"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

LUNKIEWICZ, W. W.

LUNKIEWICZ, W. W. Ziemia we wszechswiecie (The Earth in the Universe). Warszawa, 1949, p. 79.

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

LUNKIN, A. V.

Lunkin, A. V.- "Carp in the central Volga (the Tatar Republic) and economical methods for its use", Trudy Tatar, otd-niya Vsesoyuz. nauch.-issled. in-ta ozerno-rech. ryb. khoz-va, Issue 4, 1948, p. 103-24, - Bibliog: 27 items.

SO: U-4110, 17 July 53, (Letopis 'Zhurnal 'nykh Statey, No. 19, 1949).

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

L 14780-65 EWT(m)/EWP(t)/EWP(b) ASD(m)-3 JD

ACCESSION NR: AP4048542 S/0286/64/000/019/0025/0025

AUTHORS: Burovoy, I. A.; Yemel'yanov, S. V.; Lody*seva, M. S.; Lunkin, B. V.; Kebachkov, N. I.

TITLE: A regulator for controlling nonlinear objects. Class G, No. 165495 B

SOURCE: Byulleten' izobreteniy i tovarny*kh znakov, no. 19, 1964, 25

TOPIC TAGS: metal, nonferrous metal, metal forming 16

ABSTRACT: This Author Certificate presents a regulating device for controlling nonlinear objects having a few places of equilibrium, one of which is always unstable. The apparatus contains a measuring device, a static member, and an actuating mechanism. To enlarge the domain of stability by initial conditions and to achieve a high accuracy in sustaining the regulating parameter, the apparatus incorporates a supplementary loop to the measuring device. Both the terminals of the supplementary loop and the measuring device are in the logical network switched to the static member.

ASSOCIATION: Gosudarstvenny*y nauchno-issledovatel'skiy institut tsvetny*kh metallov (State Scientific Research Institute of Nonferrous Metals)

Card 1/2

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3"

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L 14780-65
ACCESSION NR: AP4048542

SUBMITTED: 10Jul63 ENCL: 00

SUB CODE: MM NO REF SOV: 000 OTHER: 000

Card 2/2

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"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

L 11273-65 EWT(d)/EWP(v)/EWP(k)/EWP(h)/EWP(1) Pf-4 AMD/APGC(b)/AFETR/ASD(d)/RAEM(1)/ASD(a)-5/ESD(gp) JXT(CZ)

ACCESSION NR: AT4247304 S/3115/64/000/021/0400/0408

B

AUTHOR: Burovoy, I. A.; Yemel'yanov, S. V.; Lodyzheva, M. S.; Lunkin, B. V.

TITLE: A static regulator with variable structure

SOURCE: Moscow. Gosudarstvennyy institut tsvetnykh metallov. Sbornik nauchnykh trudov, no. 21, 1964. Matematicheskiye modeli tekhnologicheskikh protsessov i razrabotka sistem avtomaticheskogo regulirovaniya s peremennoy strukturoy (Mathematical models of technological processes and development of variable structure feedback systems), 400-408

TOPIC TAGS: variable parameter control system, automatic regulation, static regulator, temperature regulation

14

ABSTRACT: A new static regulator with variable structure is described, which can be used to control processes having at least two equilibrium points, one of which is unstable. Block diagrams of the regulator and of an automatic control system based on the regulator are shown, as well as a wiring diagram of the regulator. When a perturbation $f(\eta)$ appears, an error signal x is produced and acts on a slave mechanism whose gain coefficient is k. When $x > \varepsilon/2 + \Delta$, the servo loop relay is switched on. The coordinate η is given the value + 1 and is delivered to the logic system. At the same time, the logic system receives the coordinate $x^* = \text{sign } x$.

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L 11273-65

ACCESSION NR: AT4047304 0

The logic system changes the regulator gain coefficient from k to K. The gain K is maintained until the coordinate difference $x - \omega$ at the input to the servo loop becomes smaller than $\varepsilon/2$. After the relay is disconnected, the magnitude of the gain coefficient returns to k. The next change of the gain coefficient from k to K will take place when the difference between the coordinates x and ω again becomes greater than $\varepsilon/2 + \Delta$. The change in gain coefficient from k to K will continue until the error signal reaches some maximum value. After this, due to change in sign of the servo loop coordinate η, the logic system will start changing the regulator gain coefficient from k to -K. Tests of the new regulator have shown that it will maintain a 555C temperature with a $\pm$ 1.5C accuracy. Orig. art. has: 11 equations and 6 figures.

ASSOCIATION: none

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

NO REF SOV: 000 OTHER: 000

Card 2/2

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

L 11274-65 EWT(m)/EWP(v)/EWP(k)/EWP(h)/EWP(1)/EWT(d) Pf-4 ASD(a)-5/AFMDC/AFETR/ESD(dp) JD/JXT(CZ)

ACCESSION NR: AT4047305 S/3115/64/000/021/0409/0417

AUTHOR: Burovoy, I. A.; Yemel'yanov, S. V.; Zelentsov, O. P.; Lunkin, B. V.; Pavlin, I. M.

TITLE: An integral regulator with variable structure and with minimal changes in the control signal

SOURCE: Moscow. Gosudarstvennyy institut tsvetnykh metallov. Sbornik nauchnykh trudov, no. 21, 1964. Matematicheskiye modeli tekhnologicheskikh protsessov i razrabotka sistem avtomaticheskogo regulirovaniya s peremennoy strukturoy (Mathematical models of technological processes and development of variable structure feedback systems), 409-417

TOPIC TAGS: variable parameter control system, automatic regulation, integral regulator

ABSTRACT: In their previous work (Avtomatika i Telemekhanika, vol XXI, No. 8, 1960), the authors showed that in the control of some continuous technological processes with interdependent parameters, excellent results are obtained when the changes in control signals, which are required by the static characteristics of the controlled object, are only of sufficient magnitude to compensate for the perturbations. In this article, the idea is extended to the design of an integral

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L 11274-65

ACCESSION NR: AT4047305

regulator with variable structure which uses the minimal required changes in control signals to control inertial objects (processes) with a time lag or objects with distributed parameters. The block and wiring diagrams of the control system are shown. The regulator consists of a servo tracking loop which produces the auxiliary coordinate η, and of logic systems which form the logic control function to change the system structure in accordance with the values of the signs of the auxiliary coordinates x^*, η and σ. For some specified combinations of signs of x^*, η and σ the channel $x - X$ is opened for transmission of the error signal x to the slave mechanism. The principal transient signals of the system are shown in Figure 1 of the Enclosure. Tests have shown that when the system is optimized for maximum perturbation, the regulator compensates accurately for this perturbation in one cycle of the slave mechanism. All perturbations which are smaller than the maximum require two or three cycles of the slave mechanism for compensation. Orig. art. has: 3 equations and 4 figures.

ASSOCIATION: Gosudarstvennyy institut tsvetnykh metallov, Moscow (State Institute of Non-Ferrous Metals)

SUBMITTED: 00 ENCL: 02 SUB CODE: IE, MM

NO REF SOV: 001 OTHER: 000

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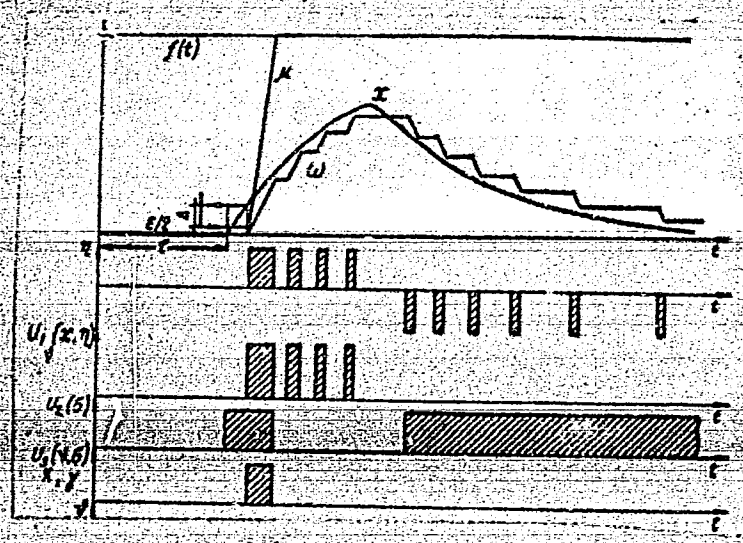
"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

L 11274-65

ACCESSION NR: AT4047305

ENCLOSURE: 01

Figure 1.



Card 3/4

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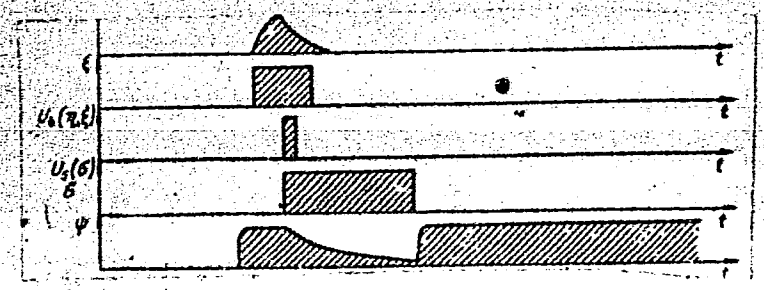
"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

L 11274-65

ACCESSION NR: AT4047305 Continuation of Figure 1. ENCLOSURE: 02



Variations in the basic system coordinates during transient operation.

Card 4/4

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"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

PETYAKSHEV, I.; LUNKIN, P.; REPIN, I.[deceased]; YEGOROV, V., red.

[Rural builder] Sel'skii stroitel'. Saransk, Mordovskoe knizhnoe izd-vo, 1964. 46 p. (MIRA 17:10)

1. Starshiy proizvoditel' rabot Kovylkinskoy mezhkolkhoznoy stroitel'noy organizatsii "Avangard", Mordovskaya respublika (for Petyakshev). 2. Zamestitel' predsedatelya kolkhoza "Sovetskaya Rossiya" Krasnoslobodskogo proizvodstvennogo upravleniya Mordovskoy respubliki (for Lunkin). 3. Nachal'nik tsekha zhelezobetonnykh konstruktsiy Ruzayevskoy mezhkolkhoznoy stroitel'noy organizatsii Mordovskoy respubliki (for Repin).

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

VASIL'YEV, V.V.; TERESHCHENKO, N.P.; prinimal uchastiye: LUN'KIN, S.P.

Qualitative chemical semimicroanalysis. Part 3: Detection of chloride ions in the reactions of the formation of Chromyl chloride. Uch.zap.LGU no.272:153-161 '59. (MIRA 13:1)
(Chromyl chloride) (Chlorine--Analysis)

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

L 31006-66 EWP(e)/EWT(m)/EWP(t) IJP(c) JD/JG/WH

ACC NR: AP6010449 SOURCE CODE: UR/0368/66/004/003/0245/0251

AUTHOR: Mokeyeva, G. A.; Lun'kin, S. P.; Feofilov, P. P.

ORG: none

TITLE: Luminescence of praseodymium in silicate glasses

SOURCE: Zhurnal prikladnoy spektroskopii, v. 4, no. 3, 1966, 245-251

TOPIC TAGS: praseodymium, ytterbium, luminescence spectrum, silicate glass, low temperature effect

ABSTRACT: Data are given from a study of spectrally luminescent characteristics of silicate glasses activated by praseodymium ions. The trivalent praseodymium cation has two $4f$ electrons and a comparatively small number of singlet ($^1S_0$, $^1G_4$, $^1D_2$, $^1I_6$) and triplet (^3H, ^3F, ^3P) levels. Absorption and luminescence of crystals and glasses activated by praseodymium are determined by forbidden transitions between these levels. The absorption spectra of the glasses were studied in the spectral region below 1μ using an SF-4 spectrophotometer, and in the region of longer waves on the automatic SV-50 spectrophotometer made by the Shimadzu Company. The luminescence spectra were recorded on installations with diffraction monochromators and FEU-38 photomultipliers, a cooled FEU-22 photomultiplier and a cooled lead sulfide photoresistor. Electronic EPPV-60-3M and PS1-02 potentiometers were used for recording the spectra. The lumi-

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L 31006-66

ACC NR: AP6010449

nescence excitation source was generally a mercury lamp with a 436 mμ glass filter. A diffraction monochromator was used for excitation in some cases. The luminescence lifetime was measured either with a pulsed tau-meter in combination with a diffraction monochromator to isolate certain sections of the luminescence spectrum, or by an ultratau-meter and a set of light filters. The first method gave the best spectral resolution while the second gave the highest accuracy for determination of τ^2. Absorption and luminescence spectra are given for glass containing 0.2% Pr_2O_3. The experimental data show a high probability for nonradiative transitions from ^3P levels to lower-lying states, particularly to the $^1D_2$ level which is the initial state for a number of intense radiative transitions in the red region of the spectrum. When the temperature is reduced to 77°K, there is a redistribution of intensities in the luminescence spectrum of trivalent praseodymium favoring the blue-green bands. It is shown that there is a nonradiative transfer of excitation energy between praseodymium ions and between praseodymium and ytterbium ions which results in concentration quenching of Pr luminescence in the first case and luminescence sensitization of Yb in the second. Quenching due to nonradiative energy transfer from praseodymium to ytterbium is less effective when the temperature is reduced to 77°K which may be due to a reduction in the overlapping of levels. Orig. art. has: 4 figures, 2 tables. [14]

SUB CODE: 20/ SUBM DATE: 10Mar65/ ORIG REF: 007/ OTH REF: 002

ATD PRESS: 4241

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APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

ACC NR: AP6030178 SOURCE CODE: UR/0237/66/000/008/0038/0040

AUTHOR: Veynberg, T. I.; Lun'kin, S. P.

ORG: none

TITLE: Measurement of the spectral absorption of glasses colored with transition-metal ions at increased temperatures

SOURCE: Optiko-mekhanicheskaya promyshlennost', no. 8, 1966, 38-40

TOPIC TAGS: silicate glass, borate glass, glass property, color additive, absorption spectrum, light absorption, temperature dependence

ABSTRACT: The purpose of the investigation was to determine the character and causes of changes in the absorption spectra of coloring ions in glasses at increased temperatures. Silicate, borosilicate, alumosilicate, and phosphate glasses of varying compositions, with and without coloring ions, were tested. The coloring ions used were Co^{+2}, Cu^{+2}, Fe^{+2} and Cl^{-}. The absorption spectra were measured in the visible (from 400 to 750 nm), ultraviolet, and infrared regions at 20, 100, 300, and 400C, except when the annealing temperature of the glass was lower than 400C, when the measurements were made at 300C. The spectral absorption was also measured after the cooling of the sample, to establish whether the change in the spectral absorption is reversible. The investigation has shown that all glasses exhibit common changes in the absorption spectra, namely shift of the boundaries and of the maxima of the absorption bands toward the longer-wave region and smearing of the absorption bands. These changes are re-

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L 10250-67

ACC NR: AP6030178

versible in character provided the sample is not heated above the annealing temperature. The changes are governed not by structural transformation but by intensification of the thermal oscillations of the individual particles in the glass. The smearing of the bands is under the influence of the coordination and valence transitions of the transition-metal ions. The temperature shift can reach 20 - 50 nm for each 100C. It is also concluded that the temperature variations of the spectral absorption of coloring ions can be used for the study of structural transformations in the glass. Orig. art. has: 5 figures.

SUB CODE: 11,20 SUBM DATE: 04Jun66/ ORIG REF: 002/ OTH REF: 001

Card 2/2

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

ACC NR: AP7003150 SOURCE CODE: UR/0368/66/005/006/0730/0734

AUTHOR: Mokeyeva, G. A.; Reyshakhrit, A. L.; Lun'kin, S. P.

ORG: none

TITLE: Nonradiative transfer of excitation energy between Yb^{3+}, Nd^{3+}, and Pr^{3+} ions in silica glass

SOURCE: Zhurnal prikladnoy spektroskopii, v. 5, no. 6, 1966, 730-734

TOPIC TAGS: excitation energy, ion energy, ion interaction, SILICATE GLASS, RARE EARTH

ABSTRACT: An investigation was made of the transfer of excitation energy in silica glass activated simultaneously with two and three rare-earth ions. The investigation of the interaction of Yb—Nd, Yb—Pr, and Nd—Pr ion pairs was based on the dependence of intensity and the duration of rare-earth ion luminescence on the concentration. The pair interaction is rather complicated: the nonradiative energy transfer can proceed in several ways and all three activators can serve as donors and acceptors of excitation energy. In the case of the interaction of Yb—Nd pairs with the simultaneous activation of glasses with Nd^{3+} and Yb^{3+} ions, a sensitized luminescence of of ytterbium results from the nonradiative transfer of energy from neodymium ions in the $^4F_{3/2}$ state to the unexcited ytterbium ions. This leads to an attenuation of the intensity and to a shortening of the luminescence duration of neodymium. A reverse energy transfer from ytterbium to neodymium does not occur. In Yb—Pr the interaction of Yb^{3+} and Pr^{3+} ions is of a dual nature. On the one hand, during excitation in the

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ACC NR: AP7003150

absorption band of Pr^{3+} ions a sensitized luminescence of Yb^{3+} takes place. On the other hand, conditions exist for the resonance transfer of excitation energy from Yb^{3+} to Pr^{3+}. Thus, the praseodymium is simultaneously a sensitizer and a quencher for ytterbium luminescence. The quenching effect of praseodymium exceeds its sensitizing effect on ytterbium. In Nd—Pr a similar phenomenon takes place during interaction of the activator pair Nd and Pr. The presence of Nd^{3+} ions provokes quenching of Pr^{3+} luminescence in bands which are bound with transitions from the $^1D_2$ level. The praseodymium ions on their part render a strong quenching effect upon the luminescence of neodymium. The authors thank P. P. Feofilov for his constant interest and attention to the work and V. P. Kolobkov for useful discussions. Orig. art. has: 3 figures. [WA-14] [JA]

SUB CODE: 20/ SUBM DATE: 28Feb66/ ORIG REF: 003/ OTH REF: 003/

Card 2/2

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

LUN'KIN, Yu.P. (Leningrad); POPOV, F.D. (Leningrad)

Effect of nonequilibrium dissociation on a supersonic flow past blunt-nosed bodies. Zhur. vych. mat. i mat. fiz. 4 no.5:896-904 S-O '64. (MIRA 17:12)

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"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

LUN'KIN, YU. P.

CARD 1 / 2 PA - 1854

SUBJECT USSR / PHYSICS
AUTHOR LUN'KIN, YU.P., MIŠIN, G.I.
TITLE On the Luminescence of the Front of a Shock Wave.
PERIODICAL Žurn.eksp.i teor.fis, 31, fasc.6, 1105-1105 (1956)
Issued: 1 / 1957

In the course of experiments carried out on a ballistic device a luminescence of the front of the shock wave was observed in several gases (J.ECKERMAN, R.SCHWARTZ, Phys.Rev., A.87, 912 (1952) although the temperature behind the shock wave in a multiatomic gas did not suffice for the excitation of luminescence. The following hypothesis may serve to explain this phenomena:

On the occasion of a collision of the molecules on the front of the shock wave, the energy of the direted motion goes over into the subordinated thermal energy. The computations carried out by C.ZENER (Phys.Rev.37, 556 (1931)) showed that after about 10 collisions a MAXWELL velocity distribution of molecules occurs, whereas the rotation- and oscillation degrees of freedom are practically left without excitation ("frozen-in"). On this occasion the entire energy goes over only to the degrees of motion of the progressing motion, and the local temperature of a gas becomes much higher than the temperature of the equilibrium established in the course of events.

After the degrees of freedom of the progressing motion the electron levels and the degrees of freedom of rotation are excited. According to the individual properties of the molecules, at first the electron levels, and then the degrees

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of freedom of rotation, or else both together can be excited. In either case local temperature remains higher than equilibrium temperature. It is just by this energy distribution which does not correspond to equilibrium, that the observed luminescence can be explained, overmore as it is the f r o n t of the shock wave that is luminescent, where the degrees of freedom of oscillation are not yet excited in view of the fact, that for their excitation from 10^4 to 10^5 shocks are necessary.

Further excitation of the degrees of freedom of rotation and oscillation leads to a decrease of gas temperature. which then tends towards equilibrium temperature and to an extinction of the luminescence. The more rapidly the interior degrees of freedom are excited on this occasion, the narrower will be the zone of luminescence. In gases with multiatomic molecules the domain of luminescence will therefore be narrower than in monoatomic gases, where temperature drop is due only to a decrease of luminescence.

The above is a translation of this short report.

INSTITUTION: Physical-Technical Institute of the Academy of Science in the USSR.

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"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

LUN'KIN, Yu. P.

40-5-1/20

AUTHOR: LUN'KIN, Yu.P. (Leningrad)

TITLE: Boundary Layer Equations and Their Boundary Conditions in the Case of Motion in a Weakly Thinned Gas for Supersonic Velocities (Uravneniya pogranichnogo sloya i granichnyye usloviya k nim v cluchaye dvizheniya v slabo razrezhennom gaze so sverkhzvukovymi skorostyami).

PERIODICAL: Prikladnaya Mat.i Mekh.,1957,Vol.21,Nr 5,pp.597-605 (USSR)

ABSTRACT: In supersonic motions in great heights the free length of path L_m is comparable with the measurements L of the moving body. Gases for which this occurs are denoted by the author as "weakly thinned gases". The boundary layer equations are set up in the weakly thinned gas according to Prandtl's method, they differ, however, from the usual Prandtl equations by the occurrence of higher derivatives in the velocities and in the temperature; the pressure gradient in the direction of the normal is different from zero which is expressed by additional terms. The boundary conditions for the derived equations are derived according to the kinetic theory; these are generalized conditions as they were set up for supersonic motions by Maxwell and Smoluchovski. The limits of applicability of the investigated equations are given with respect to the height as well as with respect to the velocity.

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Boundary Layer Equations and Their Boundary Conditions in the Case of Motion in a Weakly Thinned Gas for Supersonic Velocities. 40-5-1/20

The author thanks A.I. Gubanov for the suggestion for the present paper.
There are no figures, no tables, and 11 references, 3 of which are Slavic.

SUBMITTED: October 1, 1956

AVAILABLE: Library of Congress

Card 2/2

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"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

Lun'kin, Yu. P.

57-6-19/36

AUTHOR: LUN'KIN, YU.P.

TITLE: On the Structure of Shock Waves. (O strukture udarnykh voln, Russian)

PERIODICAL: Zhurnal Tekhn.Fiz., 1957, Vol 27, Nr 6, pp 1276-1281 (U.S.S.R.)

ABSTRACT: By making use of the basic ideas of the hypothesis developed by E.SENGER ("Weltraumfahrt", Nr 1, 4-9, 1954) the structure of the shock wave is here investigated. The following conclusions were arrived at:

1.) The non-balanced process in a shock wave can be investigated if some zones, in which part of the molecule degrees of freedom are in equilibrium and the other degrees of freedom are "frozen in" are analyzed.
2.) In the excitation domain of the progressing degrees of freedom the gradient of the gas-parameters is at its maximum.
3.) In a shock wave a domain with a thermal excitation and ionization can exist at a temperature which exceeds equilibrium temperature.
4.) The here mentioned method of a series approximation for the purpose of determining the excitation oscillations, of dissociation and of ionisation is sufficiently simple and shows good convergence.

Card 1/2

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"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

LUNKIN, YU.P.

57-8-25/36

AUTHOR Lun'kin Yu.P.

TITLE Gas Parameters at the Critical Point with Account of the Variable Specific Heat.
(Parametry gaza v kriticheskoy tochke s uchetom peremennoy teployemkosti - Russian)

PERIODICAL Zhurnal Tekhn.Fiz., 1957, Vol 27 , Nr 8, pp 1830-1835 (U.S.S.R.)

ABSTRACT There is no possibility to obtain analytic formulae for gas parameters if the variable specific heat c_p is taken into account and it is therefore necessary to apply numeral solutions. In T,1956 Vol 27, number 6 the author shows a method for the consideration of the dependence of the specific heat c_p on T and p as a consequence of oscillation excitation, dissociation and ionization of the gas on the occasion of its passage through an impact wave. This method is also applied here. The following can be said on account of the calculations: 1.- The taking into account of the variable specific heat leads to a drop of brake temperature and to an increase of the density compared with the corresponding values for a constant specific heat. In the case of M_i=12 (ratio of the velocity of increasing gas flow and the velocity of sound) these values differ by almost 100%. 2.- Change of brake pressure at the expense of variable specific heat in the case of $M_i \leqslant 12$ is not more than 3 %. 3.- Differently from the monotonous dependence of the coefficient of resistance c_x of the plate of M_i, vertically placed to the flow, leads in the case of a constant specific heat,which

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Gas Parameters at the Critical Point with Account to the Variable Specific Heat. 57-8-25/36

is being considered, to a characteristic maximum of c_x in the case of $M_1 \simeq 6,8$ which is in connection with the oscillation excitation of the molecules.
(4 illustrations and 2 Slavic references)

ASSOCIATION Leningrad Physical-Technical Institute of the Academy of Sciences of the U.S.S.R.
(Leningradskiy fiziko-tekhnicheskiy institut AN SSSR)

SUBMITTED January 26, 1957

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"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

57-28-4-37/39

AUTHOR: Lun'kin, Yu. P.

TITLE: A Remark on the Derivation of the Equations of Motion in Third Approximation as Given in Chapman's Monograph (Zamechaniye k vyvodu uravneniy dvizheniya v tret'yem priblizhenii, dannomu v monografii Chepmena)

PERIODICAL: Zhurnal Tekhnicheskoy Fiziki, 1958, Vol. 28, Nr 4, pp. 913-914 (USSR)

ABSTRACT: In Chapman's (Chepman's) monograph (Reference 1) an error occured in the calculation of the tensor of viscous tensions in the second approximation of $p^{(2)}$ (the tensor is contained in the equations of motion in third approximation) (so-called Barnett-Chapman equation) (Reference 2). The respective sections of the calculation are given here. The investigation of the Barnett-Chapman equations shows that the error made by Chapman is essential. The incorrectly found term is contained in the formula for $\partial p/\partial y$. This formula characterizes the change of pressure in the transverse direction of the boundary layer. The calculation with

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A Remark on the Derivation of the Equations of Motion in Third Approximation as Given in Chapman's Monograph

57-28-4-37/39

this error leads to the fact that the pressure within the boundary layer shows a minimum.
There are 2 references, 1 of which is Soviet.

ASSOCIATION: Leningradskiy fiziko-tekhnicheskiy Institut AN SSSR (Leningrad, Physical-Technical Institute, AS USSR)

SUBMITTED: October 25, 1957

Card 2/2

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

Lun'kin, Yu. P.

57-11-25/33

AUTHORS: Gubanov, A. I., Lun'kin, Yu. P.

TITLE: Kinetics Equationsof Gas Dissociation with Account of Diffusion (Uravneniya kinetiki dissotsiatsii gaza s uchetom diffuzii)

PERIODICAL: Zhurnal Tekh. Fiz., 1957, Vol. 27, Nr 11, pp. 2631-2639,(USSR)

ABSTRACT: A system of equations is deduced which describe the behavior of the gas in non-equilibrium diffusion and dissociation. The cases for a diatomic gas and for air as a five-components-mixture are investigated. The temperature dependence of the kinetic coefficients in the equations obtained is evaluated. However, as it is based on a series of approximations it requires an additional examination by experiments as well as a precision. It is shown that the specific velocities of the dissociation reaction in the case of air will essentially differ only by the exponential multiplicands that depend on the dissociation. It is shown that the thermo-diffusion coefficient is a very comprehensive expression and not a function of the binary thermo-diffusion coefficient, but that it is determined by the conduct of the whole multi-components-mixture it is difficult to put down the expression for the flow of particles in a general form. In this case it is difficult to approach from the point of view of the statistical theory of turbulency and it is more reasonable to base on the semi-empirical phemenological theory There are 2 Slavic references.

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"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

Kinetics Equations of Gas Dissociation with Account of Diffusion. 57-11-25/33

ASSOCIATION: Leningrad Physical-Technical Institute AN USSR (Leningradskiy fiziko-tekhnicheskiy institut AN SSSR)

SUBMITTED: May 3, 1957

AVAILABLE: Library of Congress

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"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

SOV/56-34-6-20/51

AUTHOR: Lun'kin, Yu. P.

TITLE: The Variation of Entropy During the Relaxation of a Gas Behind a Shock Wave (Izmeneniye entropii pri relaksatsii gaza za udarnoy volnoy)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol. 34, Nr 6, pp. 1526-1530 (USSR)

ABSTRACT: The author proposed in a previous paper a method for the investigation of the non-equilibrium processes in a shock wave whereby "quasi-equilibrium zones" are introduced. Applying this method, the author calculates the entropy change of a gas for the transition from one zone to another. First an expression is given for the entropy variation if there is no dissociation. The next part of this paper deals with shock waves of low intensity, the corresponding expressions of the entropy changes are given explicitely. Under certain conditions the translatory and the rotational degrees of freedom are excited without a change of the entropy and only a following excitation of the vibrations increases the entropy. There will be no sharp front of the shock wave, but a gradual change of the parameters in a distance of some dozens of free path lengths. The last part of

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The Variation of Entropy During the Relaxation of a Gas Behind a Shock Wave

this paper deals with strong shock waves. The expressions for the entropy variations are given also for this case. In a gas in which the vibrations are excited considerably already in the incident wave, the entropy varies are (under equal conditions) greater than in a gas with non-excited vibrations. The lower the dissociation energy, the greater the entropy variation. The maximum entropy variation corresponds to the excitation of the translatory degrees of freedom; during the following excitation of the rotation the increase of the entropy becomes slower. This phenomenon has the following reason: In an insulated system that approaches the equilibrium state, the increase of the total entropy may be accompanied by a decrease of the entropy of the individual parts of this system. There are 5 references, 2 of which are Soviet.

ASSOCIATION: Leningradskii fiziko-tekhnicheskii institut Akademii nauk SSSR (Leningrad Physico-technical Institute, AS USSR)

SUBMITTED: December 25, 1957

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APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

LUN'KIN, Yu.P.

Parameters of a gas behind a shock wave. Zhur.tekh.fiz. 29 no.2:180-188 F '59. (MIRA 12:4)

1. Leningradskiy fiziko-tekhnicheskiy institut.
(Shock waves)

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

LUN'KIN, Yu.P.

Shock waves in real gases. Zhur.tekh.fiz. 29 no.2:272-273 F '59. (MIRA 12:4)

1. Leningradskiy fiziko-tekhnicheskiy institut AN SSSR.
(Shock waves)

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

S/057/60/030/06/05/023
B012/B064

AUTHOR: Lun'kin, Yu. P.

TITLE: Variation of the Gas Parameters at a Non-equilibrium Dissociation Behind the Shock Wave

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1960, Vol.30, No.6, pp.622-626

TEXT: A method is explained of the approximated solution of the system of equations which describes a non-equilibrium gas dissociation behind the shock wave. On the passage of the gas through the front of a strong shock wave, the state of equilibrium is not immediately established. If the region in which the oscillation equilibrium occurs, is smaller than the corresponding region of the non-equilibrium dissociation (Ref. 1), in the investigation of dissociation the oscillations are regarded as being in equilibrium. The disturbance of this equilibrium during dissociation is taken into account by the reaction rate constants which are contained in the relaxation equation. The error in the gas enthalpy is inconsiderable, since the enthalpy itself is small as compared to the dissociation energy. The system is written down of the equations (1.1), (1.2), (1.3) of the maintenance, the state

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Variation of the Gas Parameters at a Non-equilibrium Dissociation Behind the Shock Wave

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equation (1.4) and the additional relaxation equation (1.6) suggested by the author (Ref. 2) for the change of the parameters of a diatomic gas in the region of the non-equilibrium dissociation. The formula (1.6) is transformed and formula (2.7) is obtained. It is pointed out that the solution of the system of formulas (1.1), (1.2), (1.3), (1.4), and (2.7) is rather comprehensive, and therefore an approximated solution is given here. Finally, it is pointed out that if the region in which equilibrium is established is comparable to the characteristic dimensions of the problem set (e.g. with the dimensions of the stream-lined body), the deviation from the state of equilibrium has to be taken into account, and the complete system has to be solved in consideration of the additional relaxation equation. There are 1 figure and 6 references: 3 Soviet and 3 English.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN SSSR, Leningrad (Institute of Physics and Technology of the AS USSR, Leningrad)

SUBMITTED: October 9, 1959

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84442

S/057/60/030/009/007/021
B019/B054

26.1410

AUTHORS: Gubanov, A. I. and Lun'kin, Yu. P.

TITLE: The Equations of Magnetoplasmadynamics

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1960, Vol. 30, No. 9, pp. 1046-1052

TEXT: It is usual in investigations of magnetic hydrodynamics to assume $\omega\tau \ll 1$ (ω is the Larmor frequency, τ the mean free time of charged particles). These assumptions are fulfilled in dense media and with weak magnetic fields in the plasma. Calculations in one- and two-liquid approximations were carried out for any $\omega\tau$. The introduction deals with a combination of the one-liquid approximation developed by Chapman et al. (Ref. 1) and the two-liquid theory developed by S. I. Braginskiy (Ref. 2). The relations (1) for pressure, temperature, the tensor of viscous tensions, and the heat flow are given. It is shown in the second part of the paper that expressions for the tensor of viscous tensions and the heat flow in one-liquid approximations can be easily obtained with the aid

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The Equations of Magnetoplasmadynamics

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of relations (1) from the formulas found by Braginskiy. When the resulting expressions are introduced into the motion- and energy equations of the one-liquid approximation, the equations of magnetoplasmadynamics are obtained after allowing for some transformations. The equations found are similar to those used in magnetohydrodynamics ($\omega\tau \ll 1$), and the same methods as in magnetohydrodynamics can be used for their solution. The existence of additional terms in the equations leads, however, to new physical effects which do not follow from magnetohydrodynamics. There are 3 references: 2 Soviet and 1 British.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN SSSR, Leningrad (Institute of Physics and Technology of the AS USSR, Leningrad)

SUBMITTED: July 2, 1959

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"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

84443

S/057/60/030/009/008/021
B019/B054

26.1410
24.2120

AUTHORS: Gubanov, A. I. and Lun'kin, Yu. P.

TITLE: The Cuettov Flow in Magnetoplasmadynamics

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1960, Vol. 30, No. 9, pp. 1053-1060

TEXT: The authors investigated the flow between two parallel infinite plates, one of which is at rest while the other moves in its plane. It is assumed that a magnetic field $\vec{H}_0$ exists in various directions with respect to the plates and the motion $\vec{u}$ of one plate. First, the case is studied where $\vec{H}_0$ is perpendicular to the plane of the plates. The authors show in a very long expansion that a flow originates here which is perpendicular to $\vec{u}$. This is called a specific effect of magnetoplasmadynamics. Further, the case is studied where $\vec{H}_0$ lies in the plane of the plates. Here, the authors show that the magnetic field generates not only currents in the plasma but also currents running in the plates. The distribution of currents can only be given if the shape and dimension of

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The Cuettov Flow in Magnetoplasmadynamics

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the plates and the position of the current-carrying conductors are given. Finally, the case is investigated where H_0 has any direction. It appears that in all cases investigated, properties are found which do not follow from magnetohydrodynamics ($\omega\tau \ll 1$). $\vec{H_0}$ always shows an influence on flow and viscosity. There are 3 references: 1 Soviet and 2 US.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN SSSR, Leningrad (Institute of Physics and Technology of the AS USSR, Leningrad)

SUBMITTED: April 4, 1960

Card 2/2

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

LUN'KIN, Yu.P.; POPOV, F.D.

Nonequilibrium dissociation of a gaseous mixture behind a shock wave. Zhur. tekh. fiz. 31 no.6:726-730 Je '61. (MIRA 14:7)

1. Fiziko-tekhnicheskiy institut imeni A.F. Ioffe AN SSSR, Leningrad.
(Molecular dynamics) (Shock waves)

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

27174
S/057/61/031/009/014/019
B104/102

11.5200

AUTHOR: Lun'kin, Yu. P.

TITLE: Change of entropy in the relaxation of a gas mixture behind a shock wave

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 31, no. 9, 1961, 1112-1118

TEXT: The author studies the relaxation of a mixture of two gases behind a shock wave. The mixture consists of two biatomic gases, or of one monatomic and one biatomic gas. It is shown that in weak shock waves the successive excitation of translational, rotational, and vibrational degrees of freedom is accompanied by stronger or weaker changes of entropy, depending on the amount of the monatomic component. The subscripts used in the equations denote: 1- the parameters of incident flow, 2, 3, 4, and 5- the parameters in the zones in which the translational, rotational, and vibrational degrees of freedom are excited, and where an equilibrium dissociation of the more readily dissociating component exists. If the changes of the parameters in the various zones are known, the change of entropy in the system and the effect of the nondissociating components on the excitation of

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gases behind the shock wave are found. The author gives two equations for calculating the change of entropy between the zones 1-2, 2-3, 3-4, and 4-5. Without dissociation,

$$dS = \frac{C_{p2} + \beta C_{p\beta}}{1 + \beta} \frac{dT}{T} - R \frac{dp}{p}$$ and with dissociation

$$dS = \frac{(1 - \alpha)C_{p2} + 2dC_{p1} + \beta C_{p\beta}}{1 + \alpha + \beta} \frac{dT}{T} + \frac{D}{1 + \alpha + \beta} \frac{d\alpha}{T} - R \frac{dp}{p} .$$

From a study of the relations derived from these equations for the changes of entropy between the zones, the author finds that in weak shock waves successive excitation of translational, rotational, and vibrational degrees of freedom is accompanied by an increase in entropy. Monatomic admixtures reduce the change of entropy. Whilst for a biatomic gas mixture ΔS_i becomes greater and greater, with certain amounts β of monatomic admixture ΔS_i becomes smaller and smaller. These entropy changes are explained as follows: (1) by the energy transition from excited degrees of freedom to those excited in the respective zone; this causes a drop in temperature; (2) by adiabatic compression by which the temperature is increased. Depending on the preponderance of the one or the other of the

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B104/B102

Change of entropy in the relaxation ...

two processes, the character of the entropy change is different. In strong shock waves in two-component gases, the successive excitation of the various degrees of freedom is accompanied by ΔS_i which become smaller and smaller. The existence of a monatomic component effects a smaller entropy change than it occurs in a pure biatomic gas. There are 3 references: 2 Soviet and 1 non-Soviet. The reference to English-language publication reads as follows: M. Camac et al., IAS, Preprint no. 802, 1958.

ASSOCIATION: Fiziko-tekhnicheskiy institut im. A. F. Ioffe AN SSSR Leningrad (Physicotechnical Institute imeni A. F. Ioffe of the AS USSR, Leningrad)

SUBMITTED: December 9, 1960

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31950
S/057/62/032/001/010/018
B104/B138

10.1410

AUTHORS: Krivtsova, N. V., and Lun'kin, Yu. P.

TITLE: Excitation of molecular rotation behind a shock wave

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 32, no. 1, 1962, 69-75

TEXT: A study was made of the variation in parameters due to excitation of rotational degrees of freedom behind a shock wave. By introducing a specific heat and a temperature for the degrees of freedom of transverse and rotational motion it is shown, using P. Ye. Stepanov's results (ZhTF, 17, 377, 1947), that the temperature of the transverse degrees of freedom will rise in the range $1.091 < M_0 < 1.317$ if molecular rotation is excited, and fall if it is excited in the range $M_0 > 1.317$. Restricted to hydrogen and deuterium, the approximate formula $\tau = D/p\sqrt{T}$ is derived for relaxation time. D is determined from the condition that $\tau = \tau_0 = 1.8^{-8}$ sec at $T_0 = 228^{\circ}K$ and $p_0 = 1$ atm. The relaxation zone width narrows sharply with growing M_0. The foregoing results apply to pure diatomic gases. When such a gas contains monatomic impurities, the relaxation zone narrows somewhat

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Excitation of molecular rotation ...

with increasing impurity content. This is related to the rise in gas temperature behind the shock wave. It is assumed that rotation sets in before the temperature of the transverse degrees of freedom reaches equilibrium. There are 6 figures and 8 references: 4 Soviet and 4 non-Soviet. The four references to English-language publications read as follows: G. N. Patterson. Molecular flow of gases. N. Y., 1955; H. M. Mott-Smith. Phys. Rev., 82, 885, 1951; J. I. Stewart. Rev. Sci. Instr., 17, 59, 1946; J. G. Parker. Phys. Fluid. 2, 449, 1959.

ASSOCIATION: Fiziko-tekhnicheskiy institut im. A. F. Ioffe AN SSSR, Leningrad (Physicotechnical Institute imeni A. F. Ioffe AS USSR, Leningrad)

SUBMITTED: March 27, 1961

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"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

S/207/63/000/001/026/028
E032/E114

AUTHORS: Lun'kin, Yu.P., and Yen Hsi-ch'in (Leningrad)

TITLE: The effect of rotational and vibrational relaxation on the laminar boundary layer on a plate

PERIODICAL: Zhurnal prikladnoy mekhaniki i tekhnicheskoy fiziki, no.1, 1963, 150-154

TEXT: Supersonic flight is accompanied by heating in the neighbourhood of the moving body which gives rise to the excitation of internal degrees of freedom of the gas molecules. This excitation has a finite relaxation time, and the present authors report the results of a theoretical study of the effect of the non equilibrium excitation of rotational and vibrational degrees of freedom on a laminar boundary layer on a flat plate. The analysis is confined to a diatomic gas. The excitation of rotational and vibrational degrees of freedom is considered separately in view of the results obtained in the previous paper (Yu.P. Lun'kin, ZhTF, v.27, no.6, 1957). The equations of continuity and angular momentum are then the same as before, while the heat flow vector in the energy equation is of the form:

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$$\underline{q} = -\lambda \nabla T - \lambda_+ \nabla T_+ \qquad (1.1)$$

where λ, T, and λ_+, T_+ are the thermal conductivity and temperature of "active" and "inert" (relaxing) degrees of freedom. J. Hirschfelder et al.(Molekulyarnaya teoriya zhidkostey i gazov (Molecular theory of gases and liquids), IL., 1961) have reported without proof the relation between T and T_+ for a constant specific heat c_{v+}. In the present paper this is established for the case of variable specific heat and the result is:

$$\rho \frac{\partial \varepsilon}{\partial t} = \rho \frac{\varepsilon^* - \varepsilon}{\tau} + \operatorname{div}(\lambda_+ \nabla T_+) \quad (\varepsilon = \varepsilon(T_+),\ \varepsilon^* = \varepsilon(T)) \qquad (2.8)$$

where ρ is the density, ε is the internal energy of "inert" degrees of freedom per unit mass, τ is the relaxation time, and asterisks indicate equilibrium values. This result is used to set up a system of equations for the laminar boundary layer, including terms representing the relaxation of internal degrees of freedom. The boundary conditions are then formulated for a thermally insulated and a catalytic plate at constant

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The effect of rotational and ... S/207/63/000/001/026/028
E032/E114

temperature (constant enthalpy). The solution of the partial differential equations is then given for the case of a constant specific heat and equal Prandtl numbers for both the active and inert degrees of freedom. The solution is brought to numerical conclusions, which are given in graphical form.
There are 4 figures.

SUBMITTED: April 27, 1962

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APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

BAO KHAN'-LIN' [Pao Han-lin]; LUN'KIN, Yu.P.

Vibrational relaxation behind a shock wave. Zhur.tekh.fiz. 33 no.2: 234-243 F '63. (MIRA 16:5)

1. Fiziko-tekhnicheskiy institut imeni A.F.Ioffe AN SSSR, Leningrad.
(Shock waves) (Molecules)

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

LUN'KIN, YU.P. (Leningrad); TELENIN, G.F. (Moscow)

"Gas flow with non-equilibrium physical and chemical transformations"

report presented at the 2nd All-Union Congress on Theoretical and Applied Mechanics, Moscow, 29 Jan - 5 Feb 64.

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

LUN'KIN, YU.P.; LUR'YE, S.L. (Leningrad)

"The influence of oscillation and dissociation relaxation on the laminary boundary layer over a plate".

report presented at the 2nd All-Union Congress on Theoretical and Applied Mechanics, Moscow, 29 Jan - 5 Feb 64.

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

LUN'KIN, Yu.P.; SHTENGEL', M.P.

Effect of the nonequilibrium dissociation on the flow about blunt bodies. Trudy LPI no.230:7-12 '64.
(MIRA 17:6)

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ACCESSION NR: AP4045713 S/0208/64/004/005/0896/0904

AUTHOR: Lun'kin, Yu. P. (Leningrad); Popov, F. D. (Leningrad)

TITLE: Effect of nonequilibrium dissociation on supersonic flow over blunt bodies

SOURCE: Zhurnal vy*chislitel'noy matematiki i matematicheskoy fiziki, v. 4, no. 5, 1964, 896-904

TOPIC TAGS: supersonic flow, nonequilibrium dissociation, equilibrium dissociation, shock wave, chemical kinetics, integral relation method

ABSTRACT: A brief discussion is presented of two procedures used in the method of integral relation for the solution of supersonic flow over blunt bodies when function approximation is made 1) across the shock wave and 2) along the shock wave. Notwithstanding the difficulties of the first procedure in the case of nonequilibrium flow, this procedure was used by solving the second equation of motion without approximation. In the formulation of the problem, equations of chemical kinetics were added to the equations of motion, continuity, and conservation of energy. For simplicity, a diatomic gas with nondissociating additive is considered. The solution is sought by the second approximation for the case of flow axisymmetric

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The solution is sought by the second approximation for the case of an axisymmetric

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body. Numerical calculations of flow over blunt bodies of various shapes were made by this method, with dissociative relaxation taken into account. Results of calculations for oxygen and nonequilibrium and equilibrium flows, presented in graphical form, show that the method is particularly suitable for flows over

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calculations for oxygen and nonequilibrium and equilibrium flows, presented in graphical form, show that the method is particularly suitable for flows over strongly blunted bodies, and also for bodies with surface discontinuity. The author thanks O. M. Belotserkovskiy for his valuable advice. Orig. art. has: 11 figures and 5 formulas.

ASSOCIATION: none

SUBMITTED: 25Feb64 ATD PRESS: 3110 ENCL: 00

SUB CODE: ME, AS NO REF SOV: 005 OTHER: 000

Card 2/2

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

ACCESSION NR: AP4042944 S/0057/64/034/008/1526/1530

AUTHOR: Lun'kin, Yu. P.; Popov, F. D.

TITLE: Effect of mixing on nonequilibrium dissociation of a diatomic gas behind a shock wave

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 34, no. 8, 1964, 1526-1530

TOPIC TAGS: nonequilibrium dissociation, dissociation energy, gas relaxation, diatomic gas dissociation, shock wave, linear interpolation method, nonequilibrium relaxation

ABSTRACT: The effect of mixing two diatomic gases on nonequilibrium dissociation behind a shock wave is investigated, assuming that the dissociation energies of single components are very different so that the dissociation of each component may be considered separately. A system of equations describing the variation of gas parameters in a nonequilibrium relaxation zone is established and solved by the method of linear interpolation. The results are given of numerical calculations made for an oxygen-nitrogen mixture with $\beta = 3.73$ (ratio

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ACCESSION NR: AP4042944

of the volumes of nondissociating to dissociating components at M_∞ = 9 to 15 and p_∞ = 1, 0.1, and 0.01 atm, and for an oxygen-argon mixture with β from 0 to 10 at M_∞ = 10.2 and 12, and p_∞ = 10 mm Hg. It was found that an increase in the nondissociating component, i.e., an increase in β_1, leads to an increase in temperature behind a shock wave and to a decrease in the width of the relaxation zone, while, on the other hand, an increase in the number of particles in the mixture leads to a corresponding increase in zone width. Orig. art. has: 6 figures and 16 formulas.

ASSOCIATION: Fiziko-tekhnicheskiy institut im. A. F. Ioffe AN SSSR, Leningrad (Institute of Technical Physics, AN SSSR)

SUBMITTED: 22Oct63 ATD PRESS: 3074 ENCL: 00

SUB CODE: ME NO REF SOV: 003 OTHER: 001

Card 2/2

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

ACCESSION NR: AP4042944 S/0057/64/034/008/1526/1530

AUTHOR: Lun'kin, Yu. P.; Popov, F. D.

TITLE: Effect of mixing on nonequilibrium dissociation of a diatomic gas behind a shock wave

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 34, no. 8, 1964, 1526-1530

TOPIC TAGS: nonequilibrium dissociation, dissociation energy, gas relaxation, diatomic gas dissociation, shock wave, linear interpolation method, nonequilibrium relaxation

ABSTRACT: The effect of mixing two diatomic gases on nonequilibrium dissociation behind a shock wave is investigated, assuming that the dissociation energies of single components are very different so that the dissociation of each component may be considered separately. A system of equations describing the variation of gas parameters in a nonequilibrium relaxation zone is established and solved by the method of linear interpolation. The results are given of numerical calculations made for an oxygen-nitrogen mixture with $\beta = 3.73$ (ratio

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"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

ACCESSION NR: AP4042944

of the volumes of nondissociating to dissociating components at M_∞ = 9 to 15 and p_∞ = 1, 0.1, and 0.01 atm, and for an oxygen-argon mixture with β from 0 to 10 at M_∞ = 10.2 and 12, and p_∞ = 10 mm Hg. It was found that an increase in the nondissociating component, i.e., an increase in β_1, leads to an increase in temperature behind a shock wave and to a decrease in the width of the relaxation zone, while, on the other hand, an increase in the number of particles in the mixture leads to a corresponding increase in zone width. Orig. art. has: 6 figures and 16 formulas.

ASSOCIATION: Fiziko-tekhnicheskiy institut im. A. F. Ioffe AN SSSR, Leningrad (Institute of Technical Physics, AN SSSR)

SUBMITTED: 22Oct63 ATD PRESS: 3074 ENCL: 00

SUB CODE: ME NO REF SOV: 003 OTHER: 001

Card 2/2

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"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

L 58380-65 EWT(1)/EWP(m)/EWA(d)/EPR/FCS(k)/EWA(1) Pd-1 WW/RM

ACCESSION NR: AT5015702 UR/2563/65/000/248/0007/0013

AUTHOR: Lun'kin, Yu. P.; Popov, F. D.; Timofeyeva, T. Ya.; Lipnitskiy, Yu. M.

TITLE: Passing the singular points in numerical solutions of problems on supersonic flows past bodies

SOURCE: Leningrad. Politekhnicheskiy institut. Trudy, no. 248, 1965. Tekhnicheskaya gidrogazodinamika (Technical gas hydrodynamics), 7-13

TOPIC TAGS: supersonic gas flow, dissociating gas flow, equilibrium gas flow, steady gas flow, unsteady gas flow, shock wave, shock layer, blunt body

ABSTRACT: The parameters of a shock wave are discussed by adapting an approximate method developed by O. M. Belotserkovskiy for the analysis of flows past blunt bodies from the method of integral relations proposed by A. A. Dorodnitsyn. The authors present an approximate system of differential equations which determines the flow parameters across the shock layer and does not contain singular points. The pas-

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L 58380-65

ACCESSION NR: AP5015702

sage through these points is accomplished by using either the extrapolation of velocity derivatives, or the variation of parameters, or the method of continuous calculation. This system, which is very convenient for analysis of nonequilibrium flows, can be integrated with the desired degree of accuracy by conventional methods of numerical integration over the whole shock layer, including the region where the subsonic flow turns into supersonic. This system is supplemented by a system of algebraic equations analogous to the equations describing the transition through the shock wave. The solution of both systems for a perfect gas with a constant heat capacity is outlined, and the treatment of flows in which nonequilibrium dissociation and ionization take place is indicated. Numerous analyses of equilibrium and nonequilibrium flows past blunt bodies of arbitrary shapes have been performed by the proposed method and the results (in the first approximation) for flow parameters are shown in diagrams and are briefly discussed. These parameters include the shape of the shock waves, and the temperature and pressure distributions over the surfaces of segment-shaped bodies and of a spherical segment in a flow of nonequi-

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"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

L 58380-65

ACCESSION NR: AP5015702

librium dissociating oxygen at Mach number $M_\infty = 10$, pressure $p_\infty = 0.01$ atm, temperature $T_\infty = 290K$, and radius of curvature $R = 1$ cm. Orig. art. has: 7 figures and 6 formulas. [VK]

ASSOCIATION: Leningradskiy politekhnicheskiy institut (Leningrad Polytechnical Institute)

SUBMITTED: 00 ENCL: 00 SUB CODE: ME

NO REF SOV: 004 OTHER: 000 ATD PRESS: 4042

Card 3/3

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

L 63474-65 EWP(m)/EWT(1)/EWA(d)/FCS(k)/EWA(1)

ACCESSION NR: AP5020737 UR/0057/65/035/008/1461/1470
533.601.15

23
22
B

AUTHOR: Dushin, V. K.; Lun'kin, Yu. P.

TITLE: Supersonic, nonequilibrium airflow past blunt-nosed bodies

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 35, no. 8, 1965, 1461-1470

TOPIC TAGS: supersonic flow, nonequilibrium flow, dissociated air, shock wavefront, integral relations method, aerodynamics

ABSTRACT: A procedure which makes use of the method of integral relations is described for calculating nonequilibrium airflow past blunt-nosed bodies. Solutions for supersonic flow to the second approximation which take account of six chemical reactions are presented. The air is assumed to be a mixture of diatomic (O_2, N_2, NO) and monatomic (O, N, A_2) gases between which six specific reactions are taking place. The effect of coupling of various chemical reactions on the gas-dynamic flow parameters and concentrations in a shock layer and along the body surface is investigated. The results of calculations of the flow with different values of M_∞ and P_∞ past blunt-nosed bodies of different radii are presented in graphs and analyzed. The results show that the nonequilibrium effect is more sensitive to temperature and

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"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

L 63474-65

ACCESSION NR: AP5020737

concentration and only slightly sensitive to velocity; the nonequilibrium temperature is higher than the equilibrium temperature along the axis of symmetry and lower on the body surface; the flow fields for a two-component mixture (oxygen) and for a one-component mixture (air) are similar when $P_\infty R_0$ = constant. Orig. art. has: 9 figures and 24 formulas. [AB]

ASSOCIATION: Fiziko-tekhnicheskiy institut im. A. F. Ioffe AN SSSR, Leningrad (Physicotechnical Institute, AN SSSR)

SUBMITTED: 19Oct64 ENCL: 00 SUB CODE: MF

NO REF SOV: 010 OTHER: 004 ATD PRESS: 4067

Card 2/2

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

L 31132-66 EWP(m)/EEC(k)-2/EWP(k)/EWT(1)/T/EWA(1)/EWA(d) IJP(c) RM/WG/WW

ACC NR: AP6013122 SOURCE CODE: UR/0057/66/036/004/0661/0671

AUTHOR: Lun'kin, Yu. P.; Popov, F. D.

ORG: none

TITLE: Effect of vibrational dissociating relaxation on supersonic flows past blunted bodies

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 36, no. 4, 1966, 661-671

TOPIC TAGS: supersonic aerodynamics, shock wave shape, sonic line, equilibrium flow, nonequilibrium flow, dissociation, relaxing flow, vibration relaxation

ABSTRACT: The effect of coupled vibrational relaxation and dissociation on supersonic gas flows over blunted bodies is investigated. The relaxation equations describing the simultaneous occurrence of vibrational relaxation and dissociation in a pure diatomic gas are derived in which both the effect of vibrational relaxation on the velocity of dissociation and the effect of dissociation on the variation of the mean vibrational energy are taken into account. An approximate scheme in the second approximation is presented for calculating flows with coupled excitation of nonequilibrium vibration-dissociation, based on the Dorodnitsyn method of integral relations and developed previously

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"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

L 31132-66

ACC NR: AP6013122

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by the author for flows with nonequilibrium dissociation. This scheme was applied to calculations of flows with various free-flow initial conditions and, for example, of supersonic flows of O_2 over a sphere of $R_0 = 1$ cm at $M_\infty = 10$, $P_\infty = 0.01$ atm and $T_\infty = 290$K. The shapes of shock waves and sonic lines are given in graphs for: 1) equilibrium flow, 2) flow with nonequilibrium dissociation, 3) flow with nonequilibrium dissociation and vibrations, and 4) "frozen" flow corresponding to $\gamma = 1.4$. They show that in the case of simultaneous vibrational relaxation and dissociation the shock wave is located somewhat farther from the body but nearer than in the case of "frozen" flow. The distributions of translational (T) and vibrational (T_V) temperatures along the zero streamline; the mean vibrational energy e across the shock layer on rays s = 0, 0.25, 0.50; and concentrations C_i on the same rays are determined and given in graphs. An analysis of the results shows that the effect of vibrational relaxation and dissociation on the velocity and pressure distribution is very weak, but is substantial on temperature profiles. The distributions of nondimensional temperature $T_0 = T/T_0$, where T_0 is the stagnation point temperature, given in a graph for various flows show that the drop of T_0 in the case of coupled vibration-dissociation can be 10% higher than the drop in the case of equilibrium flow and 5% higher than the drop in the presence of dissociation. It is pointed out that the intense expansion of gas in the supersonic region and the corresponding

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L 31132-66

ACC NR: AP6013122

temperature drop along the surface leads to T_0 tending toward T_0 for frozen flow, which is not the case when only nonequilibrium dissociation is taken into account. Orig. art. has: 6 figures and 29 formulas. [AB]

SUB CODE: 20/ SUBM DATE: 09Jun65/ ORIG REF: 008/ OTH REF: 005

ATD PRESS: 4239

Card 3/3

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

KHVOSTOVA, V.V.; YACHEVSKAYA, G.L.; LUNKINA, A.N.

Analysis of the genetic structure of constant 56-chromosomal triticum-agropyron hybrids. Izv. SO AN SSSR no.4. Ser. biol.-med. nauk no.1:76-78'63. (MIRA 16:8)

1. Institut tsitologii i genetiki Sibirskogo otdeleniya AN SSSR i Nauchno-issledovatel'skiy institut sel'skogo khozyaystva tsentral'nykh rayonov nechernozemnoy polosy.

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"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

TREGUBOV, N.N., inzh.; LUNKINA, G.P.

Closed system in the production of raw cornstarch. Trudy TSNIIKPP no.3:292-318 '59. (MIRA 13:9)

(Cornstarch)

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

GURVICH, S.I.; BRUSNITSYNA, N.V.; DUSYATSKIY, V.A.; LUN'KO, V.F.

New promising type of beryllium-zinc mineralization. Razved. i okh. nedr 28 no.8:1-3 Ag '62. (MIRA 15:8)

1. Geologorazvedochnyy trest No.1.
(Genthelvite)

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

GERLING, E.K.; PAP, A.M.; MOROZOVA, I.M.; AFANAS'YEVA, L.I.; LUN'KO, V.F.

Stratigraphy of the Pre-Cambrian of White Russia and adjacent areas according to data of the absolute age. Sov. geol. 7 no.3:120-126 Mr '64. (MIRA 17:10)

1. Laboratoriya geologii dokembriya AN SSSR i Institut geologicheskikh nauk AN BSSR.

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

LUN'KOV, A. P.

"Determining the Cross-Section Lines of Two Surfaces." Cand Tech Sci, Leningrad Construction Engineering Inst, Leningrad, 1954. (RZhMat, Jan 55)

Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Instiutions (12)
SO: Sum. No. 556, 24 Jun 55

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

LUN'KOV, I.D.

Rail welding on the track. Put' put.khoz. no.9:17-18 S '59. (MIRA 12:12)

1. Glavnyy inzhener RSP-8 st.Yaroslavl'-Glavnyy.
(Railroads--Rails--Welding)

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

LUN'KOV, K. M.

USSR/Engineering - Welding Electrodes Nov 49

"Welding Medium Carbon Steels With TsM-7 Electrodes," A. A. Shapiro, K. M. Lun'kov, Engineers, 2 1/2 pp

"Avtogen Delo" No 11

TsM-7 electrode was found suitable for welding medium-carbon steels, and was employed in production of automaotive combines for various combinations of medium-and low-carbon steels.

PA 153T64

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

YEREMIN, S.; USKOV, V., pilot 1 klassa, komandir korablya;
MEL'NIKOV, V. (Ul'yanovsk); KONYUKHOV, V., dispetcher;
SHARKOV, V.; LUN'KOV, N.; AVDOSHKO, M.; BOGOYAVLENSKAYA, N.

Aeronautical kaleidoscope. Grazhd. av. 21 no.6:16-17 Je '64.
(MIRA 17:8)

1. TSelinogradskiy aeroport (for Konyukhov).

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

LUNOCHARSKIY, N.N.

Effect of an e.m.f. with periodically varying parameters on a self-oscillating system. Radiotekh. i elektron. 4 no.2:286-294 F '59. (MIRA 12:2)

(Oscillators, Electric)

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

KARPOV, A.N., prof.; LUKOV, V.P., assistant

Stripping several groups of flat seams. Ugol' 34 no.5:42-44 My '59. (MIRA 12:7)

1. Novocherkasskiy politekhnicheskiy institut.
(Coal mines and mining)

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

LUNOV, E. P., Cand Tech Sci -- (diss) "Research into occurrences of mining pressure and causes of collapse of supports in the principal mining operations at the mines of the "Shakhtantratsit" trust of the "Rostovugol'" complex." Novocherkassk, 1960. 19 pp; (Ministry of Higher and Secondary Specialist Education RSFSR, Novocherkassk Order of Labor Red Banner Polytechnic Inst im Sergo Ordzhonikidze, Chair of the Construction of Mining Enterprises); 200 copies; price not given; (KL, 23-60, 125).

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

LUNOV, E. P.; SNEGIREV, Yu. D.; VYAL'TSEV, M. M.

Results of observations on rock movements in the Artem No. 2 "Glubokaya" Mine. Trudy NPI 103:77-95 '59. (MIRA 13:9)
(Donets Basin--Subsidences (Earth movements))

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

SNEGIREV, Yu.D.; VYAL'TSEV, M.M.; LUNOV, E.P.; SHAFRANOV, N.K.

Testing concretes for water permeability. Trudy NII 113:47-60 '61. (MIRA 15:2)

(Concrete--Testing)

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

LUNOV, E.P., kand.tekhn.nauk; SNEGIREV, Yu.D., gornyy inzh.; VYAL'TSEV, ~~M.M.,~~ gornyy inzh.

Rock pressure manifestations during the mining of areas overlying stoped workings. Ugol' 36 no.5:20-23 My '61. (MIRA 14:5)

1. Novocherkasskiy politekhnicheskiy institut.
(Rock pressure) (Coal mines and mining)

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

SNEGIREV, Yu.D.; VYAL'TSEV, M.M.; LUNOV, E.P.

Investigating the durability of monolithic concrete shaft lining in mines of the Rostovugol' Combine. Trudy NPI 140:29-43 '63. (MIRA 17:9)

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

LUNOV, E.P.

Some results of studying the strength of rocks by means of irregularly shaped samples. Trudy NPI 140:73-77 '63. (MIRA 17:9)

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

SNEGIREV, Yu.D., kand. tekhn. nauk; LUNOV, E.P., kand. tekhn. nauk; VYAL'TSEV, M.M., inzh.

Investigating conditions of shaft lining with reinforced-concrete tubing in coal mines of the Rostovugol' Combine. Shakht. stroi. 9 no.10:12-15 O '65. (MIRA 18:9)

1. Shakhtinskiy filial Novocherkasskogo politekhnicheskogo instituta.

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"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

CA

2

The boiling points of saturated solutions in the system (K, NH_4) (NO_3, Cl). S. I. ARONOVA AND Z. N. LUNIKAYA. *J. Chem. Ind.* (Moscow) 8, No. 18, 23-7(1931).—Tables and graphs give the b. p. of satd. solns. of all possible combinations of KCl, KNO_3 and NH_4Cl. The b. p. of a satd. soln. of NH_4NO_3 cannot be obtained because the salt decomposes at its b. p. before satn. is attained. However, some results are given for mixts. of all 4 salts. It is found, contrary to numerous conflicting statements in the literature, that NH_4NO_3 solns. do not begin to decompose below 270°. Much heat is then evolved. K and Cl ions do not affect the stability of NH_4NO_3 solns.

H. M. LEICHSTER

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

2

ea

The boiling points of concentrated solutions of the system (K,NH_4) (NO_3,Cl). S. I. Aronova and Z. N. Lutskaya. *Trans. Sci. Inst. Fertilizers* (Moscow) No. 92, 139–48(1932).—Satd. KCl soln. b_{760} 108.7°, 100 g. of the soln. contg. 38.01 g. of the salt. Satd. KNO_3 b_{760} 117°, 100 g. of the soln. contg. 76.72 g. KNO_3. NH_4Cl soln. b_{760} 116°, 100 g. of the soln. contg. 46.53 g. of the salt. NH_4NO_3 m. 170°, decomposes to H_2O and N_2O at 245°. A soln. contg. KNO_3 58.3, KCl 9.3, and H_2O 22.4 g. b_{760} 121.4°. A soln. of NH_4Cl 40.8, KCl 8.0, and H_2O 51.2 g. b_{760} 117°. Adding NH_4NO_3 to a satd. soln. of boiling KNO_3 raises the b. p. The temp. increased to 165° when the soln. became thick and the expt. could not be continued. At 144.5° the compo. was: KNO_3 49.2, NH_4NO_3 42.4 and H_2O 8.3 g. KCl + KNO_3 + NH_4Cl b. above 165°. NH_4NO_3 by itself or in the presence of KCl does not decompose until all the water has been driven off.

J. S. Joffe

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

CA

The boiling points of concentrated solutions of the system (K,NH_4) (NO_3,Cl). S. I. Arnova and Z. N. Lunshaya. *Trans. Sci. Inst. Fertilizers* (Moscow) No. 92, 130-48(1932).—Satd. KCl soln. b.p. 108.7°, 100 g. of the soln. contg. 38.01 g. of the salt. Satd. KNO_3 b.p. 117°, 100 g. of the soln. contg. 70.72 g. KNO_3. NH_4Cl soln. b.p. 116°, 100 g. of the soln. contg. 40.52 g. of the salt. NH_4NO_3 m. 170°, decomposes to H_2O and N_2O at 245°. A soln. contg. KNO_3 58.3, KCl 9.3, and H_2O 32.4 g. b.p. 121.4°. A soln. of NH_4Cl 40.8, KCl 8.0, and H_2O 51.2 g. b.p. 117°. Adding NH_4NO_3 to a satd. soln. of boiling KNO_3 raises the b. p. The temp. increased to 165° when the soln. became thick and the expt. could not be continued. At 144.5° the compn. was: KNO_3 49.2, NH_4NO_3 42.4 and H_2O 8.3 g. KCl + KNO_3 + NH_4Cl b. above 165°. NH_4NO_3 by itself or in the presence of KCl does not decompose until all the water has been driven off. J. S. Joffe

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

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1ST AND 2ND ORDERS

3RD AND 4TH ORDERS

PRECEDES AND PROPERTIES INDEX

CA

18

Preparation of potassium nitrate from ammonium nitrate and potassium chloride. S. I. Aronova and Z. N. Lunskaya. *Kali* (U. S. S. R.) 1933, No. 2, 24-8.—A study and discussion of the diagram of the system: NH_4Cl-KCl-NH_4NO_3-KNO_3. J. S.

CHEMICAL ELEMENTS

MATERIALS INDEX

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1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

18

Obtaining potassium nitrate from ammonium nitrate and potassium chloride. S. I. Aronova and Z. N. Lunskaya. *Trans. VI Mendeleev Congr. Theoret. Applied Chem.* 1932 2, Pt. 1, 579-87(1935).—The investigation of F. Jänecke on the conditions of physicochem. equil. of the reaction $NH_4NO_3 + KCl \rightleftharpoons KNO_3 + NH_4Cl$ was continued for higher temps. (the 100° isotherm).
E. E. Stefanowsky

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1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

15

Obtaining complex fertilizers of the type of Nitrophos and Ammophos. A. M. Dubovitskii and Z. N. Lunskaya. *J. Chem. Ind.* (U. S. S. R.) 14, 496–504(1937).—During the prepn. of these fertilizers there is almost no loss of N or available P_2O_5. The optical properties of the fertilizer crystals are described and the tech. details of large-scale production are discussed. H. M. Leicester

COMMON ELEMENTS

COMMON VARIABLES INDEX

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LUNSKAVA - Z. N

Reaction of potassium chloride with mixtures of sulfur dioxide, air, and steam. P. G. Margolis, Z. N. Lunskaya, and S. I. Vol'fkovich. *J. Appl. Chem. U.S.S.R.* 28, 435-9 (1955)(Engl. translation).—See *C.A.* 49, 10366f.

B. M. R.

(2)

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LUNSKAYA, Z. N.

AID P - 3416

Subject : USSR/Chemistry

Card 1/1 Pub. 152 - 1/18

Authors : Margolis, F. G., Z. N. Lunskaya and S. I. Vol'fkovich

Title : Reaction of potassium chloride with mixtures of sulfur dioxide, air, and steam

Periodical : Zhur. prikl. khim., 28, 5, 453-458, 1955

Abstract : Experiments were carried out with a gas mixture containing 5-7% SO_2 (gas velocity, 300 ml/min.) in the presence of 1% Fe_2O_3 (catalyst) at 500-550°C for 1.5-2 hours. The conversion of KCl to K_2SO_4 amounted to 94-96%; 40% of SO_2 reacted. Kaolin (3%) added to KCl prevented the latter from caking and exerted a mild catalytic effect. Four tables, 3 diagrams, 1 drawing, 2 references, 1 Russian (1942).

Institution : None

Submitted : 0 29, 1954

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LUNSKIS, G., inzh.

Mechanization of labor-consuming work in the disassembly shop of the Kaunas Motor-Vehicle Repair Plant. Avt.transp. 42 no.1:31 Ja '64. (MIRA 17:2)

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"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

LUNT, G.R., inz.

On the improvement of methods of designing industrial enterprises; English experiences. Przegl techn no.35:4,6 2 S '62.

1. Ekspert Miedzynarodowego Biura Pracy przy Centralnym Osrodku Dokształcania Kadr Kierowniczych, Warszawa.

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"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001030910004-3

SIEZAK, Ervin, doc., inz.; LUNTER, Pavol, promovany matematik

Calculation of earthwork volume and material distribution plan coordinates on the LGP-30 automatic computer. Inz stavby 11 no.10:396-397 O '63.

1. Stavebna fakulta, Slovenska vysoka skola technicka (for Slezak).
2. Ustav ekonomiky a organizacie stavebnictva, Bratislava (for Lunter).

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L 10179-63 EWT(1)/EWP(q)/EWT(m)/BDS/EEC(b)-2
AFFTC/ASD/SSD--Pq-4--WH/LJP(C)
ACCESSION NR: AP3000589 S/0051/63/014/005/0700/0704

65

AUTHOR: Karapetyan, G. O.; Lunter, S. G.; Yudin, D. M.

TITLE: Luminescence of chromium-activated glasses [Report presented 12 September 1962 at the XI Soveshchaniye po lyuminestsentsii (11th Conference on Luminescence) in Minsk]

SOURCE: Optika i spektroskopiya, v. 14, no. 5, 1963, 700-704

TOPIC TAGS: glasses, luminescence, chromium-activated glasses, phosphate glass, silicate glass, borate glass, electron paramagnetic resonance

ABSTRACT: The luminescence and EPR spectra of chromium-activated phosphate, silicate, borate and borosilicate glasses and the dependence of these spectra on the composition, temperature, preparation conditions, and Cr concentration of the glass have been studied. Luminescence spectra, recorded at 77K, had a wide band with a peak at 830 millimicrons for phosphate and silicate glasses and an additional narrow band with a peak at 690--700 millimicrons for borates and borosilicates. Both peaks were also observed for sodium borosilicate glass of the composition xNa sub 2 OyB sub 2 O sub 3 (100-x-y) SiO sub 2 (where x

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varies from 5 to 30% and y from 5 to 60%), with low intensity of the narrow band. The intensity of the narrow band dropped and finally vanished when silicon oxide content was increased, but increased with an increase in the alkali oxide and boron anhydride content. In experiments with potassium barium borate and sodium barium borate glasses prepared under reducing conditions, variations in Cr concentration of 0.05 to 1.5% brought only peak-intensity changes. The intensity of the narrow band relative to that of the wide band was higher in the potassium- than in the sodium-containing glasses. A decrease in Cr content decreased the intensity of the narrow band. Preparation of the glass under oxidizing conditions increased the intensity of the narrow band relative to the wide band. Potassium barium borate glass prepared under strongly oxidizing conditions with addition of Cr as K sub 2 CrO sub 4 rather than as Cr sub 2 O sub 3 revealed no luminescence spectra. Preparation of a 14.9% K sub 2 O, 28.2% BaO, 56.9% B sub 2 O sub 3 (mol%) glass at various temperatures (1100 to 1500C) showed that a temperature increase led to a decrease in the intensity of the narrow band. The EPR spectra of sodium borosilicate glasses with varying Cr concentration had a narrow asymmetric line with g = 1.97 and two wide lines with g = 2 and g = 4 to 6. The spectra of phosphate and silicate glasses had two wide lines. Potassium barium silicate glass prepared with Cr under strongly oxidizing conditions

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showed an intense EPR signal with g = 4.3. Luminescence and EPR signals were not observed in sodium or potassium aluminosilicates prepared under reducing conditions at room or at liquid-nitrogen temperatures. An EPR signal with g = 4 to 6 was observed for glasses prepared without Cr, suggesting that the signal is due to the presence of an impurity (probably iron). On the basis of a comparison with data in the literature, the narrow band of luminescence with a peak at 690 millimicrons is attributed to Cr sup +3 and Cr sup +5 ion pairs; the 830-millimicron peak to Cr sup +3; and the narrow EPR signal with g = 1.97, to Cr sup +5. The temperature dependence of luminescence is also interpreted in reference to the literature. Orig. art. has: 5 figures.

ASSOCIATION: none

SUBMITTED: 22Sep62 DATE ACQ: 12Jun63 ENCL: 00

SUB CODE: 00 NO REF SOV: 005 OTHER: 005

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KARAPETYAN, G. O.; KARISS, Ya. E.; LUNTER, S. G.; FEOFILOV, P. P.

"The effect of glass structure on trivalent neodymium luminescence."

report submitted for 4th All-Union Conf on Structure of Glass, Leningrad, 16-21 Mar 64.

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