

Rod, Vladimir

CZECH

Heat transfer during evaporation in jacketed vessels.  
Jan Marek and Vladimir Rod (Chemoprojekt., Prague).  
Chem. Listy, 1969, 1-6, 1133. Dimensionless relations are  
derived for computing the evapn. in jacketed vessels with  
various types of bottoms. Plots of these relations are given  
to facilitate calcs. at const. and variable temp. E. E.

①  
Smul  
2005

DEM'YANENKO, D.M.; KOROZA, V.I.; RODA, A.A.; SOLOV'YEV, L.S.

Applicability of analog computers for calculating electron  
trajectories in linear accelerators. Uskoriteli no.5:91-95  
'63. (MIRA 17:4)

CERVENKA, J.; RODA, J.; PALANOVA, A.; SOLTESOVA, A.

Contribution to early serological diagnosis of typhus. Cesk.  
epidem. 12 no.5:287-289 S '63.

1. Serova banka pri Ustave epidemiologie a mikrobiologie v  
Prahe.

(TYPHUS) (IMMUNOELECTROPHORESIS)  
(PRECIPITIN TESTS) (SHWARTZMAN PHENOMENON)

MASAR, I.; MILOSOVICOVA, A.; PUCEKOVA, G.; RODA, J.

Characteristics of the outbreak of infectious hepatitis in  
Slovakia in 1961. Cesk. epidem. 12 no.3:145-152 My '63.

1. Odbor SNR pro zdravotnictvo, Bratislava, Krajske hygienicko-  
epidemiologicke stanice Kosice, Bratislava, Banska Bystrica.  
(HEPATITIS, INFECTIOUS) (GAMMA GLOBULIN)

RODA, J

RODA J.

Plan vybudovania zdravotnej starostlivosti v ťazkom priemysle.  
/Plan for health protection in heavy industry/ Sloven. lekar 12:6  
June 50 p. 287-8.

1. NAI  
GLML Vol. 20, No. 2 Feb 1951

RODA, L.

New system of diffusion battery communication. Sakh. prom. 31 no.1:  
63-64 Ja. '57. (MIRA 10:4)

1. Karlovskiy mashinostroitel'nyy zavod.  
(Diffusers)

RODA, S.

Exploration of the Silica Caves system. p. 185. KRASY SLOVENSKY.  
Bratislava. Vol. 31, no. 6, June 1954.

SOURCE: East European Accessions List. (EEAL) Library of Congress.  
Vol. 5, No. 3, August 1956.

RODAK, G. D.

RODAK, G. D.: "Investigation of tempering under a press, combined with regulation of the polished valve plate of compressors." Min Higher Education USSR. Central Asia Polytechnic Inst. Tashkent, 1956. (Dissertation for the Degree of Candidate in Technical Sciences.)

Source: Knizhnaya letopis' No 40 1956 Moscow



CZECHOSLOVAKIA

RODAK, L.; KRSEJCI, J.; Research Institute of Veterinary Medicine,  
(Vyzkumny Ustav Veterinarniho Lekarstvi), Brno.

"Cytological and Histochemical Investigation of Postembryonic  
Development of Bursa Fabricii in Chickens."

Prague, Ceskoslovenska Fysiologie, Vol 15, No 5, Sep 66, p 390

Abstract: Experiments were conducted on 48 New Hampshire chickens aged  
up to 28 days. In 1 day old chickens the follicles of Bursa Fabricii  
were formed by medullary cells of epithelial origin. In 5-9 day old  
chickens characteristic changes in the follicular medulla occurred. The  
medullary cells were transformed into cells of the lymphatic series.  
The weight of the Bursa in 28 day old chickens was 30 times that of 1  
day old, while the total body weight increased only 5 times. No references.  
Submitted at 3 Days of Physiology of Domestic Animals at Liblice, 10 Dec  
65.

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- 92 -

"The Scattering of Non-Monochromatic Radiation on Stray Heterogeneities".

report presented at the All-Union Conference on Statistical Radio Physics,  
Gor'kiy, 13-18 October 1958. (Izv. vyssh uchev zaved-Radiotekh., vol. 2,  
No. 1, pp 121-127) COMPLETE card under SIFOROV, V. I.)

SOV/109-4-3-8/38

AUTHORS: M.I. Rodak and A.V. Frantsesson

TITLE: Application of the Turbulence Theory to the Scattering of Radiowaves at Wandering Irregularities (O primeneni teorii turbulentnosti k rasseyaniyu radiovoln na bluzhdayushchikh neodnorodnyakh)

PERIODICAL: Radiotekhnika i Elektronika, 1959, Vol 4, Nr 3, pp 398-403 (USSR)

ABSTRACT: In an article published in this journal, G. S. Gorelik (Ref 1) obtained the following formula for the correlation function of the electromagnetic field scattered by means of a cloud of wandering irregularities (scatterers):

$$\overline{EE'} = \overline{E(t) E(t+s)} = \frac{N}{2} \overline{\cos k \Delta_s \xi} \cos \omega_0 s, \quad (1)$$

where  $k = 2k_0 \sin \frac{\theta}{2}$ ;  $k_0$  and  $\omega_0$  are the wave number and frequency of the radiated wave;  $\theta$  is the scattering angle,  $\Delta_s \xi$  is the  $\xi$ -projection of the displacement of a scatterer during a time  $s$ ; and  $N$  is the number of scatterers. If the scattered field is represented in the form:

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SOV/109--4-3-8/38

Application of the Turbulence Theory to the Scattering of Radio-waves at Wandering Irregularities

$$E(t) = X(t) \cos \omega_0 t + Y(t) \sin \omega_0 t,$$

the correlation function of the field amplitude components is expressed by Eq (2). On the other hand, G.S. Gorelik showed (Ref 2) that the correlation function for the intensity of the scattered field is given by Eq (3). The aim of this paper is to find a relationship between the above formulae and the general principles of the turbulence theory. It is assumed (Ref 3) that a turbulent atmosphere contains large-scale whirls (winds) having dimensions of the order  $L$  and small-scale winds having dimensions  $\ell$ . For the region where the local turbulence is much smaller than  $L$  and much greater than  $\ell$ , the so-called structural function for  $D(\rho)$  for the field of turbulent velocities is expressed by Eq (4), where  $v_q$  is the projection of the velocity at a point  $r$  on to an arbitrary direction  $q$ ;  $b = 1.45$ ,  $\epsilon_q$  is a coefficient of the order of 1 and  $\epsilon$  is the average velocity of the energy dissipation per unit mass. It is usually assumed that in the troposphere  $L$  is of the order of 100 m or more, while  $\ell$  is of the order of

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SOV/109- - 4-3-8/38

## Application of the Turbulence Theory to the Scattering of Radio-waves at Wandering Irregularities

a few cm. It is shown that in the region where  $L \gg \lambda$ , Eqs (1) and (2) can be written as Eq (7). When calculating the correlation function for the intensity of the scattered field it is first necessary to determine the probability function  $w\{\Delta_s(\xi_i - \xi_j)\}$

which is dependent on the shape and the dimensions of the scattering volume. This probability function can be regarded as being in the form of the normal distribution (Refs 4,5); this leads to Eq (8). The function  $p(\rho)$  of Eq (8) can be in the form of either of the last two equations on page 401;  $r^2$  is the spread of the scatterers with respect to the scattering volume, while  $R$  is the radius of the sphere having a uniform density distribution; the function  $p(\rho)$  is the probability density of finding two particles from the scattering volume at a distance  $\rho$ . It is shown that if  $\rho \gg \lambda$  and  $R \gg \lambda$  the intensity correlation function can be written as Eq (13). In its final form this can be expressed as Eq (14). By comparing the spectra of the

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SOV/109-1-4-3-8/38

Application of the Turbulence Theory to the Scattering of Radio-Waves at Wandering Irregularities

amplitude components of the scattered field and the spectrum of the field intensity it is found that the width of the latter is smaller than that of the amplitude spectrum, when the cloud of the scatterers is smaller than the external dimension of the turbulence  $L$ . The effect becomes pronounced if the dimensions of the scattering volume are reduced. On the other hand, when the dimensions of the cloud are much greater than  $L$ , the effect disappears entirely. The work described was done under Dr. G.S. Gorelik, who died soon after the manuscript was submitted to the editor of the journal. There are 6 references, 5 of which are Soviet and 1 English; one of the Soviet references is translated from English.

Card 4/4

SUBMITTED: July 8, 1957

S/058/61/000/010/044/100  
A001/A101

AUTHORS: Briskina, Ch.M., Zolin, V.F., Rodak, M.I.

TITLE: On calculating paramagnetic resonance in chrome cyanide

PERIODICAL: Referativnyy zhurnal.Fizika, no.10, 1961, 163, abstract 10V357 (V  
sb. "Paramagnitn. rezonans", Kazan', Kazansk. un-t, 1960, 13-14)

TEXT: On the basis of the known Hamiltonian, the authors calculate the energy spectrum of Cr cyanide and combinations of matrix elements of spin components, necessary for determining intensity of paramagnetic absorption. The calculation was performed with a BESM (BESM) computer for fields up to 5,000 oersted (with intervals of 250 oe) and for variation in the orientation of the magnetic field relative to the crystal axis from 0 to 90° (with intervals of 5°).

[Abstracter's note: Complete translation]

Card 1/1

83257

S/109/60/005/009/002/026  
E140/E455

9.9300

AUTHOR: Rodak, M.I.

TITLE: On the Scattering of Non-Monochromatic Radiation by  
Stray Inhomogeneities <sup>19</sup>

PERIODICAL: Radiotekhnika i elektronika, 1960, Vol.5, No.9,  
pp.1370-1379

TEXT: The work was carried out in 1957 in the laboratory of G.S.Gorelik at the Institute of Radio Engineering and Electronics, Academy of Sciences USSR. The work constitutes a further generalization of the theories developed in Ref.1 to 5, consisting in the removal of the monochromaticity condition. Scattering from a cloud of N particles is considered; the particles are assumed identical in their mechanical and electrodynamical properties, with fairly great distances from the receiver and transmitter to the cloud. The scattered field is considered as a sum of processes with fluctuating delay time, a concept which appears quite convenient for calculation of the correlation function of the scattered signal. It is assumed that for the field scattered from a single motionless particle there exists a generalized correlation function, constituting the time-average of  
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S/109/60/005/009/002/026  
E140/E455

On the Scattering of Non-Monochromatic Radiation by Stray  
Inhomogeneities

the ordinary (statistical) correlation function. The scattered fields thus belong to a very broad class, including regular processes (for example, almost periodic) and stationary random processes, or their combination. In general, it is a random process with stationary variations of the statistical characteristics. The scattered field is a non-stationary random function of a non-stationary random argument, which also belongs to this class of processes. The correlation functions of the scattered field are then calculated on the basis of these assumptions. Three cases are considered: 1) the simplest case, where the scattering elements are fixed at definite (not random) points of space; 2) the case where the particles are distributed at random and their positions are independent, while their velocities are either given constant magnitude or are stationary random processes; 3) the case where the probability densities of the delays are assumed practically constant over a range  $1/\omega$  existing in the signal spectrum. It is found that

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On the Scattering of Non-Monochromatic Radiation by Stray  
Inhomogeneities

with stray motion of the scattering elements the correlation functions of the scattered field constitute the weighted sum of the correlation functions (spectra) corresponding to monochromatic signals. In contrast to the case of scattering from thick particles, scattering from randomly moving particles under assumption 3 above, causes the cross-modulation terms to vanish at each frequency. In these considerations the only characteristic of the incident field was its correlation function (spectrum). Note: On p.1370  $E_0(t)$  is defined as the field scattered from a single fixed particle. However, since the medium is assumed homogeneous and dispersionless, the author terms it the incident signal. The correlation functions of scattered field intensity are then calculated. The scattered field is assumed stationary. The calculations are first carried out for a fairly large scattering cloud, such that the fields scattered from various particles at different moments of time are statistically independent quantities. (This is the strong condition, in contrast to the condition discussed above in which the signals are merely

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On the Scattering of Non-Monochromatic Radiation by Stray  
Inhomogeneities

uncorrelated, called the weak condition.) Two cases are  
considered: in one the incident signal is a stationary random  
process whilst the other contains a regular, non-stationary  
process. Several cases are treated, after which the weak  
condition is considered. The author concludes with two remarks  
on collecting the statistics necessary to determine the parameters  
actually existing in the physical case. There are 9 Soviet  
references. X

ASSOCIATION: Institut radiotekhniki i elektroniki AN SSSR  
(Institute of Radio Engineering and Electronics,  
AS USSR)

SUBMITTED: January 3, 1960

Card 4/4

24878  
S/109/61/006/007/018/020  
D262/D306

24,7700

AUTHOR: Rodak, M.I.

TITLE: Evaluation of polarizations of alternating magnetic fields corresponding to the greatest probabilities of transition in electronic paramagnetic resonance.

PERIODICAL: Radiotekhnika i elektronika, v. 6, no. 7, 1961, 1194 - 1201

TEXT: The problem of choosing the proper polarization of the alternating magnetic field which transforms the probability of the studied transition into maximum or zero, reduces to determining the ellipse of the spin or to the evaluation of corresponding matrix elements  $S_x$ ,  $S_y$ ,  $S_z$ . This is so if the crystal elementary cell contains only one magnetic complex. If there are several magnetic complexes with different spin ellipses (complex vectors  $\vec{S}$ ) in the crystal, the problem of the greatest transition probability, for the crystal as a whole, requires additional analysis and such an ana-  
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24878

S/109/61/006/007/018/020  
D262/D306

Evaluation of polarizations ...

lysis is presented in the present article by the author. It is first shown that for certain directions of constant magnetic field  $H_0$  the position of the spin ellipse can be predicted without actually evaluating the matrix elements  $S_x$ ,  $S_y$ ,  $S_z$ . Taking e.g. the well known ruby ( $Cr^{3+}$  in corundum  $Al_2O_3$ ), emerald ( $Cr^{3+}$  in  $Be_3Al_2Si_6O_{18}$ ) or other crystals with axial symmetry of magnetic properties, the z axis is usually directed along the crystallographic axis with the x or y axes in the plane  $H_0Z$ . Calculations confirm that the plane of spin ellipse and its main axis are perpendicular to the plane  $H_0Z$  as shown by reasoning in the article. In the case of a two-complex crystal, if both are present in the crystal in the same amount, the probability of transition for the whole crystal will be the sum (with weight  $1/2$ ) of two expressions

$$P_{mn} \sim |\vec{h} \cdot \vec{S}|^2 = (h_x S_x + h_y S_y + h_z S_z) (h_x S_x + h_y S_y + h_z S_z), \quad (1)$$

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S/109/61/006/007/018/020  
D262/D306

Evaluation of polarizations ...

in coordinates  $x, y, z$  and  $x', y', z'$  of magnetic axis of both complexes respectively. As a concrete case crystal  $K_3Co(CN)_6$  with added paramagnetic ion  $Cr^{3+}$  hereinafter called chromium cyanide, is considered. In this type of crystals the constant magnetic field  $\vec{H}_0$  is usually applied in the symmetry planes  $ac$  or  $bc$ . For each case the direction of coordinate axes (along the magnetic axes) should be chosen in such a manner that the axes of different complexes are symmetrical with respect to the field  $\vec{H}_0$ . The conditions of greatest probability of transition reduces to finding the complex directional cosines of the field (hexads of numbers  $h_{1a}, h_{2a}, h_{1b}, h_{2b}, h_{1c}, h_{2c}$ ) which correspond to the maximum of quadratic polynomial  $f$  in the RHS of

$$\begin{aligned} P_{mn} &\sim \frac{1}{2} |\vec{h} \cdot \vec{S}|^2 + \frac{1}{2} |\vec{h}' \cdot \vec{S}'|^2 = \\ &= f(h_{1a}, h_{2a}, h_{1b}, h_{2b}, h_{1c}, h_{2c}) = \\ &= M |h_a|^2 + N |h_b|^2 + \end{aligned} \quad (3)$$

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D262/D306

Evaluation of polarizations ...

$$\begin{aligned}
 &+ |S'_y|^2 |h_c|^2 + S (h_{1a}h_{1c} + h_{2a}h_{2c}) + \\
 &+ S' (h_{1b}h_{2c} - h_{1c}h_{2b}) + \\
 &+ S'_{xz} (h_{1b}h_{2a} - h_{1a}h_{2b}),
 \end{aligned} \tag{3}$$

with condition

$$\varphi (h_{1a} \dots h_{2c}) = h_{1a}^2 + \dots h_{2c}^2 - 1 = 0; \tag{4}$$

This problem of determining the relative (conditional) extremum requires that all six partial derivatives of the complementary function  $\varphi$  of parameter  $\lambda$  be zero;

$$\Phi = f - \lambda \varphi.$$

Two cases of relative positions of spin ellipses are considered and it is shown that in chromium cyanide only these two cases exist. Case A. Spin ellipses of both complexes are in the same plane, per-

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14878

S. 139 61/006/007/018/020  
D262, D306

Evaluation of polarization ...

pendicular to the plane a.c. Case B. The spin ellipses of both complexes are not in the same plane but intersect along the major axis in plane a.c. Combinations of matrix elements were calculated on a BUNCH(BESM) [Abstractor's note: Presumably an electronic computer] and proved Eq. (11)

$$2S \cdot S_{xz} (M = \sqrt{S_x^2 + S_y^2}) = S(S_{xz}^2 - S^2) \quad (11)$$

to be accurate for this type of crystal. Calculations for other two and multi-complex crystals, with constant magnetic field in the symmetry plane, gave more or less similar results. Thus the crystal  $TiCl_2$  with added  $Cr^{3+}$  (Ref. 7: H.I. Gerritsen, S.E. Harrison, H.R. Lewis, I.P. Wittke, Phys. Rev. Letters, 1959, 2, 4, 153) has two magnetic complexes with a common z-axis, rotated with respect to each other by  $90^\circ$ , i.e.  $\xi = \eta = 45^\circ$  and the given formulae would with some changes apply also to this case. For an anisotropic gyromagnetic ratio g the results are still valid if the spin vector  $S$  is replaced everywhere by the magnetic moment vector  $\mu$ .

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24878

S/109, 61, 006/007/018/020  
D262/D306

X

Evaluation of polarizations ...

The author acknowledges the interest of M. E. Zhabotinskiy and the help in the experiment of Ch. M. Briskina and of V. F. Solin. There are 4 figures and 7 references: 2 Soviet-bloc and 5 non-Soviet-bloc. The references to the 4 most recent English-language publications read as follows: E. O. Schulz - Du Bois, Bell System Techn. J., 1959, 38, 1, 271; E. O. Schulz - Du Bois, E. D. Scovill, R. W. Degrasse, Bell System Techn. J., 1959, 38, 2, 335; I. M. Baker, B. Bleaney, K. D. Bowers, Proc. Phys. Soc. B, 1956, 69, pt 12, 444, 1205; H. I. Gerritsen, S. E. Harrison, H. R. Lewis, I. P. Wittke, Phys. Rev. Letters, 1959, 2, 4, 153.

SUBMITTED: July 26, 1960

Card 6/6

L 43943-65 EEC(b)-2/EWT(1)/T P1-4 IJP(c) GG

ACCESSION NR: AP5006872

8/0181/65/007/003/0717/0721

AUTHOR: Mash, I. D.; Rodak, M. I.

25  
34  
B

TITLE: Appearance of cross relaxation and spectrum of exchange-coupled ion pairs  
in paramagnetic crystals 21

SOURCE: Fizika tverdogo tela, v. 7, no. 3, 1965, 717-721

TOPIC TAGS: cross relaxation, exchange coupling, paramagnetic crystal, nuclear magnetic resonance, electron paramagnetic resonance, spin spin temperature

ABSTRACT: Manifestations of cross relaxation are analyzed with account of the possibility of changing the spin-spin temperature, which was demonstrated first by B. M. Provotorov (ZhETF v. 42, 882, 1962). By analyzing the equations of "pure" cross relaxation (neglecting relaxation in the lattice) it is shown that the tendency to equalization of the temperatures of the interacting transitions appears only if these transitions are close to being equidistant or of integer multiplicity; in all other cases the cross relaxation is manifest only in a strong change in the spin-spin temperature. An experimental confirmation is found from recent NMR experiments with LiF (Jeener et al., Phys. Rev. 133, A 478,

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L 43943-65

ACCESSION NR: AP5006872

1964). An analysis of EPR experiments in paramagnetic crystals also leads to the hypothesis that ion pairs coupled by exchange interaction make a contribution to cross relaxation. An exact calculation (without the use of perturbation theory) is made of the energy spectrum of such pairs for ruby in a magnetic field parallel to the crystal axis. Orig. art. has: 1 figure and 2 formulas.

ASSOCIATION: Institut radiotekhniki i elektroniki AN SSSR, Moscow (Institute of Radio Engineering and Electronics, AN SSSR)

SUBMITTED: 22Jul64

ENCL: 00

SUB CODE: NP, SS

NR REF SOV: 006

OTHER: 002

Card 2/2 *mb*

RODAK, M.I.

Possible consequences of a change in the spin-spin temperature of a spin system in a solid body. Fiz. tver. tela 6 no. ~~2~~ 21-528 F '64. (MIRA 17:2)

1. Institut radiotekhniki i elektroniki AN SSSR, Moskva.

RODAK, M.I.

Calculation of cross relaxation in paramagnetic crystals. Radiotekh.  
i elektron. 8 no.6:964-966 Je '63. (MIRA 16:7)  
(Crystals--Electric properties)

RODAK, M.I.

Effect of magnetic resonance saturation on cross relaxation.  
Zhur. eksp. i teor. fiz. 45 no.3:730-733 S '63. (MIRA 16:10)

1. Institut radiotekhniki i elektroniki AN SSSR.  
(Nuclear magnetic resonance and relaxation)

I 10001-63  
PI-4--IJP(C)

EWT(1)/BDS--APFTC/ASD/ESD-3--

ACCESSION NR: AP3000993

S/0109/63/008/006/0964/0966

AUTHOR: Rodak, M. I.

58

TITLE: Calculation of cross-relaxation<sup>2</sup> in paramagnetic crystals

SOURCE: Radiotekhnika i elektronika, v. 8, no. 6, 1963, 964-966

TOPIC TAGS: cross-relaxation probability, paramagnetic crystals, spin Hamiltonian, solid-state masers

ABSTRACT: A general formula, convenient for computation, is suggested for the matrix element of the spin-interaction energy, whose square is proportional to the cross-relaxation transition probability. By taking the matrix element as a whole, its square is reduced to the matrix element of the magnetic-moment operator between the initial and final states of the spin under consideration. In the few simple cases considered the general formula gives proper results or reduces to known expressions. In the more general case of strong mixing of spin

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L 10001-63  
ACCESSION NR: AP3000993

states, such as is usually found in solid-state masers, this formula makes it possible to determine the square of the energy matrix element from the matrix elements of the magnetic-moment operator and of the spin operator, provided all the radii vectors connecting the interacting spins are known. It is shown that the spin pairs located along the magnetic field or in a plane perpendicular to it do not contribute to the cross-relaxation. In such cases the cross-relaxation time for different adjoining spin pairs is equal to infinity, and, therefore, such pairs should not be taken into account in actual calculation. Orig. art. has: 4 formulas.

ASSOCIATION: none

SUBMITTED: 08Jun62

DATE ACQ: 01Jul63

ENCL: 00

SUB CODE: 00

NO REF SOV: 002

OTHER: 002

*elm/or*  
Card 2/2



RODAK, M. I.

USSR/Physics - Amplification

FD-2828

Card 1/1            Pub. 153-11/30

Author            : Rodak, M. I.

Title             : Computation of Thermal Electron Motion in a Double Beam Amplifier

Periodical        : Zhur. Tekh. Fiz, 25, 644-648, 1955

Abstract          : The effect of thermal electron motion on amplification in a two velocities electron beam is analyzed. The thermal electron scattering according to velocities is expressed by a distribution function of maxwellian type. The thermal scattering is found to decrease the range of amplified frequencies and the amplification factor. High thermal scattering destroys amplification. Five USSR and 2 foreign references.

Institution       :                   

Submitted         : October 6, 1955

ACC NR: AP6036891 (✓) SOURCE CODE: UR/0226/66/000/011/0001/0006

AUTHOR: Brynza, A. P.; Rodak, Yu. P.

ORG: Dnepropetrovsk State University (Dnepropetrovskiy gosudarstvennyy universitet)

TITLE: Atmospheric corrosion of cobalt powder

SOURCE: Poroshkovaya metallurgiya, no. 11, 1966, 1-6

TOPIC TAGS: corrosion, cobalt powder, cobalt powder corrosion, atmospheric humidity, metal oxidation

ABSTRACT: An investigation was made to determine the granulometric composition and specific surface of cobalt powder obtained by the cathodic reduction of basic cobalt carbonate. The powder is found to have a highly developed surface. The powder granules consist of finer particles 0.5—1.0  $\mu$  in size. The atmospheric corrosion of cobalt powder has been investigated in the presence of sulfur dioxide and without it. It is established that the sulfur dioxide decreases the value of critical humidity from 75—80 to 20%. The aggressive effect of sulfur dioxide increases with an increase in relative humidity, as well as the

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ACC NR: AP6036891

degree of oxidation and the specific surface of the powder. The corrosion of the powder with time in the presence of sulfur dioxide follows a parabolic pattern shown in the formation of protective films consisting of corrosion produced on the powder's surface. The effect of sulfur dioxide on the corrosion of cobalt powder and metals of the iron group is conditioned both by the acceleration of the cathodic process and by the oxidation of  $SO_2$  to sulfuric anhydride, followed by the formation of sulfuric acid which destroys the protective films on the metals. Orig. art. has: 6 figures and 2 tables. [Based on authors' abstract] [NT]

SUB CODE: 11/ SUBM DATE: 15Jan66/ ORIG REF: 010/

Card 2/2

GALUSHKO, V.P.; ZAVGORODNYAYA, Ye.F.; RODAK, Yu.P.

Cathodic reduction of some sparingly soluble cobalt compounds.  
Zhur. prikl. khim. 38 no. 10:2349-2351 0 '65. (MIRA 18:12)

1. Dnepropetrovskiy gosudarstvennyy universitet imeni 300-letiya  
vossoyedineniya Ukrainy s Rossiyey. Submitted Nov. 12, 1963.

SHOMOVA, Ye.A., RODAVSKIY, V.P.; KHASKIN, I.G.

Fungicidal activity of some aromatic derivatives of trichloroacetamide. Mikrobiologiya 34 no.4:715-719 J1-Ag '65.

(MIRA 18:10)

RODBACH, I. V.

Pavlov, I. M.; Ganin, N. P.; Rodbach, I. V.; Kapustina, M. I.  
"Electric Contact Method of Determining Rate of Rolling of Metal."  
Zavod Lab., No. 9, 1074-1076, 1950.

RODBAN, V.

Both judges and friends. Sov. profsoiuzy 13 no.2:34-35 Ja  
'62. (MIRA 15:4)

1. Predsedatel' tovarishcheskogo suda mashinostroitel'nogo zavoda  
imeni Dzerzhinskogo, g. Paku.  
(Baku--Later courts)

RODBERG, G.M., inzh.; RAKOV, E.D., inzh.

Introducing multiple machining of parts. Mashinostroenie no.3:7-10  
My-Je '62. (MIRA 15:7)

1. Zavod "Odesspoligrafmash".  
(Machine-shop practice)



USSR/Engineering  
Mines and Mining - Equipment  
Loading Equipment  
Sep 1947

"Operation of Loading Machinery at the Shafts of the Artem Coal Combine," S. S. Rodbort, K. Ya. Timofeyev  
Engrs, Gorlovka, 31 pp

"Ugol'" No 9 (258)

These workings were slightly mechanized at this combine in prewar days. Only in the days directly preceding the war were mechanized means of loading adopted at this location. The first such loading machinery type PB-1 was installed at shafts No 1 and 2 of the Orzhonikidze Coal Trust and shafts No 4

24746

USSR/Engineering (Contd)

Sep 1947

and 5 of the Gorlovka Coal Trust. This machine has proved to be one of the more efficient ones (developed by M. A. Bratslavskiy, Engr). The UMP-1 loading machine which has received limited use is not as efficient as the PB-1 and is not recommended. Pneumatic machinery is the best type to use where the shafts go down more than 500 meters.

PA 24746

24746

RODBORT, S. S.

PA 61T81

USSR/Mines and Mining  
Mining Methods  
Coal

Jan 1948

"Seventy-Fifth Anniversary of the Shaft 'Kochegarka',"  
S. S. Rodbort, S. K. Polevoy, Mining Engineers, 2 pp

"Ugol'" No 1 (262)

This shaft located at GorlovskUgol' Trust of Artem-  
Ugol' Combine, being one of oldest shafts of Donbass  
region. Shaft and tunnels include area of 9.24 sq km.  
Discusses history of shafts and mentions type of coal  
obtained in field. Some of shafts have depth of 1,140  
meters. Workers at this mine assigned task of in-  
creasing area of mines by 8 km of tunnels and putting  
into operation Shaft No 1, before end of this year.  
FDE 61T81

F

A

1951. FIRST RESULTS FROM USE OF COMBINES IN STEEPLY DIPPING SEAMS  
IN WATERGATE MINES. Rubinskii, Yu. M. and Rebbort, S.S. (Ugol (Coal),  
Aug. '51, 19-24). An account is given of the performance and organiza-  
tion of work in seams dipping at angles of 53 to 66°, using the first  
examples of a new type of coal cutter (KSP-1). (L).

RODBORT, S.S., inzhener, (g. Stalino); KOSTYUK, N.Ye., inzhener, (g. Stalino).

Analysis of the performance efficiency of coal cutter loaders with  
lengthened bars as used in the Donets Basin mines. Ugol' 31 no.10:  
28-30 0 '56. (MLRA 9:11)  
(Donets Basin--Coal mining machinery)

B-1R

*Designs*

6028\* First Summary of the Use of Combines (Mining  
Machines) on Steeply Inclined Veins in Mines of the Arty-  
myskol Combine. (In Russian) By M. Babuskin and S. S.  
Rodbert. *Ugol's* 26, Aug. 1951, p. 19-21.  
Extensive tests of mining machines were made from June 1950  
to June 1951 in the above mines. Results are discussed and  
tabulated.

RODCHENKO, G., tekhnik; GOVORUSHCHENKO, N.; TUZOV, N., inzh.

Develop efficient rates for freight haulage. Avt.transp. 43  
no.3:33-34 Mr '65. (MIRA 18:5)

1. Il-ya Ferganskaya avtobaza (for Rodchenko). 2. Khar'kovskiy  
avtodorozhnyy institut (for Govorushchenko). 3. Ministerstvo  
avtotransporta i shosseynykh dorog RSFSR (for Tuzov).

NEYMAN, M.G.; GRISHKEVICH, A.P.; BESSMERTNIY, A.S., redaktor; RODCHENKO,  
N.I., tekhnicheskii redaktor

[Trade and technical schools of Leningrad; a manual for entrants  
in the 1956 school year] Tekhnicheskie uchilishcha i tekhnikumy  
Leningrada; spravochnik dlia postupaiushchikh v 1956 godu.  
[Leningrad] Lenizdat, 1956. 164 p. (MLRA 9:10)  
(Leningrad--Technical education)

RODCHENKO, O.P.

Hibernal growth of clover and alfalfa in the Irkutsk region.  
Dokl. AN SSSR 115 no.2:400-402 J1 '57. (MIRA 10:12)

1. Vostochno-Sibirskiy filial AN SSSR. Predstavleno akademikom  
A.L. Kursanovym.

(Clover) (Alfalfa)



USSR / Cultivated Plants. Fodder Crops.

M-5

Abs Jour : Ref Zhur - Biologiya, No 13, 1958, No. 58649

Author : Rodchenko, O. P.

Inst : Acad. Sci. USSR, East Siberian Branch

Title : Winter Growth of Clover and Alfalfa in Irkutsk Oblast

Orig Pub : Dokl. AN USSR, 1957, 115, No 2, 400-402

Abstract : The laboratory of plant physiology and biochemistry of the East Siberian branch, Acad. of Sci. USSR conducted observations in 1954 - 1955 on the winter growth of clover and alfalfa in the Irkutsk region. The soil is red-brown heavy loam of the transitory type (from humus - carbonade to podzolic). The top buds of shortened hibernating stems of clover and near-root buds of alfalfa were fixed with 96% alcohol. Mitotic divisions were registered on constant preparations stained with Heidenhain's stain and the external changes in the

Card 1/2

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RODCHENKO, O.P.

Effect of the depth of the snow cover on wintering of clover and  
alfalfa in Eastern Siberia. Trudy Vost.-Sib.fil. AN SSSR no.20:  
97-104 '60. (MIRA 13:11)  
(Siberia, Eastern--Clover) (Siberia, Eastern--Alfalfa)  
(Frost protection)

RODCHENKO, O.P.

Winter growth characteristics of clover and alfalfa in Eastern Siberia.  
Trudy Vost.-Sib.fil. AN SSSR no.20:105-112 '60. (MIRA 13:11)  
(Siberia, Eastern--Clover) (Siberia, Eastern--Alfalfa)  
(Plants--Frost resistance)

RODCHENKO, O. P., Candidate Biol Sci (diss) -- "Wintering over of clover and lucerne in eastern Siberia". Moscow, 1959. 18 pp (Inst of Plant Physiology im K. A. Timiryazev of the Acad Sci USSR), 200 copies (KL, No 25, 1959, 130)

RODCHENKO, O.P.

Dynamics of stored food and changes in the state of protoplasm  
in wintering alfalfa and clover plants. Izv. AN SSSR. Ser. biol.  
no.5:571-578 S-O '58. (MIRA 11:10)

1. Vostochno-Sibirskiy filial AN SSSR, Otdel biologii.  
(ALFALFA) (CLOVER) (SIBERIA, EASTERN--DORMANCY (PLANTS))

RODCHENKO, O.P.

20-2-56/62

AUTHOR  
TITLE

RODCHENKO, O.P.

On the Hibernial Growth of Clover and Alfalfa Under the Conditions of the Irkutsk Region.

(O zimenen roste klevera i lyutserny v usloviyakh Irkutskoy oblasti - Russian)

Doklady Akad.Nauk SSSR, 1957, Vol 115, Nr 2, pp 400-402 (U.S.S.R.)

ABSTRACT

Within the cycle of development of plants hibernial growth has hitherto been little investigated. The opinions formed of it as well as the possibilities of cell-division at negative temperatures are not uniform and contradict one another. The branch laboratory mentioned at the end of this work under "A" (Plant-Physiologic and-Chemical Lab.) observed the hibernial growth of these plants. The results lead us to believe that under the conditions of the Irkutsk area the beginning of the spring growth of clover depends to a greater extent on the internal processes in the plant than on temperature conditions. In fact the growth in a frozen soil at temperatures of  $-8^{\circ}$  and  $-10^{\circ}$  begins at the level of the node of ramification. The lowest temperature on the surface of the soil under the natural snow cover reached  $-25^{\circ}$  at this time of the year. At the end of April the phenomena of growth in the point of growth of alfalfa are incomparably more active as shown by 2 tables. An especially active growth is observed in the case of the summer stand of seed of alfalfa. (2 tables and 9 Slavic references).

Page 1/2

RODCHENKO, Yu.M.

Some characteristics of the geology of and the reliability of the  
results of prospecting for Severoural'sk bauxite deposits. Trudy Inst.  
geol. UFAN SSSR no.64:177-223 '64. (MIRA 17:12)

GUSEV, Ye.M.; KADOMSKAYA, K.P.; LEVINSHTEYN, M.I.; RODCHENKO, Ye.A.

Mathematical modeling of the characteristics of a discharger used  
in protection from internal overvoltages. Trudy LPI no.242:150-158  
'65. (MIRA 18:8)



GUTKIN, Ye.S.; RODCHENKO, Yu.M.

Tectonics of the Severoural'sk Basin and its relation to bauxite mineralization. Izv. AN SSSR. Ser. geol. 30 no.2:56-66 F '65.  
(MIRA 18:4)

1. Severoural'skaya kompleksnaya geologorazvedochnaya ekspeditsiya, Severoural'sk.

VOL'KHIN, B.A., gornyy inzh.; RODCHENKO, Yu.N., gornyy inzh.

Characteristics of the roof structure at the Northern Ural Bauxite Mine and its stability in conditions of exposure. Gor. zhur. no.11:27-30 N '64. (MIRA 18:2)

1. Ural'skiy nauchno-issledovatel'skiy i proyektnyy institut mednoy promyshlennosti, Sverdlovsk (for Vol'khin). 2. Severoural'skaya kompleksnaya geologorazvedochnaya ekspeditsiya (for Rodchenko).

PALATNIK, L.S.; TANANKO, I.A.; BOERO, Yu.G.; Primala uchastiye  
RODCHENKOVA, Yu.S., inzh.

Nature of the  $\xi$ -phase in Fe - Al - C alloys. Kristallografiia  
9 no.2:209-212 Mr-Ap'64. (MIRA 17:5)

1. Khar'kovskiy politekhnicheskii institut imeni Lenina.

AZARGINOVA, F.S.; RODD, V.A.

Producing dry vaccine against cholera. Izv. Irk. gos. nauch.-issl.  
protivochum. inst. 21:131-134 '59. (MIRA 14:1)  
(CHOLERA) (VACCINES)

RODD, V. Ye.; GUZHEVNIKOV, I. A.

Control of the Daurian pika and its ectoparasites by saturating  
its burrow with calcium arsenite. Izv. Irk. gos. nauch.-issl. proti-  
vochum. inst. 16:239-243 '57. (MIRA 13:7)  
(RODEN CONTROL) (CALCIUM ARSENITES) (PIKAS)

NOYEV, V.N., inzh.; PROKHOROV, F.G., kand. tekhn. nauk; RODDATIS, F.F.,  
kand. tekhn. nauk

New standards for calculating the quality of steam, feed water  
and scavenging water. Teploenergetika 5 no. 5:82-85 My '58.  
(MIRA 11:7)

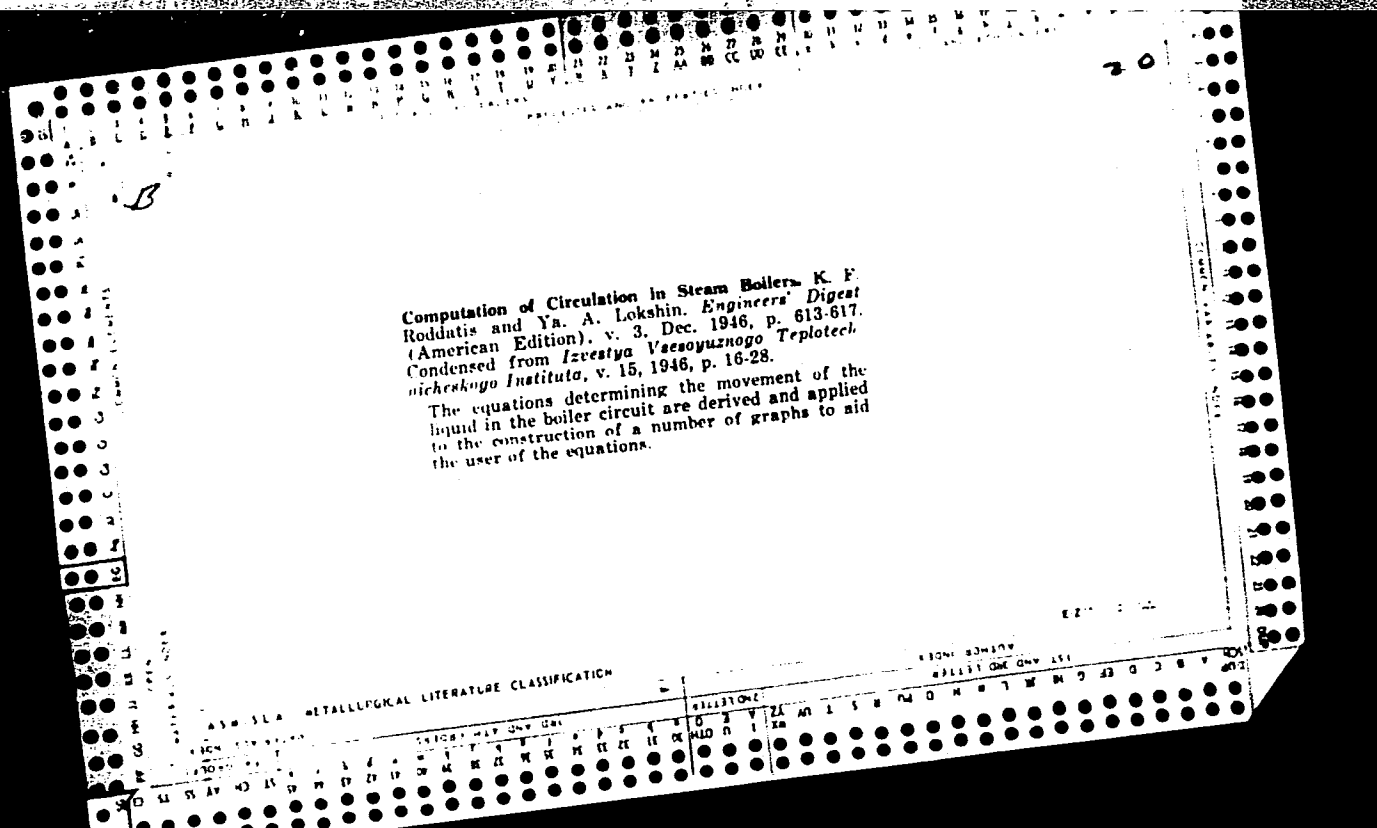
(Boilers)

1ST AND 2ND ORDERS													PROCESSES AND PROPERTIES INDEX													3RD AND 4TH ORDERS												
COMMON ELEMENTS																										FROM SLOVENIA NUMBER												
MATERIALS INDEX																																						
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1ST AND 2ND ORDERS													3RD AND 4TH ORDERS													1ST AND 2ND ORDERS												

F

4720. DESIGN OF MECHANICALLY STOKED FURNACES FOR LOW OUTPUTS.  
Tager, SA. and Roddatis, KE. (Za Ekon. Topliva (Fuel Econ.)  
Aug. 1950, 1-8). Relations between boiler capacities  
(in the 2-10 tons/ hour range), types of solid fuel, grate  
and stoking arrangements, shape of furnace, etc., are  
discussed.

(L)





RODDATIS, K.F., kandidat tekhnicheskikh nauk, redaktor; KORIKSKIY, I.K.,  
redaktor; SKVORTSOV, I.M., tekhnicheskiiy redaktor

[Combustion of anthracite culm in furnaces with heated hoppers]  
Szhiganie antratsitovogo shtyba (ASh) v topkakh s uteplennymi  
voronkami; sbornik statei. Moskva, Gos. energ. izd-vo, 1956. 62 p.  
(Furnaces) (MLRA 10:1)

SERBINOVSKIY, G.V., inzhener (Moskva); RODDATIS, K.F., kandidat  
tekhnicheskikh nauk (Moskva)

Some facts on power engineering in the German Federal Republic.  
Elektrichestvo no.7:82-87 J1 '56. (MLRA 9:10)

(Germany, West--Power engineering)

RODDATIS, K. F.

USSR/Boilers

Apr 1947

"The Temperature Conditions of the Metal of a Heated Horizontal Boiler Water Tube with Steam-water Mixture," K. F. Roddatis, 7 pp

"Izv Teplotekh Inst" Vol XVI, No 4

First results of an investigation of temperature distribution in the metal, by length and circumference, of a heated tube in the presence and absence in it of phase distribution of steam-water mixture with a pressure up to 90 atmospheres. Fully illustrated with diagrams and graphs of operating data.

5T12

RODDATIYE, K. F.

FA 64/49T56

USSR/Engineering

Boilers  
Industrial Efficiency

Dec 48

"Comparative Characteristics of Soviet Small-Capacity Boiler Constructions," K. F. Roddatiye, Cand Tech Sci, 12 1/2 pp

"Za Ekhn Top" No 12

Describes characteristics of modern Soviet small-capacity boilers, indicating type and use. Data on small-capacity boilers with hand-operated grates showed that certain features of their construction must be modified. Problem of the internal logging of pipes in boilers must be

64/49T56

USSR/Engineering

(Cont'd)

Dec 48

solved. Claims that the KRSh small-capacity boilers (designed by engineers Kurochko, MONTOE Rassudov and Shafran), reconstructed by Engg in 1945, and the VVD boilers (designed by Engg Dobrin in 1943) are the best among those examined. Gives illustrations and tables on small-capacity boilers.

64/49T56

RODDATIS, K. F., and PRZHIYALKOVSKIY, M. M.

"The temperature regime of inclined tubes. Izvestiya AN, SSSR, OTN  
No. 7, 1949

RODIN, R. P.

Technology

Modernization of low-pressure boilers  
Moskva, Gos. energ. izd-vo, 1952

Monthly List of Russian Accessions, Library of Congress, August 1952. UNCLASSIFIED.

RODDATIS, K. F.

USSR (600)

Boilers

Projection of screened contours with natural circulation. Izv. VTI, 21 No. 7, 1952.

Monthly List of Russian Accessions, Library of Congress, October 1952. UNCLASSIFIED.





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... .. of small capacity.

... Library of Congress  
June 1961.

ROD WTS, G. F.

Steam Boilers

Circulation of water in steam boilers, Nat. energ. 3, No. 1, 1955.

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

RODDATIS, K. F.

B. T. R.  
Vol. 3 No.4  
Apr. 1954  
Heat Power

(2) 114  
5068\* Top Drum of a Double Drum Low Power Boiler.  
(Russian.) K. F. Roddatis and I. F. Shapkin. *Energeticheskii  
Bulletin*, 1953, no. 9, Sept., p. 20-26.  
Discusses defects in design and construction of the top drum.  
Tables, diagrams. 3 ref.

BUZNIKOV, Yevgeniy Fedorovich; NIGROV, Vladimir Nikolayevich  
[deceased]; Prinsipal uchastiye ROZDANIS, K.F.; ROZANOV,  
M.S., red.

[Water heating boilers and their use in electric power  
plants and steam power plants] Vodogreinye kotly i ikh  
primeneniye na elektrostantsiyakh i v kotel'nykh. Moskva,  
Energia, 1965. 239 p. (MIRA 18:9)

RODDATIS, K.F., prof.

Calculating safety valves for large water-heating boilers. Nov.  
tekh. zhil.-kom. khoz.: Elek. i tepl. gor. no.5:137-149 '64.  
(MIRA 18:2)

1. Vsesoyuznyy zaochnyy energeticheskiy institut.

BULANOV, N.G.; KUPRIYANOVA, L.V.; TSUKERMAN, R.V.; BUDNYATSKIY,  
D.M.; GEL'TMAN, A.E.; KOSTOVETSKIY, D.L.; PISKAREV, A.A.;  
TARANIN, A.I.; KORNEYEV, M.I.; MOISEYEV, G.I.; KENDYS,  
P.N.; KIRPICHEV, Ye.F.; RUBIN, M.M.; SOKOLOV, N.V.;  
SHCHERBAKOV, V.A.; KOVALEV, N.N.; BELOV, A.A.; SEREBRYAKOV,  
G.M.; SATANOVSKIY, A.Ye., red.; RODDATIS, K.F., red ;  
KORKHOVA, V.I., red.; CHEREPENNIKOV, B.A., red.; KOGAN,  
F.L., tekhn. red.

[Manufacture of power machinery abroad] Energeticheskoe ma-  
shinostroenie za rubezhom. Moskva, 1961. 583 p.

(MIRA 16:8)

1. Moscow. Tsentral'nyy institut nauchno-tekhnicheskoy in-  
formatsii mashinostroyeniya.  
(Electric power plants--Equipment and supplies)

RODDATIS, K.F., kand.tekhn.nauk; KIVINZON, L.M., inzh.

Calculation of the stability of the hydrodynamic characteristics  
of the vertical pannels of once-through boilers. Teploenergetika  
10 no.1:40-46 Ja '63. (MIRA 16:1)

1. Vsesoyuznyy zaachnyy energeticheskiy institut.  
(Boilers)

RODDATIS, K.F., kand.tekhn.nauk

Steam parameters of block and large unit systems of foreign  
thermal electric power plants. Teploenergetika 9 no.1:87-89 Ja  
'62. (MIRA 14+12)  
(Electric power plants--Design and construction)



LEVIN, Izrail' Moiseyevich; BOKKACHIK, Iosif Azar'yevich; RODDATIS,  
K.F., kand. tekhn. nauk; IVYANSKIY, S.I., kand. tekhn. nauk;  
BRAUDE, I.Ye., inzh.; GOTGEL'F, I.M., kand. tekhn. nauk,  
retsenzent; POSTOLOVSKIY, S.N., inzh., retsenzent; KOMAROV,  
A.M., inzh.; LARIONOV, G.Ye., tekhn. red.

[Flue exhaust and ventilating fans for high capacity electric  
power plants] Dymosoy i ventilatory moshchnykh elektrostantsii.  
Moskva, Gos. energ. izd-vo, 1962. 183 p. (MIRA 15:4)  
(Electric power plants--Ventilation)

BUZNIKOV, Yevgeniy Fedorovich; RODDATIS, Konstantin Fedorovich;  
SPEYSHER, Vladimir Anatol'yeovich; KHITRIN, L.N., red.;  
MURZAKOV, V.V., red.

[Conversion of DKV and DKVR boilers to gas operation]  
Perevod kotlov DKV i DKVR na gazoobraznoe toplivo. Mo-  
skva, Energiia, 1964. 190 p. (MIRA 17:12)

1. Chlen-korrespondent AN SSSR (for Khitrin).

DMITRIYEV, Aleksey Aleksandrovich; RODDATIS, Konstantin Fedorovich;  
SHUKHER, S.M., red.; BORUNOV, N.I., tekhn. red.

[Boiler systems in the German Federal Republic] Kotel'nye usta-  
novki Federativnoi Respubliki Germanii. Pod red. K.F.Roddatisa.  
Moskva, Gos.energ.izd-vo, 1961. 351 p. (MIRA 15:1)  
(Germany, West--Boilers)

RODDATIS, K.F. (Moskva); Primal uchastiye: SAZONOV, V.R.

Questions on the use of natural gas in large thermal electric power  
plants. Izv. AN SSSR. Otd. tekhn. nauk. Energ. i avtom. no. 4:53-58  
Jl-Ag '60. (MIRA 13:8)  
(Electric power plants) (Gas, Natural)

GREBENKIN, V.G. [translator]; RODDATIS, K.F., red.; GIRSHFEL'D, V.Ya.,  
red.; LARIONOV, G.Ye., tekhn.red.

[Use of boiler systems] Eksploatatsiia kotel'nykh ustanovok.  
Pod red. K.F.Roddatisa. Moskva, Gos.energ.izd-vo, 1959. 495 p.  
Translated from the German. (MIRA 13:7)  
(Germany, West--Boilers)

RODDATIS, K.F., kand. tekhn. nauk

Brief review of new designs of elements for West German pulverized  
fuel plants. Energokhoz. za rub. no.6:6-12 N-D '59. (MIRA 13:3)  
(Coal, Pulverized) (Germany, West--Electric power plants--  
Equipment and supplies)

RODDATIS, K.F., kand. tekhn. nauk; LOGINOV, B.I., kand. tekhn. nauk

Utilization of austenitic steel at the Hüls Electric Power Plant  
(Federal Republic of Germany). Énergokhoz. za rub. no.2:18-22  
Mr-Ap '59. (MIRA 12:5)

(Hüls, Germany--Electric power plants)  
(Steel)

LOGINOV, B.L., kand. tekhn. nauk; RODDATIS, K.F., kand. tekhn. nauk.

Basic characteristics of boiler units of the Federal Republic of  
Germany. Energekhoz. za rub. no.5:16-20 S-O '58. (MIRA 11:12)  
(Germany, West--Boilers)



RODDATIS, K.F. kand. tekhn. nauk.

Utilizing natural gas as fuel [with summary in English].  
Teploenergetika 5 no.11:3-9 N '58. (MIRA 11:11)

1. Ministerstvo elektrostantsiy SSSR.  
(Gas, Natural)

LOGINOV, B.I., kand.tekhn.nauk; RODDATIS, K.F., kand.tekhn.nauk

Supervising and controlling the burning processes in boiler-unit  
furnaces by the method of excess oxygen. Elek. sta. 29 no.7:12-15  
Jl '58. (MIRA 11:10)  
(Combustion) (Boilers)

RODDATIS, K.F., kand.tekhn.nauk

Power resources and supply of electric power by means of nuclear  
fuels. Teploenergetika 5 no.6:79-82 Je '58. (MIRA 11:9)  
(Electric power) (Nuclear fuels)

SOV/96-58-11-1/21

AUTHOR: Roddatis, K.F., Candidate of Technical Science

TITLE: The Use of Natural Gas as Fuel  
(Ob ispol'zovanii prirodного gaza v kachestve topliva)

PERIODICAL: Teploenergetika 1958, Nr 11, pp 3-9 (USSR)

ABSTRACT: The many sources of natural gas that have been found in the last few years are briefly enumerated. Large quantities are also obtained during the production and refining of petroleum. Actual and planned output figures for natural gas from 1940 to 1972 are given in Table 1. The present output of about 31,000 million cubic metres should increase tenfold by 1972. This growth will necessitate reconsideration of the use of gas as a power fuel. As hitherto, the main consumers of natural gas will be industry, particularly the chemical industry for which it is a raw material; also communal and domestic organisations as well as thermal power stations, mainly those located in large towns. The advantages of gas as a fuel in facilitating automatic control of combustion processes and reducing atmospheric pollution are enumerated. Many long-distance pipe-lines are being constructed to

Clas 1/4

SOV/96-50-11-1/21

## The Use of Natural Gas as Fuel

deliver gas to large towns: a map of the main lines that will be completed by 1965 is given in Fig.1. It will be very convenient to burn gas as fuel in power stations near to gas pipe-lines. This will lead to a change in the fuel balance of large thermal power stations: the figures given in Table 2 indicate the proportion of power station fuel that is expected to be gas, or gas and fuel oil, by 1965. Nevertheless, solid fuel will remain predominant in thermal power stations. A number of power stations are to be constructed containing gas turbines of up to 50 MW per unit. When a power station uses only gas fuel, the fuel-handling equipment is greatly simplified. A schematic diagram of pipe-work layout in a gas-fired power station is given in Fig.2. It has been calculated that when gas replaces solid fuel the capital cost per installed kilowatt for a large station will be reduced by 17 - 22%. Though the gas may be costly, it will pay to use it even in power stations

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SOV/86-58-11-1/21

The Use of Natural Gas as Fuel

more than 1,000 kilometres from its source rather than such fuels as Moscow Basin Brown coal. When gas fuel is used it is easier to construct outdoor and semi-outdoor boiler-houses. Gas-burning power stations can be located in cities without severe air-pollution troubles. Data given in Table 3 show that the size and weight of boilers burning natural gas are much less than those for solid fuel. Perfect combustion of gas fuel cannot yet be ensured and improved burner designs are required. With existing burners from 0.3 to 3% of the gas may remain unburned but available test and operating experience with these burners has not yet been adequately analysed and generalised. Burners for natural gas should be designed to allow for the addition of nozzles for fuel oil. It is also necessary to find the best design for combined pulverised-fuel/gas burners. Special types should be devised for super-heat temperature regulation. The problem of making thermal calculations on boiler sets burning natural gas is in need of development. Little is known about heat-exchange in

Card 3/4

SOV/96-58-11-1/21

The Use of Natural Gas as Fuel

the furnace chamber when burning natural gas. The standard methods of making furnace calculations are in need of complete revision. Where the local water is very hard it may prove advisable to cool the combustion products of natural gas in order to obtain condensate of low total salt content. This may be particularly important in central Asia, **Azerbaijdzhan** and other regions. There are 3 tables, 2 figures and 6 literature references all of which are Soviet.

ASSOCIATION: Ministerstvo elektrostantsiy SSSR  
(Ministry of Electric Power Stations, USSR)

Card 4/4

NOYEV, V. N., inzh.; PROKHOROV, F.G., kand.tekhn.nauk; RODDATIS, K.F., kand.  
tekhn.nauk.

New calculated standards for steam, feed water, and blowdown.  
Teploenergetika 5 no.5:82-85 My '58. (MIRA 11:5)  
(Feed water) (Steam)



SOV/96-58-5-22/27

*Roddatis, K.F.*  
AUTHOR: Noyev, V.N., Engineer and Prokhorov, F.G., Roddatis, K.F.,  
Candidates of Technical Sciences

TITLE: New Design Standards for the Quality of Steam, Feed-water  
and Blow-down Water (Novyye raschetnyye normy kachestva  
para, pitatel'noy i produvochnoy vody)

PERIODICAL: Teploenergetika, 1958, nr 5, pp 82 - 85 (USSR)

ABSTRACT: Recent experience with high-pressure boilers makes  
it necessary to revise existing design standards for the  
quality of feed-water, boiler-water and steam. The standards  
also need to be made more precise for boilers operating at  
lower pressures.

The design standards given in this article relate to boiler  
equipment and power stations and have been accepted by the  
technical council of the Ministry of Power Stations after  
thorough consideration. They also take account of suggestions  
made by the design organisations, scientific research  
institutes, ORGRES and power undertakings. The standards  
will guide design organisations in making up losses of water in  
condensing and heat-supply power stations with drum-type  
boilers at pressures of 155 and 110 atm. The risk of fouling  
the flow parts of turbines with salts in heat and electric

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power stations is not great. Some of the salts are removed with the process of heating steam and stations of this type may be allowed higher steam-contamination figures than condensing stations. Because of recent difficulties with the formation of iron and copper deposits in boilers, only very low concentrations of iron and copper are allowed in feed-water. The standards are also stricter in respect of the free carbon-dioxide content of the steam. In order to restrict brittle fracture, limits are placed on the free alkali content of boiler water. Reference is made to nitrates and nitrites. The previous limits for the oxygen content of feed-water were too high and have been reduced.

The standards given in the tables are to enable design organisations to select the most suitable schemes for preparation of feed-water and condensate and to select boilers' accessories for ensuring the necessary purity of the steam when operated in combination with the selected method of water treatment. The standards should also lead to more reliable water conditions in power-station boilers.

The standards are then given in the form of tables; it is

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explicitly stated that they do not apply to atomic power-stations. The quality of steam delivered to a turbine must be in accordance with the requirements of Table 1. Injection water for super-heat control is defined. The quality of feed-water for power stations with drum-type boilers should satisfy the requirements of Table 2. The quality of feed-water for direct-flow boilers of any pressure without separators should conform to Table 3. The salt and silica contents of blow-down water for drum-type boilers, depending on the pressure and the accessories, are stipulated in Table 4. Limitations are placed on the free hydrated alkalinity. The amount of continuous blow-down from drum-type boilers should not exceed the standard figures. Blow-down of more than 1% from heat and electric power stations is permitted only after

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all measures have been taken to reduce it by improving the  
boiler accessories.

There are 4 tables

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