

24.2200(1121, 1147, 1068)

S/048/61/025/012/003/022  
B125/B112

AUTHORS: Ignatchenko, V. A., Degtyarev, I. F., Zakharov, Yu. V.

TITLE: Behavior of domain structure in the magnetization process

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 25, no. 12, 1961, 1439-1444

TEXT: The domain structure of small monocrystal plates, cut in parallel to the (011) plane, is very simple. Sometimes irregular inversely magnetized wedges can be observed in domains of antiparallel magnetization. The domain structure of such monocrystals was studied theoretically.

$$\gamma_M = - \frac{1}{4\pi^2} \int_0^{2\pi} d\xi \int_0^{2\pi} d\eta \int_{-z_0/2}^0 H_z(\xi, \eta, z) \omega(\xi, \eta) dz$$

is the energy density of the demagnetizing poles per unit area. The surface density  $\omega(x,y)$  of the magnetic poles which are formed on the planes  $z = 0$  and  $z = -z_0$  is periodic with the periods  $2\pi L_x$  and  $2\pi L_y$  with respect to the x and y axes. In the case most significant in practice ( $\omega(x,y)$ )

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periodic with respect to x and along y except for the interval  $(-y_0/2, y_0/2)$  everywhere equal to zero) X

$$\gamma_m = \frac{4\pi^2}{y_0} \int_{-\infty}^{+\infty} \frac{\omega_0(v) \bar{\omega}_0(-v)}{|v|} (1 - e^{-|v|x_0}) dv + \frac{4\pi^2}{y_0} \sum_{-\infty}^{+\infty} \int_{-\infty}^{+\infty} \frac{\omega_m(v) \bar{\omega}_m(-v)}{Q_m(v)} (1 - e^{-Q_m v}) dv, \quad (1.8)$$

holds with  $Q_m^2(v) = v^2 + (m/L_x)^2$ .

$$\gamma_m = \frac{8\pi^2}{x_0 y_0} \int_{-\infty}^{+\infty} \int_{-\infty}^{+\infty} \frac{\bar{\omega}(u, v) \bar{\omega}(-u, -v)}{R(u, v)} (1 - e^{-R(u, v)x_0}) dudv, \quad (1.9)$$

$$R^2 = u^2 + v^2$$

$$\bar{\omega}(u, v) = \frac{1}{4\pi^2} \int_{-\infty}^{+\infty} \int_{-\infty}^{+\infty} \omega(x, y) e^{-i(ux+vy)} dx dy.$$

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holds for a crystal with finite  $x_0, y_0, z_0$ . With  $z_0/L_x \gg 1$

$$\gamma_m = 2\pi\omega^2(1-q)^2 z_0 + \frac{8\omega^2}{\pi^2} D f(q), \quad (2.1)$$

$$f(q) = \sum_{m=1}^{\infty} \frac{1 - \cos m\pi q}{m^2},$$

$$2D = d_1 + d_3, \quad q = d_2/D.$$

follows when applying the formula

$$\gamma_m = 2\pi\omega_0^2 z_0 + 2\pi L_x \sum_{-\infty}^{+\infty} \frac{\omega_m \omega_{-m}}{|m|} (1 - e^{-P_{mn} t_0}),$$

$$\omega_m = \frac{1}{2\pi} \int_0^{2\pi} \omega(\xi) e^{-im\xi} d\xi. \quad (1.7),$$

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Behavior of domain structure ...

periodic only with respect to  $x$  and independent of  $y$ , to the domain structure shown in Fig. 1. The free energy of the crystal per unit volume,  $F(D, q) = 2\pi\omega^2 (1-q)^2 + (8\omega^2/\kappa^2 z_0) Df(q) + (\gamma/D) - \omega H(1-q)$ , consists of the energy of the demagnetizing fields, of the limiting energy and of the energy of the external magnetic field (direct along the  $z$ -axis). The equilibrium domain structure can be described for any value of the external field  $H$  by

$$D = \frac{\pi}{\omega} \left[ \frac{z_0 \gamma}{8f(q)} \right]^{1/2}, \tag{2.3}$$

$$-4\pi\omega(1-q) + f'(q) \left[ \frac{8\gamma}{\pi^2 z_0 f(q)} \right]^{1/2} + H = 0. \tag{2.4}$$

Magnetization is caused not only by diminishing the width of the unsuitably magnetized domains but also by their divergence.

$$F(D, q) = K \left( \frac{y_0}{z_0} \right) 2\pi\omega^2 (1-q)^2 + \frac{8\gamma^2}{\pi^2 z_0} D\Psi(D/y_0, q) + \frac{\gamma}{D} - \omega H(1-q), \tag{2.8}$$

$$\Psi(D/y_0, q) = \frac{4}{D} \sum_{m=1}^{\infty} \frac{1 - \cos m\pi q}{m^2} G.$$

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Behavior of domain structure ...

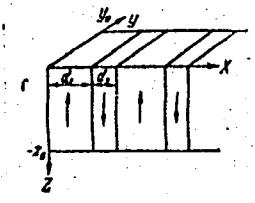
holds for a crystal of finite thickness. If  $y_0 \approx 10^{-2}$ , the following holds:

$$\chi_0 \approx [4\pi K(y_0/z_0)]^{-1} \quad \text{which agrees approximately with experimental data.}$$

The domain structure of such crystals as are finite in all three dimensions must be computed electronically. K. A. Kitover (Priklad. matem. i mekhan., 12, 233, 1948) is mentioned. There are 3 figures and 4 references: 2 Soviet and 2 non-Soviet. The two references to English-language publications read as follows: C. Kittel, Rev. Mod. Phys. 21, 541, 1949; J. Goodenough, Phys. Rev. 102, 356 (1956).

ASSOCIATION: Institut fiziki Sibirskogo otdeleniya Akademii nauk SSSR  
(Institute of Physics of the Siberian Branch of the  
Academy of Sciences USSR)

Fig. 1. Schematic drawing of domain structure.



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S/114/60/000/003/007/008  
E073/E535

**AUTHORS:** Zakharov, Yu. V. and Lebedev, O.N., Engineers

**TITLE:** Simple Method of Measuring the Flow Rate of Gas

**PERIODICAL:** Energomashinostroyeniye, 1960, No.3, pp.41-43

**TEXT:** The tested method is based on measuring the quantity of gas flowing through the piping by means of an "integrating" tube. It represents a simple solution, with an adequate accuracy; the apparatus can be produced easily in a workshop. The main dimensions of the piping and of the "integrating" tubes, including the Pitot tubes, used during the tests are tabulated. A sketch of the arrangement is shown in Fig.1. Fig.2 shows the location of the Pitot and the integration tubes in the piping (1, 2, 3, 4 are the axes along which the speeds were measured). Piping with an internal diameter of 81 and 130 mm was placed during the tests on the suction side of the fan, whilst piping of 23 mm internal diameter was placed on the pressure side of the fan. The flow rate in the piping varied as follows: between 540 and 1880 m<sup>3</sup>/h for the piping of 130 mm dia., between 250 and 490 m<sup>3</sup>/h for the piping of 81 mm dia. and between 22 and 40 m<sup>3</sup>/h for the piping of 23 mm dia. The speed was

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measured by means of the Pitot tube on a diameter which is parallel to the metering tube and on four diameters in directions as shown in Fig.2. From these values the average speeds were calculated of all the measurements. The results obtained by using the proposed "integrating" tube and the Pitot tube and the respective differences between the two are given in a table. It can be seen that the difference fluctuates between  $\pm 0.5$  to 3%, which is sufficient for practical as well as for laboratory requirements. The suitability of the "integrating" tube was verified on air but can also be used for measuring the flow rate of various gases. In the case of slightly contaminated gases containing admixtures of oil vapours etc., it is necessary to blow through from time to time the inflow holes (1, Fig.1). The location of the metering tube is practically unaffected by the length of the straight inflow part of the piping. In a number of tests the ratio of this length to the diameter was varied between 15 and 48. The diameter of the metering tube should depend on the internal diameter of the piping so as to avoid an excessive disturbance in the flow; satisfactory

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results were obtained for the ratios  $d/D_{BH}$  of about 0.04 to 0.09. The diameter of the inflow holes in the metering tube equalled  $d_0 = 0.3d$ ; it is necessary to ensure full braking of the gas flow in these holes. The number of holes is selected in dependence of the diameter of the piping on the basis of literary data. The inflow holes must be accurately drilled along a generating line of the pipe and the pipe should be placed against the flow, and so that the outermost holes are located at an equal distance from the inside wall of the pipe. The latter part of the paper deals with a method of determining the airflow rate by measuring its moisture content. A certain quantity of indicator gas is injected and the resulting concentration after intermixing is measured. The author recommends using for this purpose steam and two variants are suggested. The air humidity and temperature before and after humidification are determined by means of psychometers 1 and 4, Fig.3. The steam is fed in from an evaporator 2 into the piping 5. A micropressure gauge 3 is fitted for determining the excess air pressure. Sufficiently accurate results are obtained

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by adding 1.5 to 2 g of moisture per 1 kg of air. One measurement takes about 5 to 10 min. In comparative measurements using this apparatus as well as throttling equipment it was found that the difference between the results obtained by the two methods did not exceed 3 to 4%. There are 3 figures and 3 tables.

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Simple Method of Measuring the Flow Rate of Gas

Fig.1

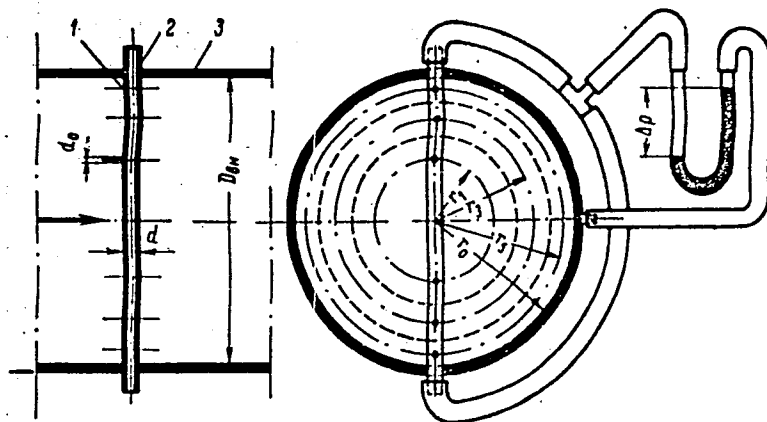


Рис. 1. Схема установки «интегрирующей» трубки в трубопроводе.

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Fig.2

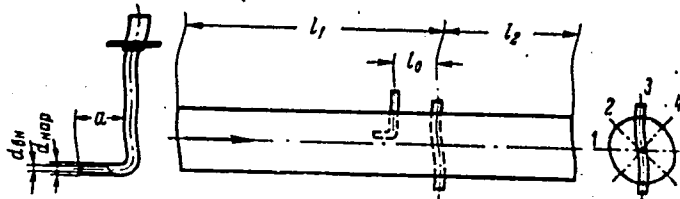


Рис. 2. Трубка Пито и ее установка в газопроводе;

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Fig. 3

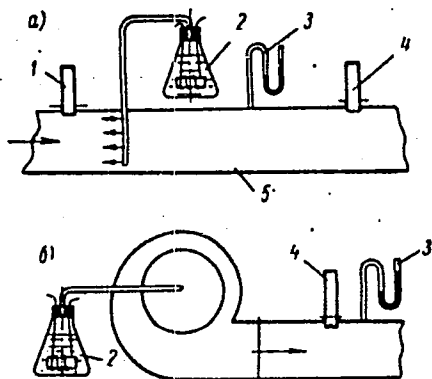


Рис. 3. Схемы измерений для определения расхода воздуха.

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S/179/60/000/01/003/034  
E031/E535

10.6000

AUTHOR:  
TITLE:

Zakharov, Yu. V. (Novosibirsk)

On Some Regularities in the Development of Free  
Turbulent Gas Streams in an Entrainment Flow

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh  
nauk, Mekhanika i mashinostroyeniye, 1960, Nr 1,  
pp 20-26 (USSR)

ABSTRACT: Some results are given of an experimental investigation  
of a single stream in an entrainment flow bounded by  
the walls of a chamber, which was made in order to  
obtain relations which could be used to determine the  
distances from the axis and from the leading boundary,  
to construct the curved axis and the trailing boundary  
of the stream and also to calculate the dimensions of  
the jet flare. Theoretical and experimental investigation  
showed that the development of a free turbulent stream  
in an entrainment flow, as in the case of a heated  
stream, is of the "automodel" type in relation to the  
hydrodynamic criterion of the Reynolds number. The use  
of the non-dimensional parameter  $\rho_2 w_2^2 / \rho_1 w_1^2$

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On Some Regularities in the Development of Free Turbulent Gas  
Streams in an Entrainment Flow

to take account of the effect of the density and velocity is verified for pipes with varying velocity profile at the orifice. The structure parameter of the stream need not be introduced. The investigation was made in a light rectangular chamber of glass. Measures were taken to make the main flow (air) uniform. The streams were introduced through pipes of variable diameters. For the quantitative investigation the stream had smoke added to it and it was photographed against the background of a dark screen carrying a rectangular grid. The results of Ivanov (Ref 3) and Shandorov (Ref 4) on the development of the streams were confirmed. It is shown that the range of validity of an expression for the distance of the stream from the axis can be extended considerably. A similar expression is given for the non-dimensional distance from the leading boundary. The results of measurements on the dimensions of the stream are given briefly. Equations for the curved axis and leading boundary of the stream are discussed. X

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On Some Regularities in the Development of Free Turbulent Gas  
Streams in an Entrainment Flow

There are 6 figures and 9 Soviet references.

ASSOCIATION: Novosibirskiy institut inzhenerov vodnogo transporta  
(Novosibirsk Institute of Water Transportation Engineers)

SUBMITTED: July 31, 1959

IX

Card 3/3

LUPAKOV, I.S.; KUZ'MICHEV, Yu.S.; ZAKHAROV, Yu.V.

Determining the permeability of tube walls by helium. Atom. energ.  
15 no.1:79-80 JI '63. (MIRA 16:8)

(Permeability) (Helium)



IGNATCHENKO, V.A.; ZAKHAROV, Ya.V.

Domain structure of thin ferromagnetic films. Zhur. eksp. i teor.  
fiz. 43 no.2:459-461 Ag '62. (MIRA 16:6)

1. Institut fiziki Sibirskogo otdeleniya AN SSSR.  
(Metal crystals--Magnetic properties)

L 5342-66 EWT(1) IJP(c)

ACCESSION NR: AP5021123

AUTHOR: Ignatchenko, V. A.; Zakharov, Yu. V.

UR/0056/65/049/002/0599/0608

TITLE: Structure of domain boundary in a ferromagnet of finite thickness

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 49, no. 2, 1965, 599-608

TOPIC TAGS: ferromagnetic material, magnetic domain boundary, uniaxial crystal, ferromagnetic film

ABSTRACT: The structure of the domain boundary of a uniaxial ferromagnetic crystal of finite thickness  $2d$  is determined by perturbation theory. Unlike all earlier studies of the subject, account is taken of the surface anisotropy  $\beta'$  and real boundary conditions on the crystal surface are employed. A uniform boundary and a boundary which is longitudinally periodic are considered. It is shown that when  $\beta' \neq 0$  there exists a range of thicknesses in which a Neel boundary can exist. When  $\beta'$  exceeds a critical value, a Bloch boundary becomes energetically more favorable at any thickness. General equations are derived for the period and shape of the periodic boundary and are investigated in two limiting cases of large and small anisotropy. Depending on the magnitude of the surface anisotropy, the Bloch

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ACCESSION NR: AP5021123

boundary may become either narrower or become broadened toward the crystal surface.  
Orig. art. has: 5 figures and 28 formulas.

ASSOCIATION: Institut fiziki Sibirskogo otdeleniya Akademii nauk SSSR (Physics  
Institute, Siberian Department, Academy of Sciences, SSSR) 4/1/65

SUBMITTED: 20Feb65

ENCL: 00

SUB CODE: SS, EM

NR REF SOV: 008

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Card 2/2 *MLA*

LAKHANIN, V.V., prof., doktor tekhn.nauk; ZAKHAROV, Yu.V., dotsent, kand.tekhn.  
nauk; LEBEDEV, O.N., dotsent, kand.tekhn.nauk

Problems in the design of atomic surface tankers. Trudy NIIVTa no.12:  
5-21 '62. (MIRA 16:3)

(Atomic ships)

(Tank vessels)

TEREKHIN, Pavel Ivanovich; PAVLOV, Vasilii Ivanovich; RYLOV, Gennadiy Vyacheslavovich; ZAKHAROV, Yuriy Vasil'yevich; SOKOLOV, A.I.,  
otv. red.

[Service life and norms for the expenditure of spare parts  
for mining machinery; a handbook] Sroki sluzhby i normy ras-  
khoda zapasnykh chastei dlia gornnykh mashin; spravochnik.  
Moskva, Nedra, 1965. 428 p. (MIRA 18:4)

KHOZE, A.N., dots.; ZAKHAROV, Yu.V., insh.

Introducing secondary live blow-off in boiler units of ships used in inland water transportation. Rech.transp. 18 no.2:26-28 P '59.

(MIRA 12:4)

(Boilers, Marine)

LUPAKOV, I.S., kand. tekhn. nauk; MOSKVICHEV, G.S., kand. tekhn. nauk;  
ZAKHAROV, Yu.V., inzh.; GERASIMOV, V.V., doktor tekhn. nauk

Comparative study of the strength of some austenitic and austenite-  
ferrite steels against corrosion cracking. Teploenergetika 11 no.6:  
40-43 Je '64. (MIRA 18:7)

(N) L 10427-66  
AM5028041

EWT(m)/EPF(n)-2/T  
BOOK EXPLOITATION

UR/

Lakhanin, Vladimir Vladimirovich; Zakharov, Yuliy Vasil'yevich; Lebedev, Oleg  
Nikolayevich

Use of atomic energy in water transportation (Ispol'zovaniye atomnoy energii na vodnom transporte) Moscow, Izd-vo "Transport", 1965. 0187 p. illus., biblio. Errata slip inserted. 1,500 copies printed.

TOPIC TAGS: nuclear physics, nuclear reactor, marine engineering, nuclear submarine, icebreaker ship, radiation detecting device, radioactivity, radioisotope, radiation, protection, radiation dosimetry, transportation equipment

PURPOSE AND COVERAGE: This book is a manual on the subject of "use of atomic energy in the national economy" for students in water transportation institutes. A short survey is given on the structure of matter, nuclear reactions and radioactive radiations. Also covered are the uses of atomic energy in water transportation, such as the use of atomic energy for propelling ships, radioactive isotopes in construction and in hydrotechnical equipment, ship repair, ship thermal engineering and work at sea floor level. This book is useful as a survey for technical engineers interested in the possible uses of atomic energy.

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UDC: 656.6:621.039:(075.8)



L 10427-66  
AM5028041

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SUB CODE: NP, GO

SUBMITTED: 13Mar65

NO REF SOV: 035

OTHER: 000

*PC*  
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L 07097-67 EWT(1) LJP(c) GG

ACC NR: AP6029104

SOURCE CODE: UR/0048/66/030/006/0945/0946

AUTHOR: Ignatchenko, V.A.; Zakharov, Yu.V.

33  
31  
B1

ORG: Institute of Physics, Siberian Section, Academy of Sciences, SSSR (Institut: fiziki sibirskogo otdeleniya Akademii nauk SSSR)

TITLE: Contribution to the theory of domain walls in ferromagnets / Report, All-Union Conference on the Physics of Ferro- and Antiferromagnetism held 2-7 July 1965 in Sverdlovsk

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 30, no. 6, 1966, 945-946

TOPIC TAGS: magnetic domain boundary, ferromagnetic film, magnetic anisotropy, mathematic physics

ABSTRACT: This paper is a short appendix to an earlier paper of the authors (Zhur. eksperim. i teor. fiz., 49, 599 (1965)) and cannot be fully understood without reference to that paper. In the earlier paper the authors discussed the theory of a domain wall in a uniaxial ferromagnet of finite thickness, taking into account the surface anisotropy. It was found that under certain conditions the domain wall will be periodic, alternating between Bloch and Neel type structure. The period of the wall depends on the thickness of the specimen. In the present note the authors consider in more detail the behavior of the wall under conditions in which the period is almost minimum. The critical period was calculated as a function of the surface

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anisotropy and another parameter of the model with the aid of a computer, and the results are presented graphically. The critical period increases with increasing surface anisotropy. The authors thank D.M.Frumin and E.K.Zykova for performing the computations. Orig. art. has: 3 formulas and 1 figure.

SUB CODE: 20      SUBM DATE: 00      ORIG. REF: 003

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S/121/59/000/12/002/003

188200

AUTHORS: Podurayev, V.N., Zakharov, Yu.Ye.

TITLE: Metal Turning Operations With Vibration Cutting

PERIODICAL: Stanki i Instrument, 1959, No 12, pp 11 - 16

TEXT: The authors point out that the extending application of multi-tool machining makes the problem of eliminating chips from the cutting zone of utmost importance, the more so, as chip breakers and the use of tools with chip-breaking grooves has not shown satisfactory results. Investigations which were carried out from 1957 to 1958 at the MVTU im. Bauman (Moscow Technical College im. Bauman) in the field of lathework with vibration cutting showed that this cutting method ensures reliable chip breaking and, moreover, if applied under optimum conditions, results in an improved machinability, decrease of cutting stresses and increase of tool durability. The tests were carried out with a hydraulic vibration slide (Figures 1 and 2), mounted on the lathe carriage, which, during the longitudinal feed, imparted additional oscillating motion to the tool. The authors describe the cutting conditions and steel grades used during the tests. Stating that one of the fundamental

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Metal Turning Operations With Vibration Cutting 8/121/59/000/12/002/003

advantages of vibro-cutting is the fact that finely broken up chips are produced, they point out that the direction of oscillations, their amplitude and frequency are of utmost importance. By experiments it was established that the most effective oscillations are those which coincide with the direction of feed, since in this case not only reliable chip breaking, but also satisfactory precision and surface finish are warranted. It was found during the tests that the necessary pressure on the piston of the operating cylinder should be 40 at. Figure 4 shows the picture of a superposition of the vibration tracks of the tool over the length of involute of the cylindrical surface during the turning with a frequency of  $f$  and an amplitude of  $A$ , with a constant longitudinal feed of  $s_0$ . The involute is given for different ratios between magnitude of perimeter of machined part  $\pi D$  and the sum of wavelengths for the integer number of periods of selected vibrations. One wavelength is  $\lambda = vT = \frac{v}{f}$ , where  $v$  is the cutting speed,  $T$  is the oscillation period and  $f$  is the oscillation frequency. By presenting pertinent formulae and graphs as results of detailed investigations, the authors state that reliable chip breaking is obtained with all oscillation frequencies which differ from the number of revolutions of the machined part by 10% or more. Concerning machining accuracy, it was found in the course of the investigations

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Metal Turning Operations With Vibration Cutting S/121/59/000/12/002/003

that, compared with ordinary turning, the vibration method does not affect the machining accuracy, which is to a great extent due to the fact that the hydraulic vibration slide possesses the same rigidity as any standard lathe slide. In order to obtain the 6th class surface finish or higher with vibration cutting, it is necessary to pay great attention to the frequency and amplitude of vibration, the cutting conditions and tool geometry. With the aid of various space diagrams and graphs the authors prove that the average height of micro-roughness during vibration turning remains constant and is equal to that of standard lathework. This was confirmed by laboratory and industrial tests carried out by the MVTU. The test data obtained show, moreover, that, if vibration turning is carried out with frequencies which come up to the revolution frequencies of the machined part or are the multiple of this magnitude, this results in a better surface finish than with standard turning. Investigations of the tool durability showed that with vibration cutting no increased wear of the tool cutting edge is taking place, as various factors, enumerated by the authors, tend to reduce the load on the cutting edge. The authors conclude that vibration cutting will be of greatest importance, particularly for automated production process. Eleven sets of graphs, 5 diagrams, 2 photographs, 4 Soviet references.

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ZAKHAROV, Yu.Ye., aspirant

Determining the axial hydrodynamic force on valves of hydraulic servomechanisms. [Trudy] MVTU no.92:85-99 '59.

(MIRA 12:10)

(Hydraulic control) (Fluid mechanics)

ZAKHAROV, Yu. Ye., Cand Tech Sci -- (diss) "Some problems of hydrodynamics and vibration in hydraulic servomechanisms and their practical application." Moscow, 1960. 19 pp; (Ministry of Higher and Secondary Specialist Education RSFSR, Moscow Order of Lenin and Order of Labor Red Banner Higher Technical College im N. E. Bauman); 150 copies; price not given; (KL, 17-60, 154)



30253  
S/145/60/000/009/004/017  
D221/D304

26.2190  
AUTHOR: Zakharov, Yu.Ye., Assistant  
TITLE: On the problem of hydrodynamics of valves  
PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Mashino-  
stroyeniye, no. 9, 1960, 45 - 58

TEXT: The author considers, with the aid of the theory of lamina-  
ry flow, the hydrodynamic forces acting on a valve. The assumptions  
are: The flow is steady; the fluid is ideal (non-viscous and non-  
compressible); the flow is horizontal, mass forces are neglected,  
and speed of fluid across its section is constant; the throttling  
edges are perfectly sharp. The valve with four throttling edges is  
then considered. Transparent models of a throttling edge of the  
valve were made to check the above assumptions. The published data  
as well as the experiments confirmed that the angle between the  
flow and the horizontal line at infinity ( $\beta$ ) is smaller than the  
angle between the contour with horizontal ( $\alpha$ ). The author then app-  
lies Euler's equation and derives integrals of contours in accor-  
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On the problem of hydrodynamics ...

dance with Bernoulli's theorems. The latter are solved by the method of conformal representations. The domain of flow is represented on an infinite triangle. In the case of conventional cylindrical valves with sharp throttling edges, the contour integrals are easily obtained in elementary functions. During mathematical work, author assumes the dimensionless quantities of  $\chi$  and  $\beta$ . These are respectively the ratio of axial clearance (opening of valve orifice) to the radial clearance, and the ratio of radial clearance to the width of the working chamber. In a given valve design, the parameter  $\beta$  is constant, whereas the coefficient  $\chi$  changes with the opening of orifice. The systems of transcendental equations which were obtained, are solved graphically. Examination of the resulting curves indicates that parameter  $\beta$  begins to affect  $\delta$  and  $\mu$  when it is commensurate with  $\chi$ , i.e. when the opening of the orifice is sufficiently wide. The theoretical values of the flow coefficient are larger than the experimental values which is due to viscosity. The theoretical flow coefficient does not depend upon the drop of pressure at the throttling edges. The obtained values are in good agreement with experimental data derived from measurements on the

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On the problem of hydrodynamics ...

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transparent model. The parameter  $\beta$  in valves used in tracking gears is usually small, and the axial hydrodynamic force is calculated by

$$F_x = K_x(\mu, \beta) \Delta p y L, \quad (15)$$

where the coefficient  $K$  is found from graphs. The radial hydrodynamic force is given by

$$F_y = K_y(\mu, \beta) \Delta p y \Delta L \quad (16) \quad \checkmark$$

and coefficient  $K_y(\mu, \beta)$  is determined graphically. The above equations express the forces generated during throttling of the liquid at one edge, thus for actual design it is necessary to consider the direction of the stream inside the chambers of the valve. The author provides a graphical comparison with fluid of the type "veretennoye 3" (spindle oil) which confirms the above. There are 8 figures and 9 references: 7 Soviet-bloc and 2 non-Soviet-bloc. The reference to the English-language publication reads as follows: Shih Jing Lee and I.F. Blackburn, Steady state axial forces on control valve pistons, Transactions of the ASME, vol. 74, no. 6, 1952.

Card 3/4

30253

On the problem of hydrodynamics ...

S/145/60/000/009/004/017  
D221/D304

ASSOCIATION: MVTU im. N.E. Bauman (MVTU im. N.E. Bauman)

SUBMITTED: January 15, 1960

Card 4/4

32707

S/145/60/000/012/002/008  
D221/D301

26.2190

AUTHORS: Zakharov, Yu. Ye., Aspirant, and Baranov, V. N.,  
Engineer

TITLE: Autooscillations of a hydraulic servomotor with a  
clearance in a rigid feedback

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Mashinostro-  
yeniye, no. 12, 1960, 55-66

TEXT: The author considers self-oscillations of a valve-controlled hydraulic servomotor in the case of clearance in the mechanical feedback. The following assumptions are made: The working fluid is incompressible (the experiments at MVTU im. Bauman reveal that oil compressibility is important only in the case of large volumes and small input pressure  $P_0$ ); leakages are disregarded; the input pressure  $P_0$  is constant; the viscosity and specific weight of fluid are constant; the overlap of working orifices is zero. Equations of motion are formulated and solved approximately by expanding the quan-  
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S/145/60/000/012/002/008  
D221/D301

Autooscillations of a ...

ties into series  $A = A_0 + \epsilon A_1 + \epsilon^2 A_2 \dots$  and neglecting the terms of an order higher than 2 in  $\epsilon$ . The frequency of autooscillations is

$$\omega = k(1 - \epsilon \frac{k^2}{8} - \epsilon^2 \frac{k^4}{64} - \dots),$$
 k being a parameter which depends

on the construction of the motor. This is followed by the analysis of valve motions which demonstrates that the swing of self-oscillations does not depend upon the supply pressure. It is, however, determined by the feedback clearance and the design of the servo. The valve frequency decreases with greater clearance and mass of the piston load. The swing of piston oscillations also does not depend on the supply pressure, but is determined by the clearance and design parameters. The above theory was verified on a model by a micrometer screw, and the displacements were recorded. It was found that the frequency of self-oscillations increased with greater supply pressure and smaller clearance which confirms the theoretical deductions. The swing of valve oscillations increases with larger clearance and supply pressure. Although this contradicts the

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S/145/60/000/012/002/008  
D221/D301

Autooscillations of a ...

theoretical deductions, it can be explained by the fact that the full swing due to both damped and undamped oscillations was measured. It is proposed that the natural frequency of the damped valve oscillations is given by  $\omega_r^2 = \omega_{ro}^2 + \omega_{rh}^2$ , where  $\omega_{ro}$  is the natural frequency of valve determined by its rigidity, its springs and the viscous friction;  $\omega_{rh}$  is the natural frequency of the valve due to static hydrodynamic force which acts on it. The second component of frequency depends on the pressure drop in the piston as well as on the inertia of the load. It follows, therefore, that the natural frequency of the valve rises with greater supply pressure, and drops with larger clearance. The swing of self-oscillations of the piston increases non-linearly with greater clearance, and also with higher supply pressure. Graphs are given. There is a good agreement with the experiment only at low supply pressures. The control of the parameters of self-oscillations of the servo with a clearance in the feedback permits the use of such oscillations for various purposes. There are 8 figures.

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Autooscillations of a ...

32707

S/145/60/000/012/002/008  
D221/D301

ASSOCIATION: MVTU im. Baumana (MVTU im. Bauman)

SUBMITTED: January 14, 1960

✓

Card 4/4



S/145/61/000/012/004/007  
D221/D302

AUTHORS: Baranov, V. N., Engineer, and Zakharov, Yu. Ye., Candidate of Technical Sciences

TITLE: Some problems of applying vibrations in the technology of machine construction

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Mashinostroyeniye, no. 12, 1961, 88-99

TEXT: The efficiency of applying ultrasonic vibrations is proved by many examples; the vibrations of lower frequencies (up to 1 Kc/s) are also used e.g. in cutting, casting, mechanization of auxiliary operations and test (all these applications are discussed). The investigations of V. P. Kuznetsov, Member of the Academy of Sciences USSR, have revealed that the stability of the cutting tool is markedly reduced in conventional machining at high speeds, and this defect is partly eliminated by vibratory cutting. The generators of vibrations are divided into 6 categories: Mechanical centrifugal, mechanical eccentric, pneumatic, hydraulic, electro-

Card 1/3

S/145/61/000/012/004/007  
D221/D302

Some problems of applying ...

magnetic, and electrodynamic. A brief description of their features is given. The authors give preference to hydromechanical and electro-hydraulic units, owing to their longer life, ease of output control, their adaptability in assembly with other equipment, etc. The correct design of the hydraulic servomotor is the main task in designing hydraulic vibrators. A description of the design method is given. MVTU im. Bauman, in cooperation with various plants, has designed and made several models of hydraulic tracer vibrators for oscillatory machining which were based on the method described. The units are designated as hydraulic or electro-hydraulic vibrating slides. One, designed in collaboration with the Izhevskiy mashinostroitel'nyy zavod (Izhev Engineering Plant) type ВГ-2 (VG-2) is covered by the author's certificate No. 123011, dated February 3, 1959, on name of Ye. Ye. Zakharov. The vibro-slide VG-3 is patented by Yu. Ye. Zakharov and V. N. Baranov (author's certificate No. 128260, dated January 29, 1959). The vibro-slide ВГС-1 (VGS-1) produced in cooperation with the Stankozavod im. S. Ordzhonikidze (Machine Tool Works im. S. Ordzhonikidze) has an author's certificate No. 134537, dated May 20, 1960, given to V. N. Baranov and

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Some problems of applying ...

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D221/D302

Yu. Ye. Zakharov. The electrodynamic vibrator for oscillatory drilling made by the Izhev Engineering Plant is patented by the authors, for which the author's certificate No. 132024, dated January 21, 1960, was issued. There are 6 figures and 12 references: 10 Soviet-bloc and 2 non-Soviet-bloc. The references to the English-language publications read as follows: P. Martens, Tooling and Production Magazine, no. 4, 1960; Armstrong, Amer. Machinist, no. 22, 1955, 99.

ASSOCIATION: MVTU im. N. E. Baumana (MVTU im. N. E. Bauman)

Card 3/3

ZAKHAROV, Yu. Ye.

B32

7

S/549/61/005/104/001/018  
D237/D304

AUTHORS: Tikhmenev, S.S., Tronina, V.P., Chikin, V.A., Knyazev, G.  
M., Gulyayev, M.P., Zakharov, Yu. Ye., Chikina, T.S., Lya-  
min, V.I., Bocharov, V.K., Shaikin, Ye.K., and Krotov, V.F.

TITLE: Scientific, pedagogical and general activities of Profes-  
sor V.V. Dobronravov

SOURCE: Moscow, Vyssheye tekhnicheskoye uchilishche [Trudy], no.  
104, 1961. Mekhanika, 7 - 18

TEXT: On the occasion of his 60th birthday and the 35th anniversa-  
ry of the scientific and pedagogical activity of Professor, Doctor  
of Physical and Mathematical Sciences, Vladimir Vasilyevich Dobron-  
ravov who is at present Professor of Theoretical Mechanics at MVTU  
im. N.E. Baumana (MVTU im. N.E. Bauman), eleven of his students  
present this appreciation. V.V. Dobronravov was born on March 17th,  
1901. In 1924 he obtained his degree in mathematics at the Saratov-  
skiy Gosudarstvennyy universitet im. N.G. Chernyshevskiy (Saratov  
State University im. N.G. Chernyshevskiy). In 1927 he accepted the  
Card 1/3

Scientific, pedagogical and ...

S/549/61/090/194/001/018  
D237/D304

post of Assistant to the Professor of Physics at the Astrakhan State Medical Institute, where in subsequent years he published a paper in neuro-biophysics. During 1929-31, he was Professor of Mathematics at the Saratov Agricultural Institute and lectured at Saratov University. From 1931 he worked in a number of higher educational establishments in Moscow and was associated with Moscow University from 1931 to 1952. In 1948 he was awarded a doctorate at Moscow State University and in 1951 he was elected to the Department of Theoretical Mechanics at MVTU im. N.E. Bauman, where in subsequent years, under his guidance, courses in specialized branches such as stability of motion, gyroscopy, oscillation, variational method etc. were developed. During his career the main contributions made were in the field of mechanics of non-holonomic systems. After 1950 he published papers on kinetics of motion of rigid body (Trudy MIKhM, no. 2, (10), 1950), stability of linear systems of diff. equations with constant coefficients in (Avtomatika i Telemekhanika, v. 17, no. 3, 1956) etc. In the 1950's he also became interested in astronautics. He has been a member of the Moscow Mathematical Society since 1944, and is an active member of the Methodological Commis-

Card 2/3

Scientific, pedagogical and ...

S/549/61/006/104/001/018  
D237/D304

tion on the Theoretical Mechanics of the Ministry of the Secondary and Higher Education of USSR. At present he is engaged in preparing a monograph on non-holonomic systems.

ASSOCIATION: Moskovskoye ordena Lenina i ordena trudovogo krasnogo znameni vyssheye tekhnicheskoye uchilishche im. Baumanu (Moscow Order of Lenin and Order of the Red Banner of Labor Higher Technical School im. Bauman)

Card 3/3

S/549/61/000/104/008/018  
D237/D304

**AUTHORS:** Zakharov, Yu.Ye., Candidate of Technical Sciences, and  
Baranov, V.N., Engineer

**TITLE:** On forced oscillations of a piston hydro-servomotor without feedback

**SOURCE:** Moscow. Vyssheye tekhnicheskoye uchilishche. [Trudy],  
v. 104, 1961. Mekhanika, 67 - 77

**TEXT:** The authors study periodic motion of the piston of the hydro-servomotor with arbitrary input signal, for the three basic types of load on the piston, which are: 1) Force constant in magnitude and direction; 2) Elastic force (spring-loaded piston); 3) Inertial force (mass of the load not neglected). Making the usual initial assumptions, the authors give the equation of motion of the piston and solve it by using a dimensionless coordinate system and expansion in terms of a small parameter. The approximate solution obtained is accurate to the 2nd order of approximation. An example is given. There are 4 figures and 4 Soviet-bloc references.

Card 1/1

BARANOV, V.N., inzh.; ZAKHAROV, Yu.Ye., assistant

Hydraulic and electrohydraulic vibrators used for technical purposes in the manufacture of machinery. Izv. vys. ucheb. zav.; mashinostr. no.6:39-51 '61. (MIRA 1417)

1. Moskovskoye vyssheye tekhnicheskoye uchilishche imeni Enamana.

(Vibrators)



ZAKHAROV, Yu.Ye.; BARANOV, V.N.; SHOMLO, Ya.

Determining the consumption ratio and hydrodynamic force on valves  
of hydraulic servomechanisms. Stan.1 instr. 33 no.3:16-21 Mr '62.  
(MIRA 15:2)

(Servomechanisms)

S/121/63/000/001/004/014  
A004/A126

AUTHORS: Baranov, V.N., Zakharov, Yu.Ye., Moiseyev, V.Ye., Bezrukov, I.M.

TITLE: Chip-breaking in turning ductile metals

PERIODICAL: Stanki i instrument, no. 1, 1963, 14 - 16

TEXT: Scientific workers of the MVTU im. Bauman have carried out investigations under production conditions to study the efficiency of various methods of chip-breaking and of removing chips from the cutting zone in turning highly ductile metals. These tests proved the possibility of obtaining a reliable breaking of chips over a wide range of cutting conditions, the required finish of the machined surface and an appropriate tool life by using the hydraulic BF-2 (VG-2) vibrating saddle. Moreover, the tests showed that vibrating saddles with electromagnetic and electrodynamic valve drives are suited best for operation in a frequency range of 25 - 100 cps, while ЭРБС-1 (КВЭС-1) vibrating saddles whose control valves are driven by an electric motor are most expediently used in a lower frequency range of 0.5 - 25 cps. The authors present a detailed description of the design features, technological parameters and opera-

Card 1/2

Chip-breaking in turning ductile metals

S/121/63/000/001/004/014  
A004/A126

tional behavior of vibrating saddles, taking into account different turning conditions. The operational tests with vibrating saddles proved that the reduction in power required for cutting is fully compensated by the power required by the hydraulic system. The use of low-frequency vibrating saddles in turning highly ductile metals ensures a reliable breaking of chips, a surface finish of at least class 6, an increase in tool life by a factor of 1.5 and a reduction in cutting power of up to 65%, while the vibrations have no negative effect on the lathe. There are 4 figures and 1 table.

Card 2/2

L 10208-66 EWT(d)/EWP(c)/EWP(v)/T/EWP(k)/EWP(l)/ETC(m) WW

ACC NR: AP5028547

SOURCE CODE: UR/0286/65/000/020/0162/0162

AUTHORS: Baranov, V. N.; Zakharov, Yu. Ya.

ORG: none

44 55 44 55

32  
B

TITLE: Electrohydraulic vibration test machine. Class 42, No. 160607

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 20, 1965, 162

TOPIC TAGS: vibration test, hydraulic device, electromagnet component

ABSTRACT: This Author Certificate presents an <sup>44</sup>electrohydraulic <sup>55</sup>test machine <sup>14</sup> for producing oscillations of a given form and length using a generator of various frequencies and amplitudes of electrical oscillations which are supplied to an electromagnet mechanism controlling the hydraulic oscillation excitation system. The machine is provided with a feedback unit containing an electrical detector connected to the piston of the hydraulic system. For the simultaneous action of translational and rotational oscillations on the investigated object, the electromagnet mechanism is in the form of two electromagnet systems acting on the common shaft. One of these systems is fastened directly to the shaft and imparts

Card 1/2

2

L 10208-66

ACC NR: AP5028547

rotational motions to it. The other system is mounted in the center of a rigidly fastened elastic membrane and imparts longitudinal motions to the shaft. The shaft is mechanically coupled to the control valves of the hydraulic slave system.

SUB CODE: 4013, 09/

SUBM DATE: 25 Jun 62

Card 278

ZAKHAROV, Yu. Ye., kand. tekhn. nauk, dotsent; GRIGOR'YEV, P.V., inzh.;  
RYAZHKOV, Yu.G., aspirant; YAKIMOVA, L.D., inzh.

Calculating the time of valve shifts in control systems of  
hydraulic transmissions. Izv. vys. ucheb. zav.; mashinostr.  
no. 10:112-122 '65 (MIRA 19:1)

1. Moskovskoye vysshaye tekhnicheskoye uchilishche im. Baumana.  
Submitted December 13, 1963.

L 04925-67 EWT(m)/EMP(w) IJP(c) EM/WW/QD

ACC NR: AT6018759

SOURCE CODE: UR/0000/65/000/000/0124/0135

AUTHOR: Baranov, V. N.; Zakharov, Yu. Ye.

60

ORG: none

B+1

TITLE: Forced vibrations of a hydraulic piston servomechanism without feedback

20

17

SOURCE: AN SSSR. Institut avtomatiki i telemekhaniki. Gidroavtomatika (Hydraulic automation). Moscow, Izd-vo Nauka, 1965, 124-135

TOPIC TAGS: hydraulic device, servomechanism, forced vibration, nonlinear vibration, vibration analysis, fluid flow, flow analysis, *ENGINE PISTON*

ABSTRACT: The forced vibrations of a piston servomechanism without feedback are examined with consideration of the compressibility of the column of working fluid. It is assumed that the coefficient of discharge in the openings of the slide valve is constant, that the pressure applied to the control slide valve of the mechanism is constant, that the mechanism operates under steady thermal conditions, i.e., the temperatures of viscosity of the working fluid are constant, that leakages from the working cavities of the cylinder, overflows between the working cavities, and leakages from the slide-valve sleeve are negligible, that the size of the working opening of the slide valve changes by a purely sine law, that the load on the piston consists of d'Alembert

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I. 01925-67  
ACC NR: AT6018759

force of inertia, force of viscous friction, elastic force constant in magnitude and direction, and force of dry friction constant in magnitude, and that the resistance of the connecting tubes leading from the control slide valve to the power cylinder is neglected. An analysis, under these assumptions, of forced vibrations of the pistons of hydraulic servomechanisms without feedback shows that the amplitude of forced vibrations in the first approximation can be considered, with an accuracy sufficient for practical calculations, inversely proportional to frequency. The introduction of pressure feedback limits the amplitude or the length of the channels in the piston; however, in this case the shape of the vibrations of the piston is close to rectangular. A hydraulic vibrator with a bilateral symmetric piston servomechanism provides the smallest nonlinear distortion factor in the first approximation; the highest nonlinear distortion factor takes place in a vibrator with a unilateral piston. In all types of vibrators with a sine law of opening of the working apertures of the control slide valve there are periodic motions which can be eliminated by taking special measures, in particular by introducing position feedback. Orig. art. has: 31 formulas and 3 figures.

SUB CODE: 420/    SUBM DATE: 25Aug65/    ORIG REF: 005/    OTH REF: 001

kh

Card 2/2



L 05422-67 - EWT(1)/EWP(m)/EWT(m) - WW/DJ/GD

ACC NR: AT6018757

SOURCE CODE: UR/0000/65/000/000/0021/0030

AUTHOR: Zakharov, Yu. Ye.

ORG: none

TITLE: Wave equation for hydraulic mechanisms

SOURCE: AN SSSR. Institut avtomatiki i telemekhaniki - Gidroavtomatika (Hydraulic automation). Moscow, Izd-vo Nauka, 1965, 21-30

TOPIC TAGS: wave equation, hydraulic device, fluid flow, flow velocity, pipe flow

ABSTRACT: To describe wave processes in hydraulic mechanisms in the general case of motion, a wave equation is derived which takes into account the change of flow velocity of the fluid and of pressure in undisturbed motion (the wave equation for hydraulic mechanisms). In deriving this equation it is assumed that the working fluid is nonviscous but compressible, that the flow of the fluid is unidimensional, the temperature of the working fluid is constant, and that the pressure and flow velocity of the fluid in undisturbed motion are functions only of time determined by equations of motion of a hydraulic mechanism without consideration of wave processes in the pipelines. By introducing a new variable this equation is reduced to a conical form of a unidimensional flow wave equation. The use of the derived wave equation for investi-

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56  
B+

L 05422-67

ACC NR: AT6018767

gating wave processes in a unilateral piston hydraulic mechanism showed that it is possible to determine disturbances superposed by wave processes in pipelines onto steady motions of a hydraulic mechanism with a given law of change of the opening of the passage of the control element. Orig. art. has: 18 formulas and 2 figures.

SUB CODE: <sup>13</sup>~~12~~,20/ SUBM DATE: 25Nov65/ ORIG REF: 016/ OTH REF: 003

Card 2/2 *Full*

L-33678-66 EWT(d)/EWT(l)/EWT(m)/EWP(k)/EWP(h)/I/EWP(v)/EWP(l) WW/DJ/BC

ACC NR: AP6013813 (A) SOURCE CODE: UR/0145/65/000/010/0112/0122

AUTHOR: Zakharov, Yu. Ye. (Candidate of technical sciences);  
Grigor'yev, P. V. (Engineer); Ryazhkov, Yu. G. (Aspirant); Yakimova,  
L. D. (Engineer)

ORG: MVTU im. N. E. Bauman

TITLE: Calculation of the switch-over time for valves in hydraulic control systems

SOURCE: IVUZ. Mashinostroyeniye, no. 10, 1965, 112-122

TOPIC TAGS: valve, hydraulic device, flow control, vehicle power transmission system

ABSTRACT: The aim of the present article is to furnish designers of control systems with a set of ready made formulas and graphs which make it possible to determine the switch-over time of typical elements of the hydraulic transmission box of locomotives. The article is based on a theoretical and experimental investigation of the hydraulic control systems of Type TKG-2 locomotives and Type UGP 750-1200 hydraulic transmissions. The mathematical development is based on the following assumptions: 1) the temperature and viscosity of the working fluid are

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UDC: 625.282

L 33678-66

ACC NR: AP6013813

constant; 2) the compressibility of the working fluid is neglected; and,  
3) the force of dry friction is assumed to be constant over the model.  
The article gives detailed drawings of the operating mechanism of the  
hydraulic transmission boxes and a series of curves based on formulas in  
dimensionless variables. Orig. art. has: 32 formulas and 5 figures.

SUB CODE: 13/ SUBM DATE: 13Dec63.

Card

2/2 *LLB*

SITKHINA, Dina Yefimovna; ZAKHAROV, Zakhar Nikolayevich,  
retsensent; KIRPICHEV, Sergey Stepanovich, retsensent;  
LIKHOVIDOV, N.K., red.

[Establishing technical norms in woodworking industries]  
Tekhnicheskoe normirovanie derevoobrabatyvalushchego  
proizvodstva. Moskva, Lesnaia promyshlennost', 1965. 182 p.  
(MIRA 18:7)

ZAKHAROV-NARTSISSOV, O.I.; OCHKIN, A.V.

Extraction of certain strong monobasic acids with trioctylamine.  
Zhur.neorg.khim. 7 no.3:665-670 Mr '62. (MIRA 15:3)  
(Acids, Inorganic) (Trioctylamine)

ZVYAGINTSEV, O.Ye.; ZAKHAROV-NARTSISSOV, O.I.; OCHKIN, A.V.

Extraction of gold from cyanide solutions obtained in ore treatment  
with n-trioctylamine. Zhur. prikl. khim. 34 no. 12:2601-2605 D '61.  
(MIRA 15:1)

(Gold ores) (Cyanide process)

ZAKHAROV-NARTSISSOV, O. I., Cand Chem Sci -- "Extraction of gold from cyanide solutions by means of certain organic solvents." Mos, 1961. (Acad Sci USSR. Inst of Gen and Inorg Chem im N. S. Kurnakov) (KL, 8-61, 231)

- 77 -



ZAKHAROV-NARTSISSOV, O.I.; MIKHAYLOV, G.G.

Study of the solubility and composition of some thorium carbonate compounds. *Izv.vys.ucheb.zav.; khim.i khim tekhn.* 3 no.1:45-48 '60. (MIRA 13:5)

1. Kafedra khimicheskoy fiziki Moskovskogo khimiko-tekhnolog'cheskogo instituta imeni D.I. Mendeleeva.  
(Thorium compounds)

5.22.00(A)

69666

AUTHORS: Zakharov-Nartsissov, O. I., Mikhaylov, G. G. S/153/60/003/01/010/058  
B011/B005TITLE: Investigation of the Solubility and Composition of Some Carbonate  
Compounds of ThoriumPERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i khimicheskaya  
tekhnologiya, 1960, Vol 3, Nr 1, pp 45-48 (USSR)

TEXT: In their paper the authors studied the solubility of  $\text{ThOCO}_3 \cdot 8\text{H}_2\text{O}$  in water. It is 41.6 mg/l. In 3 a M solution of  $\text{NaClO}_4$ , it is 46.8 mg/l. The authors indicate various known forms of thorium-carbonate compounds, as well as a diagram of thermal decomposition of  $\text{ThOCO}_3 \cdot 2\text{H}_2\text{O}$  from publications. Thorium oxycarbonate is better soluble in aqueous solutions of alkali-metal carbonates than in water, i.e. better than  $\text{U}(\text{CO}_3)_2$ . The solubility increases with increasing  $\text{CO}_3^{2-}$ -ion concentration. This suggests a formation of soluble complex thorium compounds. Here the chemical composition of the thorium-oxycarbonate precipitate changes. The thorium oxycarbonate used in the experiment was prepared by mixing equivalent amounts of  $\text{Na}_2\text{CO}_3$  solution with a  $\text{Th}(\text{NO}_3)_4$  solution marked with  $\text{UX}_1$ . The specific  $\beta$ -activity of the substance obtained was then determined.  $\text{UX}_1$  (radioactive thorium isotope) was made of "old" uranium salts (according to G. Siborg, Ref 6). The original

Card 1/3

69666

Investigation of the Solubility and Composition of Some Carbonate Compounds of Thorium

S/153/60/003/01/010/058  
B011/B005

Th(NO<sub>3</sub>)<sub>4</sub> was first purified from the β-active decomposition products of ThB (Pb). The Th(NO<sub>3</sub>)<sub>4</sub> solution prepared had practically no β-activity. The solubility was determined in Semenov's vessels in a TS-15 thermostat at 20±0.05°. Table 1 shows the results, table 2 shows the dependence of the equilibrium content of thorium in aqueous Na<sub>2</sub>CO<sub>3</sub> solutions on the concentration of the latter at an ionic strength of 3.0. These data show that the composition of the precipitate is unsteady with increasing equilibrium concentration of the CO<sub>3</sub><sup>2-</sup> ion from 0 to 0.1 mol/l. At a concentration above 0.1 mol/l, the composition of the precipitate does not change. On the basis of the analysis, one of the following formulas may be assigned to it: Na<sub>6</sub>[Th(CO<sub>3</sub>)<sub>5</sub>]·12H<sub>2</sub>O; Na<sub>4</sub>[Th(CO<sub>3</sub>)<sub>4</sub>]·Na<sub>2</sub>CO<sub>3</sub>·12H<sub>2</sub>O; Na<sub>2</sub>[Th(CO<sub>3</sub>)<sub>3</sub>]·2Na<sub>2</sub>CO<sub>3</sub>·12H<sub>2</sub>O. It may be assumed that in the aqueous Na<sub>2</sub>CO<sub>3</sub> solution the same thorium compounds exist as in the precipitate. The last formula is most probable since its coordination number for thorium is 6. The ion solubility product was computed to be

$$C_{ThO^{2+}} \cdot C_{CO_3^{2-}} = 9 \cdot 10^{-9}$$

Card 2/3

Investigation of the Solubility and Composition of  
Some Carbonate Compounds of Thorium

69666  
S/153/60/003/01/010/058  
B011/B005

The maximum thorium concentration in the system  $\text{ThOCO}_3\text{-Na}_2\text{CO}_3\text{-NaClO}_4\text{-H}_2\text{O}$  is  
13.2 g/l. There are 2 tables and 6 references, 1 of which is Soviet.

ASSOCIATION: Moskovskiy khimiko-tehnologicheskii institut im. D. I. Mendeleyeva;  
Kafedra khimicheskoy fiziki (Moscow Institute of Chemical Tech-  
nology imeni D. I. Mendeleev; Chair of Chemical Physics)

SUBMITTED: January 14, 1959

Card 3/3

KNYAZEV, G.A.; FOMIN, V.V.; ZAKHAROV-NARTSISSOV, O.I.

Ion-exchange study of the dissociation of  $\text{CoC}_2\text{O}_4$ . Zhur.neorg.  
khim. 1 no.2:342-344 F '56. (MLRA 9:10)

(Cobalt oxalates) (Ion exchange)

ZAKHAROV-NARTSISSOV, O.I.; OCHKIN, A.V.

Extraction of nitric acid with triheptylamine. Zhur.neorg.khim.  
6 no.8:1936-1939 Ag '61. (MIRA 14:8)  
(Nitric acid) (Amines)

ZVYAGINTSEV, O.Ye., ZAKHAROV-NARTSISSOV, O.I.; OCHKIN, A.V.

Extraction of gold hydrocyanic acid with n-trioctylamine. Zhur.neorg.  
khim. 6 no.8:1978-1979 Ag '61. (MIRA 14:8)  
(Hydrocyanic acid) (Gold compounds) (Trioctylamine)

5.2640

68114

SOV/78-5-1-23/45

5(2)  
AUTHORS:Zvyagintsev, O. Ye., Zakharov-Nartsissov, O. I., Ochkin, A. V.

TITLE:

Solvation and Polymerization of Cyanoauric (I) Acid in Aqueous Solutions

PERIODICAL:

Zhurnal neorganicheskoy khimii, 1960, Vol 5, Nr 1, pp 131-138 (USSR)

ABSTRACT:

This article deals with the conditions of extraction of cyanoauric (I) acid and its salts from aqueous solutions by means of organic solvents. The authors investigated: 1) the dependence of  $\frac{[H^+]}{\alpha}$  on the equilibrium concentration  $[H^+]$  of the hydrogen ions in the extraction of  $HAu(CN)_2$  by means of various alcohols ( $\alpha$  = distribution coefficient of  $HAu(CN)_2$  among aqueous and organic phase) for which they derived equation (6); 2) the dependence of the alcohol content of the aqueous phase upon the sulfuric acid concentration (Table 1). It was found that the solubility of alcohols in the aqueous phase decreases with rising concentration of  $H_2SO_4$ . 3) Furthermore, the authors studied the dependence of  $\alpha$  upon the equilibrium concentration of  $AuH(CN)_2$  in the organic phase (Table 2). It was found that

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Solvation and Polymerization of Cyanoauric (I) Acid in Aqueous Solutions

solvates of the form  $\text{HAu}(\text{CN})_2 \cdot x\text{Sol}$  are formed by reaction of  $\text{HAu}(\text{CN})_2$  with the aliphatic alcohols under consideration.

These solvates are present in the organic and aqueous phase alike. The distribution coefficient decreases with rising concentration of cyanoauric (I) acid in the aqueous phase, which is explained by the formation of polymers<sup>1</sup> of the form  $[\text{HAu}(\text{CN})_2]_n$ . Such dimers are present in the aqueous phase, and are not extracted by a 1:1 mixture of n-amyl alcohol or cyclohexanone and benzene. No polymers were detected in strongly dilute solutions. There are 1 figure, 2 tables, and 6 references, 5 of which are Soviet.

ASSOCIATION: Moskovskiy ordena Lenina khimiko-tekhnologicheskii institut im. D. I. Mendeleyeva (Moscow "Order of Lenin" Institute of Chemical Technology imeni D. I. Mendeleev)

SUBMITTED: July 9, 1959

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ZVYAGINTSEV, O.Ye.; ZAKHAROV-NART'SISSOV, O.I.

Extraction of gold from cyanide solutions obtained from the  
treatment of gold ores. Zhur.prikl.khim. 33 no.1:55-58 Ja  
'60; (MIRA 13:5)  
(Gold) (Cyanides)

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SOV/80-33-1-9/49

AUTHORS: Zvyagintsev, O. Ye., Zakharov-Nartsissov, O. I.

TITLE: Extraction of Gold From Cyanide Solutions Obtained by Treatment of Gold Ores

PERIODICAL: Zhurnal prikladnoy khimii, 1960, Vol 33, Nr 1, pp 55-58 (USSR)

ABSTRACT: The authors calculated distribution coefficients for gold and for metallic impurities (silver, iron, arsenic, copper, etc.) in extraction of gold (as  $\text{HAu}(\text{CN})_2$ ) from acidified (with  $\text{H}_2\text{SO}_4$ ) technical cyanide solutions by isoamyl alcohol. Two ore samples (submitted by Professor M. D. Ivanovskiy) were treated for gold extraction (composition (in mg/kg ore) or ore Nr 1 = Au, 16-18; Ag, 20-25; sum of Sb, Fe, Cu, 300-400; Zn, none; As, none; ore Nr 2 = Au, 17-19; Ag, 40-60; As, 50,000-60,000; Sb, 5; Zn, 80; Cu, 6,000-7,000; Fe 60,000-80,000). Hundred-gram ore samples ground to 150 mesh were placed

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into porcelain tumblers which were then filled up with solutions of NaCN (0.12 and 0.25 % weight in solutions of ores 1 and 2, respectively) and alkali (0.12% CaO and 0.2% NaOH, respectively). After 36-40 hr of mixing the decanted solution was acidified with 0.1M sulfuric acid with subsequent addition of radioactive indicators ( $\text{NaAu}(\text{CN})_2$ ,  $\text{NaAg}(\text{CN})_2$ ,  $\text{Na}_4\text{Fe}(\text{CN})_6$ , or  $\text{Na}_2\text{Zn}(\text{CN})_4$ ) to equal volume fractions of the solutions (for measurements of  $\gamma$ -activities). Copper and arsenic were determined separately--(copper by the method of Gillebrand, V. F., Lendel, G. E., et al., (Practical Manual for Inorganic Analysis (Prakticheskoy rukovodstvo po neorganicheskomu analizu), Goskhimizdat, 268 (1957)) and arsenic by the method of Analysis of Raw Mineral Materials (Analiz mineral'nogo syr'ya, Goskhimizdat, 505 (1959)). These solutions were then shaken with isoamyl alcohol, keeping the volume ratio of organic ( $v_{\text{org. equil.}}$ ) and aqueous ( $v_{\text{aq. equil.}}$ ) phases equal to 1:5 in all experiments. Distribution coefficient of

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metals ( ) was calculated by the formula  $= N_{org} / N_{aq}$ , where  $N_{org}$  and  $N_{aq}$  are -activities in organic and aqueous phases at equilibrium. For Cu and As, was found by analysis, using the formulas:

$$v_{aq. \text{ init.}} \cdot C_{aq. \text{ init.}} = v_{aq. \text{ equil.}} \cdot C_{aq. \text{ equil.}} + v_{org. \text{ equil.}} \cdot C_{org. \text{ equil.}}$$

$$= C_{org. \text{ equil.}} / C_{aq. \text{ equil.}},$$

where  $v_{aq. \text{ init.}}$  is initial volume of the aqueous phase; and  $C$  (with respective indices) is concentration of metals in these phases. Percent of gold recovery =

$$\frac{N_{aq. \text{ init.}} - N_{aq. \text{ equil.}}}{N_{aq. \text{ init.}}} \cdot 100.$$

Two subsequent extractions resulted in 98.5% of gold recovery from both ores.

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Separation of gold from silver, copper, and zinc is complete (i.e., their distribution coefficients were found to be zero), while % of iron and arsenic admixtures is very low ( Fe = 0.01, As = 0.06).

Figure 1 shows variation of distribution coefficients with concentration of sulfuric acid. There are 1 figure; 2 tables; and 5 Soviet references.

SUBMITTED: July 2, 1959

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Extraction of Gold From Cyanide Solutions  
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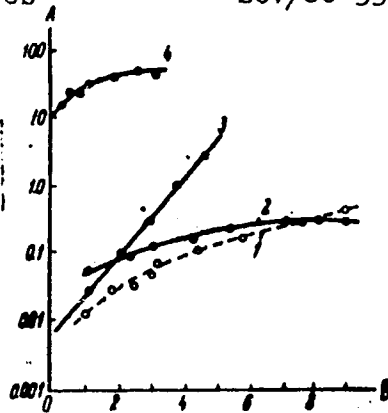


Fig. 1. Variation of distribution coefficients of gold, iron, arsenic, and sulfuric acid in their distribution between isoamyl alcohol and cyanide solution obtained from ore Nr 2 with concentration of the acid in aqueous phase. (A) Distribution coefficient  $\alpha : C_{org}/C_{aq}$ ; (B) concentration of  $H_2SO_4$  (in moles/l). (1)  $H_2SO_4$ ; (2) As; (3) Fe; (4) Au.

Card 5/5

SUDARIKOV, B.N.; FROLOV, Yu.G.; IL'ICHEV, V.A.; PUSHKOV, A.A.; ZAKHAROV-  
NARTSISSOV, O.I.; OCHKIN, A.V.

Physicochemical properties of some n-aliphatic amines. Trudy  
MKHTI no.43:21-28 '63.

(MIRA 17:10)



SUDARIKOV, B.N.; ZAKHAROV-NARTSISOV, G.I.; OCHKIN, A.V.

Oxidation of tetravalent uranium in sulfuric acid solutions  
by atmospheric oxygen. Trudy MKhTI no.43:78-81 '63. (MIRA 17:10)

ZAKHAROVA, A.

Guidance means assistance. Mest.prom.i khud.promys. 3 no.4:  
12-13 Ap '62. (MIRA 15:5)

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PLANOVSKIY, A. N.; ZAKHAROVA, A. A.; SARUKHANOV, A. V.

Kinetic design of plate apparatus taking the mixing of the liquid phase into account. Khim prom no. 3:224-227 Mr '64. (MIRA 17:5)

AVAGIMOV, Ye.A. [Avahimov, E.A.], assistant; ZAKHAROV, V.N., student 4-go kursa; ZAKHAROVA, A.A., student 4-go kursa; BELOKUROV, V.G. [Bielokurov, V.H.], student 4-go kursa

Stand for cleaning fuel and oil filters. Mekh. sil'. hosp. 13  
no.9:10-11 S '62. (MIRA 17:3)

1. Kubanskiy sel'skokhozyaystvennyy institut.

FEDOROVSKAYA, N.P.; ZAKHAROVA, A.A.

Volumetric micromethod of sulfur content determination.  
Trudy IGI 21:175-178 '63.

Micromethod for the simultaneous determination of carbon,  
hydrogen, and sulfur contents. 179-184 (MIRA 16:11)

FEDOROVSKAYA, N.P.; ZAKHAROVA, A.A.

Rapid method for determining total sulfur. Trudy IGI 8:221-228  
'59. (MIRA 13:1)  
(Coal--Analysis) (Sulfur--Analysis)

ZAKHAROVA, A.B.; ZAKHAROV, B.S.

Aconites and their use in popular medicine. Vest. AN Kazakh.SSR  
18 no.1:105-107 Ja '62. (MIRA 15:2)

(ACONITE)

L 31095-66 EWT(m)

ACC NR: AP6022810

SOURCE CODE: UR/0089/65/019/005/0458/0459

AUTHOR: Murin, A. N.; Lovskiy, L. K.; Zakharova, A. E.

ORG: none

TITLE: Production of stable <sup>19</sup>krypton and <sup>19</sup>xenon isotopes by irradiation of aluminum halides in reactors

SOURCE: Atomnaya energiya, v. 19, no. 5, 1965, 458-459

TOPIC TAGS: isotope, krypton, xenon, halide, reactor neutron flux, inert gas, quartz, activated carbon, mass spectroscopy, gas analysis, aluminum compound, irradiation

ABSTRACT: Enriched isotopes of the inert gases may be obtained by exposure of aluminum halides to a neutron flux. The halides were prepared by the reduction of the corresponding Ag halide with Al in quartz containers at about 400°C. Irradiation of 20 g of the Al halides by a total flux of  $2.16 \times 10^{17}$  n/cm<sup>2</sup> resulted in the following yields of gaseous products: from AlBr<sub>3</sub>,  $2.4 \times 10^{-2}$  cm<sup>3</sup> of <sup>80</sup>Kr and  $0.6 \times 10^{-2}$  cm<sup>3</sup> of <sup>82</sup>Kr (using <sup>79</sup>Br and <sup>81</sup>Br, respectively); from Al<sup>127</sup>I,  $6.8 \times 10^{-4}$  cm<sup>3</sup> of <sup>128</sup>Xe. After exposure to high temperatures for three weeks, the quartz ampoules placed in a gas purification system containing liquid nitrogen or dry ice (for work with xenon) traps, KOH, CuO, and Ca. The purified gases were transferred into ampoules containing active carbon. Mass spectrograms of xenon exhibited only the peak corresponding to

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UDC: 621.039.3

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ACC NR: AP6022810

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128Xe; the atmospheric impurities amounted to less than 0.1%; those of krypton showed that the mixture contained  $^{80}\text{Kr}/^{82}\text{Kr}$ , at a ratio of 3.8, as expected from calculations. Atmospheric impurities were present in amounts less than 0.05%. The authors thank D. N. Kaminkor for making possible the work on the reactor of the Physicotechnical Institute im. A. F. Ioffe and also I. K. Kirin and Yu. A. Shukolyukov for assistance in the research. Graduate student N. S. Okunev actively participated in the work. Orig. art. has: 1 table. NA

SUB CODE: 18 / SUBM DATE: 01Mar65 / ORIG REF: 003

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A.F.Zakharova. Izv.Vses.gocg.ob-va 86 no.3:314 My-Je '54. (MLRA 7:6)  
(Bucegi Mountains--Climate) (Stoenescu, S.M.)

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Division of the Karelian Isthmus into climatic regions for agricultural purposes [with summary in English]. Vest. LGU 12 no.24:123-138 '57.  
(Karelian Isthmus--Crops and climate) (MIRA 11:5)

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Study of the types of local conditions on the Karelian Isthmus,  
based on frost susceptibility. Vest.LGU no.24:74-82 '62.  
(MIRA 16:2)

(Karelian Isthmus--Frost)



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34 p. (MIRA 18:9)

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Characteristics of the thermal conditions of certain well-delineated  
areas in the Karelian Isthmus. Mat.po meteor.i klim. no.1:66-86  
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ZAKHAROVA, A.

Concentrating on production. Zhil.-kom. khoz. 13 no.5:20-21  
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1. Pradsedatel' Belorusakogo respublikanskogo komiteta  
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(White Russia--Trade unions)  
(White Russia--Municipal services)

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(Aluminum alloys—Heat treatment)