

Distribution of impurities

S/126/62/014/004/015/017
E193/E383

and ion-bombardment etching techniques were used to produce the etching pits. The etch figures were examined with the aid of an optical microscope in the case of alloys containing less than 4% Zn, an electron microscope being also used to examine the alloys with lower Zn contents. In some cases, cine-photography was employed to study the process of formation of etch figures. The angle between the surface of the polished specimen and the basal plane (0001) of cadmium ranged from 0 - 90°. Rows of small etching pits were observed in specimens with the zinc content lower than 1%. Both small and coarse etching pits were formed as the zinc concentration increased. In specimens with 4% Zn the formation of isolated hexagonal pits was observed. Starting from the zinc concentration of 6%, plate-like pits of regular hexagonal shape formed in the (0001) plane were observed only. The density of the small and coarse etch figures was practically independent of the zinc concentration, which supported the view that the etch pits corresponded to the points of emergence of the dislocations on the surface of the specimens. The results of measurements of the etch pits formed on various alloys are reproduced in Fig.6, where the relative number ($n_i / \sum n_i$) of pits in a given specimen

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is plotted against the etch-pits dimensions (d, μ), the various graphs relating to alloys with the Zn content indicated. Comparison of these distribution curves with the constitution diagram of the cadmium/zinc system shows that alloys with a Zn content lower than the limit of its solid solubility in Cd at room temperature are characterized by one system of (small) etch figures. Two systems of etch figures are formed in two-phase alloys, each with a characteristic size of etching pit. It can be postulated that the system of the coarse etch figures corresponds to dislocations decorated by the second-phase precipitates, whereas the fine etch figures correspond to dislocations with increased solute concentration, i.e. to Cottrell atmospheres. The results of the present investigation were taken as a proof that the presence of dislocations considerably affected the distribution of Zn in the alloys studied. There are 6 figures and 1 table.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im.
M.V. Lomonosova (Moscow State University im.
M.V. Lomonosov)
SUBMITTED: October 2, 1961
Card 3/4

S/126/62/014/005/005/015
E132/E460

AUTHORS: Predvoditelev, A.A., Bushuyeva, G.V., Stepanova, V.M.
TITLE: The study of the dislocation structure of crystals of zinc by selective etching
PERIODICAL: Fizika metallov i metallovedeniye, v.14, no.5, 1962, 687-692

TEXT: "Fresh" dislocations, undecorated by foreign atoms, can be made visible in depth by removing successive layers by polishing and etching. The growth structure, twinning and the dislocation structure which arise under concentrated loading, and the motion of dislocations in the 0001 plane in the $[10\bar{1}0]$ direction have been shown for Zn. The distribution of impurities in the cell walls of an internal honeycomb structure was demonstrated. Dislocations with Burger's vectors of the type $\frac{1}{3} \langle 1\bar{2}10 \rangle$ collect along the cell walls. This confirms Tiller's theory (J. Appl. Phys., v.29, 1958, 611). Gliding on the basal plane 0001 is usual but if this is hindered it occurs on the prism planes $(01\bar{1}0)$ in the directions $[\bar{1}2\bar{1}0]$, on the pyramidal planes $(01\bar{1}1)$ in the directions $[\bar{1}210]$ and on the $(2\bar{1}\bar{1}2)$
Card 1/2

The study of the dislocation ...

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E132/E460

planes in the directions $[\bar{2}\bar{1}\bar{1}\bar{3}]$. [Abstractor's note: Axial symbols appear to be incorrectly given with 4 indices.] Lines of etch pits were observed at 60° to each other distributed along $[10\bar{1}0]$, i.e. perpendicular to the planes of closest packing. They correspond to the emergence of screw dislocations lying in $\{\bar{2}112\}$ and having Burger's vectors of $\frac{1}{3} \langle \bar{2}\bar{1}\bar{1}\bar{3} \rangle$. Only pyramidal gliding is found at room temperature. There are 7 figures. ✓

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im.
N.V.Lomonosova (Moscow State University imeni
N.V.Lomonosov)

SUBMITTED: March 31, 1962 (initially)
June 6, 1962 (after revision)

Card 2/2

PREDVODITELEV, A. A.

11

by Z. G. Pinsker ("Basis of diffractional methods of investigation of perfect crystals"), B. M. Rovinskiy and L. M. Rybakova ("Investigation of dependence of mechanical properties on characteristics of structure of metals"), L. M. Utevskiy and P. M. Usikov ("Application of microscopy in investigation of structure of alloys"), A. A. Predvoditelev and N. A. Tyapunina ("Role of reproduction of dislocations in process of plastic flow"), A. V. Pertsov, N. V. Pertsov and E. D. Shukin "Self-producing internal dispersion of metals under action of strongly superficially-active metallic melting") and I. L. Mirkin ("Problems of structural investigations, advanced by requirements of progress of technology").

reports presented at the 3rd Intervuz Conference on Strength and Ductility of Metals, Petrozavodsk State University, 24-29 June 1963.

(reported in Fizika Metallov i Metallovedeniye, Vol. 16, No. 4, 1963, p 640.
JPRS 24,651 19 May 1964.

L 12797-63

EWP(q)/EWT(m)/BDS AFFTC/ASD JD

ACCESSION NR: AP3000773

S/0070/63/008/003/0405/0412

58
57

AUTHOR: Tyapunina, N. A.; Predvoditelev, A. A.; Marty*nyuk, G. K.; Shvidkovskiy, Ye. G.

TITLE: Investigation of dislocation structure and the propagation of dislocations in cadmium crystals

SOURCE: Kristallografiya, v. 8, no. 3, 1963, 405-412

TOPIC TAGS: Frank-Read source, hexagonal crystals, Cd, dislocations, Burgers vector, slip band

ABSTRACT: Because the literature is unclear on how points are provided for pinning dislocations to supply a beginning for a Frank-Read source, the authors have undertaken an analysis of possible intersections and interactions of dislocations in hexagonal crystals. They have made experimental tests by selective etching to determine dislocations, and they conclude that hexagonal crystals have favorable conditions for the formation of points that pin dislocations during plastic deformation. They conclude further that the restraint on dislocations to move in planes of the prism or the second-order pyramid considerably exceeds the restraint on movement in the basal plane, which impedes transverse slipping. Thus, during plastic deformation in hexagonal crystals, dislocations apparently

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L 12797-63
ACCESSION NR: AP3000773

occur chiefly by operation of a Frank-Read source, and this leads to the experimentally observed localization of slip bands. Orig. art. has: 4 figures, 3 formulas, and 2 tables.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova
(Moscow State University)

SUBMITTED: 06Jul62

DATE ACQ: 21Jun63

ENCL: 00

SUB CODE: 00

NO REF SOV: 007

OTHER: 014

Card 2/2

ACCESSION NR: AP4023434

S/0181/6/006/004/1032/1088

AUTHORS: Shvidkovskiy, Ye. G.; Predvoditelov, A. A.; Zalkharova, M. V.

TITLE: Conditions for growing cadmium whiskers by vapor condensation

SOURCE: Fizika tverdogo tela, v. 6, no. 4, 1964, 1032-1088

TOPIC TAGS: whisker, acicular crystal, crystal growth, crystal synthesis, artificial crystal, cadmium, vapor condensation, argon atmosphere

ABSTRACT: This paper contains experimental results regarding the effect of argon pressure on the growth of cadmium whiskers. A method is proposed for computing the vapor oversaturation in the growing tube at which whisker formation begins. The method of crystal growing employed is described in various places in the literature (G. W. Sears. Acta Met., 3, 367, 1955; E. M. Nadgornyy). On growing the crystals, the author noted a characteristic distribution of condensate along the growing tube. At first, condensation took place at the crystallization temperature of cadmium (320C) at all pressures. Exceptions were observed when the growing tube was not filled with argon (residual pressure, 10^{-6} mm Hg). The interval of growth at all vapor pressures from 10 to 600 mm Hg covered about 20-25C and lay at

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ACCESSION NR: AP4028434

295-3200, but a change in argon pressure caused a change not only in the form of the whisker but also in the time of growth. At low pressures the numbers and sizes of crystals were much greater. Results show that a constant Cd vapor oversaturation produces acicular crystals at any inert-gas pressure; the pressure merely modifies the rate of crystal growth, increasing or decreasing the diffusion rate of cadmium atoms to the growing crystal. Computations show that the whisker crystals begin to grow at a vapor oversaturation of 0.17, which is a lower value than the 0.4 recorded by P. B. Price (Phil. Mag., 5, 473, 1960). Orig. art. has: 5 figures, 1 table, and 7 formulas.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University)

SUBMITTED: 17Oct63

DATE ACQ: 27Apr64

ENCL: 00

SUB CODE: PH

NO REF SOV: 004

OTHER: 009

Card 2/2

L 12913-65 EWT(m)/EWP(t)/EWP(b) IJP(c)/AS(mp)-2/ASD(a)-5/AFM/ASD(m)-3/ASD(f)-2/
ACCESSION NR: AP4047323 ESD(t) JD S/0020/64/158/004/0935/0838

AUTHORS: Rozhanskiy, V. N.; Predvoditelev, A. A.

TITLE: On the role of diffusion¹⁸ of point defects along dislocations during the course of plastic deformation B

SOURCE: AN SSSR. Doklady*, v. 158, no. 4, 1964, 835-838

TOPIC TAGS: crystal lattice defect, dislocation study, plastic deformation, single crystal, zinc, dislocation motion

ABSTRACT: The diffusion interaction of dislocations, which occurs with point defects move along a dislocation line, was investigated in a single-crystal zinc¹⁸ foil obtained by electrolytic polishing of thin chips cleaved off a large single crystal cooled in liquid nitrogen. The (0001) plane was strictly oriented parallel to the surface of the foil. Four types of dislocations were observed in an electron microscope, with principal attention paid to the cutting

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L 12913-65
ACCESSION NR: AP4047323

6
of the ring of prismatic dislocations by the motion of edge dislocations during the course of plastic deformation. The coefficient of diffusion in the interaction of these dislocations is estimated to be about 10^{-9} cm² sec at nearly room temperature, which is some 10 orders of magnitude larger than the coefficient of volume diffusion. This large value of the coefficient shows that dislocations can serve as efficient channels for transferring point dislocations between various regions of the crystal. "The authors are deeply grateful to A. N. Orlov, V. L. Indenbom, A. L. Roytburd for valuable remarks and Ye. V. Parvova for help with the experiment." This report was presented by G. V. Kurdyumov. Orig. art. has: 3 figures and 4 formulas.

ASSOCIATION: Institut kristallografii Akademii nauk SSSR (Institute of Crystallography, Academy of Sciences SSSR); Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University)

Card 2/3

L 12913-65

ACCESSION NR: AP4047323

0

SUBMITTED: 20Apr64

ENCL: 00

SUB CODE: SS

NR REF SOV: 004

OTHER: 021

Card 3/3

L 34895-65 EWT(1)/EWP(e)/EWT(m)/EWP(w)/EWA(d)/T/EWP(t)/EEC(b)-2/EWP(b)/EWA(c)
LJP(c) JD

S/0181/65/007/002/0379/0386

ACCESSION NR: AP5005271

AUTHOR: Predvoditelev, A. A.; Zakharova, M. V.

TITLE: Concerning the strength of whisker crystals of cadmium and zinc ²⁶ ²⁷ ²⁷ ²⁴ ^B

SOURCE: Fizika tverdogo tela, v. 7, no. 2, 1965, 379-386 ¹⁸

TOPIC TAGS: filamentary crystal, cadmium, zinc, strength, dislocation density

ABSTRACT: The cadmium and zinc whiskers were grown by condensation from vapor, using a method described previously by the authors (with Ye. G. Shvidkovskiy, FTI, v. 6, 1082, 1964). The strength of the whiskers was measured with a special set-up built in accordance with a scheme described by H. B. M. Wolters et al (J. Sci. Inst., v. 38, 250, 1961). The load was measured with a ring dynamometer. The cross section area, necessary to determine the strength, was obtained by photography at large magnification, using the MJF-2 microscope. The diffraction effect on the edges were reduced by using ultraviolet light. The reduction of the experimental data by least squares has shown that for cadmium in the range of diameters 1--50 μ the strength is equal to $1.7 + 211/d^2$ (kg/mm²), where d is the diameter in microns. In the case of zinc in the range of diameters 1--80 μ , the strength is

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ACCESSION NR: AP5005271

2

$9 + 127/d^2$. Thus, unlike many other metals, the strength is proportional to the reciprocal of the diameter squared, and not to the reciprocal of the diameter. The values obtained for the strength are compared with the theoretical shear strength, and the possible effect of axial dislocations on the strength of whiskers is also discussed. It is assumed that the start of plastic flow is connected with the axial dislocations and their quantity, then the strength should be proportional to $1/d^2$, since the number of dislocations in whiskers is approximately proportional to d^2 . It is also possible that this behavior is peculiar to zinc and cadmium only. "The authors are deeply grateful to Professor Ye. G. Shvidkovskiy for a discussion of the results." Orig. art. has: 5 figures, 1 formula, and 1 table.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University)

SUBMITTED: 07Jul64

ENCL: 00

SUB CODE: SS

NR REF SOV: 009

OTHER: 021

Card 2/2

L 52526-65 EWT(1)/EWT(m)/T/EWP(t)/EEC(b)-2/EWP(b)/EWA(c) P1-4 IJP(c) JD/GG
ACCESSION NR: AP5010714 UR/0181/65/007/004/1081/1085

25
22
B

AUTHOR: Rakova, N. K.; Predvoditelev, A. A.

TITLE: Motion of dislocations and relaxation of stresses in sodium chloride crystals

SOURCE: Fizika tverdogo tela, v. 7, no. 4, 1965, 1081-1085

TOPIC TAGS: sodium chloride, dislocation motion, stress relaxation, selctrive etching

ABSTRACT: An investigation was made of the motion of dislocation and stress relaxation in single crystals of sodium chloride. The stress relaxation was measured with a relaxometer which made it possible to record directly the variation of the stress with time (V. R. Regel' and G. A. Dubov, PTE No. 6, 102, 1958). The test samples measured 5 x 5 x 10--8 x 8 x 16 mm and were cleaved from one large single crystal. The initial average dislocation density in the samples was 2 x 10⁷ cm⁻². The sample was continuously etched during the course of relaxation, making it possible to investigate the dislocation motion. The etchant used was a saturated solution of cadmium oxide and a mixture of butyl and methyl alcohols (5:3 ratio).

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L 52526-65

ACCESSION NR: AP5010714

3

This etchant made it also possible to distinguish between growth dislocations and dislocations due to strain. The results indicate that the stress relaxation in sodium chloride crystals are determined during the initial stage completely by the motion of the dislocations. Methods of calculating the amount of stress relaxation due to the motion of dislocations are indicated. "The authors thank Professor Ye. G. Shvidkovskiy for valuable advice, and E. Tupikin for performing preliminary experiments." Orig. art. has: 5 figures, 1 formula, and 1 table.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University)

SUBMITTED: 06Oct64

ENCL: 00

SUB CODE: SS, IC

NR REF SOV: 009

OTHER: 005

llc
Card 2/2

STEPANOVA, V.M.; DOLGOVA, E.S.; PUCHKOVICH, I.S.

Characterization of the phase transformation of rock salt crystals
at high temperatures. Kristallografiya 17 no.2:219-223 (1972)

1. Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosov

STEPANOVA, V.M.; PREDVODITELEV, A.A.

Interaction of glissile edge dislocations with block boundaries
in NaCl crystals. Kristallografiia 10 no.3:384-388 My-Je '65.
(MIRA 18:7)

1. Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova.

L 00467-67 EWP(m)/EWP(s)/EWP(l)/EWP(r) EWP(u) EWP(v)

ACC NR: AP6018547

SOURCE CODE: UR/0181/66/008/006/1834/1838

57
56
18

AUTHOR: Predvoditelev, A. A.; Rakova, N. K.; Chebotareva, Ye. S.

ORG: Moscow State University im. M. V. Lomonosov (Moskovskiy gosudarstvenny univer-sitet)

TITLE: Investigation of the motion of dislocations in NaCl crystals during creep

SOURCE: Fizika tverdogo tela, v. 8, no. 6, 1966, 1834-1838

TOPIC TAGS: sodium chloride, creep, crystal dislocation phenomenon, relaxation process

ABSTRACT: This is a continuation of earlier work on NaCl crystals (FTT v. 7, 1081, 1965), in which it was shown that relaxation of stresses at room temperature is determined only by conservative motion of dislocations, and singularities in the law governing this motion were established. The purpose of the present investigation was to determine the motion of dislocations during creep in single-crystal NaCl at room temperature. Soft crystals were used with yield point 120 g/mm² and initial dislocation density ~10⁵ cm⁻². Special apparatus was constructed permitting strains of the order of 10⁻⁵ cm to be registered at room temperature. The motion of dislocations was investigated by the method of directly etching the samples under load. Quantitative investigations of the dislocation motion could be made only at stresses slightly below the yield point (50 g/mm²), before intense dislocation multiplication could be observed. At 100 g/mm² and higher, the experiments failed because of the

Card 1/2

1 06467-57

ACC NR: AF6018547

large dislocation density. No pronounced dislocation multiplication was observed during the creep. It is concluded that the creep is due only to displacement of already existing dislocations, produced during the initial deformation of the crystal. Some 40% of the dislocations capable of motion participate in the creep. An expression is derived for the calculation of the creep from the measured motion parameters. The good agreement obtained between the calculated and the experimental data gives grounds for assuming, as in the earlier study of stress relaxation, that the non-stationary creep of single-crystal NaCl at room temperature is determined by redistribution of dislocations within the crystal. It is pointed out, however, that there are essential differences in the dislocation motion during creep and relaxation, so data on creep do not apply to dislocation, and vice versa. Orig. art. has: 5 figures, 1 formula, and 2 tables.

SUB CODE: 20/ SUBM DATE: 15Nov65/ ORIG REF: 010/ OTH REF: 016

Card 2/2 - *egh*

ACC NR: AF7005343

hedra broadens with increase of aluminum content is described. Although the presence of the tetrahedra should increase the resistance to plastic deformation, by hindering the motion of the dislocations, no change in the resistance to plastic deformation could be detected by measuring the microhardness; it is therefore concluded that the tetrahedra do not act as major obstacles to the motion of dislocations. Orig. art. has: 3 figures.

SUB CODE: 20/

SUBM DATE: 14 Jun 66/

ORIG REF: 001/

OTH REF: 007

Card 2/2

NIRENSHTEYN, B.Z., nauchnyy sotrudnik; PREDVODITELEVA, A.D., nauchnyy
sotrudnik PARSHINA, N.N., nauchnyy sotrudnik; AGAPOVA, A.D.,
nauchnyy sotrudnik; RAPOPORT, K.A., nauchnyy sotrudnik KOBLENTS, S.G.,
inzh.

Manufacture of chlorin knit underwear and its therapeutic use.
Tekst.prom. 21 no.6:71-73 Je '61. (MIRA 15:2)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut trikotazhnoy promyshlennosti (for Nirenshteyn, Prevoditeleva, Parshina, Agapova).
2. Institut obshchey i kommunal'noy gigiyeny (for Rapoport).
3. Trikotazhnaya fabrika "Krasnaya Zarya" (for Koblents).
(Knit goods industry)
(Underwear)

MOGILEVSKIY, Ye.M.; KHOR'KOVA, O.G.; FINGER, G.G.; PREDVODITELEVA,
A.D.; KUZ'MINA, G.P.; MIKHAYLENKO, P.P.; TUMAYAN, S.A.

Continuous process for producing viscose rayon and for its
finishing. Khim. volok. no. 6:25-27 '60. (MIRA 13:12)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut iskusstvennogo
volokna (for Mogilevskiy, Khor'kova, Finger). 2. Vsesoyuznyy
nauchno-issledovatel'skiy institut trikotazhnoy promyshlennosti
(for Predvoditeleva, Kuz'mina). 3. Tsentral'nyy nauchno-issledo-
vatel'skiy institut shelka (for Mikhaylenko, Tumayan).
(Rayon)

PREDVODITELEVA, A.D., kand.tekhn.nauk; GRECHUKHINA, N.A., inzh.

Experimental use of synthetic fibers in the knitting
industry. Tekst.prom. 19 no.12:44-46 D '59.

(MIRA 13:3)

(Textile fibers, Synthetic)

(Knit goods industry)

FREDYOTSEVA, A. D.

34030. MOGILEVSKAYA, G. A. FREDYOTSEVA, A. D. - Maryovshchaya knashstva
kottonykh chulok, legkaya prom-st', 1946, No. 9, S. 12-15

SC: Letopis' Zhurnal'nykh Statey, Vol. 49, Moskva, 1949

PREDVODITELEVA, A.D., kand.tekhn.nauk; DUBROVSKAYA, M.P., inzh.;
NIRENSHTEYN, B.Z., inzh.

Using new kinds of synthetic fibers in the knit goods industry.
Leg. prom. 18 no.7:20-22 J1 '58. (MIRA 11:9)
(Knit goods industry) (Textile fibers, Synthetic)

L 17721-66 EWP(j)/EWT(m) RM

ACC NR: AP6003415

SOURCE CODE: UR/0190/66/008/001/0076/0079

AUTHORS: Predvoditelev, D. A.; Nifant'yev, E. Ye.; Rogovin, Z. A.

36

ORG: Moscow Textile Institute (Moskovskiy tekstil'nyy institut)

B

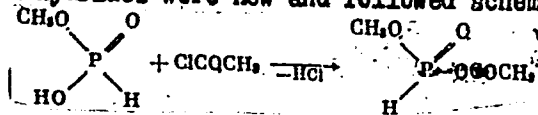
TITLE: New method for the synthesis of phosphor-containing cellulose esters

7.44.55

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 8, no. 1, 1966, 76-79

TOPIC TAGS: cellulose, phosphate ester, esterification, phosphorylation, phosphorous acid, organic synthetic process, ester

ABSTRACT: Reaction of mixed acetic and methyl phosphorous anhydride (I) with cellulose (II) yielded cellulose alkyl phosphites (III), while esterification of II with methylphosphoric anhydride (IV) gave corresponding phosphate (V). Both reactions were of interest, as the prior methods of preparation of these compounds required rigorous conditions leading to the destruction of cellulose. Syntheses of both types of anhydrides were new and followed scheme 1:



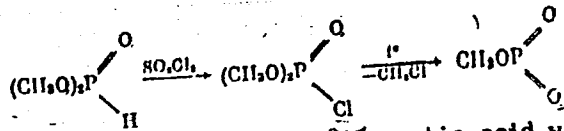
Card 1/2

UDC: 541.64+661.728.89 2

L 17721-66

ACC NR: AP6003415

and scheme 2:



Preliminary activation of cellulose with 80% acetic acid was required. III was prepared at 50--60C in an excess of I or in an organic solvent. Effects of time, temperature, and catalyst upon the amount of P introduced into the cellulose ester macromolecule were studied. Preparation of V required higher temperatures due to the lower reactivity of anhydrides of pentavalent phosphorus, and thus gave less satisfactory results. Orig. art. has: 2 figures and 3 equations.

SUB CODE: 07/

SUBM DATE: 15Feb65/

ORIG REF: 005/

OTH REF: 001

Card 2/2

nst

PREDVODITELEV, D.A.; NIFAN'YEV, E.Ye.; ROYVIL, S.A.

Synthesis of cellulose hypophosphites. Vysokom. sobor. " no. 5, 1991-1994
My '65. (M.A. 18:9)

I. Moskovskiy tekstil'nyy institut.

PREDVODITELEV, D.A.; NIFANT'YEV, E.Ye.; ROGOVIN, Z.A.

Synthesis of cellulose phosphites by the reaction of monomethyl phosphite with cellulose and their subsequent transformations.
Vysokom. soed. 7 no.6:1005-1009 Je '65. (MIRA 18:9)

1. Moskovskiy tekstil'nyy institut.

PREDVODITELEV, D.A.; TYUGANOVA, M.A.; NIFANT'YEV, E.Ye.; ROGOVIN, Z.A.

Synthesis of phosphorous cellulose esters by reesterification
of dimethyl phosphite and their subsequent transformations.
Zhur.VKHO 10 no.4:459-461 '65. (MIRA 18:11)

1. Moskovskiy tekstil'nyy institut.

L 23327-66 ENT(m)/EWP(j) RM

ACC NR: AP6006974

(A)

SOURCE CODE: UR/0190/66/008/002/0213/0218

AUTHORS: Pravoditelev, D. A.; Nifant'yev, E. Ye.; Rogovin, Z. A.

ORG: Moscow Textile Institute (Moskovskiy tekstil'nyy institut)

14
28
11
TITLE: Synthesis and chemical transformations of cellulose alkylene phosphites
(192nd report in the series "Study of the structure and properties of cellulose and its derivatives")

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 8, no. 2, 1966, 213-218

TOPIC TAGS: cellulose plastic, phosphorylation, organic synthetic process

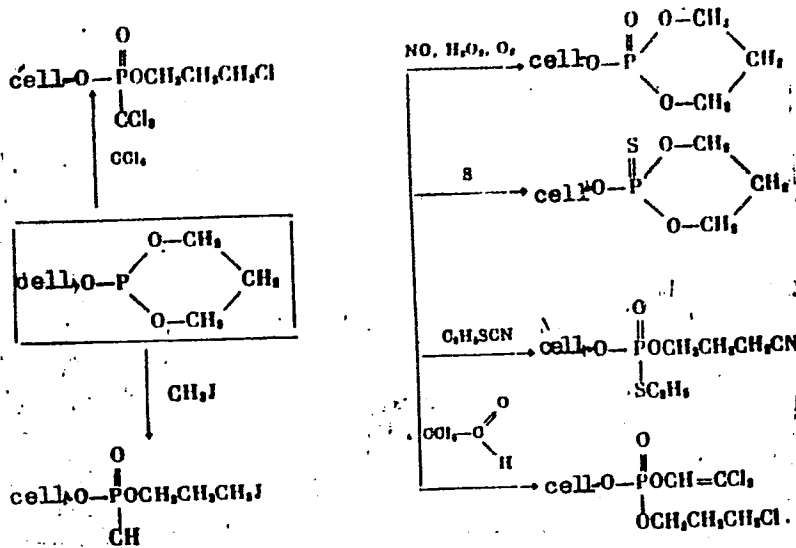
ABSTRACT: Synthesis of cellulose alkylene phosphites by phosphorylation of cellulose with amides of propylene glycol phosphites or with ethylene glycol phosphites is described. Effect of the structure of the amides, reaction time, and temperature upon the amount of the phosphorus incorporated into the product was investigated and is illustrated in Fig. 1. Reactions of cellulose propylene phosphite with a variety of reagents and the products obtained are summarized by

Card 1/3

UDC: 66.095.26

L 23327-66

ACC NR: AP6006974



Hydrolytic stability of all the resulting phosphite esters was studied; the esters of pentavalent P were found more stable than those of trivalent P. N. B. Sokolova participated in the experimental work.

Card 2/3

L 23327-66

ACC NR: AP6006974

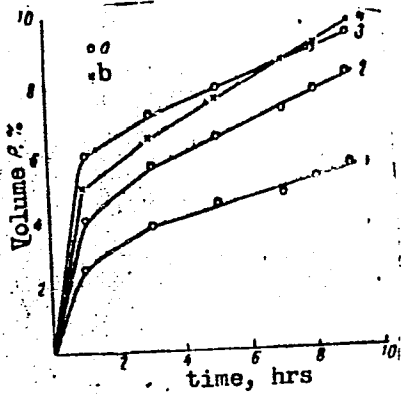


Fig. 1. Effect of the phosphorylation conditions upon the amount of phosphorus incorporated into the cellulose macromolecule (ratio 40): 1 - treatment at 80C; 2 - at 100C; 3 - at 120C. a - Phosphorylation with dimethylamide of ethylene glycol phosphite; b - phosphorylation with dimethylamide of propylene glycol phosphite.

Orig. art. has: 2 tables, 1 figure, and 11 equations.

SUB CODE: 07/

SUBM DATE: 15Feb65/

ORIG REF: 008/

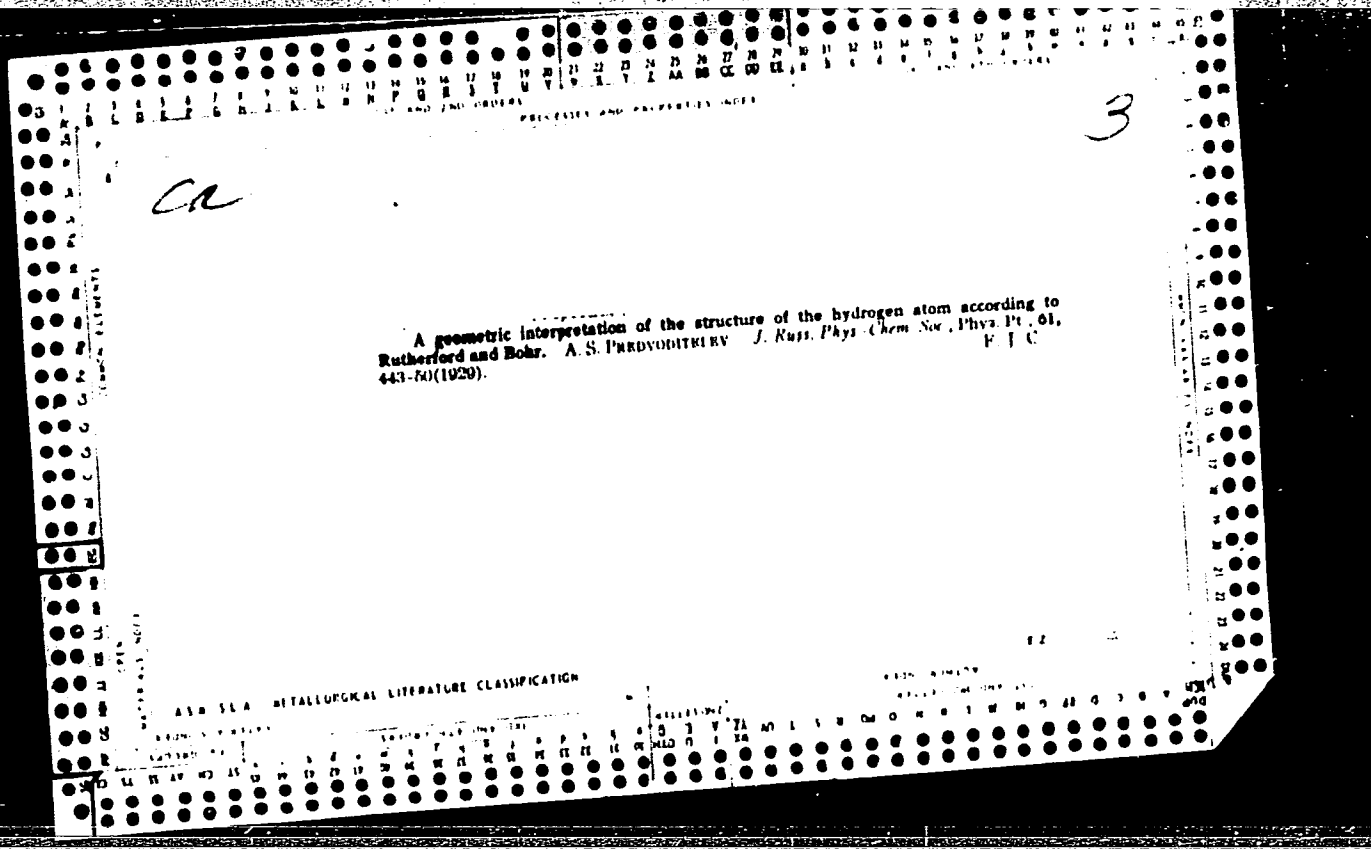
OTH REF: 005

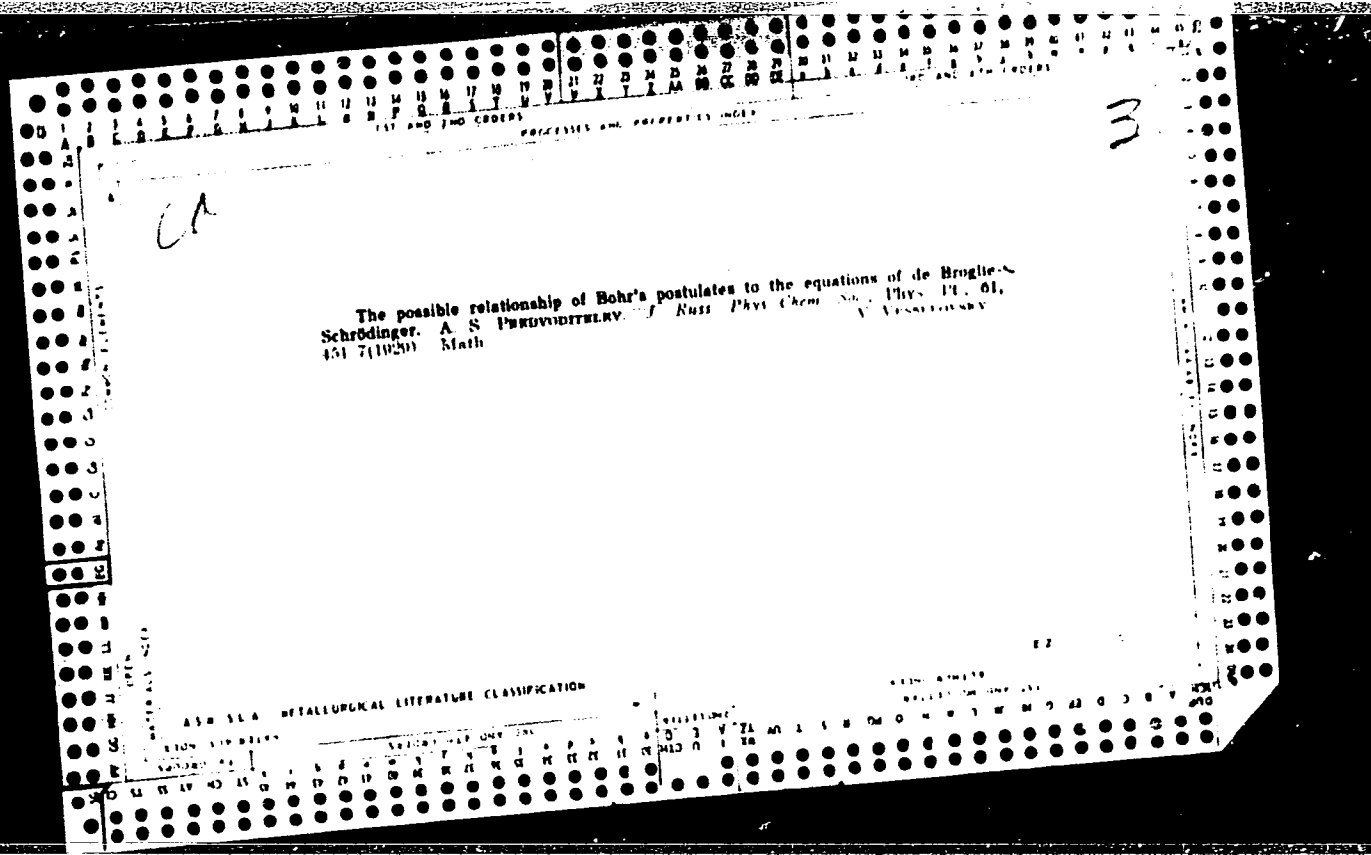
Card 3/3 FV

~~XXXXXXXXXX~~
PREVODITELEV, A.

PREVCDITELEV, A.
Z. Physik 32, 861-71 (1925)
Theory of diminuation of fluorecence.

GA: 20-1031/5





1ST AND 2ND ORDERS PROCESSES AND PROPERTIES INDEX

2

ca

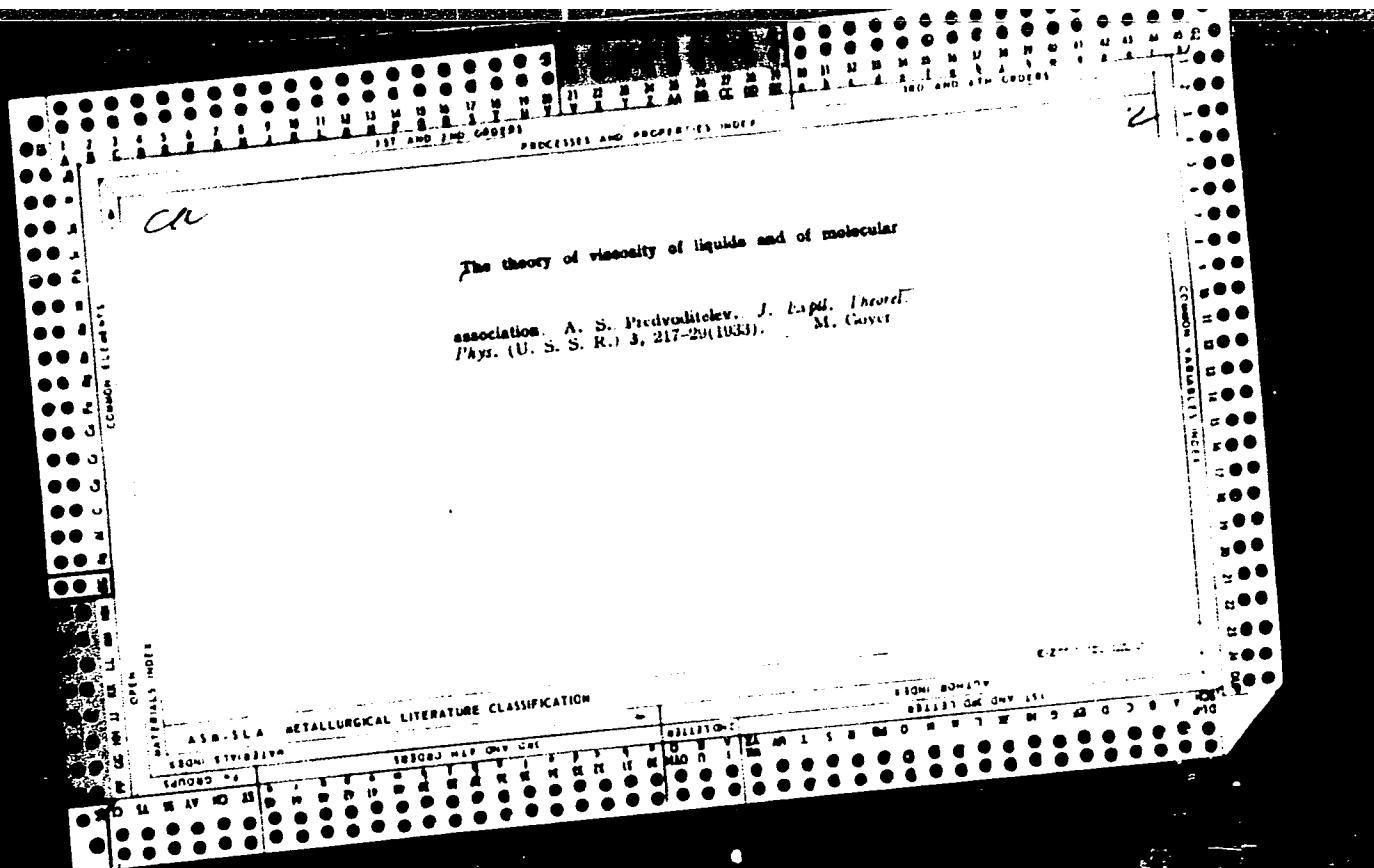
The viscosity of liquids and gases from the point of view of cyclic motion. A. S. Prudvostel'ev. *J. Exptl. Theoret. Phys. (U. S. S. R.)* 3, 231 (1943). M. G.

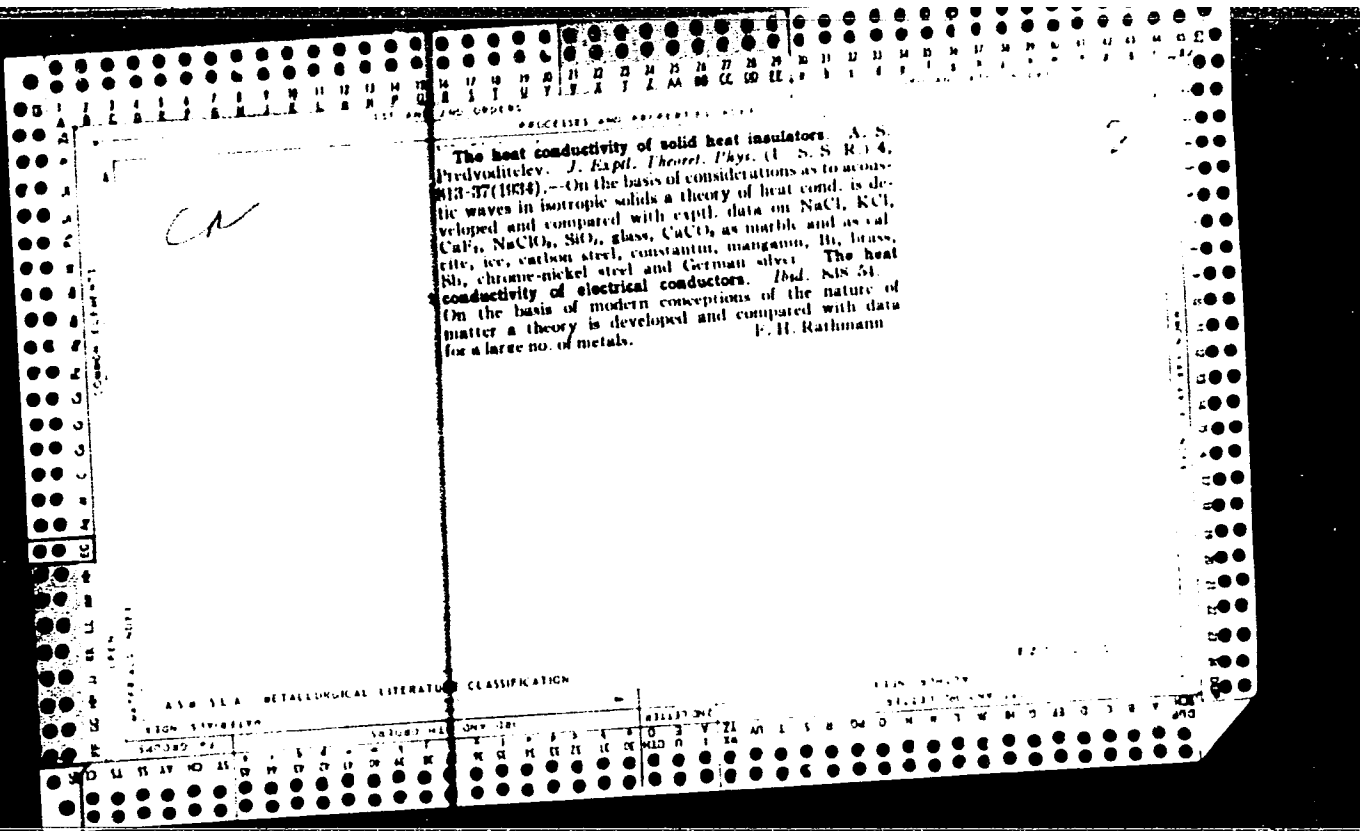
Obtaining monocrystals with a given axial orientation. P. A. Polibin and A. I. Freuman. *J. Exptl. Theoret. Phys. (U. S. S. R.)* 3, 163-4 (1943).—The method of Bridgeman was used for obtaining the crystals, a tube of diam. 11.8 mm. contg. the metal, being lowered at a rate of 2.5 mm. per hr. through a furnace. For a tube ending in a long capillary, truly aligned, the hexagonal axis of a Zn monocrystal is perpendicular to the axis of the tube. When the tube ends in a capillary to which a thin-walled sphere of the same diam. is sealed, almost touching the free end of the capillary, the hexagonal axis of the monocrystal is parallel to the axis of the tube.

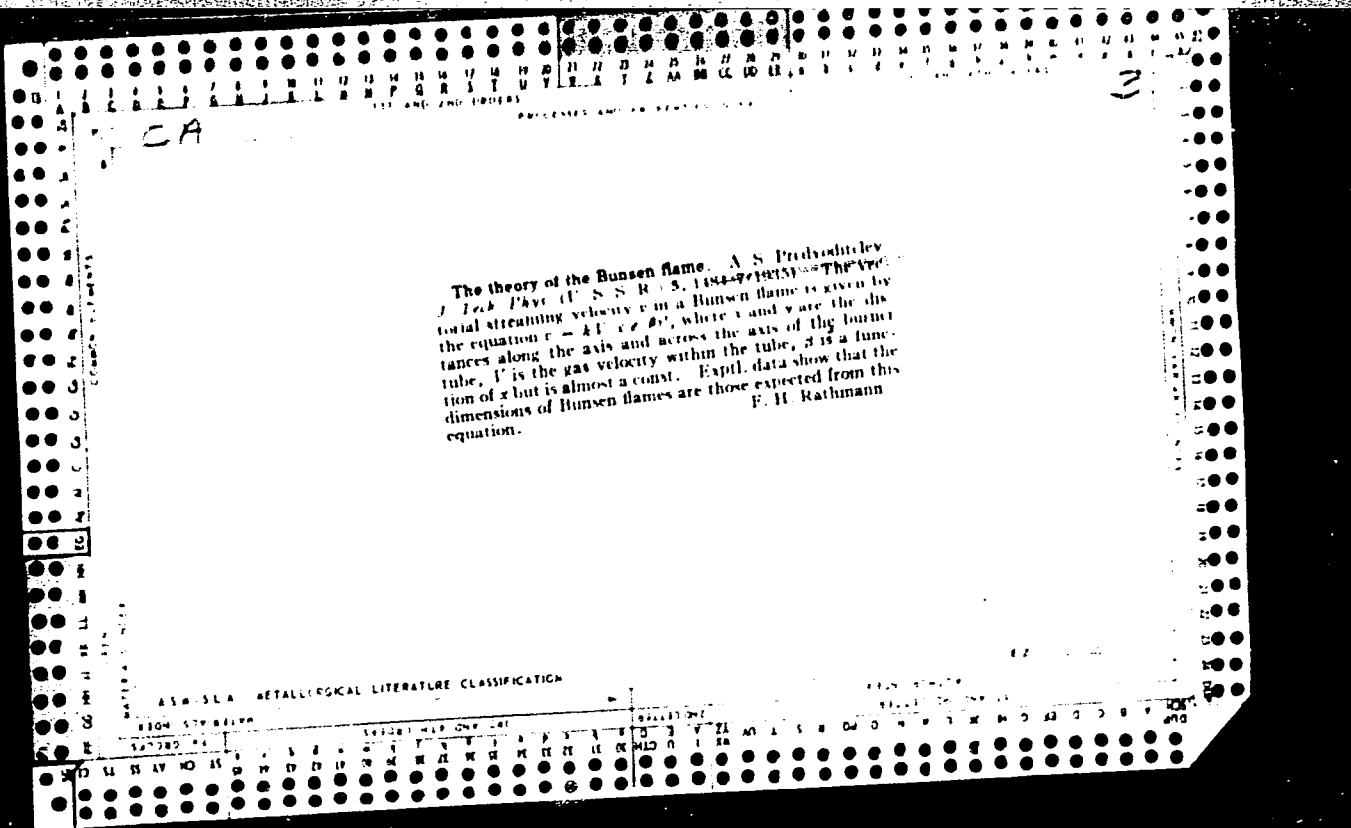
If the capillary in this same form of tube makes an angle α with the axis of the tube, the hexagonal axis of the crystal also makes an angle of α with the axis of the tube. Similar results were obtained also with Cd and Sn. Marie Goyer.

METALLURGICAL LITERATURE CLASSIFICATION

GROUPS: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100







SA

5106. Theory of the Bunsen Flame. A. Prodvodtsev. *Techn. Phys., U.S.S.R.* 2, 4, pp. 264-268, 1935. *In English.*—In criticism of Michelson's theory of the bunsen flame the author states that there is no logical reason for taking the velocity of unburnt gas inside the cone of the flame as parallel to the generatrix of the cylindrical tube through which the gas is discharging. He points out that only a knowledge of the process connected with the discharge of a gas into free space will lead to correct diagnosis of the action. The inner cone of the flame is shown to be a representation of the hydrodynamical law of the distribution of velocities over the cross-section of the torch. Tables of calculated results are shown to be in close agreement with photographic reproductions of actual flames. S. G. B.

ASS. ILLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND CODES

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5TH CODES

6TH CODES

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24

Concerning the effect of solid admixtures on the velocity of propagation of flame in combustible gas mixtures. S. Gribkova and A. Pedyushitelev. *Tekhn. Phys. U. S. S. R.* 5, 153-66(1938)(in English). - Mixts. of air and CO were studied photographically in a tube 3 cm. in diam. and about 2 m. long. The effects were studied of adding SiO₂ gel and activated charcoal of av. particle sizes from 2 to 12 μ and 6 to 10 μ, resp., and in concns. up to 200 and to 20 mg./l., resp. Flame velocity is a linear function of the dust concn.; the finer the dust, the greater the slope of the line. Silica gel decreased the velocity, and charcoal dust increased it. For SiO₂ gel the flame velocity u is given by $u = u_0 - cG/r$, where u_0 is the velocity in the absence of dust, r the av. size of the dust particles, G the dust concn. and c a const. The theoretical expressions obtained from considerations of the thermal-cond. mechanism and the temp. distribution in the flame front confirm those obtained from the exptl. data. S. L. Gerhard

ASB-51A METALLURGICAL LITERATURE CLASSIFICATION

PROCESSES AND PROPERTIES INDEX

21

CA

Combustion of a carbon particle in a current of gas
 A. S. Prudvuditelev. *J. Tech. Phys.* (U. S. S. R.) 10, 1311-23(1940). - The combustion of a C particle in a current of gas was examd. analytically with the following assumptions: (1) the gas flow can be described by a potential function, (2) O reaches the surface of C particle through the process of forced diffusion, (3) combustion on the surface occurs in such a way that the diffusional flow always remains equal to the specific speed of combustion, (4) the combustion reaction is of the first order, (5) on the equipotential surface, passing through the intersection point of gas flow with C particle the concn. of O is equal to the outside concn. The energy of activation is found to be about 20,000 cal per mol
 Roksalana Ganow

A.S.B.-S.L.A. METALLURGICAL LITERATURE CLASSIFICATION

C-2

ПРЕОДОЛТЕЛЕУ, А. С.

2000

Преодолеу, А. С. A possible classification of statistical systems. Vestnik Moskov. Univ. 1947, no. 7, 23-42 (1947). (Russian)

A criterion for the stability of motion of statistical systems is first established. Certain stepwise continuous functions associated with stable statistical systems are introduced. Identities, which are generalizations of those due to Riemann, Hugoniot and Hadamard, are found between the above functions. Combination of these identities with the Hamilton-Jacobi equation leads to equations of the Schrödinger type and of the Fokker-Planck-Einstein type, which may be easily transformed one into the other. The transformations used in establishing this connection enable the author to define canonical distributions of real, imaginary, and complex moduli. This leads to a natural classification of statistical problems in which classical and quantum statistical systems are shown to represent two aspects of the same general principle.

G. M. Volkoff.

Sum 227

Source: Mathematical Reviews, 1950 Vol 11 No. 8

21

ca

The process of gas formation in the combustion of coal in beds. A. S. Pridoditelev. *Izvest. Akad. Nauk S.S.S.R., Otdel. Tekh. Nauk* 1947, 1329-40.—Three possible chem. mechanisms of gas formation are considered: (1) CO₂ is formed on the surface or in the interior of the coal. CO results from the secondary process of CO₂ reduction on the coal surface. Oxygen is consumed solely in the formation of CO₂. (2) CO and CO₂ are formed simultaneously on the surface or in the interior of the coal. The reduction of CO₂ on the surface is a possible secondary process. Oxygen consumption produces either oxide. (3) CO and CO₂ are formed simultaneously. CO forms on or near the coal surface, where there is sufficient O concn. Reduction of CO₂ on the surface is possible, especially outside the limit of the O zone. All O consumption occurs on or near the surface. A detailed math. treatment is given, based on mechanism (3). H. K. L.

ASB-3LA METALLURGICAL LITERATURE CLASSIFICATION

GROUPS: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

PERIODS: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

CA

2

Arrhenius law in chemical kinetics of gas reactions.
A. S. Predvoditelev (Moscow State Univ.). *Doklady
Akad. Nauk S.S.S.R.* 57, 687-8 (1947).--Theoretical dis-
cussion of the effect of inelastic collisions on the distribution
of velocities in a group of material particles, particularly
among those whose activation energy is of the order of kT .
G. M. Kosolapoff

1. PREDVODITELEV, A. S.
2. USSR (600)
4. Physics and Mathematics
7. Fundamentals of Heat Transfer, M. A. Mikheyev. (Moscow-Leningrad, State Power Press, 1947). Reviewed by A. S. Predvoditelev, Sov. Kniga, No. 4, 1948.

9. Report U-3081, 16 Jan. 1953, [REDACTED].

PREDVODITELEV, A. S.

4

Predvoditelev, A. S. On the statistical ensemble of material points with variable mass. Vestnik Moskov. Univ. 3, no. 6, 41-49 (1948). (Russian)

This paper extends the author's earlier work [same Vestnik 1947, no. 7, 23-42; these Rev. 11, 633] to ensembles of relativistic particles. Using the procedure developed in the paper cited above the author starts with a classical relativistic Lagrangian and arrives at Schrödinger's relativistic wave equation, at Dirac's relativistic equation, and at generalizations of both which have not yet found physical applications. The author points out that a relation exists between the operator method of wave-mechanics, and the method of Riemann-Hugoniot-Hadamard, which he hopes will shed light on the operator method and will suggest its correct generalizations.

G. M. Volkoff.

Source: Mathematical Reviews,

Vol. 12 No. 6

5/12/50

PREDVODITELEV, A.S.

Predvoditelev, A. S. On a molecular-kinetic derivation of the equations of hydrodynamics. Izvestiya Akad. Nauk SSSR. Otd. Tehn. Nauk 1948, 545-560 (1948). (Russian)

L'auteur reprend les fondements de la théorie cinétique de Maxwell. Après avoir établi les équations de mouvement d'un fluide visqueux, il essaye de former les équations du mouvement en rejetant l'hypothèse de Maxwell: la vitesse de transport de deux molécules qui se choquent sont égales. On trouve de cette façon des équations de mouvement généralisants celles de Navier-Stokes. L'auteur applique ces résultats aux courants gazeux à deux dimensions de Tchapligne.

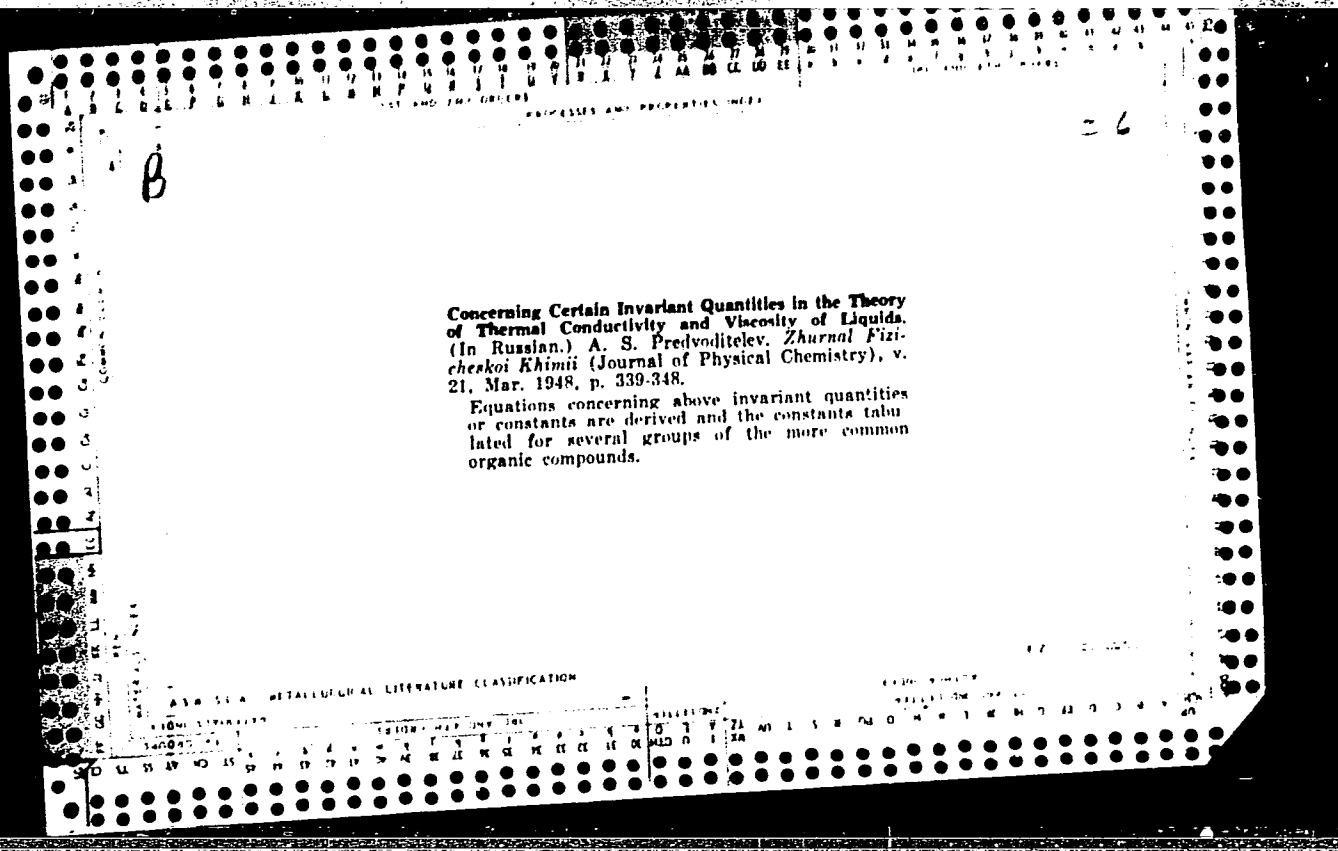
M. Kiveltovitch (Paris).

Source: Mathematical Reviews,

Vol 10 No. 2

Source

CORR. MBR. AS USSR; POWER ENGR. INST. IN
G.M. KRZHIZHANSKIY, AS USSR



USSR/Chemistry - Conductivity, Thermal Mar 1948
Chemistry - Viscosity

"Several Invariant Quantities in the Theory of Heat Conductivity and the Viscosity of Liquids," A. A. Predvoditel'ev, Inst of Phys, Moscow State U, 10 pp

"Zhur Fiz Khim" Vol XIII, No 3

Selects most suitable form of solid and gasiform matter. Subjects this form to treatment with the aid of statistical physics processes to investigate any functional relation between any parameters characteristic of matter. In view of the difficulty of complete solution of almost all of the problems, various

65R23

Mar 1948

USSR/Chemistry - Conductivity, Thermal (Contd)

limiting suppositions are made in the process of calculation. Covers the fundamental principle and the perature conductivity; adiabatic invariants and the criteria of mechanical comparison; two principles concerning the heat conductivity of liquids. Submitted 3 Jun 1947.

65R23

PREDVODIT'EV, A.

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

PREDVODITELEV, A. S.

Predvoditelev, A. S., "Some Representations on the Operator Methods of Wave Mechanics." Vestnik Moskovskogo Universiteta (Seriya Fiziko-Matematicheskikh i Yestestvennykh Nauk, No 1), No 2, 1949.

PREDVODITELEV, A. S.

Predvoditelev, A. S., "Some notes on the Nature of Elementary Particles."
Vestnik Moskovskogo Universiteta (Seriya Fiziko-Matematicheskikh i
Yestestvennykh Nauk, No 5), No 8, 1949.

PREDVODITELEV, A. S.

*Predvoditelev, A. S., Nikolai Alekseevich Umov, 1846-1915. Izdat. Moskov. Gosudarstv. Univ., Moscow, 1950. 53 pp.
A list of Umov's published works as well as a bibliography of biographical material is included.

Source: Mathematical Reviews, Vol 13 No. 3

PREDVODITELEV, A. S.

"Work on the Combustion of Solid Fuels," Vest. Ak Nauk SSSR, No.4, 1950

Cor. Mbr., AS USSR

PREDVODITELEV, A. S.

Statistical Mechanics

Clausius' theorem on the mean ergal and stable statistical systems. Vest. Mosk.un.
5 no. 6, 1950.

9. Monthly List of Russian Accessions, Library of Congress, November 1953. Unclassified.
2

CA

Molecular heat exchange in liquids. A. S. Predyolitelev. *Doklady Akad. Nauk S.S.S.R.* 72, 523-6 (1931). — Consideration of a liquid as a statistical ensemble with strong van der Waals interactions as against which pairwise collisions in the Boltzmann sense become negligible, and its treatment as a material plasma with self-consistent wave motions, leads to an expression for the coeff. of heat cond. $h = AC_0/Z^2M^2$, where C_0 has the meaning of a heat capacity (without being equal to it), and Z that of an assocn. factor. For normal liquids, $Z = 1$, the ratio h/ρ ($\rho = d.$) ought to be temp. independent; this is verified for C_2H_6 (273-561°K.), toluene (573-596°K.), and $m-C_6H_4Me_2$ (293-617°K.). H_2O behaves like a normal liquid above 150°C. (423-647°K.). Below that temp., if liquid water is treated as a soln. of ice $(H_2O)_n$ (with $n = 6$ or 8) in liquid H_2O , the ratio y of the no. of mols. of ice dissolved in 1 g. of water and the no. of mols. of ice on freezing, is given by the Duclaux formula $y = 0.187 e^{-0.00007r}$, where $r =$ centigrade temp. Hence, $h = h_0 [1 - \{(n-1)y/n\}]^2$, which, with $h_0 = 1820 \times 10^{-4}$, $n = 8$, and the Duclaux formula becomes $h = 1820 \times 10^{-4} [1 - 0.130 e^{-0.00007r}]^2$, verified between 0 and 374°C. N. Thou

PREDVODITELEV, A.S., chlen-korrespondent, otvetstvennyy redaktor.

[Problems of rocket engineering; translations and surveys of foreign periodical literature.] Vop.raket.tekh. no.3:3-123 '53. (MLRA 6:6)

1. Akademiya nauk SSSR.

(Rockets (Aeronautics))

KHITRIN, L.N.; PREDVODITELEV, A.S., chlen-korrespondent.

Basic characteristics of the combustion process of carbon. Izv.AN SSSR
Otd.tekh.nauk no.4:543-561 Ap '53. (MLBA 6:8)

1. Akademiya nauk SSSR.

(Combustion) (Carbon)

PREDVODITEL'Y, 1954

(3)
5

B. T. R.
V. 3 No. 3
Mar. 1954
Fuels and Combustion

3318 State of Homogeneous-Heterogeneous Combustion
Theory. (Russian.) A. S. Predvoditel'ey. Izvestiya Akademi
Nauk SSSR, Otdeleniye Tekhnicheskikh Nauk, 1953, no. 5, May,
p. 705-707.
Reviews work of Semenov, Khitrin, and Chukhanov. 3 ref.

6-15
JH

KNORRE, G.F.; PREDVODITELEV, A.S., chlen-korrespondent.

Application of the modern theory of combustion to an efficient organization of furnace processes. Izv. AN SSSR Otd. tekhn. nauk no. 5:730-734 My '53.
(MLRA 6:8)

1. Akademiya nauk SSSR (for Predvoditelev).
(Combustion, Theory of) (Furnaces)

PREDVODITELEV, A.S., chlen-korrespondent.

Results of the scientific-technical conference on problems concerning
the theory of the combustion of fuel. Izv.AN SSSR Otd.tekh.nauk no.5:
741-751 My '53. (MLRA 6:8)

1. Akademiya nauk SSSR.

(Combustion, Theory of)

1950, A.S.

USSR/Physics - Solid State

Oct 53

"Problem of the Liquid State of Matter," A.S. Predvoditelev

Vest Mos Univ, Ser Fizikomat i Yest Nauk, No 7, pp 39-52

Historical survey of Soviet and Western high-pressure studies. Notes that sufficiently complete optical and x-ray investigations have not been successfully organized, especially of Rayleigh and combination (Raman) scattering close to the region of liquids and of x-ray and electronographic study of phenomena during solidification. States

273T92

that Ye.V. Stupochenko, Ye. G. Shvidkovskiy, V.A. Zamkov, et al will participate in this new field in the new Physics Faculty Building.

PREDVOODITELEV, A. A.

62 The density and compressibility of the binary mixture methanol-hexane that has a top critical temperature of solution and a comparison with the values of these parameters in the critical region for a liquid-vapor system. B. A. Smirnov and A. A. Predvoditelev (M. V. Lomonosov State Univ., Moscow). *Zhur. Fiz. Khim.* 28, 1681-90 (1954).—The change in d and compressibility, β , with temp. for the binary mixt. $\text{CH}_3\text{OH}-\text{C}_6\text{H}_{14}$ was studied over the temp. range 18–48° which, depending on the concn., included the crit. region. The nature of the analogy between the crit. state of a liquid-vapor system and of a binary mixt. with a top crit. temp. of soln. is discussed and the role of thermodynamic factors is evaluated. J. R. L.

(1)

PREDVODITELEV, A.S.,

Pages from the annals of the University. Tekh. mol. 23 no.5:2-5
My '55. (MIRA 8:6)

1. Chlen-korrespondent Akademii nauk SSSR.
(Moscow University--History)

PREDVODITELEV, A.S.

B-6

USSR/ Physical Chemistry - Liquids and amorphous bodies. Gases

Abs Jour ; Referat Zhur - Khimiya, No 4, 1957, 11062

Author : Predvoditelev A.S.

Title : On the Coefficient of Thermal Conductivity and the Viscosity of Liquids and Compressed Gases

Orig Pub : Sb. posyashch. pamyati akad. P.P. Lazareva. Moscow, AN SSSR, 1956, 84-112

Abstract : On considering thermal motion of a continuous system as being randomly propagated wave processes and utilizing the notion of local, in time and space, temperature (so that thermodynamic temperature is the mean of local; see Vlasov A.A., Teoriya mnogikh chastits, Gostekhizdat, 1950), the author derives the correlation $(1 + \beta) \times W/2 = G$, wherein $W^2/2$ --mean kinetic energy of unit of mass, G --mean phase rate of pulse of temperature fluctuations, β --ratio of mean potential energy to mean kinetic energy. This correlation, Debye's ideas concerning thermal motion as a combination of acoustic oscillations, and the results of Eckert (Phys. Rev., 1948, 73, 68) are utilized for the derivation of the well-known formula of the author for thermal velocities of molecules and of resilient thermal waves. By the use of these invariants are derived, in the opinion of the author, the most general

ard 2/ Card 1/2

PREDVODITELEV, A. S. and SUNDUČOV, I. N.

"Problems of Combustion and Flame Propagation in Two-Phase Mixtures (Liquid Fuel/Air)."; a paper submitted at the Sixth International Symposium on Combustion, New Haven, Conn., 19-24 Aug 56.

Predvoditelev and Sundučov, Institute of Energetics AS USSR, Moscow, USSR

Abstract of Papers, E-4519, Branch 5

A-52806, 9 Jul 56

PHASE I BOOK EXPLOITATION 999

Predvoditelev, Aleksandr Savvich, Professor, Corresponding Member, Academy of Sciences, USSR; Stupochenko, Yevgeniy Vladimirovich, Professor; Pleshanov, Aleksandr Sergeevich; and Rozhdestvenskiy, Igor' Borisovich

Tablitsy termodinamicheskikh funktsiy vozdukh dlya temperatur ot 6000° do 12000° K i davleniy ot 0,001 do 1000 atmosfer (Tables of Thermodynamic Functions of Air for Temperatures of 6,000° to 12,000° K and Pressures of 0.001 to 1,000 Atmospheres) Moscow, Izd-vo AN SSSR, 1957. 301 p. 3,000 copies printed.

Sponsoring Agencies: Akademiya nauk SSSR. Energeticheskiy institut. Laboratoriya fiziki gorennya, Moscow. Universitet. Fizicheskiy fakul'tet, SSSR. Ministerstvo vysshego obrazovaniya

Resp. Ed.: Predvoditelev, Aleksandr Savvich, Professor; Tech. Ed.: Zelenkova, Ye.V.

Card 1/4

Tables of Thermodynamic Functions (Cont.)

999

PURPOSE: This book is intended for thermodynamicists, engineers and others working in the field of heat exchange and gas and thermodynamics.

COVERAGE: The tables presented in this book form part of the research on the properties of gases at high temperatures conducted under the general direction of Corresponding Member of the USSR Academy of Sciences Professor A. S. Predvoditelev in the combustion physics laboratory of the Energeticheskiy institut (Power Institute, of the Academy of Sciences, and in the molecular physics department of the Physics Faculty of Moskovskiy gosudarstvennyy universitet (Moscow State University). Up to the present time, the staff of the laboratory and the department have compiled tables of thermodynamic functions of air for temperatures from 1000° to 20,000° K, and also tables of the gas-dynamic and thermodynamic values of the air stream behind a straight compression shock and at the surface of a cone for approach-flow speeds up to 15,500 m. sec. The tables of thermodynamic functions of air for temperatures from 6000° to 12,000° K are the first volume of the above mentioned series of tables. The entire work of compiling

Card 2/4

Tables of Thermodynamic Functions (Cont.)

999

the tables in the present volume, including a general analysis of the problem, the solution of a number of theoretical questions arising in the thermodynamics of gases at high temperatures, the development of the method of computation and the computation formulas, the programming for the electronic computer, and the actual computation on the machine, were carried out by a group of coworkers of the combustion-physics laboratory and the molecular physics department of the Physics Faculty, consisting of Professor Ye. V. Stupochenko (leader of the group), Ye. V. Samuylov, I. P. Stakhanov, A. S. Pleshanov, and I. B. Rozhdestvenskiy. A large part of the total computations was performed on a high-speed electronic computer of the Computer Center, Academy of Sciences, USSR. Checking the tables and readying them for printing were carried out there under the supervision of L. S. Bark. Some control, intermediate, and auxiliary computations were performed at the Pervaya Moskovskaya fabrika mekhanizirovannogo scheta (First Moscow Computing Machine Factory). There are 14 references, of which 12 are English, 1 is Soviet, and 1 French.

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Tables of Thermodynamic Functions (Cont.) 999

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AVAILABLE: Library of Congress

Card 4/4

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12-22-58

PREDVODITELEV, A. S.

"The Effects of Inner Electromagnetic Fields on the Propagation of Sound in Electrolytes,"

report presented at the 6th Sci. Conference on the Application of Ultrasound in the Investigation of Matter, 3-7 Feb 1958, Moscow, organized by Min of Education RSFSR and Moscow Oblast Pedagogic Inst. Dr N. K. Krupskaya

/

FREDVODITELEV, A. S.

"Concerning Spin Detonation."

"Theoretical Examination of Vibratory Movement of the Flame Front in Closed Vessels."

"On Automodelling Processes in Chemically Active Media."

papers submitted at 7th International Symposium on Combustion, London/Oxford.
27 Aug - 3 Sep 1958.

KREDOVOD, I. S. LEV, A. S.

24(1)

R3

PHASE I BOOK EXPLOITATION

SOV/3150

Vserossiyskaya konferentsiya professorov i prepodavateley pedagogicheskikh institutov

Primeneniye ul'traakustiki k issledovaniyu veshchestva; trudy konferentsii, Vyp. 7 (Application of Ultrasonics for Analysis of Substances; Transactions of the All-Russian Conference of Professors and Teachers of Pedagogical Institutes, Nr 7) Moscow, Izd. MOPI, 1958. 283 p. 1,500 copies printed.

Tech. Ed.: S. P. Zhitov; Eds.: V. F. Nozdrev, Professor, and B. B. Kudryavtsev.

PURPOSE: This book is intended for physicists, technicians, aeronautical engineers and other persons concerned with ultrasonics.

COVERAGE: The book contains twenty eight articles which treat ultrasonic phenomena in five general categories: 1) historical data on the development of ultrasonics in the Soviet Union over the past forty years; 2) the speed of sound in suspensions of varying concentration and number and type of components and the relationship between sound velocity and the compressibility of electrolytes;

Card 1/7

Application of Ultrasonics (Cont.)

SOV/3150

3) ultrasonic investigations of physical and chemical properties of materials and the determination of physical and chemical constants, e. g. density of aqueous solutions, adiabatic compressibility, molarity of solutions. (with given temperatures), viscosity, surface tension, saturation pressure and also ultrasonic investigation of the carbon content and petrographic state of coal; 4) industrial applications of ultrasonics, e. g. emulsification of reagents, cleansing of textile fibers and enhancing the susceptibility of some synthetic fibers to dyeing, etc.; and 5) apparatus which produce ultrasonic waves. No personalities are mentioned. References accompany each article.

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AVAILABLE: Library of Congress (QC 244.V53)

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2/16/60

KANTOROVICH, Boris Veniaminovich; PREDVODITELEV, A.S., otv.red.;
IVANOV, V.M., red. izd-va LAUT, V.G., tekhn.red.

[Fundamentals of the theory of combustion and gasification
of solid fuel] Osnovy teorii gorenia i gazifikatsii tverdogo
topliva. Moskva, Izd-vo Akad.nauk SSSR, 1958. 598 p. (MIRA 11:12)

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

PREDVODITELEV, Aleksandr Savvich; STUPOCHENKO, Yevgeniy Vladimirovich, prof.;
ROZHDESTVENSKIY, Igor' Borisovich; SAMUYLOV, Yevgeniy
Vasil'yevich; PLESHANOV, Aleksandr Sergeyevich

[Tables of aerodynamic and thermodynamic values of a stream
of air behind a direct shock wave] Tablitsy gazodinamicheskikh
i termodinamicheskikh velichin potoka vozdukha za priamym skachkom
uplotneniia. Moskva, Izd-vo Akad.nauk SSSR, 1959. 77 p.

(MIRA 14:2)

1. Chlen-korrespondent AN SSSR (for Predvoditelev). 2. Labora-
toriya fiziki goreniya Energeticheskogo instituta AN SSSR (for
Stupochenko, Rozhdestvenskiy, Samuylov, Pleshonov).

(Shock waves)

PREDVODITELEV, A.S., otv.red.; KOSYKH, R.I., red.izd-va; MAKUNI, Ye.V.,
tekh.n.red.

[Physical gas dynamics] Fizicheskaya gazodinamika. Moskva,
Izd-vo Akad.nauk SSSR, 1959. 165 p. (MIRA 12:4)

1. Akademiya nauk SSSR. Energeticheskiy institut. 2. Chlen-
korrespondent AN SSSR (for Predvoditelev).
(Aerodynamics)

PREDVODITELEV, A.S., prof.; STUPOCHENKO, Ye.V., prof.; PLESHANOV, A.S.;
SAMUYLOV, Ye.V.; ROZHDESTVENSKIY, I.B.

[Tables of the thermodynamic functions of air; for temperatures ranging from 12000 to 20000° K and pressures between 0.001 and 1000 atmospheres] Tablitsy termodinamicheskikh funktsii vozdukha; dlia temperatur ot 12000 do 20000° K i davlenii ot 0,001 do 1000 atmosfer. Moskva, Izd-vo Akad.nauk SSSR, 1959. 229 p.
(MIRA 13:2)

1. Chlen-korrespondent AN SSSR (for Predvoditelev).
(Air) (Thermodynamics)

PREDVODITELEV, A.S., prof.; MLODZEYEVSKIY, A.B., prof.; ZAYTSEVA, M.G.,
~~red.~~; TERMAKOV, M.S., tekhn.red.

Ivan Filippovich Usagin. Moskva, 1959. 297 p. (MIRA 12:10)

1. Moscow. Universitet. Fizicheskii fakul'tet. Kabinet istorii fiziki.
2. Chlen-korrespondent AN SSSR (for Predvoditelev).
3. Fizicheskii fakul'tet Moskovskogo universiteta (for Mlodzevskiy).

(Usagin, Ivan Filippovich, 1855-1919)

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A006/A001

Khimiya, 1960, No. 15, p. 45, # 60442

24.1200

Translation from: Referativnyy zhurnal, Predvoditelev: A.S.

AUTHOR:

On the Propagation of Acoustic Waves in Rarefied Gases

TITLE:

PERIODICAL: V sb.: Primeneniye ul'traakust. 1 issled. veshchestva, No. 8, Moscow, 1959, pp. 19-62

TEXT:

The author analyzes equations of motion for a non-ideal dense medium assuming that the extrapolation of the generalized Euler' equation up to thermal motions is admissible. The specification of the Navier-Stokes equations is discussed for the case when the velocity gradients along the length of the molecular free path are not equal to zero. Equations are derived for the motion of a medium having the properties of a non-ideal continuity equation, from which an equation for the sound velocity in a non-ideal dense medium is derived. The equation obtained is correct for any rarefied gases. Monatomic gases are discussed in detail and an equation is found for the sound absorption coefficient. The continuity equations which are correct for the statistic system established can not be applied to describe macroscopic processes proceed-

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On the Propagation of Acoustic Waves in Rarefied Gases

ing at a rate which may be compared to the relaxation period. Therefore equations of relaxation aerodynamics are derived and from the latter an expression for the sound velocity and the absorption coefficient is found. The expression for the coefficient of sound absorption in monoatomic gas permits a comparison with the experiment. The derivation of the latter expression is based on the assumption that there is some concrete mechanism of transition of the acoustic motion into heat, which is not considered as absolute. X

B. Kudryavtsev

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

Card 2/2

SOV/24-59-2-24/30

AUTHORS: Kastelin, O.N., Mit'kina, Ye.A., Predvoditelev, A.S. (Moscow)

TITLE: Melting of Bodies in a Supersonic Current (Plavleniye tel v sverkhzvukovom potoke)

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Energetika i avtomatika, 1959, Nr 2, pp 140-141 (USSR)

ABSTRACT: Cones of Wood's metal were exposed to a supersonic air current at Mach 1.7. The cones varied in height from 9 to 33 mm and in angle from 10 to 50 degrees, and their melting was observed photographically. The maximum disintegration occurred at the nose shock wave, and the melting occurred with constant velocity, independent of the angle of the cone. There is 1 table and 3 figures.

SUBMITTED: October 14, 1957.

Card 1/1

9(1,2), 24(1)
AUTYPR: Sokolov, Ye.S., Candidate of Technical Sciences
TITLE: A Scientific Conference on the Application of Ultrasound in the Investigation of Matter
05218
SMW/142-2-3-86/27

PHYSIOLOGICAL: Irazel'ya yashchikh uchebnykh zavetsaniy, Radiotekhnika, 1980, Vol 2, Nr 3, p. 588 (USSR)

ABSTRACT: From February 10-14, 1989, the Seventh Scientific Conference on the Application of Ultrasound for the Investigation of Matter was convened in Moscow at the Moscow State Pedagogical Institute, named M.K. Krupskiy (Moscow Oblast Pedagogical Institute, named M.K. Krupskiy). About 500 was instructors from Moscow, Leningrad, Krasnoyarsk, Kazan, Stalingrad, and scientists from the German Democratic Republic and Poland participated in the conference work. More than 80 papers were read at the conference. The following sections were organized at this conference: molecular acoustics, industrial application of ultrasound research methods, propagation of ultrasound in solid bodies, demonstration of physical phenomena in schools and universities, demonstration of physical phenomena in schools and universities, the paper of V.P. Kostov was read "Physical Principles of Tech-

Card 1/3

Application of Ultrasound in the Investigation of Matter. B.D. Kostov and his paper on the application of ultrasound in industry. The following papers were read at the plenary session: A.S. Zhebrakovsky "The Sound Wave Dispersion in Kerosene"; B. Kuznetsov, Gennadiy Demetriyevich, "ultrasonic investigation of Silicon Gel and Its Derivatives"; K. Krol, Poland, "The Application of the Kolombar Klusavac Theory of Gases to the Problem of Waves with a Limited Amplitude"; S.S. Anilax, "The Theory of Resonance-type Scales"; and a paper of Professor P. Kuchert, Poland, "Research in the field of ultrasound wave propagation in liquids was the subject of the papers of B.D. Kostov, V.D. Kapar'yan, L.G. Belashkova, O.A. Zaporozhina, V.M. Zaporozhina, V.D. Kapar'yan, L.G. Belashkova, L.P. Yesshchikova, A.L. Dzyubakova, and P. Kuchert. A paper jointly prepared by B.D. Kostov, V.P. Kostov, and V.I. Kostov was presented on the development of a method for the identification of problems in the development of a solution. Dr. Kostov delivered a report on the ground equation of the state of strongly viscous liquids. The ultrasonic oscillations were subject of the reports of Yu.M. Dystrov, A.M. Trofimenko, A.I.

Card 2/3

Pyanov, L.B. Pivovarov, L.P. Izrael', E.L. Lokhin, I.L. Chernomir, and others. In the paper, the author, A.V. Khor'kov, and others deal with the application of ultrasound in welding. In the sections of acoustic research methods, the papers of A.B. Klotz and V. Korolov. These reports dealt with new research methods of ultrasound in solid bodies was the subject of the reports of L.G. Korolov, V.S. Chirpashin, L.A. Yachkov, A.I. Dvorkin, A.K. Matveyev and others. In the section dealing with acoustic demonstration at schools and universities, the following reports were delivered: M.A. Gromovskiy and V.P. Topolov, "Experimental Demonstration of Ultrasound"; S.I. Melnikov, "Experimental Demonstration of Ultrasound"; S.N. Prokof'yev, "An Acoustic Model for Demonstration Purpose". The annual conference convened at MGU in 1981 was of great interest in problem of applying ultrasound and the number of subjects of papers. The number of participants and the number of subjects is rising steadily.

Card 3/3

SUBMITTED:

5(4)

AUTHOR:

Predvoditelev, A. S., Corresponding Member, AS USSR

SOV/20-127-3-35/71

TITLE:

On the Theory of the Adsorption Wave. The Dependence of the Fatigue Layer of the Catalyst on the Rate of Gas Motion and on the Thickness of the Layer

PERIODICAL:

Doklady Akademii nauk SSSR, 1959, Vol 127, Nr 3, pp 602-605 (USSR)

ABSTRACT:

In the present paper the motion of a gas through a porous adsorbent of cylindrical shape is investigated. The following processes take part in this motion: The diffusion of the gas on the surface of the adsorbent grains, the adsorption on the surface, the chemical reaction occurring there, the desorption of the reaction products and their removal from the adsorbing layer. All these processes influence the rate distribution of filtration. The process develops in a front like the burning of a coal layer. This front is characterized by a certain rate, i.e. the parameters participating in the process are not themselves dependent on time but only on the position of the front at an arbitrary instant. Thus, individual variations in the process may be expressed, like that of the density ρ in dependence on a variable $\xi = x/t$. The filtration

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On the Theory of the Adsorption Wave. The Dependence of the Fatigue Layer of the Catalyst on the Rate of Gas Motion and on the Thickness of the Layer

rate would, in this one-dimensional case, be: $m \int dq = d(qW)$
 W - filtration rate, m - porosity of the adsorbent). By integration this results for the two instants: 1) Penetration of the front surface through the adsorbent layer. 2) The position of the front when it begins to move at constant velocity ($\xi = g$). Equations are thus obtained from which g may be calculated:

$$g = \frac{W}{m} + \frac{1}{(q_1 - q_2)} \int_{(1)}^{(2)} q d\xi = \frac{W}{m} + g_k.$$

In this expression g_k is more closely investigated; g_k expresses the mean velocity of the front at the beginning of adsorption in a small layer d_k up to the beginning of the constant velocity. For this purpose, the time T is determined, which is required for the complete penetration of the front through the adsorption layer. T depends on W . It follows herefrom that the filtration rate depends only upon the physical nature of the adsorbent. For this purpose, the influence of the grain size in dependence on the thickness of the

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On the Theory of the Adsorption Wave. The Dependence of the Fatigue Layer of the Catalyst on the Rate of Gas Motion and on the Thickness of the Layer

adsorbent layer upon the time T is briefly investigated. There are 4 figures and 1 Soviet reference.

SUBMITTED: March 30, 1959

Card 3/3