TIMOFEYEV, D.A.

Practice in correlating the peneplanation of the globe. Izv. AN SSSR. Ser. geog. no.3:14-23 '64. (MIRA 17:6)

1. Institut geografii AN SSSR.

TIMOFEYEV, D.A.

Geomorphology of accumulative lacustrine-alluvial plains. Izv. AN SSSR.Ser.geog. no.2:14-24 Mr-Ap '63. (MIRA 16:4)

1. Institut geografii AN SSSR.
(Geomorphology) (Plains)

TIMOFEYEV, Dmitriy Andreyevich; IVANOVSKIY, L.N., kand. geogr. nauk, otv. red.

[Middle and lower Olekma Valley; geomorphological analysis of the territory of the basin] Sredniaia i Nizhniaia Olekma; geomorfologicheskii analiz territorii basseina. Moskva, Nauka, 1965. 137 p. (MIRA 19:1)

TIMOFEYEV, D.A.

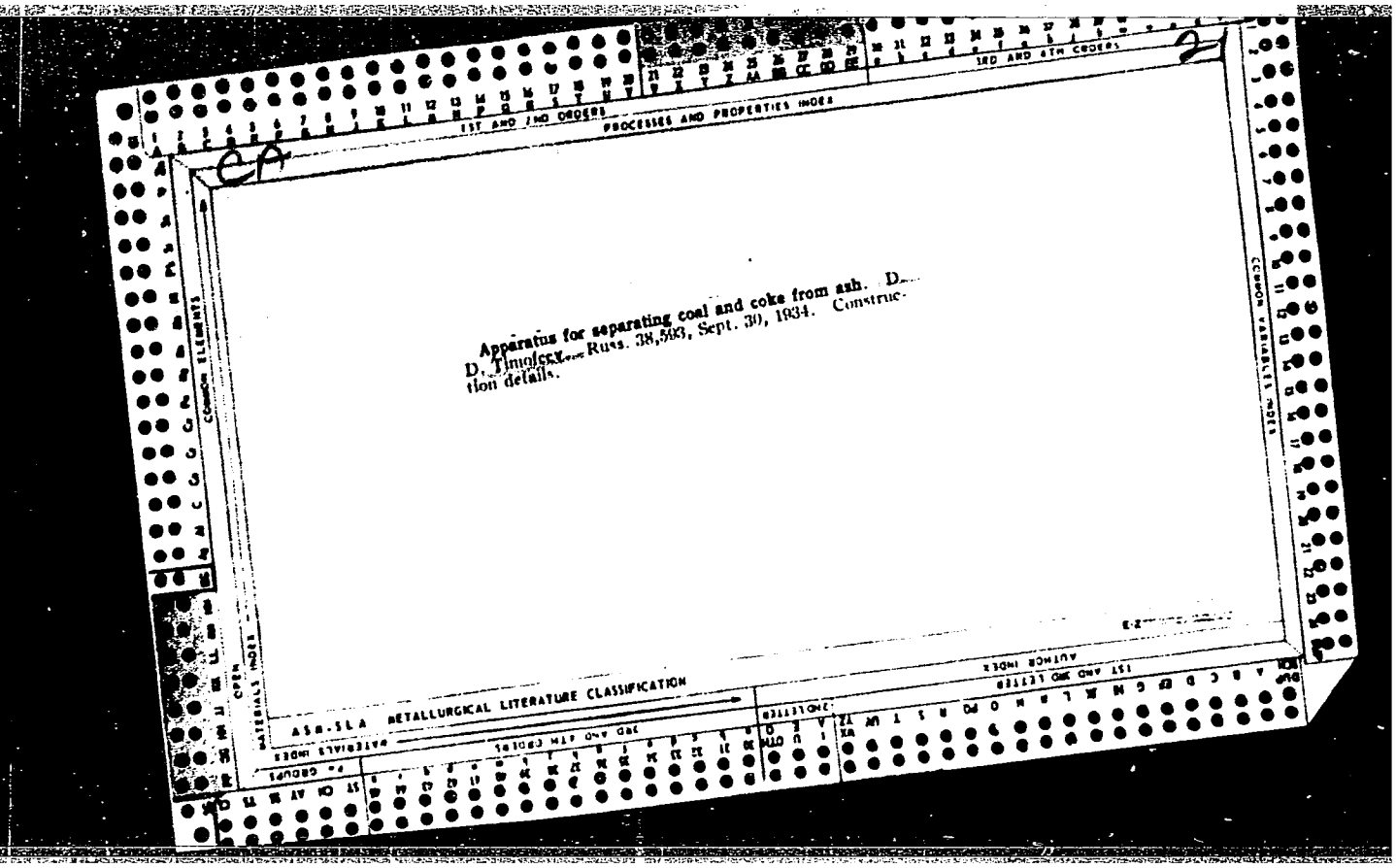
Conference of the Presidium of the Geomorphological Committee of the Division of Geologic and Geographic Sciences of the Academy of Sciences of the U.S.S.R. Izv.AN SSSR.Ser.geog. no.2:116-117 Mr-Ap '63. (MIRA 16:4)

(Geomorphology--Congresses)

BLAGOVOLIN, N.S.; MURATOV, V.M.; TIMOFEYEV, D.A.

Several problems of slope formation under the conditions of various morphostructures. Izv. AN SSSR. Ser. geog. no.3:16-25 My-Je '63. (MIRA 16:8)

1. Institut geografii AN SSSR.
(Slopes (Physical geography))



DABAGYAN, N.P.; CHUB, V.M.; TIMOFEYEV, D.I.; SHUL'GA, Ye.A.

Pack rolling of large-size, two-layer steel plate. Met.i gornorud.prom. no.5:29-33 S-O '62. (MIRA 16:1)

1. Ukrainskiy institut metallov (for Dabagyan, Chub).
2. Kommunarskiy metallurgicheskiy zavod (for Timofeyev, Shul'ga).
(Rolling (Metalwork)) (Plates, Iron and steel)

DABAGYAN, N.P.; CHUB, V.M.; TIMOFEYEV, D.I.; KHOROSHILOV, N.M.; LOKTIONOV, P.Ya.; SHUL'GA, Ye.A.

Experience of manufacturing two-layer sheet steel at the Kommunarsk Metallurgical Plant. Stal' 24 no.8:718-721 Ag '64. (MIRA 17:9)

1. Ukrainskiy nauchno-issledovatel'skiy institut metallov i Kommunarskiy metallurgicheskiy zavod.

SOKOLOVSKIY, P.I.; SAMARYANOVA, A.M.; SABIYEV, M.P.; TIMOFEYEV, D.I.

Heat treatment of low-carbon steel. Standartizatsiia 24 no.10:41-44 O '60. (MIRA 13:10)

(Steel--Heat treatment)

S/028/60/000/010/010/020
B013/B063

AUTHORS: Sokolovskiy, P. I., Samaryanova, A. M., Sabiyev, M. P., Timofeyev, D. I.

TITLE: Heat Treatment of Low Carbon Steel

PERIODICAL: Standartizatsiya, 1960, No. 10, pp. 41-44

TEXT: The experience gained in a number of metallurgical works in the heat treatment of rimming and semi-quiet steel of the type CT.3 (St.3) is described. These experiments as well as extensive scientific work were necessary for the elaboration of ГОСТ 9458-60 (GOST 9458-60). The properties of the steel plate of type St.3 subjected to heat treatment were studied by the TsNII chernoy metallurgii (Central Scientific Research Institute of Ferrous Metallurgy), TsNII stroitel'nykh konstruktsiy (TsNII for Structures) and the GPI Proyektstal'konstruktsiya at the Novo-Tagil'skiy zavod (Novo-Tagil'skiy Works). A strongly inhomogeneous structure was observed. Positive results were obtained with the heat treatment of semi-quiet steel of type St.3 made by the TsNII for structures at the zavod im. Il'icha (Works imeni Il'ich); structure and properties were

Card 1/3

Heat Treatment of Low Carbon Steel

S/028/60/000/010/010/020
B013/B063

homogeneous at different points of the plates. At present, the semi-quiet steel of the types St.3 and St.5 is studied at the Ukrainskiy institut metallov (Ukrainian Metal Institute) in collaboration with the TsNII for structures. Specimens of semi-quiet steel of type St.3 will be subjected to heat treatment at the Alchevskiy zavod (Alchevsky Works). At the Novo-Tagil'skiy works Martin steel sheets produced from rimming steel of type St. 3 with 0.14 and 0.19% carbon content, and at the works imeni Il'ich, steel sheet produced from rimming and semi-quiet steel of the type St. 3 with 0.14 and 0.21% carbon content as well as H- and U-iron No. 30 produced from rimming St. 3 steel were subjected to heat treatment. Better results were obtained in the works mentioned last. On the basis of the experiments conducted at various works the main parameters for the conditions of heat treatment could be determined. The studies of mechanical properties of steel subjected to heat treatment (Table) show that on tempering carbonsteel plates of type St. 3 sufficient homogeneity is obtained. Thicker plates have more uniform mechanical properties with good plastic properties being obtained at high strength. In spite of the good results obtained heat treatment is still imperfect since the values of the relative increase in length are frequently below the standard

Card 2/3

Heat Treatment of Low Carbon Steel

S/028/60/000/010/010/020
B013/B063

ГОСТ 9458-60 (GOST 9458-60). Hence, further experimental data are necessary. Cold brittleness and mechanical aging of carbon steel which were observed in an experimental series are lower than in low-alloy steels. In the case of thin cuts the St. 3 steel subjected to heat treatment may replace low-alloy steels with a yield point of 30 kp/mm^2. The use of carbonsteel subjected to heat treatment proved to be favorable also from the economic point of view. The experience gained at the Alchevskiy works in the heat treatment of steel boiler plates showed that the strength of carbon steel subjected to heat treatment attains the strength of some hot-rolled low-alloy steels. On the basis of a large number of experimental data collected in the works the GOST 9458-60 standards for the mechanical properties must be specified more exactly. There is 1 table.

Card 3/3

L 29809-66 EWT(m)/EWP(t)/ETI/EWP(k) IJP(c) JD/HW
ACC NR: AP6020871 SOURCE CODE: UR/0383/66/000/001/0032/0034

AUTHOR: Piryazev, D. I. (Candidate of technical sciences); Khoroshilov, N. M.; Krivonosov, Yu. I.; Timofeyev, D. I.; Shul'ga, Ye. A.; Syts'ko, A. A. 67 60 B

ORG: none

TITLE: Variations in the thickness of clad sheet 19

SOURCE: Metallurgicheskaya i gornorudnaya promyshlennost', no. 1, 1966, 32-34

TOPIC TAGS: metal cladding, sheet metal, metal rolling, metallurgic furnace, thermal conduction, steel/OKh13 steel, Kh17N13M2T steel

ABSTRACT: The authors discuss the variations in thickness of two-layer steel caused by a combination of variations and nonuniformities in the thickness of the individual slabs which make up the pack. These variations may reach ±20% of the nominal value in individual cases. Variations in the thickness was determined for mass produced sheets with a cladding layer of Kh18N10T, Kh17N13M2T and OKh13 steel. The variations in thickness and deviations from nominal value were studied during rolling of bimetal sheet from packs weighing less than 5 tons (small packs) and from packs weighing 10-12 tons (large packs). Sheet rolled from large packs shows less variation in thickness than that rolled from small packets. This is because the large slabs were hot when they were fed into the continuous furnaces and were therefore heated more uniformly. However, completely uniform heating was impossible even in three-zone continuous furnaces. The following furnace conditions are recommended

UDC: 621.9-419.004

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L 29809-66

ACC NR: AP6020871 7

for reducing variations in the thickness of plates rolled on the 2800 mill. Temperature of upper and lower sections in the joining zone should be identical: 1300-1310°C; temperature of the soaking zone should be 1260-1270°C. Total heating time should be divided into 40% for preheat, 30% for joining and 30% for soaking.

Experiments showed that planing the slabs on both sides reduced variations in thickness up to approximately 20%. The lubricating interlayer has a low thermal conductivity and impedes heat exchange between the upper and lower parts of the packet during heating which prevents temperature equalization. This causes variations in the thickness of the finished sheet. It was found that the absolute variation in thickness increases with the thickness of the sheets. The relative variations in thickness are approximately the same for sheets of all thicknesses with the exception of 16 mm sheets for which variations are somewhat lower. In 80% of the cases, deviations from the nominal thickness vary within limits from -10 to +12%. The following recommendations are given for reducing deviations from the nominal thickness using existing equipment: reducing variations in the thickness of initial slabs to ±2 mm by eliminating bending or by planing on both sides; increasing thickness of the upper slab in the pack by 7% as compared with the lower slab; heating the packets in continuous furnaces with equal temperatures for the upper and lower sections in the joining zone, a temperature of 1260°C in the soaking zone and holding in this zone for 30% of the total heating time. Taking part in the work of the article were TsNIIChM specialists L. V. Meandrov, V. A. Ustimenko, A. V. Tkachev and Kommunarskyy Metalurgical Plant specialists S. R. Sarkisyan and A. N. Nesmachnyy. Orig. art. has: 4 figures.

[JPRS]

SUB CODE: 13, 11 / SUBM DATE: none

Card 2/2 FV

NOSOV, V.S.; LEGEYDA, N.F.; [illegible]

Sheet hardening in hardening presses. Met. i gornorud. p. [illegible] (MIRA 18:12)
33 N-D '63.

TIMOFEYEV, D.I.; CHERNER, M.I.; SABIYEV, M.P.

Effect of defects in side and end edges of slabs on the quality of the sheet. Met. i gornorud. prom. no.3:36-37 My-Je '64. (MIRA 17:10)

TIMOFEYEV, D.P.; ALEKSEYEVA, N.I.

Adsorption kinetics of periodically changing concentrations of gas flow with stepwise changes in fluctuation range. Zhur. prikl. khim. 37 no.11:2533-2536 N '64 (MIRA 18:1)

1. Institut fizicheskoy khimii AN SSSR.

KAPLUN, V.A.; TIMOFEYEV, I.M.

Effect of a plane dielectric layer on the directional properties of antennas. Izv.vys.ucheb.zav.; radiofiz. 7 no.4:730-735 '64. (MIRA 18:1)

ALEKSANDROV, P.A., doktor tekhn. nauk [deceased]; GOLUBOV, M.M.; TIMOFEYEV, D.I.; SOKOLOV, B.A.

Investigating regularities of shape changes of sheet workpieces during rolling in horizontal and vertical mills. (MIRA 18:1)
Sbor. trud. UNIIM no.9:223-239 '64

1. TIMOFEYEV, D.I.

2. USSR (600)

4. Clothing Industry

7. For excellence in the quality of production and high labor efficiency. Eng. Leg. prom. no. 12. 1952

9. Monthly List of Russian Accessions, Library of Congress, March 1953. Unclassified.

TIMOFEYEV, D.I.

239

AUTHOR: Timofeev, D.I., Deputy Manager of No. 2 Sheet Rolling Shop at the imeni Voroshilov Works.

TITLE: Experience in the adoption of a 2 800 plate mill. (iz opyta osvoeniya tolstolistovogo stana 2 800).

PERIODICAL: "Metallurg" (Metallurgist), 1957, No. 1, pp. 24 - 26, (U.S.S.R.)

ABSTRACT: The 2 800 plate rolling mill commissioned at the Voroshilov Works in November, 1955, has been found to have numerous disadvantages. These are discussed in the article and the methods of overcoming them are described. The mill is for rolling plate from 4 to 50 mm thick, from 1 500 to 2 600 mm wide and up to 20 m long from various types of steel. The productivity of the mill can reach 1 100 000 tons per annum.

1 schematic drawing of the general layout.

ACCESSION NR: AP4043485 S/0133/64/000/008/0718/0721

AUTHOR: Dabagyan, N.P., Chub, V.M., Timofeyev, D.I., Khoroshilov, N.M., Loktionov, P. Ya., Shul'ga, Ye. A.

TITLE: Experiences in the production of two-layer sheet steel at the Kommunar metallurgical plant

SOURCE: Stal', no. 8, 1964, 718-721

TOPIC TAGS: steel rolling, rolling mill, sheet steel, two layer sheet steel, pack rolling, steel cladding, cast cladding, bimetal, clad steel

ABSTRACT: In a discussion of the pack-rolling of two-layer sheet steel, introduced in 1963 at the Kommunar plant, the authors specify the difficulties encountered in the previous cast-cladding process and indicate that higher technological efficiency and production on a much larger scale can be achieved with the new process without affecting the high quality of the product. To produce two-layer sheets, symmetrical four-layer packs whose size is prescribed by nomograms, are assembled from the basic steel plates a, cladding plates b, and interlayers c, as shown in the Enclosure. The equations from which specifications of the pack components are found, the necessary nomograms and the details of the process are presented. An interlayer distribution curve for carbon, chromium and nickel in a

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ACCESSION NR: AP4043485

bimetal prepared by the pack-rolling process is shown. The diffusion of the elements was investigated by metallographic, electron microscopic and layer-by-layer spectral and chemical analyses, and by means of C^{14}. From the nomograms, pack specifications for two-layer 8-25 mm thick 20k + Kh17N13M2T steel sheets can be calculated, including the proper upper-to lower plate thickness ratio. This ratio (optimally about 1.08), designated the coefficient of equithickness, is introduced into the calculations to offset nonuniform metal expansion due to a temperature gradient across the pack during heat treatment. To reduce this effect, the temperature in the upper, lower and tempering section of the furnace is held at 1340-1360, 1320-1340, and 1240-1220C, respectively. Orig. art. has: 5 figures, 1 table and 4 formulas.

ASSOCIATION: Ukrainskiy nauchno-issledovatel'skiy institut metallov (Ukrainian Scientific Research Institute of Metals); Kommunarskiy metallurgicheskiy zavod (Kommunar Metallurgical Plant)

SUBMITTED: 00 ENCL: 01 SUB CODE: MM, IE

NO REF SOV: 000 OTHER: 000

Card 2/3

ACCESSION NR: AT4043485

ENCLOSURE: 01

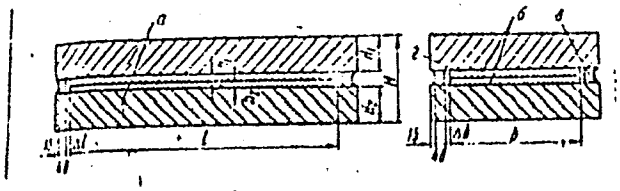

Fig. 1. Diagram of a symmetrical 4-layer pack: d - fire-proof partition; H_1 H_2; h_1 h_2.

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TIMOFEYEV, D. I.

S/137/62/000/001/079/237
A060/A101

AUTHORS: Piryazev, D. I., Golubov, M. M., Dabagyan, I. P., Timofeyev, D. I., Meleshko, A. M., Kovynev, M. V.

TITLE: The roll separating force of the metal and the loading of the main motors in the course of rolling on the thick sheet mill 2800

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 1, 1962, 4 - 5, abstract 1D21 ("Sb. tr. Ukr. n.-i. in-t metallov", 1961, no. 7, 165 - 177)

TEXT: The authors studied the power conditions for rolling at the thick-sheet mill 2800 of the Plant imeni Voroshilov. The mill is designed for rolling sheets with thickness 6 - 50 mm, width 2,500 - 2,600 mm. It consists of a stand with vertical rolls, a roughing two-high stand with working rolls 1,150 mm dia, a universal finishing four-high stand 800/1400. The stands are arranged in a sequence. The roll separating force of the metal in the roughing and the finishing stands was measured by means of force meters with wire tensometers. The force meters were welded to the pedestals of the working stands on the side of drive. The pulses from the tensometers were recorded by a magnetoelectric oscillograph ПОБ -14 (РОВ-14). A calculation of the forces from the torque was

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A060/A101

The roll separating force of...

carried out to verify the values determined by the force meters. The mean pressures were calculated from the total forces obtained experimentally. Simultaneously with the measurement of the forces, the operation of the main drive motors was oscillographed. The oscillograms recorded the current, voltage, and the number of revolutions of the motors. The investigations have demonstrated that: 1) the separating force of the metal on the rolls of the four-high stand is, in all the cases investigated, below the admissible; 2) the closest agreement with the experimental data is given by the values of the mean pressures as calculated by the Golovin-Tyagunov method; 3) the main motors of the mill 2800 are not utilized to full capacity.

G. Grigoryan

[Abstracter's note: Complete translation]

Card 2/2

TIMOFEYEV, DMITRIY ILLARIONOVICH

S/D
71.5.11
.T5

VAL'TSOVSHCHIK LISTOPROKATNYKH STANOV; POSOBIYE DLYA PROIZVODSTVENNO-TEKHNICHESKOGO OBUCHENIYA RABOCHIKH (ROLLER WORKER IN A SHEET-ROLLING MILL) MOSKVA, METALLURGIZDAT, 1955.

236P. ILLUS., DIAGRS., GRAPHS, TABLES.

TIMOFEYEV, Dmitriy Illarionovich; DIOMIDOV, B.B., redaktor; GOLYATKINA, A.G., redaktor; EVENSON, I.M., tekhnicheskiy redaktor

[Worker in a sheet-rolling mill; workers' production and technical manual] Val'tsovshchik listoprokatnykh stanov; uchebnoe posobie dlia proizvodstvenno-tekhnicheskogo obucheniia rabochikh. Moskva, Gos.nauchno-tekhn.izd-vo lit-ry po chernoi i tsvetnoi metallurgii, 1955. 236 p. (MLRA 9:1)

(Sheet metal)

KOLPASHNIKOV,A.I.; TIMOFEYEV,D.I.

Reserves in action. Tekst. prom. 15 no.5:13-14 My '55.
(MLRA 8:6)

1. Zaveduyushchiy pryadil'nym proizvodstvom fabriki imeni Lakina (for Kolpashnikov). 2. Zamestitel' zaveduyushchego tkatskim proizvodstvom (for Timofeyev).
(Textile industry)

14543-66 EWT(m)/EPF(n)-2/EWP(v)/T/EWP(t)/EWP(k)/EWP(b) JD/WW/HW/JG

ACC NR: AP6006309 SOURCE CODE: UR/0413/66/000/002/0013/0013

INVENTOR: Paton, B. Ye.; Medovar, B. I.; Puzrin, L. G.; Boyko, G. A.; Lutsyuk-Khudin, V. A.; Bondarchuk, O. P.; Timofeyev, D. I.; Dryapik, Ye. P.

ORG: none

TITLE: Method of producing metal laminates. Class 7, No. 177824 [announced by the Electric Welding Institute im. Ye. O. Paton (Institut elektrosvarki)]

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 2, 1966, 13

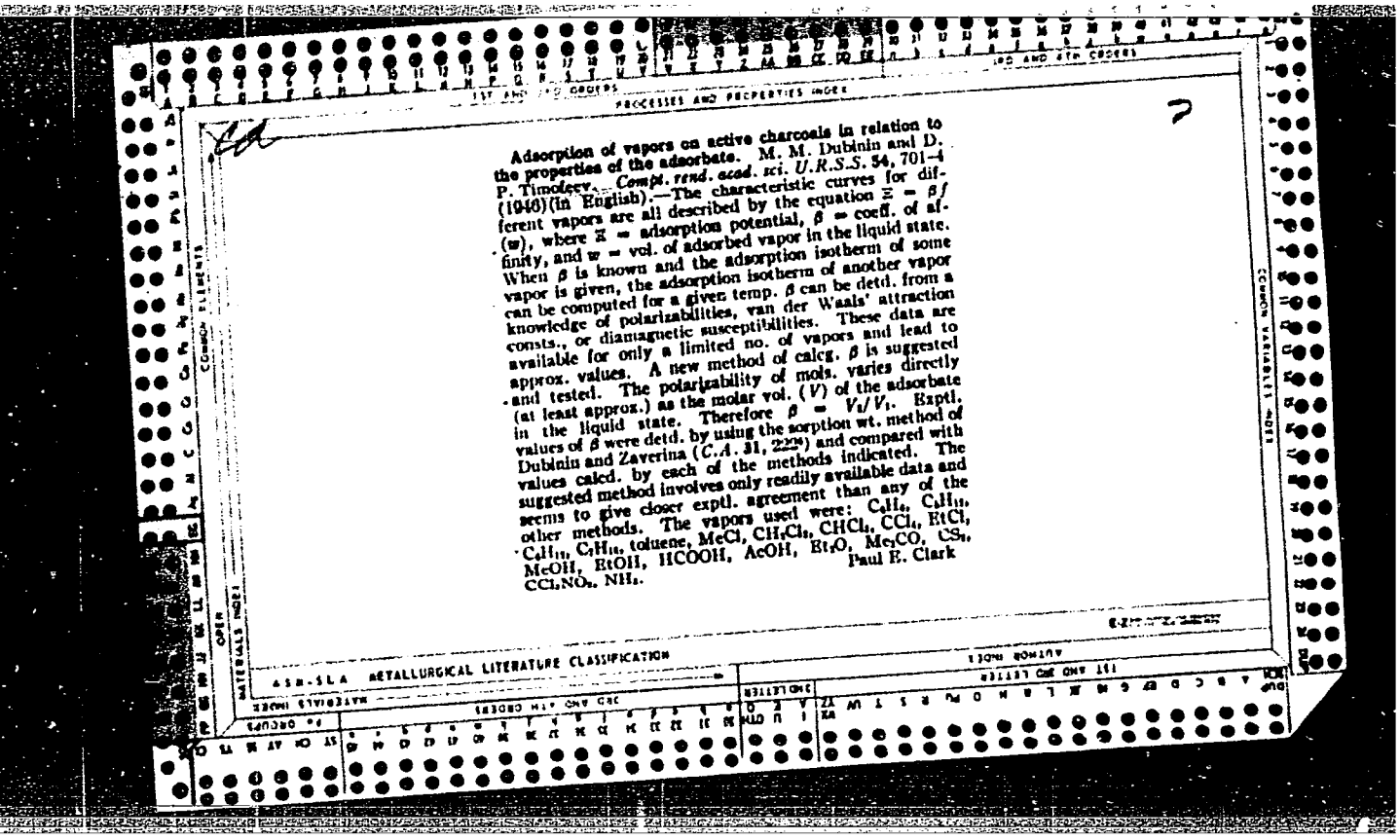
TOPIC TAGS: metal, clad metal, metal laminate, metal rolling

ABSTRACT: This Author Certificate introduces a method of producing metal laminates by pack rolling with a low-melting vanishing insert placed between the metals to be bonded. To obtain a strong bond between dissimilar metals, the rolling is done with the insert in the liquid state. [ND]

SUB CODE: 11/ SUBM DATE: 29May64/ ATD PRESS: 4197

Cladding 18

Card 1/1



PROCESSES AND PROPERTIES INDEX

7

Adsorption of vapors on active charcoals in relation to the properties of the adsorbate. M. M. Dubinin and D. P. Timofeev. *Compt. rend. acad. sci. U.R.S.S.* 54, 701–4 (1946)(in English).—The characteristic curves for different vapors are all described by the equation $\Xi = \beta f(w)$, where Ξ = adsorption potential, β = coeff. of affinity, and w = vol. of adsorbed vapor in the liquid state. When β is known and the adsorption isotherm of some vapor is given, the adsorption isotherm of another vapor can be computed for a given temp. β can be detd. from a knowledge of polarizabilities, van der Waals' attraction consts., or diamagnetic susceptibilities. These data are available for only a limited no. of vapors and lead to approx. values. A new method of calcg. β is suggested and tested. The polarizability of mols. varies directly (at least approx.) as the molar vol. (V) of the adsorbate in the liquid state. Therefore $\beta = V_1/V_1$. Exptl. values of β were detd. by using the sorption wt. method of Dubinin and Zaverina (*C.A.* 31, 2228) and compared with values calcd. by each of the methods indicated. The suggested method involves only readily available data and seems to give closer exptl. agreement than any of the other methods. The vapors used were: C_6H_6, C_6H_{12}, C_6H_{14}, C_7H_{16}, toluene, MeCl, CH_2Cl_2, $CHCl_3$, CCl_4, EtCl, MeOH, EtOH, HCOOH, AcOH, Et_2O, Me_2CO, CS_2, CCl_3NO_2, NH_3.

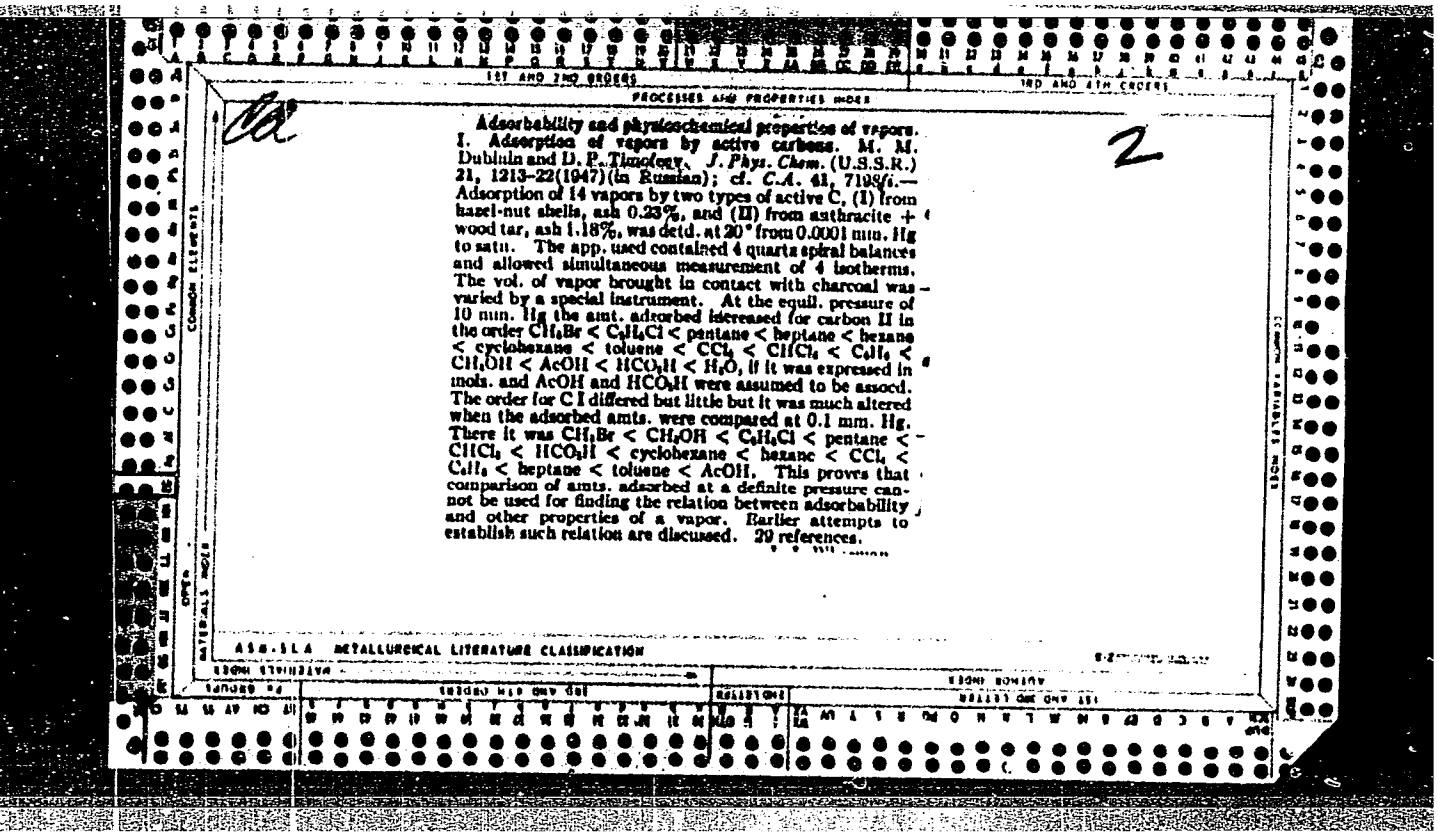
Paul E. Clark

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

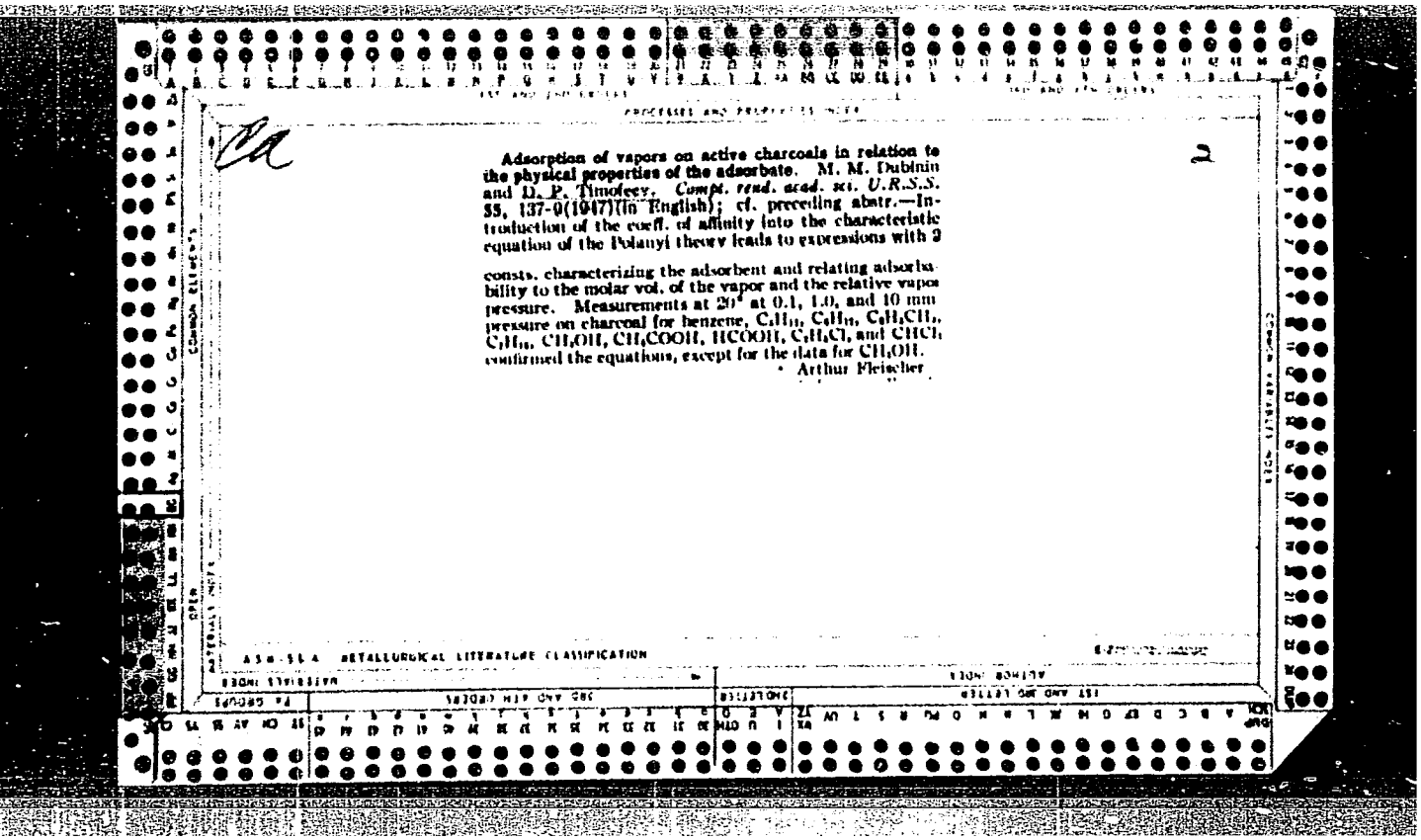
TIMOFEYEV, D. P. (Eng.-Major) Cand. Chem. Sci.

Dissertation: "Adsorbability and Physicochemical Properties of Volatile Substances." Military Academy of Chemical Defense imeni M. V. Lomonosov, 10 Jun 47.

SO: Vechernyaya Moskva, Jun, 1947 (Project #17836)



Adsorbability and physicochemical properties of vapors. I. Adsorption of vapors by active carbons. M. M. Dubinin and D. P. Timofeev. *J. Phys. Chem.* (U.S.S.R.) 21, 1213–22(1947)(in Russian); cf. *C.A.* 41, 7198i.— Adsorption of 14 vapors by two types of active C, (I) from hazel-nut shells, ash 0.23%, and (II) from asthracite + wood tar, ash 1.18%, was detd. at 20° from 0.0001 mm. Hg to satn. The app. used contained 4 quartz spiral balances and allowed simultaneous measurement of 4 isotherms. The vol. of vapor brought in contact with charcoal was varied by a special instrument. At the equil. pressure of 10 mm. Hg the amt. adsorbed increased for carbon II in the order CH_2Br < C_2H_5Cl < pentane < heptane < hexane < cyclohexane < toluene < CCl_4 < $CHCl_3$ < C_6H_6 < CH_3OH < AcOH < HCO_2H < H_2O, if it was expressed in mols. and AcOH and HCO_2H were assumed to be assocd. The order for C I differed but little but it was much altered when the adsorbed amts. were compared at 0.1 mm. Hg. There it was CH_2Br < CH_3OH < C_2H_5Cl < pentane < $CHCl_3$ < HCO_2H < cyclohexane < hexane < CCl_4 < C_6H_6 < heptane < toluene < AcOH. This proves that comparison of amts. adsorbed at a definite pressure cannot be used for finding the relation between adsorbability and other properties of a vapor. Earlier attempts to establish such relation are discussed. 29 references.

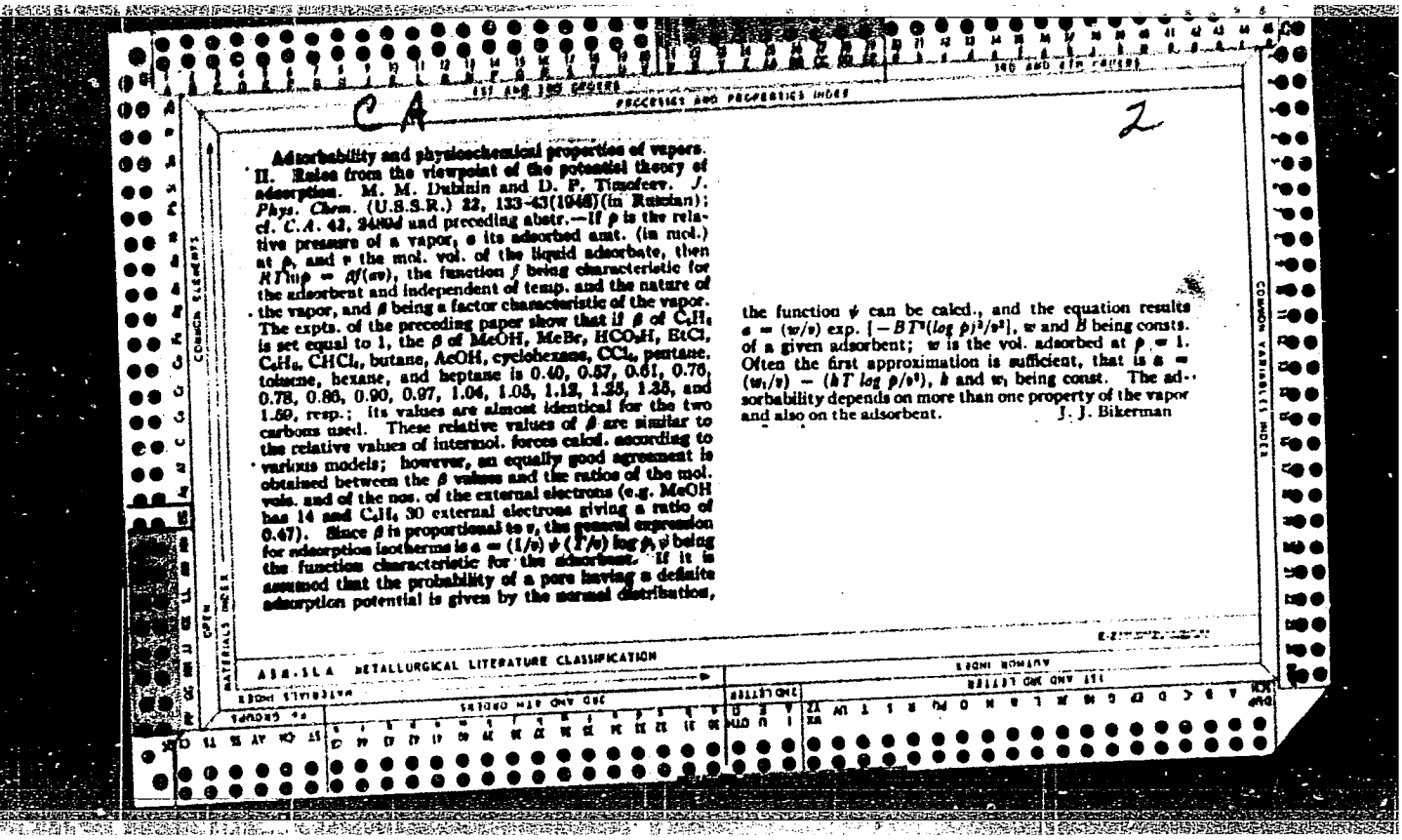


Ca

Adsorption of vapors on active charcoals in relation to the physical properties of the adsorbate. M. M. Dubinin and L. P. Timofeev. *Compt. rend. acad. sci. U.R.S.S.* 55, 137-9(1947)(In English); cf. preceding abstr.—Introduction of the coeff. of affinity into the characteristic equation of the Polanyi theory leads to expressions with 2 consts. characterizing the adsorbent and relating adsorbability to the molar vol. of the vapor and the relative vapor pressure. Measurements at 20° at 0.1, 1.0, and 10 mm pressure on charcoal for benzene, C_6H_{12}, C_6H_{14}, $C_6H_5CH_3$, C_7H_{16}, CH_3OH, CH_3COOH, $HCOOH$, C_6H_5Cl, and $CHCl_3$ confirmed the equations, except for the data for CH_3OH.

Arthur Fleischer

2



CA 2

Adsorbability and physicochemical properties of vapors. II. Rules from the viewpoint of the potential theory of adsorption. M. M. Dubinin and D. P. Timofeev. *J. Phys. Chem.* (U.S.S.R.) 22, 133-43(1948)(in Russian); cf. *C.A.* 42, 2480d and preceding abstr.—If p is the relative pressure of a vapor, a its adsorbed amt. (in mol.) at p, and v the mol. vol. of the liquid adsorbate, then $RT \ln p = \beta f(av)$, the function f being characteristic for the adsorbent and independent of temp. and the nature of the vapor, and β being a factor characteristic of the vapor. The expts. of the preceding paper show that if β of C_6H_6 is set equal to 1, the β of MeOH, MeBr, HCO_2H, EtCl, C_6H_{12}, $CHCl_3$, butane, AcOH, cyclohexane, CCl_4, pentane, toluene, hexane, and heptane is 0.40, 0.57, 0.61, 0.70, 0.78, 0.86, 0.90, 0.97, 1.04, 1.05, 1.12, 1.25, 1.35, and 1.50, resp.; its values are almost identical for the two carbons used. These relative values of β are similar to the relative values of intermol. forces calcd. according to various models; however, an equally good agreement is obtained between the β values and the ratios of the mol. vols. and of the nos. of the external electrons (e.g. MeOH has 14 and C_6H_6 30 external electrons giving a ratio of 0.47). Since β is proportional to v, the general expression for adsorption isotherms is $a = (1/v)\psi(T/\beta)$ log p, ψ being the function characteristic for the adsorbent. If it is assumed that the probability of a pore having a definite adsorption potential is given by the normal distribution, the function ψ can be calcd., and the equation results $a = (w/v)$ exp. $[-BT^2(\log p)^2/\beta^2]$, w and B being consts. of a given adsorbent; w is the vol. adsorbed at $p = 1$. Often the first approximation is sufficient, that is $a = (w_1/v) - (hT \log p/\beta^2)$, h and w_1 being const. The adsorbability depends on more than one property of the vapor and also on the adsorbent. J. J. Bikerman

TIMOFEYEV, D. P.

PA 68T15

USSR/Chemistry- Adsorption, of Vapors
Adsorption, by Active Carbon

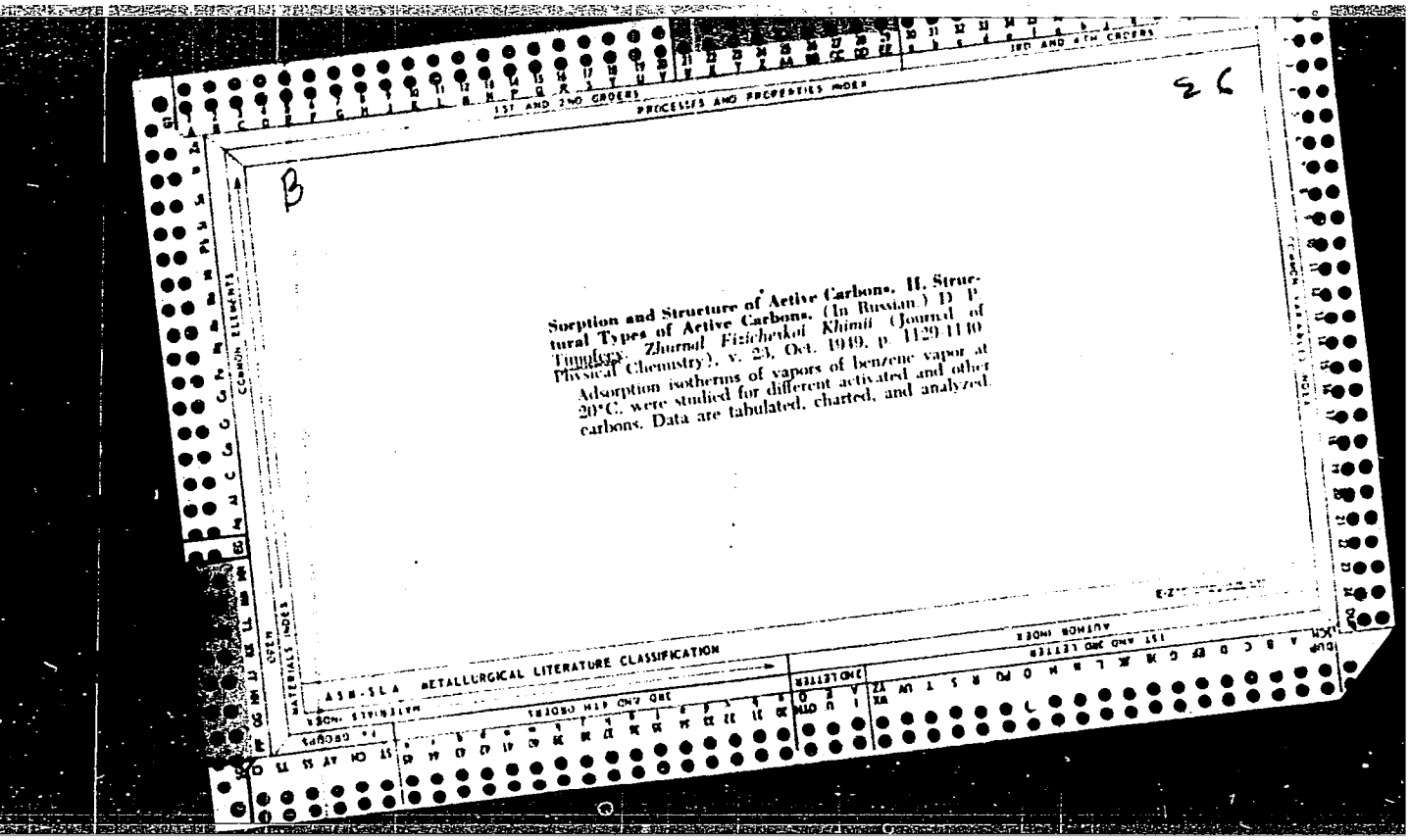
May 1948

"Problem of the Calculation of Vapor Adsorption Isotherms of Active Carbons," Academician M. M. Dubinin, D. P. Timofeyev, 3¼ pp

"Dok Ak Nauk SSSR" Vol LX, No 5

Presents method that is independent of temperature characteristic curves for various vapors and also independent of affinity characteristic curves of individual vapors during constant adsorption. Submitted 15 Mar 1948.

PA 68T15



Sorption and Structure of Active Carbons. II. Structural Types of Active Carbons. (In Russian.) D. P. Timofeev. *Zhurnal Fizicheskoi Khimii* (Journal of Physical Chemistry), v. 23, Oct. 1949, p. 1129-1140.

Adsorption isotherms of vapors of benzene vapor at 20°C. were studied for different activated and other carbons. Data are tabulated, charted, and analyzed.

CA

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Adsorption of benzene vapor on active carbon black. M. M. Dubinin and D. P. Timofeev. *Doklady Akad. Nauk S.S.S.R.* 76, 555-8(1951).—For active carbons of the 1st and the 2nd structure type, the characteristic adsorption equations are, resp., $W = W_0 \exp(-kc^2/\beta^2)$ (1) and $W = W_0' \exp(-nc/\beta)$ (2); W_0 and W_0' are the limiting vol. of the adsorption space, c = adsorption potential, β = affinity coeff., k and n = consts. of the distribution function of the adsorption space vol. over c. For carbons activated to a wt. loss of 50–75%, the characteristic equation is the sum of equations (1) and (2), multiplied, resp., by a and $(1 - a)$, where a is the fraction of the vol. of the total adsorption space W_0 corresponding to the 1st structure type, so that $W_0 = aW_0$ and $W_0' = (1 - a)W_0'$. The corresponding adsorption equation isotherm, $a = (aW_0/v)\exp[(-B T^2/\beta^2)(\log p_s/p)^2] + [(1 - a)W_0'/v]\exp[(-A T/\beta)(\log p_s/p)]$ (3), where a = amt. adsorbed, v = mol. vol. of the condensed vapor at the temp. T, and A and B are consts., holds for active carbons of mixed structure type in a wide range of relative pressures p/p_s. Increase of the fraction $(1 - a)$ of the 2nd type is usually brought about by increasing the degree of activation, as the dimensions of the micropores increase considerably as a result of thin partitions burning out. The reverse change-over, from the 2nd to the 1st type, can be brought about by activation of carbon black, composed of spherical particles, and hence originally belonging to the 2nd type; activation produces micropores, and hence gives rise to appearance of the 1st type. A sample of carbon black "Spheron Grade 6," with a mean particle size of 300 A. (by electron microscopy), a sp. surface area of 77 sq. m./g. (by adsorption of C_6H_6) or 109 sq. m./g. (from electron-microscopic measurements), showed no change of its 20° adsorption isotherm for C_6H_6 vapor after 30 min. heating either under 0.1 mm. Hg or in a stream of H_2. However, divergent adsorption isotherms were obtained after activation with CO_2 at 950° for lengths of time corresponding to a loss of wt. of 6.4, 11.3, 21.7, 55.1, or 76.3%. Equation (3) holds for all these samples up to $p/p_s = 0.6$, with the following numerical values of the consts. W_0, W_0' (cc./g.), $B \times 10^4$, $A \times 10^3$, a: initial carbon, —, 0.080, —, 3.63, —; 6.4% activation, 0.043, 0.114, 0.348, 4.0, 0.27; 11.3%, 0.062, 0.118, 0.402, 4.0, 0.41; 21.7%, 0.150, 0.108, 0.708, 4.0, 0.58; 55.1%, 0.406, 0.228, 1.18, 3.94, 0.64; 76.3%, 0.417, 0.910, 1.23, 5.10, 0.31. Above $p/p_s = 0.6$, the exptl. a values lie increasingly above the theoretical curves, evidently owing to capillary condensation between particles at points of close contact. The steady increase of the values of W_0 and B indicates progressive development of fine micropores with high c. Up to an activation of 21.7%, W_0' and A remain essentially unchanged; these values evidently correspond to adsorption at the outer surface of the carbon black particles. This would correspond to a max. thickness of the adsorption film of about 1×10^{-7} cm., or, in the case of C_6H_6, to an adsorbed film of 2–3 mol. layers. The fall of a for the highest-activated carbon evidently indicates formation, at this stage, of coarse pores. For the carbon activated to 6.4%, a is approx. twice that corresponding to the original carbon; if in the process of activation C were burned off the surface only, the surface area, and consequently also a, should increase by no more than 11%. The observed 100% increase means that C is burned off the bulk of the grains. The vols. of C burned away, corresponding to the activations of 6.4, 11.3, and 21.7%, are calcd. to 0.038, 0.071, and 0.154 cc./g., resp., i.e. are very close to the values of W_0. N. Thon

TIMOFEYEV, D. P.

USSR/Chemistry - Adsorption

Nov 53

"The Equation of the Kinetics of Adsorption on Activated Carbons," D. P. Timofeyev

Zhur Fiz Khim, Vol 27, No 11, pp 1642-1647

Considered the type of kinetics of adsorption on activated carbon in the case when neither external nor internal diffusion limits the velocity of adsorption. Found by comparing data from exptl kinetic curves of adsorption of benzene at 20° on activated carbon of various grain sizes with corresponding data from theoretical curves, that external diffusion is apparently not a limiting factor. The

274T19

shape of expl curves of adsorption of vapors on carbon with a grain size that is not too large depends on the velocity of air that brings the vapor to the adsorbent, and is not limited by the diffusion of mols of vapor from the air, which is infinitely large.

TIMOFEYEV, D.P.

Distribution of absorbed vapors in active-carbon grains with a non-linear adsorption isotherm. Zhur.fiz.khim. 29 no.4:723-729 Ap '55. (MLRA 8:8)
(Adsorption) (Carbon, Activated)

TIMOFEYEV, D.P.

Reply to A.A.Zhukhovitskii's letter concerning my article: "Equation for the adsorption kinetics of activated charcoal." Zhur.fiz.khim. 29 no.5:934-935 My'55. (MIRA 8:12)
(Adsorption) (Carbon) (Zhukhovitskii,A.A.)

TIMOFEYEV, D.P.

New book on aviation meteorology("Principles of aviation meteorology". L.T.Matveev, P.I.Smirnov. Reviewed by D.P.Timofeev). Meteor.i gidrol. no.6:63-66 Je '56. (MLRA 9:9)
(Meteorology in aeronautics) (Matveev, L.T.) (Smirnov, P.I.)

USSR/Physical Chemistry - Surface Phenomena, Adsorption, Chromatography, Ion Interchange. B-13

Abs Jour: Referat. Zhurnal Khimiya, No 2, 1958, 4015.

Author : M.M. Dubinin, Ye. D. Zaverina, D.P. Timofeyev.
Inst : Academy of Sciences of USSR.
Title : Adsorption Properties of Carbon Adsorbers. Report 1. Analysis of Earlier Obtained Experimental Data.

Orig Pub: Izv.AN SSSR, Otd. khim. n., 1957, No 6, 670-677.

Abstract: Experimental adsorption data referring to 12 different substances on two activated carbon specimens were analyzed in detail and a good conformity with the experience with the earlier developed potential theory of vapor adsorption on adsorbers with heterogeneous surface was shown. The part of the carbon structure in the adsorption process was made clear and it was shown that in the case of well adsorbed vapors (activity factor $\beta \approx 1.5$), the degree of filling (F) of the micropore

Card : 1/2 -19-

Inst. Phys. Chem AS USSR

Abs Jour: Referat. Zhurnal Khimiya, No 2, 1958, 4015.

volume is close to one at great p/p_s independently of the magnitude of the structural characteristic of the carbon B. The adsorption of such substance is determined mainly by the total micropore volume but not by their dimensions. In the case of little adsorbing substances ($\beta \approx 0.5$) and little p/p_s, the F magnitudes are small and depend strongly on F, i.e., on the micropore dimensions, their volume playing a secondary part. These conclusions determine the selection of carbon activation conditions for various purposes.

kinetic curve (γ is relative adsorption, α is a measure of time; a valid expression is $\alpha = \frac{x}{R} \frac{t}{t_\infty}$, where R is the radius of the unused sorbent grain layer, x is the radius of the layer which has already adsorbed, and t is the time). In order to verify experimentally the theoretical results the following experiments were carried out: onto two kinds of activated charcoal vapors of benzene and chloropicrin were adsorbed. The experimental results are valuated and summarized in figures 4,5, and 6 and in table 2. They agree with the theoretical results. The author thanks M.M.Dubinin, Member, Academy of Sciences, USSR, for his assistance in the work. There are 6 figures and 2 tables.

SUBMITTED: March 30, 1957

SOV/76-32-11-3/32

5(4)
AUTHOR: Timofeyev, D. P.

TITLE: On the Rate of Desorption (O skorosti desorbtsii)

PERIODICAL: Zhurnal fizicheskoy khimii, 1958, Vol 32, Nr 11, pp 2483-2486 (USSR)

ABSTRACT: The rate of desorption of organic vapors from a layer of activated charcoal through which pure air is blown is much lower than the rate of adsorption. Besides another condition (Ref 1) it may be assumed that the slow course of the desorption is only explained by the low concentration of the substance on the particle surface, by which fact a small amount of the substance is removed per unit of time. To prove the validity of this assumption, the present paper gives a comparison of the data calculated on the rate of desorption and those obtained from experiments. The experimental results of the type of the present investigations are best expressed by the equation of the adsorption isotherm by M. M. Dubinin and L. V. Radushkevich (Ref 3). Proceeding from this equation another equation is derived according to which the desorption curves of benzene vapors are calculated from two samples of activated charcoal and then are

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On the Rate of Desorption

compared with the experimental data. The measurement of the rate of desorption was carried out according to a method already described (Ref 4). The calculated curves are somewhat lower than those obtained by experiments. It is, therefore, assumed that the concentration on the surface as well as in the interior of the coal grains is the same. As the calculated and experimental curves agree rather well, it is maintained that the external diffusion on the surface of the coal particles in the case of not too high flow rates (of the air) does not exert any particular influence on the desorption rate from the layer of the activated charcoal. The residual value of the adsorption and the rate of desorption are dependent on the structure of the activated charcoal which is characterized by the constants w_o and B (from the above-mentioned equation of the adsorption isotherm). There are 2 figures, 1 table, and 4 Soviet references.

SUBMITTED: March 30, 1957

Card 2/2

SOV/20-122-3-31/57

5(4)
AUTHORS: Timofeyev, D. P., Voskresenskiy, A. A.

TITLE: The Investigation of the Mechanism of Internal Diffusion by the Method of X-Ray Diascopy (Issledovaniye mekhanizma vnutrenney diffuzii metodom rentgenovskoy diaskopii)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 122, Nr 3, pp 434-436 (USSR)

ABSTRACT: The matter adsorbed in porous sorbents from a flowing gas moves by diffusion in the volume of the pores and on the surface. Both kinds of transfer proceed simultaneously and into the same direction. This paper deals with the separation of the flows in the gaseous and in the adsorption phase. The idea of the method is discussed in a few lines. Granulated charcoal of vapor-gaseous activation was used as a sample for these investigations. The results of one of the experimental series are represented by a figure. According to these results, the transfer of matter in the gaseous phase is of essential importance and the rôle of the great pores as means of transfer is very essential for the velocity of the internal diffusion. The authors thank Academician M. M. Dubinin for dis-

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The Investigation of the Mechanism of Internal Diffusion by the Method of X-Ray Diascopy

cussing the results. There are 4 figures.

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR
(Institute of Physical Chemistry, Academy of Sciences, USSR)

PRESENTED: April 26, 1958, by M. M. Dubinin, Academician

SUBMITTED: April 12, 1958

SOV/62-59-7-31/38

5(4)
AUTHOR: Timofeyev, D. P.

TITLE: Application of the Method of Analogy for the Solution of Some Diffusion Problems (Primeneniye metoda analogiy dlya resheniya nekotorykh zadach diffuzii)

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1959, Nr 7, pp 1340 - 1341 (USSR)

ABSTRACT: The dependence of the diffusion coefficient on concentration may in some cases be regarded as proportionality.

$D = D_o \frac{c}{c_o}$ (1). The solution of the one-dimensional diffusion equation for this case $\frac{\partial c}{\partial t} = \frac{\partial}{\partial x}\left(D_o \frac{c}{c_o} \frac{\partial c}{\partial x}\right)$ (2) with the simplest boundary conditions was supplied by the papers, references 1-3. In the case of complicated boundary conditions the problem is no more soluble directly. In the present paper, an approximative solution of equation 2 is obtained for any arbitrary boundary and initial conditions by the application of the method of analogy. It is illustrated by the example of

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the laminar gas flow. For this flow, an equation analogous to equation (2) is found. For this equation, the function p (x,t) must be found according to function

$\beta = \frac{c}{c_o} = \frac{p}{p_o}$ and condition $B=D_o=kp_o$. This is determined by the aid of a model device for diffusion processes, the so-called gas dynamic integrator. A short mention is made of some variations (variation in the dispersion degree of granular material, variation in the viscosity of the gas and variation in the ratio of the diameter of the capillary to the volume) of the gas dynamic integrator. There are 5 references, 3 of which are Soviet.

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR (Institute of Physical Chemistry of the Academy of Sciences, USSR)

SUBMITTED: January 3, 1959

7(0)
AUTHOR: Timofeyev, D. P. SOV/76-33-3-35/41

TITLE: Reservoir for the McLeod Gauge (Rezervuar dlya manometra Mak-Leoda)

PERIODICAL: Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 3, p 727 (USSR)

ABSTRACT: One of the drawbacks of the McLeod gauge consists in the fact that the mercury contained in the gauge can flow out or penetrate into the gauge reservoir as soon as the vacuum is switched on or switched off. In order to eliminate this drawback the author designed a small attachment for the gauge which connects it to the gas pipe (Fig). The attachment contains a porous membrane (filter Nr 4) that is penetrable by air, but not by mercury. There is 1 figure.

ASSOCIATION: Akademiya nauk SSSR, Institut fizicheskoy khimii, Moskva (Academy of Sciences USSR, Institute of Physical Chemistry, Moscow)

SUBMITTED: November 4, 1958

Card 1/1

CHMUTOV, K.V., otv.red.; SHEMYAKIN, F.M., red.; GAPON, T.B., red.; YELOVICH, S.Yu., red.; SALDADZE, K.M., red.; TIMOFEYEV, D.P., red.; LEVI, T.G., red.izd-va; MAKUNI, Ye.V., tekhn.red.

[Chromatography, its theory and uses; proceedings of the All-Union Conference on Chromatography] Khromatografiia, ee teoriia i primenenie; trudy Vsesoiuznogo Soveshchaniia po khromatografii. Moskva, 1960. 462 p. (MIRA 13:7)

1. Akademiya nauk SSSR. Otdeleniye khimicheskikh nauk.
(Chromatographic analysis)

S/074/60/029/03/004/004
B008/B006

AUTHOR: Timofeyev, D.P.

TITLE: Mechanism of Mass Transfer in Porous Sorbents

PERIODICAL: Uspekhi khimii, 1960, Vol 29, Nr 3, pp 404-423 (USSR)

ABSTRACT: This is a survey of papers published during the last ten years in the field of investigation of the transfer mechanism of adsorbable gases in porous sorbents. First, the main types of transfer of nonadsorbable gases are described briefly in order to classify existing data. The types discussed are: the viscous flow (Refs 7-17) -table 1; molecular diffusion (Refs 18-25) - tables 2,3; flow of gas in the transition region (Refs 18,26-42) - figure 1; model of a porous body, mixed transfer - figures 2-5. In the second part of the paper, the transfer of adsorbable gases is discussed (31,81-99), the following subjects being treated in greater detail: diffusion at the surface of the sorbent (Refs 43,47,57,83-85,100-123) - tables 4, 5 and figures 6,7; activation energy of the diffusion process in porous bodies (Refs 44,91,124-131) - table 6 and figures 8,9; some methods of estimating the size of the migration effect (Refs 90,91, 132-133); flow of liquid adsorbate (Refs 93-98); capillary flow (Ref 133) - figure 10; peculiarities of water vapor transfer in finely porous adsorbents (Refs 124,134). By applying various methods of investigation, an exact investigation of the peculiarities of the

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transfer of adsorbable gases was possible. From the existing data a rough picture of the transfer process can be given for different ranges of relative pressure and various degrees of saturation. It would be important to find a relation between the different types of transfer and the structure of the adsorbent. The finding out of some rules correlating the rate of transfer with the strength of adsorption is only a first beginning in the above-mentioned field of investigation. The structure of sorbents has scarcely been investigated from a kinetic point of view. Kinetic investigation methods of the structure of porous bodies would therefore have to be developed. Mention is made of L.S. Leybenzon, B.V. Deryagin, S.P. Bakanov, M.M. Dubinin, and A.A. Voskrasanskiy. There are 10 figures, 6 tables, and 134 references, 28 of which are Soviet.

ASSOCIATION: In-t fizicheskoy khimii AN USSR (Institute of Physical Chemistry AS, USSR)

TIMOFEYEV, D.P.; YERASHKO, I.T.

Dependence of the diffusion coefficient upon the extent of adsorption of activated carbon. Dokl.AN SSSR 132 no.5:1144-1147 Je '60. (MIRA 13:6)

1. Institut fizicheskoy khimii Akademii nauk SSSR. Predstavleno akademikom M.M.Dubininym.
(Adsorption) (Carbon, Activated)
(Diffusion)

5.1115

25212 S/062/61/000/007/002/009
B117/B230

AUTHORS: Timofeyev, D. P., and Yerashko, I. T.

TITLE: Sorption kinetics of water vapors on A-type zeolites

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye khimicheskikh nauk, no. 7, 1961, 1192-1197

TEXT: In the present work the sorption kinetics of water vapors were examined with a large amount of fillers on a molecular sieve of the type Linde 5A, grain radius 1.6 mm. The sorption kinetics was measured at constant water vapor pressure in vacuum by means of a sorption scale. A common weighing device, used for examining adsorption isotherms was applied, provided with an additional volume of ~10 l connected to the system for the control of vapor pressure. For a more convenient computing of diffusion coefficients, the grains of the adsorbent were carefully treated to obtain a cylindrical form of equal height and width. The weighed portion consisting of a few grains was evacuated by means of a mercury pump at 350°C within 3 to 4 hours before the experiment. The increase in the amount of

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adsorption was determined by elongation of the spiral spring of the scale by a cathetometer having a graduation of 0.01 mm. The sensitivity of the spiral amounted to $2.44 \cdot 10^{-3}$ g/mm. The experiments were conducted at 0° and 30°C. Temperature in the air thermostat was maintained at 20°C in the first case, and at 30°C in the second case. Diffusion coefficients were computed from the diffusion equation for finite cylinders. Within the examined range of charging, the diffusion coefficient depends in a complex manner on the amount of adsorption: at the beginning it increases and after passing through a maximum it decreases. A 30°C, diffusion coefficients have amounts several times higher than at 0°C. This indicates an activated diffusion character. The dependence of the coefficient of activated diffusion on temperature is expressed by the equation

$$D = D_0 \exp(-E/RT) \qquad (5)$$

E - activation energy; D_0 - factor before the exponent; R - gas constant; T - temperature. In case of two different temperatures, the activation energy of the diffusion process may be found from the equation

$$E = 4.57\ (T_1T_2/T_2 - T_1)\ \log\ (D_2/D_1) \qquad (6)$$

D_1 and D_2 are diffusion coefficients corresponding to temperatures T_1 and T_2. Values of activation energy computed from this equation show (Table 1) that it decreases as the amount of adsorption increases. Isosteric adsorption heat, calculated from the water vapor isotherms at 0° and 30°C, drops within the examined charging range as low as 11 to 10 kcal/M. Experiments were conducted within the charging range of 18 to 24 per cent by weight of the adsorbent. The most probable pore radius amounted to 2500 Å. With zeolite grains diffusion takes place in the intercrystalline cavities and inside the crystals. Experiments were conducted at pressures as high as 26 mm Hg; thus, the mean free path of molecules (of the order of magnitude of 10^{-3} to 10^{-4} cm) was, under such conditions, longer than the intercrystalline cavities. Therefore transition into the gaseous phase took place by Knudsen diffusion. The coefficient of the Knudsen diffusion for a capillary of infinite length is determined by the equation $D_k = (2/3)$ ur (9), u - gas-dynamic velocity of molecules (for water at 20°C,

Sorption kinetics of water...

$u = 5.1 \cdot 10^4$ cm/sec); r - radius of capillary. From (9), $D \approx 1$ cm^2/sec was found by introducing the values for u and r (2500 Å). Correcting the finite capillary length according to Clausing, (Ref. 10: P. Clausing, Physica 2, 65 (1929)) this amount is reduced to 0.4 cm^2/sec. The Henry constant amounted to 2000 to 5000 within the examined charging range. Hence, the real diffusion coefficient in the gaseous phase amounted to

$$D_e = D_k/H = 0.8 \cdot 10^{-4} - 2 \cdot 10^{-4} \text{ cm}^2/\text{sec},$$

i.e, it was by two orders of magnitude higher than the values obtained by experiments. It follows that diffusion resistance mainly occurs at diffusion in the crystalline components of zeolite grains. Taking account of the migration of molecules on the external crystal surface may be only appraised as an additional argument in favour of this conclusion. Table 2 shows the values D_o for different amounts of adsorption and mean free paths Δ in the transition of molecules into an activated state. It is evident that the values of Δ and, accordingly, D_o decrease as the charging degree rises. In this case, the decrease of D_o affects the amount of the diffusion

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coefficient, dropping in spite of decreasing activation energy, more than the factor exp (-E/RT). The values found for Δ show a satisfactory agreement with the mean free paths of molecules with elementary displacement in the sorption cell, obtained by purely geometrical considerations. There are 4 figures, 2 tables, and 10 references: 2 Soviet-bloc and 8 non-Soviet-bloc. The most recent references to English-language publications read as follows: Ref. 1: R. M. Barrer, Brit. Chem. Engng. May 1959, 1; Ref. 8: P. H. Lewis, J. phys. Chem, 63, 527 (1959).

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR
(Institute of Physical Chemistry of the Academy of Sciences USSR)

SUBMITTED: September 30, 1960

Card 5/6

TIMOFEYEV, D.P.; KABANOVA, O.N.; Prinimala uchastiye YERASHKO, I.T.

Kinetics of water vapor sorption on zeolites of the type A from gas carrier flow. Izv. AN SSSR. Otd.khim.nauk no.9:1539-1542 S '61. (MIRA 14:9)

1. Institut fizicheskoy khimii AN SSSR.
(Water vapor) (Zeolites)

S/062/63/000/001/017/025
B101/B186

AUTHORS: Kabanova, O. N., and Timofeyev, D. P.

TITLE: Determination of the diffusion coefficient of water vapor on granulated zeolites by sorption from the carrier gas stream

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye khimicheskikh nauk, no. 1, 1963, 176 - 178

TEXT: The sorption of water vapor on granulated zeolites, grain diameter 3-4 mm, was measured at 20°C and a velocity w of the carrier gas (N_2) between 0.23 and 1.4 m/sec to find the optimum conditions for determining the diffusion coefficient D. Sorption increased with increasing w, but only slightly between 0.7 and 1.4 m/sec. Calculation of the Biot number Bi for an infinite cylinder and for a sphere showed that at 1.4 m/sec Bi reached values which made it possible to calculate D approximately by the equation for internal diffusion: $D = kR^2/\pi^2 t_{0.5}$ (6), where $t_{0.5}$ is the time until reaching the adsorption $\gamma = 0.5$, and k a coefficient depending on the shape

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of the grains. Method recommended for determining D: Measuring the rate of sorption at w = 1.4 - 1.5 m/sec on grains of 3-4 mm in diameter until reaching $\int = 0.6 - 0.7$, reduction of w to 0.2 - 0.3 m/sec, and continuation of the test until equilibrium is established to determine the limiting adsorption. The diagram $\int$ versus $\sqrt{t}$ is used to determine the time $t_{0.5}$, and D is calculated from Eq. (6). There are 2 figures.

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR (Institute of Physical Chemistry of the Academy of Sciences USSR)

SUBMITTED: August 13, 1962

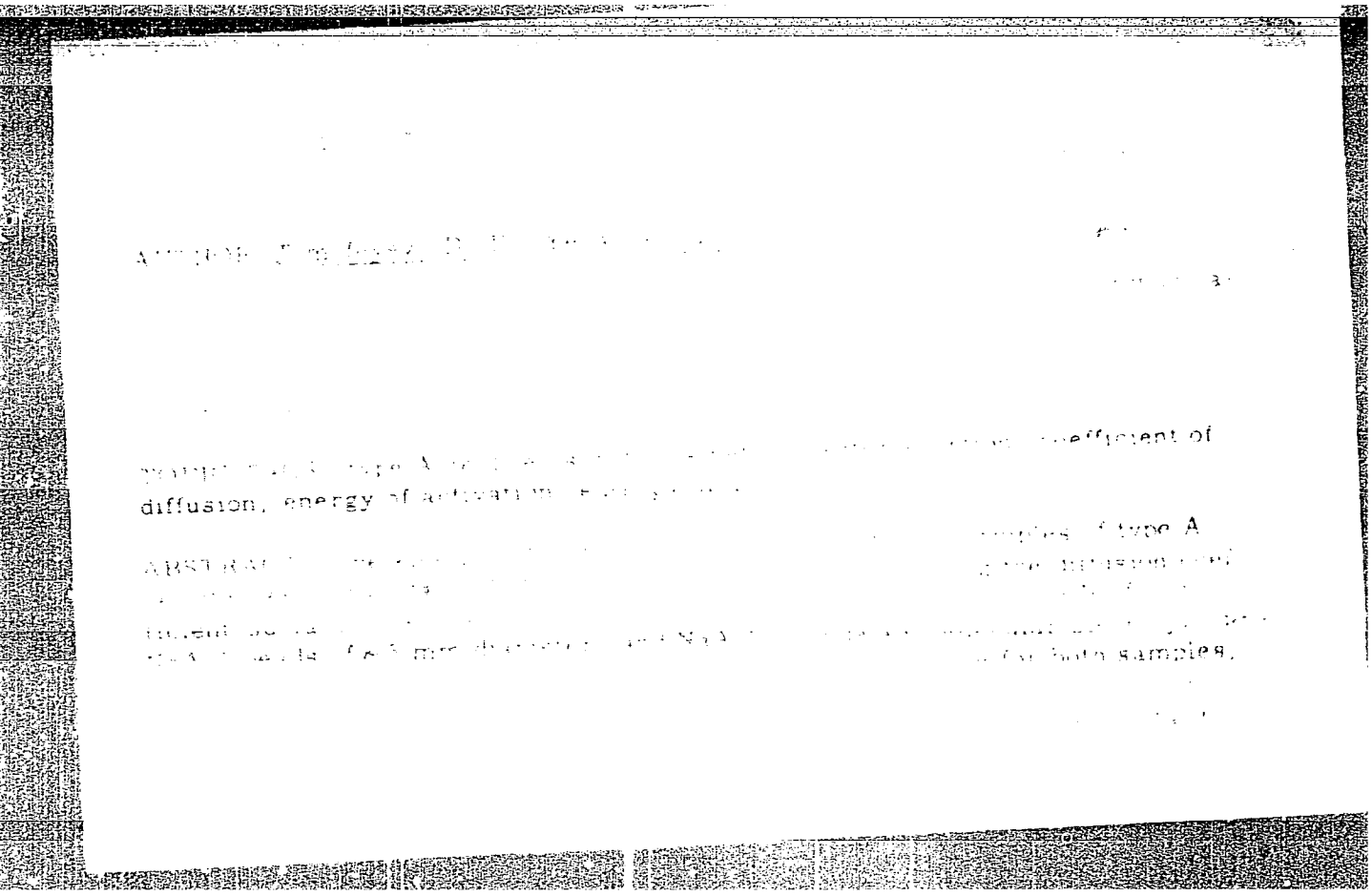
ALEKSEYEVA, N.I.; TIMOFEYEV, D.P.

Kinetics of adsorption at varying concentration of gas in a flow.
Zhur.prikl.khim. 37 no.7:1538-1544 Jl '64. (MIRA 18:4)

TIMOFEYEV, D.P.

Approximate equation for the intradiffusion kinetics of adsorption. Zhur.fiz.khim. 39 no.11:2735-2737 N '65.
(MIRA 18:12)

1. Institut fizicheskoy khimii AN SSSR.



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coefficient of

Type A

samples.

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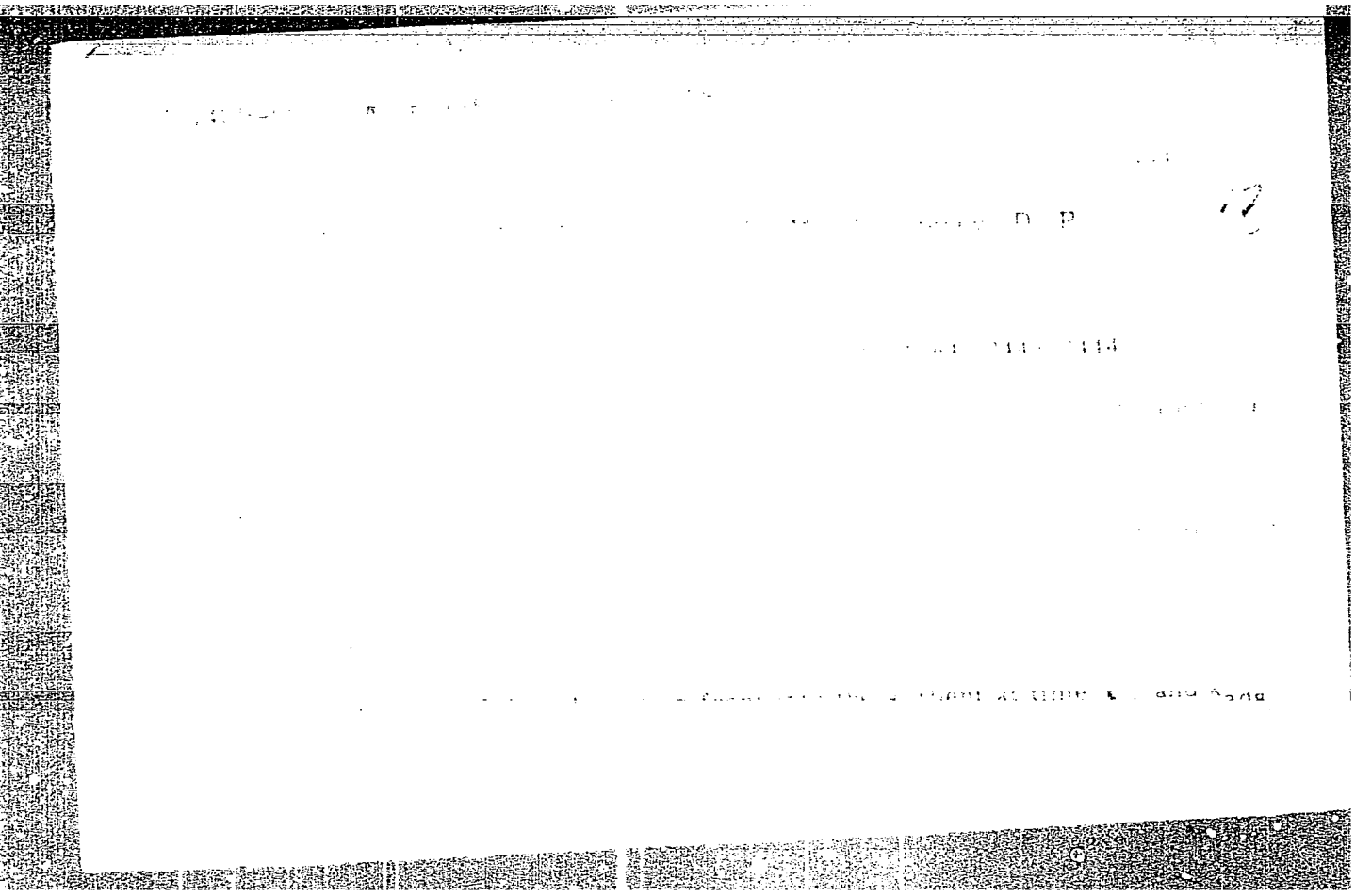

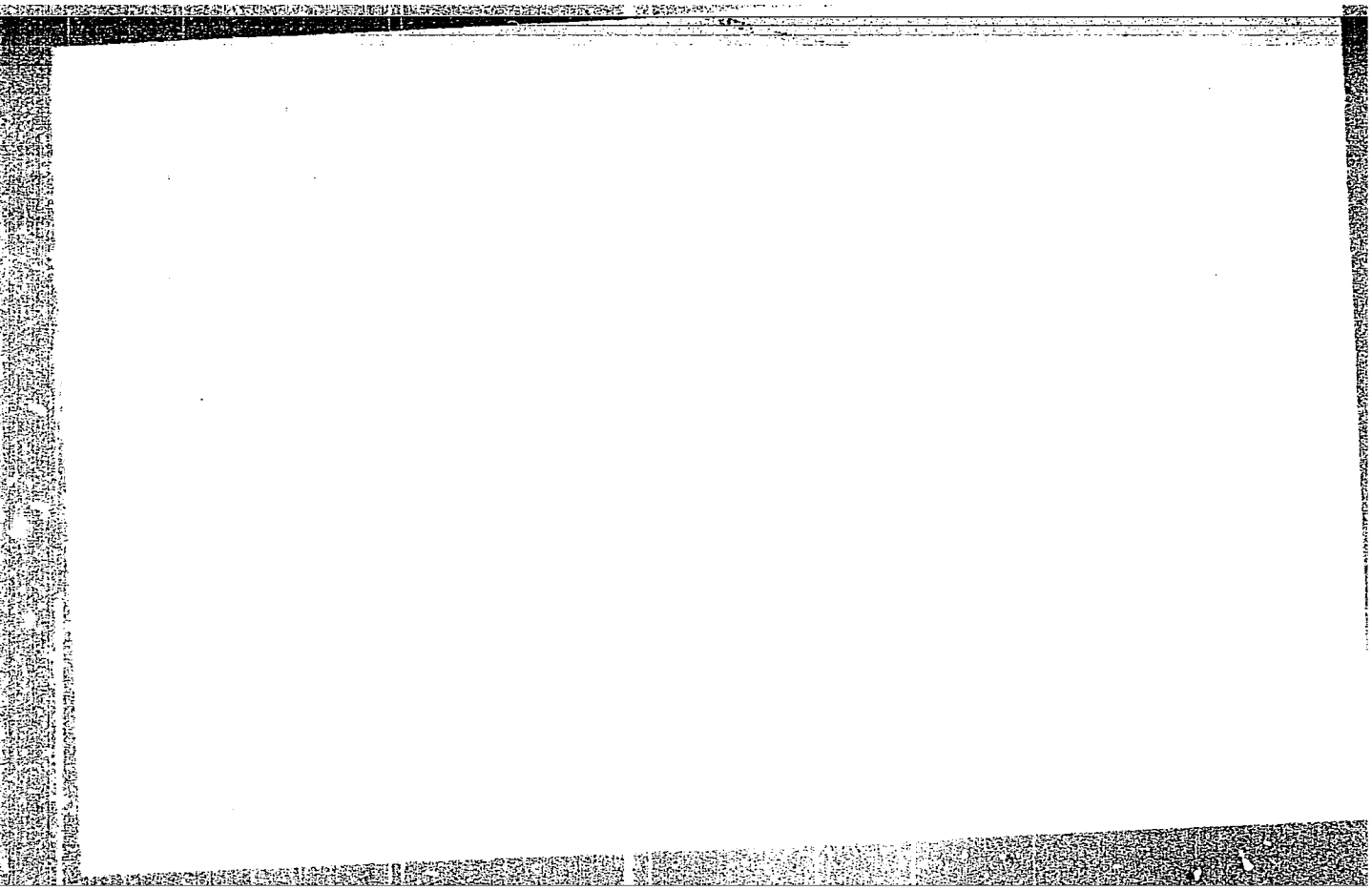

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32
B

AUTHOR: Timofeyev, D. P.; Alekseyeva, N. I.

ORG: Institute of Physical Chemistry, AN SSSR (Institut fizicheskoy khimii AN SSSR)

TITLE: Kinetics of adsorption from the carrier-gas flow in the presence of a stepwise variation of concentrations

SOURCE: AN SSSR. Doklady, v. 166, no. 4, 1966, 917-919

TOPIC TAGS: adsorption, chemical kinetics, gas flow, zeolite, benzene

ABSTRACT: In recovery units with a fluidized bed of sorbent, adsorption occurs in the presence of a periodically changing concentration at grain surface as the sorbent moves from one shelf to another. The authors present the results of an investigation of the kinetics of the adsorption of benzene vapors by AP-3 activated charcoal and NaX zeolite. It was established that the distribution of adsorption as a function of the gradation of concentration is such that it increases with every gradation in a more or less uniform manner, calculated on the basis of the following data: maximum adsorption rate for benzene vapors: 0.162 g/g for zeolite and 0.370 g/g for charcoal; cylindrical shape of zeolite and charcoal grains; grain diameter 3 mm for both zeolite and charcoal; grain length 3 mm for zeolite, 6 mm for charcoal; gas (Benzene vapors) flow rate -- 0.2 m/sec in experiments with zeolite and 0.5 m/sec in experiments with charcoal. This article was presented by Academician M. M. Dubinin on 4 June 1965. Orig. art. has: 2 figures, 3 formulas and 1 table. [JPRS: 36,455]

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UDC: 541.183.5

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ALEKSEYEVA, N.I.; TIMOFEYEV, D.P.

Determination of the concentration on the external surface of the sorbent grain. Zhur. prikl. khim. 38 no.5:1162-1164 My '65. (MIRA 18:11)

1. Institut fizicheskoy khimii AN SSSR.

TIMOFEYEV, D.P.; YERASHKO, I.T.

Kinetics of water vapor sorption on A-type zeolites. Report No.2: Dependence of the diffusion coefficient on filling. Izv. AN SSSR. Ser. khim. no.10:1761-1769 O '64. (MIRA 17:12)

1. Institut fizicheskoy khimii AN SSSR.

ZNAMENSKIY, Yu.D.; KISAROV, V.M.; TIMOFEYEV, D.P.

Adsorption kinetics of a substance with varying adsorbability.
Zhur. fiz. khim. 38 no.10:2443-2444 O '64. (MIRA 18:2)

TIMOFEYEV, D.P.; ALEKSEYEVA, N.I.

Adsorption kinetics in the increasing concentration of gas in a flow. Zhur. prikl. khim. 36 no.9:1919-1928 D '63. (MIRA 17:1)

1. Institut fizicheskoy khimii AN SSSR.

TIMOFEYEV, D.P.

Calculating the parameters of a batch in adsorption columns with a moving bed of sorbent. Zhur. prikl. khim. 36 no.5: 1021-1028 My '63. (MIRA 16:8)

1. Institut fizicheskoy khimii AN SSSR.
(Adsorption)

PONOMAREV, A.S.; TIMOFEYEV, D.P.

Diffusion coefficients in secondary pores of granulated zeolites. Dokl. AN SSSR 150 no.5:1081-1083 Je '63. (MIRA 16:8)

1. Institut fizicheskoy khimii AN SSSR. Predstavleno akademikom M.M.Dubininym.

(Zeolites) (Diffusion)

KABANOVA, O. N.; TIMOFEYEV, D. P.

Determination of the water vapor diffusion coefficient in granulated zeolites by the method of sorption from the gas-carrier stream. Izv. AN SSSR Otd. khim. nauk no.1:176-178 '63. (MIRA 16:1)

1. Institut fizicheskoy khimii AN SSSR.

(Water vapor) (Zeolites) (Sorption)

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PHASE I BOOK EXPLOITATION SOV/6246

Soveshchaniye po tseolitam. 1st, Leningrad, 1961.

Sinteticheskiye tseolity; polucheniye, issledovaniye i primeneniye (Synthetic Zeolites: Production, Investigation, and Use). Moscow, Izd-vo AN SSSR, 1962. 286 p. (Series: Its: Doklady) Errata slip inserted. 2500 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Otdeleniye khimicheskikh nauk. Komisiya po tseolitam.

Resp. Eds.: M. M. Dubinin, Academician and V. V. Serpinskiy, Doctor of Chemical-Sciences; Ed.: Ye. G. Zhukovskaya; Tech. Ed.: S. P. Golub'.

PURPOSE: This book is intended for scientists and engineers engaged in the production of synthetic zeolites (molecular sieves), and for chemists in general.

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Synthetic Zeolites: (Cont.) SOV/6246

COVERAGE: The book is a collection of reports presented at the First Conference on Zeolites, held in Leningrad 16 through 19 March 1961 at the Leningrad Technological Institute imeni Lensovet, and is purportedly the first monograph on this subject. The reports are grouped into 3 subject areas: 1) theoretical problems of adsorption on various types of zeolites and methods for their investigation, 2) the production of zeolites, and 3) application of zeolites. No personalities are mentioned. References follow individual articles.

TABLE OF CONTENTS:

Synthetic Zeolites: (Cont.) SOV/6246

THEORETICAL PROBLEMS OF ADSORPTION ON ZEOLITES. METHODS OF INVESTIGATION

Card 3/23

TIMOFEYEV, Dmitriy Petrovich; YEGOROV, N.G., red.; SIMKINA, G.S., tekhn. red.

[Kinetics of adsorption] Kinetika adsorbtsii. Moskva, Izd-vo Akad. nauk SSSR, 1962. 251 p. (MIRA 16:2)
(Adsorption)

TIMOFEYEV, D.T.

Effect of systematic vernalization and shelterbelts on barley yields. Agrobiologiia no. 3:455-457 My-Je '60. (MIRA 13:12)

1. Selektsionnaya stantsiya Kuybyshevskogo sel'skokhozyaystvennogo instituta.
(Barley) (Vernalization) (Windbreaks, shelterbelts, etc)

IVANNIKOV, V.F., nauchnyy sotr.; PAKHOMOV, A.Ya., nauchnyy sotr.; UCHAYKIN, V.D., nauchnyy sotr.; FOMIN, I.P., nauchnyy sotr.; TIMOFEYEV, D.T., nauchnyy sotr.; TRET'YAKOV, G.P., red.; SEMENCHUK, S.I., red.; YASHCHEN'KINA, Ye.A., tekhn. red.

[Improve cultivation practices and increase sugar beet yields] Sovershenstvovat' agrotekhniku, povyshat' urozhai sakharnoi svekly. Kuibyshev, Kuibyshevskoe knizhnoe izd-vo, 1960. 52 p.
(MIRA 14:10)

1. Kinel'skaya selektsionnaya stantsiya Kuybyshevskogo sel'skokhozyaystvennogo instituta (for Ivannikov, Pakhomov, Uchaykin, Fomin, Timofeyev)

(Sugar beets)

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S/024/60/000/005/007/017
E073/E435

6.9000 (also 1344)

AUTHORS: Timofeyev, D.V. and Frolov, A.S. (Moscow)

TITLE: A Probability Method of Calculating Non-Symmetric and Non-Sinusoidal Regimes in Electrical Systems

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Energetika i avtomatika, 1960, No.5, pp.131-134

TEXT: The authors recommend that the method of probability should be used for investigating the conditions of operation of electrical systems in the case of existence of non-symmetric and non-sinusoidal loads, which vary at random and are practically independent for the individual phases. The approach to the solution does not change when there is a correlation between the phenomena under investigation. It is stated that this method can be used to obtain the integral distribution laws for the quantities under investigation from the given laws of distribution of non-symmetrical and non-sinusoidal loads and from their maximum values on each phase on the secondary side of the transformer. The voltage at any point in a complicated electrical system and the currents in all its branches can be determined if the load currents I_k are known for all the three phases at each point k. If the system under consideration

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A Probability Method of Calculating Non-Symmetric and Non-Sinusoidal Regimes in Electrical Systems

has linear parameters, it is sufficient to use the super-position principle. Thus, for example, using the matrix notation, the voltage at a point j is in general given by

$$\dot{U}_j = \left(\sum_{i=1}^{m} \dot{E}_i \dot{S}^{-1} \dot{C}_{sij} + \sum_{k=1}^{n} \dot{I}_k \dot{S}^{-1} \dot{Z}_{skj} \right) \dot{S}$$

where $\dot{E}_i$ is the system of emf's in the i-th branch, $\dot{G}_{sij}$ is the matrix of the distribution coefficients for the symmetric voltage components for the point j with respect to the symmetric emf components in the i-th branch, $\dot{Z}_{skj}$ is the matrix of the total resistances for the points k and j with respect to the symmetrical components of the currents and voltages of any frequency, $\dot{S}$ and $\dot{S}^{-1}$ are the coefficients which ensure conversion from phase quantities into symmetric components and vice versa, n and m are the number of given currents and emf's.

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A Probability Method of Calculating Non-Symmetric and Non-Sinusoidal Regimes in Electrical Systems

For a three-phase system with equal parameters for each element of all the phases and equal mutual parameters for each pair of phases, the matrices C_{sij} and Z_{skj} will be diagonal. Therefore, for any frequency the calculation can be carried out separately for the currents and voltages for each of the three sequences, using the appropriate equivalent circuit. In the general case we obtain for the circuit of each sequence g:

$$\dot{U}_j = \sum_{i=1}^{m} \dot{E}_i \dot{C}_{gij} + \sum_{k=1}^{n} \dot{I}_k \dot{Z}_{gkj}$$

However, if the system of positive sequence of the basic frequency is not considered, the voltage of the appropriate sequence is determined from the following expression:

$$\dot{U}_j = \sum_{\ell}^{m} \dot{I}_{\ell} \dot{Z}_{ej}$$

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A Probability Method of Calculating Non-Symmetric and Non-Sinusoidal Regimes in Electrical Systems

Non-symmetric loading can be constant or variable with time. The solution is considered for the general case when, in addition to constant loads of the system, there are loads which vary at random with time independently of each other. The following two possible cases are considered: the active and the reactive components of the current of each single phase load ℓ vary independently; the active and the reactive components of the load current $I_{\ell u}$ relative to the voltage does not vary when this current changes. On the basis of this method, calculations were carried out at VNIIE which enabled elucidating the dependence of the voltage and the current of the positive and the negative phase sequence in the presence of random single-phase traction loads in electrical systems. It proved possible to carry out these calculations in a short time on the "Strela" computer, for complicated electrical systems with a large number of widely spaced traction loads. Comparison of this method of calculation for the expression without the imaginary part (which can be calculated graphically) showed

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satisfactory agreement for a relatively small number of investigations. The here described method can be used successfully not only for calculating non-symmetrical and non-sinusoidal load conditions but also for symmetrical conditions in electrical systems and also for other calculations of a similar nature. Acknowledgments are made to N.A.Kartvelishvili and N.N.Chentsov for their interest in this work. There is 1 Soviet reference.

SUBMITTED: May 14, 1960

Card 5/5

TIMOFEYEV, D.V.; BIRYUKOVA, R.P.

Operating conditions of condensers in systems with transverse-capacitive compensation. Prom. energ. 16 no.12:21-26 D '61. (MIRA 14:12)

(Electric networks) (Electric current rectifiers) (Condensers (Electricity))

MEL'NIKOV, N.A., kand.tekhn.nauk; TIMOFEYEV, D.V., inzh.

Special features in the operation of electric systems feeding a.c. electric locomotives. Elektrichestvo no.6:10-15 Je '61. (MIRA 14:10)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut elektroenergetiki.
(Electric locomotives)
(Electric railroads--Current supply)

GORNSHTEYN, V.M. (Moskva); GORTINSKIY, S M. (Moskva); KARTVELISHVILI, N A (Moskva); MAMIKONYANTS, L.G. (Moskva); MEL'NIKOV, N.A. (Moskva); TIMOFEYEV, D.V. (Moskva); TSVETKOV, Ye.V. (Moskva)

Principal trends in carrying out overall electrification. Elektrichestvo no.10:77-79 O '61. (MIRA 14:10)
(Electrification)

Transactions of the 6th Conf. on Probability Theory and Mathematical Statistics and of the Symposium on Distributions in Infinite-Dimensional Spaces held in Vil'nyus, 5-10 Sep '60. Vil'nyus: Gospolitizdat Lit SSR, 1962. 493 p. 2500 copies printed

TIMOFEYEV, D.V.; FROLOV, A.S.

More about the probability method for calculating nonsymmetircal and nonsinusoidal operating modes of electrical systems. Izv. vys. ucheb. zav.; energ. 5 no.9:116-117 S '62. (MIRA 15:10)
(Electric networks)

KORITSKIY, A.V., prof.; MEL'NIKOV, N.A., prof.; TIMOFEYEV, D.V., kand. tekhn.nauk

Nonsymmetrical three-phase to two-phase transformers for electric power supply of single-phase traction networks. Elektrichestvo no.1:48-51 Ja '63. (MIRA 16:2)
(Electric power distribution) (Electric transformers)
(Electric railroads—Current supply)

TIMOFEYEV, D.V., kand.tekhn.nauk

Laws governing changes in traction current loads. Elektrichestvo no.2:57-62 F '63. (MIRA 16:5)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut elektroenergetiki.
(Electric railroads--Current supply)

TIMOFEYEV, D.V., kand.tekhn.nauk

Experimental study of laws governing changes in voltages and currents in traction loads. Trudy VNIIE no.15:133-165 '63. (MIRA 16:12)

TIMOFEYEV, D.V., kand.tekhn.nauk

Inverse sequence conditions in electrical systems and voltage conditions at the busbars of substations with single-phase traction loads. Elektrichestvo no.3:29-38 Mr '63. (MIRA 16:4)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut elektroenergetiki.
(Electric railroads--Current supply)

TIMOFEYEV, D.V., kand.tekhn.nauk

Simplified probability method for calculating nonsymmetrical and nonsinusoidal modes of operation in electrical systems with single-phase traction loads. Elektrichestvo no.9:48-54 S '63. (MIRA 16:10)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut elektroenergetiki.

TIMOFEYEV, D.V.; ROZANOV, M.N., red.

[Operating modes of electrical systems with traction loads; lectures] Rezhimy v elektricheskikh sistemakh s tiagovymi nagruzkami. Moskva, Vses. zaochnyi energ. in-t Pt. 2. 1964. 101 p. (MIRA 18:12)