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L 20807-65 EWT(m)/EWA(d)/T/EWP(t)/EWP(b) Pb-4 SSD/BSD/AFWL/ASD(f)-3/
[illegible] MJW/JD/WB
[illegible]: AR4048245 S/[illegible]/[illegible]/[illegible]/009/1057/1057

[illegible]: Ref. zh. Metallurgiya, Abs. 91356

AUTHOR: Khitrik, I. S.

[illegible]: The tendency of austenitic stainless steels toward [illegible]talline corrosion as a function of their boron content

[illegible]RCE: Sb. Proiz-vo trub. Vy*p. 12, M., Metallurgiya, 1964,

TOPIC TAGS: boron, austenitic steel, stainless steel, oxygen, nitrogen, grain size, intercrystalline corrosion/ steel 1Kh18N9, steel [illegible]Kh18N9T, steel Kh18N11B

TRANSLATION: The effect of small additions of B (up to 0.09%) on the tendency toward intercrystalline corrosion of steels 1Kh18N9, 1Kh18-[illegible] Kh18N11B was investigated. Steel 1Kh18N9 was tested after [illegible] from 1100° and steels 1Kh18N9T and Kh18N11B after quenching [illegible] and annealing at 650° for 2 hrs. The tendency toward intercrystalline corrosion was determined by the AM method (GOST

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L 20807-65

ACCESSION NR: AR4048245

6032-581. Steel 1Kh18N9 did not exhibit any tendency toward intercrystalline corrosion, and addition of B did not show any effect [illegible] tendency toward intercrystalline corrosion. [illegible] without B and with a [illegible] intercrystalline corrosion. [illegible] eliminated the tendency [illegible] in [illegible] positive effect of B is explained by its internal [illegible] crystalline adsorption and also by the fact that it decreases the [illegible] of O and N in the steel. It is also connected with the [illegible] of grain size from the effect of B. Steel Kh18N11B with and without B did not exhibit a tendency toward intercrystalline corrosion.

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GONCHAREVSKIY, M.S., kand. tekhn. nauk; SHCHESNO, L.P., inzh.; KHITRIK, I.S., inzh.

Structure and strength of zinc vapor-diffusion coatings depending on the conditions of the process. Proizv. trub no.12:103-107 '64. (MIRA 17:11)

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

NUTENKO, E.A.; KHITRIK, L.A.

Comparison of the clinical aspects and course of schizophrenia in close relatives in 111 families. Zhur. nevr. i psikh. 65 no.10:1547-1553 '65. (MIRA 18:10)

1. Zaporozhskaya oblastnaya psikhiatricheskaya bol'nitsa (glavnyy vrach I.Ya.TSinman).

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KHITRIK, M. YE.

Khitrik, M. Ye.

"Investigation of the isotope composition of radioactive elements in minerals with an unstable relationship between actinium and radium." Min Higher Education USSR. Kazakh State U imeni S. M. Kirov. Alma-Ata, 1956. (Dissertation For the Degree of Candidate in Chemical Sciences.)

Knizhnaya letopis'
No 21, 1956, Moscow.

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SOV/137-58-9-18645

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 9, p 69 (USSR)

AUTHORS: Khitrik, O.I., Gasik, M.I.

TITLE: Effect of Certain Factors Upon the Quality of Self-baking Continuous Electrodes (Vliyaniye nekotorykh faktorov na kachestvo samospekayushchikhsya nepreryvnykh elektrodov)

PERIODICAL: Izv. vyssh. uchebn. zavedeniy. Chernaya metallurgiya, 1958, Nr 2, pp 64-70

ABSTRACT: An investigation is made of the effect of temperature and baking rate on the properties of self-baking electrodes (E). The electrode paste consisted 50% of carbonized anthracite coal and 50% of foundry coke, with 24% pitch added thereto. It is established that in increase in firing temperature from 400 to 900°C results in a decline from 350 to 267 kg/cm^2 in the ultimate strength of the specimens while the true sp. gr. rose from 1.87 to 1.91, apparent sp. gr. diminished from 1.52 to 1.54, porosity increased from 18.7 to 23.8%, oxidizability declined from 16.04 to 13.39%, and friability increased from 4.03 to 9.4%. The resistivity of the specimens dropped sharply as baking temperature rose from 400 to 700°C and then remained virtually stable

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KHITRIK S.I.

9

Results of the first All-Union Conference on Direct Reduction of Iron Ores. A. N. POKHVISNEV AND S. I. KHITRIK. *Domez* 1932, No 4-5, 1-19.—Problems of direct reduction of iron ores are discussed by a no. of metallurgists and chemists. The discussion embraces progress in this field in Germany, Sweden, England, U. S. A. and particularly the possibilities and actual accomplishments in various localities in U. S. S. R.

S. L. MADORSKY

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PROCESSES AND PROPERTIES

Smelting ferrosilicon from roasted pyrite. S. I. Khitrik and A. E. Poznanskii. *Domez* 1934, No. 2-3, 37-45.—In a study of the application of roasted pyrite to the production of ferro-Si, the authors had in view the effect of the starting material, roasted pyrite, iron filings or Fe ore, on caking of the charge and on energy consumption. The charge consisted of the Fe carrier, quartz and coke. The expts. were carried out in a 40-kw. elec. furnace. Ferro-Si alloys contg. the following amts. of Si were prepd.: 75, 65 and 45% from roasted pyrite; 75% from Fe filings; 75 and 60% from Fe ore. The roasted pyrite was in powd. form. In the prepn. of 45% Si alloy from roasted pyrite (where the pyrite represented 25% of the charge), no difficulties were encountered and the charge descended regularly. In the prepn. of alloys with a higher Si content caking of the charge took place. In this respect pyrite was superior to Fe filings, but inferior to the ore. In general, the performance of the furnace depended not so much on the nature of the Fe carrier as on its amt. in the charge. As to energy consumption, it required, per ton of alloy, 46,000, 42,500 and 34,000 kw. hrs. for the 75, 65 and 45% alloys from pyrite, resp.; 43,000 and 38,000 kw. hrs. for the 75% alloy from filings and for the 60% alloy from ore, resp. A large amt. of pyrite was lost as fine dust, on account of its fineness. Its high S and C contents did not interfere with obtaining a high-grade ferro-Si.

S. L. Madorsky

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1ST AND 2ND ORDERS

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3

Relation between voltage and arc length. S. I. Khitrik and N. M. Chulke. *Domez* 1935, No. 10, 33-44. An attempt was made to det. the relation between the voltage (E) and the single-phase a.-c. arc length (l) in elec. furnaces. Arcs between acid slag and C, basic slag and C, metal and C, and graphite and C electrodes were investigated. For high-current arcs (at const. temp.), $E = a + Bl$. B = voltage gradient $= b - ct + dt^2$. The values of a, b, c and d for various conditions were detd.

B. Z. Kamich

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ELECTROMETALLURGY IN THE SOVIET UNION DURING THE LAST TWENTY YEARS. B.S. BARSKII, SI. Khitrik and N.M. Chuiko. Teoriya i Prakt. No. 11, 46-59(1937).- The no. of elec. furnaces rose from 4 in 1913 to 173 in 1937 with a capacity of 798,000 tons. The output of elec. steel rose from 11,500 tons in 1927-28 to 862,000 tons in 1937 while output of ferro alloys increased from 600 tons in 1927-28 to 168,900 tons in 1937. Av. furnace capacity rose from 3160 tons/yr. in 1934 to 4620 tons/yr. in 1937)

[illegible] Kamich

Teoriya i Prakt Met

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3RD AND 4TH ORDERS

Ca

4

Making ferrosilicon by use of sinter S. Khlytik. *Teoriya i Prakt. Met.* 10, No. 1, 52-4(1938); *Met. Abstracts* (in *Metals & Alloys*) 9, 480(1938).—In place of charging quartz, Fe ore and reducing agents, into the elec. furnace, it is proposed to replace them with a sinter made of river sand and Fe ore. Some expts. conducted in a lab. air furnace showed that the use of sinter permits saving of about 1/3 the current required for reduction. M. W. B.

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1ST AND 2ND ORDERS

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3RD AND 4TH ORDERS

ca

4

Electrical resistance of the charge used in making ferrosilicon. S. Khitrik and Va. Tsybakin. *Teoriya i Prakt. Met.* 10, No. 3, 23 9(1938); *Met. Abstracts (in Metals or Alloys)* 9, 480(1938). The elec. resistances of coke and mixts. of (1) coke and quartz, (2) of coke, quartz and steel chips and (3) of coke, quartz and Fe ore were detd. at temps. up to 950°. The resistance of coke drops about 50-60% on heating between 900° and 850° and then remains practically stationary. With the same coke size, increasing quartz lumps from 10 to 50 mm. reduced the resistance of the charge from 140 to 42 ohms. Elec. resistance of a mixt. is a straight-line function of the coke-quartz diameter ratio. Deviations from this rule observed in plant operation can be attributed to stratification of the charge.

M. W. B.

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CA

9

Increasing the yield of chromium from chromium ore in the smelting of ferrochromium low in carbon. S. I. Khitrik and Ya. F. Tsytsakin. *Teoriya Prakt. Met.* 11, No. 4-5, 31-7(1939); cf. following abstr.—The content of Cr_2O_3 in the slag depends on its basicity. The greater the ratio $CaO:SiO_2$ the less Cr_2O_3 is in the slag. An increase of $CaO:SiO_2$ to 1.5 decreases the content of Cr_2O_3 to 2-4% and increases the amt. of slag by 2.5%. The coeff. of Cr yield in such cases is 65-6% (at Cr_2O_3 4% in the slag). A further increase of the basicity of slag is not recommended, because slag with $CaO:SiO_2 = 1.5$ is brittle. At $CaO:SiO_2 = 1.75$ the elec. cond. of the slag increases to twice its ordinary value, which leads to an increased C content caused by the voltaic arc. Up to $CaO:SiO_2 = 1.5$ no difficulties during smelting are encountered because the m. p. of such a slag is below 1500°. Overheating the bath increases the Cr_2O_3 content in the slag. There is a definite relation between ΣCr_2O_3 and ΣFe which is expressed by the cubic parabola $\Sigma Cr_2O_3 = K(\Sigma FeO)^3$. The coeff. K depends on the compn. of ferrochrome and is 0.25 for ferrochrome contg. Cr 56%. Owing to the relation existing in the slag between ΣCr_2O_3 and ΣFeO no Fe ore should be added to the furnace before emptying because the O of the ore oxidizes not only Si, but also Cr. The use of limestone alone is not recommended, because a large amt. of heat is necessary for its combustion in the open furnace (approx. 1250 kw.-hrs./ton of limestone) and the CO_2 formed oxidizes Si and Cr. This reduces the coeff. of the utilization of Si and increases the Cr_2O_3 content in the slag. The use of small amts. of limestone in the charge (25-30%) is recommended because this agitates the bath, causing a better mixing of the slag and accelerating the reduction of Cr from the ore. The limestone must be in the form of well-burned pieces. A fresh layer of ore must be created for increasing Cr. Some limestone should be added if foam is formed after the addn. of a small amt. of ore under the electrodes.

W. R. Henn

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CA

9

Increasing the yield of chromium from chromium ore in the production of ferrochrome containing no carbon. S. I. Khitrik and A. Ya. Glikson. *Teoriya Prakt. Met.* 12, No. 4, 21-3(1940); cf. *C. A.* 35, 715[1]. To increase the yield of Cr in the production of "OO ferrochrome" the ratio CaO:SiO_2 was increased from 1.15-1.2 to 1.5-1.6. This decreased the content of Cr_2O_3 in the slag from 8-10% to 4%. The yield of Cr from the ore increased from 51 to 65-6%. The compn. of the Cr ore was SiO_2 6.12, Cr_2O_3 35.31, CaO 2.64, MgO 21.28, FeO 12.21, Al_2O_3 17.88%; loss on ignition was 4.20%. The lime contained SiO_2 3.80, CaO 80.16, MgO 1.16, and FeO + Al_2O_3 1.20%; loss on ignition was 1.20%. The ferrosilicon contained Si 70.8, Fe 22.52, Ca 1.14, Mg 0.26 and Al 2.53%; and loss on ignition was 1.3%. The content of Cr_2O_3 in the slag varied between 2.22 and 5.38 (av. 3.77%) and that of Fe between 0.33 and 2.31%. W. R. Henn

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9

Sintering fine chromium ores. S. I. Khitrik and G. Y. Volkovitskii. *Teoriya Prakt. Met.* 12, No. 10, 24-30 (1940).—The fine Cr ore from the Kempirsalskii massive (0-10 mm.) can be converted to C-free sinter with 75% ferrosilicon or fine coke as fuel. Roasting with fine coke (0-0.5 mm.) produces a complete burning of C_1 and produces a sinter lower in C than was the original ore. The quality of the sinter produced with fine coke is improved by adding to the mixt. lime 5% and sand 10% of the wt. of the mixt. In the production of ferrochrome, Cr of the sinter is reduced more nearly completely than is Cr in the original fine ore. W. R. Henn

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Material- and Heat-Balance of a Ferro-Silicon Smelting Arc Furnace. S. I. Khitrik. (Stal, 1947, vol. 7, pp. 603–609 [in Russian]; Chemical Abstracts, 1949, vol. 43, May 10, cols. 3295–3297). The balances were compiled for furnaces smelting 75% and 45% ferrosilicon. The thermal efficiency was around 50% and the overall efficiency around 46%. The principal heat losses were through the furnace gases and radiation of the charge hole. These losses can be lowered by providing a hood over the furnace and utilizing the furnace gases.

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CA

Mechanism of silicon reduction in smelting ferrosilicon. Ya. V. Dashevskii and S. I. Khitrik. *Stal* 8, 802-6 (1948).—The reduction of SiO_2 to Si goes through an intermediate step of SiO. SiO_2 is reduced to SiO by C, SiC and Si. The thermodynamically calcd. heat of reaction when SiO_2 is reduced by C is lower than when the reduction is by Si or SiC. Therefore, in the furnace the main reducing agent is C. M. Hosch

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KHITRIK, S. I.

USSR/Metals Oct 48
Ferrosilicon
Silicon

"Mechanisms of Silica Reduction During the Melting of Ferrosilicon," Ya. V. Dashevskiy, Cand Tech Sci, S. I. Khitrik, Zaporog Factory of Ferrous Alloys and Dnepropetrovsk Metal Inst, 5 pp

"Stal'" No 10

Silica reduction during melting of ferrosilicon and crystalline silicon involves formation of intermediate oxide (the monoxide). Thermodynamic analysis of process indicates that main reducer of silica is carbon, as reaction with silica and silicon carbide requires considerably higher temperatures.

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

KHITRIK, S. I.

Khitrik, S. I. "Effect of moisture on burden materials on the yield of chrome during smelting of ferrochrome," Nauch. trudy (Dnepropetr. metallurg. in-t im. Stalina), Issue 15, 1948, p. 3-31 - Bibliog: 15 items

SO: U-3264, 10 April 1953, (Letopis 'Zhurnal 'nykh Statey, No. 3, 1949)

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

Khitrik S.I.

Use of Vacuum in Metallurgy (Cont.) 533 Moscow, Izd-vo AN SSSR, 1958, 165p.
Trans. of a Conf. on Above (Inst. Metallurgy, AKad. Nauk SSSR)
There are 2 drawings. (ed. SAMARIN, A. M.)

Khitrik, S.I., Neymark, N.Ya., Nikolayev, V.I. and Gasik, M.I. Obtaining Dense Ingots of Carbon-free Ferrochrome and Metallic Manganese by the Vacuum-treatment Method 112

Author's conclusions: 1. Blistering of the ingots is caused by a high gas content, particularly hydrogen and nitrogen. 2. Vacuum treatment is the simplest and most reliable method of producing dense ingots of these metals. 3. Introduction of vacuum treatment of ferroalloys at the Zaporozh'ye Ferroalloys Plant resulted in an increase of 5-20 percent in the satisfactory yield of metallic manganese and an increase of 3 percent in the case of carbon-free ferrochrome. 4. Vacuum treatment of alloys makes it possible to reduce the content of gases, phosphorus, and nonmetallic inclusions. 5. Vacuum treatment under a residual pressure of about 5 mm. mercury also permits a certain reduction of the carbon content, thus assuring a yield of Khr0000-type ferrochrome of unvarying quality. 6. It is recommended that vacuum treatment be tested in the production of other ferroalloys. (There are 3 Soviet references).

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KHITRIK, S.I., doktor tekhn. nauk, prof.; GASIK, M.I., inzh.

Effect of certain factors on the quality of continuous self baking electrodes. Izv. vys. ucheb. zav.; chern. met. no.2:64-70 F '58. (MIRA 11:5)

1. Dnepropetrovskiy metallurgicheskiy institut.
(Electrodes)

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A004/A001

Translation from: Referativnyy zhurnal, Mashinostroyeniye, 1959, No. 10, pp. 186-187, # 38656

AUTHORS: Khitrik, S. I., Kazachkov, I. P., Zavaluyev, I. P., Babkov, T. M., Moshkevich, Ye. I.

TITLE: The Effects of Nonmetallic Impurities of Ferrochrome on the Quality of Stainless Steel

PERIODICAL: Tekhn.-ekon. byul. Sovnarkhoz Zaporoshck. ekon. adm. r-na, 1958, No. 3, pp. 44-47

TEXT: The contents of nonmetallic impurities in carbon-free ferrochrome fluctuates within a wide range and principally is directly interdependent on the magnitude of Si-content in it. Si, lowering the solubility of O_2 in ferrochrome, combines with it and forms oxides. Holding the liquid ferrochrome in the ladle under a vacuum ensures a liberation of the gases and leads to an intensive agitation of the metal. The continuous exchange of metal being in contact with slag promotes the oxidation of Si by slag oxides. The passing over into the slag of suspended nonmetallic impurities in the metal agitated and cooled by vacuum treat-

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The Effects of Nonmetallic Impurities of Ferrochrome on the Quality of Stainless Steel

ment, is facilitated. In vacuum-treated ferrochrome the Si-content is considerably lowered and, correspondingly also that of the nonmetallic impurities (approximately 35%). Test ingots of the 2X13 (2Kh13) grade stainless steel, weighing 2.8 tons, were smelted in 20-ton electric furnaces from a fresh charge with additions of vacuum-treated and non-treated Xp00 (KhrOO) grade ferrochrome to the nonreduced metal in amount of 25% of the melt weight. Vacuum-treated ferrochrome differs from the non-vacuum-treated by a lower content of nonmetallic impurities (on the average by 25%) and a somewhat higher Si-content (on the average by 0.12%). An analysis of the content of nonmetallic impurities in steel assays taken from the metlt in the middle of the teeming, showed that the degree of contamination of ferrochrome by nonmetallic impurities affects also the purity of the steel, by 16% on the average. An increase of the Si-content in ferrochrome affects the degree of steel contamination with nonmetallic impurities. Si, introduced into steel, quickly oxidizes, and since the 2Kh13 grade steel is of a high ductility, it is difficult to float the impurities, which have been brought in by the ferrochrome and which were formed owing to Si-oxidation, into the slag. The

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The Effects of Nonmetallic Impurities of Ferrochrome on the Quality of Stainless Steel

remainder of nonmetallic impurities in steel depends on its degree of contamination at the moment of deoxidation by aluminum. A direct dependence has been established between the presence of fine cracks in rolled steel and the content of nonmetallic impurities in it and the Si-content brought in with ferrochrome. In order to obtain a high-quality 2Kh13 stainless steel, vacuum-treated ferrochrome with a Si-content of not higher than 0.7 - 0.75% should be used. There are 4 figures.

K. I. B.

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

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KHITRIK, S.I., prof., doktor tekhn.nauk

Methods of investigating heats of charge-resistance batch furnaces. Trudy NTO Chern.met. 15:3-10 '59. (MIRA 13:7)

(Electric furnaces) (Smelting--Testing)

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

KHITRIK, S.I.

PHASE I BOOK EXPLOITATION SOV/4548

Akademiya nauk SSSR. Komissiya po fiziko-khimicheskim osnovam proizvodstva stali

Primeneniye vakuuma v metallurgii (Use of Vacuum in Metallurgy) Moscow, Izd-vo AN SSSR, 1960. 334 p. Errata slip inserted. 4,500 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Institut metallurgii imeni A.A. Baykova. Komissiya po fiziko-khimicheskim osnovam proizvodstva stali.

Resp. Ed.: A.M. Samarin, Corresponding Member, Academy of Sciences USSR; Ed. of Publishing House: G.M. Makovskiy; Tech. Ed.: S.G. Markovich.

PURPOSE: This collection of articles is intended for technical personnel interested in recent studies and developments of vacuum steelmaking practice and equipment.

COVERAGE: The book contains information on steel melting in vacuum induction furnaces, and vacuum arc furnaces, reduction processes in vacuum, and degassing of steel and alloys. The functioning of apparatus and equipment, especially vacuum furnaces and vacuum booster pumps is also analyzed. Personalities are mentioned in connection with some of the articles and will appear in the Table of Contents. Three articles have been translated from English. Some of the

Kazachkov, I.P., and S.I. Khitrik. Effect of Vacuum Treatment [in a Ladle] of the Carbonless Ferrochrome on the Amount of Its Oxide Inclusions 127

Fedorov, T.F., and F.I. Shamray. Physicochemical Principles of Vacuum-Thermic Methods of Treating Lithium 137

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Novik, L.M., A.I. Lukutin, and A.M. Samarin. Vacuum Treatment of Bessemer Steel 145

Kuznetsov, M.P., and G.E. Tsukanov. The Effect of Vacuum Treatment in Ladle on the Properties of Bessemer Rail Steel 151

Krasovskiy, A.I., and V.D. Kodolov. The Effect of Vacuum Treatment in Ladle on the Weldability of Bessemer Constructional Steel 156

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

KRAVCHENKO, V.A.; KHITRIK, S.I.

Reaction of silicon carbide with metals and oxides in the making of ferroalloys. Izv.vys.ucheb.zav.; chern.met. no.4: 87-98 '60. (MIRA 13:4)

1. Dnepropetrovskiy metallurgicheskiy institut.
(Ferrosilicon--Metallography) (Silicon carbide)
(Chemistry, Metallurgic)

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6"

"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

SHANDRENKO, G.I.; KHITRIK, M.V.

Hardening parts for metallurgical equipment is an important potential of metal economy. Metallurg 5 no.6:36 Je '60. (MIRA 13:8)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut organizatsii proizvodstva i truda chernoy metallurgii.
(Metallurgical plants--Equipment and supplies)

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6"

"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

KRAVCHENKO, V.A., inzh.; KHITRIK, S.I., doktor tekhn.nauk

Solubility of silicon carbide in iron-silicon alloys. Stal' 20 no.6:520-522 Je '60. (MIRA 14:2)

1. Zaporozhskiy zavod ferrosplavov i Dnepropetrovskiy metallurgicheskiy institut.

(Silicon carbide) (Solubility)

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6"

"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

18.7520

23114
S/148/60/000/007/021/023/XX
A161/A033

AUTHORS: Khitrik, S.I.; Kravchenko, V. A.

TITLE: The formation of silicon carbide in electric ferroalloy furnaces

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Chernaya metallurgiya, no. 7, 1960, 68 - 74

TEXT: The carbide formation processes during the melting of crystalline silicon, ferrosilicon, silicochrome, silicomanganese and silicocalcium has been studied on pieces taken from different zones in the furnace.. The pieces were studied by chemical, petrographic, and mineralogic analysis. It has been proven by such analysis and laboratory experiments that not only silicon oxide but also silicon carbide form side products. Silicon carbide was present in most of the specimen parts, beginning with the top and ending with the bottom levels in the furnaces, alongwith a great quantity of complex minerals. It was present in amorphous form as well as in clear cubic and polyhedral crystals. Various impurities in it (Al, Fe, Cr, Mn, C and other) colored it yellow, green, blue, blueish black. It was stated that the magma (of which the majority of the samples consisted) in contact with coke as well as coke impregnated with it had a

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23174

S/148/60/000/007/021/023/XX
A161/A033

The formation of silicon carbide ....

greenish color. It was revealed by careful microscopic investigation that the "green component" in the magma was coke turned into a peculiar form of green silicon carbide, apparently a transition product formed by the reaction of coke with liquid magma. It resembled very much the "siloxicon" described by N.Ye Filonenko (Ref. 13: Issledovaniye fazovogo sostava vozvratnykh materialov v proizvodstve karbida kremniya (Investigation of the Phase Composition of Recoverable Materials in the Silicon Carbide Production) Abrasivy, No. IX,TsBTI ENIMS, 1953). observed in the process of silicon carbide production in resistance furnaces. The article includes photomicrographs. Silicon carbide with an extraordinarily dense structure was found in transfer products from a furnace melting silicocalcium; it may be assumed that it crystallized from the liquid state, although any authors thought until recently that silicon carbide does not exist in liquid state. The greenish bloom on the inside of the graphite crucibles and graphite rods in the quartz glass melting process in induction vacuum furnaces was revealed to be fine crystalline SiC, and the crystals had also a blue and yellow color, and sometimes these were all present in one crystal. Minute silicon nuggets were also present in the bloom. It was concluded that silicon carbide may form in reactions:

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$$SiO_{2ж} + 3C_{гр} = SiC_{тв} + 2CO \quad (1)$$

$$\Delta Z^0_{(1)} = 125\,820 - 83.88\,T \text{ cal}$$

already at about 1,250°C, while the reaction of silicon reduction in production of 45-% ferrosilicon (Ref. 18: V. P. Yelyutin, Yu. A. Pavlov et al. Proizvodstvo ferrosplavov (Ferroalloy Production), Metallurgizdat, 1957) is possible at 1,377°C, and in production of 75-% ferrosilicon at 1,485°C. The formation of carborundum is possible in the reaction:

$$Si + C = SiC,$$

$$\Delta Z^0_{(2)} = -24400 + 8.3T \text{ cal.} \quad (2)$$

As the flue gas contains up to 85 % carbon oxide, the reaction

$$3Si_{пар} + 2CO = SiC_{тв} + SiO_2$$

$$\Delta Z^0_{(4)} = -483090 + 195.95\,T \text{ cal} \quad (4)$$

is also possible. The possibility of SiC formation reactions was studied in the

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23174

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A161/A033

The formation of silicon carbide ....

laboratory (in a Tamman furnace), and the origination of a liquid phase in the charge used for ferrosilicon was already observed at 1,300 - 1,400 °C. Such temperatures are possible at high levels in modern 10,000 kva ferroalloy furnaces. The probability of the reactions (2) and (4) was confirmed. A piece of coke submerged into liquid ferrosilicon soon turned into silicon carbide (greenish pseudomorphous SiC). Ferrosilicon was melted in a graphite crucible and held in CO covered with greyish-green amorphous SiC. The formation of silicon carbide became more intense at a rise in temperature; SiO was present together with SiC in the forming layer. Engineer Yu. V. Chepelenko carried out the temperature measurements in the ferroalloy furnace. There are 5 figures and 20 references: 15 Soviet-bloc and 5 non-Soviet-bloc. The references to English language publication read as follows: E. E. Thum, Metal Progress, vol. 70, No. 4, X, 1956; G. N. Baumann, Journal of the Electrochemical Society, 99, 1952, No. 3.

ASSOCIATION: Dnepropetrovskiy metallurgicheskiy institut (Dnepropetrovsk Metallurgical Institute)

SUBMITTED: June 25, 1959.

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APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6"

"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

KHITRIK, S. I.

15

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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115

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.

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

Bogatenkov, V.F., K.T. Kurochkin, and P.V. Umrikhin. Investigating the Permeability of Basic Open-Hearth Slag to Hydrogen 195

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PART II. CONVERTER PROCESSES

Baptizmanskiy, V.I. Certain Problems of the Mechanism and

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

18.3280

32596
S/137/61/000/011/017/123
A060/A101

AUTHORS: Kazachkov, I.P., Khitrik, S.I.

TITLE: Effect of vacuum-treatment of liquid carbonless ferrochrome upon oxide impurities

PERIODICAL: Referativnyy zhurnal. Metallurgiya, no. 11, 1961, 25, abstract 11V172 ("Sb. nauchn. tr. Dnepropetr. metallurg. in-ta", 1958 (1959), no. 37, 145 - 158)

TEXT: Vacuum treatment of Fe-Cr in the ladle makes it possible to obtain ingots with lowered (by ~35%) oxide-impurity content. Under vacuuming of the Fe-Cr its purification from suspended oxide impurities is furthered by the more intensive liberation of gases and the consequent stirring of the alloy, which occur at a residual pressure of 250 - 100 mm of mercury. The oxide impurities are borne out into the slag by the rising streams of the alloy and by adhering to the up-floating gas bubbles. The holding of Fe-Cr under vacuum beyond the point at which the noticeable liberation of gas bubbles from it stops, has no effect upon the further purification of the alloy of oxide impurities. The degree of purification of the Fe-Cr of oxide impurities depends chiefly upon their con-

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A060/A101

Effect of vacuum-treatment ...

tent in the state of suspension during the time of vacuuming, and the higher is the Si concentration and the lower the temperature of the Fe-Cr, the more oxide impurities are contained in the alloy in the state of suspension before the vacuuming, and the higher the degree of purification from them of the Fe-Cr during the vacuuming period. As result of the vacuum treatment the Fe-Cr is obtained with a lowered Si and gas content. Under crystallization of the ingots made of this Fe-Cr, less oxide impurities are formed in them and the oxidation-gas cavities present in ordinary Fe-Cr ingots, which are an additional source of oxide contamination of these ingots, are absent. There are 6 references.

V. Gasilina

[Abstracter's note: Complete translation]

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

KADINOV, Ye.I.; RABINOVICH, A.V.; KHITRIK, S.I.

Methods of calculating and results of the material balance in the smelting of 1Kh18N9T steel. Izv. vys. ucheb. zav.; chern. met. 4 no.8:56-71 '61. (MIRA 14:9)

1. Dnepropetrovskiy metallurgicheskiy institut.
(Steel, Stainless--Metallurgy)

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

KONOVALOV, B.S.; LAPITSKIY, V.I.; YEM, A.P.; KHITRIK, S.I.

Use of exothermic three-component ferroalloys as addition elements in 14KhGS steel. Izv. vys. ucheb. zav.; chern. met. 4 no.12:45-49 '61. (MIRA 15:1)

1. Dnepropetrovskiy metallurgicheskiy institut.
(Steel alloys--Metallurgy) (Iron alloys)

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6"

"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

KADINOV, Ye.I.; KHITRIK, S.I.

Effect of basic technological factors on the loss of chromium during the blowing of a high-chromium bath with oxygen. Izv. vys. ucheb. zav.; chern. met. 5 no.10:50-58 '62. (MIRA 15:11)

1. Dnepropetrovskiy metallurgicheskiy institut.
(Chromium steel—Metallurgy)
(Oxygen—Industrial applications)

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6"

"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

KHITRIK, S.I., doktor tekhn. nauk; KADINOV, Ye.I., inzh.; BORODULIN, G.M., inzh.; TREGUBENKO, A.F., inzh.; YATSKEVICH, I.S., inzh.; DEMIDOV, P.V., inzh.; FRANTSOV, V.P., inzh.; SMOLYAKOV, V.F., inzh.; MALIKOV, G.P., inzh.; DOVGIY, M.M., inzh.; MOSHKEVICH, Ye.I., inzh.; RABINOVICH, A.V., inzh.

Reducing chromium losses in the manufacture of acid-resistant and stainless steels in electric arc furnaces. Met. i gornorud. prom. no.1:17-20 Ja-F '62. (MIRA 16:6)
(Steel, Stainless—Electrometallurgy)

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

3

S/133/62/000/007/003/014
A054/A127

AUTHORS: Goncharov, I.A.; Yem, A.P.; Konovalov, V.S.; Lapitskiy, V.I.; Marakhovskiy, I.S.; Pilonov, V.A.; Khitrik, S.I.; Yaitskiy, A.K.

TITLE: Determination of the optimum composition of silico-chromane and its application in alloying 14 ХГС (14KhGS) grade steel

PERIODICAL: Stal', no. 7, 1962, 615 - 616

TEXT: Tests were carried out (with the cooperation of A.S. Rabinovich, G.T. Dzenko, N.V. Pal'chik, M.I. Vaynshtok, P.L. Konstantinov, et al.) on the application of silicochromane (with 15 - 18% Si, 25 - 40% Mn and 25 - 35% Cr) in alloying 14KhGS grade steel. (The application of this ternary alloy was proposed by V.P. Kazov, I.S. Marakhovskiy, I.M. Loykin, A.A. Khomutov, A.A. Podgorodetskiy.) Silicochromane for the tests was produced from ferromanganese, ferrochrome, ferrosilicon, etc.) the test steel was smelted in a 10-kg induction furnace and in 15-ton and 220-ton open-hearth furnaces. Besides testing ferrochromane with various percentages of the main components, the investigations also covered the possibility of adding this alloy to the steel without its previous

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3

S/133/62/000/007/003/014
A054/A127

Determination of the optimum composition ....

reduction. When ferrochromane was added to the bath without previous reduction, the burning out of manganese was 35%, that of silicon 80 - 85%, while, when it was added to the reduced bath the corresponding values were not more than 4 - 5 and 45 - 50%. The burning loss of chrome is not greatly affected by the degree of bath-reduction. By reference to laboratory tests, silicochromane with 32 - 34% Mn, 35 - 36% Si and 18 - 19% Cr was used in the pilot plant tests with a 15-ton open-hearth furnace. In these tests silicochromane replaced silicomanganese in preliminary reduction and ferrochrome + ferromanganese in alloying. The burning loss of manganese was 5 - 7%, that of silicon 50 - 55% and of chrome 16 - 18% in this test series. When 50% of silicochromane was added in the furnace and 50% in the ladle, the losses of silicon were decreased to 42% and the total amount of the alloy required for reduction and alloying dropped by 10%. The loss of manganese increased to 15%, while the burning loss of chrome remained unchanged (15%). Similar results were obtained for the 220-ton furnace. The optimum composition for silicochrome was found to be 35 - 38% Mn, 32 - 35% Si and 21 - 23% Cr. The distribution of the main elements in the height of the ladle was more uniform than with reduction according to the conventional methods. The amount of gases also decreased when silicochromane was used. As to nonmetallic inclu-

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3

Determination of the optimum composition S/133/62/000/007/003/014
A054/A127

sions the metal reduced by silicochromane showed silicate inclusions mainly in the skin of the ingot bottom, evidently because they could not float due to the lower liquidity of the metal caused by the addition of great amounts of ferro-alloys in the ladle. This, however, can be corrected by using exothermic ferro-alloys. There is 1 figure.

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

S/148/62/000/011/002/013
E079/E151

AUTHORS: Kadinov, Ye.I., Litvinova, T.I., and Khitrik, S.I.

TITLE: Phase composition of slags during electric refining of stainless steels

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Chernaya metallurgiya, no.11, 1962, 61-69

TEXT: During refining of stainless steels of the type 1X18H9T (1Kh18N9T) in basic arc furnaces by remelting internal scrap, using oxygen for refining, from 15 to 20% of chromium is lost into the slag, due to the incomplete reduction of the chromium from slag, into which it passes during the melting and oxidising periods. In order to find methods of reducing chromium losses, the chemical and mineralogical composition of slag samples taken in the course of two heats carried out according to the specified method (not described) was investigated. The results obtained indicated that the reduction of chromium oxides from the slag at the end of the blowing period cannot take place with existing slag and deoxidation practices. It is necessary to increase the fluidity and basicity of the oxidising slag as well

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

KHITRIK, S.I.; VLASENKO, V.Ye.; GASIK, M.I.; YEM, A.P.; NEFEDOV, Yu.A.

Refining 75-per cent ferrosilicon from aluminum. Izv.vys.ucheb. zav.; chern.met. 5 no.4:45-53 '62. (MIRA 15:5)

1. Dnepropetrovskiy metallurgicheskiy institut.
(Ferrosilicon--Metallurgy) (Aluminum)

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6"

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GONCHAROV, I.A.; YEM, A.P.; KONOVALOV, V.S.; LAPITSKIY, V.I.; MARAKHOVSKIY, I.S.; FILONOV, V.A.; KHITRIK, S.I.; YAITSKIY, A.K.; Prinimali uchastiye: RABINOVICH, A.S.; DUZENKO, G.T.; PAL'CHIK, N.V.; VAYNSHTOK, M.I.; KONSTANTINOVA, P.L.

Determination of an efficient composition of silicochromium and its use for alloying 14Kh2S steel. Stal' 22 no.7:615-616 Jl '62. (MIRA 15:7)

(Silicon-chromium alloys)
(Steel—Metallurgy)

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6"

"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

S/764/61/000/000/003/003

AUTHORS: Khitrik, S. I., Doctor of Technical Sciences; Volkov, V. F., Nikolayev, V. I., Engineers; Yem, A. P., Candidate of Technical Sciences; Gasik, M. I., Assistant; Yemlin, B. I., Engineer.

TITLE: Industrial experience with the vacuum treatment of iron alloys.

SOURCE: Razvitiye ferrosplavnoy promyshlennosti SSSR. Ed. by N. M. Dekhanov and others. Kiyev, Gostekhizdat USSR, 1961, 231-240.

TEXT: The paper describes experimental vacuum techniques applied by the School of Electrometallurgy of the Dnepropetrovsk Institute of Metallurgy, jointly with the Zaporzh'ye Iron-Alloys Plant, for the making of dense ingots free of gas blowholes of C-free ferrochrome and metallic Mn. The work was begun in 1953, and the present paper describes the improved vacuum chamber and pumping system developed since 1955 and 1956 (schematic cross-section shown). The vacuum chamber comprises a metallic container with an internal lining of a single row of firebrick. The removable cover is water-cooled and, while not protected by a lining, is shielded from the heat radiation of the liquid metal by means of a sheet-metal screen. The pumping plant, which is connected to the chamber by means of a large-diam conduit, is placed at a distance of 25 m from the chamber. A multiple-

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unit pumping system is used. With the use of a single PMK-4 (RMK-4) pump, the residual pressure attained is 30-40 mm Hg; the additional operation of 2 BH-6I' (VN-6G) pumps reduces the pressure to 8-15 mm Hg after 7-9 min. The chemical composition of the metal after various holds in the ladle prior to vacuum treatment and for various durations of the vacuum treatment is shown, and it is established that the Cr_2O_3 content in the slags decreases on the mean by 24% and the FeO content decreases by 20%. This decrease is attributed to a process of reduction of these oxides by Si and also by the SiO and CO oxides which form during the oxidation of Si and C in the metal. The beneficial effects of the vacuum treatment are also interpreted with respect to the decarburization of ferrochrome and others. The results of this work have been brought into practical operation at the Zaporozh'ye Iron-Alloys Plant. In March 1957 a vacuum equipment was also established at Plant No. 3 for the vacuum treatment of metallic Mn. Whereas in 1957 only 3% of the total ferrochrome production was vacuum-treated, in 1958 nearly 50% of the total ferrochrome production was vacuum-treated. A further study of the favorable effect of vacuum treatment on the quality of ferrochrome, ferromanganese, ferrosilicon, silicomanganese, and silicochrome is recommended. It is also important to study the effect of vacuum treatment of iron alloys on the quality of the alloyed steel. The experience of the Zaporozh'ye Iron-Alloys Plant substantiates the technical and economic advantages of a broad-scale vacuum treatment of ferrochrome and metallic

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Industrial experience with the vacuum S/764/61/000/000/003/003

Mn at other plants also. There are 2 figures, 4 tables, and 8 references (6 Russian-language Soviet and 2 English-language originals: Evans, J., Problems of Modern Metallurgy, no.1, 1954; Sally, A.N., Brandes, E.A., Mitchells, C.V., J. Inst. Met., v.8, 1953; the first of these in Russian translation).

ASSOCIATION: Dnepropetrovskiy metallurgicheskiy institut (Dnepropetrovsk Metallurgical Institute) and Zaporozhskiy Zavod Ferrosplavov (Zaporozh'ye Iron-Alloys Plant).

Card 3/3

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KADINOV, Ye.I.; LITVINOVA, T.I.; KHITRIK, S.I.

Phase constitution of slags during the electric melting of stainless steels. Izv.vys.ucheb.zav.; chern.met. 5 no.11:61-69 '62. (MIRA 15:12)

1. Dnepropetrovskiy metallurgicheskiy institut.
(Steel, Stainless—Electrometallurgy) (Slag—Testing)

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

EDNERAL, Fedor Prokop'yevich, prof., doktor tekhn. nauk; KHITRIK, S.I., prof., doktor tekhn. nauk, retsenzent; CHUYKO, N.M., prof., doktor tekhn. nauk, retsenzent; KHOLODOV, A.I., dots., kand. tekhn. nauk, retsenzent; VENETSKIY, S.I., inzh., red.; KARASEV, A.I., tekhn. red.

[Electrometallurgy of steel and ferroalloys] Elektrometallurgiia stali i ferrosplavov. Izd.3., ispr. i dop. Moskva, Metallurgizdat, 1963. 640 p. (MIRA 16:8)
(Steel--Electrometallurgy)
(Iron alloys--Electrometallurgy)

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6"

"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

KHITRIK, S.I., doktor tekhn. nauk; DEKHANOV, N.M., inzh.; SARANKIN, V.A., inzh.; ZEL'DIN, V.S., inzh.; BELIKOV, Yu.V., inzh.

Making manganese metal on a phosphorous-free slag from first-grade Nikopol' manganese ore. Met. i gornorud. prom. no.5:66-68 S-O '63. (MIRA 16:11)

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

S/148/63/000/002/001/006
E111/E451

AUTHORS: Kadinov, Ye.I., Khitrik, S.I.

TITLE: Refining period in the electric melting of stainless steels

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Chernaya metallurgiya, no.2, 1963, 68-76

TEXT: The main chromium losses during refining in electric melting with oxygen lancing are by transfer to the slag. Among the factors responsible is the formation of $(CrO)_x \cdot SiO_2$. In industrial trials on experimental heats of type 1X18H9T (1Kh18N9T) steel, deoxidation was carried out with type AMK alloy immediately after lancing by adding 0.15 to 0.20% Al, 0.35 to 0.40% Si and about 1.0% Mn of the charge weight. Ferrochromium and lime (13 kg/ton charge) were then added and, after the ferrochromium had melted, the slag was deoxidized with silicon-containing powders (silicon addition 14.5 to 15.0 kg/ton) and lime, giving a basicity $(CaO + MgO) : SiO_2$ of not less than 1.4 and slag chromium content of less than 7%. The high silicon consumption had no significant effect on silicon content in the metal (0.58% average). The

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average chromium content of the slag run off was down to 6.5% (20% with normal practice). These measures together with changes in melting and lancing practice to decrease the amount of chromium oxidized (e.g. by better control of temperature and slagging conditions) raised the chromium recovery from 82.3 to 95% and reduced oxidation losses by more than one-third. No significant complications ensued and heat time was almost unaffected. There are 5 figures and 1 table.

ASSOCIATION: Dnepropetrovskiy metallurgicheskiy institut (Dnepropetrovsk Metallurgical Institute)

SUBMITTED: May 24, 1962

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6"

"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

GASIK, M.I.; SHCHESNO, L.P.; KHITRIK, S.I.

Corrosion resistance of stainless chromium-nickel steel made with the use of various brands of ferrochromium. Izv. vys. ucheb. zav.; chern. met. 6 no.11:79-87 '63. (MIRA 17:3)

1. Dnepropetrovskiy metallurgicheskiy institut.

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

SARANKIN, V.A.; KHITRIK, S.I.

Role of metal regulus in the slag during the making of carbon-free ferrochromium. Izv. vys. ucheb. zav.; chern. met. 6 no.12:54-61 '63. (MIRA 17:1)

1. Dnepropetrovskiy metallurgicheskiy institut.

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

ACCESSION NR: AR4027927 S/0137/64/000/002/V040/V040

SOURCE: RZh. Metallurgiya, Abs. 2V263

AUTHOR: Kadinov, Ye. I.; Khitrik, S. I.

TITLE: Reduction of chromium during the electric melting of stainless steel

CITED SOURCE: Nauchn. tr. Dnepropetr. metallurg. in-t, vy*p. 51, 1963, 77-96

TOPIC TAGS: stainless steel melting, chromium reduction, deoxidation

TRANSLATION: A procedure was developed for carrying out a reductive process in the course of melting of type 18-8 steel, which makes it possible to raise the assimilation of Cr from 82.3 to 95% and more. The new procedure requires that (1) after O_2 is blown through the bath, the metal be deoxidized to the maximum possible extent with the alloy Mn-Si-Al (AMK); (2) by increasing the total amount of added lime to 7.0-7.5% of the weight of the metal, the basicity of the slag be raised to 1.4, and (3) that the consumption of silicon deoxidizers in the powder used to deoxidize the slag be increased. When 18-8 steel was made in accordance with the new procedure in 30-t electric furnaces, the quality of the metal was somewhat improved.
V. Shumskiy

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ACCESSION NR: AR4027927

DATE ACQ: 19Mar64 SUB CODE: ML ENCL: 00

Card 2/2

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

SARANKIN, V.A.; KHITRIK, S.I.

Sources of carbon in the manufacture of carbon free ferrochromium in arc furnaces. Nauch. trudy DMI no.51:143-161 '63. (MIRA 17:10)

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6"

"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

YEMLIN, B.I.; KHITRIK, S.I.

Improving the operation of furnaces in the manufacture of carbon-free ferrochromium. Nauch. trudy DMI no.51:173-181 '63. (MIRA 17:10)

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6"

"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

BELIKOV, Yu.V.; KEKELIDZE, M.A.; KRASNYKH, I.F.; SIORIDZE, G.Ya.; KHITRIK, S.I.; SHATIRISHVILI, G.A.; SHIRER, G.B.

Making silicon-manganese alloys from sintered 2d and 3d-grade concentrates of the Nikopol' deposit. Stal' 24 no.2:140-143 F '64. (MIRA 17:9)

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6"

"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

GASIK, Mikhail Ivanovich, kand. tekhn. nauk, dots.; L'VOVA, Ol'ga Konstantinovna, inzh.; RAGULINA, Raisa Ivanovna, inzh.; ALIVOYVODICH, Miro Khristoforovich, inzh.; KHITRIK, S.I., prof., doktor tekhn. nauk, nauchn. red.

[Manufacture and operation of continuously self-annealing electrodes and anodes] Proizvodstvo i ekspluatatsiia nepreryvnykh samoobzhigaiushchikhsia elektrodov i anodov. Moskva, Metallurgiia, 1965. 254 p. (MIRA 18:5)

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6"

"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

KHITRIK, S.I.; YEM, A.P.; CHEPELENKO, Yu.V.; RABINOVICH, A.V.

Kinetics of the reduction of sinter and of an ordinary charge mixture in the production of ferrosilicon. Izv. vys. ucheb. zav.; chern. met. 8 no.10:69-73 '65. (MIRA 18:9)

1. Dnepropetrovskiy metallurgicheskiy institut.

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

KHITRIK, S.I.; GASIK, M.I.; LEYBOVICH, R.Ye.; LAGUNOV, Yu.V.; KUCHER, A.G.

Specific heat of carbonizing an electrode mixture. Stal' 25 no.2:135-136 F '65. (MIRA 18:3)

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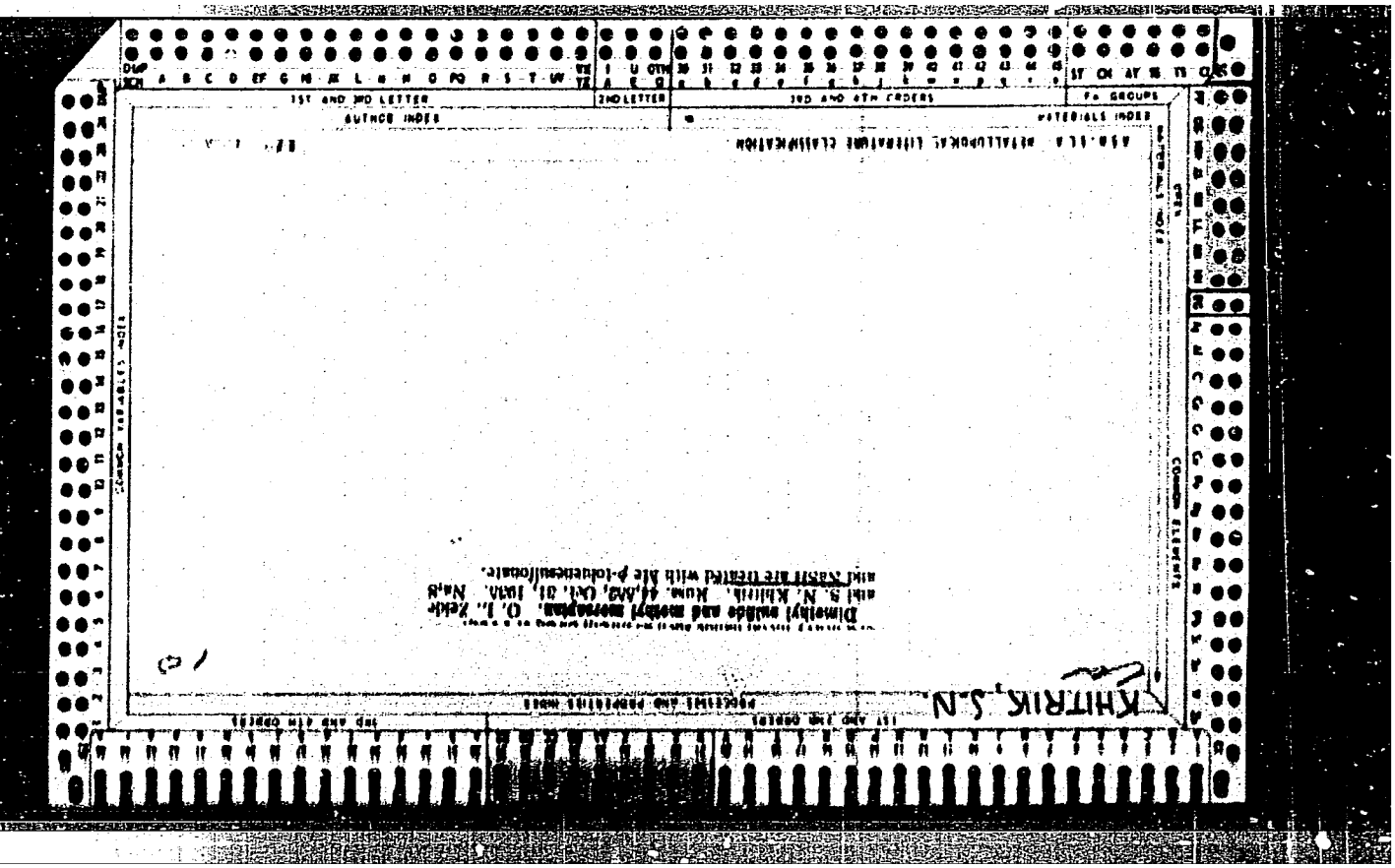

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1ST AND 2ND ORDERS 3RD AND 4TH ORDERS

PROCESSES AND PROPERTIES INDEX

The action of acetoacetic ester on 2-aminopyridine. S. N. Khitrik. *J. Gen. Chem.* (U. S. S. R.) 9, 1109-17 (1939).—Acetoacetic ester (I) (26 g.) with 9.4 g. 2-aminopyridine (II) at 100° for 4 hrs. gives 4 g. 2-acetoacetaminopyridine (III), m. 113°; methiodide, yellow prisms, m. 133-4° (decompn.). III (3 g.) with 15 cc. concd. H_2SO_4 at room temp. for 24 hrs. gives 25% *1,5-dihydroxy-6-methyl-4-pyrimidone* (IV), $b_{0.4}$ 143-53°, m. 122°. I (6.5 g.) with 9.4 g. II at 130° for 4 hrs. gives 17% *β-2-pyridylaminocroton-2-pyridylamide* (V), needles, m. 166°, also obtained from II with III by heating at 140° for 4 hrs. V, vacuum-distd. or cyclized with concd. H_2SO_4, at 25°, gives IV. Heated with dil. HCl V is decompd. to II and III. I (38 g.) with 20 g. II at 150-60° for 4 hrs. gives IV; *HCl salt*, partially m. 290°, complete 310°; *chloroplatinate*, brown plates, m. 220° (decompn.); *picrate*, yellow, m. 177° (decompn.); *methiodide*, orange prisms, m. above 280°. Exposed to the air IV forms the *monohydrate*, m. 105-7°, which (or IV) recrystd. from water gives $C_6H_8N_2O_2.2.5H_2O$, m. 84°. IV heated with maleic anhydride in PhCl undergoes the Diels-Alder reaction to give $C_{10}H_{10}N_2O_4$, m. 135-6°. Nitrated at 0° in concd. H_2SO_4 with HNO_3-H_2SO_4 (1:3) IV gives the *5-NO_2 deriv.* (VI), yellow, m. 184°, readily decompd. with hot 20% HCl to II. Heated with alkali VI is decompd. with evolution of NH_3. The formation of IV from I and II is postulated as proceeding through the intermediate condensation products III and V. John Livak

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

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KHITRIK, S.N.

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

Lab. Org. Chem., Mil. Acad. im. Voroshilov

Some peculiarities of the reaction course connected with the tendency of conjugated double bond formation. 1,2-Diallylidene-1,2-diphenylethane from 3-benzoylpropyl bromide. S. N. Khitrik. *J. Gen. Chem.* (U. S. S. R.) 10, 2095-7(1940).—Reducing 3-benzoylpropyl bromide (I) with Al-Hg in moist ether (by the method of Wislicenus, *Ber.* 28, 1325 (1895)) yielded the pinacol 4,5-diphenyl-1,8-dibromo-4,5-octanediol (II) instead of the expected 3-halophenylpropyl alc. Attempting to dehydrate II in order to obtain 4,5-diphenyl-1,8-dibromo-3,5-octadiene led to the splitting of 2 mols. of HBr, together with 2 mols. of H_2O and to the formation of 1,2-diallylidene-1,2-diphenylethane (III). Such a course of a dehydration reaction explains the expressed tendency of conjugated double bond formation. In the course of prepg. III the following methods were developed: a new method of prepn. of benzoylacetoacetic ester (IV) and a simplified method of prepn. of I (Chelinzev, *C. A.* 20, 6223[6]). Also a new substance, *3-benzoylpropyl acetate* (V), was isolated. *Synthesis of IV.* Acetoacetic ester (130 g. (1 mol.)) was dissolved in 300 ml. of 15% aq. NaOH (1.1 mols.). After cooling to 15°, 140 g. (1 mol.) of BzCl and 300 ml. (1.1 mols.) of 15% aq. NaOH were added simultaneously from 2 dropping funnels, keeping the temp. of the reaction mixt. not above 20°. It was essential that the reaction mixt. remained clear, that there was no excess of alkali, that there was no BzCl odor, and that the addn. of BzCl was easily regulated. The mixt. was stirred for 1.5–2 hrs. after the addn. of the reagents and extd. with ether, to remove the partially formed dibenzoylacetoacetate (13–15 g.), which is insol. in alkali. The aq. alk. soln. of benzoylacetoacetate was shaken with 70 g. NH_4Cl in 220 ml. of 10–12% aq. NH_3 at 40–50°. The colored IV which sepd. was removed after 4–5 hrs. The residue was extd. with ether and added to the previously sepd. IV. The combined solns. were washed with 1% HCl, then with water, then dried and the solvent distd. The residue was vacuum-distd. and 95–100 g. of IV (0.5 mol.) distd. at 144–5° (8 mm.). Benzoylbutyrolactone (VI) was prepared by the Chelinzev method (*loc. cit.*), replacing abs. with ordinary alc. The yield of VI (m. 50–1°, b_2 193–8°) was 45% of the reacted acetoacetic ester. VI (3.8 g.) in 3.5 ml. of glacial AcOH was boiled for 15 min. over a small flame, and 3 drops of concd. H_2SO_4 were added. A strong evolution of CO_2 was noted. The mixt. heated for 2 hrs. longer acquired a brownish color. It was then poured into cold water and extd. with ether. The ether ext. was washed with a soda soln. and with water, dried and evapd. The residue was vacuum-distd. (6 mm.). A colorless product was obtained which distd. at 159–60° and after some time crystd., m. 26–8°. The yield was 2.5 g. of V (60%). VI (3.8 g.) was added to 7.6 g. NaBr in 6.6 g. of H_2O. The stirred mixt. was heated to 60° and 3 g. of concd. H_2SO_4 added dropwise, while stirring vigorously. The mixt. was heated to boiling and 7.3 g. of concd. H_2SO_4 was added dropwise, continuing the vigorous stirring. The mixt. was heated and stirred continually for 2 hrs., cooled and poured into 5 vols. of H_2O. The sepd.

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product was extd. with ether. The ext. was washed with a soda soln. and with water, dried and the solvent distd. The residue was vacuum-distd. and the fraction $b_{0.5}$ 140-52° was collected. I crystd. after some time, m. 36°. The yield was 3.8 g. II was obtained from I. I (2 g.) was dissolved in 24 g. of moist ether and 7 g. of freshly prepd. Al-Hg was added. The reduction proceeded rapidly. After 15 min. the flask content was filtered from the unchanged Al-Hg and dried over $MgSO_4$. After removal of the solvent the residue crystd. After recrystg. II m. 100-1°. The yield was 0.81 g. III was obtained by heating 0.4 g. of II in the presence of a small crystal of sulfanilic acid until it melted. An intensive evolution of HBr and a sharp coloring of the reaction mass was noted. After 0.5 hr. it was treated with a weak soda soln., the ppt. washed with hot water and recrystd. from alc.; 0.18 g. of III, white cryst. product, was obtained, m. 84-5°. It was insol. in water, sol. in alc. and acetone, and little sol. in ether.

James J. Lichtin

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KHITRIK, S.N.

CA

10

The synthesis of primary β,γ-unsaturated alcohols, glycols and their derivatives. S. N. Khitrik. *J. Gen. Chem.* (U. S. S. R.) 10, 2098-2100(1940).—Bivinyl is obtained almost quantitatively when Mg acts on $(:CHCH_2Br)_2$ instead of the corresponding di-Mg deriv. A reaction course like this can be explained only by the specially expressed tendency to conjugated double bond formation. PhCH:CHMgBr does not react with 2-chloroethyl *p*-toluenesulfonate, in distinction from other Mg org. compds.

James J. Lichtin

Lab Org. Chem., Red Army Military Acad. Chem. Defense im. K. Ye. Voroshilov

METALLURGICAL LITERATURE CLASSIFICATION

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

KHITRIK, S. N., BUNIN, K. P. and TROITSKAYA, Ye. P.

"Effect of Individual Elements on the Thermal Stability of White Iron," Stal', No.5, pp. 417-19, 1945

Evaluation B-59660

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

USSR/Chemistry - Heterocyclic Compounds Jan 1948
Chemistry - Synthesis

"Mechanism of the Formation of Condensed Heterocyclic Systems: I, Mechanism of the Formation of 2-Oxy-5.6-Divinylenelepidine (Alpha-Naphtho-Beta-Oxylepedine)," S. N. Khitrik, Lab of Org Chem, Mil Acad of Chem Defense of the Red Army imeni K. Ye. Voroshilov, 2½ pp

"Zhur Obshch Khim" Vol XVIII (LXXX), No 1

PA 64T47

Beta-naphtho-2-oxy-4-methylquinoline can be obtained by simple thermal processing of one of the products of condensation of beta-naphthylamine with acetoacetic esters. The mechanism of this thermal treatment is connected with the separation of one molecule of beta-naphthylamine, and is analogous to the mechanisms of the processing of 2-pyridilamide (2-pyridil)-aminocrotonic acid. Submitted 14 Dec 1946.

64T47

KHITRIK, S. N.

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6"

"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

KHITRIN, A. (Kirovskaya oblast')

Wolves eat turnips. IUn.nat. no.5:13 My '59. (MIRA 12:6)
(Wolves)

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

KHITRIN, I.I., kand.med.nauk

Conference on exercise therapy at resorts and sanatoriums. Vop.kur., fizioter. i lech.fiz.kul't. no.4:87-89 O-D '55. (MIRA 12:12)
(EXERCISE THERAPY)

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

KHITRIN, L. I.

KHITRIN, L.I., inzhener.

Steadily develop harbor facilities on the Volga. Rech.transp. 16 no.8:6 Ag '57. (MIRA 10:11)

(Volga River--Harbors)

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

KHITRIN, L.N.

BC

A-1

PROCESSES AND PROPERTIES INDEX

1ST AND 2ND ORDERS

3RD AND 4TH ORDERS

Diffusion of gases through metals. L. N. KHITRIN (J. Exp. Theor. Phys. U.S.S.R., 1934, 4, 160—170).—The Richardson formula reproduces the experimental data for the diffusion of H_2, CO, CO_2, C_2H_2, CH_4, and N_2 through Fe at 300—1000°. H_2 and CO diffuse readily, C_2H_2 and CH_4 more slowly, and CO_2 and N_2 only slightly at 300°. The rate for H_2 is a max. at 550°. CH. ABS. (e)

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1ST AND 3RD LETTER

2ND LETTER

3RD AND 4TH ORDERS

Fe GROUPS

AUTHOR INDEX

MATERIALS INDEX

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

Hydrogen in electric steel. S. O. Khitrik. *Teriya i Prakt. Mat.* No. 4, 48-56(1936).—Addn. of Mn, Ni, Si and Al decrease the H_2 content, but addn. of cast iron causes an increase. No direct relation between H content and steel quality was detd., but the higher the ratio of H/CO in the gases emanating from the liquid metal, the poorer the macrostructure. B. Z. Kamich

PROCESSES AND PROPERTIES INDEX

1ST AND 2ND ORDERS

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

CA

The influence of pressure on the speed of normal flame propagation. L. Khitrin. *Tech. Phys. U. S. S. R.* 3, 936-39(1936)(in English).—The effect of increased pressure on the nature of the change in the speed of flame propagation was studied in mixts. of air with C_6H_6 and Et_2O. The linear speed of flame propagation decreases and the mass velocity increases as the pressure is increased. The law of growth of the mass velocity with pressure may be expressed by a relation of the type $m = K_1(p)^{1/2} + K_2$, where K_1 and K_2 are consts. An analysis of the results found by Ubbelohde using the burner method on mixts. of CO, C_6H_6 and CH_4 supports the observed effect and the type of the given relation between the pressure and the value of the mass velocity of flame propagation for mixts. with air. The relation is in good accord with Jouguet's theoretical formula (*C. A.* 13, 1766). H. G.

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1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

CA

2

Process of the flame propagation in constant-pressure bombs. L. Khitrin. *Tech. Phys. U. S. S. R.* 3, 1028-33 (1936)(in English).—Expts. with CO-air mixts. in the "const.-pressure bomb" of Stevens (*C. A.* 18, 2267), in which an instantaneous photographic method is used, confirmed Stevens' assumption of complete spherical propagation of the flaming surface and of equal and sym. expansion of the spherical soap-bubble film (*C. A.* 20, 2740; 22, 2058, 4831; 24, 1982). C. G. Storm

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2179. Influence of Pressure on the Normal Flame Propagation Velocity in Gases. K. Kelednew and L. Khitrin. *Techn. Phys., U.S.S.R.* 3. 12. *pp.* 1034–1043, 1936. *In English.*—The constant pressure bomb method [see preceding Abstract] is the most thorough method for the measurement of the normal speed of flame propagation and is fully applicable to work at high pressures (detonation). The constant pressure bomb and burner methods may be considered as the only methods at present existing which allow of the measurement of the actual value of the normal speed of flame propagation in gases. The value of the linear normal speed of propagation decreases with pressure for gas-air mixtures, within the pressure limits studied, and does not depend on the pressure in any way in the case of mixtures with O_2. The value of the mass velocity of propagation grows with increase of pressure, in the case of O_2 mixtures it takes the form of straight line proportionality, and for air mixtures $m = k_1 \sqrt{p} + k_2$. The character of the change of the linear and mass velocities with pressure, for air mixtures is analogous with the effect observed using the burner method, and this character may be considered as being independent of the method of measurement. AUTHORS.

A53j

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

Application of the tube method for the measurements of the normal speed of flame propagation in gases. L. Khitrin. *Tech. Phys. U. S. S. R.* 4, 110-20(1937).—The speed of uniform flame movement is proportional to the rate of ignition, and depends on the dimensions of the flame surface and the conditions of propagation. The normal speed of inflammation is the ratio of rate of fuel consumption to the area of the surface of inflammation. The normal speed of propagation is detd. accurately by the tube method, but it is necessary to record the shape and dimensions of the flame surface which correspond to the stage of uniform movement along the tube. Only when external phys. conditions (such as dimensions of flame surface) remain unchanged is the speed of uniform movement a relative characteristic of the process of propagation.

B. E. Anderson

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

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1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

RA

2

Theory of Bunsen flames. L. Khitin. *Tech. Phys. U. S. S. R.* 4, 121-37(1937).—The internal "cone," which is the gas ignition surface, of a Bunsen flame is theoretically explained in a more simple manner and with greater phys. reality than was done by Michelson (Michelson, collected works, Vol. 1). The height of the cone and dimensions of the lateral surface are calcd. from the formula $Z = a(R-r) - b(R^2-r^2)$ where R is the tube radius, r is a variable radius vector, and a, b are consts. depending upon dimensions of burner and gas flow. Certain peculiarities of the form of this cone are established, and are explained from the point of view of the finite thickness of the zone of noticeable heating of the gas contiguous with the surface of ignition.

B. E. Anderson

MATERIALS INDEX

OPEN

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6"

"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

1ST AND 2ND ORDERS

3RD AND 4TH ORDERS

PROCESSES AND PROPERTIES INDEX

21

Rapid combustion of fuel. L. N. Khitrin and S. V. Tatishchev. *Teploslovoe Khoz.* (Wärmewirtsch.) 1939, No. 2, 29-30; *Chem. Zentr.* 1939, II, 208. The combustion reaction can be intensified by increasing the surface of the fuel and by increasing the velocity of the air current supplied. The investigation included a study of the products of combustion as well as of the construction of suitable firing equipment and boiler plants. M. G. M.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6"

"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

PROCESSES AND PROPERTIES INDEX

Characteristics of the heterogeneous reaction in the combustion of carbon. L. N. Khitrin (G. M. Krzhizhanovskii Energetics Inst. Acad. Sci. U.S.S.R., Moscow). *Izvest. Akad. Nauk S.S.S.R., Otdel. Tekh. Nauk* 1948, 341-8.—(1) An appropriate approx. boundary condition for the case of the combustion ($C + O_2$) taking place wholly at the outer surface (subscript F) of the solid is, generally, $-D(\partial c/\partial n)_F = \alpha f(c_F)$, where D = diffusion coeff., c = concn. of O_2, n = normal to the surface (pointing away from it), $f(c)$ = rate of chem. reaction as a function of c, α = reaction rate const.; if the reaction takes place both at the surface and inside the solid, the condition is $-D(\partial c/\partial n)_F = -kf(c_F) - D_i(\partial c_i/\partial n)_F$, where the subscript i refers to the inside of the solid, and k is a const. pertaining strictly to the outer surface. Validity of this expression is, however, limited to the case where all reactions are of the first order; in that case, $\alpha = k + D_i(\partial c/\partial n)_F/f(c_F) = k + D_i[\partial \ln(c_i/c_0)/\partial n]_F$. Equations of this type hold for any of the heterogeneous processes taking place at the surface of C, not only for $C + O_2 \rightarrow CO_2$ but also for $C + CO_2 \rightarrow 2CO$; noting the magnitudes pertaining to the latter by subscript 2, the conjugate reaction (subscript 2,1) will be represented by $\alpha_{2,1} = k_{2,1} + (\alpha_2 - k_2)f(c_F)/f_2(c_{2,F}) + D_{2,1}(\partial c_{2,1}/\partial n)_F/f_2(c_{2,F})$. The magnitudes α are termed the coeffs. of reactive gas exchange. (2) An expression of the sp. rate of combustion of C, K_s, is gained by taking into account the concns. of all gases involved, O_2 (c), CO (c_1), and CO_2 (c_2), related by $c + \epsilon c_1 + c_2 = c_0$, where c_0 = molal concn. of O_2 in the initial mixt., ϵ = coeff. allowing for the change of the no. of mols. in the reaction $2C + O_2 \rightarrow 2CO$, $\epsilon = 1 + (O_2)_{initial}$. The procedure differs from that of Tu, Davis, and Hottel (*C.A.* 28, 5002[3]) in that no const. stoichiometric factor is introduced to link K_s with the rate of diffusive arrival of O_2. The final expression is $K_s = -D[2\epsilon(\partial c_1/\partial n)_F + (\partial c_2/\partial n)_F]$ moles C/sq. cm./sec., or, multiplied by $-12/32$, in g. C/sq. cm./sec. (in which case the c are in g./cc.). Thus, K_s is detd. not only by the stream of O_2 but also by CO and CO_2. (3) The rate of arrival of O_2 to the surface of C being $-D[\epsilon(\partial c_1/\partial n) + (\partial c_2/\partial n)]$ moles/sq. cm./sec., and the rate of departure of (CO + CO_2), $-D[2\epsilon(\partial c_2/\partial n) + (\partial c_1/\partial n)]$, there is a balance $-D\epsilon\partial c_1/\partial n$ of gas moving away from the surface of the burning C, and opposing diffusion of O_2 to the surface. The linear velocity of the gas stream, perpendicular to the surface, is $w = -D[\epsilon(\epsilon - 1)/c_0]\,\partial c_1/\partial n$ cm./sec.; $w = 0$ only if $\epsilon = 1$ but is significant in pure O_2 where $\epsilon = 2$.

N. Thon

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6"

"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

KHITRIN, L. N.

PA 70T26

USSR/Chemistry - Carbon
Chemistry - Combustion

Apr 1948

"Combustion of Spherical Particles of Carbon. Influence of Secondary Reactions on Fundamental Characteristics of the Process," L. N. Khitrin, Power Engr Inst imeni G. M. Krzhizhanovskiy, Acad Sci USSR 17 pp

"Iz Ak Nauk SSSR, Otdel Tekh Nauk" No 4

Studied the effect of secondary chemical reactions on the process of the combustion of carbon. Theoretical analysis of the process of combustion of carbon sphere showed that secondary reactions may have powerful effect on basic characteristics of the

70T26

USSR/Chemistry - Carbon (Contd)

Apr 1948

process and particularly on the rate of the specific speed of combustion. Results of the experiment may be applied to calculation of the coefficients of reaction quantity and rules of diffusion migration. Results also may be used as basis for computation of the combustion of fine carbon particles. Submitted Jan 1948.

70T26

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6"

"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

KHITRIN, L. N.

PA 12/49T101

USSR/Physics Jul 48
Combustion
Mathematics, Applied

"One Method of Studying the Characteristics of Secondary Reaction and Diffusion in the Combustion of Carbon," L. N. Khitrin, Power Inst imeni G. M. Krzhizhanovskiy, Acad Sci USSR, 8 pp

"Iz Ak Nauk SSSR, Otdel Tekh Nauk" No 7

Method is to measure speed of combustion of a circular carbon disc placed at a known depth in a cylindrical cup. Deduces formula $Z = \frac{d}{dL}\left(\frac{1}{K_s^c}\right)$ where L = depth of disc; K_s^c = rate of combustion.

[redacted] 12/49T101

USSR/Physics (Contd) Jul 48

Analyzes experimental results of Davis and Hottel (Ind Eng Chem 1934). Shows that when $D = 0.18\left(\frac{T}{273}\right)^n$ the value of n is approximately 2. Submitted 31 Jan 48.

[redacted] 12/49T101

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6"

"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

KHITRIN, L. N.

Predvoditelev, A. S., Khitrin, L. N., Tsukhanova, O. A., Kolodtsev, Kh. I., and Grodzovskiy, M. K., "Combustion of Carbon. Experiments in Building up the Physicochemical Principles of the Process." Academy of Sciences USSR, 1949, 408 pp, 2,500 copies.

USSR/Physics - Combustion
Gasification

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011

"Combustion of Carbon," L. N. Khitrin, O. A. Tsukhanova

"Uspekh Fiz Nauk" Vol XLI, No 3, pp 311-331

Discusses basic characteristics of combustion process, concept of coefficient of reaction gas exchange, basic laws of process, role of secondary reaction, and influence of admixtures on gasification. Includes graphs of speed of combustion of anthracite vs temperature, etc.

168T81

"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

KHITRIN, L. N.

PA 55/49T95

USSR/Physics Jul 48
Flame
Carbon Monoxide

"Effect of Pressure on the Rate of Diffusion of a Flame of Carbon Monoxide," L. N. Khitrin, Inst of Phys Moscow State U imeni M. V. Lomonosov, 8½ pp

"Zhur Fiz Khim" Vol XXII, No 7

Gives following formula to determine pressure effect in mixtures of the gas with air:

$$u\rho = u_0 \rho_{min} + A(p - p_{min})^{0.75}$$

where A is a constant, ρ_{min} and p_{min} are, respectively, minimum pressure and minimum density, and

55/49T95

USSR/Physics (Contd) Jul 48

u_0 is the maximum rate of diffusion. Submitted 7 Jul 47.

55/49T95

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6"

"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

KHITRIN, L. N.

USSR/Chemistry - Combustion 21 Jul 51

"On the Question of Flameless Combustion of Gases," L. N. Khitrin, Power Eng Inst imeni G. M. Krzhizhanovskiy, ~~Acad Sci USSR~~

"Dok Ak Nauk SSSR" Vol LXXIX, No 3, pp 475-478

Carried out thermodynamic calcns for various types of gas flow, types of burners, and distributions of combustion catalyst in flameless surface combustion.

(CA 47 no.16: 7869 '53)

211T23

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6"

"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

KHITRIN, L. N.

USSR/Engineering - Heat Engineering, Combustion Apr 53

"On the Basic Characteristics of the Process of Carbon Combustion," L. N. Khitrin

Iz Ak Nauk SSSR, OTN, No 4, pp 543-561

Analyzes process of C combustion, establishing regularities of chem transformations and mechanism of these transformations in combustion process, and giving math formulation of this process in form of system of approximate equations. Suggests number of

276T42

problems which require further theoretical and exptl development. Presented by A. S. Predvoditelev, Corr Mb Acad Sci USSR 1 Sep 52.

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6"

"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

KHITRIN, L.N.

Subject : USSR/Engineering AID P - 2387

Card 1/1 Pub. 110-a - 1/15

Authors : Chukhanov, Z. F., Khitrin, L. N. and Golubtsov, V.A., Corr. Memb., Academy of Science, USSR

Title : Efficient utilization of fuels - a new stage in power development

Periodical : Teploenergetika, 7, 3-12, Jl 1955

Abstract : The necessity for fuel saving gives new importance to the method of processing coal - i.e. using heat treatment for extraction of gas liquid tar and other by-products before combustion. The results of theoretical and experimental study are reported. The process of separating gas, and tar is explained graphically and in detail. The thermal treatment of peat shale and pulverized coal from the Moscow basin is presented with curves. The authors recommend more research and consider the reported study as the beginning of a new field in efficient fuel utilization. Thirteen diagrams. Eight Russian references, 1949-1955.

Institution: ENIN AN SSSR (Institute of Power Engineering, Academy of Sciences, USSR

Submitted : No date

KHITRIN, L.N.

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

Subject : USSR/Engineering AID P - 2763

Card 1/2 Pub. 110-a - 5/14

Authors : Khitrin, L. N., Corr. Mem., Academy of Sciences, Shelestin, Yu. P., Eng.

Title : Using cyclone furnaces in steam-power and processed steam installations operated with solid fuel

Periodical : Teploenerg, 9, 26-32, S 1955

Abstract : The Institute of Power Engineering of the Academy of Sciences of the USSR designed a forced draft furnace with 2 stages (a firing unit and a furnace where the forced circulation of fuel particles is created by air draft) for the combustion of small size fuel. The article gives a detailed description and diagrams of this installation. Results of experiments made with half-coking machine-cut peat with fluid clinker removal tested in this furnace are reported with diagrams and tables. This type

"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

KHITRIN, L.N.

Concentration ignition limits of gas mixtures in motion. L. N. Khitrin and S. A. Gol'denberg. *Doklady Akad. Nauk SSSR* 103, 169-72(1955); cf. preceding abstr. — An expression was derived in the preceding paper for the crit. characteristics of ignition with an incandescent body and for the speed of the reaction involving the concn. of inert gases in the gas mixt. The heat theory of the ignition-concn. limits of stationary and moving gas mixts. permits establishing the presence of typical, sharply defined ignition ranges (flame-propagation limits) which are not connected with an assumption of discontinuous changes of chem. reaction rates. The theory gives suitable kinetic characteristics of flame processes, and makes it possible to calc. the crit. values of ignition parameters under differing conditions of pressure, mixt. temp., flow velocity, and the size of the incandescent body by means of the principal characteristics of the combustible mixt. W. M. Sternberg

CH

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6"

"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

KHITRIN, L. N.

Conditions for the combustion-front stabilization and the flame propagation velocity under limiting conditions. L. N. Khitrin and S. A. Gol'denberg. *Doklady Akad. Nauk* [illegible], 861-3(1955); cf. *C.A.* 50, 3854*bc*.—A general expression $Re_{cr.} = AS^{n}$ is derived for the evaluation of the crit. flame front stabilization factors, where S, called the stabilization criterion $= ud/a$ (u = normal flame velocity, d = flame diam., and a is a temp. cond. coeff.). A and n are const., and A under varying conditions equals 1.45, while $n = 0.5$. The expression can be rewritten as $Re_{cr.} = 1.45S^{n}$.

W. M. Sternberg

(1)

Power Eng. Inst. im. G. M. Krzhizhanovskiy, A.S. USSR

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6"

"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

KHITRIN, L.N.

USSR/Chemistry - Physical chemistry

Card 1/1 Pub. 22 - 28/45

Authors : Khitrin, L. N., Memb. Corres., Acad. of Sc., USSR, and Gol'denberg, S. A.

Title : Ignition of gaseous mixtures in a stream with an incendescent body

Periodical : Dok. AN SSSR 103/2, 277-280, Jul 11, 1955

Abstract : Investigation was conducted to determine the critical characteristics of igniting quiescent and moving gaseous media. The phenomenon of concentrated ignition boundaries (flame propagation) is explained. The role of the incandescent body when coming in contact with the gaseous medium and its functions in the boundary layer are discussed. Data are given regarding the limits of concentration, boundary velocities of the flame, flame stabilization criteria and other related phenomena. Thirteen references: 9 USSR and 4 USA (1937-1954). Graphs.

Institution : Acad. of Sc., USSR, Power Engineering Inst. im. G. M. Krzhizhanovskiy

Submitted : December 16, 1954

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6"

"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

SPEYSHER, Vladimir Anatol'yevich; ANDREYEV, Vladimir Il'ich; KHITRIN, L.N., otvetstvennyy redaktor; GRIGOR'YEV, Ye.N., redaktor izdatel'stva; POLYAKOVA, T.V., tekhnicheskiy redaktor

[Combustion of gas obtained by underground gasificationin tunnel burners with premixtures] Szhiganie gaza podzemnoi gazifikatsii v tunnel'nykh gorelkakh predvaritel'nogo smesheniia. Moskva, Izd-vo Akademii nauk SSSR, 1956. 67 p. (MIRA 9:7)

1. Chlen-korrespondent AN SSSR (for Khitrin)
(Coal gasification) (Combustion)

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6"

"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

Khitrin, L. N.

CHUKHANOV, Z.F.; KHITRIN, L.N.; GOLUBTSOV, V.A.; TENNIS, I.G., redaktor; ZELENKOVA, Ye.V., tekhnicheskiy redaktor

[Heat engineering; ways of using heat efficiently] Energotekhnologicheskoe ispol'zovanie topliva; puti effektivnogo primeneniia topliva. Moskva, Izd-vo Akademii nauk SSSR, 1956. 126 p. (MIRA 9:3)

1. Chlen-korrespondent AN SSSR (for Chukhanov, Khitrin, Golubtsov)

(Heat engineering)

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6"

"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

KHITRIN, L. N. Prof. Dr. and KNORRE, G. F. Prof. Dr.

"On Fundamental Factors and Possible Methods of the Intensification of the Combustion of Solid Fuels," paper presented at the 5th World Power Conference, Vienna, 1956

In Branch #5

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6"

"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

KHITRIN, L. N. and GOLDENBERG, S. A.

"Influence of the Initial Temperature of a Combustible Mixture and of the Pressure of the Ambient Medium of the Limits of Stabilization" a paper submitted at the Sixth International Symposium on Combustion, New Haven, Conn., 19-24 Aug 56.

GOLDENBERG, and Khiterin Institute of Energetics, AS USSR, Moscow, USSR and ACADEMY OF SCIENCES, Moscow, USSR in that order.

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6"

"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

Khitrin, L.N.

USSR/ Electricity - Fuel utilization

Card 1/1 Pub. 124 - 4/28

Authors : Chukhanov, Z. F.; Khitrin, L. N.; and Golubtsov, V. A., Memb. Correspondents of the Acad. of Sc., USSR

Title : Complex electric power technological utilization of fuel

Periodical : Vest. AN SSSR 26/1, 27-37, Jan 1956

Abstract : Various ways for reducing the specific solid fuel (coal) consumption by technical and industrial undertakings (R/R, manufacture of gas, liquid fuels, foundries, electric power, etc.) are discussed from the economical view point. Graphs; drawings.

Institution : .....

Submitted : .....

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6"

"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000722020011-6

KHITRIN, L. N.

KHITRIN, L. N. and GOLOVINA, Ye. S.

"Influence de l'echauffement des melanges benzene-air sur la vitesse de propagation de la flamme,"

report heard at the XVIth Congress of Pure and Applied Chemistry, Paris, France, 18-24 June 1957.

Inst. Power Engineering
Academy of Sciences, USSR, Moscow

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