PUSTYNNIKOV, Vasiliy Grigor'yevich, kand. tekhn. nauk, dotsent; ANISIMOV, Sergey Dmitriyevich, aspirant

Electronic device for controlling quality in thermal treatment of steel components. Izv. vys. ucheb. zav.; elektromekh. 7 no.4:471-478 '64 (MIRA 17:7)

1. Kafedra elektrotekhniki Rostovskogo-na-Donu instituta sel'skokhozyaystvennogo mashinostroyeniya. 2. Zaveduyushchiy kafedroy elektrotekhniki Rostovskogo-na-Donu instituta sel'skokhozyaystvennogo mashinostroyeniya (for Pustynnikov).

PUSTYNNIKOV, V.G.; ANISIMOV, S.D.

Multiparametric electromagnetic testing of steel products. Zav. lab. 30 no.10:1236-1239 '64. (MIRA 18:4)

1. Rostovskiy institut sel'skokhozyaystvennogo mashinostroyeniya.

ANISIMOV, Sergey Dmitriyevich, aspirant

Formation of a multifrequency signal with consideration of information quantity. Izv. vys. ucheb. zav.; elektromekh. 8 no.4:437-440 '65. (MIRA 18:5)

1. Kafedra elektrotekhniki Rostovskogo instituta sel'skokhozyaystvennogo mashinostroyeniya.

28(0) PHASE I BOOK EXPLOITATION SOV/2908

Anisimov, Sergey Fedorovich

Chelovek i mashina; filosofskiye problemy kibernetiki (Man and Machine; Philosophical Problems of Cybernetics) Moscow, 1959. 53 p. 24,000 copies printed.

Sponsoring Agency: Obshchestvo po rasprostraneniyu politicheskikh i nauchnykh znaniy RSFSR.

Ed.: V. F. Fal'skiy; Tech. Ed.: I. I. Zhernevskaya.

PURPOSE: This booklet is intended for those interested in methods of control and communication applied to the analysis of the operations of machines.

COVERAGE: The booklet briefly describes the origin and development of cybernetics and its current application in the analysis of the operation of such machines as electronic computers. Some aspects of the theory of information, feed back and self-adjustment of systems, and high-speed electronic computers are

Card 1/2

ANISIMOV, S. F.

Chelovek i mashina (Filosofskiye problemy kibernetiki) /Man and Machine (Philosophical Problems of Cybernetics)/, Moscow, 1959, 56 pages.

ANISIMOV, S. and VISLOBOKOV, A.

"Certain Philosophical Problems of Cybernetics," Kommunist, 1960, No. 2, Pages 108 - 118.

S/057/60/030/009/019/021
B019/B054

11.8000

AUTHOR: Anisimov, S. I.

TITLE: Heavy Detonation in a Nonideal Gas

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1960, Vol. 30, No. 9, pp. 1124-1127

TEXT: The author writes down the equation of state which describes the substance in heavy detonations in a much simplified form:
$p = \rho RT[1 + b\rho + 0.625(b\rho)^2 + 0.2869(b\rho)^3 + 0.1920(b\rho)^4]$ (1). In his further investigation, the author starts from system (2) which describes the central-symmetric motion of the medium. By substitution (3) this system is transformed into systems of ordinary differential equations whose solution and integrals are thoroughly discussed. The essential physical condition is the assumption that C_v is constant even at high temperatures. Finally, water is considered as an example. As pressure in (1) is assumed to be proportional to temperature, the author had to

Card 1/2

Heavy Detonation in a Nonideal Gas

S/057/60/030/009/019/021
B019/B054

restrict himself to sufficiently high temperatures. Fig. 1 graphically shows the density-, pressure-, and velocity distributions. The author thanks M. A. Yel'yashevich, Academician of the AS BSSR, and Professor A. S. Kompaneyets for discussing the work. There are 1 figure and 5 references: 4 Soviet and 1 US.

ASSOCIATION: Institut fiziki AN BSSR Minsk (Institute of Physics of the AS BSSR, Minsk)

SUBMITTED: October 3, 1959

Card 2/2

GINISLMOV, S. I.

Report presented at the Conference on Heat and Transfer, Minsk, USSR, 5-10 June 61.

(16)

RM-2852
54

253. S. I. [illegible], T. L. Perelman, Diffusion of Charged Particles at the Presence of Recombination

254. T. L. Perelman, On Heat Transfer in Laminar Flow in the Inlet Part of a Tube

255. I. G. Portnov, Solution of Some Problems With Phase Conversions by Operational Calculus

256. L. M. Simuni, Numerical Solution of Some Problems of Motion of a Liquid With Variable Viscosity

257. S. L. Detkov, On Conformal Transformation of Radiations Fields in Vacuum

258. Yu. A. Samoylovich, Calculation of Heating of Rectangular Bodies According to Technological Conditions

259. I. R. Mikk, Emissivity of Cylindrical Radiating Volume

260. V. N. Timofeev, V. M. Malkin, F. R. Shklyar, Theory of Regeneration Heat Exchanger Design

261. E. I. Taubman, On Calculation Method of Heat Transfer Through the Wall at Change of the Aggregation State of One or Both Heat Agents

262. A. V. Kavaderov, Yu. A. Samoilovich, V. N. Kalugin, Regularities of Heating of the Simplest Shapes by Radiation and Convection

263. G. L. Babukha, Peculiarities and Some Results of Thermal Treatment Investigations of Polydispersed Fluidized Materials

264. L. S. Klyachko, Heat and Mass Transfer at Joint Free and Forced Convection

265. Yu. V. Lapin, Heat and Mass Transfer at Turbulent Flow of Compressible Gas at Foreign Substance Supply

266. A. S. Ginevsky, E. E. Solodkin, Influence of Transversal Curvature of the Surface on Heat Transfer Rate of Axi-symmetrical Bodies and Ducts

267. A. A. Gryaznov, On the Heat and Mass Transfer Theory at Convective Motion of Liquid

268. V. I. Subbotin, M. Kh. Ibragimov, B. V. Nomofilov, Measurement of Temperature Turbulent Pulsations in a Liquid Flow

269. A. A. Pomerantsev, On the Theory of Fusion and Burning of a Body (The Stephan Problem)

31644
S/207/61/000/006/021/025
A001/A101

1.1210

AUTHORS: Anisimov, S. I., Kuznetsov, N. M. (Minsk, Moscow)

TITLE: Self-modeling problem of strong explosion in water

PERIODICAL: Zhurnal prikladnoy mekhaniki i tekhnicheskoy fiziki, no. 6, 1961, 167-168

TEXT: The authors consider the self-modeling problem of strong explosion for the case when disturbed motion is spherically symmetric and temperature T_2 (at the shock wave front) exceeds considerably 3,000°K. The equation system of central-symmetrical adiabatic motion in partial derivatives is transformed into a system of ordinary differential equations and its order is lowered by using integrals of energy and adiabaticity following from the self-modeling nature of the motion (investigation of self-modeling solution was conducted by N. N. Kochina and N. S. Mel'nikov) and, after transformations, one differential equation of the first order is obtained. This equation is integrated numerically and the results for velocities, pressures and densities as functions of distances traveled by the shock wave are tabulated and presented graphically. An equation is derived which enables one to calculate the distance r_2 traveled by the shock

Card 1/2

35758
S/124/62/000/003/037/052
D237/D302

11.5300

AUTHORS: Yel'yashevich, M.A., and Anisimov, S.I.

TITLE: Relaxation phenomena in high-velocity gas flows

PERIODICAL: Referativnyy zhurnal, Mekhanika, no. 3, 1962, 103, abstract 3B669 (Dokl. AN BSSR, 1961, no. 8, 5, 324-326)

TEXT: A simple, approximate method is considered, of calculating non-uniformities of flow in problems of gaseous dynamics. The method is based on the fact that in many cases, interesting from the practical point of view, the flow appears to be locally either almost in equilibrium or almost stationary. The reason for this is that the time of relaxation τ, necessary for the thermodynamic equilibrium to establish itself in various weakly excited degrees of freedom, is very seldom temperature dependent. Also, characteristic time of the gas-dynamical process τ_0 which can be defined as $\tau_0 = W(d\,W/dt)^{-1}$ (W - specific enthalpy), depends on the local temperatures to an even smaller extent. Hence, the temperature inter-

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val in which τ and τ_0 are comparable, is very narrow. In the zero approximation in solutions of gas-dynamical problems it can be assumed that in the regions where $\tau \ll \tau_0$ the flow is in equilibrium, while for $\tau \gg \tau_0$ it is stationary. The surface where $\tau = \tau_0$ resembles the surface of discontinuity for the derivative da/dx where a - a magnitude characteristic for an unstable process, e.g. degree of dissociation or energy of molecular vibrations. At $\tau \ll \tau_0$, da/dx = $\bar{da}/dx$ ($\bar{a}$ - equilibrium magnitude), while for $\tau \gg \tau_0$, da/dx = 0. All the entropy changes concentrate on the surface of discontinuity, as equilibrium and stationary flows are isentropic. As an example, the dependence of the magnitude ln τ/τ_0 on the x-coordinate is calculated for recombination of oxygen in the flow through a conical nozzle. Initial temperature and pressure were 5000°C and 0.1 atm. The graph shows that a hundredfold change of τ/τ_0 occurs at a distance equal to the diameter of a critical cross-section, i.e. a stationary flow occurs very seldom. More exact calculations can be performed by the method of successive approximations, using the solution obtained by the above method, as a zero approximation. [Abstractor's note: Complete translation].

Card 2/2

ANISIMOV, S.I.

Stationary temperature distribution in connection with a chemical reaction. Dokl. AN BSSR 5 no.9:3[illegible]-3[illegible]2 S '61. (MIRA 14:10)

1. Institut fiziki AN BSSR. Predstavleno akademikom AN BSSR
(Integral equations)
(Chemical reactions)

10.1410

26.2114

31726
S/057/61/031/012/013/013
B104/B112

AUTHOR: Anisimov, S. I.

TITLE: Establishment of oscillation equilibrium behind a shock wave

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 31, no. 12, 1961, 1491 - 1493

TEXT: In the range of establishment of oscillation equilibrium, a flow is described by the system of equations

$$\left.\begin{aligned} \rho v &= \rho_0 v_0, \\ p + \rho v^2 &= p_0 + \rho_0 v_0^2, \\ I + \frac{v^2}{2} &= I_0 + \frac{v_0^2}{2}, \\ I &= \frac{7}{2} RT + E_k, \\ p &= \rho RT, \\ v \frac{dE_k}{dx} &= \frac{E_k(T) - E_k}{\tau(p, T)}. \end{aligned}\right| \quad (1)$$

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Establishment of oscillation...

where E_k is the oscillation energy per unit mass, $E_k(T)$ its equilibrium value at the temperature T, and $\tau(\rho_1 T)$ the relaxation time. $\tau(\rho_1 T) = \frac{A}{\rho T^{1/6}} \exp(B/T^{1/3})$ is valid according to L. Landau et al. (Phys. Zs. d. Sowjetunion, 10, 36, 1936). After introducing the dimensionless specific volume $V = \rho_0/\rho = v/v_0$ and carrying out a simple transformation,

$$\frac{x}{x_0} = \frac{1}{\varepsilon} \int_{\frac{\rho_0}{\rho_1}}^{\frac{\rho_0}{\rho}} \frac{\tau(z)\left(6z - \frac{7}{2}a\right) z dz}{E(z) + \frac{7}{2}az - 3z^2 - b}, \qquad (3)$$

where

$$a = 1 + \frac{1}{\gamma_0 M^2}; \quad b = \frac{1}{2}\left[1 + \frac{2}{(\gamma_0 - 1)M^2}\right]; \quad x_0 = v_2\tau_2; \quad \varepsilon = \frac{\rho_0}{\rho_2};$$

$$\tau(z) = \frac{\tau\left[\frac{\rho_0}{z}; \frac{v_0^2}{R} z(a-z)\right]}{\tau_2}; \quad E(z) = \frac{1}{v_0^2} E_k\left[\frac{v_0^2}{R} z(a-z)\right].$$

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Establishment of oscillation...

is obtained by integrating the equation of motion. The index "0" refers to the supersonic flow, and the index "2" to the equilibrium flow. Quantities referring to the area immediately behind the wave front are denoted by the index "1". Bearing in mind the above-mentioned function for $\tau, \lambda(3)$ can be integrated only numerically. With reference to a paper by D. A. Frank-Kamenetskiy (Diffuziya i teploperedacha v khimicheskoy kinetike. Izd. AN SSSR, M., 1947), instead of (3),

$$\frac{x}{x_0} = \frac{1}{\varepsilon^2} \int_{\frac{p_2}{p_1}-1}^{\frac{p_2}{p_1}=1} \frac{(t+\varepsilon)^2\left(6t - \frac{7}{2}a + 6\varepsilon\right)e^{-kt}}{\left[\left(C+\frac{7}{2}\right)a - (C+6)\varepsilon - (C+3)t\right]} dt, \qquad (4)$$

is obtained, where $z = \xi + t$, CR is the specific oscillation heat capacity, and $k = (BR^{1/3}/v_0^{2/3}) / \{(a-2\xi)/\xi(a-\xi)^{4/3}\}$. This integral is

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Establishment of oscillation...

given in tables. For the case of strong shock waves,

$$\frac{x}{x_0}=\frac{354}{29}\left(e^{-k\left(V-\frac{1}{8}\right)}-e^{-\frac{k}{24}}\right)+\frac{22}{29}\left(Ei\left(-\frac{k}{24}\right)-Ei\left[-k\left(V-\frac{1}{8}\right)\right]\right), \quad \text{(A)}$$

is obtained, where $Ei(-x) = \int_0^{\infty} e^{-t}dt/t$. Terms of the order of $(\rho_0/\rho_1 - \varepsilon)^2 \approx 0.0017$ are neglected. The solution

$$\rho\tau=\frac{\rho_0}{v_0}\frac{E(V)+\frac{7}{2}aV-3V^2-b}{\left(6V-\frac{7}{2}a\right)V\frac{dV}{dx}},$$

$$T=\frac{v_0^2}{R}V(a-V).$$

of (1) is given for investigations where the relaxation time of the gas is determined from the experimental density distribution behind a shock

Card 4/5

88404

S/020/61/136/004/012/026
B019/B056

9.9600 (also 1143, 1482)

AUTHOR: Perel'man, T.L., and Anisimov, S.I.

TITLE: Density Distribution of Charged Particles in Meteor Tracks

PERIODICAL: Doklady Akademii nauk SSSR, 1961, Vol. 136, No. 4, pp. 810-812

TEXT: For the purpose of studying the reflection of radiowaves from meteor tracks it is necessary to know the density distribution of charged particles. By diffusion, recombination, and addition of electrons to neutral atoms and molecules, density changes, the latter effect not changing the density distribution, but the effective recombination coefficient. The relative effect of recombination and diffusion upon the density distribution may be expressed by the dimensionless parameter $\varepsilon = \alpha q/D$, where α is the recombination coefficient , q the number of ionizations per unit length of the meteor track, and D the diffusion coefficient. A differential equation is given, which describes the density of charged particles produced by a meteor moving with uniform speed:

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Density Distribution of Charged Particles in Meteor Tracks

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B019/B056

$$\partial n/\partial t = D\frac{1}{r}\frac{\partial}{\partial r}\left(r\frac{\partial n}{\partial r}\right) - \alpha n^2 + \frac{q}{2\pi v}\varepsilon\left(\frac{r}{r_o}\right)\delta(z - vt) \quad (2)$$

$$n(0,t) < \infty \quad , \quad n(\infty,t) = 0 \quad (3)$$

This differential equation may be calculated by means of the perturbation theory in the case of small ε. With ε being greater, the perturbation theory is not applicable, and an approximation has to be found. The authors discuss the two methods of solution and obtain expressions describing the time dependence of the number of charged particles. They thank Academician Ya.B. Zel'dovich for valuable advice, as well as Member of the AS BSSR M.A. Yel'yashevich, G.L. Barenblatt und Yu.P. Rayzer for discussions. There are 3 references: 2Soviet and 1 US.

ASSOCIATION: Institut fiziki Akademii nauk BSSR
(Institute of Physics, Academy of Sciences BSSR)

PRESENTED: September 1, 1960, by Ya.B. Zel'dovich, Academician

Card 2/3

88404

Density Distribution of Charged Particles in Meteor Tracks

S/020/61/136/004/012/026
B019/B056

SUBMITTED: July 22, 1960

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S/207/62/000/001/011/018
B145/B138

AUTHORS: Anisimov, S. I., Romanov, G. S. (Minsk)

TITLE: Nonequilibrium flow of air in nozzles

PERIODICAL: Zhurnal prikladnoy mekhaniki i tekhnicheskoy fiziki, no. 1, 1962, 76 - 81

TEXT: The article deals with some problems of the kinetics of adjusting equilibrium between the translatory and inert degrees of freedom of the molecules in air at high temperature. The following slow processes which occur in air at high temperatures are studied:

$$O + O + M \rightleftarrows O_2 + M \quad (1)$$
$$N + N + M \rightleftarrows N_2 + M \quad (2)$$
$$N + O + M \rightleftarrows NO + M \quad (3)$$
$$O + N_2 \rightleftarrows NO + N \quad (4)$$
$$N + O_2 \rightleftarrows NO + O \quad (5)$$
$$O_2^* + M \rightleftarrows O_2 + M \quad (6)$$
$$N_2^* + M \rightleftarrows N_2 + M \quad (7)$$

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Since there is up to 150-200% uncertainty in the rate constant values (k_i rate constant of the go-reaction, k_i' of the return reaction), some simplifications are made: M, any molecule or atom, is equally effective as third body during recombination, the contribution of NO to the total energy and total pressure is neglected and $\sum_{i=3,4,5} (d[NO]/dt)_i = 0$ is assumed. The effect of the vibrational relaxation on the rate of recombination may be neglected when the condition $k\bar{\rho}\tau/\bar{\mu} \ll 1$ (k rate constant of the reaction $M + O_2^* \rightarrow O + O + M$, ρ density, $\bar{\mu}$ mean molecular weight, τ relaxation time) is satisfied. If the weight fractions are denoted by α_i (i = 0, N), the dissociation energies by D_i, and the equilibrium energies of vibration by ε_i, using the equation system $\{ vA(x) = \text{const}, dp/dx + \rho v\, dv/dx = 0, h_0 - h - v^2/2 = 0$ (18) (A(x) nozzle cross section) (for a one-dimensional flow without diffusion, friction or heat exchange), one obtains the equation

Nonequilibrium flow of ...

$$\frac{d\alpha_O}{dx}[(1.5T + D_O - \varepsilon_O) F(\alpha_O, \alpha_N, T) - T] + 1.142 \frac{d\alpha_N}{dx}[(1.5T + D_N - \varepsilon_N) F(\alpha_O, \alpha_N, T) - T] + \frac{dT}{dx}\left[(1.5\alpha_O + 1.713\alpha_N + 3.882) F(\alpha_O, \alpha_N, T) - \frac{2\mu_O}{\bar{\mu}}\right] + \frac{d\alpha_O}{dx}(0.233 - \alpha_O) F(\alpha_O, \alpha_N, T) + 1.142 \frac{d\alpha_N}{dx}(0.767 - \alpha_N) F(\alpha_O, \alpha_N, T) + \frac{2\mu_O T}{\bar{\mu}} \frac{dA}{A dx} = 0 \quad (21)$$

$$\left(F(\alpha_O, \alpha_N, T) = 1 - \frac{RT}{2\bar{\mu}(h_o - h)}\right)$$

which, together with the kinetic equations

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Nonequilibrium flow of ...

$$\frac{d\alpha_O}{dx} = \frac{2\rho}{v\mu}\left(k_1\frac{0.233-\alpha_O}{2} - k_1'\frac{\alpha_O^2\rho}{\mu_O}\right) + \frac{2}{v}\left[k_5\frac{\rho\alpha_N(0.233-\alpha_O)}{2\mu_N} - k_5'\alpha_O[NO]\right]$$

$$\frac{d\alpha_N}{dx} = \frac{2\rho}{v\mu}\left(k_2\frac{0.767-\alpha_N}{2} - k_2'\frac{\alpha_N^2\rho}{\mu_N}\right) + \frac{2}{v}\left[k_6\frac{\rho\alpha_O^2(0.767-\alpha_N)}{2\mu_O} - k_6'\alpha_N[NO]\right] \qquad (22)$$

Здесь

$$\frac{de_O}{dx} = \frac{1}{v}\frac{e_O(T)-e_O}{\tau_O(T,\rho)}, \qquad \frac{de_N}{dx} = \frac{1}{v}\frac{e_N(T)-e_N}{\tau_N(T,\rho)}$$

$$[NO] = \frac{\rho}{2}\frac{2k_3'\alpha_N\alpha_O\rho/\bar{\mu} + k_4\alpha_O(0.767-\alpha_N) + k_5\alpha_N(0.233-\alpha_O)}{k_3\mu_O\mu_N/\bar{\mu} + k_4'\alpha_N\mu_O + k_5'\alpha_O\mu_N}$$

forms a closed system, the integration of which requires numerical methods. In the case of a "partial freezing in" (vibration in equilibrium, but without change of gas composition) the following solution is easily obtained:

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Nonequilibrium flow of ...

$$\frac{A}{A_*} = \left(\frac{T}{T_*}\right)^{\frac{0.5\alpha_O + 0.571\alpha_N + 2.773}{\alpha_O + 1.142\alpha_N + 1.109}} \times \sqrt{\frac{c_*^2}{2(h_0 - h)}} \times$$
$$\times \exp \frac{(0.233 - \alpha_O)(I_O^* - I_O) + 1.142(0.767 - \alpha_N)(I_N^* - I_N)}{\alpha_O + 1.142\alpha_N + 1.109} \qquad (23)$$
$$I_i = \frac{\theta_i}{T}\left(1 - \exp\frac{-\theta_i}{T}\right)^{-1} - \ln\left(\exp\frac{\theta_i}{T} - 1\right)$$

The asterisks denote quantities which are variable in the critical cross section. The vibration was assumed to be harmonic. In the case of an equilibrium flow it is best to start from the changed Eq. (18): $\rho v A(x) = \text{const}$, $h_o - h - v^2/2 = 0$, $S = S_o$ (S entropy), since integration of (21), (22) leads to unclear solutions. Calculation of the system (21), (22), by means of an electronic computer, for some concrete values of the initial densities and temperatures, showed that the deviation from equilibrium is high for nozzles of about 10 cm, and that the approximation of the "frozen-in flow" is better than that of the equilibrium flow. Ya. B.

Card 5/6

S/250/62/006/001/001/002
I028/I218

AUTHOR: Anisimov, S. I. and Khodyko, Yu. V.

TITLE: Convective diffusion in the boundary. layer in the case of flow inside an angle

PERIODICAL: Akademiya nauk Belaruskay Doklady. v. 6, no. 1, 1962, 19-21

TEXT: The flow in a dihedral angle formed by plane plates is considered, and the equations of convective diffusion in its boundary layer are solved exactly. The differential equation describing the distribution of the concentration $c(x,y)$

$$v_x \partial c/\partial x + v_y \partial c/\partial y = D\, d^2c/dy^2 \qquad (1)$$

is integrated, and its general solution is given. Two simple particular cases are indicated: a) for $c(x,0) = c_0$ = const, $c(x,y) = c_0$; b) for $c(x,0) = c_0 x^{-n}$, $c(x,y) = c_0 x^{-n}\, u(\eta\,;\, n)/u(0\,;\, n)$ where $\eta = y/x\,\sqrt{Re/2x} + \eta_0$.

ASSOCIATION: Institut fiziki AN BSSR (Institute of Physics of AS BSSR)

PRESENTED: March 20, 1961

Card 1/1

ANISIMOV, S.I. (Minsk); PEREL'MAN, T.L. (Minsk)

A nonlinear heat transfer problem. PMTF no.5:136-139 S-O '63. (MIRA 16:11)

ACCESSION NR: AP4004149 S/0294/63/001/002/0276/0280

AUTHORS: Anisimov, S. I.; Nogotov, Ye. F.

TITLE: Steady-state theory of a thermal explosion

SOURCE: Teplofizika vy*sokikh temperatur, v. 1. no. 2, 1963, 276-280

TOPIC TAGS: thermal explosion, thermal explosion stationary theory, temperature distribution, iteration method, temperature jump, steady state theory, explosion

ABSTRACT: The conditions under which stationary temperature distribution is possible in a medium containing temperature-dependent heat sources is analyzed mathematically, with a particular aim of determining the critical dimension of the region containing the heat sources (D), beyond which stationary temperature distribution becomes impossible (thermal explosion becomes possible). The problem reduces essentially to an investigation of the existence of a solution of the boundary value problem $\Delta t + qf(u) = 0$ in the domain (D) with

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ACCESSION NR: AP4004149

$u = u_0$ on the boundary of this domain. It is shown that some results can be obtained with the aid of known existence and uniqueness theorems for the solutions of integral equations. By way of an example a detailed analysis is made of the one-dimensional problem

$$T' + q \exp(-1/T) = 0; \quad 0 \leq x \leq 1$$

$$T(1) = T_0, \quad T'(0) = 0$$

(T - temperature in units of activation energy E, $q = Q\ell^2/Ek$ - dimensionless parameter, in which k - thermal conductivity of the medium, Q - intensity of heat release in the chemical reaction, and ℓ - dimension of the vessel) for which uniqueness and existence conditions are obtained. 'In conclusion the authors are grateful to M. A. Yel'yashevich and A. S. Kompaneyets for a discussion of some results of the present work.' Orig. art. has: 10 formulas and 1 table.

ASSOCIATION: Institut fiziki AN BSSR (Physics Institute, AN BSSR)

SUBMITTED: 07Jun63 DATE ACQ: 26Dec63 ENCL: 00

Card 2/3

ANISIMOV, S.I.; ROMANOV, G.S.

Kinetics of the decay of two-atomic molecules in the absence of vibrational equilibrium. Dokl. AN BSSR 7 no.6:376-377 Je '63. (MIRA 16:10)

1. Institut fiziki AN BSSR. Predstavleno akademikom AN BSSR M.A.Yel'yashevichem.

ANISIMOV, S.I.

Effect of vibrational relaxation on the dissociation rate of diatomic molecules. Zhur. fiz. khim. 37 no.12:2754-2757 D '63. (MIRA 17:1)

1. Institut fiziki AN BSSR.

ANISIMOV, S.I.; KHODYKO, Yu.V.

Flow of a gas with delayed vibrations past the frontal critical point of a blunt-nosed body. Zhur. tekh. fiz. 33 no.11:1333-1337 N '63. (MIRA 16:12)

1. Institut fiziki AN BSSR, Minsk.

L 26127-65; EWT(d) IJP(c)
ACCESSION NR: AP5006444 S/0051/65/018/003/0522/0523

AUTHOR: Anisimov, S. I.

TITLE: On the solution of integral equations of open resonators

SOURCE: Optika i spektroskopiya, v. 18, no. 3, 1965, 522-523

TOPIC TAGS: integral equation, eigenvalue problem, field distribution, open resonator, resonator

ABSTRACT: The method of moments is used to integrate the equation

$$E(x, y) = \lambda \iint_{(\sigma)} K(x, y; \xi, \eta) E(\xi, \eta)\, dS(\xi, \eta), \qquad (1)$$

which describes the field distribution on the mirrors of an open resonator. The method was described by L. V. Kantorovich and V. I. Krylov (Priblizhennyye metody vysshego analiza [Approximate Methods of High Analysis], Fizmatgiz, 1962), and is an analog of the Galerkin method for the approximate solution of boundary value differential equations. The eigenvalues of equation (1) are determined for a re-

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ACCESSION NR: AP5006444

2

sonator with plane-parallel mirrors, and the results of the variational method, the method of iterations, and the proposed method of moments are compared. It is pointed out that, to obtain satisfactory results by the iteration method, it is necessary to calculate as many as 300 successive approximations, and that the validity of the variational method proposed for the solution of the problem is doubtful. The case of the author's method makes it applicable to investigations of characteristics of resonators of more complicated form, to studies of the dependence of properties of resonators on their parameters, and to the solutions of other practical problems. "I thank B. I. Stepanov for a discussion of the work and for valuable remarks, and also Ya. B. Vasilevskaya for help with the numerical calculations." Orig. art. has: 4 formulas and 1 table. [02]

ASSOCIATION: none

SUBMITTED: 13Apr64 ENCL: 00 SUB CODE: EC, MA

NO REF SOV: 002 OTHER: 005 ATD PRESS: 3210

Card 2/2

L 15064-65 EWT(d)/EWT(m)/EWP(w)/EWA(d)/EWP(t)/EWP(k)/EWA(h) Pf-4/Peb APWL/
AEDC(a)/ASD(a)-5/AFETR/ESD(dp)/EM
ACCESSION NR: AP4048859 S/0170/64/000/011/0115/0116

AUTHOR: Azimov, S. I.

TITLE: Thermal rupture problem for a hollow cylinder

SOURCE: Inzhenerno-fizicheskiy zhurnal, no. 11, 1964, 115-116

TOPIC TAGS: differential equation, boundary value problem, chemical kinetics, cylindrical body

ABSTRACT: The author obtains the upper bound δ^* of δ occurring in

$$\Delta u = -\delta \exp u \quad s(D), \tag{1}$$

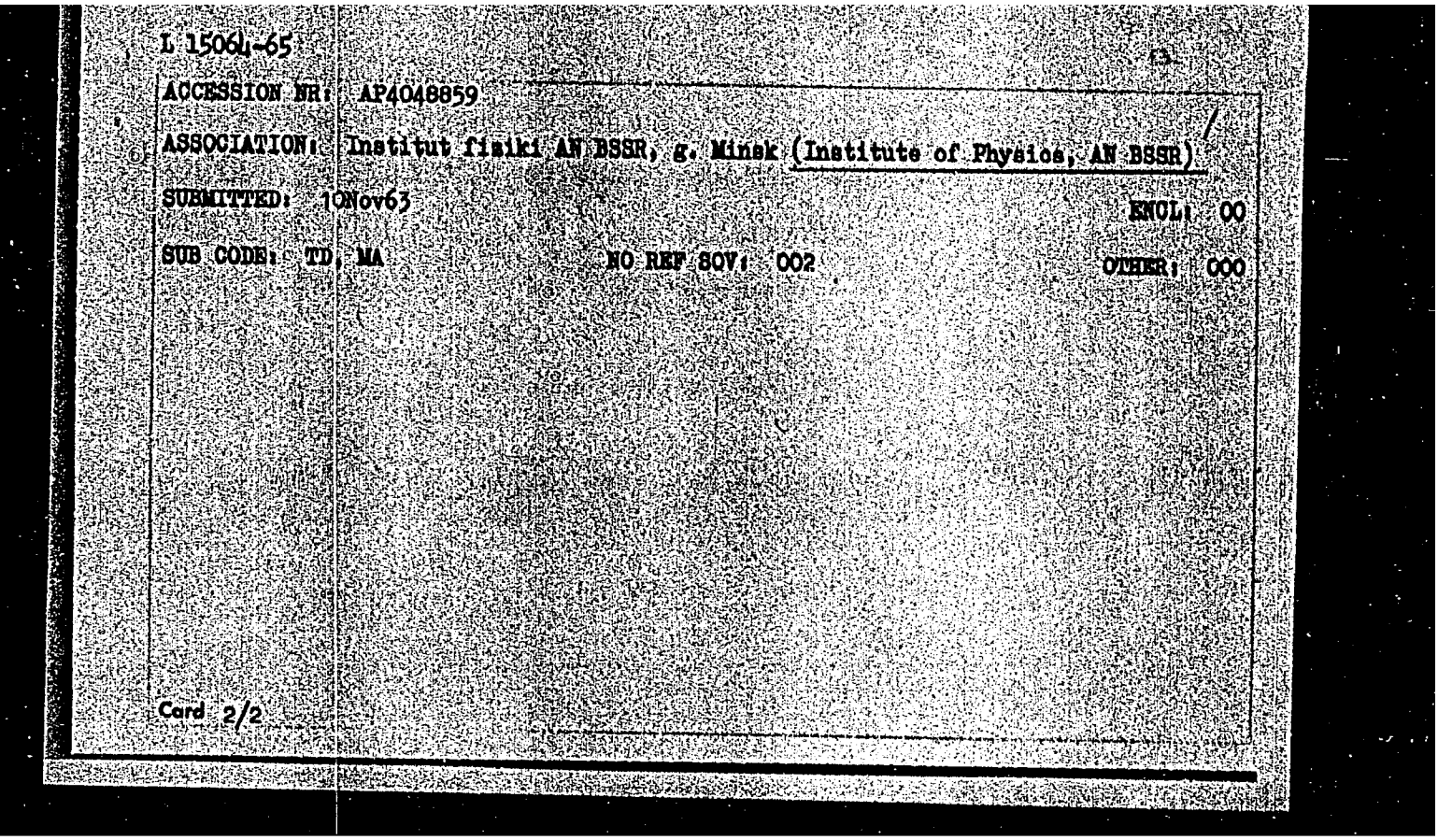
$$u|_\Gamma = 0 \tag{2}$$

for the particular case of a ring in which the solution depends only on $|z|$ where the solution of (1) is expressed as

$$\exp u = \frac{8\varepsilon|\Phi'(z)|^2}{\delta[1+\varepsilon|\Phi(z)|^2]^2}, \tag{3}$$

where Φ is analytic. Orig. art. has: 6 formulas.

Card 1/2



L 15064-65

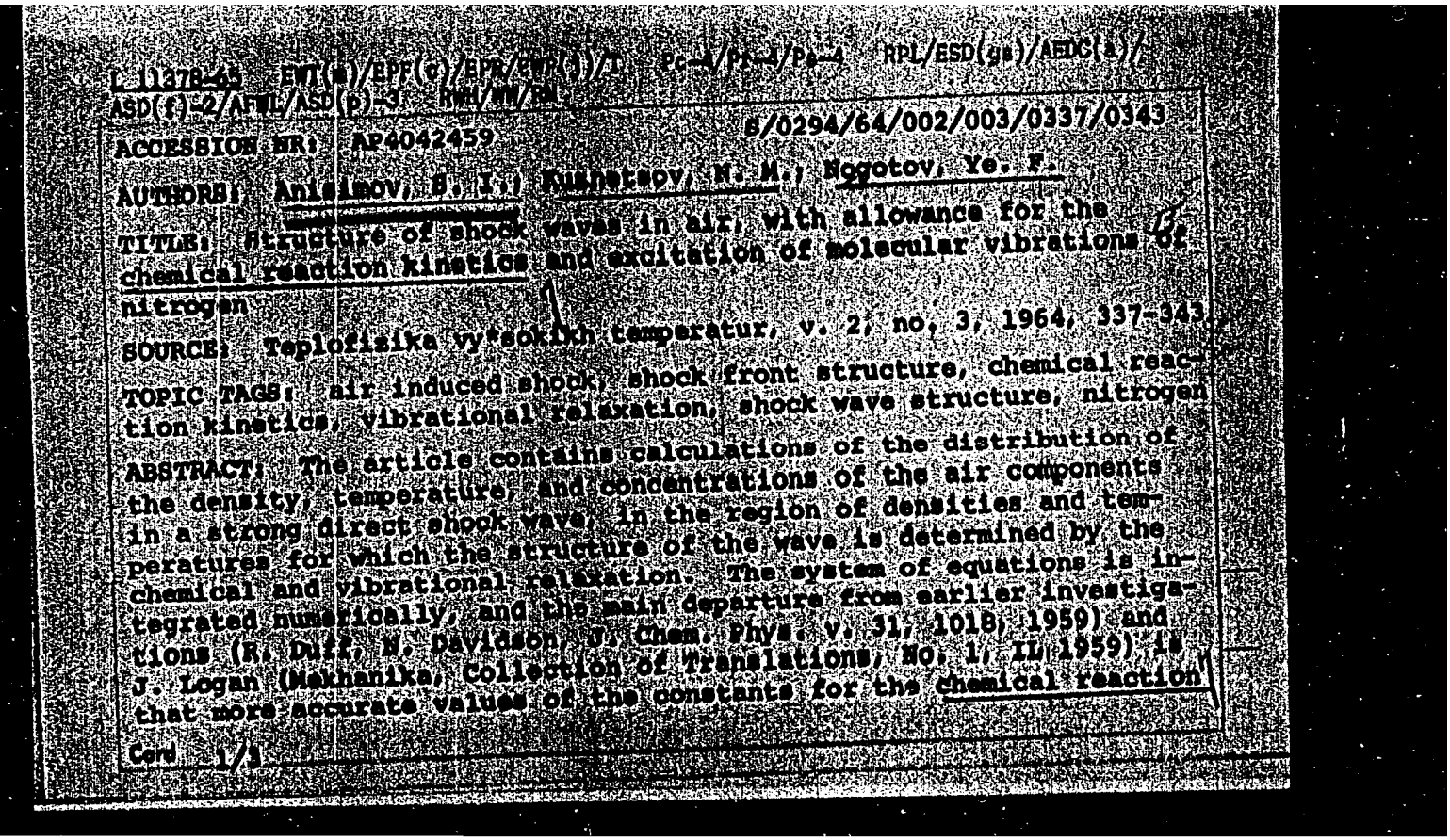
ACCESSION NR: AP4048859

ASSOCIATION: Institut fiziki AN BSSR, g. Minsk (Institute of Physics, AN BSSR)

SUBMITTED: 10Nov63 ENCL: 00

SUB CODE: TD, MA NO REF SOV: 002 OTHER: 000

Card 2/2



L 11378-65 EWT(m)/EPF(c)/EPR/EWP(j)/T Pc-4/Pf-4/Pa-4 RPL/ESD(gs)/AEDC(a)/
ASD(f)-2/AFWL/ASD(p)-3 RWH/WW/RM

ACCESSION NR: AP4042459 S/0294/64/002/003/0337/0343

AUTHOR: Anisimov, S. I.; Kuznetsov, N. M.; Nogotov, Ye. F.

TITLE: Structure of shock waves in air, with allowance for the chemical reaction kinetics and excitation of molecular vibrations of nitrogen

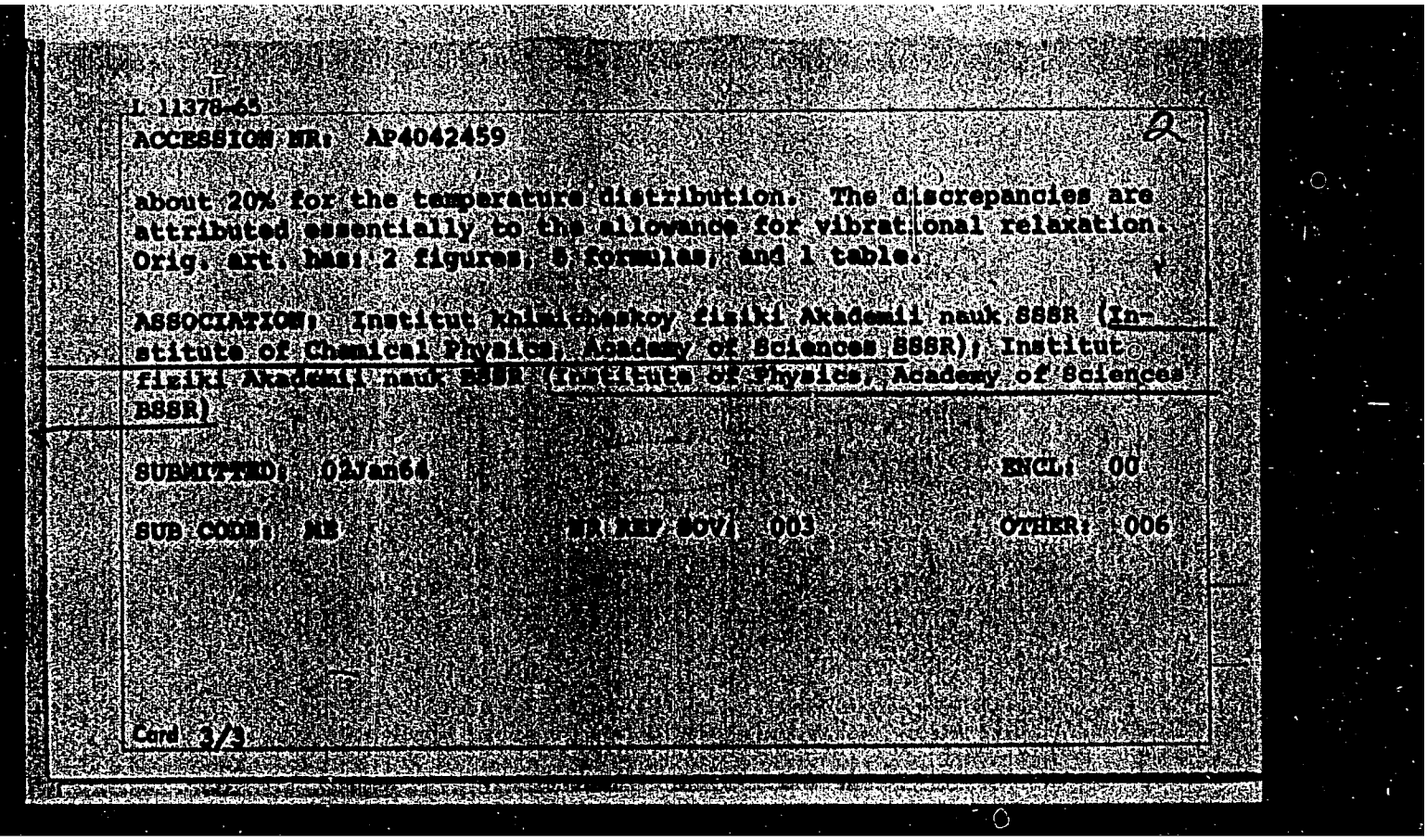
SOURCE: Teplofizika vysokikh temperatur, v. 2, no. 3, 1964, 337-343

TOPIC TAGS: air induced shock, shock front structure, chemical reaction kinetics, vibrational relaxation, shock wave structure, nitrogen

ABSTRACT: The article contains calculations of the distribution of the density, temperature, and condentrations of the air components in a strong direct shock wave, in the region of densities and temperatures for which the structure of the wave is determined by the chemical and vibrational relaxation. The system of equations is integrated numerically, and the main departure from earlier investigations (R. Duff, N. Davidson, J. Chem. Phys. v. 31, 1018, 1959) and J. Logan (Makhanika, Collection of Translations, NO. 1, IL 1959) is that more accurate values of the constants for the chemical reaction

Card 1/3

rates are used and their temperature dependences taken into account. In addition, the kinetics of the excitation of the molecular oscillations of the nitrogen is allowed for and the calculations are made for practically the entire interval of the parameters of the shock wave in which the chemical kinetics exerts a decisive influence on the structure. Another difference between the present and earlier work is that account of the non-monotonic behavior of density and temperature behind the front of the shock wave. The results are obtained by numerically integrating the equations of the chemical reaction kinetics and the relaxation equation for the excitation of molecular vibrations of nitrogen. The extrema of pressure and density in the structure of the wave and discussed in light of the experimental results obtained by others. The results of the calculation were found to be satisfactory agreement with the previously published work by one of the authors (N. M. Kuznetsov, Inzh.-fiz. zh. v. 3, 17, 1960) and by R. Duff and N. Davidson. The differences appear most pronouncedly at high temperatures (T ≥ 8000K) and reach



L 11378-65

ACCESSION NR: AP4042459

about 20% for the temperature distribution. The discrepancies are attributed essentially to the allowance for vibrational relaxation. Orig. art. has: 2 figures, 8 formulas, and 1 table.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics, Academy of Sciences SSSR); Institut fiziki Akademii nauk SSSR (Institute of Physics, Academy of Sciences SSSR)

SUBMITTED: 02Jan64 ENCL: 00

SUB CODE: AS NR REF SOV: 003 OTHER: 006

Card 3/3

ACCESSION NR: AP3003176 S/0250/63/007/006/0376/0377

AUTHORS: Anisimov, S. I.; Romanov, G. S.

TITLE: On kinetics of diatomic-molecule dissociation in absence of vibrational equilibrium

SOURCE: AN BSSR. Doklady, v. 7, no. 6, 1963, 376-377

TOPIC TAGS: rotational equilibrium, vibration relaxation, dissociation rate, diatomic molecule, vibration equilibrium, Boltzmann distribution, vibration energy

ABSTRACT: On the assumption of rotational equilibrium, the effect of vibrational relaxation on the dissociation rate has been studied in diatomic molecules. The case of small deviations from vibrational equilibrium was considered, assuming a Boltzmann distribution for the vibrational degrees of freedom, with temperature T' slightly different from the translational temperature T, or, for $\Delta = T-T'/T$

$$\frac{k'}{k} \approx 1 + \frac{E(T) - \bar{E}_m}{KT}\Delta,$$

where $E(T) = \frac{1}{I(T)} \sum_{i=0}^{N-1} E_i e^{-E_i/KT}$, and $\bar{E}_m$ - arithmetic mean of vibrational energy in

Card 1/2

ACCESSION NR: AP3003176

interval (N-m,N). The largest effect caused by vibrational nonequilibrium has been evaluated for the distribution function $f_i = \begin{cases} 0 & i \neq 0 \\ 1 & i = 0. \end{cases}$ Orig. art. has: 6 formulas.

ASSOCIATION: Institut fiziki AN BSSR (Institute of Physics, AN BSSR)

SUBMITTED: 01Nov62 DATE ACQ: 24Jul63 ENCL: 00

SUB CODE: AI NO REF SOV: 003 OTHER: 000

Card 2/2

ACCESSION NR: AP4028948

AUTHOR: Anisimov, S.I. S/0057/64/034/004/0620/0623

TITLE: On the non-monotonic variation of temperature and density behind a strong shock front in a gas

SOURCE: Zhurnal tekhnicheskoy fiziki, v.34, no.4, 1964, 620-623

TOPIC TAGS: shock wave, shock wave temperature variation, shock wave density variation, inert degrees of freedom, relaxation processes

ABSTRACT: The variation of temperature and pressure in the non-equilibrium region behind a shock front is discussed qualitatively. Following Ya.B.Zel'dovich and Yu. P.Rayzer (UFN 63,3,1957), the author calls a degree of freedom "inert" provided its relaxation time is long compared with the mean free flight time of a molecule. It is the presence of inert degrees of freedom (molecular vibrations, dissociation, electron excitation, etc.) that gives rise to extended non-equilibrium regions behind shock fronts. If the relaxation times of all the inert degrees of freedom are distinct and remain so throughout the whole non-equilibrium region (they are functions of the pressure and temperature), the temperature falls monotonically from its

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ACCESSION NR: AP4028948

value immediately behind the shock front to its equilibrium value far behind the front. If, however, the difference between the relaxation times of two inert degrees of freedom changes sign at some temperature between the initial and equilibrium values, the temperature may pass through a minimum within the non-equilibrium region, and if those two inert degrees of freedom are the only important ones, it will indeed do so. In this case the density will pass through a maximum if dissociation processes are not involved, and it may pass through a maximum if such processes are involved. The case of dissociation of oxygen and excitation of nitrogen molecular vibrations is adduced as an example of a pair of inert degrees of freedom satisfying the required condition; at sufficiently high temperatures the dissociation is the more rapid process, but since recombination takes place via three-body collisions, it may become the slower process in the cooler regions. An explanation of observed non-monotonic temperature and density variations offered by A.Resler & B.Cary, and J.Logan (references are given only to Russian translations) is criticized, but the discussion is too brief to permit a judgement to be formed concerning the merit (or even the nature) of the rejected explanation. "In conclusion, I express my sincere gratitude to L.E.Gurevich and Yu.P.Rayzer for discussing the present contribution." Orig.art.has: 7 formulas.

Card 2/3

Card 3/3

ANISIMOV, S.I.

Thermal explosion problem for a hollow cylinder. Inzh.-fiz. zhur. no.11:115-116 N '64. (MIRA 18:2)

1. Institut fiziki AN Belorusskoy SSR, Minsk.

L 58528-65 EWT(1) IJP(c)

ACCESSION NR: AP5009288 UR/0217/65/010/002/0362/0362

577.3

AUTHOR: Anisimov, S. I.

TITLE: System of growth equations and some other dynamic systems used in biological modeling

SOURCE: Biofizika, v. 10, no. 2, 1965, 362

TOPIC TAGS: biophysics, mathematic method

ABSTRACT: In many investigations, beginning with the early, well-known work of Volterra [1], systems of differential equations analogous to those referred to as dynamic systems in mechanics are used to describe the development of biological systems. Far more frequently, a simple system with two variables is used to describe a biological system with two trophic levels. More complex problems have been studied using numerical methods.

Card 1/4

L 58528-65
ACCESSION NR: AP5009288

In connection with these works, attention is focused on one substantial requirement which dynamic systems representing models of true biological systems must satisfy: dynamic model systems, in keeping with accepted terminological inconsistencies, must be *coarse*. The reason for this requirement is that the topological structure of phase trajectories need not vary as a function of minor equation variations. Thus the requirement for coarseness becomes obvious, since it is always necessary to disregard a number of minor effects when building a dynamic system. Nevertheless, quite frequently in connection with biological systems, dynamic systems are examined which are not really coarse. For example, the simplest system of equations proposed by Volterra [1]

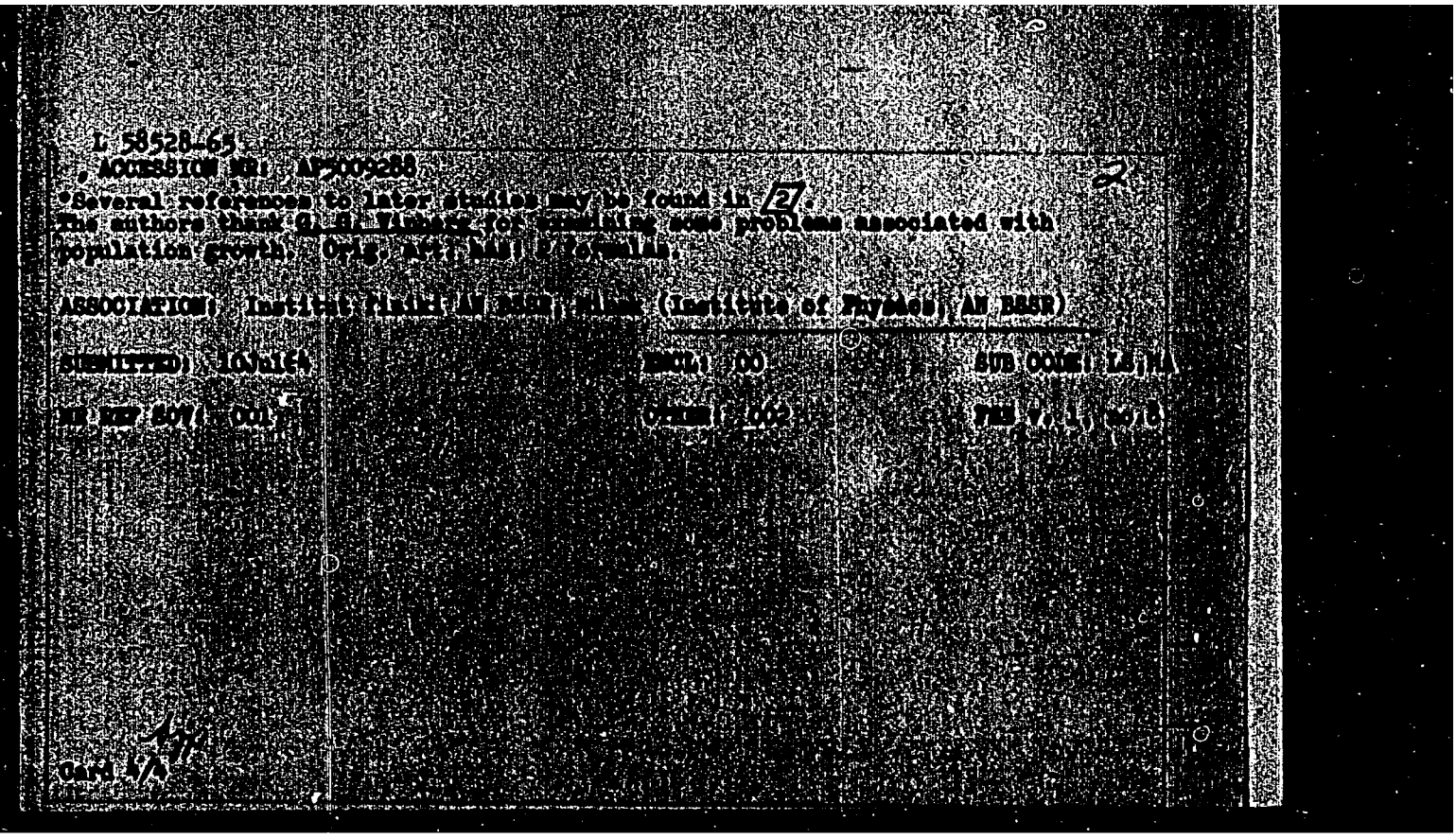
$$\begin{cases} dx/dt = Ax - Bxy \\ dy/dt = -Dy + Cxy \end{cases} \qquad (1)$$

Card 1/4

is not coarse and cannot, therefore, be considered as a model of a true biological system. Actually, it is not hard to convince oneself that the singular point of the above equation (D/C, A/B) is the center, and according to known theorems [3], singular points of this type cannot occur in a coarse system. The above system is even "biologically incorrect," since it is very clear that a function describing the "interaction" of trophic levels must be finite. From this standpoint, a more correct system would be expressed in the form:

$$\frac{dx}{dt} = ax - bxf(y) \qquad (2)$$
$$\frac{dy}{dt} = -c + dxf(y).$$

It is natural to assume for the function $f(x)$ that $0 < f(x) < M <$ and that the derived factor $f'(x)$ decreases constantly with the increase of x. Under these conditions system (2), as opposed to system (1), is coarse. The singular point (x_0, y_0), where $f(x_0) = c/b$; $y_0 = ab/cx_0$, is the stable junction [if $c/a < (1 - R)^2/4R$] or the stable focus [if $c/a > (1 - R)^2/4R$, $R = x_0 f'(x_0)/f(x_0) < 1$)]. Of course, the example considered is not unique.



L 58528-65
ACCESSION NR: AP5009288
Several references to later studies may be found in [illegible].
The authors thank [illegible] for [illegible] some problems associated with
population growth. Orig. art. has: [illegible] formulas.
ASSOCIATION: Institut; Fizik; AN BSSR; Minsk (Institute of Physics) AN BSSR)
SUBMITTED: 10Dec64 ENCL: 00 SUB CODE: [illegible]
NR REF SOV: 001 OTHER: 002 PUB [illegible]
Card 1/3

ANISIMOV, S.I.

Solution of integral equations of open resonators. Opt. i spektr. 18 no.3:522-523 Mr '65. (MIRA 18:5)

ANISIMOV, S.I.

System of growth equation and some other dynamic systems modeling biological objects. Biofizika 10 no.2:362 '65. (MIRA 18:7)

1. Institut fiziki AN BSSR, Minsk.

L 40385-66 FBD/EWT(l)/EWT(m)/EEC(k)-2/T/EWP(t)/ETI/EWP(k) LJP(c) WG/JD/WW/JG

ACC NR: AP6025256 SOURCE CODE: UR/0057/66/036/007/1273/1284

AUTHOR: Anisimov,S.I.; Bonch-Bruyevich,A.M.; Yel'yashevich,M.A.; Imas,Ya.A.; Pavlenko,N.A.; Romanov,G.S.

ORG: none

TITLE: The effects of intense light beams on metals

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 36, no.7, 1273-1284

TOPIC TAGS: laser effect, metal melting, metal vaporizing, heat of sublimation

ABSTRACT: The authors have investigated theoretically and experimentally the phenomena accompanying the disruption of metals by focused laser beams. In the present paper there is considered the case of a laser producing approximately 1 millisec pulses, each consisting of a sequence of approximately 1 microsec spikes. The phenomena accompanying disruption of metals by giant laser pulses will be discussed in a future paper. In the theoretical part of the paper, fluxes of 10^{12} to 10^{16} erg/cm^2 sec on an approximately 1 mm diameter spot are considered. It is shown that under these conditions the transport of energy in the metal by heat conduction during the duration of a spike is negligible, and the problem of the vaporization of the metal is accordingly treated in one dimension. Formulas are derived, and curves are presented for different metals, relating the energy flux in the laser beam, the temperature of the metal surface, the erosion rate of the metal surface (i.e., the rate of increase

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L 40385-66

ACC NR: AP6025256

in the depth of the hole), and the velocity and pressure of the jet of metal vapor. The temperature of the metal surface is not equal to the boiling temperature, as was erroneously assumed by J.F.Ready (J. Appl. Phys., 36, No.2, 462, 1965). The theoretical relations were tested by experiments on some 16 metals and alloys, using neodymium glass lasers producing up to 300 J pulses. The laser beam was focused with a lens onto the parallelepipedonical specimen and the disruptive process was recorded cinematographically at 10^5 frames per sec. In most of the experiments a glass plate was cemented to one face of the specimen and the laser beam was so directed parallel to the glass-metal boundary that about half of the beam passed freely through the glass and the other half penetrated into the metal, vaporizing it. In those experiments the process was photographed through the glass. The mass of metal removed by the laser pulse was determined by weighing the specimen, and the impulse due to reaction of the metal vapor jet was measured. The experiments were in qualitative agreement with the theory, and quantitative agreement in order of magnitude was found. The authors feel that development of a more accurate theory would not be worthwhile, owing to the large variations between different lasers. Three stages were distinguished in the disruption process: in the first stage the temperature of the metal surface increased at the rate of approximately 10^{10} degree/sec; in the second stage metal was vaporized from the specimen and a hole was formed in it; and in the third stage a pressure of 10^2 to 10^3 atmospheres developed within the hole and a powerful jet of metal vapor issued from it at supersonic velocities. The ratio of the laser pulse energy to the mass of metal

Card 2/3

L 40385-66
ACC NR: AP6025256

lost by the specimen was approximately equal to, but in most cases somewhat less than, the heat of sublimation of the metal. An appreciable mass of the metal was ejected as liquid. Orig. art. has: 9 formulas, 9 figures, and 2 tables. [15]

SUB CODE: 20, 11/ SUBM DATE: 26Jun65 ORIG. REF: 005 OTH REF: 004
ATD PRESS: 5153

Card 3/3 vmb

L 09326-67 EWP(m)/EWT(l)/EWT(m) WW/JW/JWD

ACC NR: AP6030934 SOURCE CODE: UR/0207/66/000/004/0150/0151

AUTHOR: Anisimov, S. I. (Minsk); Vitkin, E. I. (Minsk)

ORG: none

TITLE: Some variational problems of the theory of thermal explosions

SOURCE: Zhurnal prikladnoy mekhaniki i tekhnicheskoy fiziki, no. 4, 1966, 150-151

TOPIC TAGS: thermal explosion, variational problem, nonlinear differential equation, approximation method

ABSTRACT: The authors point out that most of the results obtained in stationary theory of thermal explosion pertains to symmetrical regions, in which the temperature distribution depends on a single space coordinate, whereas practical problems deal with two or three independent variables, for which the nonlinear partial differential equations are difficult to solve without a tremendous amount of numerical calculations. It is shown, since the solutions of physical interest are only those corresponding to low temperatures, that the calculations can be simplified by approximating the exponential temperature dependence with a trinomial. The application of this approximation to the variational solution of problems involving a cylinder of finite length, a rectangle, and a parallelepiped show satisfactory agreement with results obtained by others. Orig. art. has: 11 formulas.

SUB CODE: 20/ SUBM DATE: 17May65/ ORIG REF: 004/ OTH REF: 001

Card 1/1

ACC NR: AT7000377 SOURCE CODE: UR/0000/66/000/000/0096/0103

AUTHOR: Anisimov, S. I.; Khodyko, Yu. V.

ORG: Instituto of Physics, AN BSSR, Minsk (Institut fiziki AN BSSR)

TITLE: Convoctivo diffusion in tho boundary layor with flow in an angle

SOURCE: Teplo- i massoperenos, t. 6: Metody raschota i modelirovaniya protsessov teplo- i massoobmena (Heat and mass transfer, v. 6: Methods of calculating and modeling heat and mass transfer processes). Minsk, Nauka i tekhnika, 1966, 96-103

TOPIC TAGS: laminar flow thermal diffusion, mathematic analysis, boundary layer theory

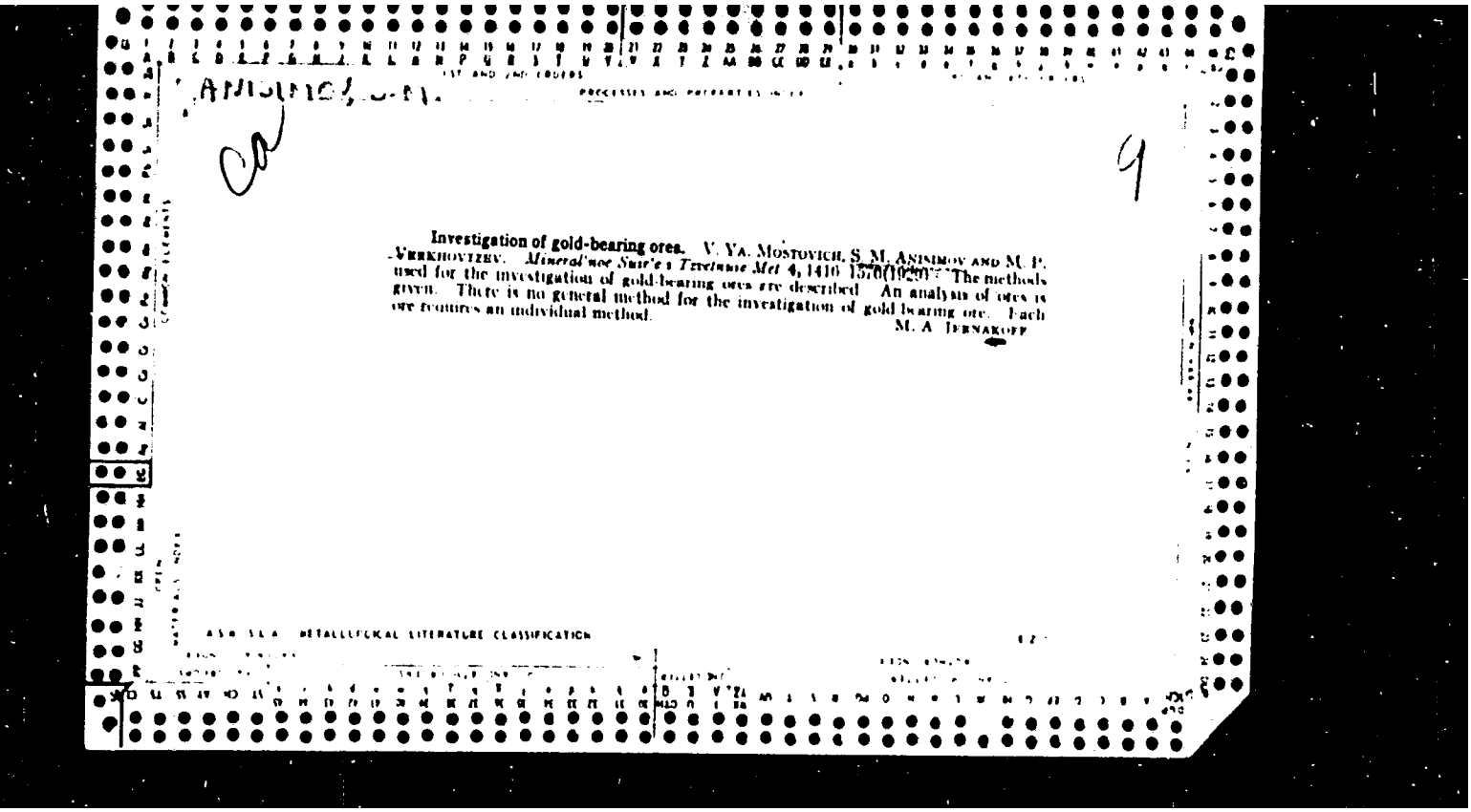
ABSTRACT: The article presents an exact analytical solution for the equation of convective diffusion in the laminar layer with flow between non-parallel flat walls. In the mathematical formulation of the problem it is assumed that the liquid is incompressible and non-dissipating, and the concentration of reacting impurities in the flow is small, so that any change in the parameters of the flow as a function of the composition or the temperature can be neglected. The coordinate system is chosen as shown in the figure. With the usual assumptions of the theory of the boundary layer, the system of equations, which can be integrated, can be writtin in the form:

Card 1/2

ANISIMOV, S.M.

VERETENNIKOV, A.I.; ANISIMOV, S.M.

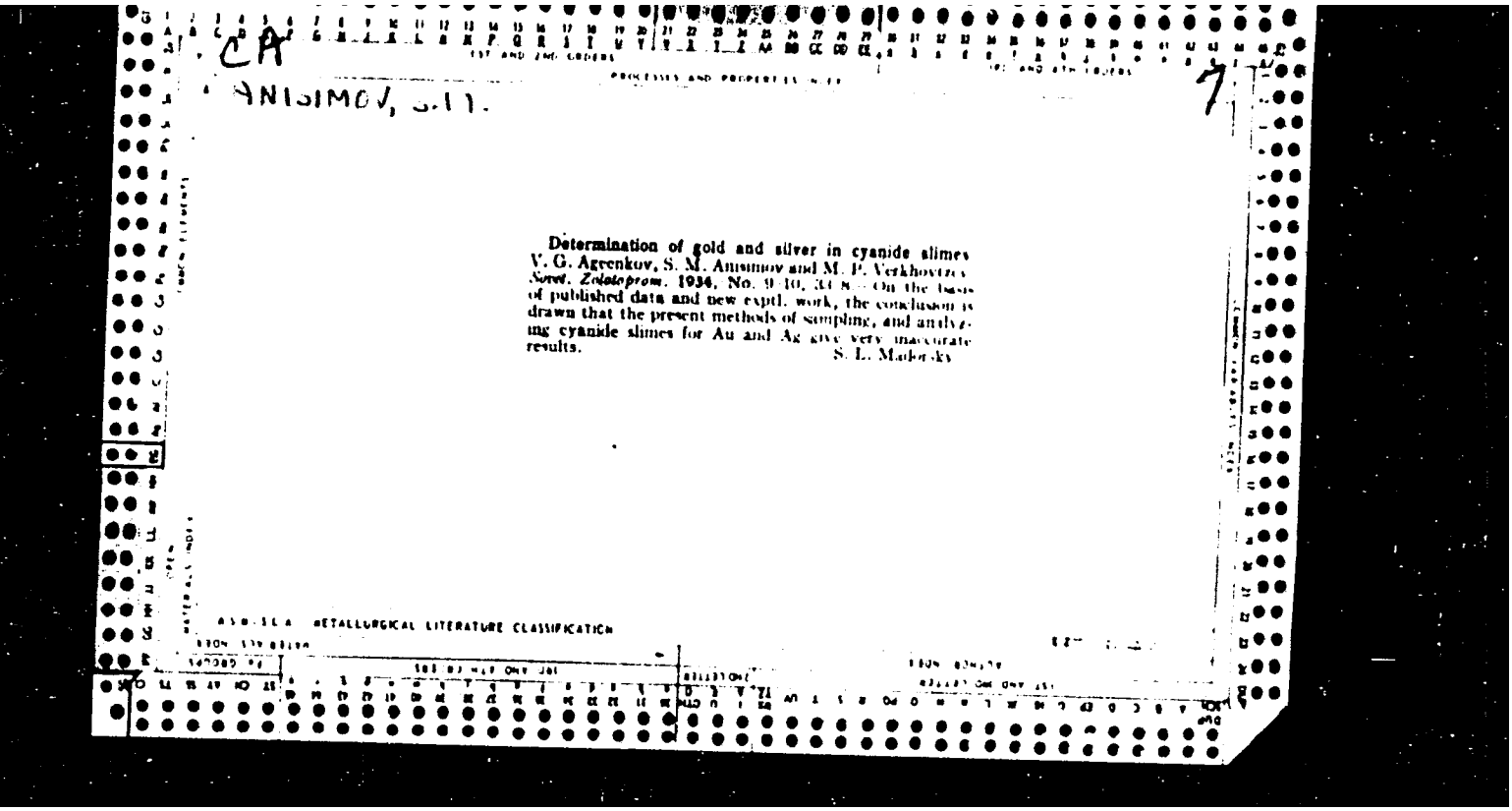
Improve land records. Zemledelie 6 no.1:83-84 Ja '58. (MIRA 11:1)
(Omsk Province--Farm management)



Investigation of gold-bearing ores. V. Ya. Mostovich, S. M. Anisimov and M. P. Verkhovtzev. *Mineral'noe Sur'e i Tzvetnye Met* 4, 1410 1570(1929). The methods used for the investigation of gold-bearing ores are described. An analysis of ores is given. There is no general method for the investigation of gold bearing ore. Each ore requires an individual method.

M. A. Iernakoff

A.S.M.E.A. METALLURGICAL LITERATURE CLASSIFICATION

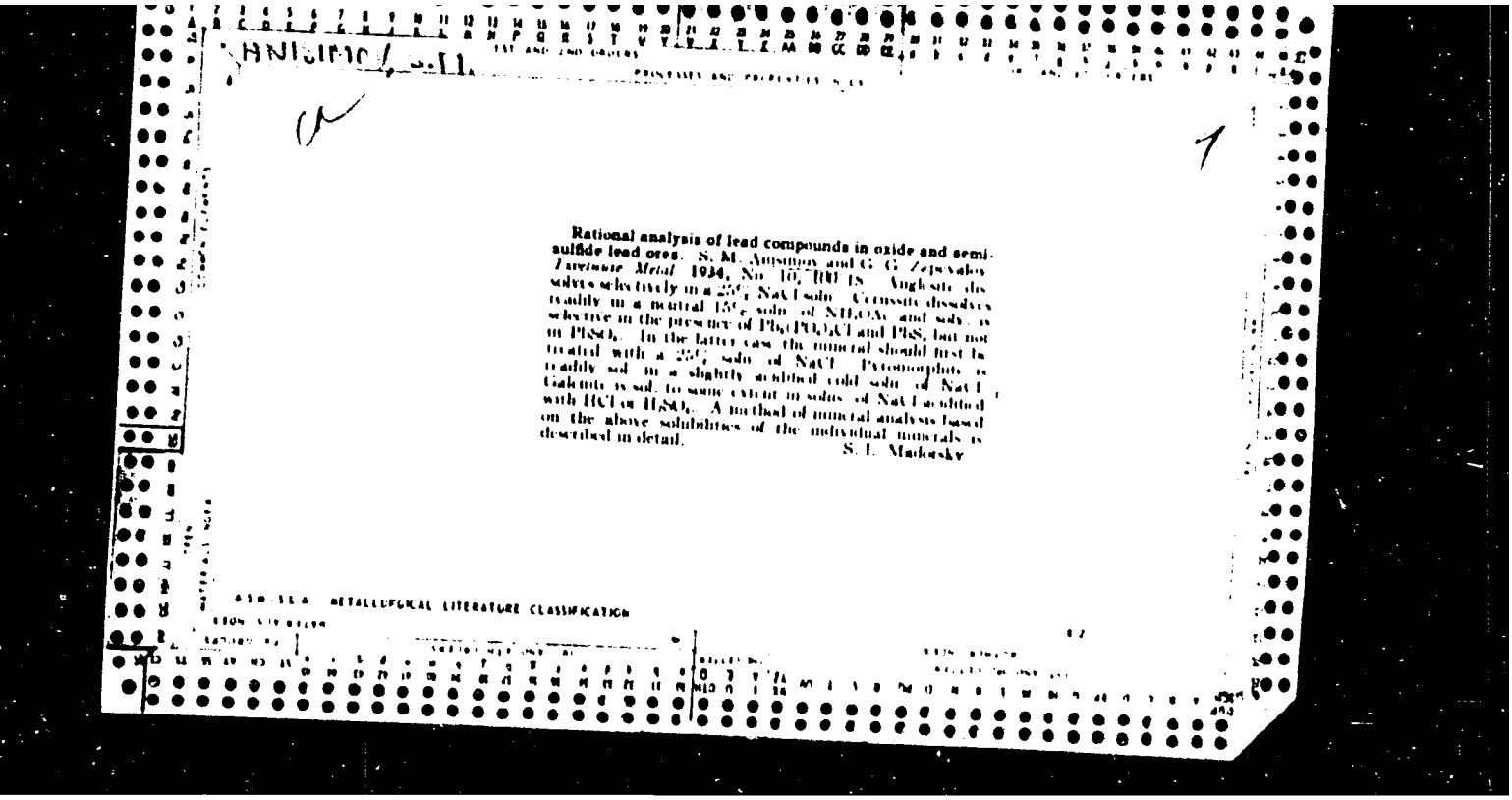


CA

ANISIMOV, S.M.

Determination of gold and silver in cyanide slimes
V. G. Agrenkov, S. M. Anisimov and M. P. Verkhovtzev
Sovet. Zolotoprom. 1936, No. 9-10, 33-8.—On the basis of published data and new exptl. work, the conclusion is drawn that the present methods of sampling, and analyzing cyanide slimes for Au and Ag give very inaccurate results.
S. L. Madorsky

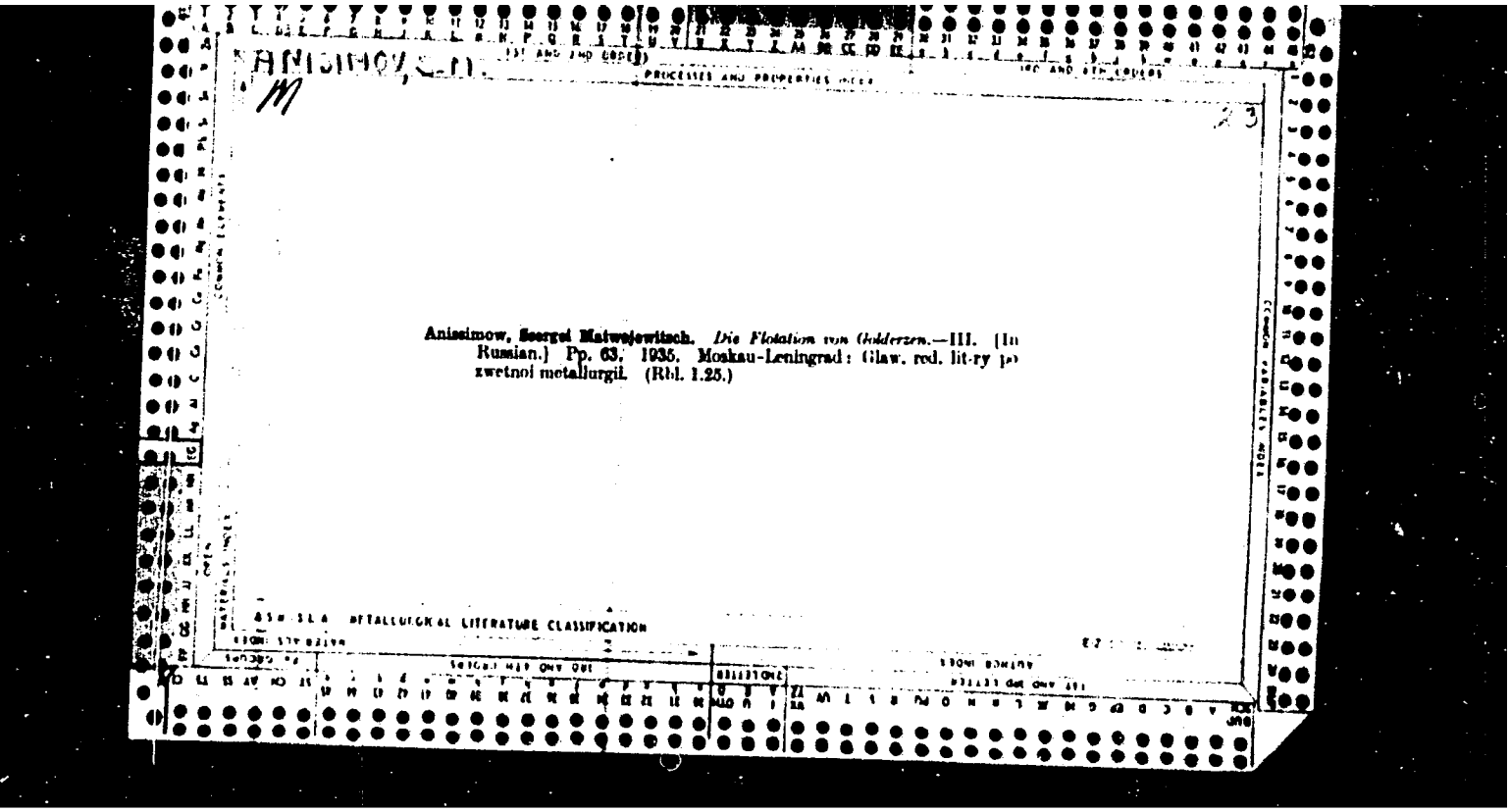
METALLURGICAL LITERATURE CLASSIFICATION



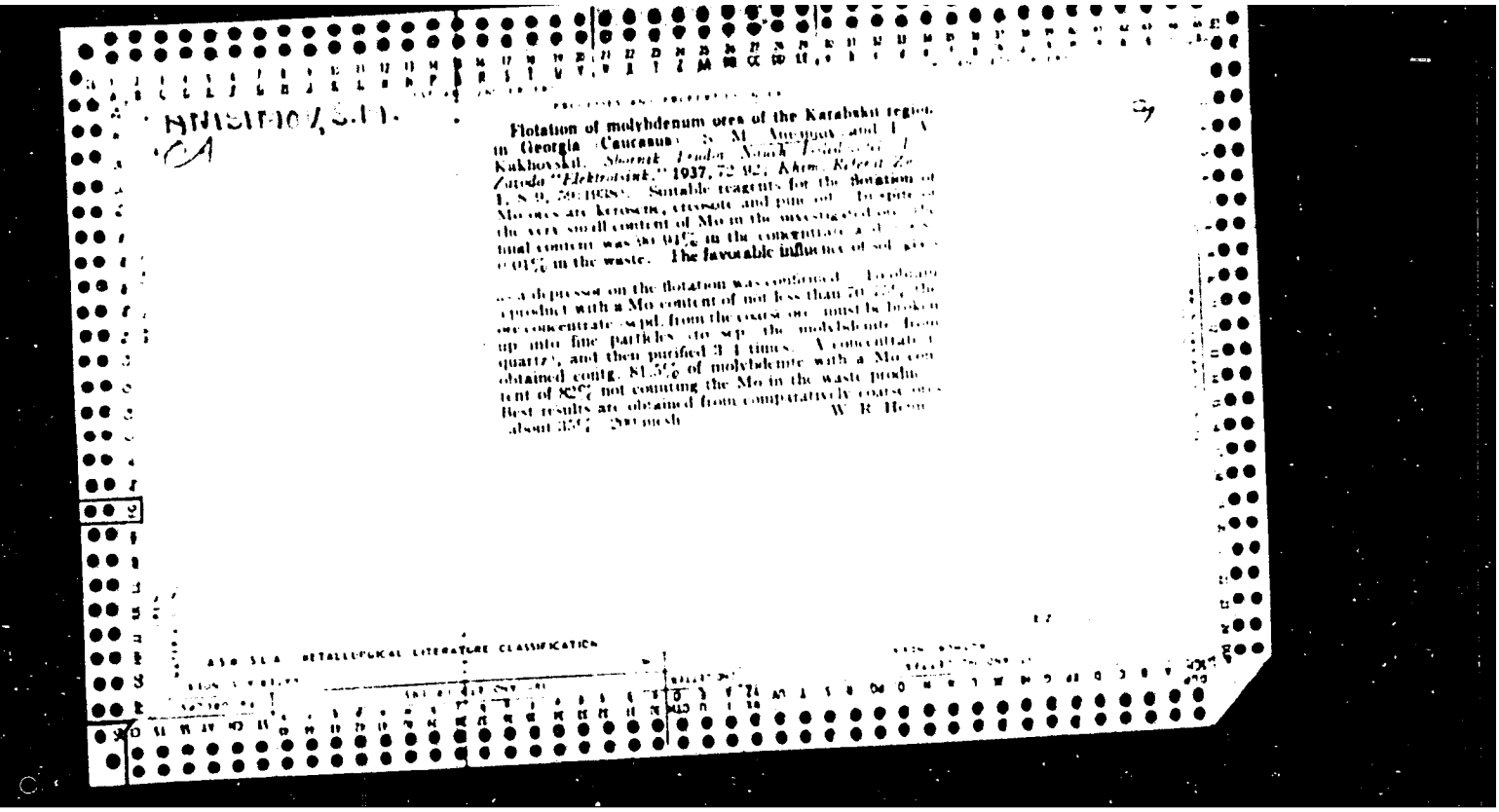
Rational analysis of lead compounds in oxide and semi-sulfide lead ores. S. M. Antsipov and G. G. Zaĭtsev. *Tsvetnye Metal* 1934, No. 10, 1001-18. Anglesite dissolves selectively in a 25% NaCl soln. Cerussite dissolves readily in a neutral 15% soln. of NH_4OAc and sulfate is selective in the presence of $PbCl_2$, PbCO$_3$, and PbS, but not in $PbSO_4$. In the latter case the mineral should first be treated with a 25% soln. of NaCl. Pyromorphite is readily sol. in a slightly acidified cold soln. of NaCl. Galenite is sol. to some extent in solns. of NaCl acidified with HCl or H_2SO_4. A method of mineral analysis based on the above solubilities of the individual minerals is described in detail.

S. L. Madorsky

A.S.M. U.S.A. METALLURGICAL LITERATURE CLASSIFICATION

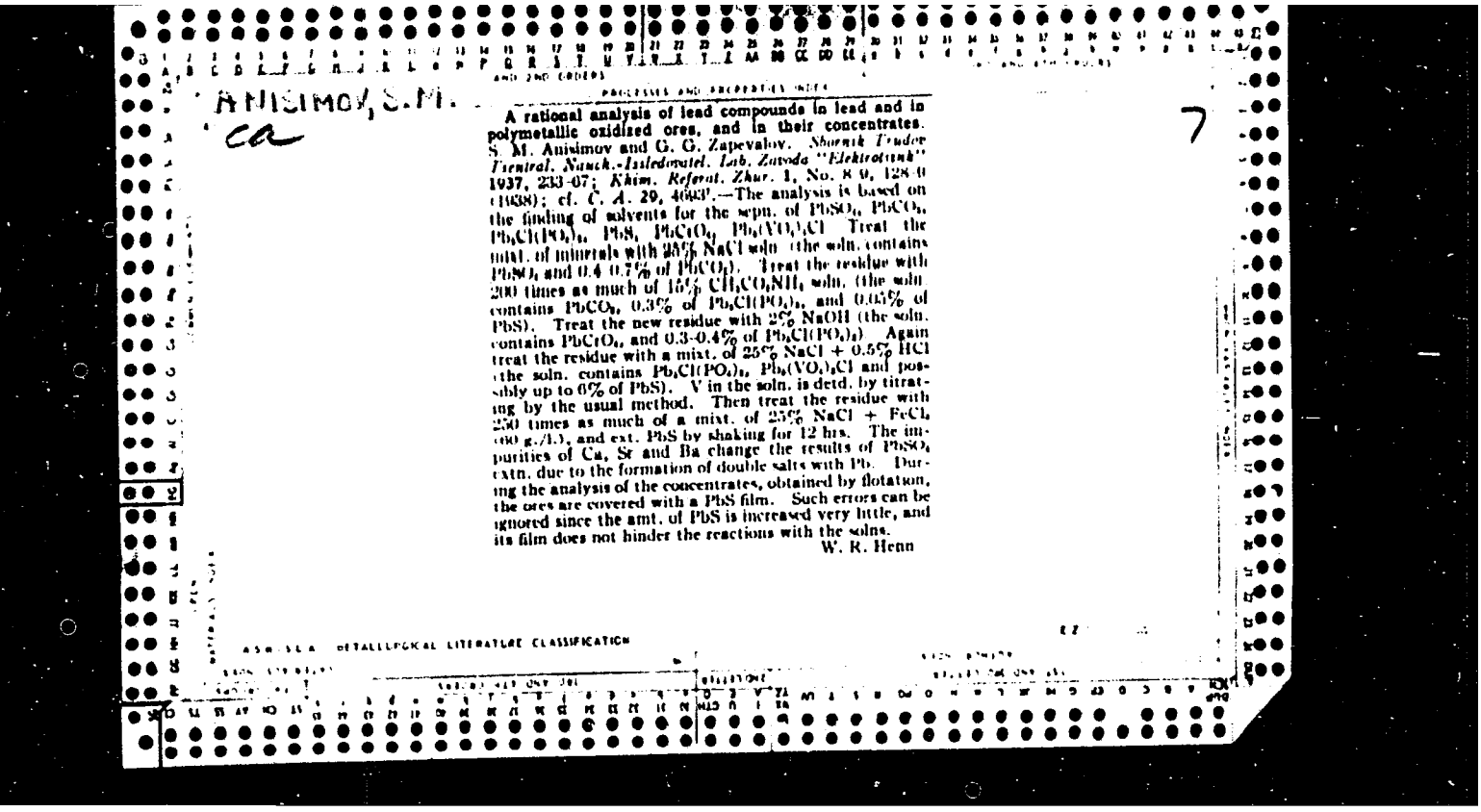


Anissimow, Seergei Matwejewitsch. *Die Flotation von Golderzen.*—III. [In Russian.] Pp. 63. 1935. Moskau-Leningrad: Glaw. red. lit-ry po zwetnoi metallurgii. (Rbl. 1.25.)



Flotation of molybdenum ores of the Karabakh region in Georgia (Caucasus). S. M. Anosov and I. V. Kukhovskii. *Sbornik Trudov Nauch. Issled. Inst. Zavodu "Elektrostal,"* 1937, 72-92; *Khim. Referat. Zhur.* 1, No. 9, 59-60(1938). Suitable reagents for the flotation of Mo ores are kerosene, creosote and pine oil. Despite the very small content of Mo in the ores treated, the total content was 30-91% in the concentrate and 0.01% in the waste. The favorable influence of soda on the depression on the flotation was confirmed. To obtain a product with a Mo content of not less than 70-75%, the ore concentrate must be broken up into fine particles etc. to sep. the molybdenite from quartz, and then purified 3-4 times. A concentrate obtained contg. 81.5% of molybdenite with a Mo content of 82% not counting the Mo in the waste product. Best results are obtained from comparatively coarse ores, about 35% -200 mesh.

W. R. Hess



ANISIMOV, S.M.

Ca

7

A rational analysis of lead compounds in lead and in polymetallic oxidized ores, and in their concentrates. S. M. Anisimov and G. G. Zapevalov. *Sbornik Trudov Tsentral. Nauch.-Issledovatel. Lab. Zavoda "Elektrotsink"* 1937, 233-07; *Khim. Referat. Zhur.* 1, No. 8 9, 128-0 (1938); cf. *C. A.* 29, 4693⁹.—The analysis is based on the finding of solvents for the sepn. of $PbSO_4$, $PbCO_3$, $Pb_5Cl(PO_4)_3$, PbS, $PbCrO_4$, $Pb_5(VO_4)_3Cl$. Treat the mixt. of minerals with 25% NaCl soln. (the soln. contains $PbSO_4$ and 0.4-0.7% of $PbCO_3$). Treat the residue with 200 times as much of 10% $CH_3CO_2NH_4$ soln. (the soln. contains $PbCO_3$, 0.3% of $Pb_5Cl(PO_4)_3$, and 0.05% of PbS). Treat the new residue with 2% NaOH (the soln. contains $PbCrO_4$, and 0.3-0.4% of $Pb_5Cl(PO_4)_3$). Again treat the residue with a mixt. of 25% NaCl + 0.5% HCl (the soln. contains $Pb_5Cl(PO_4)_3$, $Pb_5(VO_4)_3Cl$ and possibly up to 6% of PbS). V in the soln. is detd. by titrating by the usual method. Then treat the residue with 250 times as much of a mixt. of 25% NaCl + $FeCl_3$ (60 g./l.), and ext. PbS by shaking for 12 hrs. The impurities of Ca, Sr and Ba change the results of $PbSO_4$ extn. due to the formation of double salts with Pb. During the analysis of the concentrates, obtained by flotation, the ores are covered with a PbS film. Such errors can be ignored since the amt. of PbS is increased very little, and its film does not hinder the reactions with the solns.

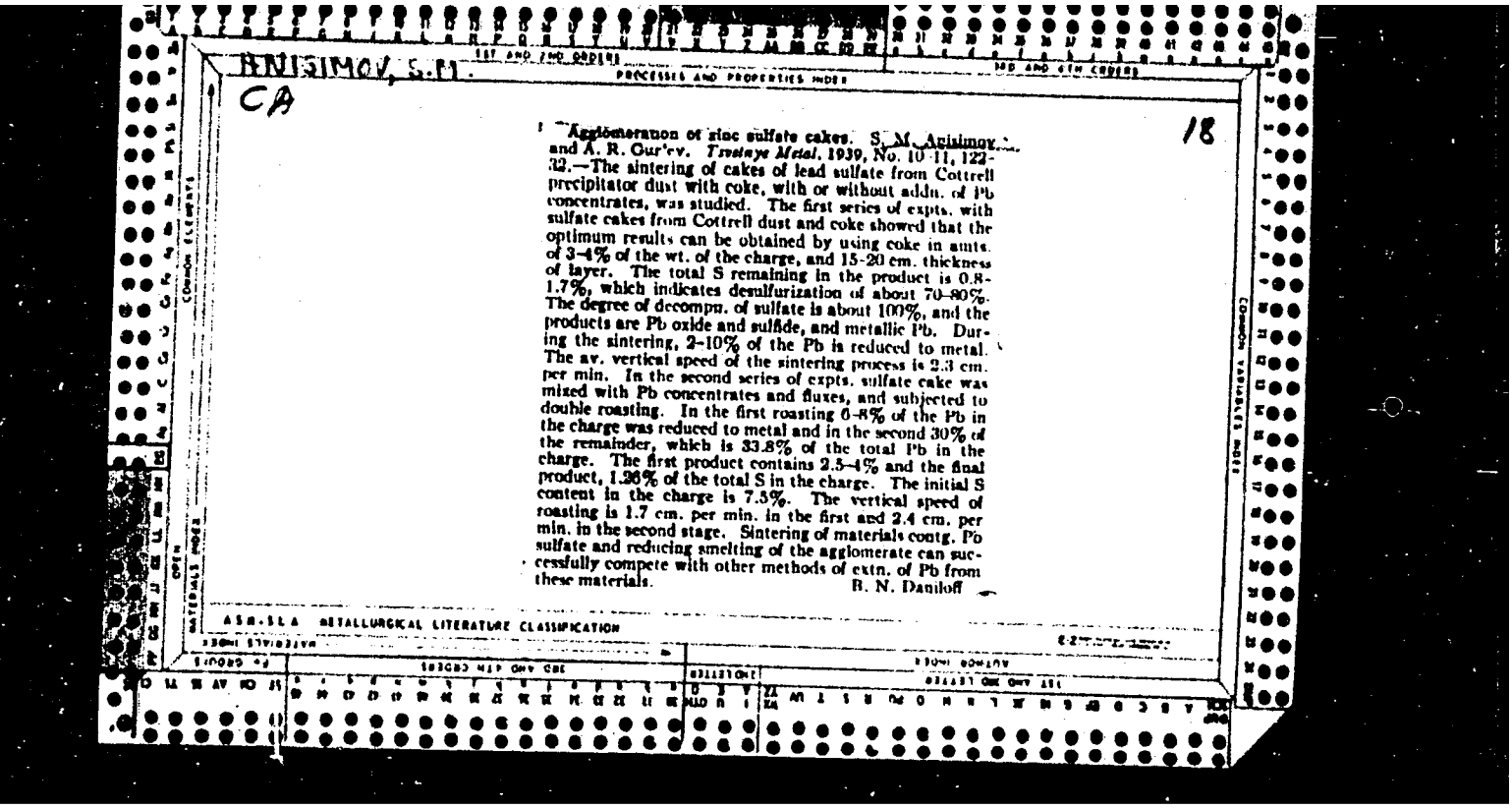
W. R. Henn

ANISIMOV, S.M., GURIYEV, A. R.

USSR

Professor, Candidate of Technical Sciences
"The Sintering of Lead Sulphite Cakes"
Tsvet. Met. 14, No. 10-11, Oct. - Nov. 1939

Report U-1506, 4 Oct. 1951



AGISIMOV, S.M.

CA

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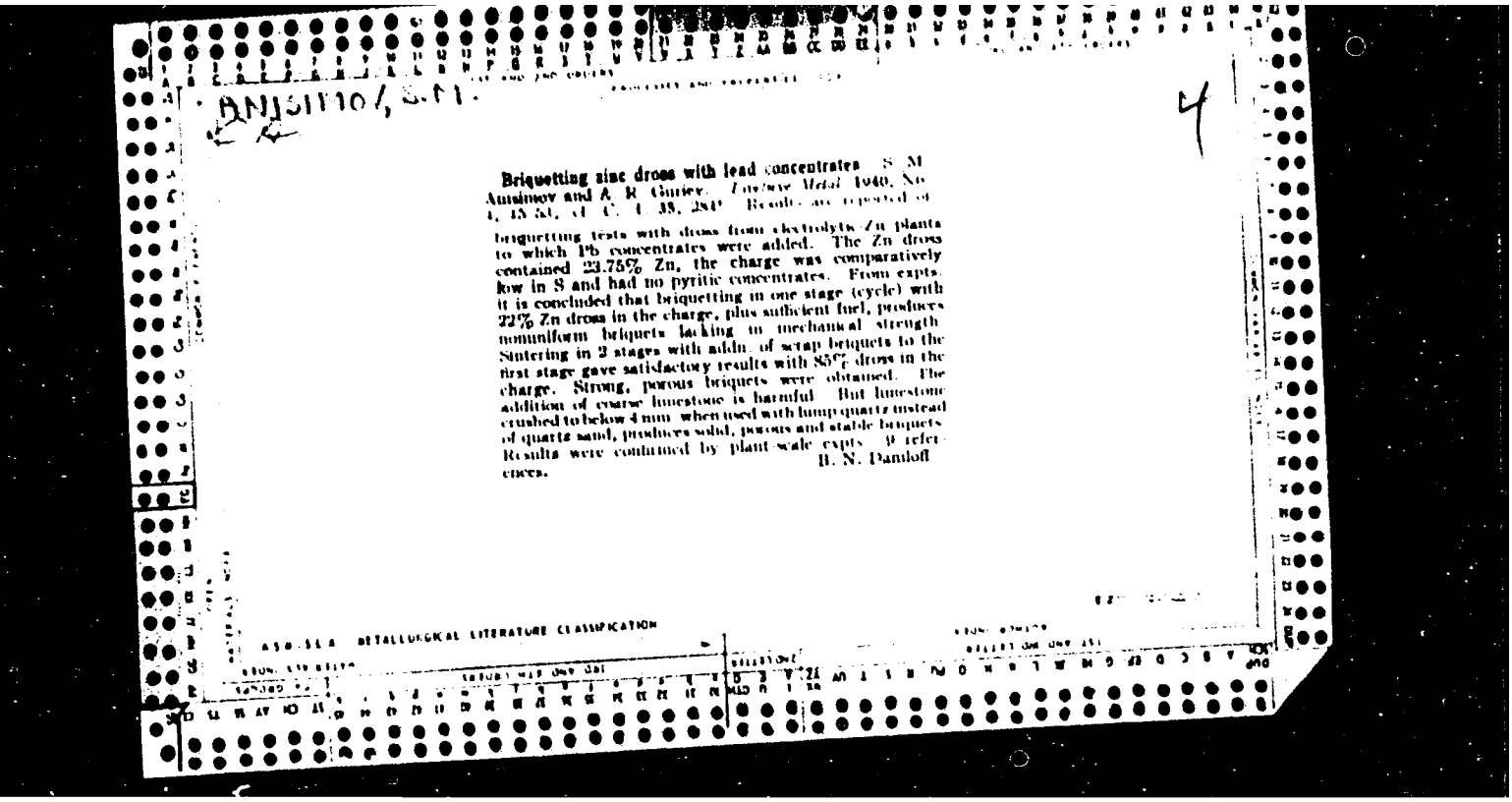
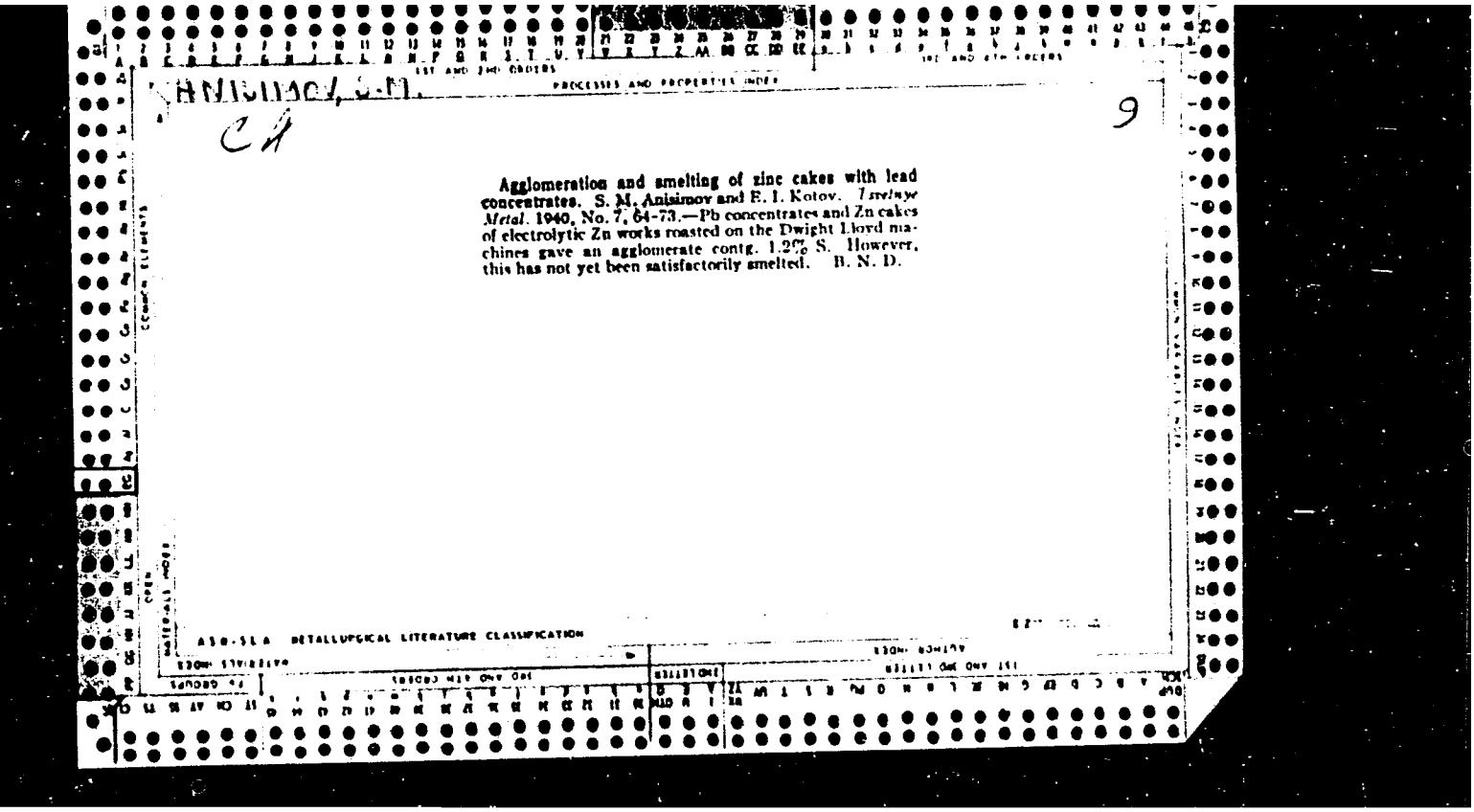
Agglomeration of zinc sulfate cakes. S. M. Agisimov and A. R. Gur'ev. *Tsvetnye Metal.* 1939, No. 10-11, 122-32.—The sintering of cakes of lead sulfate from Cottrell precipitator dust with coke, with or without addn. of Pb concentrates, was studied. The first series of expts. with sulfate cakes from Cottrell dust and coke showed that the optimum results can be obtained by using coke in amts. of 3-4% of the wt. of the charge, and 15-20 cm. thickness of layer. The total S remaining in the product is 0.8-1.7%, which indicates desulfurization of about 70-80%. The degree of decompn. of sulfate is about 100%, and the products are Pb oxide and sulfide, and metallic Pb. During the sintering, 2-10% of the Pb is reduced to metal. The av. vertical speed of the sintering process is 2.3 cm. per min. In the second series of expts. sulfate cake was mixed with Pb concentrates and fluxes, and subjected to double roasting. In the first roasting 6-8% of the Pb in the charge was reduced to metal and in the second 30% of the remainder, which is 33.8% of the total Pb in the charge. The first product contains 2.5-4% and the final product, 1.36% of the total S in the charge. The initial S content in the charge is 7.5%. The vertical speed of roasting is 1.7 cm. per min. in the first and 2.4 cm. per min. in the second stage. Sintering of materials contg. Pb sulfate and reducing smelting of the agglomerate can successfully compete with other methods of extn. of Pb from these materials.

B. N. Danilov

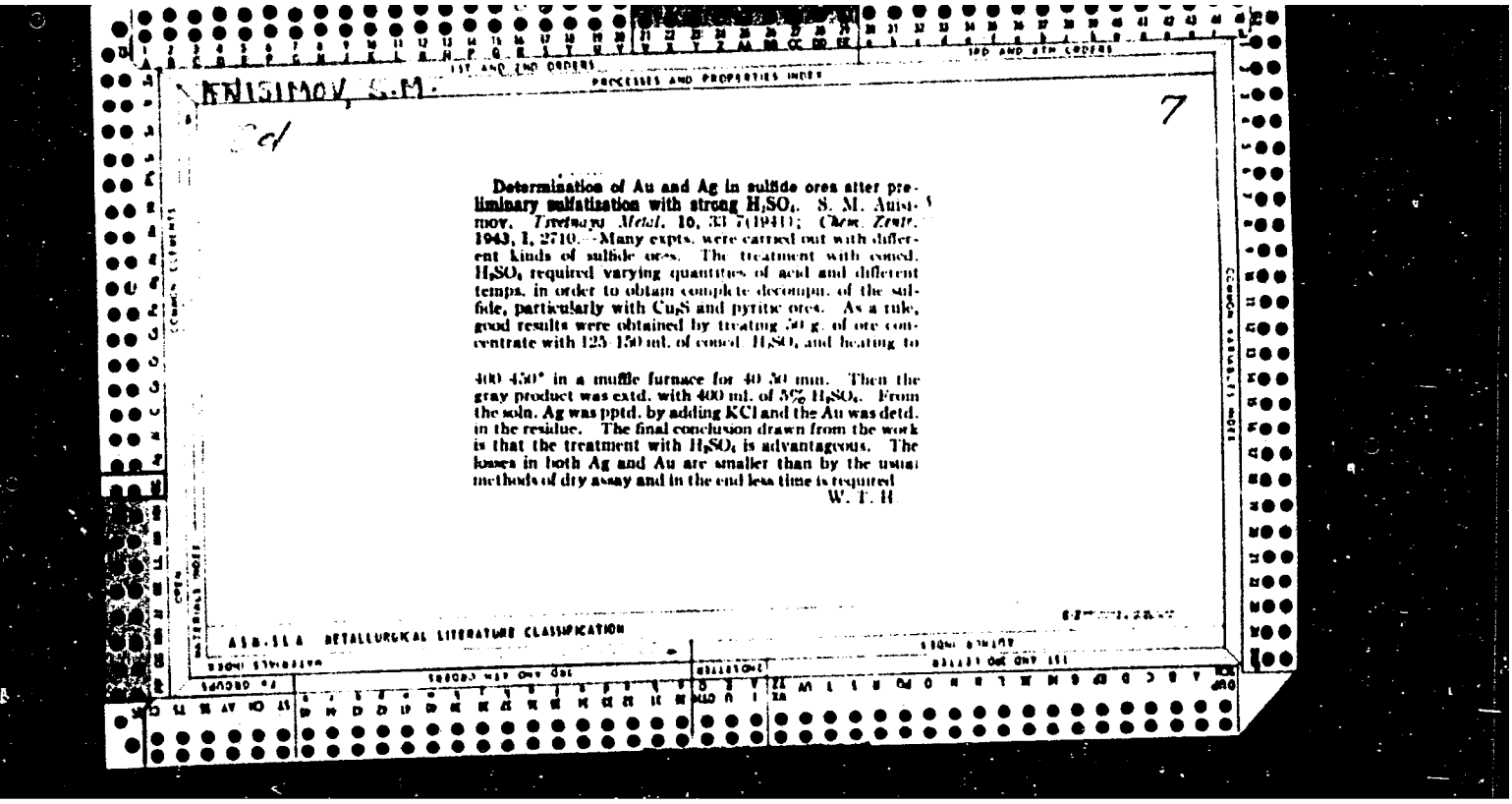


Briquetting zinc dross with lead concentrates S. M. Anisimov and A. R. Gurev. *Tsvetnye Metal* 1940, No. 4, 45-51; cf. C. A. 33, 2849. Results are reported of briquetting tests with dross from electrolytic Zn plants to which Pb concentrates were added. The Zn dross contained 23.75% Zn, the charge was comparatively low in S and had no pyritic concentrates. From expts. it is concluded that briquetting in one stage (cycle) with 22% Zn dross in the charge, plus sufficient fuel, produces nonuniform briquets lacking in mechanical strength. Sintering in 2 stages with addn. of scrap briquets to the first stage gave satisfactory results with 85% dross in the charge. Strong, porous briquets were obtained. The addition of coarse limestone is harmful. But limestone crushed to below 4 mm. when used with lump quartz instead of quartz sand, produces solid, porous and stable briquets. Results were confirmed by plant-scale expts. 9 references.

B. N. Danilov



Agglomeration and smelting of zinc cakes with lead concentrates. S. M. Anisimov and E. I. Kotov. *Tsvetnye Metal.* 1940, No. 7, 64-73.—Pb concentrates and Zn cakes of electrolytic Zn works roasted on the Dwight Lloyd machines gave an agglomerate contg. 1.2% S. However, this has not yet been satisfactorily smelted. B. N. D.



ANISIMOV, S.M.

7

Determination of Au and Ag in sulfide ores after preliminary sulfatization with strong H_2SO_4. S. M. Anisimov. *Tsvetnye Metal.* 10, 33-7(1941); *Chem. Zentr.* 1943, I, 2710.—Many expts. were carried out with different kinds of sulfide ores. The treatment with concd. H_2SO_4 required varying quantities of acid and different temps. in order to obtain complete decompn. of the sulfide, particularly with Cu_2S and pyritic ores. As a rule, good results were obtained by treating 50 g. of ore concentrate with 125-150 ml. of concd. H_2SO_4 and heating to 400-450° in a muffle furnace for 40-50 min. Then the gray product was extd. with 400 ml. of 5% H_2SO_4. From the soln. Ag was pptd. by adding KCl and the Au was detd. in the residue. The final conclusion drawn from the work is that the treatment with H_2SO_4 is advantageous. The losses in both Ag and Au are smaller than by the usual methods of dry assay and in the end less time is required.
W. T. H.

A58-51A METALLURGICAL LITERATURE CLASSIFICATION

ANISIMOV, S.M.; YEMEKEYEV, V.I.

Scientific and technical student conference at the Northern Caucasus School of Mining Engineering. Izv.vys. ucheb. zav.; tsvet. met. no.3:153-155 '58. (MIRA 11:11)
(Caucasus--Mining engineering--Study and teaching)

SOV/149-58-6-6/19

AUTHORS: Anisimov, S.M. and Dashkov, N.P. (Deceased)

TITLE: Roasting and Sintering of Zinc and Lead Concentrates in Oxygen-enriched Air (Obzhig i aglomeratsiya tsinkovogo i svintsovogo kontsentratov v atmosfere vozdukha, obogashchennogo kislorodom)

PERIODICAL: Izvestiya Vysshikh Uchebnykh Zavedeniy, Tsvetnaya Metallurgiya, 1958, Nr 6, pp 49 - 63 (USSR)

ABSTRACT: The object of the investigations described in the present paper was to check the claims made by various workers (Refs 1-5) who have stated that application of oxygen-enriched air for roasting zinc concentrates can increase the rate of oxidation, the degree of desulphurisation and the concentration of SO_2 in the exhaust gases, although this method of roasting when applied to lead concentrates, which form easily fusible mixtures, might cause difficulties in obtaining a completely roasted and desulphurised product. The experimental work was carried out in a laboratory apparatus for autogenous down-draught blast-roasting, shown in Figure 1, as follows: 1 - oxygen cylinder, 2 - pressure regulator, 3 - gas mixer provided

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with a propeller, 4 - sintering vessel measuring 20 x 20 cm and 50 cm high, with an effective hearth area of 120 cm^2, 5 - electric igniting device, 6 - two microgauges for measuring the flow of gases, 7 - dust chamber, 8 - suction pump capable of drawing 150 m^3 through 1 m^2 of the hearth area per minute at the maximum vacuum of 390 mm H_2O and 9 - electric motor.

The oxygen content (up to 70%) of the gas mixture could be controlled within ± 2% and was periodically checked by chemical analysis of the mixture and by the manometer readings. The quantity of air admitted to the gas mixer was controlled by varying the vacuum under the hearth. The weight of the charge varied between 14 and 30 kg. Before each experiment the charge was moistened and then carefully mixed. A small quantity of roasted agglomerate placed on the grate served to support the charge, on top of which 30 g of coke and 200g of dry sawdust were placed to facilitate ignition. Gas permeability of the charge

Roasting and Sintering of Zinc and Lead Concentrates in Oxygen-enriched Air

was determined by measuring the rate of flow of the gas mixture on the entry side of the sintering vessel. The temperature of the charge and of the exhaust gases and the vacuum gauge and micro-manometer readings were recorded at least once a minute throughout each experiment. In each experiment three to twelve samples of the exhaust gases were analysed for the CO_2 and oxygen contents. The charge was made up to dry zinc concentrate - 40 mesh size and partially roasted concentrate - 6 mesh size. The compositions of the concentrate (top line) and the partially roasted concentrate (bottom line) are given in a table on p 51 (in the latter case both the total sulphur content and the proportion of sulphur present in the form of sulphate are given). To obtain maximum gas permeability, in the first series of experiments 8% of H_2O was added to charge consisting of 85% calcine and 15% concentrate. After each experiment, a sample of the obtained calcine, crushed and screened through a 4 mm sieve was analysed for total sulphur content, sulphur

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present as SO_4, total zinc and zinc soluble in a 10% solution of H_2SO_4. In the first stage of the investigation, the effect of the sulphur content of the charge, consisting of 14.5 to 29% concentrate and 85.5 to 71.0% calcine and forming a layer of 250 mm high, on the rate of roasting was studied. The results of some experiments are given in Table 1 (top for air roasting, bottom for roasting in oxygen-enriched air), and in Figures 2 and 3. The time dependence of the basic parameters of the sintering process in experiments Nr 63 (without added oxygen) and Nr 58 (oxygen-enriched air) is shown in Figures 2 and 3, respectively. The scales of these diagrams (from left to right) are as follows: flowmeter readings in mm H_2O; vacuum in mm H_2O; the temperature of the exhaust gases in ^oC; the temperature of the charge in ^oC. In the next series of experiments, in which the sulphur content of the charge remained constant and equal to 5% (corresponding to a content of concentrate of 15%), the effect of the thickness of the layer of the charge and

of the variation of the oxygen content of the gas mixture were studied. The results of these experiments are given in Table 2 (top part - variable thickness of the charge layer, bottom part - variable oxygen content of the gas mixture). In the next series of experiments, the effect of the oxygen content in the gas mixture and of the rate of flow of the mixture was examined, the other conditions being: the concentrate content of the charge - 13 to 15%; the thickness of the charge layer - 350 mm in experiments with air and 250 mm in experiments with oxygen/air mixture. The data are given in Table 3.

The variation of the main parameters of the roasting process during experiments Nrs 31 and 51 is shown in Figures 4 and 5, respectively. The scales are the same as those in Figures 2 and 3 with the exception that the curves shown in Figure 4 do not include a graph of the variation of the temperature of the charge. The charge used in experiments comprising the next stage of the investigation consisted of 10 to 18% concentrate, 40 to 32% partially roasted product and 50% calcine when roasting was done in

Roasting and Sintering of Zinc and Lead Concentrates in Oxygen-enriched Air

air, and 10% concentrate, 40% partially roasted product, and 50% calcine when roasting in an air/oxygen mixture. In both cases, 10 to 12% H_2O was added to the charge and the thickness of the charge layer in all the experiments was 200 mm. The results of these experiments are given in Table 4.

Finally, roasting and sintering of lead concentrates were studied, using both air, and air/oxygen mixture. Materials used in these experiments included lead concentrate containing 69.1% Pb, iron ore with 64.0% Fe, quartz with 94.7% SiO_2 and limestone containing 50% CaO. Roasting and sintering were carried out in two stages. The charge used in the first stage consisted of: 100 kg concentrate, 14.7 kg iron ore, 10.6 kg quartz, 13.7 limestone and 0 to 40% sintered agglomerate. The quantity of fluxes used was calculated to give a slag containing 24% SiO_2, 34% FeO, 16% CaO and 14% ZnO. The charge without the sintered agglomerate contained 50% Pb, 11% S in the form of sulphide

and 7% H_2O. The charge used for the second roast consisted of the product of the first operation crushed to -6 mm size and contained 4 to 6% moisture. The thickness of the charge layer in the first and in the second stages of the process was 200 and 300 to 325 mm, respectively. The results of the experiments are given in Table 5.
It is stated in the conclusions that:
1) the results of experiment on single-stage roasting of zinc concentrate with recirculation of the calcine carried out in air and air/oxygen mixture showed that, other conditions being equal, the rate of roasting and, consequently, the output per unit hearth area increased in proportion to the increase of the oxygen content of the air/gas mixture. Application of the air/oxygen mixture increased the degree of desulphurisation of the concentrate and correspondingly decreased the sulphur content of the final product. Calcine was obtained under these conditions which, even when the sulphur-rich fines had not been separated, contained as little as 0.12 to 0.4% S;
2) the higher the quantity of air or the air/oxygen

Roasting and Sintering of Zinc and Lead Concentrates in Oxygen-enriched Air

mixture blown through the charge per unit time, the higher was the rate of roasting.
3) when the sulphur content of the charge roasted in air exceeded 5 to 6%, the temperature attained by the charge during roasting and the rate of roasting increased, a large quantity of ZnO crystals was formed, premature fusion of the charge occurred and calcine with a high S content was obtained. Although the oxidising reaction was even more intensive when an air/oxygen mixture was used, the calcine produced under these conditions had a low S content, did not contain ZnO crystals and had good mechanical strength;
4) application of the air/oxygen mixture resulted in an increase of the SO_2 content of the exhaust gases. (Better utilisation of the oxygen could be obtained if the exhaust gases with low contentration of SO_2 were re-circulated.);
5) although the cadmium and lead contents of the calcine roasted in air/oxygen mixtures were very low owing to more intensive volatilisation of these impurities, the losses of zinc under these conditions, due to volatilisation, did

Roasting and Sintering of Zinc and Lead Concentrates in Oxygen-enriched Air

not exceed 1 to 2% and were not higher than those occurring during roasting in air.
6) In comparison with two-stage roasting, the one-stage process gives more uniformly roasted and sintered product, increases the output of the hearth reckoned in weight of ZnS treated per unit hearth area per unit time.
7) Application of air/oxygen mixture for roasting Pb-rich concentrates did not increase the rate of burning owing to the fact that these concentrates tend to fuse at comparatively low temperatures.
There are 5 figures, 5 tables and 11 references, 7 of which are Soviet, 3 English and 1 German.

ASSOCIATION: Severokavkazskiy gornometallurgicheskiy institut. Kafedra metallurgii tyazhelykh tsvetnykh metallov (North Caucasian Institute of Mining and Metallurgy. Chair of Heavy Non-ferrous Metals)

SUBMITTED: June 9, 1958

ANISIMOV, S.M.

18(6) PHASE I BOOK EXPLOITATION SOV/3199

Akademiya nauk SSSR. Institut obshchey i neorganicheskoy khimii im. N. S. Kurnakova

Analiz blagorodnykh metallov (Analysis of Noble Metals) Moscow, 1959. 193 p. Errata slip inserted. 2,700 copies printed.

Resp. Ed.: N. K. Pshenitsyn, USSR Academy of Sciences, Corresponding Member; and O. Ye. Zvyagintsev, Doctor of Chemical Sciences; Eds. of Publishing Houses: T. G. Levi, and D. N. Trifonov; Tech. Ed.: I. M. Guseva.

PURPOSE: This collection of articles is for scientists engaged in the study and analysis of the noble metals.

COVERAGE: This is a collection of articles on the analysis of the noble metals. It includes studies carried out by the Institute of General and Inorganic Chemistry im. N. S. Kurnakov (AN SSSR), as well as reports presented by scientific research organizations and by industrial enterprises at the Third and Fourth Conference on Noble Metals held in 1954 and 1957, respectively. The studies and reports describe new organic reagents for gravimetric determination of platinum metals, and physicochemical methods of analysis (spectrophotometric, polarographic and potentiometric). Special attention is given to spectral analysis for the determination of admixtures in alloys of platinum metals, silver, and gold, as well as in refined noble metals. The collection also includes analytical methods, tables and charts for materials containing metals of the platinum group, as well as a review of the literature on the analysis of platinum metals published in the last five years. No personalities are mentioned. References follow each chapter.

Anisimov, S. M.

18(6) PHASE I BOOK EXPLOITATION SOV/3153

Akademiya nauk SSSR. Institut obshchey i neorganicheskoy khimii im. N. S. Kurnakova

Analiz blagorodnykh metallov (Analysis of Noble Metals) Moscow, 1959. 193 p. Errata slip inserted. 2,700 copies printed.

Resp. Ed.: N. K. Pshenitsyn, USSR Academy of Sciences, Corresponding Member; and O. Ye. Zvyagintsev, Doctor of Chemical Sciences; Eds. of Publishing House: T. O. Levi, and D. N. Trifonov; Tech. Ed.: I. N. Guseva.

PURPOSE: This collection of articles is for scientists engaged in the study and analysis of the noble metals.

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ROZHKOV, P.I., laureat Stalinskoy premii, otv.red.; PSHENITSYN, N.K., retsenzent; ZVYAGINTSEV, O.Ye., prof., doktor khim.nauk, retsenzent; PRILEZHAYEVA, N.A., prof., doktor fiz.nauk, retsenzent; ANISIMOV, S.M., prof., red.; SHULAKOV, P.G., red.; SEMENOVA, N.Ya., red.; GUT'KOV, A.D., red.; DOLGIKH, V.I., red.; KAMAYEVA, O.M., red.izd-va; ISLENT'YEVA, P.G., tekhn.red.

[Methods of analyzing platinum metals] Metody analiza platinovykh metallov, zolota i serebra; sbornik nauchnykh trudov. Moskva, Gos.nauchno-tekhn.izd-vo lit-ry po chernoi i tsvetnoi metallurgii, 1960. 256 p. (MIRA 13:9)

1. Russia (1917- R.S.F.S.R.) Krasnoyarskiy ekonomicheskiy administrativnyy rayon. Sovet narodnogo khozyaystva. 2. Chlen-korrespondent AN SSSR (for Pshenitsyn).
(Platinum--Analysis) (Gold--Analysis)
(Silver--Analysis)

ANISIMOV, S.M.; OREKHOV, M.A.

Drying granulated concentrates and sinter cake by the suction of preheated air. Izv.vys.ucheb.zav.; tsvet.met. 3 no.2:74-79 '60. (MIRA 15:4)

1. Severokavkazskiy gornometallurgicheskiy institut, kafedra metallurgii tyazhelykh metallov.
(Ore dressing) (Sintering)

SERIKOV, Z.A.; ANISIMOV, S.M.

Alkali-sulfide method for the treatment of flue dust in lead refineries. Izv. vys. ucheb. zav.; tsvet. met. 3 no. 6:65-73 '60. (MIRA 14:1)

1. Severokavkazskiy gornometallurgicheskiy institut. Kafedra metallurgii blagorodnykh i redkikh metallov.
(Lead--Metallurgy) (Fly ash)

S/149/61/000/001/006/013
A006/A001

AUTHORS: Anisimov, S.M., Saval'skiy, S.L., Osipov, A.P.

TITLE: The Separation of Selenium and Tellurium From Platinum Metals in the Form of Trivalent Ferric Selenite and Tellurite

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Tsvetnaya metallurgiya, 1961, No. 1, pp. 101 - 105

TEXT: A method for the separation of selenium and tellurium from platinum metals used in analytical practice is based on their joint precipitation with ferric hydroxide (Ref. 1). This method was tested and described by M.F. Proshkovich and P.V. Faleyev (Ref. 2). The control of the full separation of selenium and tellurium from platinum metals would be facilitated and simplified, if there were data available on the solubility of trivalent ferric selenites and tellurites in hydrochloric acid solutions at different acidities and temperatures, and on the effect of ammonium chlorides on their solubility. If in hydrochloric acid solutions, containing tetravalent tellurium and trivalent iron, the amount of the latter is not sufficient to form ferric tellurite, tellurium dioxide may be precipitated if the solutions are neutralized. To bring about tellurium separation in

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The Separation of Selenium and Tellurium From Platinum Metals in the Form of Trivalent Ferric Selenite and Tellurite

the form of dioxide, the optimum pH value must be known at which its speeded up precipitation and the effect of ammonium chloride take place. Eventually, to obtain ferric selenite and tellurite precipitates, enriched with selenium and tellurium, the pH values must be selected, at which not only the coprecipitation of platinum metals but also that of some impurities (iron) can be prevented. The aforementioned problems were studied by the authors with the participation of Engineer K.S. Perel'muter. Ferric selenite was prepared by the interaction of ferric sulfate and sodium selenite by a method given in Reference 3, according to which the precipitate has a constant composition with a Fe:Se molar ratio corresponding to $Fe_2(SeO_3)_3$. The composition of the dry precipitate of Fe selenite obtained is expressed by the formulae $Fe_2(SeO_3)_3 \cdot 3H_2O$. Ferric tellurite was prepared by the interaction of 0.1 n. solution of sodium tellurite (pH = 1.1) with 0.3 n. solution of ferric sulfate. The molar Fe:Te ratio exceeded 2 - 3 times the stoichiometric ratio of these elements in the formula $Fe_2(TeO_3)_3$. The composition of the dry precipitate is expressed by the formula $Fe_2(TeO_3) \cdot H_2O$. The solubility of selenite and tellurite of trivalent iron was studied at 19, 40 and 70°C in hydrochloric acid solutions with pH = 1; 1.5; 2.0 and 2.5 and also in HCl solu-

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The Separation of Selenium and Tellurium From Platinum Metals in the Form of Trivalent Ferric Selenite and Tellurite

tions containing 10% NH_4Cl with pH = 1 and 2.5, at 19°C. It was found that the solubility of ferric tellurites and selenites decreased with a lower acidity of the solutions; it was higher in HCl solutions with 10% ammonium chlorides. At elevated temperatures in HCl solutions with pH = 1, a slight increase of trivalent ferric selenite and tellurite solubility takes place. In saturated solutions with pH 1.5, 2.0 and 2.5, the Te, Se : Fe ratio increases. To investigate the stability of HCl solutions of tetravalent tellurium, two initial solutions were prepared by dissolving TeO_2 in HCl. The former had a pH value of 0.85 and contained 0.98 mg/ml Te; the latter contained 2 mg/ml Te and 50 g/l NH_4Cl with a pH value equal to 0.5. It was found that the precipitation of tellurium dioxide from HCl solutions of tetravalent tellurium proceeded already at a pH value of 0.5 and attained a maximum rate at pH = 5.3 - 5.4. The precipitation of tellurites and selenites of trivalent iron from HCl solutions containing free HCl, NH_4Cl and ammoniates of platinum, palladium rhodium, ruthenium, iridium was investigated at their neutralization with soda. The initial solution was composed of Se - 665; Te - 766; Fe - 708; Pd - 69; Pt - 40; Re - 50; Ru - 30, and Ir - 30 (mg/l). The results

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The Separation of Selenium and Tellurium From Platinum Metals in the Form of Trivalent Ferric Selenite and Tellurite

obtained show that optimum conditions for the precipitation of tellurites and selenite are pH values of 2.3 - 2.5 and a 90% excess of iron against the stoichiometric amount. Under these conditions tellurium extraction attained 97.5% and selenium extraction 95.4%. The ferric selenite and tellurite precipitates separated out of solutions, at a pH value of 2.28, contained 215 g/t platinum, 460 g/t palladium, and 59 g/t rhodium or 3.7; 4.6 and 5.1% respectively of their content in the initial solution. The precipitate contained very small amounts of ruthenium and iridium. There are 2 tables and 6 Soviet references.

ASSOCIATIONS: Severokavkazskiy gornometallurgicheskiy institut (North Caucasian Institute of Mining and Metallurgy); Kafedra metallurgii tyazhelykh tsvetnykh metallov (Department of Metallurgy of Heavy Non-Ferrous Metals)

SUBMITTED: July 4, 1960

Card 4/4

ANISIMOV, S.M.; NEKRASOV, B.D.; PETRENKO, V.I.

Stage flotation of unyielding gold-bearing ores. Izv. vys. ucheb. zav.; tsvet. met. 5 no.2:50-55 '62. (MIRA 15:3)

1. Severokavkazskiy gornometallurgicheskiy institut, kafedra metallurgii redkikh i blagorodnykh metallov.
(Gold ores) (Flotation)

ANISIMOV, S.V.; PETRENKO, V.I.

Behavior and separation of impurities during the thermal dissociation of silver nitrate. Izv. vys. ucheb. zav.; tsvet. met. 8 no.5:61-65 '65. (MIRA 18:10)

1. Severokavkazskiy gornometallurgicheskiy institut, kafedra metallurgii blagorodnykh i redkikh metallov.

ANISIMOV, S.M.; SVISTUNOV, N.V.; ASTAKHOVA, Ye.P.

Gold flotation out of pure quartz placer ores. TSvet. met. 38 no.11:45-50 N '65. (MIRA 18:11)

ANISIMOV, S. N.

Anisimov, S. N. "A self-actuated rotor for a synchronous motor," Trudy Leningr. politekhn. in-ta im. Kalinina, 1948, No. 3, p. 217-30.

SO: U-3736, 21 May 53, (Letopis 'Zhurnal 'nykh Statey, No. 18, 1949).

ANISIMOV, S.S., inzh.; DARAGAN-SUSHCHOV, V.I., inzh.

New audiometers. Bezop. truda v prom. 2 no.11:25-27 N '58. (MIRA 11:11)
(Audiometer) (Ultrasonic waves--Industrial applications)

88715

S/127/60/000/006/007/007
B012/B054

9.6110

AUTHORS: Anisimov, S. S., and Daragan-Sushchov, V. I.

TITLE: New Method of Determining Atmospheric Pollution With Dust

PERIODICAL: Gornyy zhurnal, 1960, No. 6, p. 74

TEXT: From 1957 - 1959, the Tsentral'naya nauchno-issledovatel'skaya laboratoriya (TsNIL) Gosgortekhnadzora (Central Scientific Research Laboratory (TsNIL) of the Gosgortekhnadzor) developed a dust counter which is based on the capability of the acoustic field of changing its parameters in dependence on the change of physical constants of the air investigated. An acoustic field is formed in the production of elastic vibrations by the respective sound or ultrasound vibrator in the direction of the analogous receiver in the gas medium investigated. If the distance between vibrator and receiver is equal to $\lambda/2$ (half wave) or its multiple, a "standing wave" is formed. This state is caused by the physical atmospheric state, the frequency of elastic vibrations, the distance between vibrator and receiver, and corresponds to the maximum energy output on the receiver

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New Method of Determining Atmospheric Pollution With Dust

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element. On the introduction of components changing the physical atmospheric state (especially dust), the parameters of the standing wave are redistributed, and less energy is put out on the receiver element. The degree of disturbance, and thus the change in emf on the receiver, can be expressed in mg/m^3 on the dial of the indicator. Such a device (produced at the TsNIL) comprises an electronic vibrator (generating vibrations of 5 - 6 kc/sec), an acoustic working chamber, an acoustic compensation chamber (to eliminate the effect of temperature changes) with transmitters, an electronic differential amplifier, an indicator, and a filter. The air-intake system is equipped with a rubber balloon. The electronic part of the device is composed of semiconductors. OP-4 (OR-4) mercury oxide elements are used as feeding source. The device weighs about 1.5 - 2 kg. Its sensitivity can be changed according to the frequency used and the distance chosen. The smallest amount of dust measurable is 10 - 20 mg/m^3. After appropriate reconstruction it would be possible to record the dust content continuously. Tests of the device in the dust plants of the Institut gigiyeny truda i profzabolevaniy AMN SSSR (Institute of Labor Hygiene and Professional Diseases of the Academy of Medical Sciences USSR) showed the

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New Method of Determining Atmospheric Pollution With Dust

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B012/B054

high sensitivity of the device. Work is being done at present to simplify the design, increase the dependability, and reduce the weight of the device.

ASSOCIATION: Tsentral'naya nauchno-issledovatel'skaya laboratoriya Gosgortekhnadzora RSFSR (Central Scientific Research Laboratory of the Gosgortekhnadzor RSFSR)

Card 3/3

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000101620019-1"

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24.1900 2209, 1160, 1147

S/032/60/026/012/011/036
B020/B056

AUTHORS: Daragan-Sushchov, V. I. and Anisimov, S. S.

TITLE: An Acoustic Method of Gas Analysis

PERIODICAL: Zavodskaya laboratoriya, 1960, Vol. 26, No. 12, 1368-1369

TEXT: From the various methods basing upon the measurement of acoustic quantities, the authors chose the measurement of the change in the propagation velocity of acoustic oscillations in air under atmospheric conditions as depending on the change of the density of the gas-air medium effected by various impurities (especially CH_4). The physical basis of the method is the fact that the propagation rate of sound in a gas mixture is between the respective rates in the pure gases. The velocity of sound in a gas is expressed by the equation

$$V = \sqrt{(p/\varrho)\cdot\gamma},$$

where γ is the ratio of the individual specific heats, p the gas pressure, and ϱ the density. With a sound source emitting sound waves in the direc-

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the phase shift is sensitive to small [illegible]

The device constructed consists of an oscillation transmitter and a receiver of acoustic oscillations made of piezoceramics, which are both located in a 5 cm^3 chamber. By means of an electron generator, a voltage having a frequency of 165 kcps is applied to the transmitter. The electric signal is transformed into elastic oscillations of the same frequency, which

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tion of the surface of the receiver which is located at a distance d from the sound generator, the relation $t_1 = d/V_1$ holds for the time required by the soun to cover this distance, where V_1 is the propagation rate of sound in the gas mixture. If another gas is used, the propagation rate is V_2, and in that case the relation $t_2 = d/V_2$ holds for t_2, and the relation $\Delta t = t_1 - t_2 = d(1/V_1 - 1/V_2)$ for the difference in time, where the difference in time is expressed as the phase angle between the transmitted and the received signal by the relation $\theta = 2\pi f\Delta t = 2\pi fd(1/V_1-1/V_2)$, where f denotes the oscillation frequency. The method used for measuring the phase shift is sensitive to small concentrations of the gas impurities. The device constructed consists of an oscillation transmitter and a receiver of acoustic oscillations made of piezoceramics, which are both located in a 5 cm^3 chamber. By means of an electron generator, a voltage having a frequency of 165 kcps is applied to the transmitter. The electric signal is transformed into elastic oscillations of the same frequency, which cause an electric signal on the surface of the receiver element; this

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signal is amplified and transmitted to an indicator. At a distance of $\lambda/2$ between transmitter and receiver, a standing wave is formed, whereby the maximum e.m.f. on the surface of the receiver is generated. By changing the composition of the gas mixture, the density of the gas medium and thus also the wave length is changed. This leads to a change in the signal phase, and to a decrease of the energy in the receiver. The scale may be calibrated in percents of the measured gas. The block diagram of the ultrasonic gas analyzer is shown in the figure. The electrical part of the device consists of semiconductor triodes П6Б (P6B) and is fed by the elements ОР-4 (OR-4). Several variants of this device are described. There is 1 figure.

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