L 9636-66 EWP(e)/EWT(m)/EWP(w)/T/EWP(t)/EWP(b) IJP(c) JD

ACC NR: AP5027714 SOURCE CODE: UR/0129/65/000/011/0042/0045

AUTHOR: Prokhorov, P. A. 44,55

ORG: none

TITLE: Effect of small additions of titanium on the properties and structure of low-carbon low-alloy steel

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 11, 1965, 42-45

TOPIC TAGS: titanium, low carbon steel, low alloy steel, austenite transformation, metal grain structure 44,55

ABSTRACT: Usually 0.04% Ti is added to Soviet structural steels used in hot-rolled or heat-treated state, with the object of improving the deoxidation conditions. The actual Ti content of these steels is 0.01-0.03%. Since the literature contains no data on the effect of this amount of titanium on the properties and structure of steel, the author investigated the mechanical properties and structure of high-strength structural steels of the Mn-Si-Mo-V type, to which Ti was added during melting. Findings: small amounts of Ti (0.02-0.04%) may considerably affect structural transformations in normalized low-alloy low-carbon steel. Like boron, titanium prevents the segregation of upper polygonal ferrite and contributes to the supercooling of austenite to temperatures of the intermediate and martensite regions. This leads to a sharp decrease to (1-2 kg-m/cm^2) in the impact strength of steel and increase in

Card 1/2 UDC: 669.295:669.15-194

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ACC NR: AP5027714

2

its other strength properties. The critical Ti content above which its effect becomes appreciable is determined by the content of the other alloy elements (Mo, V and B) and by the austenitization temperature. Normalization of hot-rolled steel considerably reduces the size of ferrite and pearlite grains; no products of decomposition have been detected in the intermediate and martensite regions. This indicates that Ti as a carbide-forming element enhances the resistance of austenite during cooling only if it is present in the solid solution. Orig. art. has: 4 figures, 2 tables.

SUB CODE: 11, 13/ SUBM DATE: none/ ORIG REF: 002/ OTH REF: 001

Card 2/2

KUZEMA, I.D., kand. tekhn. nauk; PROKHOROV, P.A.; MOLOTKOV, V.A.; KATS, T.M.; RUSETSKAYA, M.I.; BELOUSOVA, N.G.

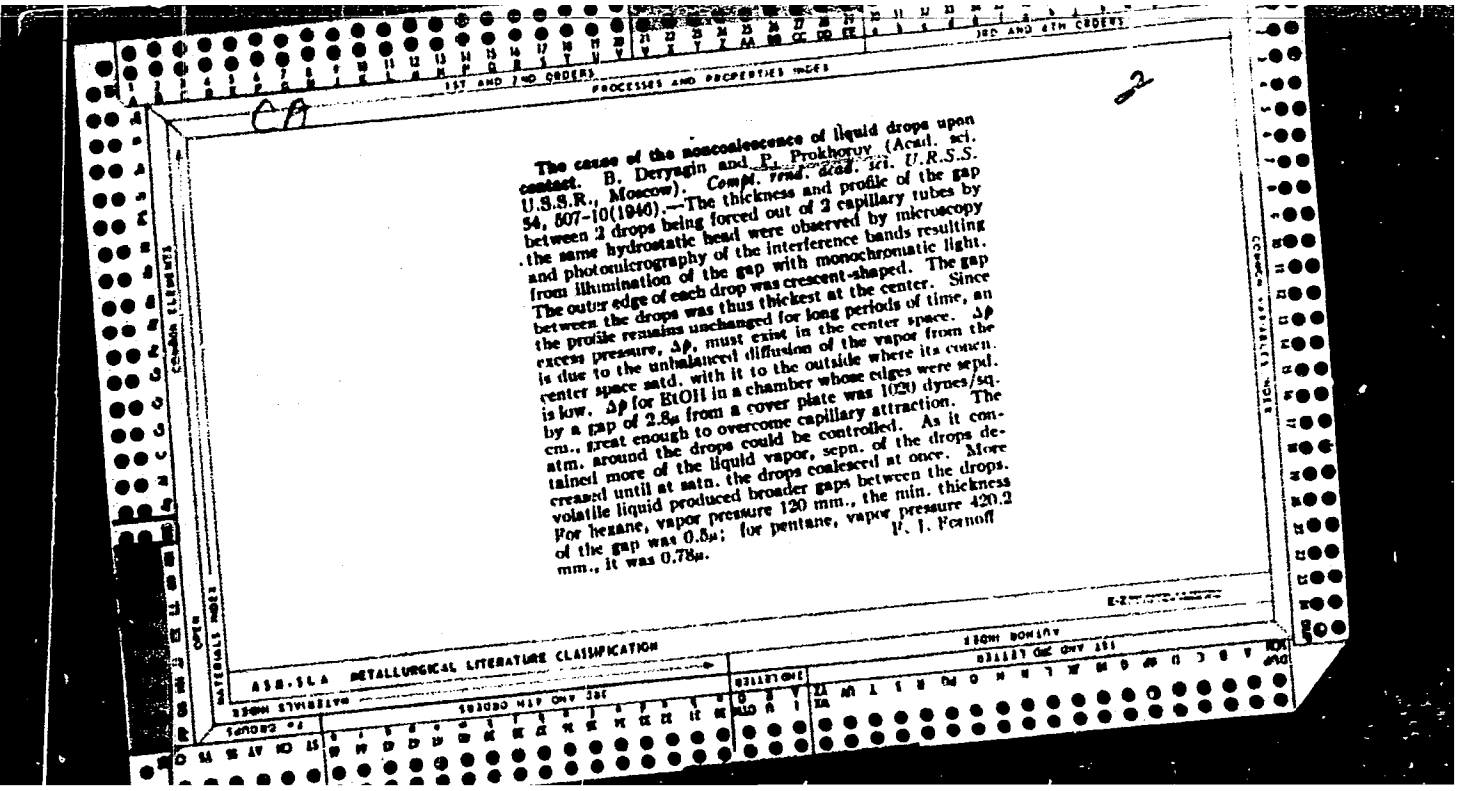
Characteristics of the production of sheet for extra-large boilers. Met. i gornorud. prom. no.5:38-40 S-O '64. (MIRA 18:7)

PROKHOROV, P.A.

Effect of small additions of titanium on the properties and structure of low-carbon, low-alloy steel. Metalloved. i term. obr. met. no.11:42-45 N '65. (MIRA 18:12)

CHERNENKO, S.Ye., PROKHOROV, P.I.

Protecting the exhaust pipes of electrostatic precipitators against corrosion. Khim.prom. no.8:709 D '59. (MIRA 13:6)
(Pipe corrosion)



The cause of the noncoalescence of liquid drops upon contact. B. Deryagin and P. Prokhoruv (Acad. sci. U.S.S.R., Moscow). *Compt. rend. acad. sci. U.R.S.S.* 54, 807–10(1940).—The thickness and profile of the gap between 2 drops being forced out of 2 capillary tubes by the same hydrostatic head were observed by microscopy and photomicrography of the interference bands resulting from illumination of the gap with monochromatic light. The outer edge of each drop was crescent-shaped. The gap between the drops was thus thickest at the center. Since the profile remains unchanged for long periods of time, an excess pressure, Δp, must exist in the center space. Δp is due to the unbalanced diffusion of the vapor from the center space satd. with it to the outside where its concn. is low. Δp for EtOH in a chamber whose edges were sepd. by a gap of 2.8μ from a cover plate was 1020 dynes/sq. cm., great enough to overcome capillary attraction. The atm. around the drops could be controlled. As it contained more of the liquid vapor, sepn. of the drops decreased until at satn. the drops coalesced at once. More volatile liquid produced broader gaps between the drops. For hexane, vapor pressure 120 mm., the min. thickness of the gap was 0.8μ; for pentane, vapor pressure 420.2 mm., it was 0.78μ.

V. I. Fernoff

PROKHOROV, P. S.

"Causes of the Noncoalescence of Water Droplets in Collision," by P. S. Prokhorov and V. N. Yaskin, Lab. of Surface Forces, Inst. of Physical Chemistry, Acad. Sci., USSR, April 1947

B-76026

PROKHOROV, P. S.

Sep 1947

USSR/Physics
Fog
Meteorological Research

"Investigation of the Reasons for Nonfusion of Liquid Droplets Under Lengthy Contact," P. S. Prokhorov, 11 pp
Inst. Phys. Chem., A S USSR -
"Zhur Fiziches Khim" Vol XXI, No 9 - pp. 1045-55

The author attempts to explain the phenomena of fogs where there are thousands of liquid particles which remain separated from one another. Discusses the method used in conducting the experiments and gives diagrams of the equipment used. Gives results of his experiments and confirms them with mathematical formulae. One photograph of the interference rings

24T103

Sep 1947

USSR/Physics (Contd)

around a drop of hexane. Experiments were carried out at the Laboratory of Surface Tensions of the Institute of Physical Chemistry, Academy of Sciences of the USSR. Prof B. V. Deryagin assisted the author.

24T103

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

C A

Causes of nonmerging of water drops on collision. P. S. Prokhorov and V. N. Vashin (Inst. Phys. Chem. Acad. Sci. U.S.S.R., Moscow). *Kolloid. Zhur.* 10, 123-4(1948).—Merging of colliding water drops is influenced by the satn. with vapor of the space sepg. the drops. H_2O drops of 0.4 mm. diam., falling from a vertical capillary from a height of 13 mm., were reflected on a mirror inclined by 35° to the horizontal plane, and, on rebounding, were made to collide with a stationary drop held in a Pt wire ring. Merging occurred only when the horizontal distance between the point of reflection of the 1st drop and the stationary drop remained below a crit. distance *d*. With the relative humidity of the surrounding space increasing from 80 to 100%, *d* for H_2O, a 2% aq. soln. of $MgSO_4$, and 2% $MgSO_4$ + 2% NaCl, increased, resp., from 4.65 to 5.65, 3.7 to 4.7, and 2.7 to 3.6 mm. Thus, satn. with vapor plays a similar role in preventing merging of drops in dynamic collision as in static contact (*C.A.* 41, 6004a). On the other hand, in collision, an increase of the distance of the colliding drops results in the reflected drop impinging at a somewhat lower point on the stationary drop, the difference, under the above conditions, being of the order of 0.1-0.2 mm., i.e., comparable with the dimensions of the drop and significant. N. Thon

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

PROKHOROV, P.S.

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A study of reasons of noncoalescence of liquid droplets under static conditions (under prolonged contact). B. V. Deryagin and P. S. Prokhorov. *Novye Idei v Oblasti Tekhniki Akademii Nauk S.S.S.R., Inst. Fiz.-Khim., Sbornik Statei* 1949, 84–101.—A method was developed that permits study of the shape and dimensions of the air space between 2 touching half-droplets, while preventing their coalescence. It involves microscopic observation of interference rings with monochromatic light of continuously variable wave length, and permits variation in the compn. of the surrounding atm. The air space has a form resembling a crater inverted over another crater, and the distance between the rims of the opposite craters is the parameter studied. This gap is larger for liquids with higher vapor pressure, and it decreases with increasing concn. of the vapor in the surrounding atm. The noncoalescence of the half-droplets is explained by an excess pressure in the air space caused by the diffusion of the vapor of the substance through the gap between the rims of the air space, while air is drawn into the air space. A study was made with an app. designed to serve as a model illustrating the diffusion theory, and an equation was derived for this case, relating the value of the excess pressure to the size of the gap and properties of the substance. The exptl. results obtained on this app. closely follow the theoretical values. The equation applied to half-droplets of Et_2O gives a value for the gap several times as large as the exptl. value. This is explained by the flow of the liquid, in the outer layer of the half-drops, from the center of the air space toward the gap between the rims. This effect was absent in the expts. with the model. The diffusion theory explains the dependence of the size of the gap on the vapor pressure of the liquid and on the concn. of the vapor in the surrounding atm.

Ludwig Luft-Zurakowski

CA

Apparatus for determination of the coefficients of diffusion of vapors of liquids in the atmosphere. B. V. Deryagin, P. N. Prokhorov, and A. D. Malkina (Acad. Sci. U.S.S.R.). *Zavodskaya Lab.* 10, 382 3(1941); cf. C.A. 44, 8184g.—The app. consists of a vessel provided with a horizontal porous separator. The test liquid is introduced into the bottom compartment, while air or other gas is circulated through the upper compartment. Both air spaces are connected to a differential manometer, with 3-way stopcock switching. The differential pressure read on the manometer is proportional to the vapor pressure difference on the 2 sides of the porous barrier. Tests with acetone, CCl_4, benzene, and MeOH gave satisfactory results. O. M. Kvashapuff

CA

New diffusion manometric instruments for measuring diffusion coefficients, volatility, and vapor content of various liquids in the atmosphere. B. V. Deryagin, [illegible] S. Prokhorov, and A. D. Malkina (Acad. Sci. U.S.S.R., Moscow). *Zhur. Fiz. Khim.* **24**, 865-[illegible] (1950).—A chamber contg. satd. vapor is sepd. by a porous membrane (pore diam. 1-3 μ) from a chamber in which the vapor pressure p is kept very low by an air current. In steady state, the pressure difference between the 2 chambers at a first approximation is $\eta D(p_0 - p)/kP$; D is the diffusion coeff. of the vapor, η viscosity of the air-vapor mixt., p_0 the pressure of the satd. vapor, P the pressure in the air chamber, and K the app. const. The following D were obtained at 0° and 20°: Me_2CO 0.1076 and 0.1120, benzene 0.0841 and 0.0890, MeOH 0.1214 and 0.1398, and CCl_4 0.1236 and 0.1424 cm.²/sec. Another method makes the knowledge of η unnecessary. The instrument can be used also for detg. vapor pressures (if D is known), the product Dp_0 which dets. the rate of evapn., and the rate of thermal diffusion of vapors. J. J. Bikerman

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PROKHOROV, P. S.

USSR/Chemistry - Aerosols

Dec 51

"The Effect of Moisture Deficiency on the Speed of Coagulation of Water Aerosol," P. S. Prokhorov, B. V. Deryagin, L, F. Leonov, Lab of Surface Forces, Inst Phys Chem, Acad Sci USSR

"Dok Ak Nauk SSSR" Vol LXXXI, No 4, pp 637-640

Coagulation of droplets is retarded if the surrounding atm is not satd with the vapor of the droplets. This is confirmed experimentally. Coagulation is shown graphically to decrease with increased dryness of surrounding air.

202T25

PROKHOROV, P. S., MALKINA, A D., DERYAGIN, B. V.

USSR (600)

Diffusion

Determination of diffusion coefficients, evaporation rate and content of vapors of various liquids in the atmosphere. Trudy Inst. fiz. khimii AN SSSR No. 1, 1952.

Monthly List of Russian Accessions, Library of Congress, December 1952. Unclassified.

USSR/Chemistry - Aerosols Jan 52

"The Effect of a Moisture Deficiency on the Processes of Collision and Coalescence of Water Drops," P. S. Prokhorov, L. F. Leonov, Lab of Surface Forces, Inst of Phys Chem, Acad Sci USSR

"Kolloid Zhur" Vol XIV, No 1, pp 66-72

Using new method and app for lab modeling of water clouds in air-vapor current which permit control of the direction of drop motion in a current and taking of data on drop distribution by size, showed that consideration of dependence of water-

203T8

USSR/Chemistry - Aerosols (Contd) Jan 52

drop collision efficiency on moisture deficiency of surrounding atm is necessary for clarification of mech of drop formation and that 100% efficiency requires absence of moisture deficiency or supersatn of surrounding atm with water vapor.

(CA 47 No.20 : 11311 '53)

203T8

PROKHOROV, P. S.

PROKHOROV, P.S.

CARD 1 / 2 PA - 1260

SUBJECT USSR / PHYSICS
AUTHOR DERJAGIN, B.V., PROCHOROV, P.S., BATOVA, G.A., LEONOV, L.F.
TITLE The Diffusion Hygrometer.
PERIODICAL Zurn. techn. fis, 26, fasc. 4, 887-894 (1956)
Publ. 4 / 1956 reviewed 9 / 1956

The diffusion hygrometers described here are based upon the fact that in the chamber of the device containing a dry and a humid substance (and which is separated from the material to be investigated by a porous wall) under- or overpressure is produced while the diffusion current is steady. Here 4 varieties of these hygrometers are described each of which may have its own particular sphere of action. The two chamber hygrometer consists of two chambers which are separated from the surrounding atmosphere by uniform porous separating walls (of coal or mipor). Construction and mode of operation of the device are described. Using the two chamber hygrometer is complicated by the necessary determination of the apparatus constant K, the necessity of knowing atmospheric pressure, the diffusion coefficient, and air humidity.
The three chamber hygrometer: In order to make the apparatus constant of the hygrometer independent of temperature and pressure, PROCHOROV and DERJAGIN suggested a three chamber hygrometer. The first chamber is dry, the second and third are used for compensation. Construction and operation of the apparatus are discussed. By means of this hygrometer it is possible to determine humidity independent of temperature and atmospheric pressure, above all also in the case of negative temperature. Next, hygrometers with assumed

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Zurn.techn.fis, 26, fasc.4, 887-894 (1956) CARD 2 / 2

sensitivity and slight inertia are described. In order to reduce inertia and at the same time to increase sensitivity, the manometer travels are strengthened by negative back-coupling. The four chamber hygrometer consists of 2 parts: of a two chamber hygrometer with a dry chamber, and of a device containing a dry and a humid matter and a porous wall. Humidity was measured by determining the ratio (decrease of pressure between dry and humid chamber / decrease of pressure measured by the two chamber hygrometer with dry material). Conclusions: The above described types of diffusion hygrometers offer some advantage against devices hitherto in use for measuring air humidity; they may be constructed so as to have different degrees of sensitivity and inertia. Diffusion hygrometers have a linear scale and make it possible to measure humidity within a wide range of temperature, also below 0° C.

INSTITUTION: Institute for Physical Chemistry, Moscow.

PROKHOROV, P. S., IZMAILOVA, B. V. and DERYAGIN, B. V.

"Influence of Adsorption Layers on the Growth of Condensation Nuclei in a Super-Saturated Atmosphere," paper to be presented at the 2nd International Congress of Surface Activity, International Union of Pure and Applied Chemistry, London, 12 April 1957.

Phys. Chem. Lab. of Surface Phenomena, AS USSR

PROKHOROV, P. S., , IZMAYLOV, G. I. and DERYAGIN, B. V.

"Moglichkeit der Oberlachen-Aktivierung und Passivierung von Reimen fuer Wasserdampf-Kondensation."

paper delivered at the Intl. Cong. on Surface Activity, London, 8-12 Apr 1957.

Angewandte Chemie, No. 16, 1957.

Prokhorov, P.S.

80803

SOV/124-59-9-10352

3.5000

Translation from: Referativnyy zhurnal, Mekhanika, 1959, Nr 9, p 113 (USSR)

AUTHORS: Vlasenko, G.Ya., Deryagin, B.V., Kudravtseva, N.M., Prokhorov, P.S., Storozhilova, A.I., Churakov, V.V.

TITLE: Flow Methods for Investigating Atmospheric Aerosols

PERIODICAL: V sb.: Issled. oblakov, osadkov i grozovogo elektrichestva. Leningrad, Gidrometeoizdat, 1957, pp 185 - 188

ABSTRACT: Not only the number of particles within the volume unit, but also their dimension distribution can be determined by the ultramicroscopic flow investigation method. For this purpose, an optical discriminator (photometric wedge), making it possible to obtain the particle-brightness distribution, was mounted into the target illuminating device of an ultramicroscope. A new wedge-graduation method is described; the graduation curves of the dependence of particle dimensions on the wedge position can be obtained quickly, when applying the method mentioned. The authors report on the flow method applied to the study of the atmospheric condensation nuclei. For this purpose, a simple

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Flow Methods for Investigating Atmospheric Aerosols

accessory device is developed for "revealing" the condensation nuclei containing in the atmosphere. This accessory device consists of an air-moistening chamber and a cooling channel, in which vapor condensation on the condensation nuclei proceeds. The condensation nuclei, enlarged in this way, are carried away by the air current, arrive at the cell of the ultramicroscope, and can be recorded by the observer. The optimum operation conditions of the device were determined experimentally. By the ultramicroscopic flow method, the automation of registering aerosol particles or "revealed" condensation nuclei can be brought about. The design of an automatic counter developed for this purpose is presented. This counter carries out the registration of aerosol particles of high numerical concentrations without failing.

S.V. Severin

Card 2/2

124-58-9-10057

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 9, p 88 (USSR)

AUTHORS: Batova, G. A., Deryagin, B. V., Leonov, L. F., Nikol'skiy, A. P., Prokhorov, P. S.

TITLE: Diffusion Hygrometers (Diffuzionnyye gigrometry)

PERIODICAL: V sb.: Issled. oblakov, osadkov i grozovogo elektrichestva. Leningrad, Gidrometeoizdat, 1957, pp 189-191

ABSTRACT: Bibliographic entry

1. Hygrometers--Equipment 2. Diffusion

Card 1/1

IZMAYLOVA, G.I.; PROKHOROV, P.S.; DERYAGIN, B.V.

Flow method for measuring critical supersaturation for condensation centers. Trudy Inst. fiz. khim. no.6:158-161 '57. (MIRA 11:10)
(Condensation)

PROKHOROV, P. S.

Distr: 4E4j/4E2c(j)/4E3d

✓ The possibility of surface activation and passivation of nuclei in the condensation of water vapor. G. I. Ivanchenko, P. S. Prokhorov, and B. V. Deryagin (Inst. Phys. Chem., Acad. Sci. U.S.S.R., Moscow). *Kolloid. Zhur.* 19, 160-61 (1957).—A stream of dry air (m_1 moles/sec., H_2O vapor pressure = p_1) was mixed with a stream of moist air (m_2 moles/sec., H_2O vapor pressure = p_2), and p_2 was varied until visible fog appeared in the mixing chamber; the supersatn. S corresponding to fog formation was calcd. as $S = (m_1p_1 + m_2p_2)/p_s(m_1 + m_2)$; p_s = satd. vapor pressure at the mixing temp. When NaCl crystals (obtained by vaporization of drops of dil. NaCl solns.) were introduced in the dry stream, the S was greater (0.84 to 1.33), the smaller was the approx. radius of the crystals (0.2 to 0.026 μ). When C_2H_5O was adsorbed on the crystals before the expt., S increased by, e.g., 40%, but $(EtSi)_2O$, COMe$_2$, and iso-AmOH lowered S. A SiO_2 powder contg. about 2% Na_2CO_3 and 8% $CaCO_3$ was heated to 120–732° before the expt.; heating raised S up to 4-fold. The chem. or thermal treatment of the condensation nuclei changes the accommodation coeff. on them.

J. J. Bikerman

7
2 May
3

PROKHOROV, P. S.

5

Automatic recording diffusional humidity meter. A. P. Nikol'skii, B. V. Deryagin, P. S. Prokhorov, and G. A. Batova. *Zavodskaya Lab.* 23, 497–500 (1957); cf. *C.A.* 44, 1038*d*.—The app. was constructed for moisture detn. in a gas by measuring convection diffusion through a porous membrane with a pore diam. considerably larger than the mean free path of the dry air and steam mols. A chamber with some hygroscopic substance ($LiCl$ or $CaCl_2$) was tightly covered with a plate of material contg. fine pores (compressed graphite, porcelain, etc.) and placed in the moist air. The pressure inside the chamber decreased owing to the absorption of water vapor, and some moist gas diffused through the membrane. The partial pressure difference of dry gas inside and outside the chamber was a function of the water vapor pressure in the moist gas, and the coeff. of proportionality between the total and partial pressures at the two sides

PROKHOROV, P. S. Doc Chem Sci -- (diss) "Experimental studies of diffusion phenomena in aerosol systems." Mos, [redacted] /Publishing House of the Acad Sci USSR/, 1959. 26 pp (Acad Sci USSR. Inst of Phys Chem), 200 copies (KL, 45-59, 143)

PROKHOROV, P. S.; DERYAGIN, B. V.; IZMAYLOVA, G. I.; DUKHIN, S. S.;

"The adsorption of vapors by condensation nuclei and their influence on the formation of water aerosols,"

report presented at the Fourth All-Union Conference on Colloidal Chemistry, Tbilisi, Georgian SSR, 12-16 May 1958 (Koll zhur, 20,5, p.677-9, '58, Taubman, A.B)

PROKHOROV, P.S. and LEONOV, L.F.
(Inst. of Phys. Chem., AS USSR)

"The Study of Long Distance Forces Acting Between Water Drops and Non-volatile Particles."

paper submitted at the meeting of The Faraday Society, Bristol, England, 13-15 Sep '60

82880
S/120/60/000/02/011/052
E032/E314

24,6810

AUTHORS: Deryagin, B.V., Prokhorov, P.S., Vasichko, M.V. and Leonov, L.F.

TITLE: A Diffusion Chamber with Supersaturation Which is Constant Both in Space and Time

PERIODICAL: Pribory i tekhnika eksperimenta, 1960, No 2, pp 45 - 47 (USSR)

ABSTRACT: The supersaturation in a Wilson chamber disappears rather rapidly owing to the unavoidable condensation of vapour on the walls and also due to heat transfer. In diffusion chambers supersaturation is constant in time, but not in space. The method suggested in the present paper is free from these two disadvantages and can be used to obtain supersaturation which is constant both in time and in space. The idea is to use a periodic variation of the temperature of the walls of the chamber. The problem is formulated as follows. It is assumed that the walls are always moist and the flow of liquid down the walls can be neglected. Under these conditions the thickness of the layer of moisture is constant. If one neglects the heat transfer

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E032/E314

A Diffusion Chamber with Supersaturation which is Constant Both in Space and Time

associated with diffusion then the periodic change in the temperature of the walls will produce a heat wave propagated into the chamber. If the temperature of the walls is known then one can calculate the density of the vapour as a function of time. If the period of the temperature oscillations on the walls of the chamber is taken to be sufficiently short, then the temperature and diffusion waves are damped out in the neighbourhood of the walls and most of the volume of the chamber is maintained at an average temperature and density which can be expressed in terms of the temperature variation on the walls. If the amplitude of the temperature oscillations on the walls is small, the mean density of vapour in the chamber will be equal to the saturation vapour density at the average temperature of the walls and, consequently, the supersaturation will be equal to unity. At larger amplitudes of the temperature oscillations, the supersaturation will be greater than unity.

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A Diffusion Chamber with Supersaturation Which is Constant Both in Space and Time

The supersaturation will increase with the amplitude of the oscillations in the temperature of the walls. A chamber based on these ideas is shown in Figure 2. The working walls 1 were made of aluminium foil 0.05 mm in thickness and were in the form of squares 200 x 200 mm. These walls were attached to the perspex frame 2 which was 50 mm thick. The heat waves are practically damped out at a distance of 3 mm from the wall when the period of 1 sec is used. The side walls formed by the frame are kept at the average temperature of the chamber. This tends to reduce side effects but does not eliminate them altogether, so that the working volume is smaller than the geometrical volume. The heat was applied by passing short but large current pulses (of the order of a few hundred amperes) through leads in thermal contact with the aluminium walls. The heat was removed by copper vessels 6 (Figure 2) filled with a mixture of acetone or alcohol and solid carbon dioxide. The thermal contact between the refrigerator and the aluminium wall

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A Diffusion Chamber with Supersaturation Which is Constant Both in Space and Time

of the chamber was through a thin paper layer 7 . The rate of cooling could be adjusted by varying the thickness of this paper. This construction was used to obtain a temperature change of $\pm$ 3 °C with a period of 1 sec at an average temperature of 20 °C. The chamber was heated for 0.2 sec and cooled for 0.8 sec. The supersaturation in the chamber calculated from these data should be about 1%. In order to increase the degree of supersaturation, a larger amplitude in the temperature oscillations is required. The chamber can be used to reproduce slow atmospheric processes since the supersaturation in the formation of clouds is usually 0.1% and only relatively rarely exceeds 1%. Figure 3 shows the dependence of the supersaturation on the temperature amplitude for different average temperatures.
There are 3 figures.

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A Diffusion Chamber with Supersaturation Which is Constant Both in Space and Time

ASSOCIATION: Institut fizicheskoy khimi AN SSSR
(Institute of Physical Chemistry of the Academy of Sciences of the USSR)

SUBMITTED: March 9, 1959

Card 5/5

PROKHOROV, P. S.

PHASE I BOOK EXPLOITATION SOV/5590

Konferentsiya po poverkhnostnym silam. Moscow, 1960.

Issledovaniya v oblasti poverkhnostnykh sil; sbornik dokladov na konferentsii po poverkhnostnym silam, aprel' 1960 g. (Studies in the Field of Surface Forces; Collection of Reports of the Conference on Surface Forces, Held in April 1960) Moscow, Izd-vo AN SSSR, 1961. 231 p. Errata printed on the inside of back cover. 2500 copies printed.

Sponsoring Agency: Institut fizicheskoy khimii Akademii nauk SSSR.

Resp. Ed.: B. V. Deryagin, Corresponding Member, Academy of Sciences USSR; Editorial Board: N. N. Zakhavayeva, N. A. Krotova, M. M. Kusakov, S. V. Nerpin, P. S. Prokhorov, M. V. Talayev and G. I. Fuks; Ed. of Publishing House: A. L. Bankvitser; Tech. Ed.: Yu. V. Rylina.

PURPOSE:. This book is intended for physical chemists.

Card 1/8

Studies in the Field of Surface Forces (Cont.) SOV/5590

COVERAGE: This is a collection of 25 articles in physical chemistry on problems of surface phenomena investigated at or in association with the Laboratory of Surface Phenomena of the Institute of Physical Chemistry of the Academy of Sciences USSR. The first article provides a detailed chronological account of the Laboratory's work from the day of its establishment in 1935 to the present time. The remaining articles discuss general surface force problems, polymer adhesion, surface forces in thin liquid layers, surface phenomena in dispersed systems, and surface forces in aerosols. Names of scientists who have been or are now associated with the Laboratory of Surface Phenomena are listed with references to their past and present associations. Each article is accompanied by references.

TABLE OF CONTENTS:

Studies in the Field of Surface Forces (Cont.) SOV/5590

V. SURFACE FORCES IN AEROSOLS

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Studies in the Field of Surface Forces (Cont.) SOV/5590

AVAILABLE: Library of Congress

JA/rsm/os
10/28/61

Card 8/8

PROKHOROV, P.S.; LEONOV, L.F.

Study of long-range diffusion forces between water droplets and nonvolatile particles [with summary in English]. Koll. zhur. 23 no.4:464-468 Jl-Ag '61. (MIRA 14:8)

1. Institut fizicheskoy khimii AN SSSR, Moskva.
(Diffusion)

PROKHOROV, Petr Sergeyevich,; LEONOV, L. F.

"Experimental study of diffusion forces"
To be presented at the First National Conference on Aerosols - Liblice, Czechoslovakia, 8-13 Oct 1962

Inst. of Physical Chemistry, Acad. of Sci. USSR, Moscow

42822

S/169/62/000/010/035/071
D228/D307

3,5900

AUTHORS: Prokhorov, P.S. and Leonov, L.F.

TITLE: Investigation of diffusive long-range action forces between water drops and nonvolatile particles

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 10, 1962, 11, abstract 10B69 (In collection: Issled. oblakov, osadkov i grozovogo elektrichestva, M., AN SSSR, 1961, 83-87)

TEXT: The experimental set-up for measuring diffusive long-range forces between water drops and a 1 mm diameter silvered globule is described together with some results of the research. The measurements were made with a torsion balance. This had a sensitivity of $0.4 \cdot 10^{-9}$ g and was fitted with an autocollimation raster photorelay, an amplifier, and an electronic recording potentiometer. The droplet and the globule were grounded during the measurements in order to obviate the possibility of the induction of the electrostatic charges. The diffusive forces were determined (after elimin-

Card 1/2

Investigation of diffusive ...

ating the influence of convection currents) at a differing humidity of the surrounding medium and at different distances. No diffusive forces were detected when the surrounding medium was fully saturated with water vapor. If the humidity is nil, considerable diffusive forces appear, and their magnitude depends on the distance. At 40% humidity the diffusive forces are considerable, but their abatement is more marked than is the case with zero humidity. In this event the diffusive forces are inversely proportional to the square of the distance in the range from 5 to 12 mm. In this interval the order of magnitude of the repulsive forces amounts to $1 \cdot 10^{-9}$ g. On the further approach of the drops the square relation is disturbed, and the forces grow more slowly. The experimental data cited agrees well with the theory, developed by B.V. Deryagin and S.S. Dukhin.
[Abstracter's note: Complete translation]

Card 2/2

PROKHOROV, S., kand.arkhitektury

Experimental settlement at the Konakovo State Regional Electric Power Plant. Na stroi. Ros. 3 no.5:3-5 My '62. (MIRA 15:9)
(Konakovo—City planning)

PROKHOROV, S., podpolkovnik; TABUNOV, I., podpolkovnik.

Device for night firing at silhouettes and burst of shots. Voen. vest. 37 no.1:79-82 Ja '58. (MIRA 11:2)
(Target practice--Equipment and supplies)

PROKHOROV S

KISELEV, I. (g. Gor'kiy); PROKHOROV, S. (g. Gor'kiy)

Material interest in carrying out business accounting. Vop.ekon. no.2: 140-145 F '57. (MLRA 10:5)

(Gorkiy--Automobile industry--Accounting)

PROKHOROV, S., podpolkovnik; KLEVTSOV, P., mayor

Do away with all shortcomings in the organization of marksmanship training. Komm.Vooruzh.Sil 1 no.6:73-76 Mr '61. (MIRA 14:8)
(Shooting, Military)

PROKHOROV, S., podpolkovnik

An excellent drill stance, a firm step. Starsh.-serezh. no.12:21 D '61. (MIRA 15:3)

(Military education)

PROKHOROV, S., podpolkovnik

The "opponent" is in front. Starsh.-serzh. no.3:8-9 Mr '62. (MIRA 15:4)

(Attack and defense (Military science))

LEYZEROVICH, A.Sh., inzh.; TRUBILOV, M.A., kand.tekhn.nauk; PROKHOROV, S.A., inzh.; KULICHIKHIN, V.V.

Buckling of steam turbine housings due to thermal stresses. Teploenergetika 12 no.10:57-62 O '65. (MIRA 18:10)

1. Vsesoyuznyy teplotekhnicheskiy institut.

PROKHOROV, S.A., inzh.

Temperature distribution in the flanges of the VPt-50-3 turbine during starts with steam heating. Teploenergetika 11 no.8:19-23 Ag '64. (MIRA 18:7)

1. Vsesoyuznyy teplotekhnicheskiy institut.

TRUBILOV, M.A., kand. tekhn. nauk; CHERNETSKIY, N.S., inzh.; PROKHOROV, S.A., inzh.

Temperature regime of the front packing bushings in the LMZ-series high pressure turbine under operating conditions. Teploenergetika 6 no.12:30-38 D '59. (MIRA 13:3)

1.Vsesoyuznyy teplotekhnicheskiy institut.
(Steam turbines)

TRUBILOV, M.A., kand. tekhn. nauk; PROKHOROV, S.A., inzh.; LEVCHENKO, B.L., inzh.; ROMANCHIK, K.K., inzh.

Change of the axial gaps of the VK-100-6 turbine during its operation. Teploenergetika 11 no.3:61-66 Mr '64. (MIRA 17:6)

1. Vsesoyuznyy nauchno-issledovatel'skiy teplotekhnicheskiy institut i Leningradskiy metallicheskiy zavod im XXII s"yezda KPSS.

TRUBILOV, M.A., kand.tekhn.nauk; PROKHOROV, S.A., inzh.; GRIBKOV, M.N., inzh.

Effect of axial transposition of the rotor on the efficiency of a steam turbine. Izv. vys. ucheb. zav.; energ. 3 no. 7:153-158 Jl '60. (MIRA 13:8)

1. Vsesoyuznyy ordena Trudovogo Krasnogo Znameni teplotekhnicheskiy nauchno-issledovatel'skiy institut imeni F.E. Dzerzhinskogo.
(Steam turbines)

L 30784-66 EWP(k)/EWT(d)/EWP(h)/T-2/EWP(1)/EWP(f)/EWP(v) WW

ACC NR: AP6022096 SOURCE CODE: UR/0096/66/000/004/0025/0029

AUTHOR: Trubilov, M. A. (Candidate of technical sciences); Prokhorov, S. A. (Engineer)

ORG: All-Union Heat Engineering Institute (Vsesoyuznyy teplotekhnicheskiy institut)

TITLE: Investigation of the unevenness in heating of the cutoff valve in the T-100-130 turbine during startup

SOURCE: Teploenergetika, no. 4, 1966, 25-29

TOPIC TAGS: heating engineering, turbine, valve, thermocouple, turbine design, turbine rotor, heat balance, heat insulation/T-100-130 turbine

ABSTRACT: Experimental data are presented from an investigation of the temperature field of the cutoff valve of the T-100-130 turbine and an analysis of the operating conditions of its mountings during startup. For the investigation, 12 thermocouples were installed in a valve, which was then subjected to various starting regimes, including that recommended by the factory. In order to increase the reliability of the valve mountings, the authors recommend: 1) in the development of new valve designs an attempt to create identical heating conditions for cover and body; 2) the best possible heat insulation of valve caps; 3) pre-heating of the valves before starting the rotor; 4) lower than normal parameter steam whenever possible during startup, followed by gradual increase to nominal parameters; 5) checking temperature differences of valve parts during operation. Orig. art. has: 5 figures and 5 formulas. [JPRS]

SUB CODE: 13 / SUBM DATE: none

UDC: 621.165.621.882.5.0001.5

Card 1/1 VS

PROKHOROV V.G.

MEDNIKOV, B.M.; PROKHOROV, V.G.

A new species of Cyclopteropsis (Pisces, Cyclopterinae) from the Bering Sea. Dokl. AN SSSR 111 no.3:717-719 N '56. (MLRA 10:2)

1. Kamchatskoye otdeleniye Vsesoyuznogo Tikhookeanskogo nauchno-issledovatel'skogo instituta rybnogo khozyaystva i okeanografii. Predstavleno-akademikom Ye.N. Pavlovskim.
(Bering Sea--Cyclopteridae)

PROKHOROV, V.G.

PHASE I BOOK EXPLOITATION SOV/4959

Ural'skoye soveshchaniye po spektroskopii

Materialy 2 Ural'skogo soveshchaniya po spektroskopii, Sverdlovsk, 1958 g. (Materials of the Second Urals Conference on Spectroscopy, Held in Sverdlovsk, 1958) Sverdlovsk, Metallurgizdat, 1959. 206 p. Errata slip inserted. 1,000 copies printed.

Sponsoring Agency: Ural'skiy filial Akademii nauk SSSR. Komissiya po spektroskopii and Ural'skiy dom tekhniki VSNTO.

Eds.: [illegible] Borisovich Shayevich and Gennadiy Pavlovich Skornyakov; Tech. Ed.: M. M. Matlyuk.

PURPOSE: This collection of articles is intended for spectral analysis laboratory workers at ferrous and nonferrous metallurgical plants, and for laboratory personnel of the metal-working industry, geological and prospecting organizations, and similar scientific research laboratories.

COVERAGE: The collection contains papers read at the Second Urals Conference on the spectral analysis of ferrous and nonferrous metals and alloys, slags, ores, agglomerates, refractories and other materials used in industry. The material of the conference includes articles on the analysis of steels (including the determination of gases), ferroalloys, nonferrous and light metals and alloys, pure noble metals, etc. The present volume is intended to disseminate the latest experience in working with spectral laboratories, and to report on the results of scientific research. The author thanks R. I. Outkina and Yu. M. Buravlev. Almost all of the articles are accompanied by references.

PROKHOROV, V.I.

New methodical regulations for the composition and explanation of draft state standards. Standartizatsiia 24 no.11:47-49 N '60.
(MIRA 13:11)

(Standardization)

PROKHOROV, V.I.

Toward new achievements in technology. Izobr.i rats. no.10:2-4 O'60. (MIRA 13:10)

1. Sekretar' Vsesoyuznogo tsentral'nogo soveta profsoyuzov.
(Technological innovations)

PETROV, S.M., red.; PROKHOROV, V.I., red.; RUMYANTSEV, A.F., red.; SHITAREV, G.I., red.; SHITOV, N.F., red.; ZAKLADNAYA, V.M., red.; NAUMOV, K.M., tekhn. red.

[Toward the victory of communist labor; work practice of the party, Communist Youth League and trade-union organizations with communist labor brigades] K pobede kommunisticheskogo truda; ob opyte raboty partiinykh komsomol'skikh i profsoiuznykh organizatsii s brigadami kommunisticheskogo truda. Moskva, Izd-vo VPSh i AON pri TsK KPSS, 1961. 271 p. (MIRA 14:8)

1. Kommunisticheskaya partiya Sovetskogo Soyuza. Vysshaya partiynaya shkola.

(Socialist competition)

DAVYDOV, A.B., kand.tekhn.nauk; PROKHOROV, V.I., inzh.

Air-cooling machines in the air-conditioning systems.
Vod.i san.tekh.no.4:26-29 Ap '65.
(MIRA 19:1)

SOV/46-5-3-25/32

24(1), 9(6)

AUTHOR: Prokhorov, V.G.

TITLE: Comment on Yu.B. Semennikov's Criticism of my Paper "On the Problem of Conversion of an Ultrasonic Image into a Visible One". (Po povodu kritiki Yu.B. Semennikovym moyey raboty "K voprosu preobrazovaniya ul'trazvukovogo izobrazheniya v vidimoye")

PERIODICAL: Akusticheskiy zhurnal, 1959, Vol 5, Nr 3, pp 379-380 (USSR)

ABSTRACT: Semennikov (Ref 1) criticized the present author's work (Akusticheskiy zhurnal, 1957, Vol 3, Nr 3, pp 254-261). Semennikov's criticisms of (1) the proposed equivalent circuit for an electron-acoustic converter, (2) description of the converter load, (3) the formula for its internal resistance and (4) the formula for no-load sensitivity of a piezo-plate at resonance are rebutted by Prokhorov in the present letter. There are 2 Soviet references.

ASSOCIATION: Leningradskiy elektrotekhnicheskiy institut im. V.I. Ul'yanova (Lenina). (Leningrad Electrotechnical Institute imeni V.I. Ul'yanov (Lenin))

SUBMITTED: May 4, 1959

Card 1/1

PROKHOROV, V.I., inzh.

Fastening air ducts to cantilever brackets with a building and assembly "pistol". Vod.i san.tekh. no.4:27-31 Ap '62. (MIRA 15:8)

(Air pipes)

PROKHOROV, Vasiliy Il'ich

[Trade unions and the creative initiative of the masses] Profsoiuzy i tvorcheskaia initsiativa mass. Moskva, Profizdat, 1961. 61 p. (Bibliotechka profsoiuznogo aktivista, no.16) (MIRA 16:1)

(Trade unions)

DROZDOV, Yevgeniy Afanas'yevich, kand. tekhn. nauk; PROKHOROV, Vladimir Ivanovich, kand. tekhn. nauk; PYATIBRATOV, Aleksandr Petrovich, kand. tekhn. nauk; TIKHONOV, S.N., inzh.-polkovnik, red.; SOLOMONIK, R.L., tekhn. red.

[Principles of computer engineering] Osnovy vychislitel'noi tekhniki. Moskva, Voen.izd-vo M-va oborony SSSR, 1961. 425 p. (MIRA 14:12)
(Electronic calculating machines)

PROKHOROV, V.I.

Thirty years since the establishment of the first state standards in the U.S.S.R. Standartizatsiia no.2:7-13 Mr-Ap '56. (MLRA 9:5)

1. Komitet standartov, mer i izmeritel'Nykh priborov.
(Standards, Engineering)

PROKHOROV, V.I.

Organization of standardization work. Standartizatsiia 26 no.5:60-61 My '62. (MIRA 15:7)

(Standardization)

PROKHOROV, V.I.

Problems of technical specifications. Standartizatsiia 26 no.8:62 Ag '62. (MIRA 15:8)
(Standards, Engineering)

DROZDOV, Yevgeniy Afanas'yevich, kand. tekhn. nauk, dots.;
PROKHOROV, Vadim Ivanovich, kand. tekhn. nauk, dots.;
FYATIBRATOV, Aleksandr Petrovich, kand. tekhn. nauk,
dots.; YERLYKIN, L.A., red.

[Fundamentals of computer technology] Osnovy vychislitel'-
noi tekhniki. Izd.2., perer. Moskva, Voenizdat, 1964.
463 p. (MIRA 17:9)

AUTHOR: Prokhorov, V.I. SOV/28-58-5-1/37

TITLE: A New Elaboration and Presentation Procedure for the Approval of State Standards (Novyy poryadok razrabotki i predstavleniya na utverzhdeniye gosudarstvennykh standartov)

PERIODICAL: Standartizatsiya, 1958, Nr 5, pp 3 - 5 (USSR)

ABSTRACT: The changes in the procedure for elaborating and presenting standards for state approval are described. In the new instructions the standards are divided into various groups dealing with: 1) the standardization of parts and

Card 1/2

A New Elaboration and Presentation Procedure for the Approval of State Standards

units in production machinery; 2) standards governing the quality of production; 3) production testing standards. Other groups of standards cover marking, packing, transportation, storage etc.

ASSOCIATION: Komitet standartov, mer i izmeritel'nykh priborov (The Committee of Standards, Measures and Measuring Instruments)

1. Industry--USSR 2. Standardization--USSR

PROKHOROV, V.I.

Toward new successes in constructive work. Okhr.truda i sots. strakh. no.1:3-8 Ja '59. (MIRA 12:2)

1. Sekretar' Vsesoyuznogo tsentral'nogo soveta profsoyuzov.
(Industrial hygiene)

PROKHOROV, V.I.

Introduction periods for state standards. Standartizatsiia 26 no.2:54-55 F '62. (MIRA 15:2)
(Standardization)

PROKHOROV, V.I.

New regulations for the approval of specifications has improved the quality of broad consumption goods. Standartizatsiia 29 no.4: 54-55 Ap '65. (MIRA 18:7)

L 33503-65
ACCESSION NR: AR5003891

mm Hg. Pumping down then stops, the temperature is raised to 170°C and 5-6 kg/cm^2 pressure is applied. Following this, the specimen is slowly cooled to 60°C. When the specimens were of large size the pulse amplitudes were determined with respect to stilbene single crystal and measured in individual areas of the specimen upon irradiation with γ-rays from a Co^{60} source using FEU-29. The error in measurement was ± 10%. It was established that the decrease in pulse amplitude when the thread is 500 mm long is ∿35%. The filaments may be used in scintillation counters. (See *Ref. Zhur. Khim*, 1964, 3S374).

SUB CODE: OC ENCL: 00

Card 2/2

LEYRIKH, V.E.; VEPRIK, I.B.; PROKHOROV, V.Kh.

Expanding portland cement for fusing joints of precast reinforced concrete storage tanks. Stroi.truboprov. 8 no.7:6-8 Jl '63. (MIRA 17:2)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut po stroitel'stvu magistral'nykh truboprovodov.

PROKHOROV, V.M.; CHAY DYAN'-IN [Ch'ai Tien-ying]

Diffusion of Ce^{144} in the soil. Pochvovedenie no.7:107-109 Jl '63. (MIRA 16:8)

1. Agrofizicheskiy nauchno-issledovatel'skiy institut.
(Soils--Cerium content) (Diffusion)

S/069/63/025/001/003/008
B101/B186

AUTHOR: Prokhorov, V. M.

TITLE: Ion diffusion in an adsorbing disperse medium

PERIODICAL: Kolloidnyy zhurnal, v. 25, no. 1, 1963, 60-65

TEXT: The diffusion equation derived for a medium comprising a liquid conducting phase and an adsorbing solid phase is based on Fick's diffusion equation, with the cross section S of the conducting phase a function of the coordinate x. Diffusion takes place in x-direction and the total cross section S_o of the column remains constant.

$$\partial c/\partial t = \left[WD_o/(W + dn/dc)\right]\left[s\partial^2 c/\partial x^2 + (ds/dx)(\partial c/\partial x)\right],$$

is obtained, where c is the concentration of the diffusing substance in the liquid phase, D_o is the diffusion coefficient, $W = \Delta V_{liq}/\Delta M_{sd}$ is the ratio between the volume of the liquid phase and the amount of solid phase in the elementary layer; W is the content of moisture if water is used as liquid phase; n is the amount of substance adsorbed by the unit mass of the solid phase; $s = S/S_o$. The equation

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S/069/63/025/001/003/008
B101/B186

Ion diffusion in an adsorbing ...

$\partial c/\partial t = D\partial^2 c/\partial x^2$ (11), where $D = d_o W^2 D_o/(W+K)$ and d_o is the weight by volume of the medium, holds for s = const and dn/dc = const = K, where K is the coefficient of distribution of the substance over the two phases. Hence, the dependence of D on W may be linear (K = 0) or square ($K \gg W$). The diffusion of Sr^{90} through wet quartz sand (I), wet black soil (II), wet soddy medium-podzolized soil (III) and wet loamy chestnut soil (IV) was conducted to prove the correctness of the above assumptions. $Sr^{90}Cl_2$ was caused to diffuse through columns filled with these soils during 15 months. Humidity and radioactivity of the individual column sections were measured. Results: In agreement with Eq. (11), log c was a linear function of x^2. For IV, D was found to be $1.85 \cdot 10^{-7}$ cm/sec at W = 41.6%. If the humidity is expressed in parts by volume, $\theta = d_o W$, then D versus θ is linear for I and square for II, whereas the curves for III and IV showed inflections caused by a complex function $s(\theta)$. K is 0.011 ± 0.005 for I and 12.0 ± 1.0 for II. For III and IV, K was estimated to be 6 and 8, respectively. These values are much lower than those for soil suspensions. Thus, K = 490 ± 50 for a 1:50 suspension of II. There are 5 figures.

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S/069/63/025/001/003/008
Ion diffusion in an adsorbing ... B101/B186

ASSOCIATION: Agrofizicheskiy institut (Institute of Agricultural Physics)

SUBMITTED: October 29, 1961

Card 3/3

PROKHOROV, V.M., dots.

"Biochemistry of wounds and injuries" by L.S. Cherkasova. Reviewed by V.M. Prokhorov. Vest.khir. 82 no.1:148-150 Ja '59. (MIRA 12:2)

(WOUNDS) (PHYSIOLOGICAL CHEMISTRY)
(CHERKASOVA, L.S.)

PROKHOROV, V.M.

Determining the resolving time of a counter. Izm.tekh. no.9:42-43 S '61. (MIRA 14:8)

(Nuclear counters—Testing)

PROKHOROV, V.M., dotsent

Foreign bodies in the peritoneal cavity. Zdrav.Belor. 5 no.8:66 Ag '59. (MIRA 12:10)

1. Iz gospital'noy khirurgicheskoy kliniki (zaveduyushchiy I.M. Stel'mashonok) Minskogo meditsinskogo instituta.
(PERITONEUM--FOREIGN BODIES)

S/186/62/004/002/007/010
E075/E136

21.7200

AUTHOR: Prokhorov, V.M.

TITLE: On the diffusion of strontium-90 in soil and sand

PERIODICAL: Radiokhimiya, v.4, no.2, 1962, 205-211

TEXT: The author attempted to derive an expression describing simultaneously diffusion and adsorption processes for Sr^{90} taking place in soil. The following expression was obtained for the coefficient of diffusion D for a case where a linear adsorption isotherm applies:

$$D = \frac{dW^2 D_o}{W + k} \qquad (10)$$

where D_o = diffusion coefficient of a substance in the liquid phase, k = distribution coefficient, W = relative content of moisture in the soil. Experiments were carried out to confirm Eq.(10), whereby the dependence of diffusion of Sr^{90} on moisture was investigated in two media with different adsorptional properties: 1) quartz sand; 2) black earth. It was found that Eq.(10) applies to the sand and black earth. In the latter case

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D_o for $SrCl_2$ solution was taken as 1.2×10^{-5} cm^2/sec. For quartz sand the dependence of D on W is close to being linear, but in contrast to the black earth k for the sand depended strongly on its moisture content. This was found to be connected with the presence of soluble impurities on the sand surfaces. The distribution coefficient k obtained by the author for the moist black earth (k = 21) differs considerably from the value of k found previously for an aqueous suspension of the black earth (Ref.11:Yu.A. Kokotov, R.F. Popova, A.P. Urbanyuk, Radiokhimiya, v.3, no.2, 1961, 199).
Acknowledgments are expressed to M.K. Mel'nikova for directions in this work and to Yu.A. Kokotova for comments.
There are 6 figures and 2 tables.

SUBMITTED: March 23, 1961

Card 2/2

MEL'NIKOVA, M.K.; PROKHOROV, V.M.

Diffusion of cations in an air-dry soil. Koll.zhur. 27 no.3:406-411 My-Je '65. (MIRA 18:12)

1. Agrofizicheskiy nauchno-issledovatel'skiy institut, Leningrad.
Submitted March 28, 1964.

PROKHOROV, V.M.

Effect of soil moisture on the diffusion rate of strontium-90. Pochvovedenie no.10:61-63 O '65. (MIRA 18:11)

1. Agrofizicheskiy nauchno-issledovatel'skiy institut.

PROKHOROV, V.M.; FRID, A.S.

Effect of salt concentration of a soil solution on the diffusion rate of strontium microquantity in soils. Radiokhimiia 7 no.4:496-498 '65. (MIRA 18:8)

L 00033-66 EWT(m)/EWP(t)/EWP(b) DIAAP/IJP(c) JD
ACCESSION NR: AP5020307 UR/0186/65/007/004/0465/0472
532.72:546.42:631.4:537.21

AUTHOR: Prokhorov, V. M.; Krasnoshchekova, R. Ya.

TITLE: Migration of radioactive strontium in soil under the influence of an electric field

SOURCE: Radiokhimiya, v. 7, no. 4, 1965, 465-472

TOPIC TAGS: strontium, soil physics, electrophoresis

ABSTRACT: Under the influence of an electric field the transport of cations adsorbed on soil particles takes place due to electromigration and electroosmosis. An equation is derived which describes both of these processes. Knowing the values of the diffusion coefficient D and the velocity of ions V one can calculate the extent to which the soil can be purified, at some point x, to a prescribed degree. In principle the possibility of purification of the soil from radioactive contamination is determined by the mobility of the contaminants in the electric field and the consumption of energy. The present experiments were conducted to determine the feasibility of purification of the soil from radioactive strontium by means of an electric field. In electromigration of Sr^{89} in a soil filled cell the maximum

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L 00033-66

ACCESSION NR: AP5020307

activity peak moves toward the cathode with some decrease of the peak height due to quasidiffusion spreading of the zone. It was thus shown that soil may be decontaminated from Sr by this method, although the process is rather slow. With 100 v output the consumption of energy for moving the Sr^{89} peak was 400-100 kw-hr/m^3. After 1080 hrs in a cell containing equally distributed Sr^{89} the fraction of the original specific activity in 60% of the soil between the anode and the cathode did not exceed 1-2%. The activity between the anode and 90% of the distance toward the cathode was 14% of the original activity in the whole cell. The authors express their gratitude to M. K. Mel'nikova and S. V. Nerpin for their continual interest in this work and valuable suggestions. Orig. art. has: 3 figures and 1 table.

ASSOCIATION: none

SUBMITTED: 12Jun64 ENCL: 00 SUB CODE: NP, LS

NO REF SOV: 004 OTHER: 001

Card 2/2

L 00028-66 EWT(m)/EWP(t)/EWP(b) IJP(c) JD UR/0186/65/007/004/0496/0498
ACCESSION NR: AP5020312 532.72:546.42:631.4

AUTHOR: Prokhorov, V. M.; Frid, A. S.

TITLE: The effect of salt concentration in soil solutions on the rate of diffusion of microquantities of strontium in the soil

SOURCE: Radiokhimiya, v. 7, no. 4, 1965, 496-498

TOPIC TAGS: soil, diffusion, strontium-90

ABSTRACT: The purpose of this investigation was to measure directly the effect of the composition of the soil solution on the rate of diffusion of radioactive isotopes in the soil. The experiments were conducted with Sr-90 without a carrier. The soil (37 m^2/g, specific surface) was wetted with concentrations of $CaCl_2$ solutions ranging from 3.3 10^{-2} to 8.5 g-equiv/l. The soil was moistened to the extent of 30% by weight. To correct for adsorption of Ca^{++} by soil the equilibrium concentration of $CaCl_2$ was determined by complexometric titration. The diffusion coefficient of strontium-90 as a function of the concentration of Ca^{++} is shown in the figure (Enclosure 01). In the concentration range $4 \cdot 10^{-3}$ - 5.8 10^{-1} N the diffusion coefficient of strontium increases by approximately a factor of 13. From 0.6 to

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L 00028-66
ACCESSION NR: AP5020312

J

6.6 N the diffusion coefficient remains practically constant. The data presented may be useful in estimating the migration of Sr-90 in soil from radioactive wastes with large salt concentration. The authors wish to express their gratitude to M. K. Mel'nikova for her interest in this work and to A. F. Batygin for his help in carrying out experiments. Orig. art. has: 1 figure and 1 table.

ASSOCIATION: none

SUBMITTED: 27Nov64 ENCL: 01 SUB CODE: NP, LS

NO REF SOV: 004 OTHER: 001

Card 2/3

L 00028-66
ACCESSION NR: AP5020312

ENCLOSURE: 01

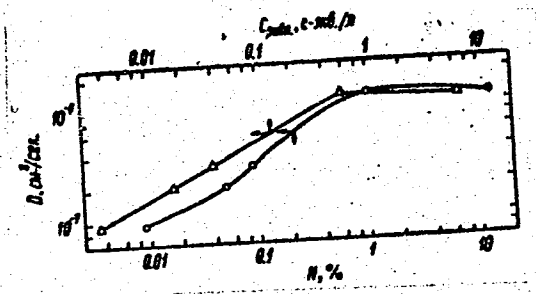

Fig. 1. Diffusion coefficient of Sr-90 in soil as a function of the concentration of Ca^{+2}.
C_{eq} -- concentration of Ca^{+2} in an equilibrium soil solution (g-equiv/l);
N -- total concentration of calcium in soil, recalculated to $CaCl_2$ (in % of the weight of dry soil).

Card 3/3

L 3451-66 EWT(m)/EWA(h)
ACCESSION NR: AP5016933

UR/0089/65/018/006/0631/0632
621.43

AUTHOR: Prokhorov, V. M.

TITLE: Role of diffusion processes in the migration of radioactive contaminations

SOURCE: Atomnaya energiya, v. 18, no. 6, 1965, 631-632

TOPIC TAGS: radioactive fallout, nuclear debris, physical diffusion, radio strontium

ABSTRACT: Thi is an abstract of article no. 15-3240, submitted to the source publication, but not published. A method is proposed for investigating the contribution of diffusion and vertical migration of an isotope, on the basis of data on the contents of the isotope in the surface layer of ground or soil. It is assumed provisionally for this purpose that the isotope can penetrate into the soil only by diffusion. Three variants of the variation of the concentration of the isotopes on the surface of the soil are considered. These variants

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ACCESSION NR: AP5016933

are closest to those prevailing under natural conditions: 1) immediate entry; 2) constant concentration; 3) concentration increasing linearly with time. Formulas expressing the fraction of the isotope (relative to the total amount in the soil) contained in the upper layer of soil of a given thickness, as a function of a dimensionalist parameter $y = \ell/2(Dt)^{1/2}$, where ℓ is the thickness, D the diffusion coefficient, and t the diffusion time. Plots from which the actual diffusion coefficient can be determined are presented for all three variants. Comparison with published data on the distribution of Sr^{90} in soil under natural conditions shows that the average actual diffusion coefficient is close to that obtained by the author under laboratory experiments (3×10^{-8} -- 2.5×10^{-7} cm^2/sec). This shows that diffusion plays an important role in the vertical migration of Sr^{90}. Orig. art. has: 1 figure and 1 table.

ASSOCIATION: None

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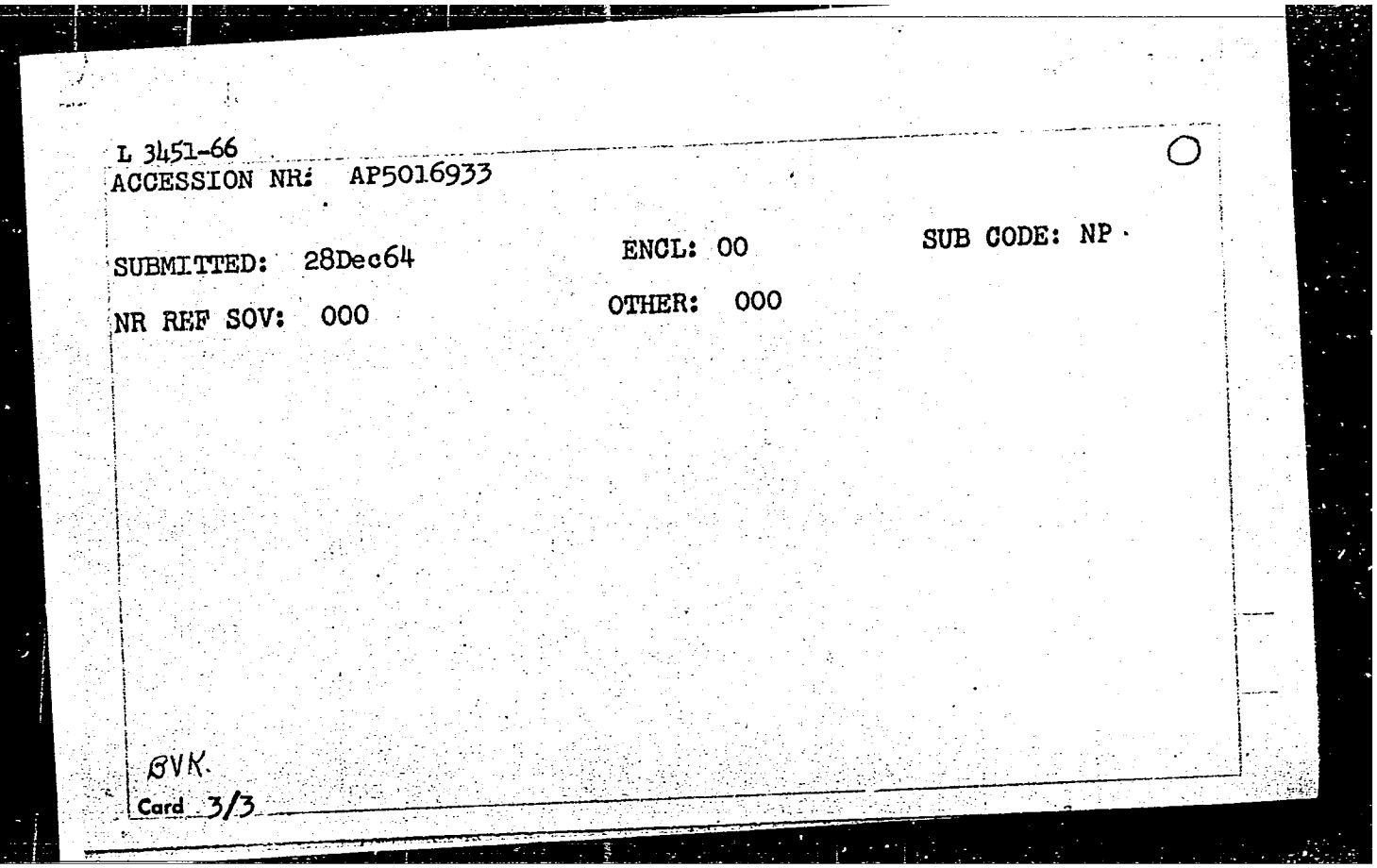

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PROKHOROV, V.M., dots.; SHUBA, A.I., assistent.

Primary tumors of the spleen. Khirurgiia 34 no.12:75-77 D '58. (MIRA 12:1)

1. Iz gospital'noy khirirgicheskoy kliniki (dir. I.M. Stel'mashonok) Minskogo meditsinskogo instituta.

(SPLEEN, neoplasms
primary (Rus))

PROKHOROV, V.M.; NARKEVICH, F.V.

Use of potentiated anesthesia in surgery. Zdrav. Belor. 6 no.8:36-41 Ag '60. (MIRA 13:9)

1. Iz gospital'noy khirurgicheskoy kliniki (direktor - I.M. Stel'mashonok) Minskogo meditsinskogo instituta i onkokhirurgicheskogo otdeleniya 1-y klinicheskoy bol'nitsy (glavvrach A.I.Shuba).
(ANESTHESIA) (SURGERY)

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S/115/61/000/009/004/006
E032/E114

21.6000

AUTHOR: Prokhorov, V.M.

TITLE: Determination of the resolving time of a counter

PERIODICAL: Izmeritel'naya tekhnika, 1961, No.9, pp. 42-43

TEXT: The usual method whereby the dead-time of a counter may be measured is the so-called paired sources method. However, this method involves the insertion of two radioactive specimens into the lead castle, which the present author states is sometimes difficult to do. The method described in the present note avoids this difficulty. The method is described as follows. A metal filter of a given thickness transmits a constant fraction of the radiation emitted by a given source, whatever the activity of the source, i.e.

$$\frac{I_o}{\bar{I}_o} = \text{const} = A. \qquad (1)$$

where I_o is the activity of the radiation emitted by the source and $\bar{I}_o$ is the transmitted intensity. If I denotes the number

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of counts recorded by the counter with a given dead time τ, then

$$I_o = \frac{I}{1 - I\tau} \quad (2)$$

so that

$$\frac{\frac{I}{1 - I\tau}}{\frac{\bar{I}}{1 - \bar{I}\tau}} = A. \quad (3)$$

Solving for τ it is found that

$$\tau = \frac{AI - I}{\bar{I}I(A - 1)} \quad (4)$$

The constant A can be found for a given filter with a very low activity source (low counting rate). Thus, if one determines the constant A in a preliminary experiment, the dead-time of the counter can be determined from two measurements instead of three. However, for large values of $I\tau$ the initial formula (2) does not hold. For large $I\tau$, one can show that since

$$I = I_o e^{-I_o \tau} \quad (6)$$

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it follows that

$$\frac{I}{\bar{I}} = \frac{I_o}{\bar{I}_o} e^{-\tau(I_o - \bar{I}_o)} = A e^{-\bar{I}_o \tau(A - 1)}$$

so that

$$\tau = \frac{1}{\bar{I}_o(A - 1)} \ln \frac{\bar{I}A}{I}$$

Since $\bar{I}_o\tau$ is A times smaller than $I_o\tau$ it can be assumed that

$$\bar{I}_o \approx \frac{\bar{I}}{1 - \bar{I}\tau}$$

and hence, finally

$$\tau \approx \frac{\ln \frac{A\bar{I}}{I}}{\bar{I}\,(A - 1 + \ln \frac{A\bar{I}}{I})} \qquad (7)$$

The table gives a comparison of the present method and the paired sources method (MST-17 counter (MST-17 counter) + a $Sr^{90}+Y^{90}$ source).

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There are 1 figure and 3 Soviet references.

Table

No.	Paired sources	Method: Equation (4)	Method: Equation (7)
		$\tau \times 10^6$ min	
1	5.3	4.7	4.4
2	5.0	3.6	3.5
3	4.5	4.2	4.0
Average	$4.9 \cdot 10^{-6}$ min	$4.2 \cdot 10^{-6}$ min	$4.0 \cdot 10^{-6}$ min

[Abstractor's note: This is an abridged translation.]

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