BRATCHENKO, I.

Automobiles, roads and transportation. Nauka i zhyttia 12 no.6:4-6 Je '62. (MIRA 15:7)

1. Ministr avtomobil'nogo transporta i shosseynykh dorog Ukrainskoy SSR.
(Automobiles) (Roads)

BRATCHENKO, I.

Highway transport workers of the Ukraine are facing new objectives. Avt.transp. 40 no.2:1-3 F '62. (MIRA 15:2)

1. Ministr avtomobil'nogo transporta i shosseynykh dorog Ukrainskoy SSR.

(Ukraine--Transportation, Automotive)

BRATCHENKO, I.

Toward new achievements in work. Avt.transp. 41 no.4:5-6 Ap '63.
(MIRA 16:5)

1. Ministr avtomobil'nogo transporta i shosseynykh dorog UkrSSR.
(Ukraine--Transportation, Automotive)

BRATCHENKO, I.

Efficiency of shifting short-range freight from railroad to automotive transportation. Avt. transp. 42 no. 5:1-3 My '64.

1. Ministr avtomobil'nogo transporta i shosseynykh dorog UkrSSR.

BRATCHENKO, I.

Motor vehicle and the road form a unified complex. Avt. transp. 43 no.4:12-15 Ap '65. (MIRA 18:5)

1. Ministr avtomobil'nogo transporta i shosseynykh dorog UkrSSR.

BRATCHENKO, I.I.

The obligation undertaken by Ukrainian road builders is practicable. Avt. dor. 26 no.2:1-2 F '63. (MIRA 16:4)

1. Ministr avtomobil'nogo transporta i shosseynykh doro UkrSSR.
(Ukraine—Road construction)

BRATCHENKO, N. T.

29308 Mikroskopicheskoye issledovaniye otdelyaemogo iz pora zheniy sheyki matki v nativnykh preparatakh dlya diagnostiki raka. Voprosy onkologii i rentgenologii. No 1-2, 1948, s. 113-21

SO: Letopsi' Zhurnal'nykh Statey, Vol. 39, Moskva, 1949

S/844/62/000/000/100/129
D204/D307

AUTHORS: Mikhaylov, N. V., Tokareva, L. G., Bratchenko, T. D., Karpov, V. L. amd Malinskiy, Yu. M.

TITLE: The action of γ radiation on artificial fibers

SOURCE: Trudy II Vsesoyuznogo soveshchaniya po radiatsionnoy khimii. Ed. by L. S. Polak. Moscow, Izd-vo AN SSSR, 1962, 589-595

TEXT: The effects of 0.05 - 1000 Mrad doses on polyamide and polyester fibers, and the possibility of improving the thermal stability of synthetic fibers and improving their adhesion to rubber by the addition of various monomers, were investigated. Polyethylene terephthalic fiber was practically unaffected under doses of up to 100 Mrad, owing to the stabilizing effect of the aromatic groups, whilst a caprone fiber was already affected at 1 Mrad. The specific viscosity (η) of 0.5% solutions of irradiated caprone filaments and single fibers (diameter respectively 0.03 and 0.7 mm) was measured. For the thinner fiber, η increased in vacuum and decreased

Card 1/3

in air, whilst η of the monofiber increased when the latter was irradiated both in the presence and absence of air. This, and the changes in the strength and elongation showed that polyamide fibers undergo oxidative processes on irradiation; the greater changes in the presence of O_2 were particularly pronounced for the thinner fibers. Thin fibers underwent destruction when irradiated in air, whilst thicker specimens became structurized owing to the less ready diffusion of O_2 into the mass; structurization of the thicker fibers was also observed in vacuum. In contrast to the caprone fiber which was mainly structurized in both amorphous and crystalline states on irradiation, a terylene fiber was largely destroyed in the amorphous and structurized in the crystalline state. This difference in the behavior of polyamide and polyester fibers is ascribed to the considerably higher crystallinity of the latter. The above phenomena should be kept in mind when artificial fiber materials are to be utilized in practice. The effects of additions of acrylonitrile, styrene, toluyldiisocyanate, hexamethylenediisocyanate and vinylpyridine to the caprone fiber were studied, with

doses of 0.01 - 50 Mrad, finding that in all cases, for a dose of 50 Mrad, the loss in strength was considerably reduced by the monomers, both at 20 and at 80°C. Acrylonitrile grafted on to the caprone fiber. There are 3 figures and 4 tables.

ASSOCIATION: Vsesoyuznyy nacuno-issledovatel skiy institut iskusstvennykh volokon; Fiziko-khimicheskiy institut im. L. Ya. Karpova (All-Union Scientific Research Institute of Artificial Fibers; Physico-Chemical Institute im. L. Ya. Karpov)

OSTROUKHOV, M.Ya.; PANCHENKO, S.I.; Prinimali uchastiye: FRISHBERG, V.D.; PETROV, V.K.; RESHETKO, A.; VYATKIN, G.P.; BRATCHENKO, V.P.; FOFANOV, A.A.; MILYAYEV, M.N.; PRIVALOV, V.Ye.; MUSTAFIN, F.A.; PUSHKASH, I.I.; LAZAREV, B.L.

Experimental blast furnace smelting using coke from wet preparation coals. [Sbor. trud.] Nauch.-issl.inst.met. no.4:63-70 '61. (MIRA 15:11)

1. Vostochnyy uglekhimicheskiy institut (for Ostroukhov, Panchenko, Frishberg, Petrov, Reshetko). 2. Nauchno-issledovatel'skiy institut metallurgii (for Vyatkin, Bratchenko). 3. Nizhne-Tagil'skiy metallurgicheskiy kombinat (for Privalov, Mustafin, Pushkash, Lazarev).

(Blast furnaces—Testing)
(Coke—Testing)

KHOLZAKOV, V.I.; BRATCHENKO, V.P.; OSTROUKHOV, M.Ya.; LUKIN, P.G.; NEKIPELOV, S.P.; POPOV, Yu.A.; GAVRILYUK, L.Ya.

Investigating the processes in the stack and hearth of a blast furnace during smelting with sinter of Bakal and Sokolovka-Sarbay ores. Stal' 23 no.4:297-300 Ap '63. (MIRA 16:4)

1. Chelyabinskiy nauchno-issledovatel'skiy institut metallurgii i Chelyabinskiy metallurgicheskiy zavod.
(Blast furnaces)

KHOLZAKOV, V.I.; BRATCHENKO, V.P.; OSTROUKHOV, M.Ya.; LUKIN, P.G.; GAVRILYUK, L.Ya.

Effect of the shape of a blast furnace working area on the distribution of the gas flow. Metallurg 8 no.8:6-9 Ag '63. (MIRA 16:10)

BRATCHENKO, V.P.; KHOLZAKOV, V.I.; OSTROUKHOV, M.Ya.

Reduction and slag formation processes in blast furnaces during the smelting of Bakal and Sokolovka Sarbay ores. Izv. vys. ucheb. zav.; chern. met. 7 no.2:34-41 '64. (MIRA 17:3)

1. Chelyabinskiy nauchno-issledovatel'skiy institut metallurgii.

AL'SHEVSKIY, A.Ye. [deceased]; BRATCHENKO, V.P.; BOL'SHAKOVA, L.I.; KOPYRIN, I.A.; NEKRASOV, V.G.; PLASTININ, B.G.; RYSYUKOV, N.Ye.; ZHURAVLEV, S.M.

Analysis of the performance of a large-size blast furnace. Metallurg 9 no.12:4-8 D '64. (MIRA 18:2)

1. Orsko-Khalilovskiy metallurgicheskiy kombinat i Chelyabinskiy nauchno-issledovatel'skiy institut metallurgii.

SAGAYDAK, I.I.; NEKRASOV, V.G.; KOPYRIN, I.A.; BORTS, Yu.M.; BRATCHENKO, V.P.; RYSYUKOV, N.Ye.; KAKUSHA, N.P.; SHAPIRO, V.Z.

Operation of a large capacity blast furnace with natural gas. Metallurg 10 no.7:16-19 Jl '65. (MIRA 18:7)

1. Orsko-Khalilovskiy metallurgicheskiy kombinat i Chelyabinskiy nauchno-issledovatel'skiy institut metallurgii.

TASHCHIYEV, Yu.S., kand.med.nauk; BRATCHIK, A.M.

Blood coagulation and prevention of thrombus formation in urological operations. Urologiia no.6:33-38 '64. (MIRA 18:11)

1. Laboratoriya po izucheniyu svertyvayemosti krovi pri gospital'noy terapevticheskoy klinike (zav. - prof. P.A. Tepper) Krymskogo meditsinskogo instituta i urologicheskoye otdeleniye (zav. - E.M.Shimkus) Krymskoy oblastnoy klinicheskoy bol'nitsy, Simferopol'.

BRATCHENKO, Yu.M., inzh.

Autoclaved foamed concrete articles based on a slag binder. (MIRA 15:7)
Stroi. mat. 8 no.6:15-16 Je '62.
(Sand-lime products) (Lightweight concrete)
(Slag)

BRATCHENKO, Yu.M.; TSELUYKO, M.K.; GRITSENKO, V.D.

Stabilization of blast-furnace slag. Stroi. mat. 11 no.7:13-14 Jl. '65. (MIRA 18:8)

1. Luganskiy filial Yuzhnogo nauchno-issledovatel'skogo instituta promyshlennogo stroitel'stva Gosstroya SSSR.

BRATCHENKO, Yu.M., inzh.; GRITSENKO, V.D., inzh.

Pneumatic apparatus for introducing admixtures into slag melts.
Mekh. stroi. 20 no.10:27 O '63. (MIRA 16:10)

BRATCHENKO, Yu.M., inzh.

Autoclaved slag binding material. Stroi.mat. 9 no.11:33 N '63. (MIRA 17:4)

BRATCHENKO, Yu.M., inzh.; NEFEDCHENKO, P.A., inzh.; ZAVGORODNYAYA, O.M., inzh.

Wall panels from porous foamed slag concrete. Stroi. mat. 10 no.9:13 S '64 (MIRA 18:2)

MURAV'YEVA, N.T.; BRATCHEVA, M.I.; ALEKSEYENKO, N.F.

Oxidation-reduction potential of some soils of the Kashka-Dar'ya Valley. Dokl.AN Uz.SSR no.11:52-56 '59.
(MIRA 13:4)

1. Institut pochvovedeniya AN UzSSR. Predstavleno akad. AN UzSSR Ye.P. Korovinym.
(Kashka-Dar'ya Valley--Soil chemistry)

37964

S/137/62/000/005/038/150
A006/A101

1.1500

AUTHORS: Bratchik, A. V., Burdakov, Yu. M., Polupanov, G. G., Mikhaylov, S. A.

TITLE: Continuous cadmium casting into rods

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 5, 1962, 21, abstract 50128 ("Metallurg. i khim. prom-st' Kazakhstana. Nauchno-tekhn. sb". 1961, no. 5 (15) 113 - 118)

TEXT: To eliminate Cd losses and facilitate labor conditions during its casting, a unit for the continuous casting of Cd into rods was assimilated at the Ust'-Kamenogorsk Lead-Zinc Combine. The unit is equipped with a refining boiler, connected with the crystallizer. At such a connection the metal is supplied to the crystallizer and the molten Cd, having no contact with air, is not oxidized. The crystallizer is made of grade Ст.45 (St.45) steel. For cutting the rod after its extrusion, shears are mounted; to extrude the rod from the crystallizer, a horizontal two-roll machine is used; grooves for the passage of the rod are cut in the rolls. For initial extrusion (starting the machine) a Cd or other metal primer is placed into the crystallizer. The primer has the same diameter as the rod. To draw the rod out of the crystallizer, as

Card 1/2

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A006/A101

Continuous cadmium casting into rods

it is formed in the unit, the principle of periodical extrusion is employed: the rod formed is drawn out of the crystallizer and is replaced by molten metal, and the extrusion operation is repeated.. The rod length depends on the crystallizer length (in the given case, the rod length was 230 mm at a crystallizer length of 300 mm). To ensure continuous operation of rolls, a ratchet with a duplicating device was used. The unit for the continuous casting of Cd into rods can operate on an electric circuit with both manual and automatic control. The efficiency of the unit with one crystallizer is 25 kg/hour. The extrusion speed is 1 mm/sec; duration of the extrusion cycle and the formation of the rod is 5 sec; the rod diameter is 8.5 mm; optimum Cd temperature in the boiler during casting is 350°C; the dimensions of the unit are 1,500 x 1,500 x 800 mm.

G. Svodtseva'

[Abstracter's note: Complete translation]

Card 2/2

BRATCHIK, A.V.

137-58-5-8801

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 5, p 10 (USSR)

AUTHORS: Bratchik, A.V., Burdakov, Yu. M.

TITLE: A Dust-free Tubular Transporter for Hot Friable Materials (Trubchatyy nepylyashchiy transporter dlya sypuchikh goryachikh materialov)

PERIODICAL: Byul. Tsentr. in-t inform. M-va tsvetn. metallurgii SSSR, 1957, Nr 7, pp 19-22

ABSTRACT: The transporter consists of individual lengths of pipe within which a continuous, helically twisted, band is enclosed. As the band rotates, the material introduced into the pipe is turned over gradually and acquires a motion of translation along the axis of the pipe. The transporter consists of the following major components: housing, power drive, receiving container, band fasteners, roller supports, and a charging device. An over-all view is given, together with a schematic representation of various components of the transporter.

A. Sh.

1. Materials--Transportation

Card 1/1

BRATCHIK, A.V.

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SOV/136-59-10-6/18

AUTHORS: Getskin, L.S., Batyuk, A.G., Tsyb, P.P., Gorokhvodatskaya, R.I., Savrayev, V.P., Zinov'yev, V.P., Fel'dman, V.G., Bratchik, A.V. and Polulyakh, V.P.

TITLE: Mastering the Process of Sulphatizing Lead Dusts

PERIODICAL: Tsvetnyye metally, 1959, Nr 10, pp 35-42 (USSR)

ABSTRACT: The method of sulphatizing poly-metallic ores and concentrates was first developed in the Soviet Union by Professor A.Ye.Makovetskiy in 1923. Since then, a great deal of investigational work has been done in this connection. One variant of this method, so-called Makovetskiy-Gintsvetmet process, consisting of mixing the material with diluted (60%) sulphuric acid and treating the pulp in a cylindrical sulphatizator at 200°C, was put to test at a pilot plant (designed to treat 3 t of sulphide concentrate per day) at Ordzhonikidze. However, even after three years' operation, no means have been found to overcome serious difficulties associated with the formation of crust in the sulphatizator and with rapid corrosion of the equipment and of the gas system, due to the action of hot gases containing water and acid vapours. Work on this problem was resumed at VNIITsvetmet in 1955

Card 1/7

and, as a result, a modified method was developed which, by now, has also been tested on a semi-industrial scale. The main difference between the new and the original method is the application of concentrated sulphuric acid which could not be used previously, owing to the fact that cementation of the dense pulp took place in the equipment used in the old process, ie in the mixer, re-pulper and sulphatizator. This difficulty was overcome by nodulizing the powder materials mixed with concentrated sulphuric acid in a pan granulator. Owing to the exothermic nature of the reactions taking place during the nodulizing process, the nodule temperature rises to 200°C or even higher and this ensures rapid distillation of chlorine and fluorine and accelerates sulphatization of the pulp components. The subsequent heating of the granules to 350°C (necessary to distill off arsenic and to complete the sulphatizing reactions) is carried out in a reactor, using the fluidized bed principle (Ref 1). The preliminary investigation was carried out in a large laboratory plant in which dusts from various lead and copper smelting plants were treated. On the basis of the

Card 2/7

results of this work, the staff of the Ust'-Kamenogorskiy Lead-Tin Combine in cooperation with VNIITsvetmet, designed and constructed a large pilot plant capable of treating 10 t of lead-bearing dusts per day. Its main components, ie the granulator shown diagrammatically in Fig 1 and the fluidized bed reactor illustrated in Fig 2, were constructed in the Combine workshops. The granulator, driven by a 14 kW electric motor, is equipped with a pan 1500 mm diameter and 250 mm deep, the axis of which is inclined to the horizontal at an angle of 30 to 60° and which rotates at the rate of 8 to 14 rev/min. Gases evolved during the process are removed through an exhaust hood. The application of concentrated sulphuric acid made it possible to use mild steel as the constructional material of the granulator, the inlet and outlet pipes and the ventilating system. The reactor shell (Fig 2) is also made of steel, lined inside with a single layer of a refractory brick; the active area of the hearth is 0.75 m^2, the height of the fluidized bed, 105 cm, the total height of the reactor being 3.5 m. The final product obtained in the fluidized bed reactor is discharged into a

Card 3/7

Mastering the Process of Sulphatizing Lead Dusts

stainless steel tank, from which it is pumped into mechanical agitators, where the sulphate product is leached out. The following are the main operations carried out in the hydro-metallurgical section: leaching out of the sulphate product, settling and washing the lead cake, precipitation of raw metals, removal of arsenic and iron from the solutions and extraction of cadmium. The lead dusts treated in the experimental pilot plant contained (%): 49.3 Pb, 16.3 Zn, 2.5 Cd, 0.5 Cu, 1.0 Fe, 5.3 As, 1.0 Cl and 0.2 F. The consumption of concentrated sulphuric acid in nodulizing this product varied between 55 and 62% of the weight of the dust which corresponded to 110% of the theoretically required quantity. (The authors point out here that if sulphuric acid of the concentration less than 92% is used, the nodulizing process is adversely affected, granules of low mechanical strengths are obtained, the quantity of distilled off chlorine, fluorine and arsenic is reduced and the output of the granulator is reduced.) With the granulator inclined at 55° and operating at 8.3 rev/min, 10 to 15 t of the dust was treated per day, the obtained

Card 4/7

product containing 80% of the -5 mm fraction. The proportion of dust carried away by the exhaust gases was comparatively small and amounted to 1% only; the quantity of gases evolved during the process was also small, owing to the low chlorine, fluorine and arsenic contents in the dust; the H_2S content in the gases varied between zero and 9 mg/m^3. The optimum temperature for sulphatizing the granules in the fluidized bed reactor was 350°C. The capacity of the reactor was 12 to 14 t/m^2/24 hr, the air consumption being 3000 m^3/hr. The granules remained in the reactor for more than two hours; however, it was found that the time necessary for the completion of the sulphatizing reaction and for the removal of 90% of arsenic, is approximately 45 min; consequently, it can be assumed that the productivity of the reactor could be increased, whereby its specific air consumption would be reduced. The solutions (including those obtained during washing and filtering the lead cake) resultant from the water leach of the sulphate product, contained (g/l): 37.9 Zn, 6.5 Cd; the washed lead cake contained (%): 0.52 Zn, 0.16 Cd, 64.3 Pb;

Card 5/7

97% Zn and 95% Cd present in the dust was recovered in the solution; the recovery of Zn, Cd and Pb in the lead cake was 2.4, 4.8 and 98% respectively; the recovery of raw metals amounted to 74 to 93%; 80 to 90% arsenic was distilled off during the sulphatizing treatment; 80 to 85% chlorine and fluorine and 60 to 75% selenium was distilled off during both nodulizing and sulphatizing processes. After describing the dust-collecting process and various controlling equipment, the authors state their conclusions. (1) Difficulties experienced in the application of the sulphatizing process on an industrial scale have been overcome by using concentrated sulphuric acid and by nodulizing the pulp in a rotary pan granulator. (2) No signs of corrosion of the granulator, made of mild steel, have been observed during the test period; both the granulator and the fluidized bed reactor have been working continuously without any stoppages and the working conditions have been satisfactory. (3) The process, as outlined in the present paper, has been found to be very efficient regarding the degree of both the recovery of rare and non-ferrous metals present in the dust and the

Card 6/7

removal of the volatile components. (4) A necessary condition for ensuring efficient purification of the gases leaving the fluidized bed reactor is lowering the temperature of the gases to 25 to 30°C and the application of a wet system of dust collection. To comply with the sanitary regulations regarding the arsenic content in the exhaust gases, a supplementary cleaning operation in a wet electro-filter is necessary. (5) The application of the sulphatizing process for treating lead dust provides a convenient means of utilizing this complex material and can be recommended for adoption in all the lead plants in the Soviet Union. There are 2 figures, 1 table and 1 Soviet reference.

ASSOCIATIONS: VNIITsvetmet
Ust'-Kamenogorskiy svintsovo-tsinkovyy kombinat
(Ust'-Kamenogorskiy Lead-Zinc Combine)

Card 7/7

BRATCHIK, F.P.

BRATCHIK, F.P.; SHAVERDOV, Yu.Sh.

A leading diesel locomotive shed. Elek. i tepl. tiaga no.11:42-43 N '57. (MLRA 10:11)

1. Nachal'nik teplovoznogo depo Gudermes Ordzhonikidzevskoy dorogi (for Bratchik). 2. Glavnyy inzhener teplovoznogo depo Gudermes Ordzhonikidzevskoy dorogi (for Shaverdov).
(Gudermes--Diesel locomotives--Maintenance and repair)

BRATCHIK, M.V.

Cooking of starch-containing raw material with its subsequent dispersion. Spirt.prom. 27 no.1:40-42 '61. (MIRA 14:2)
(Starch)

BRATCHIK, V. M. Cand Agr Sci -- (diss) "Characteristics of the Cultivation of Sedge Under Conditions of the Poles'ye Region of the Ukrainian SSR." Khar'kov, 1957. 14 pp 20 cm. (Min of Agriculture USSR, Khar'kov Order of Labor Red Banner Agricultural Inst im V. V. Dokuchayev), 100 copies (KL, 27-57, 108)

PSHENICHNYY, Nikon Ivanovich[Pshenychnyi, N.I.], kand. sel'khoz.nauk; BRATCHIK, V.M., kand. sel'khoz.nauk, otv. red.; GURENKO, V.A. [Hurenko, V.A.], red.; MATVIICHUK, O.A., tekhn. red.

[Growing forage beans in the Ukraine]Vyroshchuvannia kormovykh bobiv na Ukraini. Kyiv, Tovarystvo dlia poshyrennia polit. i naukovykh znan' URSR, 1962. 35 p. (MIRA 16:2)
(Ukraine--Broad bean)

BRATCHIK, Yefim Isaakovich; VASYUTOVICH, Vasiliy Vasil'yevich; ARSKIY, F.N., retsenzent; KHOREV, B.S., retsenzent; PREOBRAZHENSKIY, V.I., red.; USENKO, L.A., tekhn. red.

[Moscow-Brest; railroad guide] Moskva - Brest; zheleznodorozhnyi putevoditel'. Moskva, Transzheldorizdat, 1962. 134 p. (MIRA 15:7)
(Railroads--Handbooks, manuals, etc.)

BOBIN, Ye.V.; PIRIN, I.V., retsenzent; BRATCHIK, Ye.I., red.;
MEDVEDEVA, M.A., tekhn. red.

[Control of industrial noise in railroad transportation] Bor'ba s proizvodstvennym shumom na zheleznodorozhnom transporte. Moskva, Izd-vo "Transport," 1964. 141 p.
(MIRA 17:3)

VEDENKIN, Sergey Grigor'yevich, prof.; VINITSKIY, Lazar' Yefimovich kand. tekhn. nauk; LUK'YANCHIKOV, Ivan Kuz'mich, inzh.; RYZHOVA, Zinaida Alekseyevna, kand. tekhn. nauk; SITKOVSKIY, Il'ya Pavlovich, inzh.; BRATCHIK, Ye.I., red.

[Polymers in railroad transportation] Polimery zheleznodorozhnomu transportu. [By] S.G.Vedenkin i dr. Moskva, Transport, 1964. 91 p. (MIRA 18:1)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut zheleznodorozhnogo transporta, otdeleniye polimerov (for Ryzhova). 2. Glavnyy konstruktor Vsesoyuznogo nauchno-issledovatel'skogo instituta zheleznodorozhnogo transporta (for Sitkovskiy). 3. Rukovoditel' otdeleniya polimerov Vsesoyuznogo nauchno-issledovatel'skogo instituta zheleznodorozhnogo transporta (for Luk'yanchikov). 4. Rukovoditel' laboratorii korrozii otdeleniya ispytaniya materialov i konstruktsiy Vsesoyuznogo nauchno-issledovatel'skogo instituta zheleznodorozhnogo transporta (for Vedenkin). 5. Rukovoditel' laboratorii reziny otdeleniya polimerov Vsesoyuznogo nauchno-issledovatel'skogo instituta zheleznodorozhnogo transporta (for Vinitskiy).

KHRULEV, Valentin Mikhaylovich; BRATCHIK, Ye.I., red.

[Synthetic adhesives in railroad technology] Sinteticheskie klei v zheleznodorozhnoi tekhnike. Moskva, Transport, 1965. 150 p. (MIRA 18:2)

ANATOL'YEV, Leonid Nikolayevich; BRATCHIK, Ye.I., red.

[The passenger's companion; railroad route programs] Sputnik passazhira; skhemy zheleznodorozhnykh marshrutov. IAroslavl', Transport, 1965. 159 p. (MIRA 18:8)

BRATCHIKOV, I. L., FITIALOV, S. Ya. and TSEYTIN, G. S. (Leningrad)

"About the Structure of Dictionary and the Coding of Information for Machine Translation."

Theses - Conference on Machine Translations, 15 - 21 May 1958, Moscow.

ACCESSION NR: AT4008632 S/3040/63/000/002/0105/0115

AUTHORS: Baluyev, A. N.; Bratchikov, I. L.; Balina, G. I.; Igolkin, V. N.; Kovrigin, A. B.; Marty*nenko, B. K.; Poroshin, B. S.; Surin, S. S.

TITLE: Compiling routine for an electronic digital computer using input language ALGOL

SOURCE: Leningrad. Universitet. Kafedra vy*chislitel'noy matematiki i vy*chislitel'ny*y tsentr. Vy*chislitel'naya tekhnika i voprosy* programmirovaniya, no. 2, 1963, 105-115

TOPIC TAGS: digital computer, digital computer compiler, ALGOL computer language, computer language, complex algorithm, computer programming, machine language, binary code computer, computer input language, ALGOL

ABSTRACT: The input language and the algorithm of the programming

Card 1/2

ACCESSION NR: AT4008632

program developed in the Computation Center of Leningradskiy Universitet (Leningrad University), which is an abbreviated and modified variant of ALGOL-60, is described. The language differs from ALGOL in that the program as a whole constitutes one block and there are no descriptions of types; a separate class of identifiers is used for each class. The operators (particularly the procedure operators) and the description of the procedures are simplified and standardized. The input language itself and the operating principles of the programming program are described in detail and the algorithm for solving a system of linear algebraic equations of 50th order by the Gauss method, with choice of the principal element, is used as an example. Orig. art. has: 28 formulas.

ASSOCIATION: Leningradskiy gosudarstvenny*y universitet (Leningrad State University)

SUBMITTED: 15May62	DATE ACQ: 23Jan64	ENCL: 00
SUB CODE: CP	NO REF SOV: 002	OTHER: 000

Card 2/2

BRATCHIKOV, I.L.

Methods for reducing the scope of information tables.
Metod. vych. no.2:139-156 '63.
(MIRA 18:11)

BRATCHIKOV, S. G., and MIKHAYLOV, V. V.

"Methods for Determination of the Heat Developed in Slag and the Heat Given Off by Moist Air From Iron Ore" a paper read at the International Metallurgists' Conference, Moscow 26-30 June 56

SO: CS-3,302,240, 11 Jan 57.

BRATCHIKOV, S.G., YESIN, O.A., POPEL, S.I., RAZUMOV, V.N., PLOTNIKOV, I.M.

"Electrochemical Desulphurization of Steel in Induction Furnace,"
lecture given at the Fourth Conference on Steelmaking, A.A. Baikov, Institue of Metallurgy, Moscow, July 1-6, 1957

SOV/137-58-7-14237

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 7, p 40 (USSR)

AUTHORS: Mikhaylov, V.V., Bratchikov, S.G.

TITLE: The Viscosity of High-alumina Slags (Vyazkost' vysokoglinozemistykh shlakov)

PERIODICAL: Tr. Ural'skogo politekhn. in-ta, 1957, Nr 67, pp 108-113

ABSTRACT: During the smelting of iron bauxites one of the important prerequisites for the successful working of a blast furnace is the obtaining of low-viscosity high-alumina slags (HS). The viscosity η of slags with a low $[SiO_2]$ was measured on a viscosimeter according to the angle of torsion of the elastic thread attached to a carbon spindle which rotates in the molten HS. Eight specimens of synthetic HS with 3-8% $[SiO_2]$ and the slag of an operating blast furnace of the Pashiya cement-metallurgical plant (SiO_2 10.2%) were examined. The results of the investigation corroborate the diluting fluidifying role of Ca in HS and, contrary to the data in the literature, show a low η of the slag with $[SiO_2] <$ 8%. At 1600°C the η of slags with 42% CaO and <8% $[SiO_2]$ does not exceed 6 poises and at 1500° does not exceed 10 poises, which proves the possibility of

Card 1/2

SOV/137-58-7-14237

The Viscosity of High-alumina Slags

blast-furnace smelting of slags of a similar chemical composition for the aluminum and the cement industry.

A.R.

1. Blast furnaces--Performance 2. Slags--Viscosity 3. Slags--Test results
4. Bauxite--Applications 5. Aluminum oxides--Applications

Card 2/2

BRATCHIKOV S.G.

137-58-6-11484

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 6, p 33 (USSR)

AUTHORS: Mikhaylov, V.V., Bratchikov, S.G., Serebrennikova, Ye.S.

TITLE: An Investigation of the Heats of Formation of High-alumina Slags (Issledovaniye teplot obrazovaniya vysokoglinozemistykh shlakov)

PERIODICAL: Tr. Ural'skogo politekhn. in-ta, 1957, Nr 67, pp 114-123

ABSTRACT: The heats of formation of high-alumina slags used in blast-furnace smelting were determined by calorimetry. A mixture of finely-divided (-200 mesh) powders of CaO (99.7%), Al_2O_3 (99.67%) and SiO_2 (98.86%), totaling 3 g in weight, with 0.8 g added charcoal, contained in a Pt crucible, is placed in a calorimeter bomb in which an O_2 pressure of 30 atm abs is established. The mixture is ignited by an electrically heated wire. The calorimeter bomb is placed in a calorimeter. The temperature is measured to an accuracy of ±0.002°C. The heat from the combustion of the wire and the paper sleeve in which the mixture in the Pt cup is housed, is determined by comparison with control experiments. The heat capacity of the calorimeter is determined by burning benzoic acid. The fusion

Card 1/2

137-58-6-11484

An Investigation of the Heats of Formation of High-alumina Slags

products are slag beads of entirely homogeneous composition, a fact that is checked by measuring optical constants and by mineralogical analysis. The measurements are accurate to within ±6.0% of the value read. 12 compositions are studied, having the following % composition: 3-10 SiO_2, 35-48 CaO, and 42-62 Al_2O_3. In addition, the heats of formation of $2CaO \cdot Al_2O_3 \cdot SiO_2$, $CaO \cdot Al_2O_3$, and $5CaO \cdot 3Al_2O_3$ are determined, and are found to be 81, 36, and 43 kcal/kg, respectively. For other high-alumina slags the heat of formation is calculated by the formula $q = (1.1CaO + SiO_2)$ kcal/kg, where CaO and SiO_2 are in weight %.

I.K.

1. Slags--Heat of formation 2. Slags--Analysis 3. Colorimeters--Applications
4. Colorimeters--Equipment

Card 2/2

BRATCHIKOV, S.G.

137-58-5-9006

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 5, p 37 (USSR)

AUTHORS: Mikhaylov, V.V., Bratchikov, S.G.

TITLE: A Study of Temperatures Accompanying Primary Slag Formation in the Smelting of Bauxite (Izucheniye pervichnogo shlakoobrazovaniya pri plavke boksita)

PERIODICAL: Tr. Ural'skogo politekhn. in-ta, 1957, Vol 67, pp 124-130

ABSTRACT: Five samples of bauxite with 2-3 mm grains were investigated. Three of these samples were preliminarily reduced in a stream of CO; granulated limestone (2-3 mm) was added to one of the remaining samples in an amount equivalent to 80% of the weight of the bauxite. A metallic crucible containing the sample of bauxite was placed into a resistance furnace which had been preheated to a temperature of 500°C and contained a carbon tube 45 mm in diameter. The sample was then heated at a rate of three degrees per minute. It established that, although the reduced bauxite becomes soft at 1000-1100° if no CaO is present in the charge, the formation of primary Fe slag takes place at temperatures above 1600°, which is attributable to the formation of a fusion-resistant chemical compound, $FeAl_2O_4$. In pre-

Card 1/2

A Study of Temperatures (cont.)

sence of CaO the melting point of slag decreases to 1400-1420°. In the process of melting of bauxite the CaO serves as a slag-diluting agent. In the course of formation of slag, FeO contained in the $FeAl_2O_4$ is displaced by the stronger basic oxide, CaO, and is then reduced directly.

G.S.

1. Bauxite--Processing 2. Slags--Development 3. Slags--Temperature factors

Card 2/2

YESIN, O.A.; POPEL', S.I.; BRATCHIKOV, S.G.; RAZUMOV, V.N.; PLOTNIKOV, I.M.

Desulfurization of steel in induction furnaces with the aid of direct current. Zhur.prikl.khim. 31 no.12:1837-1842 D '58. (MIRA 12:2)

(Steel--Metallurgy) (Desulfuration)

24(8)

PHASE I BOOK EXPLOITATION SOV/2117

Soveshchaniye po eksperimental'noy tekhnike i metodam vysokotemperaturnykh issledovaniy, 1956

Eksperimental'naya tekhnika i metody issledovaniy pri vysokikh temperaturakh; trudy soveshchaniya (Experimental Techniques and Methods of Investigation at High Temperatures; Transactions of the Conference on Experimental Techniques and Methods of Investigation at High Temperatures) Moscow, AN SSSR, 1959. 789 p. (Series: Akademiya nauk SSSR. Institut metallurgii. Komissiya po fiziko-khimicheskim osnovam proizvodstva stali) 2,200 copies printed.

Resp. Ed.: A.M. Samarin, Corresponding Member, USSR Academy of Sciences; Ed. of Publishing House: A.L. Bankvitser.

PURPOSE: This book is intended for metallurgists and metallurgical engineers.

COVERAGE: This collection of scientific papers is divided into six parts: 1) thermodynamic activity and kinetics of high-temperature processes 2) constitution diagram studies 3) physical properties of liquid metals and slags 4) new analytical methods and production of pure metals 5) pyrometry, and 6) general questions. For more specific coverage, see Table of Contents.

A versatile new instrument was developed for determining free linear shrinkage, hindered (or retarded) shrinkage, forces developing during hindered shrinkage, and resistance of the metal to the formation of hot cracks. By means of this instrument it was shown that steel with a peritectic composition (about 0.2 percent C) exhibits maximum resistance to the formation of hot cracks. This resistance falls sharply both with a decrease and an increase in carbon content. But with an increase the resistance falls only until a content of 0.5 percent C has been reached; with greater amounts of carbon the resistance begins to rise again. The effect of manganese content and teeming temperature on hot-crack formation were also investigated.

Card 14/32

5 (2)

AUTHORS: Bratchikov, S. G., Yesin, O. A., Sryvalin, I. T.

SOV/163-59-2-6/48

TITLE: The Thermochemistry of Melted Lead Silicates (K termokhimii rasplavlennykh silikatov svintsa)

PERIODICAL: Nauchnyye doklady vysshey shkoly. Metallurgiya, 1959, Nr 2, pp 32-37 (USSR)

ABSTRACT: The specific heat in the $PbO-SiO_2$ melts was measured in the temperature interval of 550°-960° in solid and liquid state. The average molar specific heat and enthalpy for melts of different compositions are given in tables 1 and 2. The dependence of the melting heat (L) and enthalpy (ΔH_{298}^{T}) on the composition of the samples of the system was investigated and is given in figure 1. It is concluded from the results that stable compounds with the group Pb-O-Si exist in the melts. The experimentally measured c_p-values are higher than the additively detected ones. The results concerning the enthalpy, of the specific- and melting heats confirm the fact that the melts represent compounds with the structures

Card 1/2

The Thermochemistry of Melted Lead Silicates SOV/163-59-2-6/48

$PbSiO_3$ and Pb_2SiO_4. Several thermodynamic parameters (characteristic values) for the melts $PbO-SiO_2$, as e. g. the heat (ΔH_x), entropy (ΔS_x), and the isobaric potential (ΔZ_x) were computed (Table 3). The dependence of heat (ΔH_x) and entropy (ΔS_x) on the isobaric potential (ΔZ_x) of the composition of the melt $PbO-SiO_2$ was investigated at 1223° K and the results are given in table 3. Stable asymmetrical groups like Pb-O-Si exist in the melt. The Laboratory Assistant B. T. Kadnikov and the Students S. I. Andrianov and V. I. Sokolov assisted in the measurements. There are 3 figures, 3 tables, and 10 references, 7 of which are Soviet.

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

SUBMITTED: July 4, 1958

Card 2/2

5(1,2)

AUTHORS: Yesin, O. A., Bratchikov, S. G. SOV/153-2-2-20/31

TITLE: Thermochemical Characteristics of Melted Iron Silicates (Termokhimicheskiye kharakteristiki rasplavlennykh silikatov zheleza)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i khimicheskaya tekhnologiya, 1959, Vol 2, Nr 2, pp 247 - 253 (USSR)

ABSTRACT: Some of the structural features of silicates at low temperatures (Ref 1) in their crystalline phase as well as in their gaseous phase, could be explained by means of heat capacity. Analogous examination at high temperatures may supply material for an explanation of the structural properties of the liquid phases. Unfortunately the data given on the heat capacities of melted silicates, are only few (Refs 2,3). In order to fill this gap, the authors concentrated on the technically important system of $FeO-SiO_2$ the properties of which were often dealt with (Refs 6-11). The heat capacity was measured by means of the mixing method in the sphere of temperatures comprising the transition from the solid into the liquid phase (1100-1330°). For this purpose a plant is used with an adiabatic calorimeter (construction of the Institute obshchey i neorganicheskoy khimii AN SSSR - Institute of General and Inorganic

Card 1/3

Chemistry of the AS USSR). Figure 1 shows the experimental isotherms $\Delta H^{T298} - H_{FeO}$ (curve 3 for 1290°) and the isotherms computed according to the rule of additivity from the enthalpies of the undercooled liquid oxides (straight line 4). The position of the experimental curve 3 below the corresponding straight line 4, apparently indicates (Refs 14,15) that there are orthosilicate Fe-O-Si groups in the melting mass developing during the evolution of heat. In other words, these groups develop besides the oxide melting. Therefore the additivity of the heat of fusion can only be maintained if the compound Fe_2SiO_4 is taken into consideration.

The difference in the heat effect of the reactions is approximately estimated from the deviation of the actual heat of fusion of the second sample (~4500 cal), from the heat of fusion computed according to the rule of additivity (~5700 cal). The authors proved that the degree of the disordered concentration of the liquid iron orthosilicate, estimated according to the radius of curvature of the liquidus curve at its maximum point, and also according to the heat of fusion, does not differ very much from that which is computed according to the thermochemical knowledge

Thermochemical Characteristics of Melted Iron Silicates SOV/153-2-2-20/31

of solid substances. It was ascertained that the found values of the heat of mixture and those of the excess isobar potential, qualitatively correspond to the data achieved during the investigation of chemical equilibria and distribution coefficients. The negative sign of the heat of mixing and of the excess entropy, is explained by the authors as a confirmation of the existence of a larger order than the accidental statistical order with regard to the position of the Fe and Si cations beside the O-anions in the melting mass. Low positive values of the excess isobar potential are explained by a superposition of the effects connected with the silica polymerization due to its permanent solubility. There are 3 figures, 1 table, and 27 references, 21 of which are Soviet.

ASSOCIATION: Ural'skiy politekhnicheskiy institut; Kafedra teorii metallurgicheskikh protsessov (Ural Polytechnical Institute, Chair for the Theory of Metallurgical Processes)

SUBMITTED: February 10, 1958

Card 3/3

YESIN, O.A., doktor tekhn.nauk; BRATCHIKOV, S.G., kand.tekhn.nauk

Heat capacity of molten iron silicates. Trudy Ural.politekh. inst. no.75:243-247 '59. (MIRA 13:4)
(Iron silicates--Thermal properties)

BRATCHIKOV, S.G.; YESIN, O.A.

Thermochemistry of PbO - Na_2O and Na_2O - SiO_2 melts. Izv. vys. ucheb. zav.; tsvet. met. 3 no.4:39-44 '60. (MIRA 13:9)

1. Ural'skiy politekhnicheskiy institut. Kafedra teorii metallurgicheskikh protsessov.
(Metallic oxides) (Thermochemistry)

BRATCHIKOV, S.G.

Heat capacity of nodules and concentrates. Izv. vys. ucheb. zav.; cherm. met. no.2:5-9 '61. (MIRA 14:11)

1. Ural'skiy politekhnicheskiy institut.
(Ore dressing) (Heat capacity)

TOPORISHCHEV, G.A.; YESIN, O.A.; BRATCHIKOV, S.G.

Thermochemical characteristics of PbO - SiO_2 - Na_2O melts. Izv. vys. ucheb. zav.; tsvet. met. 4 no.3:37-43 '61. (MIRA 15:1)

1. Ural'skiy politekhnicheskiy institut, kafedra teorii metallurgicheskikh protsessov.
(Lead sodium silicates--Thermal properties)

BRATCHIKOV, S.G.

Studying the heat conductivity of granules and concentrates. Izv. vys.ucheb.zav.; chern.met. 4 no.6:157-163 '61. (MIRA 14:6)

1. Ural'skiy politekhnicheskiy institut.
(Sintering) (Heat--Conduction)

S/149/62/000/001/001/009
A006/A101

AUTHORS: Toporishchev, G. A., Yesin, O. A., Bratchikov, S. G.

TITLE: Thermochemical investigation of $PbO-Na_2O-SiO_2$ melts

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Tsvetnaya metallurgiya, no. 1, 1962, 50 - 58

TEXT: To complete thermochemical data of the ternary $Na_2O-PbO-SiO_2$ system, enthalpy and heat capacity values were determined for melts corresponding to sections $PbSiO_3-Na_2SiO_3$, $PbSiO_3-Na_2O \cdot 3PbO \cdot 6SiO_2$ and $Na_2O \cdot 2PbO \cdot 3SiO_2-Na_2Si_2O_5$. The measurements were made on a unit with an adiabatic calorimeter by the method of mixing at 400 - 1,000°C, including both the solid and liquid state. The authors determined melting heats of compounds $Na_2O \cdot 3PbO \cdot 6SiO_2$, $Na_2Si_2O_5$ and $Na_2SiO_3 \cdot 2PbSiO_3$, and the dissociation constant of the latter for Na_2SiO_3 and $PbSiO_3$. The existence of phase transformation in solid specimens of the system $Na_2SiO_3-PbSiO_3$ at 820°K was observed. The nature of changes in the melting heats and the heat capacities with the composition, leads to the conclusion that there are atomic orderings in the melts, approaching the structure of $Na_2SiO_3 \cdot 2PbSiO_3$ and $Na_2O \cdot 3PbO \cdot 6SiO_2$ compounds, and that there is a different degree of polymerization

Thermochemical investigation of... S/149/62/000/001/001/009
A006/A101

of silico-oxygen anions. There are 3 tables, 4 figures and 10 Soviet-bloc references.

ASSOCIATIONS: Ural'skiy politekhnicheskiy institut (Ural Polytechnic Institute)
Kafedra teorii metallurgicheskikh protsessov (Department of the Theory of Metallurgical Processes)

SUBMITTED: April 27, 1961

Card 2/2

BRATCHIKOV, S.G., TOPORISHCHEV, G.A.

Heat capacity of iron ores and sinters. Izv.vys.ucheb.zav.; chern. met. 5 no.6:16-20 '62. (MIRA 15:7)

1. Ural'skiy politekhnicheskiy institut.
(Iron ores--Thermal properties)

BRATCHIKOV, S.G.; TOPORISHCHEV, G.A.

Heat conductivity of iron ores and sinters. Izv. vys. ucheb. zav.; chern. met. 5 no.8:12-17 '62. (MIRA 15:9)

1. Ural'skiy politekhnicheskiy institut.
(Iron ores--Thermal properties)

BRATCHIKOV, S.G.; BAZILEVICH, S.V.; YAROSHENKO, Yu.G.; MAYZEL', G.M.

Analysis of heat-exchanging processes during sintering by the filtration method. Izv. vys. ucheb. zav.; chern. met. 6 no.6: 18-26 '63. (MIRA 16:8)

1. Ural'skiy politekhnicheskiy institut.
(Sintering) (Heat--Transmission)

BRATCHIKOV, S.G.; BAZILEVICH, S.V.; YAROSHENKO, Yu.G.; MAYZEL', G.M.

Calculating temperatures during the sintering process. Izv. vys. ucheb. zav.; chern. met. 6 no.8:47-53 '63. (MIRA 16:11)

1. Ural'skiy politekhnicheskiy institut.

YAROSHENKO, Yu.G.; BAZILEVICH, S.V.; BRATCHIKOV, S.G.

Method of heat calculations in the roasting of fluxed nodules. Izv. vys. ucheb. zav.; chern. met. 6 no.10:22-29 '63. (MIRA 16:12)

1. Ural'skiy politekhnicheskiy institut i Nizhne-Tagil'skiy metallurgicheskiy kombinat.

BRATCHIKOV, S.G.

Temperature dependence of changes in the enthalpy and heat capacity of iron ores and sinter. Izv. vys. ucheb. zav.; chern. met. 6 no.12:35-37 '63. (MIRA 17:1)

1. Ural'skiy politekhnicheskiy institut.

BRATCHIKOV, S.G.; KHUDOROZHKOV, I.P.

Effect of solid carbon on the melting temperature of sinter charges. Izv. vys. ucheb. zav.; chern. met. 7 no.10:34-40 '64. (MIRA 17:11)

1. Ural'skiy politekhnicheskiy institut i Nizhne-Tagil'skiy metallurgicheskiy kombinat.

BRATCHIKOV, S.G.

Ignition conditions in sintering. Izv. vys. ucheb. zav.; chern. met. 8 no.2:49-52 '65. (MIRA 18:2)

1. Ural'skiy politekhnicheskiy institut.

BRATCHIKOV, S.G.

Calculating gas composition during sintering. Izv.vys.ucheb.zav.; chern. met. 8 no.4:40-44 '65. (MIRA 18:4)

1. Ural'skiy politekhnicheskiy institut.

BRATCHIKOV, S.G.; TUMASHEV, V.I.

Calculating the height of the zone of solid fuel combustion in a layer of inert materials. Izv.vys.ucheb.zav.; chern.met. 8 no.8:24-27 '65. (MIRA 18:8)

1. Ural'skiy politekhnicheskiy institut.

KHUDOROZHKOV, I.P.; MAYZEL', G.M.; BRATCHIKOV, S.G.; RAVIKOVICH, I.M.; GROSHEV, M.Ya.

Heat treatment of sinters. Izv. vys. ucheb. zav.; chern. met. 8 no.10:37-41 '65. (MIRA 18:9)

1. Ural'skiy politekhnicheskiy institut i Nizhne-Tagil'skiy metallurgicheskiy kombinat.

RAVIKOVICH, I.M.; KHUDOROZHKOV, I.P.; BRATCHIKOV, S.C.; MAYZEL', G.M.; GROSHEV, M.Ya.

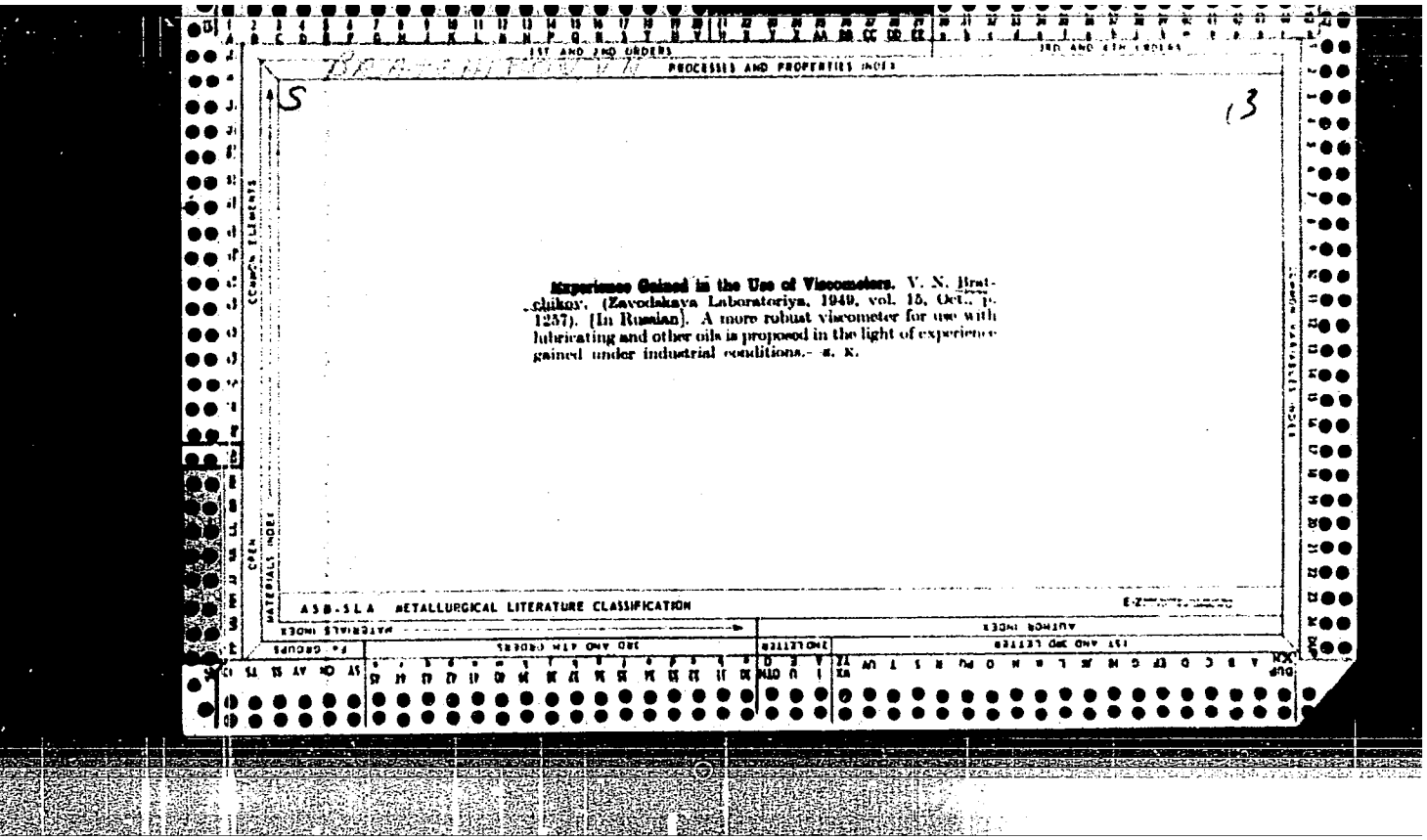
Influence of return conditions on the indices of the sintering processe. Metallurg 10 no.8:8-11 Ag '65. (MIRA 18:8)

1. Nizhne-Tagil'skiy metallurgicheskiy kombinat.

BRATCHIKOV, S.G.

Heat capacity of lead concentrates and sinters at high temperatures. Izv. vys. ucheb. zav.; tsvet. met. 7 no. 4: 79-81 '64 (MIRA 19:1)

1. Ural'skiy politekhnicheskiy institut, kafedra metallurgicheskikh pechey.



Experience Gained in the Use of Viscometers. V. N. Bratchikov. (Zavodskaya Laboratoriya, 1949, vol. 15, Oct., p. 1257). [In Russian]. A more robust viscometer for use with lubricating and other oils is proposed in the light of experience gained under industrial conditions.– a. k.

BRATCHIKOV, V.N., inzh.

Ash abrasion of tubular heating surfaces of boiler units. Izv. vys.ucheb. zav.; energ. no.5:94-99 My '58. (MIRA 11:8)

1.Tomskiy ordena Trudovogo Krasnogo Znameni politekhnicheskiy institut imeni S.M.Kirova.
(Fly ash) (Boilers)

18(7) SOV/143-58-10-13/24

AUTHOR: Bratchikov, V.N, Engineer

TITLE: The Influence of Some Metal Properties on the Ash Wear of Boiler Tubes

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Energetika, 1958, Nr 10, pp 99-106 (USSR)

ABSTRACT: Presently, at thermal power plants chiefly protective measures are taken for reducing the wear of boiler tubes in streams of abrasive ash particles. These methods have their known disadvantages. Eliminating the influence of the abrasive ash particles is practically impossible at the present state of boiler engineering. Investigations must be conducted for establishing those metal properties having an influence on the ash wear. A number of investigations on this subject was made in the USSR and abroad. In this connection the author mentions the work of M.M. Khrushchov and A.A. Soroko-Novitskaya, G.D. Polosatnik, and V. N. Kashcheyev. A great number of experiments concerning the wear resistance of metals in a stream of ab-

Card 1/6

The Influence of Some Metal Properties on the Ash Wear of Boiler Tubes

rasive ash particles was conducted at the laboratories of TsKTI, VTI and TsNIITMASh. Experiments made with different metals, steel, tin, copeer, lead, steel with different coatings, showed that the metal hardness did not produce any quantitative characteristic of the metal wear resistance. Attempts of connecting the metal hardness with the wear resistance did not show the proper results. Presently, the characteristic has not yet been found, reflecting the influence of metal properties on the wear resistance in a flow of abrasive ash particles. In his paper [Ref 10], the author derived a formula for determining the wear of a metal tube in a flow of abrasive ash particles. This formula facilitates the calculation of the weight reduction of a metal tube by the flow of abrasive ash particles.

$$G=C\eta M\mu D^{1}-\xi_{v}^{4}-\xi_{\tau}\left[g/m^{2}\right] \qquad (1)$$

The Influence of Some Metal Properties on the Ash Wear of Boiler Tubes

$$M = \frac{(7-\xi)\delta}{\sqrt{H_{din}^{1}}\,\xi(3-\xi)(5-\xi)k} \qquad (2)$$

The symbols mean: C - propertionality factor, depending on the abrasive properties of ash; G - weight of the metal removed, g/m^2; η - probability factor concerning impact of ash particles on metal surface; μ - ash concentration, g/m^3; v velocity of ash particles, m/sec; τ - time in hours; D - average diameter of ash particles, microns; ξ and k - some metal constants; δ - specific weight of the metal, kg/m^3; H_{din} - impact hardness of the metal, kg/m^2. For determining the correctness of the formula (1) and the numerical values of some magnitudes, the author conducted experiments concerning the ash wear of tubes manufactured of different metals. The experimental equipment is shown in figure 1. It consists of a rectangular,

The Influence of Some Metal Properties on the Ash Wear of Boiler Tubes

closed aerodynamic tube into which the tubes under investigation were placed. Ash used for the experiment was obtained from the ash catcher of a boiler working on pulverized Cheremkhovo coal. The tubes consisted of five sections each, whereby only the center sections were investigated. The sections were rings, having a length of not more than 40 mm, whereby it was possible weighing them on analytic scales. Economizer tubes made of ordinary steel, steam superheater tubes made of chrome-molybdenum steel, aluminum and lead tubes were used. The tube wear was determined by the loss of weight. Three experiments were performed having a duration of 100, 45 and 29 hours. Provisions were made that all tubes were exposed to identical conditions. The author presents the experimental results in tables and in graphs, comparing them to calculated values. The deviation of the experimental and calculation data is within permissible ranges. The results of the author's experiments contradict contemp-

The Influence of Some Metal Properties on the Ash Wear of Boiler Tubes

orary recommendations for using alloy-steel tubes, considering a wear resistance factor of the metal equal to 0.7. Apparently this factor was based on experiments at TsKTI [Ref 2] which did not reflect the conditions of wear in a flow of abrasive particles. The author then compares the results of his investigations with experiments conducted at VTU as shown in table 5. He states that the difference is within permissible ranges. The investigations show that the interaction of all forces upon impact of ash particles on the tube surface must be taken into consideration for determining the ash wear of boiler tubes. The formula cited by the author permits a calculation of the wear of any metal in an ash flow. The formula was obtained for a single tube, enclosed by the flow of ash particles on all sides. The author introduces a number of additional factors for adapting the formula to the specific conditions of a heater surface: $\beta\mu$ - factor, considering the irregularity of the ash concen-

tration in the gas flow area; β_v - factor, considering the irregularity of the velocity in a gas flow area; $A = C\beta_\rho\beta_a$, whereby β_ρ and β_a are maximum wear factors. The final version of the formula (1) for the ash wear of tubes arranged in chessboard form will be:

$$G = AMD^{1-\xi_\eta}\beta_\mu\mu(\beta_v)^{4-\xi_r}\left[g/m^2\right]$$

For determining the thinning of the tube walls the formula $h_{max} = \frac{G}{\gamma}$ [mm] may be used. There are 1 diagram, 4 graphs, 5 tables and 10 Soviet references. This article was presented by the Kafedra teploenergeticheskikh ustanovok i kotlostroyeniya (The Chair of Thermal Power Installation and Boiler Building)

ASSOCIATION: Tomskiy politekhnicheskiy institut imeni S.M. Kirova (Tomsk Polytechnical Institute imeni S.M. Kirov) Kafedra teploenergeticheskikh ustanovok i kotlostroyeniya (Chair of Thermal Power Equipment and Boiler Building)

SUBMITTED: March 6, 1958

AUTHOR: Bratchikov, V. N. SOV/32-24-7-58/65

TITLE: An Attachment to Polishing Machines (Prisposobleniye k polirovannomu stanku)

PERIODICAL: Zavodskaya Laboratoriya, 1958, Vol. 24, Nr 7, pp. 902 - 902 (USSR)

ABSTRACT: A simple device is described which increases the output and the quality of fine polishing by carefully mixing the water-abrasive mixture and directing it automatically to the polishing plate. A brass rod is immerged into a metallic vessel of from 1,5 to 3 liters mounted on a stand. The brass rod at its lower end is connected with a flexible shaft which effects the rotation. The added quantity of the suspension is regulated by a tap at the container, with the liquid level being controlled by a level gauge tube. In order to avoid possible mechanical impurities in the suspension the container and the mixing device are produced of brass blanched with lye, or coated with an anti-oxidation film. The device can feed two or three machines at the same time. Its construction is simple and useful.

Card 1/2

SOV/32-24-7-58/65

An Attachment to Polishing Machines

ASSOCIATION: Khar'kovskiy institut mekhanizatsii sel'skogo khozyaystva (Khar'kov Institute for the Mechanization of Agriculture)

Card 2/2

BRATCHIKOV, V.N., inzh.

Determining the consumption of air. Elek. sta. 29 no.7:77 Jl '58.
(MIRA 11:10)
(Steam boilers)

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18(7)

AUTHOR: Bratchikov, V.N., Engineer

TITLE: The Ash Erosion of Tubes Having an Inclined Position Towards the Flow (Zolovoy iznos trub, naklonno raspolozhennykh k potoku)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy - Energetika, 1959, Nr 2, pp 95-100 (USSR)

ABSTRACT: The calculation method of Bratchikov [Ref 1] is used to obtain a formula for determining the ash erosion of boiler tubes located at an arbitrary angle of inclination towards an ash stream. In this case, the author divides the impact force of the particles on the tube surface into three components, as shown by figure 1, and presents equations for these forces. The tube is inclined towards the flow of ash particles by the angle β, and the impact of the ash particles is at point A, shifted by the angle α on the perimeter of the tube from the horizontal axis of circumference. The erosion maximum is shifted to the frontal generatrix according to the increase of

Card 1/3

the inclination angle. The author did not find in literature any data on the wear of tubes having an inclined position towards a stream of abrasive particles, although investigations on this problem were performed by workers of VTI and TsKTI, for example, V.A. Lokshin [Ref 2]. The author presents a formula (7) which permits to determine the erosion of the tube at a given value of the inclination angle. Then he describes an experimental investigation of the erosion of tubes placed at an angle β towards an ash stream and of tubes placed horizontally in the latter. He presents a comparison of calculated and experimental results in table 1. The author comes to the conclusion that the amount of metal removed from the tube surface increases initially with an increasing tube inclination angle towards the stream of abrasive ash particles, and it will decrease after the tube inclination angle β reached a certain magnitude. The magnitude of this angle

The Ash Erosion of Tubes Having an Inclined Position Towards the Flow

varies with different metals. The erosion maximum is shifted to the frontal generatrix with an increase of the tube inclination angle towards the ash stream, whereby the thinning of the walls in the areas of maximum erosion remains constant up to a certain magnitude of the angle (depending upon the metal properties) whereafter the thinning of the metal begins to decrease. There are 4 graphs, 1 diagram, 1 table and 4 Soviet references.

ASSOCIATION: Tomskiy ordena Trudovogo Krasnogo znameni politekhnicheskiy institut imeni S.M, Kirova (Tomsk Red Banner Order - Polytechnical Institute imeni S.M. Kirov)

PRESENTED: Kafedra teplotekhnicheskikh ustanovok i kotlostroyeniya (Chair of Thermal Equipment and Boiler Construction)

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1. Laboratory of General Chemistry, Polytechnic Institute, Bucharest.

BRATEK M.D.

Chromatographic separation and identification of alkaloids present in lupine. M. Wiewiórowski and M. D. Bratek. *Bull. acad. polon. sci.*, Classe II, 4, 3–6 (1950) (in English).

Lupine seeds were ground with 10% NaOH and anhyd. Na_2SO_4, the mixt. was placed on a chromatographic column, moistened with Et_2O, eluted with $CHCl_3$, and the $CHCl_3$ ext. was treated with 0.1*N* HCl prior to evapn. of the $CHCl_3$ on a steam bath. The ext. was treated further by paper chromatography. Hydroxylupanine (I) and lupanine were found in *Lupinus albus*, *L. angustifolius*, and *L. polyphyllus*. Four new basic compds. amounting to 30% of the total alkaloids in *L. angustifolius* were found. The qual. compn. of different parts of the same plant is different and varies with age. Young plants of white lupine contain sparteine (II), but no I; with the appearance of pods, II decreases and I appears.

Thelma E. Habgood

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1. Institute of Biochemistry and Biophysics, Poznan Branch, Polish Academy of Sciences and Department of Organic Chemistry, A. Mickiewicz University, Poznan. Presented by J. Suszko.