SOURCE: IVUZ. Chernaya metallurgiya, no. 6, 1963, 58-67

TOPIC TAGS: steel degasification, induction vacuum furnace, VG 50/2500 motor generator, C,Mn,Si,P,S, residual pressure

ABSTRACT: Authors studied the mechanism of steel degasification during its vacuuming. A type MGP - 52V semi-industrial induction vacuum furnace with a VG 50/2500 motor generator was used for the tests. The metal was commercial iron composed of C, Mn, Si, P and S. The metal was melted down and then saturated with hydrogen, after which the slag was cleaned off from the surface and samples were taken for determining the hydrogen content. Test temperatures and holding time were varied. Authors conclude that degasification of a metal during vacuuming occurs under kinetic conditions initially, then in proportion to the decrease of the hydrogen concentration in the mixed and diffusion conditions. Hydrogen content in the metal after degasification was proportional to the square root of the residual pressure in the chamber for all conditions. A change in the hydrogen concentration and

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