BORISAVLJEVIC, Ruza; EBEL, Franja; KOSANOVIC, Duro

Application of the Baker-Philippoff equation in determining internal viscosity of polymethylmethacrylate and the dimethylitaconate-styrol copolymer. Glas Hem dr 27 no.7/8:355-366 '62

1. Galenika Development Laboratory for Scientific Research in the Organic and Pharmaceutical Chemistry, Belgrade-Zemun/

BORISAVLJEVIC, Ruza; MAMUZIC, Rastko,I.; MIHAILOVIC, Mihailo Lj.

N-benzoyphthalimide, Pt.4. Glas Hem dr 27 no.7/8:389-395 '62.

1. Faculty of Science, Institute of Chemistry, Beograd.

BORISAVLJEVIC, Ruza; BOSNJAK, Jovan; MAMUZIC, Rastko I.; MIHAILOVIC, Mihailo Lj.

N-benzoylpthalimide. Pt. 2. Glas Hem dr 27 no.5/6:299-311 '62.

1. Institute of Chemistry, Faculty of Sciences, Beograd.

ACC NR: AP6032809 SOURCE CODE: YU/0001/66/000/009/1621/1624

AUTHOR: Borisavljevic, Ruza (Graduate chemist; Advisor; Beograd-Zemun); Kosanovic, Duro (Graduate chemist; Advisor; Beograd-Zemun)

ORG: [Borisavljevic] Research Laboratory "Galenika" (Razvojne laboratorije "Galenika"); [Kosanovic] Pharmaceutical and Chemical Industry "Galenika" (Farmaceutsko-hemijske industrije "Galenika")

TITLE: Development of methacrylate and acrylate production

SOURCE: Tehnika, no. 9, 1966, 1621-1624

TOPIC TAGS: methacrylate, acrylate, methacrylate production, acrylate production

ABSTRACT: Development of methacrylate and acrylate production and the raw material for such production are reviewed. A description of industrial processes currently in use is given. Certain production methods are discussed for possible future application. The acetone cyanohydrin and isobutylene (Escambia) prosesses are the two methods involved in the production of methyl methacrylate. For the production of acrylate, five methods are presently in use: the ethylene cyanohydrin,

UDC: 678.744=861

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000206320008-0"

propiolactone, carbonyl (Reppe's), acrylonitrile, and propylene processes. [Based on authors' abstract] [KS]

SUB CODE: 07, 11/SUBM DATE: none/ORIG REF: 001/SOV REF: 001/ OTH REF: 013/

ACC NR: AP6032807 SOURCE CODE: YU/0001/66/000/009/1600/1604

AUTHOR: Borisavljevic, R. (Graduate chemist; Advisor); Despic, A. (Doctor; Graduate engineer; Associate professor); Kosanovic, D. (Graduate engineer; Advisor)

ORG: [Borisavljevic] Research Laboratory "Galenika", Belgrade-Zemun (Razvojne laboratorije "Galenika"); [Despic] Division of Chemical Technology, Belgrade University (Tehnoloskog fakulteta Univerzteta u Beogradu); [Kosanovic] Pharmaceutical and chemical Industry "Galenika", Belgrade-Zemun (Farmaceutsko-hemijske industrije "Galenika")

TITLE: Contribution to the study of methacrylacetone polymerization

SOURCE: Tehnika, no. 9, 1966, 1600-1604

TOPIC TAGS: polymerization, polymerization catalyst, methacrylacetone, methylmethacrylate, intrinsic viscosity

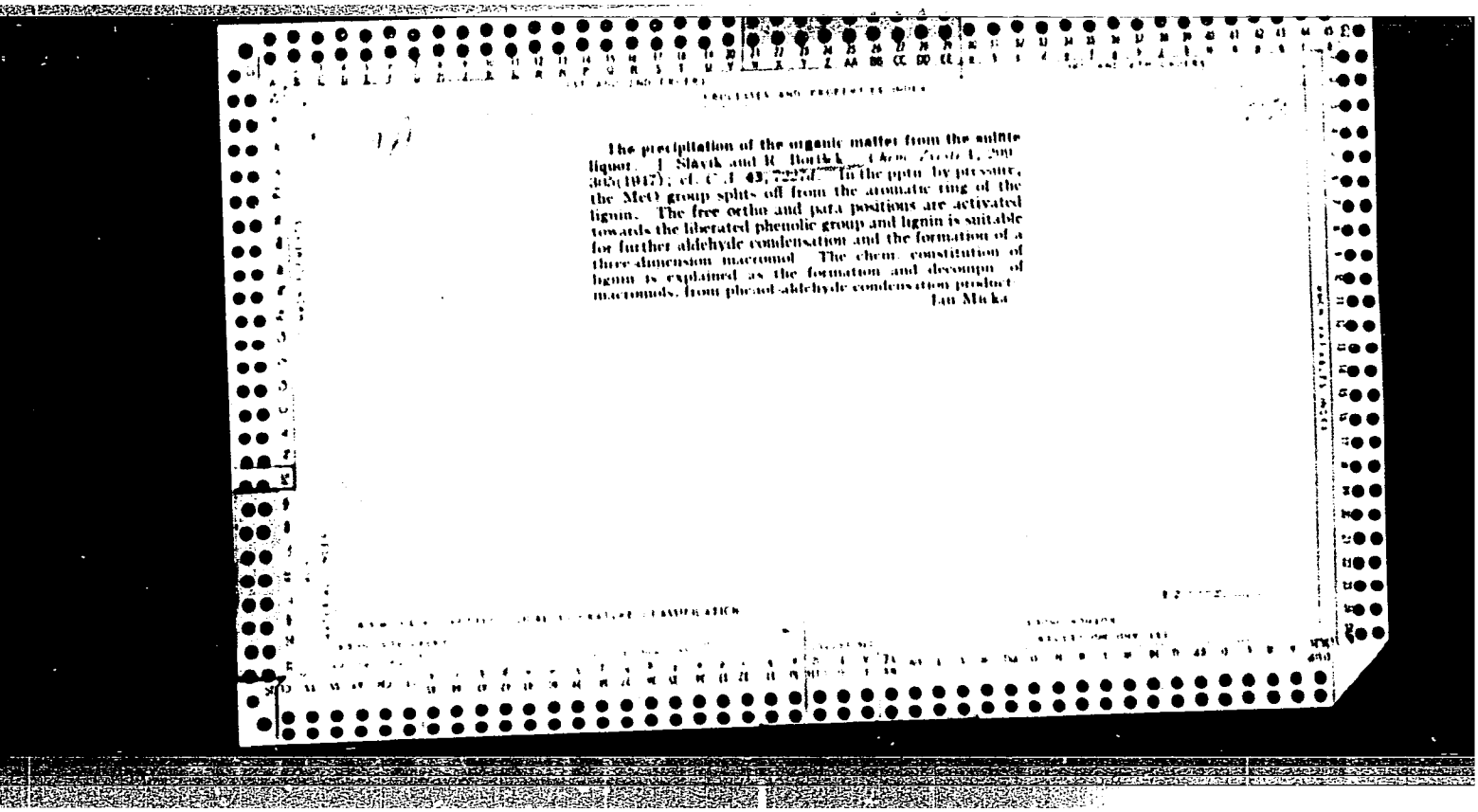
ABSTRACT: Radical type bulk polymerization of methacrylacetone was studied in the 0—100% conversion range at various temperatures (50, 60, 70 and 80C) and with different amounts of α,α'-azo-iso-butyronitrile as polymerization catalyst

Card 1/2 UDC: 678.744=861

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000206320008-0"

(0.3%, 0.5% and 1%). The results are compared with those obtained for methylmethacrylate polymerization. It was found that there is considerable similarity between the two processes with the rate of the former being considerably lower and the gel effect somewhat less pronounced. The change in molecular weight during polymerization was also investigated. The relation between the intrinsic viscosity and the molecular weight $[\eta] = KM^{\alpha}$ was assumed and the constants were found experimentally to be $K = 6.8 \times 10^{-5}$ and $\alpha = 0.8$. Molecular weight distribution function was obtained by fractionation of a sample of the polymer resulting from polymerization at 50° with 0.5% of the catalyst. Orig. art. has: 3 figures. [Authors' abstract]

SUB CODE: 07/SUBM DATE: none/ORIG REF: 003/SOV REF: 003/OTH REF: 016/



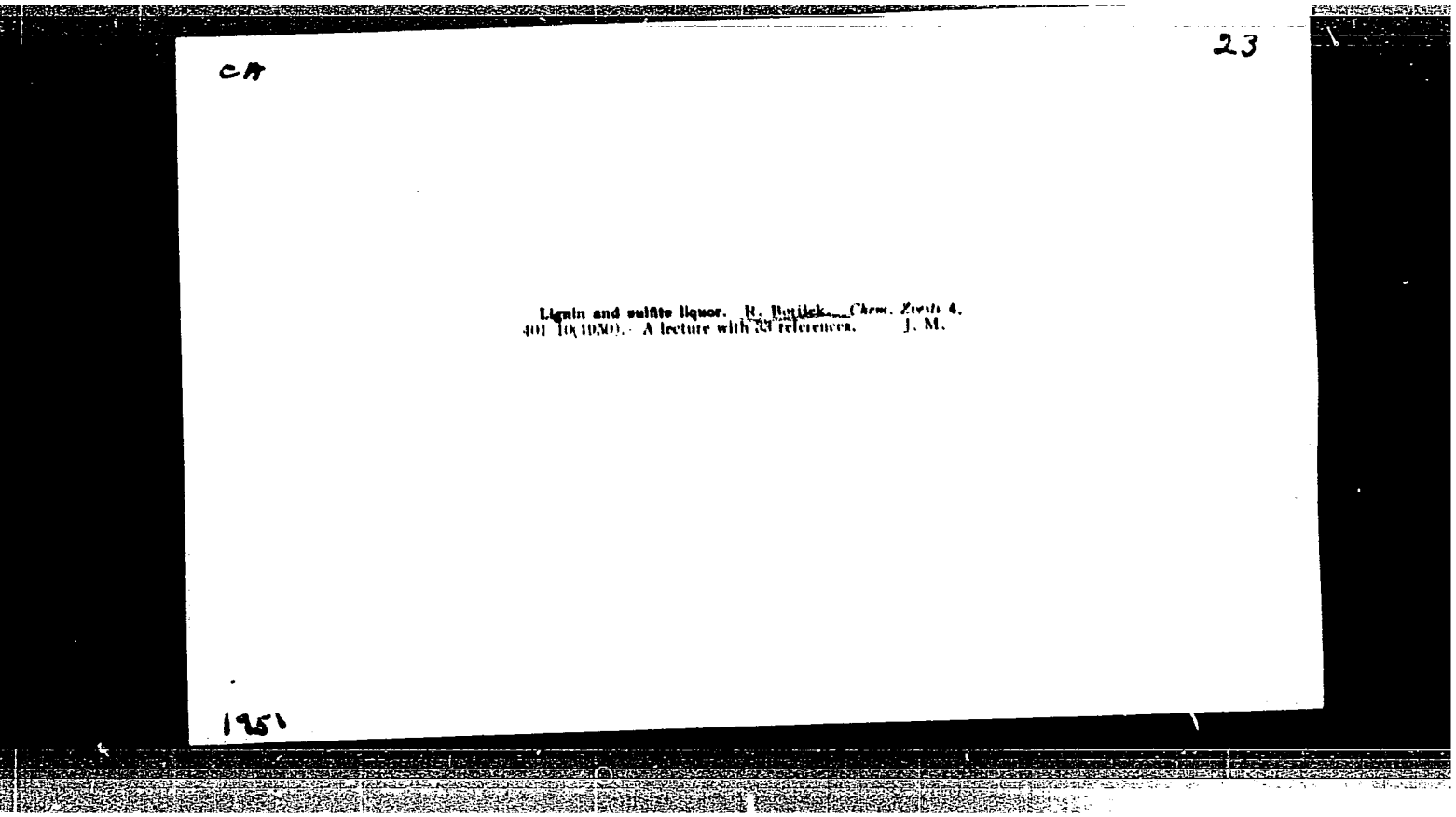
The precipitation of the organic matter from the sulfite liquor. J. Slavik and R. Bouček. *Chem. Zvesti* 1, 300-305(1947); cf. *C. A.* **43**, 7227*d*. In the pptn. by pressure, the MeO group splits off from the aromatic ring of the lignin. The free ortho and para positions are activated towards the liberated phenolic group and lignin is suitable for further aldehyde condensation and the formation of a three-dimension macromol. The chem. constitution of lignin is explained as the formation and decompn. of macromols. from phenol-aldehyde condensation product.
Jan Mička

CA

23

Aldehyde-bound sulfur dioxide in sulfite waste liquor. R. Bergiek. *Chem. Zeesti* 4, 328-35(1950).—SO_2 reversibly bound to aldehyde components is reviewed. Splitting off of SO_2 at higher temps. under pressure in acid and alk. medium was studied. In the alk. medium it depends especially not only on pH but also on the hydroxide in the order of decreasing degree of dissocn.: $NaOH(KOH) > Ca(OH)_2 > Ba(OH)_2 > NH_3$. ... Jan Micka

1957

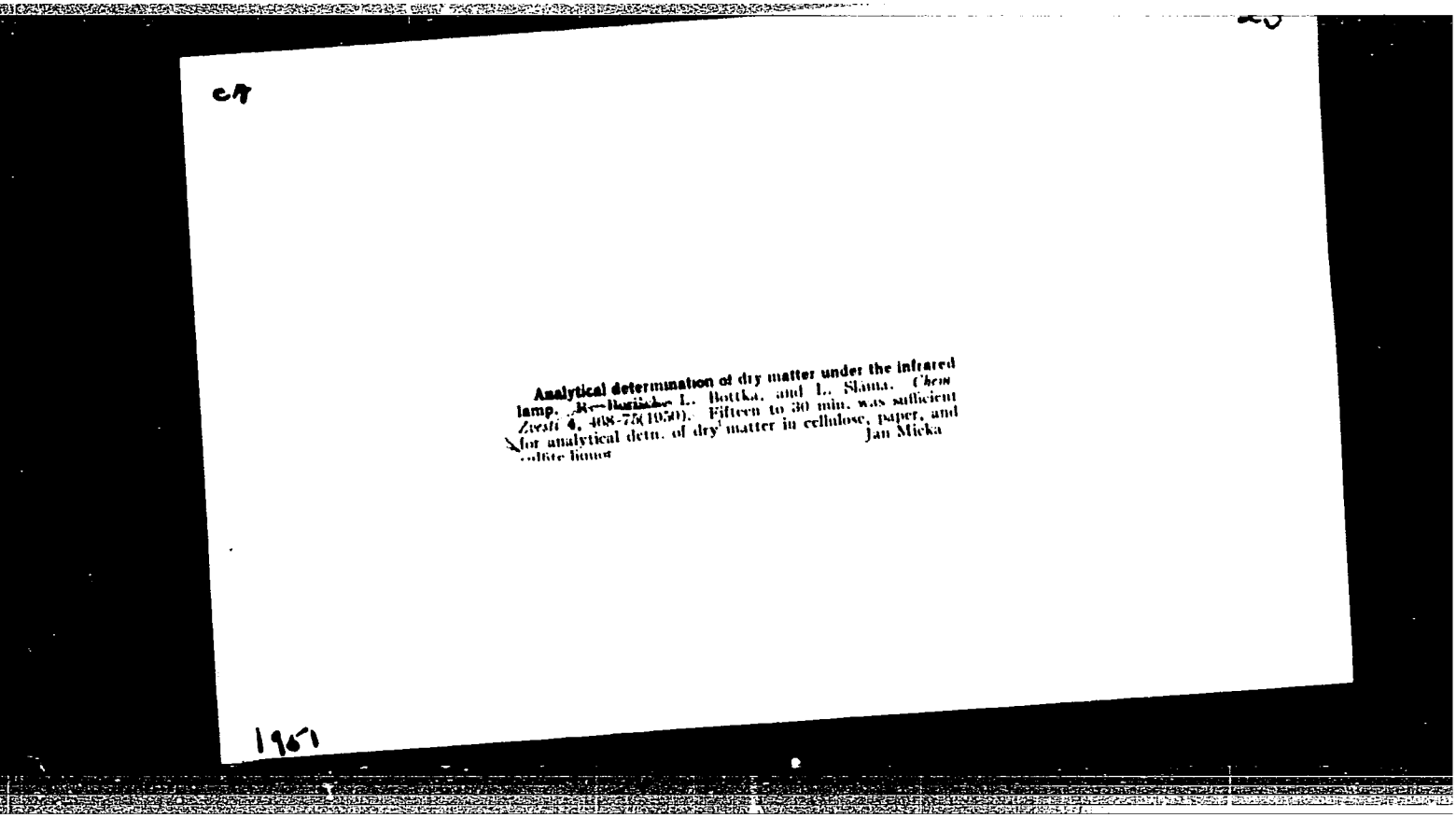


CM

23

Lignin and sulfite liquor. R. Ruttick. Chem. Zvesti 4, 401-10(1950). A lecture with 33 references. J. M.

1951



c7

Analytical determination of dry matter under the infrared lamp. J. Hanáček, L. Bottka, and L. Slama. *Chem Zvesti* 4, 468-75(1950). Fifteen to 30 min. was sufficient for analytical detn. of dry matter in cellulose, paper, and cellulose linters. Jan Micka

1951

CA

23

The reaction of lignin with formaldehyde. R. Bonička and J. Polčin. *Chem. Zvesti* **5**, 322-30(1951). Both qual. and quant. reactions of lignin with formaldehyde have been revised. HClO reacts with the side chain of lignin and various types of lignin can be differentiated. Sulfite lignin and ethanol lignin show best reactions. The reaction appears to be of the aldol type. Jan Micka

C-4

Setting free the phenolic group by ammonia under pressure in sulfite liquors. R. Horilek. *Chem. Zvesti* 5, 331-8 (1951).—Treating with NH_3 under pressure is equally good as with NaOH. Jan Micka

CA

23

The reaction of lignin hexamethylenetetramine. K. Borůšek. *Chem. Zvesti* **5**, 338-55(1951).—N is firmly bound on the side chain in the reaction of lignin with hexamethylenetetramine. This reaction can be used as an analytical method for differentiating various types of lignin.
Jan Micka

BORISEK, RUDOLF

Sulfite cooking in the U.S.S.R. in theory and in practice. Rudolf Borišek. *Chem. Zvesti* 6, 57–65(1952).—A lecture.
Jan Micka

"Fast Method for Determining the Total Sulfur Content of Sulfite Liquors." p. 98, Praha, Vol. 9, no. 4, Apr. 1954.

SO: East Europe Accessions List, Vol. 3, No. 9, September 1954, Lib. of Congress

Borisek, R.

Absorption tower helps in the regeneration of sulfur dioxide. pl 195. PAPIR A CELULOSA. (Ministerstvo lesu a drevarskeho prumyslu) Praha. Vol. 9, no. 9, Sept. 1954.

SOURCE: EEAL - LC Vol. 5 No. 10 Oct. 1956

"Suggested Method for Quick Determination of SO_2 in Gases." p. 108, Praha, Vol. 9, no. 5, May 1954.

SO: East European Accessions List, Vol. 3, No. 9, September 1954, Lib. of Congress

Borisek, R.

Improvement of the regenration of sulfur dioxide. p. 257. PAPIR A CELULOSA. (Ministerstvo lesu a drevarskeho prumyslu) Praha. Vol. 10, no. 12, Dec. 1955.

Source: EEAL LC Vol. 5, No. 10 Oct. 1956

4

The effect of lignosulfonic complex on colloidal and rheological properties of the bentonite suspensions. F. Esterka and R. Horáček (Ústav naftový výskum, Brno priemyslu celu~~lózy, Bratislava~~, Czech.). *Chem. zvesti* 10, 604–11 1956)(German summary).—A theory of org. dispersing agents in bentonite suspension is developed, and the constitution of the lignin complex from waste sulfite liquor is studied. The stabilization of colloidal and rheological properties of mineral clay of Sarmatian inner Alpen pan with chlorolignosulfonic acid is described and compared to the dispersing action of tannins.

Jan Micka

BORISEK,R., dr.inz.; MINARIK, F., inz.

Mechanism of sulfite delignification at high temperatures.
Sbor cel pap no.7 247-62 '62.

BORISENKA, R. V.

USSR/Medicine - Pharmacophysiology

Card 1/1 Pub.30 - 15/18 FD-864

Author : Borisenka, R. V.

Title : The results of investigations of the toxicity of manganese compounds and alloys containing manganese

Periodical : Farm. i toks. 17, 54-58, Jul/Aug 54

Abstract : Experiments on frogs showed that manganese has a definite effect on the nervous system and possesses various degrees of toxicity depending upon the compound in which it is introduced into an organism. Soluble manganese compounds like manganese chloride were found to be the most toxic. The toxicity of manganese in alloys was found to depend upon and vary with the other elements in the alloys. Ferromanganese proved to be more toxic than silicomanganese. Manganese dioxide and a physiological solution containing manganese were also tested. The results of the experiments are presented on three graphs and two charts. Nine Soviet references are cited.

Institution : Chair of Labor Hygiene (Head - Prof. Z. I. Izrael'son) of the I Moscow Order of Lenin Medical Institute

Submitted : --

BORISENKO, A.; SHIPOV, Yu.

Condition of the Japanese laboring class. Sots. trud no.2:40-47 F '58. (MIRA 11:1)
(Japan--Labor and laboring classes)

BORISENKO, A.

Give daily attention to educational work among employees. Sov. profsoiuzy 17 no. 2:44-45 Ja '61. (MIRA 14:2)

1. Predsedatel' Rostovskogo obkoma profsoyuza rabotnikov gosuchrezhdeniy.
(Rostov Province--Labor and laboring classes--Education)

BORISENKO, A.; SHASTITKO, V.

Economic efficiency of foreign trade in socialist countries.
Vnesh. torg. 42 no.5:24-31 '62. (MIRA 15:4)
(Communist countries--Commerce)

BORISENKO, A.A., inzhener.

Level indicator. Energetik 3 no.5:11 O '53. (MLRA 6:10)
(Water meters)

BORISENKO, A.A., master.

Welding nickel-chromium wire. Energetik 2 no.1:20 Ja '54.
(MLRA 7:1)
(Electric wire)

BORISENKO, A.A.

Gas escape in development workings. Zap. LGI 46 no.1:3-5 '62.
(MIRA 16:6)

(Mine gases)

BORISENKO, A.G. (Stavropol')

Establishing a regional study museum in the Krasnogorskaya Secondary School, Stavropol Territory. Geog. v shkole 23 no. 6:65-66 N-D '60. (MIRA 13:11)
(Krasnogorskaya (Stavropol Territory)--Geographical museums)

BORISENKO, A.A., kand.tekhn.nauk

Efficiency of degasifying seams by development mining. Ugol' 39 no.2:55-57 F '64. (MIRA 17:3)

1. Shakhta No.18 kombinata Vorkutugol'.

BORISENKO, A.I.

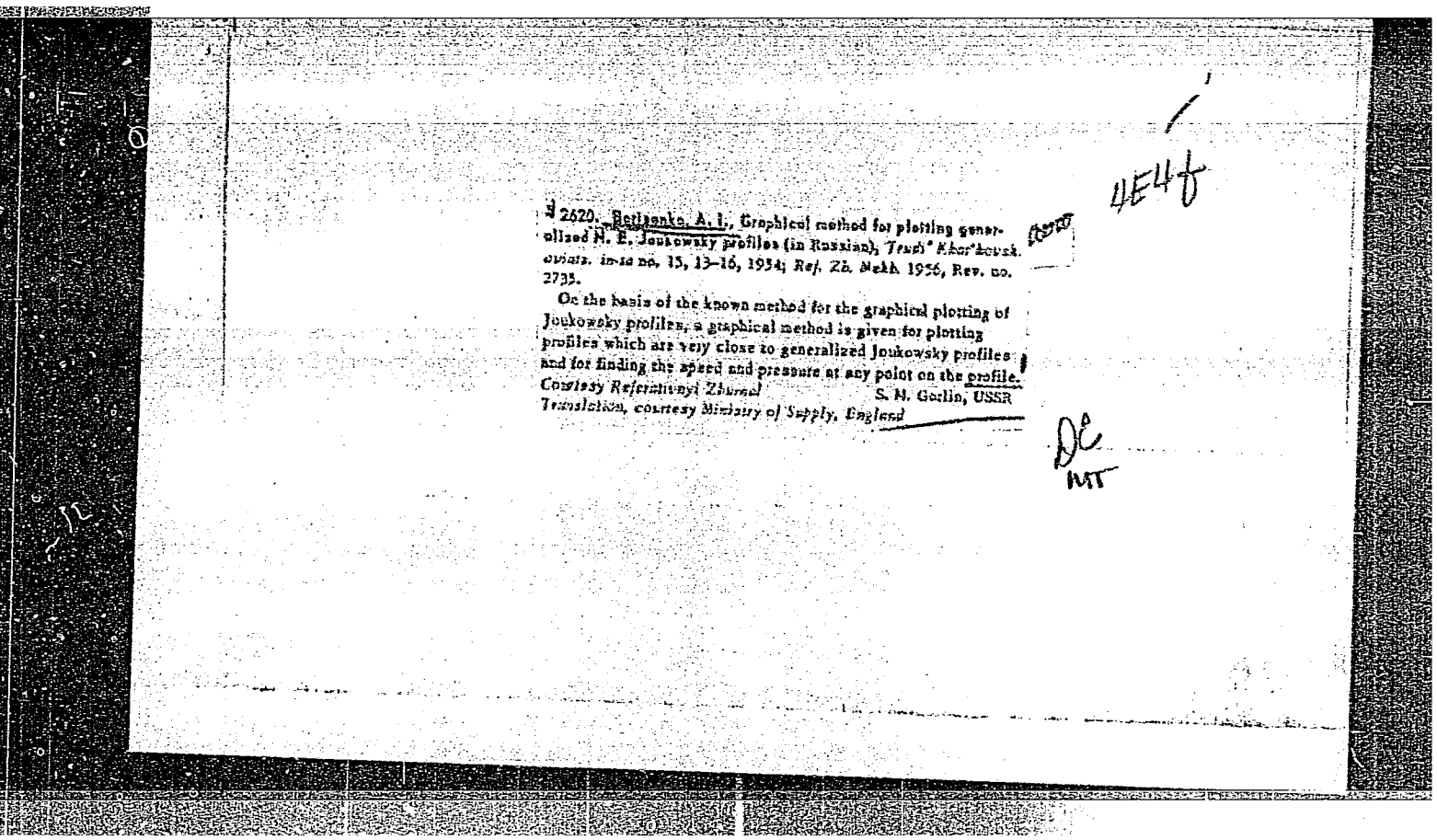
Vortex layer method for solving problems on flow past bodies.
Sborn.trud.lab.prob.bystr.mash. 3:89-111 '53. (MLRA 9:9)
(Fluid dynamics)

BORISENKO, A.I.; GOROZHANKIN, A.P., kandidat tekhnicheskikh nauk.

Data on the investigation of ventilation and cooling of enclosed electric machines. Sbor.trud.lab.probl.bystr.mash. no.4:141-150 '53. (MLRA 7:12)
(Electric machinery--Ventilation)

BORISENKO, A.I., kandidat tekhnicheskikh nauk.

Theory of hydrodynamic lattices of circular cylinders. Sbor. trud.lab.probl.bystr.mash. no.4:39-67 '54. (MLRA 7:12)
(Hydrodynamics)

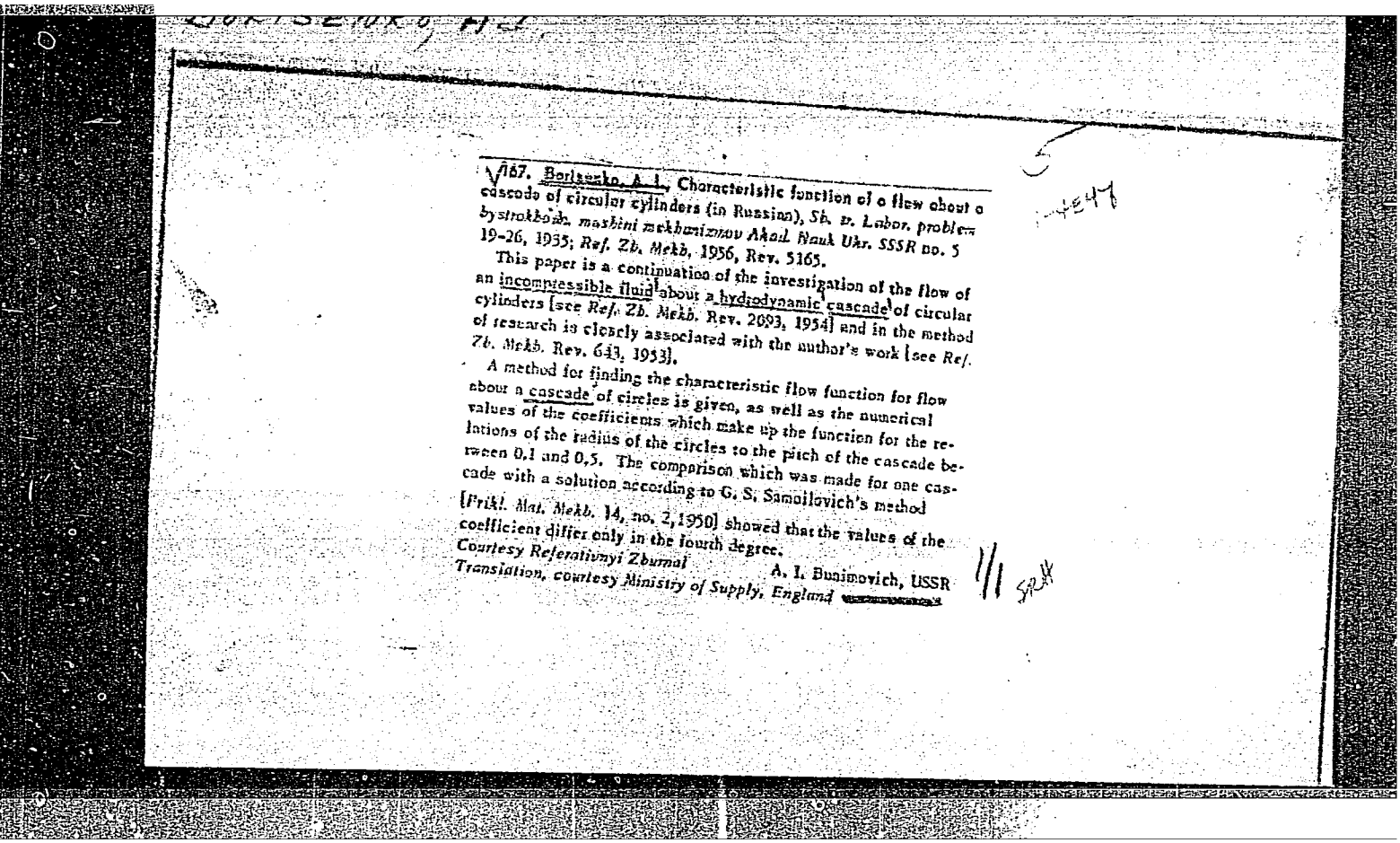


2620. Petrenko, A. I., Graphical method for plotting generalised N. E. Joukowsky profiles (in Russian), *Trudy Kaz'kovsk. aviats. in-ta* no. 15, 13–16, 1934; *Ref. Zh. Mekh.* 1956, Rev. no. 2735.

On the basis of the known method for the graphical plotting of Joukowsky profiles, a graphical method is given for plotting profiles which are very close to generalized Joukowsky profiles and for finding the speed and pressure at any point on the profile.

Courtesy Referativnyi Zhurnal S. N. Gorlin, USSR

Translation, courtesy Ministry of Supply, England



5167. Borisenko, A. I. Characteristic function of a flow about a cascade of circular cylinders (in Russian), *Sb. tr. Labor. problem bystrokhodn. mashini mekhanizmov Akad. Nauk Ukr. SSSR* no. 5 19-26, 1955; *Ref. Zh. Mekh.* 1956, Rev. 5165.

This paper is a continuation of the investigation of the flow of an incompressible fluid about a hydrodynamic cascade of circular cylinders [see *Ref. Zh. Mekh.* Rev. 2093, 1954] and in the method of research is closely associated with the author's work [see *Ref. Zh. Mekh.* Rev. 643, 1953].

A method for finding the characteristic flow function for flow about a cascade of circles is given, as well as the numerical values of the coefficients which make up the function for the relations of the radius of the circles to the pitch of the cascade between 0,1 and 0,5. The comparison which was made for one cascade with a solution according to G. S. Samoilovich's method [*Prikl. Mat. Mekh.* 14, no. 2, 1950] showed that the values of the coefficient differ only in the fourth degree.

Courtesy Referativnyi Zhurnal A. I. Bunimovich, USSR

Translation, courtesy Ministry of Supply, England

BORISENKO, A.I.

Using the vertex layer method for solving problems on a streamlines around solid bodies. Sbor. trud. Lab. probl.bystr. mash. no.5:195-197 '55. (MLRA 9:2)
(Stretenskii, L.N.) (Vertex-motion) (Fluid dynamics)

BORISENKO, A. I.

"Velocity and Temperature Field in a Fluid Layer Between Two Plates with a Relative, Mutually Parallel Motion," by A. I. Borisenko, Khar'kov Aviation Institute, Prykladna Mekhanika, Vol 2, No 4, 1956, pp 425-437

The author presents an accurate solution of the problem on the distribution of temperature and velocity in a layer of liquid (and gas) between two flat plates, one of which is in parallel motion with the other stationary plate. The problem is solved by an analysis of the diffusion of energy for any type of relationship change between the coefficients of viscosity and heat conductivity and temperature.

Sum 1239

SOV/124-58-5-5349

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 5, p 55 (USSR)

AUTHOR: Borisenko, A.I.

TITLE: The Flow Past a Hydrodynamic Cascade of Elliptical Cylinders (Obtekaniye gidrodinamicheskoy reshetki ellipticheskikh tsilindrov)

PERIODICAL: Sb. tr. Labor. gidravl. mashin, AN UkrSSR, 1956, Nr 6, pp 59-73

ABSTRACT: An integral equation is written and solved with respect to the distribution of vortices along the contours of ellipses in a cascade of elliptical cylinders exposed to a plane stationary potential flow of an incompressible fluid. The solution to the equation is obtained by the method of expansion into a series, a method previously used by the author for the particular case of a cascade of circular cylinders [Sb. tr. Labor. problem bystrokhodnykh mashin i mekhanizmov (Symposium on "Laboratory Problems of High-speed Machinery and Mechanisms), AN UkrSSR, 1953, Nr 4, pp 39-67; also, RZhMekh, 1954, Nr 2, abstract 2095]. The other method of solving the problem in question is well known [Voytashevskiy, D.A., Raschety i

Card 1/2

SOV/124-58-5-5349

The Flow Past a Hydrodynamic Cascade of Elliptical Cylinders

issledovaniya gidrodinamicheskikh reshetok (Analysis and Investigations of Hydrodynamic Cascades), Gos. n.-tekhn. izd-vo mashinostroit. lit-ry, Moscow, 1953; also, RZhMekh, 1953, Nr 2, abstract 651].

G.Yu. Stepanov

1. Fluid flow--Mathematical analysis 2. Hydrodynamic research--USSR

Card 2/2

BORISENKO, A.I., kandidat tekhnicheskikh nauk; YANTOVSKIY, Ye.I., inzhener.

Thermal resistance of the air gap in electric machines. Vest. elektroprom. 28 no.3:53-56 Mr '57. (MLRA 10:4)

1. Khar'kovskiy aviatsionnyy institut i Khar'kovskiy elektromekhanicheskiy zavod.

(Electric machines)

. BORISENKO, A I.

AUTHOR: Borisenko, A.I., Candidate of Technical Sciences and Yantovskiy, E.I., Engineer. 110-6-7/24

TITLE: Heat transfer in asymmetrically-heated ducts in electrical machines. (Teplootdacha v asimmetrichno nagrevayemykh kanalakh elektricheskikh mashin.)

PERIODICAL: "Vestnik Elektropromyshlennosti" (Journal of the Electrical Industry) 1957, Vol.28, No.6, pp.21-26 (U.S.S.R.)

ABSTRACT: The cooling of some parts of electrical machines may be considered as heat transfer from a uniformly heated wall to a flow of air or other gas along the wall. The conditions are always those of turbulent flow. If both the walls of the plane duct give out an equal quantity of heat the temperature distribution is symmetrical relative to the axis of the duct and heat transfer can be calculated by existing formulae. If the walls of the duct contain heat sources of different intensity or if one wall contains no heat sources the temperature distribution will not be symmetrical and the duct may be described as asymmetrically-heated. Such cases are often met in practice.

The article then considers steady turbulent flow of

Card 1/5

Heat transfer in asymmetrically-heated ducts in electrical machines. (Cont.) 110-6-7/24

an incompressible gas between two stationary parallel walls. The pressure gradient along the duct, the intensity of the heat source (and therefore the temperature gradient) will be considered constant. In accordance with modern views on the flow of liquid and heat transfer in it, account must simultaneously be taken of the action of two physical processes; orderless mixing by the exchange of small volumes of liquid which depends on the conditions of flow and molecular mixing.

Since the mechanisms of internal friction and heat conduction are the same, expressions may be written for the tangential stress and heat flux density for laminar flow. Similar equations are then written for turbulent flow and for the total frictional stress and heat flux density normal to the direction of movement. An expression is then given for the quantity of heat transmitted in the direction of movement for unit time per unit sectional area and then an expression is written, the first term of which corresponds to the increase in internal energy of an element of gas flowing along the duct, and the second characterises the quantity of heat reaching the element of gas from neighbouring layers by turbulent and molecular conductivity. The equation

Card 2/5

Heat transfer in asymmetrically-heated ducts in electrical machines. (Cont.) 110-6-7/24

will cover the case when the lower walls of the duct is heat-insulated and contains no source of heat and the other is heated. Other cases can be obtained by summating individual solutions. The appropriate equations are then derived and are finally expressed in terms of dimensionless magnitudes.

The distribution of the heat transfer coefficient across the canal is usually determined semi-empirically. For a long time it was supposed that turbulent thermal conductivity and viscosity passed through a minimum on the axis of the duct. However, calculations of temperature distribution based on this assumption lead to an obviously false conclusion. Recent careful experiments have shown that the minimum of turbulent properties on the axis of the duct is very smooth and differs very little from the maximum value. Therefore, proceeding from the approximate concept of turbulent viscosity in the form of a parabola with its maximum on the axis of the duct the assumption may be used to obtain a result in a form convenient for use which is, moreover, more

Card 3/5

accurate than the assumption made in some works, of a linear relationship between the turbulent viscosity and the distance to the wall. A relationship is then given in terms of semi-empirical theory of turbulence. After further development the author arrives at a logarithmic law of velocity distribution which differs from the usually accepted law in that it is valid right up to the wall and that the velocity does not have a discontinuity on the axis of the duct. A formula is then given for the law of velocity distribution and results calculated by this formula are compared in Table 1 with published results which are known to be in good agreement with careful experiments. Good agreement is shown between the two. Figure 3 shows a comparison between the temperature distribution in an asymmetrically-heated duct determined by calculation and from experiment. It is shown that the temperature distribution formula given is in good agreement with the experimental results. The greatest divergence occurs at the middle of the duct.

Card 4/5

For practical applications it is necessary to determine the temperature difference between the cold and hot walls and a method of doing this is given. Fig. 5 is

Heat transfer in asymmetrically-heated ducts in electrical machines. (Cont.) 110-6-7/24

a graph that can be used in place of a formula to calculate the asymmetrical heating of ducts occurring in electrical machines. Unfortunately data is not available to permit verification of the formula and graph for high Reynolds numbers. In conclusion a practical example is worked out. It is the determination of the heating of the surface of the stator steel of an enclosed synchronous machine type MA36-7 2/4 above the surrounding air.

Card 5/5

There are 5 figures, and 3 references, 2 of which are Slavic.

ASSOCIATION: Kharkov Aviation Institute (Kharkovskiy Aviatsionnyy Institut) and KhEMZ.

SUBMITTED: December 30, 1956.

AVAILABLE:

BORISENKO, A.I.

A paradox in hydrodynamics. Sbor. trud. Lab. gidr. mash. no.7: 113-118 '58. (MIRA 12:9)
(Airfoils)

SOV/144-58-9-15/18

AUTHORS: Borisenko, A. I., Candidate of Technical Sciences, Docent, and Yantovskiy, Ye. I., Engineer

TITLE: On the Question of Cooling Electrical Machines (K voprosu okhlazhdeniya elektricheskikh mashin)

PERIODICAL: Izvestiya Vysshikh Uchebnykh Zavedeniy, Elektromekhanika, 1958, Nr 9, pp 112-115 (USSR)

ABSTRACT: The need for some form of cooling, natural or forced, of electrical machines is first discussed in general terms in relation to its influence on performance and design. Natural cooling is defined as purely convective air-cooling which may be assisted by good geometric design but does not employ supplementary blowers. In forced cooling blowers or pumps are used to circulate the coolant, which may be either gas or liquid. The point is made that sharp temperature gradients, and frequent and large temperature fluctuations in time, rather than high temperatures themselves, often present the more difficult problems of machine operation, maintenance, wear and tear etc. Thus, a machine which generates a high running temperature may not necessarily require cooling, if it is run continuously at this

temperature without frequent starting and stopping, and provided temperature gradients and fluctuations are minimized by good design. Alternatively, if a certain amount of cooling is still necessary this may often be achieved by natural convection alone, especially if the heat transfer surface can be maximized, e.g. by cooling fins. Close attention should also be given to the material of such heat transfer surfaces, if a choice exists, since materials having equivalent mechanical and/or electrical properties can differ quite markedly in their thermal conductivity and emissivity. If the above requirements are not met and forced cooling is necessary, the rival claims of gas and liquid coolant may be considered. The latter presents problems of containment and, usually, of corrosion also; however it is generally a more effective coolant because specific-heat, mass-flow products can be achieved. That would be impossible using gas coolants without the installation of excessively expensive blower power. If a small amount of forced cooling is required as an assist to natural convection, then a gas coolant is the

On the Question of Cooling Electrical Machines

obvious choice; otherwise the choice between gas and liquid will be determined by the peculiarities of construction, performance and maintenance of the particular machine under consideration. The paper includes a résumé of the salient characteristics of some typical gas-cooled and liquid-cooled machines, namely, air-cooled asynchronous motors, types MA36-52/4, MA36-52/8 and MA36-62/8 and submerged (deep well and oil drilling) motors PED-55 and MAPZ-273-54/2. The mass-flow characteristics for the air-cooled types exhibit a power law increase in cooling with flow velocity which, within limits, more than offsets the cost of achieving the extra flow. In the case of liquid cooling of the stator surface of an enclosed asynchronous motor, the temperature drop between the surface of the stator and the liquid is only 5 to 10% of the over-heating of the winding; the largest component of the temperature difference is the temperature gradient in the active steel. In this case efforts should be made to reduce the temperature gradient in the steel, for instance, by using Armco

 steel which has a higher thermal conductivity. If the

On the Question of Cooling Electrical Machines

liquid cooling is applied on the stator surface as well as on the internal surfaces of the rotor (for instance, motors of electric oil drills), the heat fluxes are parallel and thereby the heat flux through the stator is reduced. In such machines the greatest temperature difference is that along the thickness of the insulation, which may amount to 70% of the total over-heating of the winding. In the latter case measures for reducing the thermal resistance of the steel of the stator and the rotor or of the boundary layer of the cooling liquid will have little effect and efforts should be mainly concentrated on reducing the thickness and increasing the thermal conductivity (for instance by impregnation with quartz-sand varnish) of the windings.

There are 4 figures, 1 table and 2 references, 1 of which is Soviet, 1 German.

ASSOCIATIONS: Kafedra elektrotekhniki Khar'kovskiy aviatsionnyy institut (Chair of Electrical Engineering, Khar'kov Aviation Institute) and Khar'kovskiy elektromekhanicheskiy zavod (Khar'kov Electro-Mechanical Works)

SUBMITTED: August 12, 1958

110-58-5-8/25

AUTHORS: Borisenko, A.I., Candidate of Technical Sciences and Yantovskiy, Ye.I., Engineer

TITLE: The Thermal Design of Enclosed Induction Motors Types MA-36 and PED (Teplovoy raschet zakrytykh asinkhronnykh elektrodvigateley tipov MA-36 i PED)

PERIODICAL: Vestnik Elektropromyshlennosti, 1958, Vol 29, Nr 5, pp 25 - 28 (USSR).

ABSTRACT: Heat-transfer in an electrical machine takes place by conductive and convective heat exchange to the cooling medium inside and outside the machine. The temperature drop in the gap between the rotor and the stator is determined from relationships derived from the theory of heat-transfer in a small gap between smooth concentric cylinders. The temperature drop in the insulation is calculated by the usual methods, as in a plane wall. The temperature drop along the teeth is determined as for a heat-conducting rod with uniformly-distributed internal heat sources. The temperature drop radially outwards through the stator is also determined as for a plane wall with uniformly distributed heat sources. A diagram of the enclosed self-ventilated motors, types MA-36 and PED, that are considered in the article are illustrated

Card 1/4

diagrammatically in Figure 1, which shows their distinctive feature to be direct cooling of the stator core by the cooling medium, which can move at a high speed. An important but insufficiently studied magnitude is the velocity of cooling air between the core and the frame. This should be calculated for and/machines of the type considered an approximate semi-empirical formula gives satisfactory results. In calculating the heating of the ventilating air the axial component of the air velocity should be included in calculations. The assumptions that are made in the calculation are stated. The total heating of the part of the stator winding which is in the slots is determined as the sum of the temperature drops in the insulation, in the teeth, in the outward path through stator and in the cooling medium; the temperature rise of the cooling medium must be added and is taken as half the total temperature rise of the cooling medium. To calculate the temperature rise of the rotor windings, the temperature drop in the gap, in half the radial height of the rotor teeth and in the thickness of the rotor slot insulation must be added to the temperature rise for the stator. In loaded machines, calculation reveals a large

 temperature drop along the radial height of the stator teeth,

The Thermal Design of Enclosed Induction Motors Types MA-36 and PED

which indicates that the stator conductors at the bottom of the slots are less heated than those near the air gaps. The design procedure and necessary auxiliary information are then given.

The initial data for the thermal calculations are then stated, including the dimensions, as indicated in Figure 1, the heating losses and the velocity; also the physical properties of the materials and cooling media, taken from published data. The sequence of calculation is then described - in particular, Nusselt's criterion may be determined either graphically, using Figure 2, or analytically. Then the special features of the design of liquid-filled machines (submersible types) and of machines with an internal fan are considered.

Test and design data for a number of machines are tabulated. The winding temperature was determined by resistance, with extrapolation to the instant of switching off. Usually the experimental temperature rise is greater than the calculated value. This is probably because the stray losses generally exceed 0.5% of the output. The procedure described in the article is used at the Khar'kov Electro-Mechanical Works for designing enclosed and submersible induction motors.

The Thermal Design of Enclosed Induction Motors Types MA-36 and PED

There are 3 figures. 1 table and 9 references, 6 of which are Soviet and 3 English.

ASSOCIATIONS: Khar'kovskiy aviatsionnyy institut (Kharkov Aviation Institute) and KhEMZ

BORISENKO, Aleksandr Ivanovich; TARAPOV, Ivan Yevgen'yevich; BLANK, Ya.P., prof., otv.red.; GERMAN, V.L., prof., otv.red.; TRET'YAKOVA, A.N., red.; TROFIMENKO, A.S., tekhn.red.

[Vector analysis and the beginnings of the calculus of tensors] Vektornyi analiz i nachala tenzornogo ischisleniia. Khar'kov, Izd-vo Khar'kovskogo gos.univ., 1959. 237 p. (MIRA 13:8)
(Calculus of tensors) (Vector analysis)

27564
S/170/61/004/010/019/019
B108/B102

26.5200

AUTHORS: Borisenko, A. I., Zimin, E. P., Yakovlev, A. I.

TITLE: Flow of a liquid and heat exchange in the gap between two rotating coaxial cylinders with initially axial motion of the liquid

PERIODICAL: Inzhenerno-fizicheskiy zhurnal, v. 4, no. 10, 1961, 129-133

TEXT: Thermal calculations for certain kinds of electromotors require knowledge of the velocity and temperature fields between stator and rotor. Therefore, the authors studied the laminar flow of a liquid between two coaxial cylinders axis-z with the radii r_1 and r_2 ($r_2 > r_1$). Density ρ, specific heat c_p, viscosity μ, and heat conductivity λ of the liquid are assumed to be constant. Steady flow and heat transfer are described by the equations $\rho(\vec{W}\nabla)\vec{W} = -\nabla p + \mu\Delta\vec{W}$ (1), $\rho c_p \vec{W}\nabla T = \lambda\Delta T + \mu D$ (2), $\mathrm{div}\vec{W} = 0$ (3), where μD is the function of viscous dissipation. The conditions $d/d\rho = 0$ and $W_r = 0$ are postulated. Consequently, $W_z = W_z(r)$. Under

Card 1/4

these conditions one may write $p = \varphi(r) + \ldots z$, where $\ldots = -\frac{dp}{dz} = \text{const}$, so that $\frac{\partial p}{\partial r} = \frac{d\psi}{dr}$ and $W_\varphi = W_\varphi(r)$. Eqs. (1) - (3) assume the form

$$\rho \frac{W_\varphi^2}{r} = \psi', \tag{8}$$

$$\Pi + \mu\left(W_z'' + \frac{1}{r}W_z'\right) = 0, \tag{9}$$

$$W_\varphi'' + \frac{1}{r}W_\varphi' - \frac{W_\varphi}{r^2} = 0. \tag{10}$$

The primes indicate differentiation with respect to r. The solutions to these equations are $W_z = C_1 \ln r - \frac{\Pi}{4\mu} r^2 + C_2$ (11), $W_\varphi = C_3 r + C_4/r$ (13), and $\varphi(r) = \varphi'(r) + C_5$, where $\varphi'(r) = \frac{C_3^2}{2} r^2 + 2C_3 C_4 \ln r - C_4^2/2r^2$. The constants C_i may be determined from boundary conditions. Assuming that

$z = 0$ and $p = p_1$ at the inlet and $z = L$, $p = p_2$ at the outlet of the flow channel, one obtains $\pi = -(p_1 - p_2)/L$. The calculations show that the velocity distribution is independent of the temperature distribution. The energy balance equation (2) assumes the form

$$\rho c_p W_z \frac{\partial T}{\partial z} = \lambda \left(\frac{\partial^2 T}{\partial r^2} + \frac{1}{r} \frac{\partial T}{\partial r} + \frac{\partial^2 T}{\partial z^2} \right) + \mu \left(\frac{dW_\varphi}{dr} - \frac{W_\varphi}{r} \right)^2 + \mu \left(\frac{dW_z}{dr} \right)^2. \quad (15)$$

For this equation, a solution of the form $T = Az + \theta(r)$ (16) may be found. Elementary calculations show that

$$0 = -\frac{\pi(\pi + \rho A C_4)}{64 \mu \lambda} r^4 + \frac{1}{4} \left(C_2 + \frac{C_1 \pi}{\lambda} - \frac{\rho A C_1 C_4}{2\lambda} \right) r^2 - \frac{\mu C_4^2}{\lambda r^2} - \frac{\mu C_1}{2\lambda} (\ln r)^2 + \frac{\rho A C_1 C_4}{4\lambda} r^2 \left(\ln r - \frac{1}{r} \right) + D_1 \ln r + D_2. \quad (17)$$

Card 3/4

The constants D_1 and D_2 can be determined from boundary conditions. For numerical calculations, either the temperature gradient on the cylinders or the specific fluxes q_1 and q_2 on the walls of the cylinders may be given. The following relation is found for A:

$$A = \frac{\partial T_m}{\partial z} = \frac{2(q_1 r_1 + q_2 r_2)/(r_1 + r_2) + \int_{r_1}^{r_2} (\mu D)\, dr}{\rho c_p \int_{r_1}^{r_2} W_z\, dr}. \qquad (19),$$

where T_m is the mean temperature of the liquid. There are 3 Soviet references.

SUBMITTED: February 20, 1961

Card 4/4

PHASE I BOOK EXPLOITATION SOV/6017

Borisenko, Aleksandr Ivanovich

Gazovaya dinamika dvigateley (Engine Gas Dynamics), Moscow, Oborongiz, 1962. 793 p. Errata slip inserted. 9000 copies printed.

Reviewer: G. Yu. Stepanov, Doctor of Physics and Mathematics; Ed.: I. Ye. Tarapov, Candidate of Physics and Mathematics; Ed. of Publishing House: F. G. Tubyanskaya; Tech. Ed.: V. P. Rozhin; Managing Ed.: S. D. Krasil'nikov, Engineer.

PURPOSE: This textbook is intended for students in aviation schools of higher education, in aviation divisions of other schools of higher education, and in power-engineering divisions of machine-building institutes, and also for readers from turbine design offices and laboratories.

COVERAGE: Fundamentals of gas dynamics for aircraft engines, mainly gas-turbine, are presented. One-dimensional and linearized plane flows, inlets, and nozzles are discussed in detail. Included are the theory of blade profile and of the grid profiles, cavitation and pulverization of liquids, and the mechanics of

Card 1/10 2

highly rarefied gases. Elements of magnetogasdynamics and the derivation and analysis of the equations of continuous media are also considered. The author thanks I. Ye. Tarapov, Docent; G. T. Pozhidayev, Engineer; I. L. Povkh, Professor; B. S. Vinogradov, Docent; G. S. Stepanov, Doctor of Physics and Mathematics; K. N. Davydov, Docent, Engineer; N. I. Akhiyezer, Corresponding Member, Academy of Sciences UkrSSR; I. M. Kirkho, Corresponding Member, Academy of Sciences, Latvian SSR; A. D. Myshkis, Professor; A. I. Bunimovich, Candidate of Physics and Mathematics; A. V. Vatazhin, Engineer; V. N. Yershov, Docent; Yu. V. Stepanov, Docent; and E. P. Zimin, B. N. Mel'nikov, and I. P. Miroshnik, students. References accompany each chapter.

TABLE OF CONTE[illegible] [Abridged]:

BORISENKO, A.I., kand.tekhn.nauk; Yakovlev, A.I., inzh.

Independently operating "rider" fans for cooling d.c. machinery with medium power ratings. Vest. elektroprom. 33 no.8:23-26 Ag '62. (MIRA 15:7)

(Electric machinery--Cooling)

BORISENKO, Aleksandr Ivanovich, kand.tekhn.nauk, dotsent; YAKOVLEV, Aleksandr Ivanovich

Hydraulic resistance of medium-sized electrical machines. Izv.vys. ucheb.zav.; elektromekh. 5 no.10:1137-1144 '62. (MIRA 15:11)

1. Zaveduyushchiy kafedroy gazotermodinamiki i reaktivnykh dvigateley Khar'kovskogo aviatsionnogo instituta (for Borisenko).
2. Vedushchiy inzhener laboratorii promyshlennoy aerodinamiki Khar'kovskogo aviatsionnogo instituta (for Yakovlev).
(Electric machinery--Cooling)

L 14406-63 EPA(b)/EWT(1)/BDS AEDC/AFFTC/AFMDC/ASD Pd-4

ACCESSION NR: AP3003320 S/0041/63/015/002/0119/0134

58

AUTHOR: Borisenko, A. I.; My*shkis, A. D. (Kharkov)

TITLE: Plane flow of an ideal incompressible fluid of thin profile around a large bend

SOURCE: Ukrainskiy matematicheskiy zhurnal, v. 15, no. 2, 1963, 119-134

TOPIC TAGS: vortex layer, incompressible fluid, thin profile, large bend

ABSTRACT: It is known that the problem of plane flow of an ideal incompressible fluid of thin profile around a small bend, as well as a lattice of such profiles, can be solved by the method of vortex layers. This method considers the unknown flow to be the result of a system of vortices distributed along the chords of the profile, where the density of vortices is determined from the boundary condition on the profile. This leads to an integral equation for this density. In the case of large bends, treated by the authors, the method of vortex layers can also be used if the vortex is situated on the center line of the profile. The method of vortex layers leads to the necessity of effectively solving a singular integral equation for a single profile and one for a lattice of profiles. A single parabolic profile is discussed in detail. In this case the equation assumes another form, and its solution is found in the form of a series with undetermined coefficients which are

Card 1/2

L 14406-63

ACCESSION NR: AP3003320

found by means of an infinite system of linear equations whose coefficients are expressed by double Fourier coefficients. A rapidly converging iterational method is indicated for finding the latter; the system of equations is also solved by means of rapidly converging iterations. The method may be extended to polynomial profiles higher than second power and on a lattice of profiles without essential changes. The work does not contain full formal proofs. Orig. art. has: 28 formulas, 1 diagram, and 1 table.

ASSOCIATION: none

SUBMITTED: 28Jan61	DATE ACQ: 24Jul63	ENCL: 00
SUB CODE: PH,MM	NO REF SOV: 006	OTHER: 001

Card 2/2

L 12916-63 BDS/EWP(q)/EWT(...) AFFTC/ASD JD/JG

ACCESSION NR: AP3000187 S/0080/63/036/004/0818/0824

AUTHOR: Borisenko, A. I.; Artem'yev, V. I.; Antonova, N. I.

TITLE: Diffusion mobility of iron in a protective coating of niobium and molybdenum

SOURCE: Zhurnal prikladnoy khimii, v. 36, no. 4, 1963, 818-824

TOPIC TAGS: niobium, niobium diffusion coating, molybdenum, molybdenum diffusion coating, glass coating, iron diffusion, thermal expansion coefficient

ABSTRACT: The diffusion of Fe in two-phase systems of Nb-glass and Mo-glass has been studied by the method of tagged atoms (Fe^{59}) in an attempt to clarify the effect of Fe on the protective ability of glass coatings. In the preliminary experiments the parameters of Fe diffusion in individual components were determined. Films of Fe^{59} were deposited on specimens of 366 glass (58% SiO_2, 20% Ba_2O_3, 5.0% each Al_2O_3 and CoO, 6% TiO_2, and 3.0% each ZrO_2 and BeO) and sintered 99.7%-pure Mo and 99.8%-pure Nb, which were then held at 1000—1200C (Nb and Mo) or 700—900C (glass) for 10-100 hr in argon at 150—180 mm Hg. It was found that the temperature dependence of the coefficient of Fe diffusion in Nb and Mo is exponential and is expressed by the equations $D = 1.6 \times 10^{-3} \exp [54,000/RT]$ for Mo and

Card 1/3

L 12916-63

ACCESSION NR: AP3000187

1

$D = 3.0 \times 10^{-3}$ exp [51,000/RT] for Nb, where 54,000 and 51,000 are the values of the activation energy in cal/g-atom. The low values of the activation energy appear to be a result of diffusion proceeding predominantly along the grain boundaries, which is usual in sintered Nb and Mo. The diffusion of Fe in the 366 glass in the 700—900C range was found to be negligible. In the second series of experiments the 366 glass coating with uniformly distributed Fe^{59} was fused on Nb and Mo specimens at 1380—1420C in an argon atmosphere, and the coated specimens were annealed for 45 hr at 1200C in argon at 160 mm Hg. In both cases, the Fe atoms were found to move toward the glass-metal interface. Stresses resulting from a difference in the coefficients of thermal expansion (Nb, 84×10^{-7}; Mo, 52×10^{-7}; 366 glass, 30×10^{-7} in the 25—600C range) intensify the Fe migration. In the case of Nb almost all the Fe is concentrated in the glass layer adjacent to the Nb with very little Fe migration into the surface layer of Nb, owing to microcracks originated by thermal stresses. No microcracks are formed in coating on Mo, which facilitates formation of a continuous glass-metal interface through which Fe atoms readily diffuse into Mo. Orig. art. has: 2 tables, 4 figures, and 10 formulas.

ASSOCIATION: none

Card 2/3

BORISENKO, A.I. (Khar'kov); MYSHKIS, A.D. (Khar'kov)

Plane flow of an ideal incompressible liquid past thin profiles with large flexures. Ukr. mat. zhur. 15 no.2:119-134 '63. (MIRA 16:9)

L 60898-65 EWG(j)/EWT(l)/EWP(e)/EWT(m)/EPF(c)/EWP(i)/EPF(n)-2/EWG(m)/EWA(d)/EWP(v)/EPA(w)-2/T/EWP(t)/EWP(k)/EWP(z)/EWP(b)/EWA(c) IJP(c) JD/WW/RM/JG/WB/AT/WH

AM5019747 BOOK EXPLOITATION UR/ 60 53 621

Usov, Leonid Nikolayevich; Borisenko, Anatoliy Isidorovich (Doctor of Technical Sciences) 44,55 44,55

The use of plasma for obtaining refractory coatings (Primeneniye plazmy dlya polucheniya vysokotemperaturnykh pokrytiy). Moscow, Izd-vo "Nauka", 1965. 84 p. illus., biblio. (At head of title; Akademiya nauk SSSR) 4000 copies printed.

TOPIC TAGS: plasma, plasma use, refractory coating, corrosion, structural material corrosion, gas corrosion, corrosion prevention

PURPOSE AND COVERAGE: This book is intended for scientific works, technologists and designers engaged in research on means for protecting structural materials against high-temperature gas corrosion. The book reviews present engineering possibilities of obtaining an ionized gas jet. It describes methods of obtaining plasma and presents various designs of elements of a unit serving for deposition of protective coatings. Methods of depositing certain refractory compounds with the aid of a plasma jet are discussed. Data on the physical properties of coatings intended for the protection of structural materials against high-temperature gas corrosion are presented.

Card 1/4

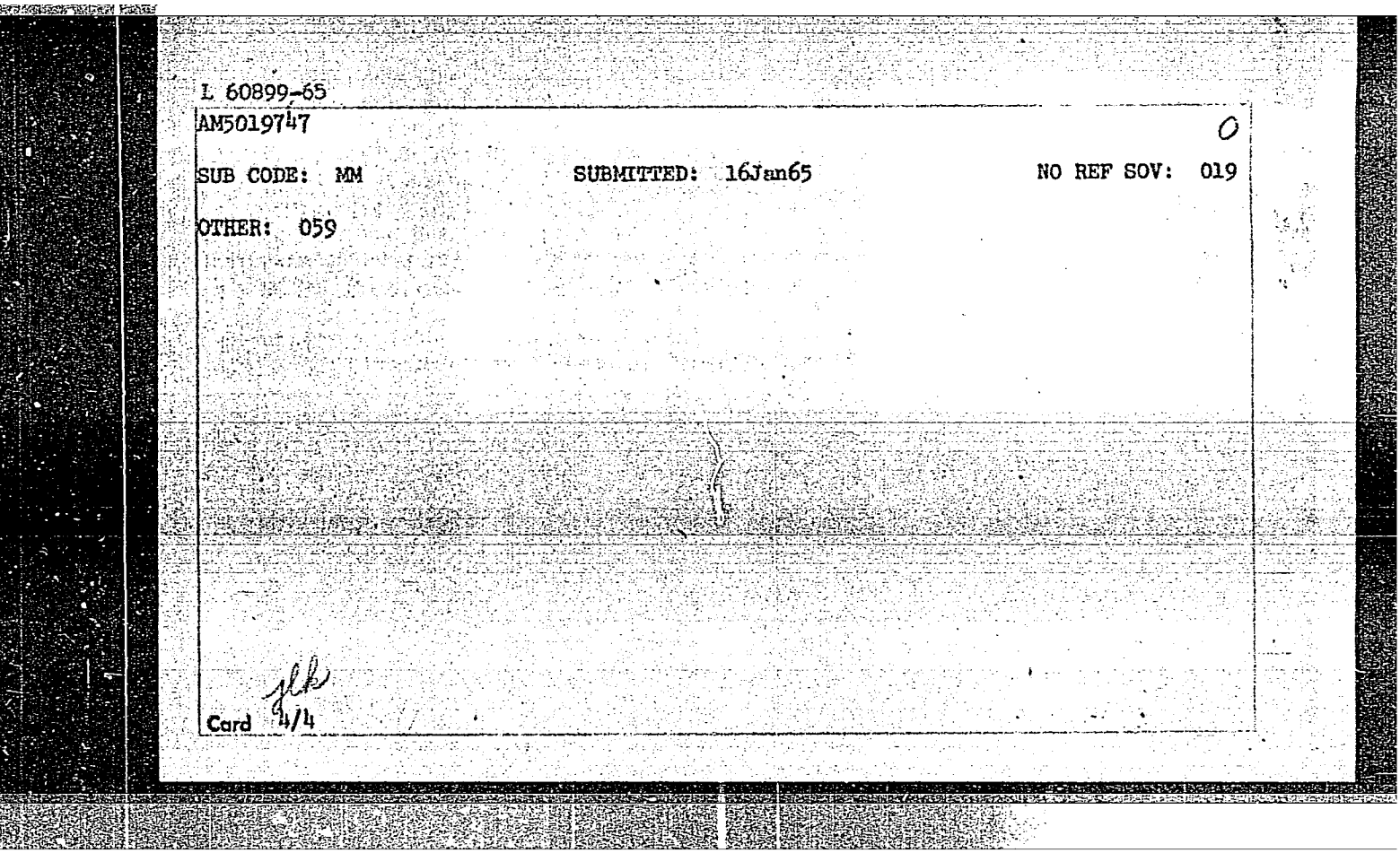
L 60899-65

AM5019747

4

TABLE OF CONTENTS:

Card 2/4



L 60899-65
AM5019747 0

SUB CODE: MM SUBMITTED: 16Jan65 NO REF SOV: 019

OTHER: 059

Card 1/1

L 15747-66 EWP(e)/EWT(m)/EWP(w)/T/EWP(t)/EWP(k)/EWP(b)/ETC(m)-6 JD/WW/WH

ACC NR: AT5027950 SOURCE CODE: UR/0000/65/000/000/0147/0155

AUTHOR: Nikolayeva, L. V.; Borisenko, A. I. (Doctor of technical sciences)

ORG: none

TITLE: Pliable glass enamel coatings for chromel and alumel wires

SOURCE: Seminar po zharostoykim pokrytiyam. Leningrad, 1964. Zharostoykiye pokrytiya (Heat-resistant coatings); trudy seminara. Leningrad, Izd-vo Nauka, 1965 147-155

TOPIC TAGS: enamel coating, glass product, thermocouple, specialized coating, wire

ABSTRACT: Chromel-alumel thermocouples 0.5-0.1 mm in diameter are often set into metallic blocks heated to 700-800C. Attempts to insulate them by glass enamel coatings applied from aqueous suspension failed because of the brittleness of the thick layer obtained. A method was proposed for the application of a 2-3 μ pliable layer from a semicolloidal solution, while retaining the electrical properties at high temperatures. The SiO_2 hydrolysate and the highly dispersed solutions were prepared by the solution ceramic method (S. W. Bradstreet, solution

1/3

ceramic for enameling, Ceramic Age 66, 6, 1955, 24). The calculation of the required concentrations of salts in solutions was made according to the formulas on hydrolysis, (during coating) of selected compounds, e.g., $(C_2H_5O)_4Si \rightarrow H_4SiO_4 \rightarrow SiO_2$, or $2Cr(NO_3)_3 \cdot 9H_2O \xrightarrow{t^\circ} Cr_2O_3 + 3N_2O_4 + 1.5O_2 + 18H_2O$. The quality of the solution mixture, and hence the quality of the coatings, depended on the sequence of mixing. The solutions of various salts should be mixed by adding them into the SiO_2 hydrolysate in the following sequence: (1) H_3BO_3, $LiNO_3$, $NaNO_3$, $Ca(NO_3)_2$, $Sr(NO_3)_2$, $Zn(NO_3)_2$, $Al(NO_3)_3$; (2) $Ba(NO_3)_2$; $Zr(NO_3)_4$; (3) $Pb(NO_3)_2$; and (4) $Co(NO_3)_2$, $Ni(NO_3)_2$, $Cr(NO_3)_3$. The surface of the wire should be cleansed of oil and grease. An immersion of the wire for 5-6 minutes into a heated (70-90C) mixture of $NaCO_3$ 25-30 g/l and reagent OP-10 3-6 g/l with subsequent washing in hot water and acetone was sufficient. The coating could be made either by immersion into a solution or by drawing through a plastic sponge wetted by the solution. After coating wires were dried for several minutes at 60-70C and rapidly baked in an electric furnace at the melting temperature of the coating (850-950C). The coatings obtained sometimes had small defects easily removable by repeated coating. The three coatings ontaining (1) 25.0% SiO_2, 13.0% CaO, 12.0% B_2O_3, 5.0% ZnO, 3.0% MgO, 4.0% MnO_2, 2.0% NiO; (2) 33.0% SiO, 0.45% K_2O, 0.5% Li_2O, 5.8% CaO, 6.5% B_2O_3, 43.0% PbO, 10.0% BaO, 1.0% CoO; and (3) 42.0% SiO_2, 10.0% K_2O, 5.0% B_2O_3

L 15747-66
ACC NR: AT5027950

43.0% PbO, 2.0% CoO has uniform continuous layers, 3-5μ thick, and satisfactorily high pliability and electric insulating properties. Orig. art. has: 3 figures and 2 tables.

SUB CODE: 11/ SUBM DATE: 20Jul65/ ORIG REF: 003/ OTH REF: 003

3/3

ACC NR: AT6027145 SOURCE CODE: UR/0000/65/000/000/0184/0189

AUTHOR: Nikolayeva, L. B.; Borisenko, A. I.

ORG: none

TITLE: Thin-layer glass-enamel coatings for chromel and alumel wire

SOURCE: AN SSSR. Otdeleniye obshchey i tekhnicheskoy khimii. Issledovaniya v oblasti khimii silikatov i okislov (Studies in the field of chemistry of silicates and oxides). Moscow, Izd-vo Nauka, 1965, 184-189

TOPIC TAGS: protective coating, thermocouple, glass property

ABSTRACT: The article describes compositions of glass enamels and methods of their deposition from semicolloidal solutions on chromel and alumel wires to be used as flexible, insulated thermocouples. Stable solutions were prepared which contained cations of the heavy metals barium and lead in addition to silic acid sol. Solutions containing zirconium should be used within 24 hours of their preparation. A new method of depositing the coatings was worked out which makes prior heating of the specimen to be coated unnecessary. The method consists in immersing the wire in the solution or passing it through a foam-plastic sponge wetted with the solution. Compositions of soluble glass enamels are proposed which under the same firing conditions are fused onto chromel, alumel and their alloy, so that they can be deposited on finished ther-

Card 1/2

ACC NR: AT6027145

mocouples. Continuous, flexible coatings having an adequate heat resistance at 600-750°C were obtained. Orig. art. has: 2 figures and 2 tables.

SUB CODE: 11/ SUBM DATE: 18Jun64/ ORIG REF: 005/ OTH REF: 003

Card 2/2 gd

BABUSHKIN, V.N.; BORISENKO, A.I.

Unit for studying diffusion in solids. Prib. i tekh.eksp. 10 no.5:158-160 S-O '65. (MIRA 19:1)

1. Institut khimii silikatov AN SSSR, Leningrad. Submitted July 25, 1964.

USOV, Leonid Nikolayevich; BORISENKO, Anatoliy Isidorovich, doktor tekhn. nauk

[Use of a plasma in producing heat-resistant coatings] Primenenie plazmy dlia polucheniia vysokotemperaturnykh pokrytii. Moskva, Nauka, 1965. 84 p. (MIRA 18:3)

BORISENKO, A.I.

USSR/Electronics - Vacuum Techniques H-9

Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 7193

Author : Roykhrudol', E.M., Smirnitskaya, G.V., Borisenko, A.I.
Title : Ionic Pump with Cold Electrodes and Its Characteristics

Orig Pub : Radiotekhn. i elektronika, 1956, 1, No 2, 253-259

Abstract : An investigation was made of the absorption of gases in an electric discharge by cold cathodes, placed in a longitudinal magnetic field at a pressure 10^{-2} -- 10^{-8} mm mercury, voltages up to 4.5 kv, and magnetic field intensities of 350 -- 1,000 oerstod, for air, neon, and helium. The smaller pump-out velocity in the case of neon and helium is attributed to weaker cathode spattering in these gases. The optimum ratios between the applied voltages and the intensity of the magnetic field have been chosen experimentally. It is shown that the anode material does not play a substantial role, and that the best results are obtained with cathodes made of tantalum, molybdenum, and niobium. The distribution of the current density on the surface of the cathode is investigated, and it is shown that in the cathode-spattering process the greatest

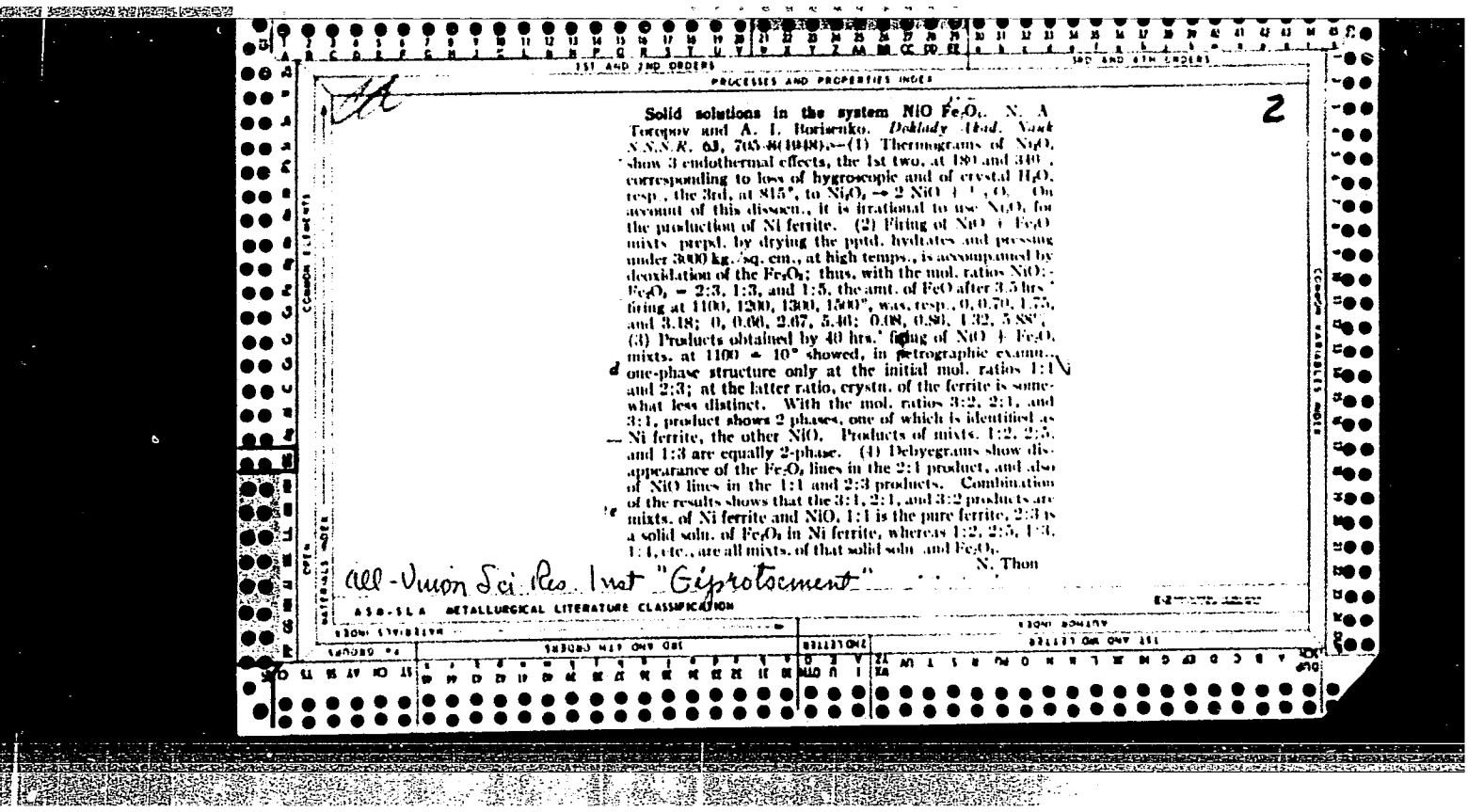
Card : 1/2

USSR/Electronics - Vacuum Techniques H-9

Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 7193

role is played by the central region of the cathode. The dependence of the pump-out speed on the geometry of the discharge gap, on the distance between electrodes, and on the diameter of the tube has been established. The pump can operate on ac and dc, and there is no saturation. The capacity of the pump can be increased considerably by connecting several sections in parallel (in a single tube). Bibliography, 7 titles

Card : 2/2



1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

2

Solid solutions in the system NiO Fe_2O_3. N. A. Toropov and A. I. Borisenko. *Doklady Akad. Nauk S.S.S.R.* 63, 705-8(1948).—(1) Thermograms of $Ni(O)_2$ show 3 endothermal effects, the 1st two, at 180 and 340°, corresponding to loss of hygroscopic and of crystal H_2O, resp., the 3rd, at 815°, to $Ni_2O_3 \rightarrow 2\,NiO + \frac{1}{2}\,O_2$. On account of this dissocn., it is irrational to use Ni_2O_3 for the production of Ni ferrite. (2) Firing of NiO + FeO mixts. prepd. by drying the ppted. hydrates and pressing under 3000 kg./sq. cm., at high temps., is accompanied by deoxidation of the Fe_2O_3; thus, with the mol. ratios NiO: Fe_2O_3 = 2:3, 1:3, and 1:5, the amt. of FeO after 3.5 hrs. firing at 1100, 1200, 1300, 1500°, was, resp., 0, 0.70, 1.75, and 3.18; 0, 0.00, 2.07, 5.46; 0.08, 0.81, 1.32, 5.88%. (3) Products obtained by 40 hrs. firing of NiO + Fe_2O_3 mixts. at 1100 ± 10° showed, in petrographic examn., one-phase structure only at the initial mol. ratios 1:1 and 2:3; at the latter ratio, crystn. of the ferrite is somewhat less distinct. With the mol. ratios 3:2, 2:1, and 3:1, product shows 2 phases, one of which is identified as Ni ferrite, the other NiO. Products of mixts. 1:2, 2:5, and 1:3 are equally 2-phase. (4) Debyegrams show disappearance of the Fe_2O_3 lines in the 2:1 product, and also of NiO lines in the 1:1 and 2:3 products. Combination of the results shows that the 3:1, 2:1, and 3:2 products are mixts. of Ni ferrite and NiO, 1:1 is the pure ferrite, 2:3 is a solid soln. of Fe_2O_3 in Ni ferrite, whereas 1:2, 2:5, 1:3, 1:4, etc., are all mixts. of that solid soln. and Fe_2O_3.

N. Thon

All-Union Sci. Res. Inst. "Giprotsement"

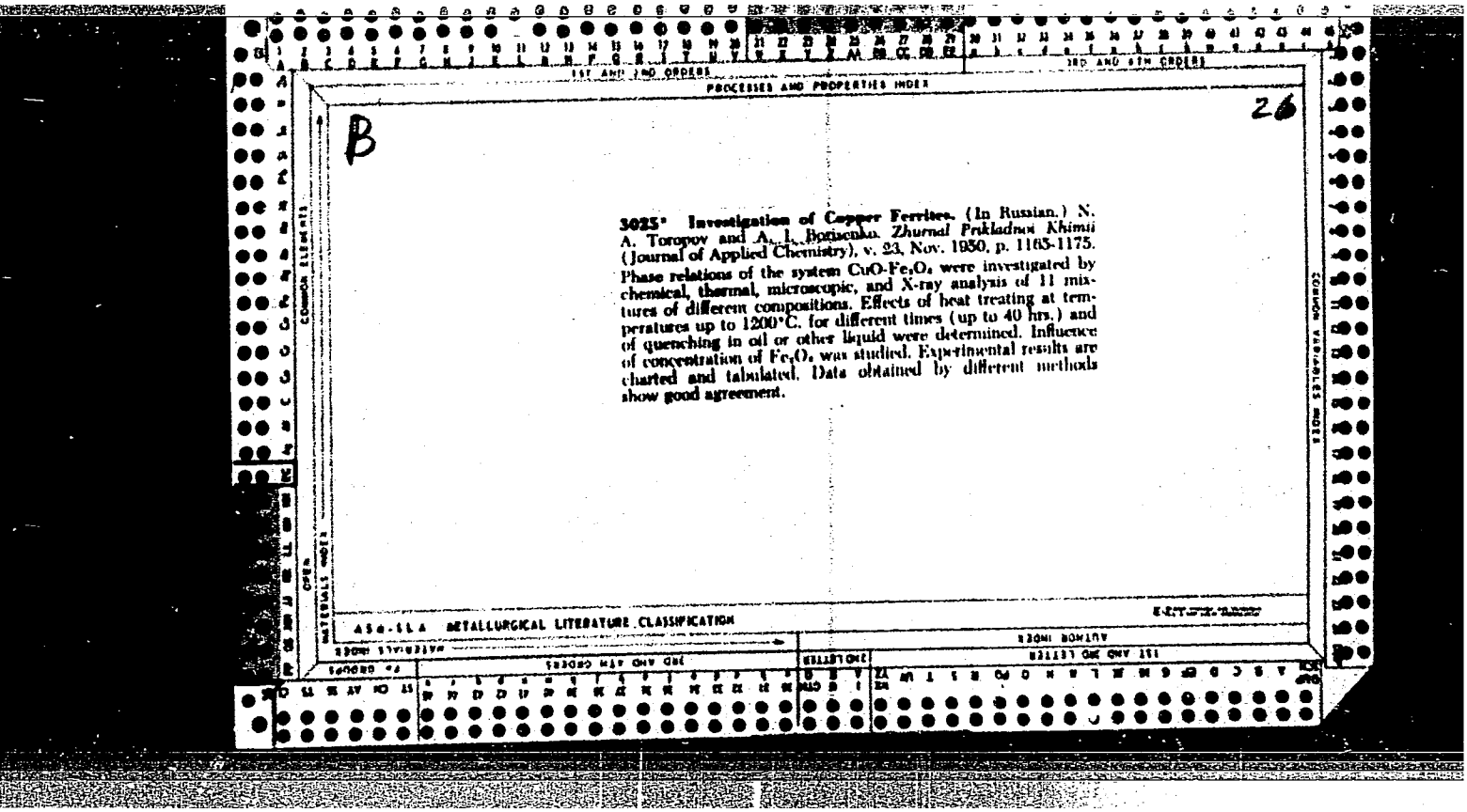
A50-SLA METALLURGICAL LITERATURE CLASSIFICATION

BORISENKO, A. I. (Anatoliy Isakovich)

BORISENKO, A.I.

All-Union Sci. Res. Inst. 'Giprotsement'

"Solid Solutions in the System $CoO-Fe_2O_3$," Dok. AN. 66, No. 5, 1949. Giprotsement,"



PROCESSES AND PROPERTIES INDEX

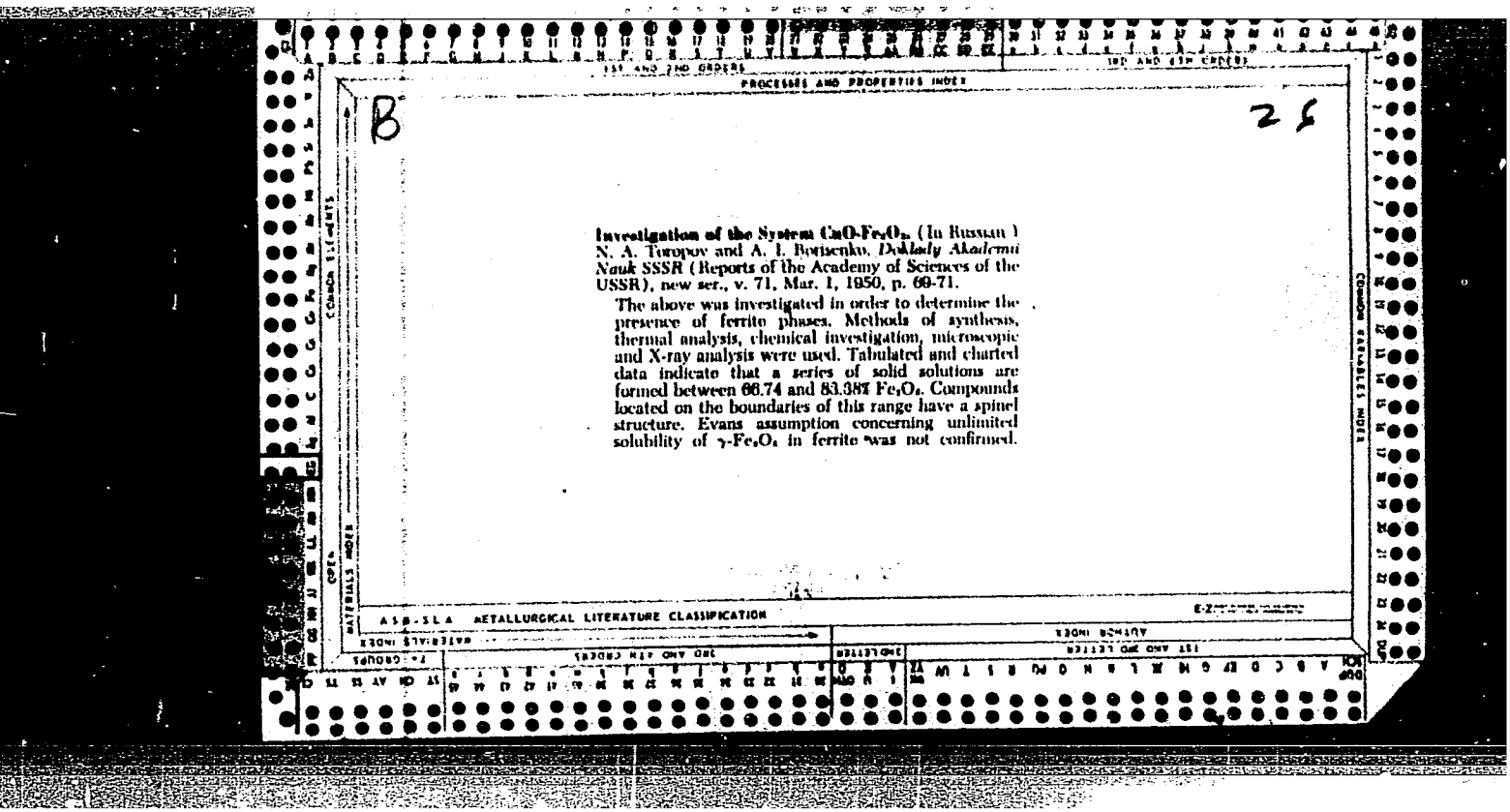
B

26

3025* Investigation of Copper Ferrites. (In Russian.) N. A. Toropov and A. I. Portnenko. *Zhurnal Prikladnoi Khimii* (Journal of Applied Chemistry), v. 23, Nov. 1950, p. 1165-1175. Phase relations of the system CuO-Fe_2O_3 were investigated by chemical, thermal, microscopic, and X-ray analysis of 11 mixtures of different compositions. Effects of heat treating at temperatures up to 1200°C. for different times (up to 40 hrs.) and of quenching in oil or other liquid were determined. Influence of concentration of Fe_2O_3 was studied. Experimental results are charted and tabulated. Data obtained by different methods show good agreement.

ASM-ILA METALLURGICAL LITERATURE CLASSIFICATION

AUTHOR INDEX

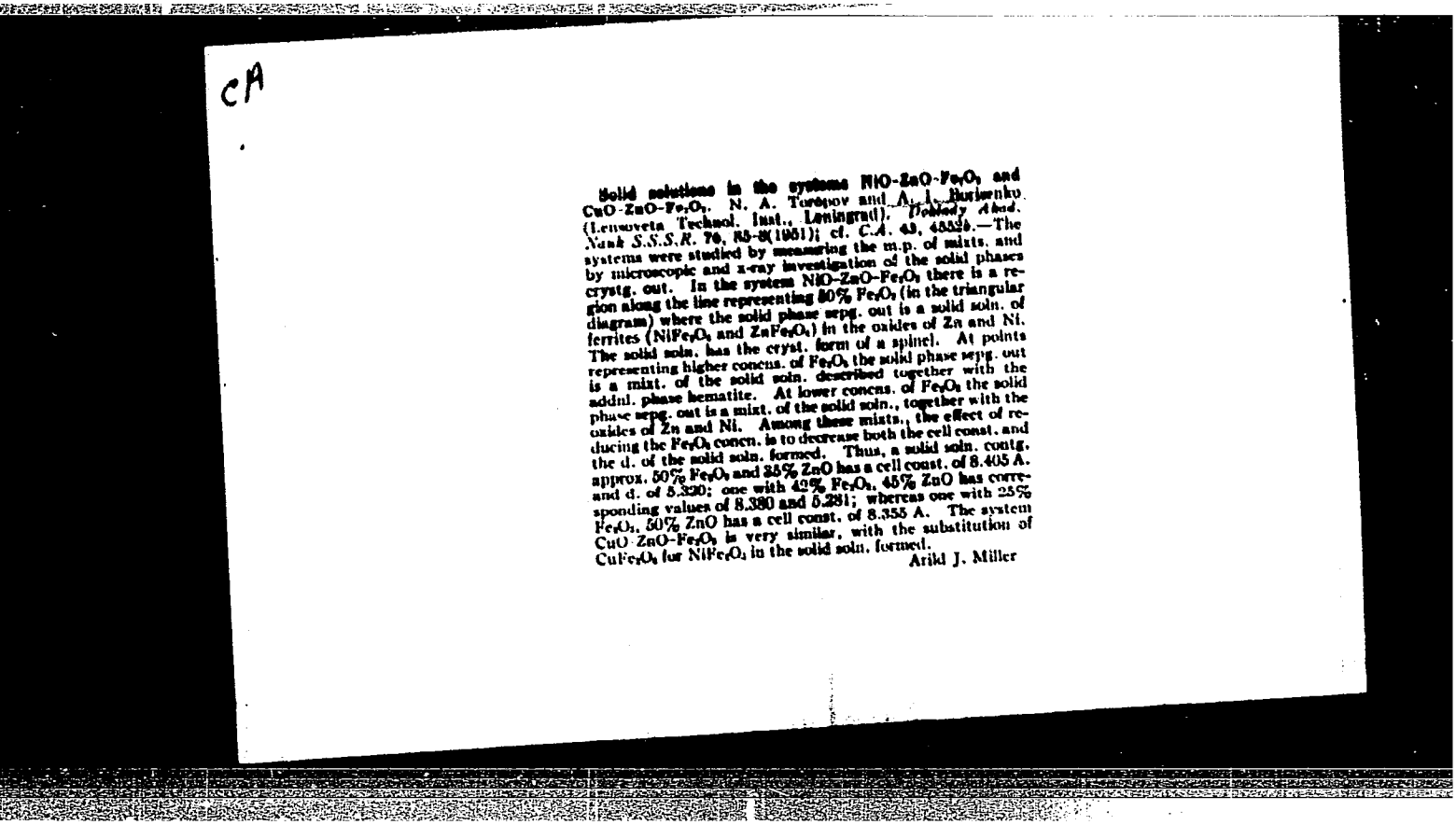


B

26

Investigation of the System CuO-Fe_2O_3 (In Russian) N. A. Toropov and A. I. Borisenko. *Doklady Akademii Nauk SSSR* (Reports of the Academy of Sciences of the USSR), new ser., v. 71, Mar. 1, 1950, p. 69-71.

The above was investigated in order to determine the presence of ferrite phases. Methods of synthesis, thermal analysis, chemical investigation, microscopic and X-ray analysis were used. Tabulated and charted data indicate that a series of solid solutions are formed between 66.74 and 83.38% Fe_2O_3. Compounds located on the boundaries of this range have a spinel structure. Evans assumption concerning unlimited solubility of γ-Fe_2O_3 in ferrite was not confirmed.



CA

Solid solutions in the systems NiO-ZnO-Fe_2O_3 and CuO-ZnO-Fe_2O_3. N. A. Toropov and A. I. Burkenko (Lensoveta Technol. Inst., Leningrad). *Doklady Akad. Nauk S.S.S.R.* 76, 85-8(1951); cf. *C.A.* 43, 4855b.—The systems were studied by measuring the m.p. of mixts. and by microscopic and x-ray investigation of the solid phases crystg. out. In the system NiO-ZnO-Fe_2O_3 there is a region along the line representing 50% Fe_2O_3 (in the triangular diagram) where the solid phase sepg. out is a solid soln. of ferrites ($NiFe_2O_4$ and $ZnFe_2O_4$) in the oxides of Zn and Ni. The solid soln. has the cryst. form of a spinel. At points representing higher concns. of Fe_2O_3 the solid phase sepg. out is a mixt. of the solid soln. described together with the addnl. phase hematite. At lower concns. of Fe_2O_3 the solid phase sepg. out is a mixt. of the solid soln., together with the oxides of Zn and Ni. Among these mixts., the effect of reducing the Fe_2O_3 concn. is to decrease both the cell const. and the d. of the solid soln. formed. Thus, a solid soln. contg. approx. 50% Fe_2O_3 and 35% ZnO has a cell const. of 8.405 A. and d. of 5.320; one with 42% Fe_2O_3, 45% ZnO has corresponding values of 8.380 and 5.281; whereas one with 25% Fe_2O_3, 50% ZnO has a cell const. of 8.355 A. The system CuO-ZnO-Fe_2O_3 is very similar, with the substitution of $CuFe_2O_4$ for $NiFe_2O_4$ in the solid soln. formed.

Arild J. Miller

CA

Solid solutions in the system zinc oxide-ferric oxide. N. A. Toropov and A. I. Boriscnko. *Doklady Akad. Nauk S.S.S.R.* **82**, 607–9(1952).—Samples obtained by sintering for 20 hrs. were examd. by microscopy and x-ray diffraction. The time necessary for the completion of Zn ferrite formation with a compn. $ZnO + Fe_2O_3$ is shortened considerably by short consecutive sinterings sepd. by grinding and pressing anew; whereas 19 hrs. at 1100° is necessary for this compn. to complete reaction in a single heating, 11.5 hrs. is sufficient with 4 intermediate grindings and pressings. The max. permissible temp. is 1100°; higher temps. cause magnetite formation. In microscopic examn., samples of the comps. ($ZnO:Fe_2O_3$) 1:1, 2:3, 1:2, and 2:5 show one single light-gray phase. On passing from 1:1 to 2:5, there is some increase of the porosity. On passing from 3:2 to 3:1, the porosity increases very considerably, and the mech. cohesion decreases. The same loss of compactness and strength is found with comps. with a Fe_2O_3 content higher than 2:5. By X-ray examn. showed that the pure spinel structure is preserved from the compn. 1:1 to 2:5 inclusive. In all other samples, spinel structure is present. The intensity of the ZnO lines increases from the compn. 3:2 to samples with higher ZnO contents. Free Fe_2O_3 is found in 1:3 and in all samples with higher hematite content. The x-ray pattern of the Zn ferrite synthesized at 1100° is analogous to that of the natural franklinite (from New Jersey, U.S.A.) The following comps. ($ZnO:Fe_2O_3$) can be interpreted on the basis of these detns.: 3:1, 2:1, 3:2, mixts. of Zn ferrite and ZnO; 1:1, Zn ferrite; 2:3, 1:2, [illegible], solid solns. of hematite in Zn ferrite; 1:3, 1:4, 1:5, mixts. of solid soln. and hematite. The alleged compd. $2ZnO:Fe_2O_3$, described by Raychaudhuri (*C.A.* 29, 7138[3]) is nothing but a solid soln. of Fe_2O_3 in Zn ferrite. N. Thon

TOROPOV, N.A.; BORISENKO, A.I.

Physicochemical study of solid solutions formed by orthosilicates of calcium and barium. (In: Soveshchanie po eksperimental'noi mineralogii i petrografii. 4th, Moscow, 1952. Trudy, Moskva, 1953. No.2, p.214-229). (MLRA 7:3)

1. Fiziko-khimicheskaya laboratoriya Instituta khimii silikatov Akademii nauk SSSR. (Silicates) (Systems (Chemistry)) (Solutions, Solid)

Hydrous calcium silicates. N. A. Toropov, A. I. Borisenko, and P. V. Shirokova. *Izvest. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk* 1953, 68–9.—The reactions of $Ca(OH)_2$ with SiO_2 hydrogels depend chiefly on the dispersity of the "silicic acids." This is the principal reason for so many contradictory results on the syntheses of Ca silicate hydrates in the literature. A detailed synthetic method is given, starting from pure CaO, anhyd. glycerol, and silica gel. First, Ca glycerolate is formed by the reaction of CaO with excess glycerol. The SiO_2 gel is not dissolved in glycerol. Powdered quartz does not react quickly enough, and the yield of the synthesis is unsatisfactory. Ca glycerolate, reacting with amorphous silicic acid at 190°, forms $2CaO.SiO_2$, which, after dilution of the liquid with excess H_2O, is changed to $2CaO.SiO_2.H_2O$, very pure, and in practically 100% yield. It is an extremely fine powder, apparently amorphous, although its x-ray diffraction pattern is that of a well-defined compd. The spacings from the x-ray diagram agree well with those given by Taylor (*C.A.* 45, 3569*f*) for $2CaO.SiO_2.H_2O$. At 900° the hydrate is changed to $2CaO.SiO_2$ without formation of free CaO. W. Eitel

TOROPOV, N. A., BORISENKO, A. I., SHIROKOVA, I. V.

Silicates

Calcium hydrosilicates. Izv. AN SSSR Otd. khim. nauk. No. 1, 1953.

Monthly List of Russian Accessions, Library of Congress
June 1953. UNCL.

U S S R

Investigation of the system tricalcium silicate-tricalcium phosphate. N. A. Toropov, A. I. Borisenko, and P. V. Shirokova. *Doklady Akad. Nauk S.S.S.R.*, 92 [5] 1015-18 (1953).—Disks made from mixtures of $3CaO \cdot SiO_2$ (I) and $3CaO \cdot P_2O_5$ (II) were heated at 1450°C., and every 10 min. a different disk was removed and subjected to microscopic and chemical analysis. Disks prepared of 98 to 50 mole % I and 2 to 50 mole % II were found to consist of tricalcium silicate, free CaO, solid solutions of silicophosphates, and tetracalcium phosphate (III), in amounts depending on the original proportions of I and II. Free CaO increased with time, reaching a maximum in 60 min. At this point, tricalcium silicate, dicalcium silicate, CaO, tricalcium phosphate, and traces of tetracalcium phosphate were observed. After 70 min. at 1450°C., free CaO dropped to a minimum. Free CaO is formed in accordance with $3CaO \cdot SiO_2 \rightarrow CaO + 2CaO \cdot SiO_2$ and only in the presence of II. Detection of III is indicative of the reaction $3CaO \cdot P_2O_5 + CaO \rightarrow 4CaO \cdot P_2O_5$. After 80 min., silicocarnotite was also detected and there was a further increase in the amount of free CaO, reaching a constant limit at 100 to 140 min. The final content of free CaO depended on the composition of the disks, increasing to 11.47 wt. % for 0 to 20 mole % II and dropping to 0 for 60 mole % and more II. In all cases, free CaO was less than that expected from decomposed I. This was traced to solution of CaO in silicocarnotite and nagelschmidtite with the formation of more basic silicophosphates. B.Z.K.

BORISENKO, A. I.

✓Interaction of calcium phosphate with clinker materials. N. A. TOROPOV AND A. I. BORISENKO. *Tsement*, 20 [6] 10-14 (1954).—The study dealt with the high-temperature reactions of tricalcium phosphate with the synthetic clinker materials $2CaO \cdot SiO_2$, $3CaO \cdot SiO_2$, $4CaO \cdot Al_2O_3 \cdot Fe_2O_3$, $6CaO \cdot 2Al_2O_3 \cdot Fe_2O_3$, $3CaO \cdot SiO_2 + 2CaO \cdot SiO_2$, and $2CaO \cdot SiO_2 + 3CaO \cdot SiO_2 + 4CaO \cdot Al_2O_3 \cdot Fe_2O_3$. Incomplete linking of CaO during burning of raw cement mixtures containing P_2O_5 is due to thermal decomposition of tricalcium silicate in the presence of P_2O_5, with the formation of dicalcium silicate and free CaO. The influence of tricalcium phosphate on a mixture of dicalcium and tricalcium silicates during burning is determined by the proportion of these silicates in the mixture. The permissible content of P_2O_5 increases with decreasing content of tricalcium silicate in the clinker. The content of P_2O_5 should be established on the basis of physical tests. The behavior of mixtures of tricalcium silicate with tetracalcium aluminoferrite in the presence of additions of tricalcium phosphate is analogous to the behavior of tricalcium silicate. Tricalcium phosphate does not react with Ca aluminoferrites although it dissolves therein during melting. The P_2O_5 is in the clinker as a component of belite, which dissolves Ca silicophosphates, and in the ferruginous phase, which dissolves up to 28% $3CaO \cdot P_2O_5$ at 1500°C. Change in the appearance of alite due to the presence of P_2O_5 in mixtures is determined by nonuniformity of crystals, indicating the start of decomposition of $3CaO \cdot SiO_2$. Use of carbonates containing P_2O_5 should be limited to the production of belite cements. B.Z.K.

MT

AI

(1)

BORISENKO, A. I.

Conditions of synthesis of zinc ferrite. N. A. Tvorgov and A. I. Borisenko. *Zhur. Prikhl. Khim.* 28, 1347–8 (1955); *cf. C.A.* 43, 4552b.—To mixts. of Zn and Fe_2O_3 in equal mol. proportions a soln. of active Zn^{++} was added; the mixt. was dried, compressed under 750 kg./sq. in., and fired for 5 hrs. The curves of sp. activity vs. temp. passed through a sharp min. at 500° and after a sharp rise began to flatten out. The min. was ascribed to the formation of Zn ferrite and the migration of Zn ions from the ZnO to the Zn ferrite lattice (cf. Fricke, *et al.*, *C.A.* 33, 6698[illegible]). The plot of loss of activity vs. temp. passed through a sharp max. at 500°, fell abruptly and flattened out at 800°. The flattening is ascribed to the formation of spinel (cf. Barth, *et al.*, *C.A.* 26, 5036) and finally to the completion of the reaction.

I. Brucewitz

62 (7)

1. Institut Khimii Silikatov Akademii nauk SSSR.

(Zinc ferrates (III))

BORISENKO, A.I.

The cobalt-60 diffusion in cobalt ferrites. A. I. Borisenko and [illegible]. *Doklady Akad. Nauk S.S.S.R.* 105, 1274–7(1955).—The diffusion coeff. in the ceramic-type materials, Co ferrites, was studied; the effect of a uniform phase compn. on the diffusion of one of its components. The samples were synthesized in the solid phase by heating the required proportions of Fe_2O_3 and CoO to produce $3CoO.2Fe_2O_3$, $CoO.Fe_2O_3$, $CoO.2Fe_2O_3$, $2CoO.3Fe_2O_3$, and $CoO.3Fe_2O_3$ for 4 hrs. to 1200°, grinding to −0.25% on a 300-in.-mesh screen, compressing into 15-mm. disks, and reheating for 3 hrs. at 1380°. A thin layer of Co^{60} was applied by coating the polished disks with a cellulose acetate soln. contg. Co^{60}, and the Co distribution uniformity was tested radiographically. The disks were then heated to 1200–1350° for 10–15 hrs. A max. diffusion activation energy was found in $CoO.Fe_2O_3$ which contained the least amt. of voids. The diffusion activation energy dropped sharply in ferrites with Fe_2O_3:CoO > 1.

W. M. Sternberg

BORISENKO, A.I.

USSR/Physical Chemistry - Thermodynamics, Thermochemistry, Equilibria, Physical-Chemical Analysis, Phase Transitions. B-8

Abs Jour : Referat Zhur - Khimiya, No 1, 1958, 403

Author : A.I. Borisenko, P.V. Shirokova.
Inst : -
Title : Study of Calcium Titanates.

Orig Pub : Zh. neorgan. khimii, 1956, 1, No 4, 615-618

Abstract : It was established by the method of complex thermal analysis (RZhKhim, 1953, 2166) that at 765° the 3-calcium dititanate $3CaO.2TiO_2$ (I) suffered a polymorphous transformation accompanied by a small heat effect. It was eatablished by the x-ray-ionization analysis that an insignificant change of the tetragonality of the crystalline lattice of I took place in the temperature range from 700 to 800°, and splitting of some diffraction lines was observed at high temperatures (900 to 1200°), which was caused by structural changes of the crystalline lattice of I.

Card 1/2

USSR/Physical Chemistry - Thermodynamics, Thermochemistry, Equilibria, Physical-Chemical Analysis, Phase Transitions. B-8

Abs Jour : Ref Zhur - Khimiya, No 1, 1958, 403

A new crystalline phase $3CaO.Ti_2O_3$ is produced by melting I several times in electric arc flame.

Card 2/2

A.I. Borisenko

15(2)

AUTHOR: Vargin, V.V.

SOV/72-58-12-22/23

TITLE: Conference on Enamels and Metal Enameling (Soveshchaniye po emalyam i emalirovaniyu metallov)

PERIODICAL: Steklo i keramika, 1958, Nr 12, pp 47-48 (USSR)

ABSTRACT:

The organizers of the conference were: Leningradskoye oblastnoye nauchno-tekhnicheskoye obshchestvo promyshlennosti stroitel'nykh materialov (Leningrad Oblast Scientific and Technical Society of the Industry of Building Materials); Leningradskiy sovnarkhoz (Leningrad Council of National Economy) and Leningradskiy tekhnologicheskiy institut imeni Lensoveta (LTI) (Leningrad Technological Institute imeni Lensovet (LTI). The program of the conference included: the most important problems of enamel synthesis, enameling of metal products and industrial apparatus. About 250 experts took part in the conference: representatives from works in the UkrSSR, Ural, Novosibirsk, Ulan-Ude, Kuznetsk, Dzerzhinsk, as well as functionaries of the universities, of the scientific research and design institutes in Leningrad, Moscow, Novocherkassk, Dnepropetrovsk, Sverdlovsk, Riga, Khar'kov, and other towns. More than 40 reports were given and discussed. Professor K.S. Yevstrop'yev, director of the LTI imeni Lensovet, in his opening speech stressed the great economic importance of the problem of enameling metal products and apparatus.

Card 1/6

Ye.I. Litvinova (LTI imeni Lensovet) reported on the influence of metal quality on the formation of "fish-scales" in enameling.

A.A. Appen, Institut khimii silikatov AN SSSR (Institute of Silicate Chemistry of the AS USSR), spoke on the present stage of the problems of calculating the properties of glass and enamels according to their composition.

M.V. Serebryakova (LTI imeni Lensovet) gave a survey of foreign literature on enamels and metal enameling.

M.N. Lifshits, Nauchno-issledovatel'skiy institut sanitarnoy tekhniki (Scientific Research Institute of Sanitary Engineering) reported on the enameling of products in the electric field of a corona discharge.

I.C. Petrunya, Luganskiy zavod imeni Artema (Luganskiy Works im. Artema) spoke of new types of enameled steel products made in this factory.

Card 2/6

Iu.P. Nikitin, Ural'skiy politekhnicheskiy institut (Ural'skiy Polytechnical Institute) reported on the character of interaction between metals and melted enamels.

N.S. Smirnov, Ural'skiy nauchno-issledovatel'skiy institut chernykh metallov (Ural'skiy Scientific Research Institute of Ferrous Metals) reported on the influence of the condition of the steel surface on the formation of the enamel coat.

A.I. Borisenko, Institute of Silicate Chemistry of the AS USSR, spoke on the new method of obtaining thin silicate coats of semi-colloid solutions.

Ye.N. Podkletnov spoke on a new enameling method with heating of the products by high-frequency currents.

P.A. Rozhdestvenskiy, Lys'venskiy metallurgicheskiy zavod (Lys'venskiy Metallurgic Works) gave informations on new enamels used by the factory.

T.I. Polyutash, Novosibirskiy metallurgicheskiy zavod (Novosibirskiy Metallurgic Works) reported on the dependence of the moistening angle and the enamel deliquescence on the correlation of boric and non-boric salts.

Card 3/6

20-119-2-42/60

AUTHOR: Borisenko, A. I.

TITLE: The Production of Thin Silicate Coatings From Solutions (Polucheniye tonkosloynykh silikatnykh pokrytiy iz rastvorov)

PERIODICAL: Doklady Akademii Nauk SSSR, 1958, Vol. 119, Nr 2, pp. 339-341 (USSR)

ABSTRACT: The covering of metals, alloys, and ceramic materials with thin silicate coatings for the purpose of protection against corrosion and to provide an impermeability to gases as well as to achieve a decorative effect cannot always be carried out by the usual technological methods of the enameling industry. Following, the author describes the generally valid scheme used in this industry (refs. 1-3). The particles of the very finely crushed enamels are by 8-12 times greater than the prescribed thickness of the coating. A finer crushing would demand a considerable consumption of energy. For this reason solutions were used which, when heated, decompose into volatile components and oxides, which then form parts of the coating to be laid on (ref. 4). They were named ceramic or solaramic solutions

Card 1/4

(ref. 7) and contain e.g. nitrates of chromium, aluminum, calcium, and other metals. Since it could not be found in the data published that a solution had been found containing all components of the silicate coating in the form of corresponding compounds, namely a solution from which, when heated, also silicon is separated besides metallic oxides, the author tried to produce stable semi-colloidal solutions which contain nearly all of the most important initial components of glasses, enamels, and glazes. The compounds of the silicate compositions can be greatly varied on this occasion. Such solutions can be produced by mixing silica brine with true solutions of those compounds which decompose into volatile components and corresponding oxides at relatively low temperatures. In table 1 compositions of silicate coatings are given which were produced from solutions and laid on steel, porcelain, corundum, and molybdenum. They are all suited to be used in several layers. The thickness of the layers could be varied within 0,5 and 100 μ and more. A usual color atomizer was used for application. The metal surface should be subjected to such a thermal treatment on which low oxides form. Then the wetting by the mentioned solution is highest (refs. 7-10).

Firing is carried out either in neutral gas or in air, according to the oxidizability of the coating and does not last longer than 1-2 minutes with small samples. The temperature of firing must be lower by 130-180° than the temperature which would be necessary for the usual enamel of the same composition. The produced coating forms a thin vitreous layer which rigidly adheres to the surface of the material to be coated. The layer is impermeable to gas and demands no additional processing by soaking with other materials. These are the advantages of these solutions: lower firing temperature, equal thickness of the coating can be achieved easily, simple working method: a) production of the solution b) spraying on to the product heated to 280-410°, c) firing. There are 1 table and 11 references, 5 of which are Soviet.

ASSOCIATION: Institut khimii silikatov Akademii nauk SSSR (Institute for Silicate Chemistry, AS USSR)

PRESENTED: October 10, 1957, by S. I. Vol'fkovich, Member, Academy of Sciences, USSR

The Production of Thin Silicate Coatings From Solutions 20-119-2-42/60

SUBMITTED: October 8, 1957

Card 4/4