LADYGINA-KOTS, Nadezhda Nikolayevna, doktor biol. nauk (1889-1963); SHOROKHOVA, Ye.V., otv. red.; MORAF, I.A., red.

[Prerequisites of human thinking; imitative construction by apes and children] Predposylki chelovecheskogo myshleniia; podrazhatel'noe konstruirovanie obez'ianoi i det'mi. Moskva, Nauka, 1965. 108 p. (MIRA 18:5)

SHOROKHOVA, Yekaterina Vasil'yevna; KOZERUK, V., red.; NEYMAN, F., mladshiy red.; CHEPELEVA, O., tekhn. red.

[The problem of consciousness in philosophy and natural science] Problema soznaniia v filosofii i estestvovedenii. Moskva, Izd-vo sotsial'no-ekon.lit-ry, 1961. 362 p. (MIRA 15:1)
(Consciousness)

Shoropin, V.D.

BORNATSKIY, Ivan Ivanovich, kandidat tekhnicheskikh nauk; KAZACHKOV, Ye.A., redaktor; SHOROPIN, V.D., redaktor; ATTOPOVICH, M.K., tekhnicheskiy redaktor.

[Desulfuration of Marten steel] Desul'firatsiia martenovskoi plavki. Moskva, Gos.nauchno-tekhn.izd-vo lit-ry po chernoi i tsvetnoi metallurgii, 1955. 113 p. (MLRA 8:12)
(Steel--Heat treatment)

SHOROR, Vl.

"It's good to live in the Baikal region." Sov.voin 38 no.16: 14-15 Ag '56. (MLRA 9:12)

(Baikal region)

SHOROR, Vl.

One's own mark. Izobr.i rats. no.12:14-15 D '59.
(MIRA 13:8)
(Bearing industry--Technological innovations)

SHORO., Vl.

Looking toward the future. Izobr.i rats. no.6:28-30 Je '60.
(MIRA 14:8)

1. Spetsial'nyy korrespondent zhurnala "Izobretatel' i ratsionalizator", g.Kramatorsk.
(Kramatorsk—Technological innovations)

SHOROR, Vl. (g.Belgorod)

Damage to an important business. Izobr.i rats. no.8: 29-30 Ag '60. (MIRA 13:7)

1. Spetsial'nyy korrespondent zhurnala "Izobretatel' i ratsionalizator."
(Belgorod--Boiler makers--Technological innovations)

SHOROR, Vl.

Published in Izhevsk ("Experience of mixed brigades" by N.P. Zubarev, "Automation of reeling processes" by A.K. Belopashtsev). Izobr.i rats. no.1:46 Ja '61. (MIRA 14:1)
(Automation) (Technological innovations)
(Zubarev, N.P.) (Belopashtsev, A.K.)

SHOROR, Vladimir

With ability and with all his heart. Izobr. i rats. no. 5:2 of cover, 6-7 My '61. (MIRA 14:5)
(Containers)

SHOROSHOV, M.Kh.; NAZAROV, G.V.

Phase tranformations in α- and $\alpha+\beta$- titanium alloys in the weld zone and criteria for the selection of welding conditions. Titan i ego splavy no.10:278-283 '63. (MIRA 17:1)

18(7) SOV/20-123-5-11/50

AUTHOR: Shorr, B. F.

TITLE: The Effect of Unequal Heating Under Conditions of Creep on the Variation of the Stressed State (Vliyaniye neravnomernogo nagreva v usloviyakh polzuchesti na izmeneniye napryazhennogo sostoyaniya)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 123, Nr 5, pp 809-812 (USSR)

ABSTRACT: If parts of any engine are exposed to the combined influence of stresses, high average temperatures and high inhomogeneities of the temperature field, a creep appears in them and the rate of its development is different in different points of the cross section of the engine part. This causes a rather strong redistribution of the stresses. According to the theory of solidification, the following equation can be given for an uniaxial stressed state:

$v_p = \text{sign } \sigma \cdot Ae^{-\beta/T}(e^{k|\sigma|} - 1)\ \Phi(p)$. $v_p = d\ \varepsilon_p/d\tau$ denotes the rate of creep; T - the absolute temperature; A, β, k - experimental constants; p - a parameter characterizing the solidifying plastic deformation accumulated by the creep.

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The Effect of Unequal Heating Under Conditions of Creep Upon the Variation of the Stressed State

For inhomogeneously heated bodies, the author assumes $p = p^+ + \varkappa p^-$ for $\sigma > 0$ and $p = p^- + \varkappa p^+$ for $\sigma < 0$ with $p^+ = \int_0^\tau v_p^+ d\tau_1$, $p^- = \int_0^\tau |v_p^-| \, d\tau_1$. p^+ denotes the plastic deformation accumulated during the period of expansion, p^- - during the period of compression. The coefficient $\varkappa$ characterizes the direction of the solidifying influence of the plastic deformation. A "fast" plastic deformation is assumed to exert no influence upon the solidification caused by creep. The function σ and β/T are approximated by linear expressions in the interval τ_{i-1} and τ_i. For an uniaxial stressed state ($\sigma_x = \sigma$, $\sigma_y = \sigma_z = 0$) the deformation can be given as $\varepsilon_x = \sum_{k=1}^{n} f_k(x) \psi_k(y,z)$. A connection between stresses and

The Effect of Unequal Heating Under Conditions of Creep Upon the Variation of the Stressed State

deformations is given for the special case of the expansion and bending of a straight rod of any cross section. Another way of solution may be used if the sign of the stresses does not depend on time. The author gives a short comparison of the various solutions. The law of the distribution of the steady rates of creep over the cross section of the rod coincides with the "kinematic" distribution law of the deformations. From the above-mentioned solutions, the distribution law of the stresses in the steady state of the creep can be derived. A figure shows the stresses in an expanded rod for a parabolic distribution of the temperature over its cross section. In the design of engine parts inhomogeneously heated to high temperatures it is not sufficient to investigate only the initial stressed state, the dependence of the stresses on time has also to be taken into account. There are 2 figures and 9 Soviet references.

PRESENTED: July 2, 1958, by Yu. N. Rabotnov, Academician
SUBMITTED: June 26, 1958

25(2) PHASE I BOOK EXPLOITATION SOV/3096

Birger, I.A., B.F. Shorr, and R.M. Shneyderovich

Raschet na prochnost' detaley mashin; spravochnoye posobiye dlya konstruktorov (Design of Machine Parts for Strength; Manual for Designers) Moscow, Mashgiz, 1959. 459 p. Errata slip inserted. 25,000 copies printed.

General Ed.: I.A. Birger, Doctor of Technical Sciences, Professor; Reviewer: N.P. Dorogov, Engineer; Ed.: N.V. Manakin, Engineer; Managing Ed. for Reference Literature: I.M. Monastyrskiy, Engineer; Tech. Ed.: A.F. Uvarova.

PURPOSE: This manual is intended for engineers and designers.

COVERAGE: The book deals with practical methods of designing parts and units of machines for strength and vibration resistance. Special attention is given to threaded joints, tooth gearing, parts of turbines, and piston engines. Formulas for determining stresses in struts, thin plates, and shelves are presented. No personalities are mentioned.

Card ~~1/14~~

SOV/179-59-1-12/36

AUTHOR: Shorr, B. F. (Moscow)

TITLE: Calculations on Unsteady Creep of Unevenly Heated Bars of Arbitrary Cross-Section (K raschetu na neustanovivshuyusya polzuchest' neravnomerno nagretykh sterzhney proizvol'nogo poperechnogo secheniya)

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Mekhanika i mashinostroyeniye, 1959, Nr 1, pp 89-96 (USSR)

ABSTRACT: Assuming the strain is made up of four components:

$$\varepsilon = \sigma / E + \gamma t + \varepsilon_p^* + \varepsilon_p \qquad (1.2)$$

where σ is the stress, γ the coefficient of thermal expansion, t the temperature, ε_p^* the rapid plastic deformation, and ε_p the plastic deformation accumulated during the creep process, the stress distribution and stress relaxation in an unevenly heated stressed beam are found

Calculations on Unsteady Creep of Unevenly Heated Bars of Arbitrary Cross-Section

mathematically, and numerical examples given for alloy EI-437A. There are 4 figures and 11 Soviet references.

SUBMITTED: July 2, 1958.

SHORR, B.F. (Moskva)

Evaluating nonstationary creep of nonuniformly heated rods with arbitrary cross section. Izv.AN SSSR.Otd.tekh.nauk. Mekh. i mashinostr. no.2:89-96 Ja-F '59. (MIRA 12:5)
(Creep of materials)

24(6) SOV/179-59-4-32/40

AUTHOR: Shorr, B. F. (Moscow)

TITLE: On the Experimental Examination of the Theory of Extension of Twisted Rods

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye tekhnicheskikh nauk. Mekhanika i mashinostroyeniye, 1959, Nr 4, pp 176 - 178 (USSR)

ABSTRACT: Some results of experiments are put forward here. Elongated rectangular twisted rods were stretched. A comparison of the experimental data with those of the calculation shows that the limits for the application of various theories are determined by the "torsion parameter" β^2. At $\beta^2 \ll 1$, the linear theory can be applied, whereas in all other cases the nonlinear terms must be considered. The investigations were carried out on duralumin samples according to figure 1. Immediately after hardening, the samples were uniformly twisted by a torsion machine to various residual angles, and were subjected, in this state, to natural aging. Formula (1) is indicated for the principal characteristic of such rods, namely for the angle of the decrease in torsion under the influence of pull. Formula (2) is indicated for coeffi-

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cient k, and formula (3) for β^2. k is connected with the nonlinear character of 0. The data indicated show that at $\beta^2 \ll 1$ all theories offer correct results, while a consideration of the nonlinearity in the form of $k'' = 1/(1+\nu)$ is convenient. In the cases where β^2 is comparable to unity (in practice, β^2 attains the value of 2-3), the consideration of the nonuniform distribution of normal stresses in the cross section is compulsory. It is convenient to carry out the calculation by formulas (1) - (3). They ensure an accuracy up to $\beta^2 \approx 5$, and can be used for rods with any (also an unsymmetric) elongated cross section. There are 5 figures and 4 Soviet references.

SUBMITTED: April 3, 1959

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AUTHOR: Shorr, B. F. (Moscow)

TITLE: Contribution to the Theory of Twisted Non-Uniformly Heated Bars

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Mekhanika i mashinostroyeniye, 1960, Nr 1, pp 141-151 (USSR)

ABSTRACT: An approximate analysis is given of a twisted non-uniformly heated bar with an arbitrary cross-section, which takes account of the non-linear distribution of normal stresses and is applicable, according to experimental evidence, up to parameters of twist (as defined in the course of the analysis) not exceeding 5 (moderate twist). Earlier work, in which the methods of the theory of elasticity were used, is listed (Riz, P.M. and others). Although confined to elastic deformation without heating, the results of these methods were restricted to the simplest cross-sections. Approximate methods have been applied to uniformly heated bars with cross-sections of certain types. A general theory is now given applicable without

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restriction of cross-sectional form or temperature distribution which takes account also of variable elastic constants. A uniform twist along the length of the bar is assumed such that the helix angle remains small. An "orthogonal" cross-section is defined which is normal to the free sides surfaces of the bar. The elastic deformation under torsion is considered a continuation of the built-in twist. It is assumed following Dzhanelidze, G.Yu. (Prikladnaya matematika i mekhanika, 1949, Nr 6, pp 597-608) that the orthogonal cross-section does not change under extension or flexure but is displaced as a solid body. Relations between strains are deduced from this assumption leading to equations between stresses derived from the conditions of equilibrium of a longitudinal element bounded by a plane and an orthogonal cross-section. The shear stress acting in the orthogonal cross-section contains one term due to torsion and another due to the normal stress.

Card 2/5 The force and moment components in a plane cross-section.

Contribution to the Theory of Twisted Non-Uniformly Heated Bars

assumed to be given, are expressed in terms of the stress distributions already derived. This yields the four basic equations which are linear in relation to the components of plane deformation and non-linear in relation to the twisting angle. For cross-sections with length and width of the same order, the shear stresses due to normal stress distributions and the effects of constrained torsion can be neglected. The basic equations are simplified. Further formal simplifications are achieved by substitution of variables and the appropriate choice of the coordinate frame. Finally, a cubic equation is obtained for the angle of twist (equation 3.9) in which the twist parameter, defined by Eq (3.13) is contained. Neglecting all but the linear term in the angle of twist, an expression for the effective geometric stiffness under torsion of an initially twisted bar gives results which under certain conditions coincides with that given by Chen Chu ("The Effect of the Initial Twist on the

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Torsional Rigidity of Thin Prismatical Bars and Tubular Members", Proceedings of the First U.S. National Congress of Applied Mechanics, 1952, pp 265-269). When the twist parameter is small compared with unity, the normal stresses can be computed as for untwisted bars. In moderately twisted bars, the twist parameter is of order unity. The torsional rigidity of such bars is greatly increased, as confirmed by the present author's experiments ("Contribution to the Experimental Verification of the Theory of Extension of Twisted Bars", Izvestiya Akademii nauk SSSR, O.T.N., Mekhanika i mashinostroyeniye, 1959, Nr 4), the approximate theory of the present paper remains valid up to a twist parameter of 5. The rigidity under extension and flexure are reduced and the normal stresses suffer a redistribution. In blades of turbo-machinery and propellers, the twist parameter is typically 2 and over. In cross-sections with little warping of the plane sections, the initial twist is of small significance, for example, in circular cylinders. Elongated, highly

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warping cross-sections suffer the greatest effects of the initial twist. The simplification in the general equations appropriate to thin cross-sections are considered. Some comparisons are made with earlier exact solutions and the approximations of the present theory are proved to be acceptable.
There are 3 figures and 13 references, 12 of which are Soviet and 1 English.

SUBMITTED: October 6, 1959

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26.2120

S/179/60/000/005/003/010
E081/E135

AUTHOR: Shorr, B.F. (Moscow)

TITLE: The Theory of the Torsion of Thin-Walled Bars

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Mekhanika i mashinostroyeniya, 1960, No 5, pp 74-79

TEXT: The paper is a continuation of previous work, published in the 1960 No 1 issue of the same journal. The torsion of thin-walled bars of extended cross-section has applications to air fans and to the blades of axial compressors and turbines. The torsion of such bars is accompanied by other effects such as: untwisting under the influence of axial forces and bending moments; axial extension and bending by a twisting moment; and change of rigidity. In addition to the general theory of twisted bars of arbitrary section based on the special hypothesis of "orthogonal sections", explained in the above mentioned paper, it is of interest to consider the effects in relation to the theory and hypotheses of Vlasov (Ref 2). The problem is formulated by taking two sets of mutually orthogonal helical lines z, s on the surface of a cylinder of radios R (Fig 1) such that the angle δ between the

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The Theory of the Torsion of Thin-walled Bars

tangent to the line s = const and the axis of the cylinder satisfies the condition $\delta^2 \ll 1$. The components of curvature k_1, k_2, and of twisting of the surface k_{12} are then given by Eq (1.2). For a twisted shell of thickness h, the geometrical relations (1.3), the equilibrium equations (1.4) and the elastic relations (1.5) are obtained, where ε_1, ε_2 are the extensions; γ is the shear; χ_1, χ_2 the changes of curvature; τ the change of twist in the middle surface; the direction of the displacements u, v, w, the internal force factors N_1, M_1 etc., and the longitudinally distributed load p_i are shown in Fig 1. N_{1t} and M_{1t} are given by (1.6) where ζ is the distance of the point from the middle surface, γt is the thermal expansion, and $E(s)$ is the average elasticity modulus through the thickness. Vlasov's theory (Ref 2) gives the conditions (1.7) as an approximation. On the basis of the above formulation, Eqs (2.6) are obtained, which permit the calculation of the geometrical characteristics of the cross-section of a twisted bar.

Fig 1

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The Theory of the Torsion of Thin-walled Bars

Further development leads to the differential equation (3.5) for the torsion of a twisted thin-walled bar when unevenly heated, and to Eq (3.8) for the forces N_1, M_1, M_{12}, and the corresponding stresses.

There are 2 figures and 6 Soviet references.

SUBMITTED: May 11, 1960

Card 3/3

88515

S/179/60/000/006/007/036
E022/E107

11,2313 also 2915

AUTHOR: Shorr, B.F., (Moscow)

TITLE: On Calculating Non-Uniformly Heated Cylinders in the Elasto-Plastic Region

PERIODICAL: Izvestiya Akademii nauk sssr,Otdeleniye tekhnicheskikh nauk, Mekhanika i mashinostroyeniye, 1960, No. 6, pp. 57-62

TEXT: The problem of elastoplastic equilibrium of non-uniformly heated thick-walled cylinders has been tackled by many authors (L.M. Kachanov Ref.1, V.M. Sobolevskiy Ref.2, D. Bland Ref.3, A.A. Il'yushin Ref.4, and I.A. Birger Ref.5). In Refs.1 and 2 it was assumed that a single plastic zone is developed (this corresponds to a particular temperature field) and that the material is incompressible in the plastic region (which leads to discontinuity of some functions at the boundary of the zones). In Ref.3, in spite of these assumptions, it is also assumed that the St.Venant plasticity condition ($\sigma_\theta > \sigma_x > \sigma_r$) is valid, although this is not always true for non-uniformly heated cylinders. In the present article, which is based on the theory

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of small elastoplastic deformations (Refs. 4 and 5), two methods are presented for the solution of the thermoplastic problems. Work hardening and compressibility of the material are taken into account. In the first method use is made of the "elastic" solution and the complementary stresses, while in the second method the "plastic" solutions are employed. Both these methods are used to solve the problem of the elastoplastic behaviour of thick-walled cylinders with axisymmetric loading and arbitrary gradients of temperature, as well as of physical and mechanical properties of the material in the radial direction. In the "elastic" solution (Ref.5) for every elastoplastic strain ε_{jk} in addition to the actual stresses σ_{jk} occurring in the material, hypothetical elastic stresses σ_{jk}^{o}, which would occur if the material suffered these strains in a purely elastic manner, are introduced (see Fig.1). Assuming further elastic changes of volume as expressed by

$$\sigma = K(\theta - 3\alpha t) \qquad (1.5)$$

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On Calculating Non-Uniformly Heated Cylinders in the Elasto-Plastic Region

where the local values of K and α depend on the local temperature (and therefore may vary from point to point),

$$\sigma_{jk} = 2G\left(e_{jk} + \delta_{jk}\frac{\mu\theta}{1-2\mu} - \delta_{jk}\frac{1+\mu}{1-2\mu}\alpha t\right) - \sigma_{jk}^{*} \qquad (1.8)$$

$$\left(\delta_{jk} = \begin{cases} 1 & \text{при } j = k \\ 0 & \text{при } j \neq k \end{cases}\right) \qquad (1.8)$$

is obtained. Next, strain ε_{jk} is expressed in terms of displacement u_j and by introducing Eq. (1.8) into equations of equilibrium, and taking into account the boundary conditions

$$u_j = u_j^{oo} + Q_j(\sigma_{jk}^{*}) \qquad (1.9)$$

and

$$\sigma_{jk} = \sigma_{jk}^{oo} + L_{jk}(\sigma_{jk}^{*}) - \sigma_{jk}^{*} \qquad (1.10)$$

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On Calculating Non-Uniformly Heated Cylinders in the Elasto-Plastic Region

are obtained, in which u_j^{oo} and σ_{jk}^{oo} are respectively the actual displacement and the actual stress corresponding to the given temperature field, and Q_j and L_{jk} are the linear operators of the complementary stresses. Finally, by means of successive approximations (starting with the initial elastic value $\sigma_{jk}^{o(0)} = \sigma_{jk}^{oo}$) the required solution is obtained. The operators Q_j and L_{jk} are then evaluated for $t = 0$ and for the case of an axisymmetrically heated and loaded sloping cylinder of the inner and outer radii a and b respectively, and the boundary conditions given:

$$\sigma_r(a) = \sigma_r(b) = 0, \qquad \int_a^b \sigma_x(r)\, r\, dr = 0 \qquad (2.1)$$

As an example, thermal stresses are computed for a cylinder in which the temperature difference between the hot inner surface and cold outer surface is 250 °C with the following parameters:

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$\gamma = 0.5$, $E = 1.85 \times 10^6$ kg/cm^2, $\sigma_T = 22$ kg/mm^2, $\mu = 1/3$, $\alpha = 17.2 \times 10^{-6}$ per °C. In these circumstances there are two plastic zones formed. The convergence of the successive solutions for σ_i is shown in a graph and compared with the purely elastic solution. Also the elastic and elastoplastic stresses are compared in another graph. Computations show that when there is only one plastic zone formed (as in the case with a smaller temperature gradient) then only two or three approximations are sufficient. With the development of more plastic zones the method of "elastic" solution requires many successive approximations. In this case it may be assumed that the material is incompressible and after solving the problem the required corrections may be introduced by means of successive approximations. For a cylinder with an internal pressure p_a and external pressure p_b as well as an axial force P, and heated inside so that the radial temperature gradient is 250 °C, the results of such an approach are shown on yet another graph.

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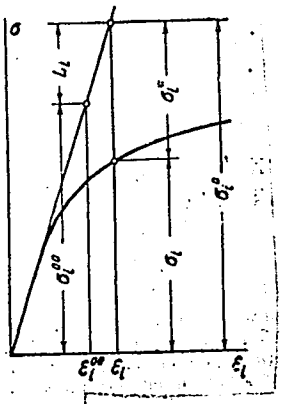
On Calculating Non-Uniformly Heated Cylinders in the Elasto-Plastic Region

There are 4 figures and 6 references: 5 Soviet and 1 English.

SUBMITTED: October 27, 1959



Фиг. 1.

Fig.1

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AUTHOR: Shorr, B.F. (Moscow)

TITLE: Vibrations of twisted bars

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye tekhnicheskikh nauk. Mekhanika i mashinostroyeniye, 1961, No.3, pp.102-112

TEXT: The paper is a continuation of previous work (Ref.13: Izv. AN SSSR, OTN, Mekhanika i mashinostroyeniye, 1960, No.1; Ref.14: Izv. AN SSSR, OTN, Mekhanika i mashinostroyeniye, 1960, No.5; Ref.15: Izv. AN SSSR, OTN, Mekhanika i mashinostroyeniye, 1959, No.4). The vibration of twisted bars is of interest in connection with airscrew blades and the vanes of compressors and turbines. The approach based on the classical Kirchhoff-Clebsch theory of thin bars assumes that, irrespective of the twist in the bar, the longitudinal strain, the angle of twist and the components of curvature are proportional respectively to the longitudinal stress, the twisting moment and the bending moments. This approach has had only limited success and more general relationships, involving coupling between longitudinal, bending and twisting deformations, have been proposed. In the present

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Vibrations of twisted bars

paper, the problem is investigated using the general relationships proposed previously by the author (Ref.13,14). These relationships are stated in matrix form and, with the aid of the equilibrium equations, the differential equations governing the vibrations are derived. These equations, together with the boundary conditions appropriate to one clamped and one free end, lead to a system of integral equations. The expressions for the potential and kinetic energies are also derived. In considering the lowest modes of vibration, the longitudinal inertial forces and bending in the plane of maximum rigidity can be neglected; the simplified equations obtained in this way are solved to give the frequencies of the first and second bending modes and the first torsional mode of an axial turbine vane. These frequencies are compared with those (a) calculated ignoring the twist, (b) calculated from the Kirchhoff-Clebsch theory and (c) obtained from experiment. The values calculated from the present theory agree closely with experiment, whereas the remaining calculated values differ considerably. Experimental frequencies are also given for a number of twisted duralumin bars and compared with calculated values. Thanks are expressed to

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Vibrations of twisted bars

N.N.Akimova and N.V.Zemskov for participation in the work. P.M.Riz, A.I.Lur'ye, G.Yu.Dzhanelidze. V.M.Marchenko, S.A.Tumarkin and I.A.Burger are mentioned for their contributions in the field. There are 5 figures and 16 references: 10 Soviet and 6 non-Soviet. The four most recent references to English-language publications read as follows:

Rossard D.D. J.Appl.Mech., 1953, June, v.20, No.2, p.241-244;
Carnegie W. Proc. Inst. Mech. Engnrs. 1959, v.173, No.12;
Sato Takeshi. Trans. Japan Soc. Mech. Eng., 1958, 24, No.147, p.866-872; 2nd rept., Trans. Japan Soc. Mech. Eng., 1960, 26, No.161, p.4-11;
Knowles J.K., Reissner E. Quart. Appl. Math., 1960, 17, No.4, p.409-422.

SUBMITTED: March 7, 1961

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21.1300 (1138, 1425, 1504)

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B136/B201

AUTHORS: Fridman, Ya. B., Sobolev, N. D., Borisov, S. V. Yegorov, V. I., Konoplenko, V. P., Morozov, Ye. M. Shapovalov, L. A. and Shorr, B. F.

TITLE: Some problems of thermal strength in reactor construction

PERIODICAL: Atomnaya energiya, v. 10, no. 6, 1961, 606 - 619

TEXT: The general idea of the failure of thermal strength includes two types of fracture: the gradual (subcritical) fracture as a consequence of an extreme deformation or of a great number of cracks or of large-sized cracks; causes and manifestations of those fractures are discussed, and the loss of elastic or plastic strength on the passage through the critical state. Either type of fracture may be brought about by four causes of stress: 1, mechanical or thermal shock stresses; 2, brief static loads for some minutes or hours; 3, static loads for some months or years; 4, periodic loads. Fig. 1 presents examples in the variation of elastic and plastic conditions in a tube, and a fictitious elastic tension is shown to arise in the plastic zone (dashed line), while the forms of mechanical

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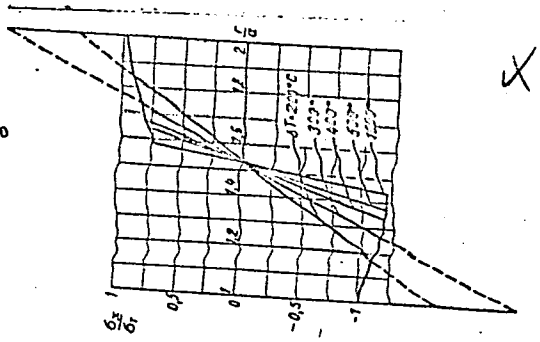
and thermal stress are intercompared in Fig. 4. Creep arises in nonuniformly heated structural elements, and cracks appear as a consequence of plastic deformation, particularly with materials having a low plasticity at room temperature. For calculating the creeping process the assumption is made on the basis of the creep theory that there is a functional relationship between the rate of creep v_i, the instantaneous stress σ_i, the temperature T, the time τ, and the plastic deformation P, namely, $v_i = v_{i_*}\left(\frac{P}{P_*}\right)^{-\alpha}$. Here, $P = \int_0 v_i d\tau$; $v_{i_*} = f_*(\sigma_i, T)$; $P_* = f_*(\sigma_i, T)$. The thermal fatigue fracture has much in common with the mechanical one. It can be therefore determined from the known mechanical properties of a material. Whereas, however, the thermal fracture appears already after 10^3-10^4 cycles, the mechanical one takes 10^7-10^8 cycles to appear. A characteristic feature of the thermal fracture is the local deformation in zones with a particularly large temperature difference also in homogeneous fields of stress. This is also related to the appearance of high microstresses (Table 3). For sudden thermal shocks the temperature jump giving rise to a brittle fracture may

be estimated by an equation. Of importance in the practice, however, is the creep character and the durability of the material under combined mechanical and nonsteady thermal loads. Experimental results are illustrated in Fig. 9, where the curves of variation of length-versus-time (scale 400:1) are compared with the cyclic temperature curve II and the thermal and elastic deformation III. As opposed to combined stress conditions, in which the strain-stress characteristic concerned is worsened with increased temperatures, stresses in case of a purely thermal stress are of a thermal origin and lead to bulging of structural elements in the hot zones, without, however, causing their breakdown. The micromechanical properties were checked in two ways. The principle of the second is illustrated in Fig. 13, while the results of the former - for static elongations and at 1400 - 1500°C in vacuum or in a controlled atmosphere, are presented in Fig. 12. In Fig. 13, 1 denotes the sample with a cross section of 2 X 1 or 3 X 1 mm, that is placed in a groove milled out from block 2. The pressure is yielded by stamp 3 made of tungsten briquettes 4. The resulting breakdown is indicated over contact 7. There are 13 figures, 3 tables, and 39 references: 27 Soviet-bloc and 12 non-Soviet-bloc. The three most recent references to English-language publications

Some problems of thermal strength ...

read as follows: Fracture, New York, Wiley and Sons, 1959; E. Sternbery, I. Chakravorty, Quart. Appl. Math., 17, no. 2, 205 (1959); E. Glenny et al. J. Inst. Metals, May (1959).

SUBMITTED: September 19, 1960



Legend to Fig. 1: Distribution of axial stresses and enlargement of the plastic zone in a thick-walled tube with various temperature jumps: r - radius of an arbitrary point; a - inner radius

Card 4/9 4

SHORR, B. F. (Moscow)

"Periodical processes in creep"

report presented at the 2nd All-Union Congress on Theoretical and Applied Mechanics, Moscow, 29 January - 5 February 1964.

ACCESSION NO: AP4020048 S/0032/64/030/003/0340/0347

AUTHORS: Shorr, B. F.; Dul'nev, R. A.

TITLE: Investigation of temperature stresses and creep during variations in temperature

SOURCE: Zavodskaya laboratoriya, v. 30, no. 3, 1964, 340-347

TOPIC TAGS: creep, thermal stress, temperature change, shearing stress, thermal fatigue, strength, material failure, static failure

ABSTRACT: This is a survey of a great number of papers, Soviet and others, relative to strength of materials when subjected to changes in temperature. It is pointed out that increase in temperature affects the thermal resistance directly (by changing mechanical properties) and indirectly (by formation of thermal stresses from expansion). Many papers have been written on thermal fatigue, and it has been found that shearing stresses play a dominant role in the failure of material because of thermal fatigue. In some cases a connection has been found between characteristics of thermal fatigue and static failure. Some authors have proposed using steady static loading to test thermal fatigue. This survey of the literature points out that future advances in studying thermal resistance at different

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ACCESSION NO: AP4020048

temperatures will depend chiefly on investigation of the actual conditions of the operating parts under natural conditions. Standard methods must be developed for comparative tests of materials applicable to definite conditions of operation, and it is urgent to study the kinetics of the processes leading to fractures and failure and to work up a proper technical theory of strength. Orig. art. has: 6 figures and 1 table.

ASSOCIATION: none

SUBMITTED: 00	DATE ACQ: 27Mar64	ENCL: 00
SUB CODE: AP	NO REF SOV: 043	OTHER: 019

Card 2/2

L 12863-65 EPA/EWT(1)/EWT(m)/EWP(w)/EWP(f)/EWG(v)/EWP(v)/T-2/EWP(k)/EPA(bb)-2
Pe-5/Pf-4/Pw-4 AEDC(b)/ASD(p)-3/AFTC(a)/AEDC(a)/APGC(a)/ASD(d) WW/EM/MLK
ACCESSION NR: AP4048289 S/0000/64/000/001/0217/0246

AUTHOR: Shorr, B. F.

TITLE: Bending-twisting oscillations of twisted compressor blades

SOURCE: Prochnost' i dinamika aviatsionny*kh dvigateley (Durability and dynamics of aircraft engines); sbornik statey, no. 1. Moscow, Izd-vo Mashinostroyeniye, 1964, 217-246

TOPIC TAGS: compressor blade, compressor blade vibration, axial compressor

ABSTRACT: The author briefly discusses the three known approaches to the problem of the calculation of eigenfrequencies and oscillation modes of the twisted working blades of axial compressors: 1) the solution on the basis of the classical theory of thin rods according to Kirchhoff and Klebsch; 2) the solution from the point of view of the general equations of the theory of elasticity; 3) the solution on the basis of the theory of plates and shells. In the present article, the author bases his calculation of the flexo-torsional oscillations of twisted working compressor blades on the applied theory of twisted rods of extended or elongated profile (B. F. Shorr. Kolebaniya zakruchenny*kh sterzhney, Izv. AN SSSR, OTN, "Mekhanika i mashinostroyeniye", 1961, No. 3, and K teorii zakruchenny*kh neravnomerno nagrety*kh sterzhney, Izv. AN SSSR, OTN, "Mekhanika i

Card 1/3

mashinostroyeniye", 1960, No. 1). The author points out, in this connection, that in recent times this method has been subjected to rather broad-based experimental verification with favorable results. In employing this theory, attention is called to the principal peculiarities of twisted blades, such as the marked fall-off of the first frequency, the deformation relationship of the bending-twisting vibrations which occurs even when the positions of the centers of gravity and the centers of elasticity of the sections coincide, the dynamic stress redistribution due to twisting, etc. The author notes that, at the present time, the general method presented in this article for the computation of the flexo-torsional oscillations of a twisted blade has been successfully programmed for electronic digital computers. The fundamentals of the theory of twisted rods of extended profile are first discussed in the article, with special attention to the basic relations between internal force factors and deformations. Deflections or shifts are also considered, along with balance equations and the problem of the determination of the special geometric characteristics of the blade. In the second main section of the paper, the author takes up the problem of the free oscillations of a non-rotating blade. Basic equations are derived and analyzed, and the energy ratios and the condition of orthogonality are discussed. The rotating blade is the subject of the third chapter of the article, while the forth section is dedicated to the general method of calculation for bending-

L 12863-65
ACCESSION NR: AT4046189

ing-twisting oscillations in a twisted blade. The first and subsequent forms of oscillation of a rotating and non-rotating blade are considered separately. Orig. art. has: 4 figures and 129 formulas.

ASSOCIATION: None

SUBMITTED: 15Apr64 ENCL: 00 SUB CODE: PR

NO REF SOV: 014 OTHER: 001

Card 3/3

GRINBERG, S.M., inzh.; SHORR, B.F., kand. tekhn. nauk

Theory of the vibrations of rolling-around hinged vanes. Rasch.na proch. no.10:324-351 '64. (MIRA 18:1)

BIRGER, I.A., red.; DAREVSKIY, V.M.; KINASOSHVILI, R.S.; SERENSEN, S.V., red.; SHORR, B.F., red.; RODZEVICH, S.S., red.

[Stability and dynamics of aircraft engines] Prochnost' i dinamika aviatsionnykh dvigatelei; sbornik statei. Moskva, Mashinostroenie. No.1. 1964. 287 p. (MIRA 18:10)

L 11618-66 EWT(m)/EWP(w)/EWP(v)/T-2/EWP(k)/ETC(m) WW/EM/GS

ACC NR: AT6001270 SOURCE CODE: UR/0000/65/000/000/0292/0315

AUTHOR: Shorr, B. F.

56
B+1

ORG: none

TITLE: Vibration calculation of hinged blades 24

SOURCE: Prochnost' i dinamika aviatsionnykh dvigateley (Strength and dynamics of aircraft engines); sbornik statey, no. 2, Moscow, Izd-vo "Mashinostroyeniye," 1965, 292-315

TOPIC TAGS: turbine blade vibration, turbine blade, rotor blade, blade vibration, vibration theory, vibration analysis

ABSTRACT: A general method is presented for calculating the combined flexural-torsional vibrations of curved blades attached to the rotor disc by hinges. It is assumed that the hinge axis is parallel to the rotor shaft, that the hinge pin mass is insignificant in comparison to the blade mass, and that the amplitude of the vibration is small, thus permitting the use of linear equations. The method is an extension of the one previously developed for rigidly mounted blades. (Shorr, B. F. Izgibno-krutil'nyye kolebaniya zakruchennykh kompressornykh lopatok, sb. "Prochnost' i dinamika aviatsionnykh dvigateley," no. 1, Mashinostroyeniye, 1964.) Orig. art. has: 9 figures and 101 formulas. [AS]

SUB CODE: 21/ SUBM DATE: 17Jul65/ ORIG REF: 007/ ATD PRESS: 4177

Card 1/1

1. SHOR', F. A.

2. USSR (600)

4. Skull- Abnormities and Deformities

7. Osteodystrophia fibrosa of the cranium. Vest. oto-rin. 14, no. 6, 1952.

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

SHORR, F.A.

Sarcoma of the ear in early childhood. Vest. oto-rin. 25 no.2:103-104 Mr-Ap '63. (MIRA 17:1)

1. Iz otorinolaringologicheskogo otdeleniya bol'nitsy No.11 Timiryazevskogo rayonnogo otdela zdravookhraneniya Moskvy.

1. SHORR, M. A.

2. USSR (600)

4. Medicine - Formulas, Receipts, Prescriptions

7. Simlified receipts. Apt.delo no. 6, 1952.

9. Monthly Lists of Russian Accessions, Library of Congress, March 1953, Unclassified.

SHORR, M.A.

Vishnevskii salve. Apt.delo no.4:47-48 Jl-Ag '53. (MLRA 6:8)
(Ointments)

SHORB, M.A.

Care for men. Apt.delo 3 no.3:31-32 My-Je '54. (MLRA 7:6)
(PHARMACY,
*in Russia)

SHORR, U.

Atomic batteries. Dos. such. fiz. no.5:227-230 '57.
(MIRA 16:6)
(Atomic energy)

Distr: 4E3c 2 cys

Heat transfer between a liquid-fluidized bed and the container wall. E. Ruckenstein, V. Shorr, and G. Suciu (Polytechnic Inst. Bucarest). *Acad. rep. populare Romîne, Inst. fiz. atomică si Inst. Fiz., Studii cercetări fiz.* 10, 235–46(1959); cf. Levenspiel and Walton, *C.A.* 48, 5562*h*; Mickley and Trilling, *C.A.* 43, 6475*a*.—Preliminary results of heat transfer between a gas oil or H_2O fluidized bed and the container wall are reported. The exptl. data are interpreted by means of the modified model proposed by L. and W., which is in satisfactory agreement with present data, as well as that by previous investigators (M. and T., *loc. cit.*). The results have been correlated by means of 2 empirical equations represented generally by $Nu = F(Re, Pr, Ar)$. M. Lapidot

NIKIFOROVA, Z.F.; SHCHERBAKOV, K.A.

Capillary bed in the skeletal muscles of frogs; intravital observations. Fiziol. zhur. 49 no.7:830-833 Jl '63. (MIRA 17:11)

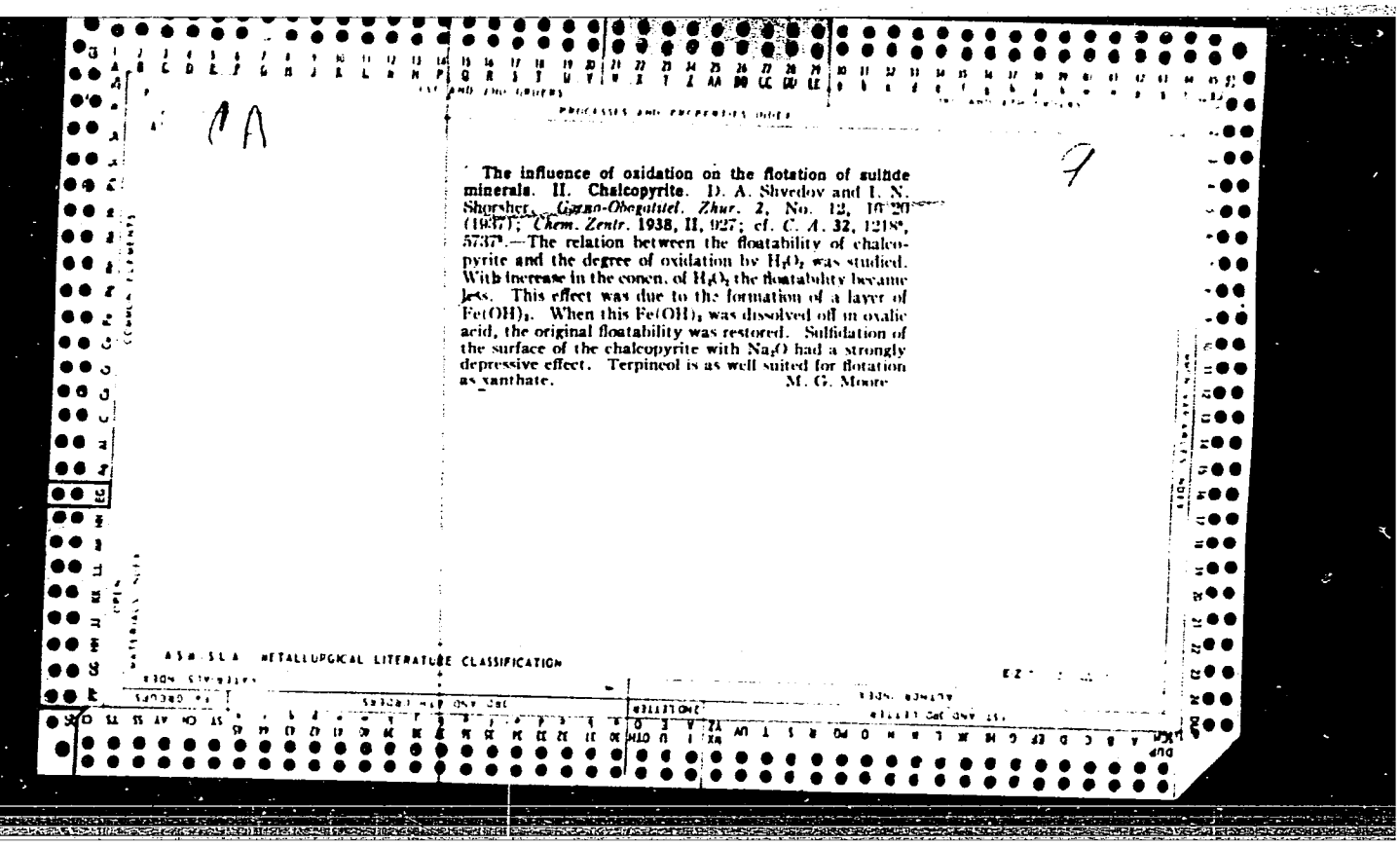
1. From the Laboratory for Histochemistry of the Novosibirsk Institute for Experimental Biology and Medicine, Novosibirsk.

ZABORENKO, K.B.; POLYAKOV, V.P.; SHOROSHEV, Yu.G.

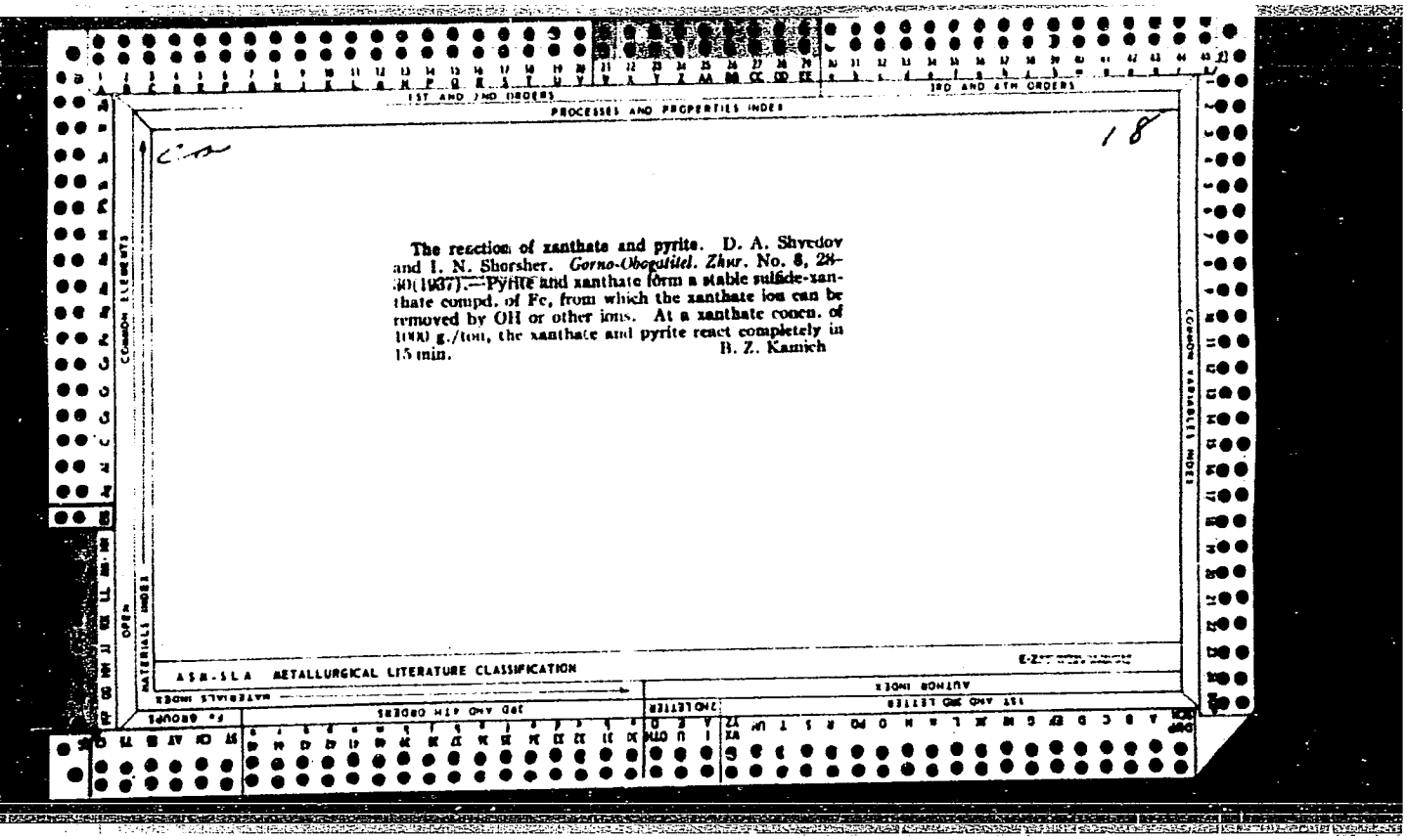
Application of the complex emanation-thermal method to the study of phase diagrams as exemplified by the system KCl - $CaCl_2$. Radiokhimiia 7 no.3:324-329 '65. (MIRA 18:7)

ZABORENKO, K.B.; POLYAKOV, V.P.; SHUROKHOV, Yu.G.

Application of the complex formation-thermal method to the study of phase diagrams in the system CaO - Fe_2O_3. Radiokhimiia 7 no.3: 309-315 '65. (MIRA 18:7)



The influence of oxidation on the flotation of sulfide minerals. II. Chalcopyrite. D. A. Shvedov and I. N. Shorshev. *Gorno-Obogatitel. Zhur.* 2, No. 12, 16–20 (1937); *Chem. Zentr.* 1938, II, 927; cf. *C. A.* 32, 1218⁸, 5737⁹.—The relation between the floatability of chalcopyrite and the degree of oxidation by H_2O_2 was studied. With increase in the concn. of H_2O_2 the floatability became less. This effect was due to the formation of a layer of $Fe(OH)_3$. When this $Fe(OH)_3$ was dissolved off in oxalic acid, the original floatability was restored. Sulfidation of the surface of the chalcopyrite with Na_2O had a strongly depressive effect. Terpineol is as well suited for flotation as xanthate. M. G. Moore

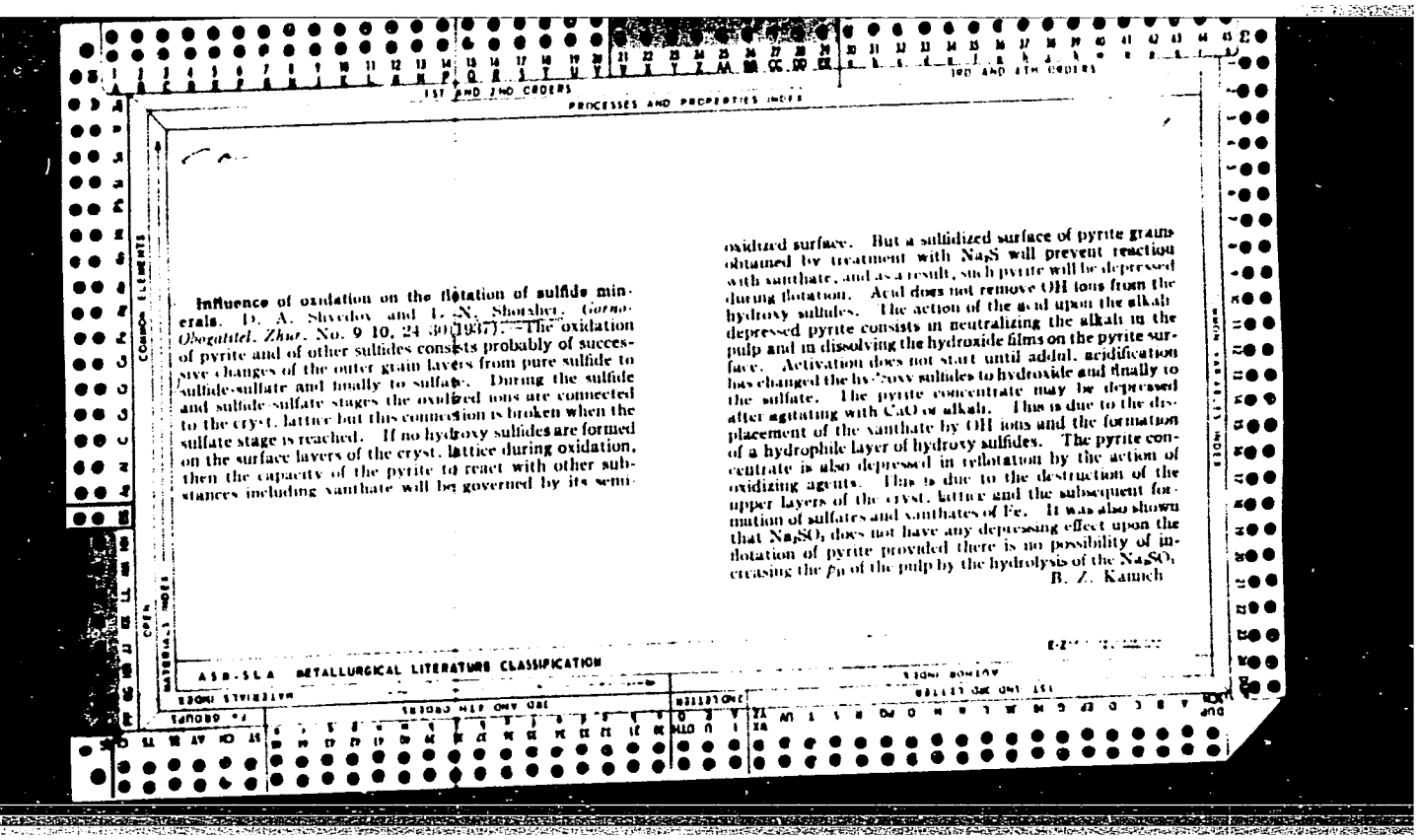


PROCESSES AND PROPERTIES INDEX

18

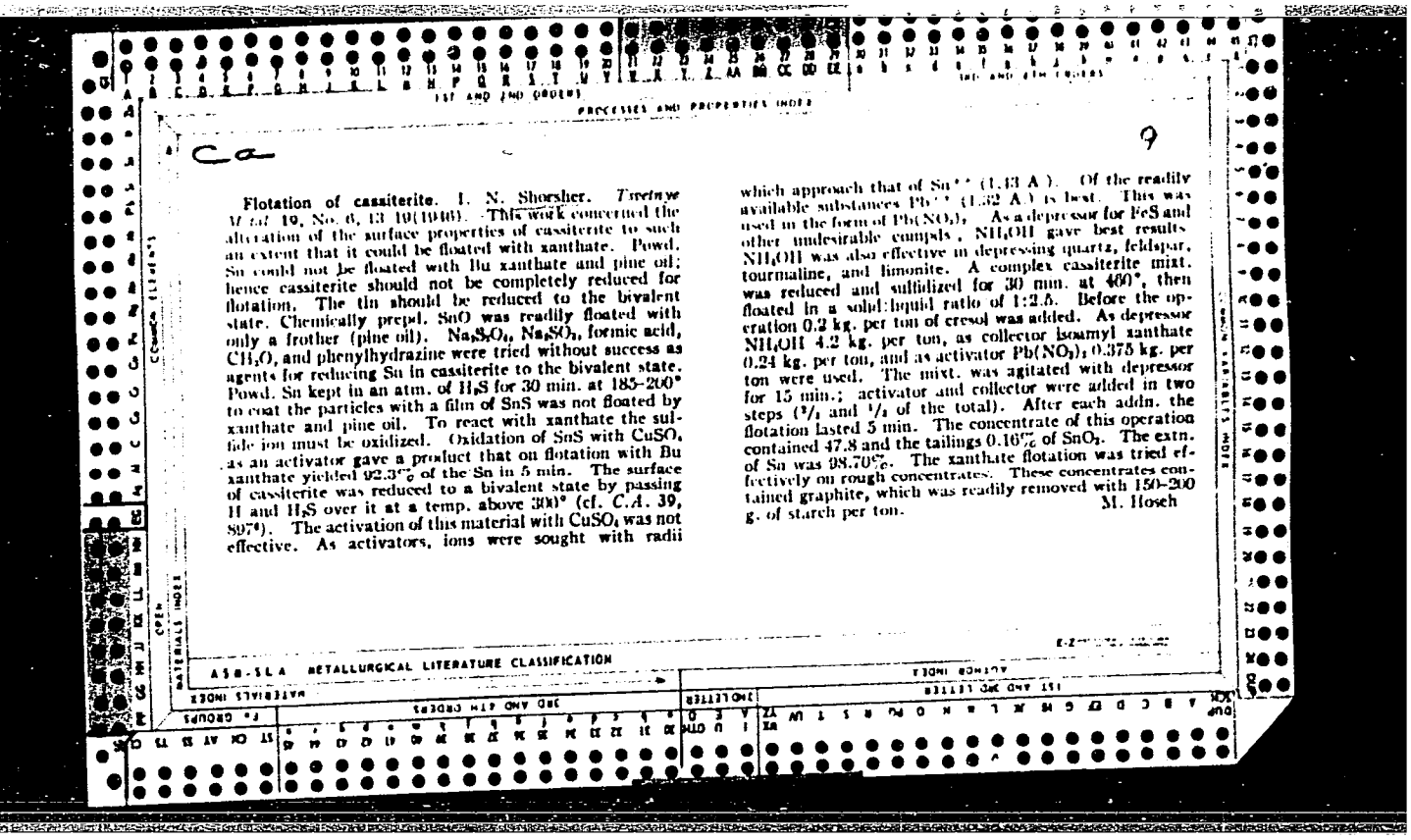
The reaction of xanthate and pyrite. D. A. Shvedov and I. N. Shorsher. *Gorno-Obogatitel. Zhur.* No. 8, 28–30 (1937).—Pyrite and xanthate form a stable sulfide-xanthate compd. of Fe, from which the xanthate ion can be removed by OH or other ions. At a xanthate concn. of 1000 g./ton, the xanthate and pyrite react completely in 15 min.
B. Z. Kamich

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



Influence of oxidation on the flotation of sulfide minerals. D. A. Shvedov and I. N. Shoukhet. *Gorno-Obogatitel. Zhur.* No. 9-10, 24-30 (1937). The oxidation of pyrite and of other sulfides consists probably of successive changes of the outer grain layers from pure sulfide to sulfide-sulfate and finally to sulfate. During the sulfide and sulfide-sulfate stages the oxidized ions are connected to the cryst. lattice but this connection is broken when the sulfate stage is reached. If no hydroxy sulfides are formed on the surface layers of the cryst. lattice during oxidation, then the capacity of the pyrite to react with other substances including xanthate will be governed by its semi-oxidized surface. But a sulfidized surface of pyrite grains obtained by treatment with Na_2S will prevent reaction with xanthate, and as a result, such pyrite will be depressed during flotation. Acid does not remove OH ions from the hydroxy sulfides. The action of the acid upon the alkali-depressed pyrite consists in neutralizing the alkali in the pulp and in dissolving the hydroxide films on the pyrite surface. Activation does not start until addnl. acidification has changed the hydroxy sulfides to hydroxide and finally to the sulfate. The pyrite concentrate may be depressed after agitating with CaO or alkali. This is due to the displacement of the xanthate by OH ions and the formation of a hydrophile layer of hydroxy sulfides. The pyrite concentrate is also depressed in reflotation by the action of oxidizing agents. This is due to the destruction of the upper layers of the cryst. lattice and the subsequent formation of sulfates and xanthates of Fe. It was also shown that Na_2SO_3 does not have any depressing effect upon the flotation of pyrite provided there is no possibility of increasing the p_H of the pulp by the hydrolysis of the Na_2SO_3.

B. Z. Kanuch

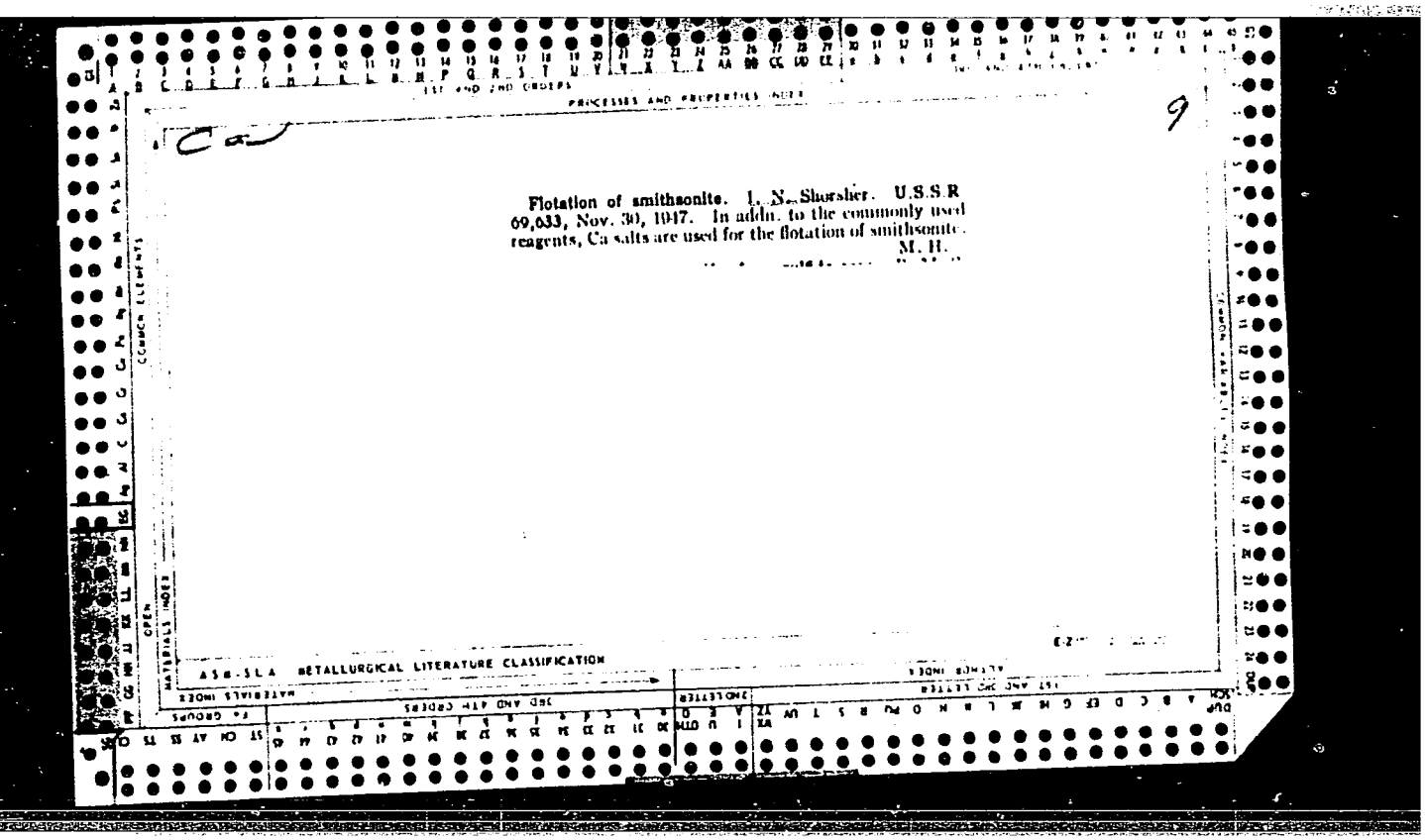


Ca

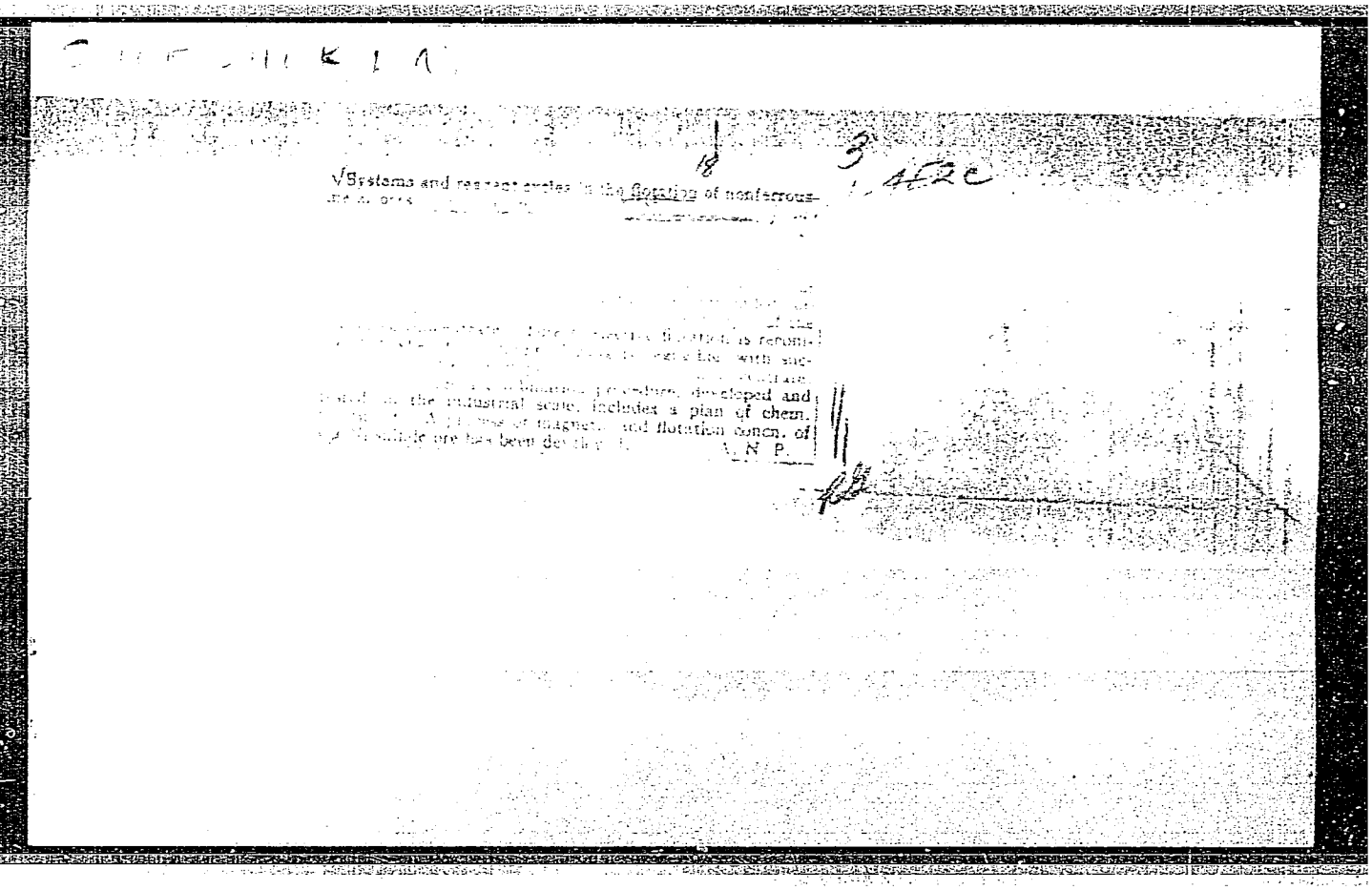
9

Flotation of cassiterite. I. N. Shorsher. *Tsvetnye Metal* 19, No. 6, 13-19(1946). This work concerned the alteration of the surface properties of cassiterite to such an extent that it could be floated with xanthate. Powd. Sn could not be floated with Bu xanthate and pine oil; hence cassiterite should not be completely reduced for flotation. The tin should be reduced to the bivalent state. Chemically prepd. SnO was readily floated with only a frother (pine oil). $Na_2S_2O_4$, Na_2SO_3, formic acid, CH_2O, and phenylhydrazine were tried without success as agents for reducing Sn in cassiterite to the bivalent state. Powd. Sn kept in an atm. of H_2S for 30 min. at 185–200° to coat the particles with a film of SnS was not floated by xanthate and pine oil. To react with xanthate the sulfide ion must be oxidized. Oxidation of SnS with $CuSO_4$ as an activator gave a product that on flotation with Bu xanthate yielded 92.3% of the Sn in 5 min. The surface of cassiterite was reduced to a bivalent state by passing H and H_2S over it at a temp. above 300° (cf. *C.A.* 39, 897⁶). The activation of this material with $CuSO_4$ was not effective. As activators, ions were sought with radii which approach that of Sn^{++} (1.43 A.). Of the readily available substances Pb^{++} (1.32 A.) is best. This was used in the form of $Pb(NO_3)_2$. As a depressor for FeS and other undesirable compds., NH_4OH gave best results. NH_4OH was also effective in depressing quartz, feldspar, tourmaline, and limonite. A complex cassiterite mixt. was reduced and sulfidized for 30 min. at 460°, then floated in a solid:liquid ratio of 1:2.5. Before the operation 0.2 kg. per ton of cresol was added. As depressor NH_4OH 4.2 kg. per ton, as collector isoamyl xanthate 0.24 kg. per ton, and as activator $Pb(NO_3)_2$ 0.375 kg. per ton were used. The mixt. was agitated with depressor for 15 min.; activator and collector were added in two steps (2/3 and 1/3 of the total). After each addn. the flotation lasted 5 min. The concentrate of this operation contained 47.8 and the tailings 0.16% of SnO_2. The extn. of Sn was 98.70%. The xanthate flotation was tried effectively on rough concentrates. These concentrates contained graphite, which was readily removed with 150–200 g. of starch per ton.

M. Hoseh

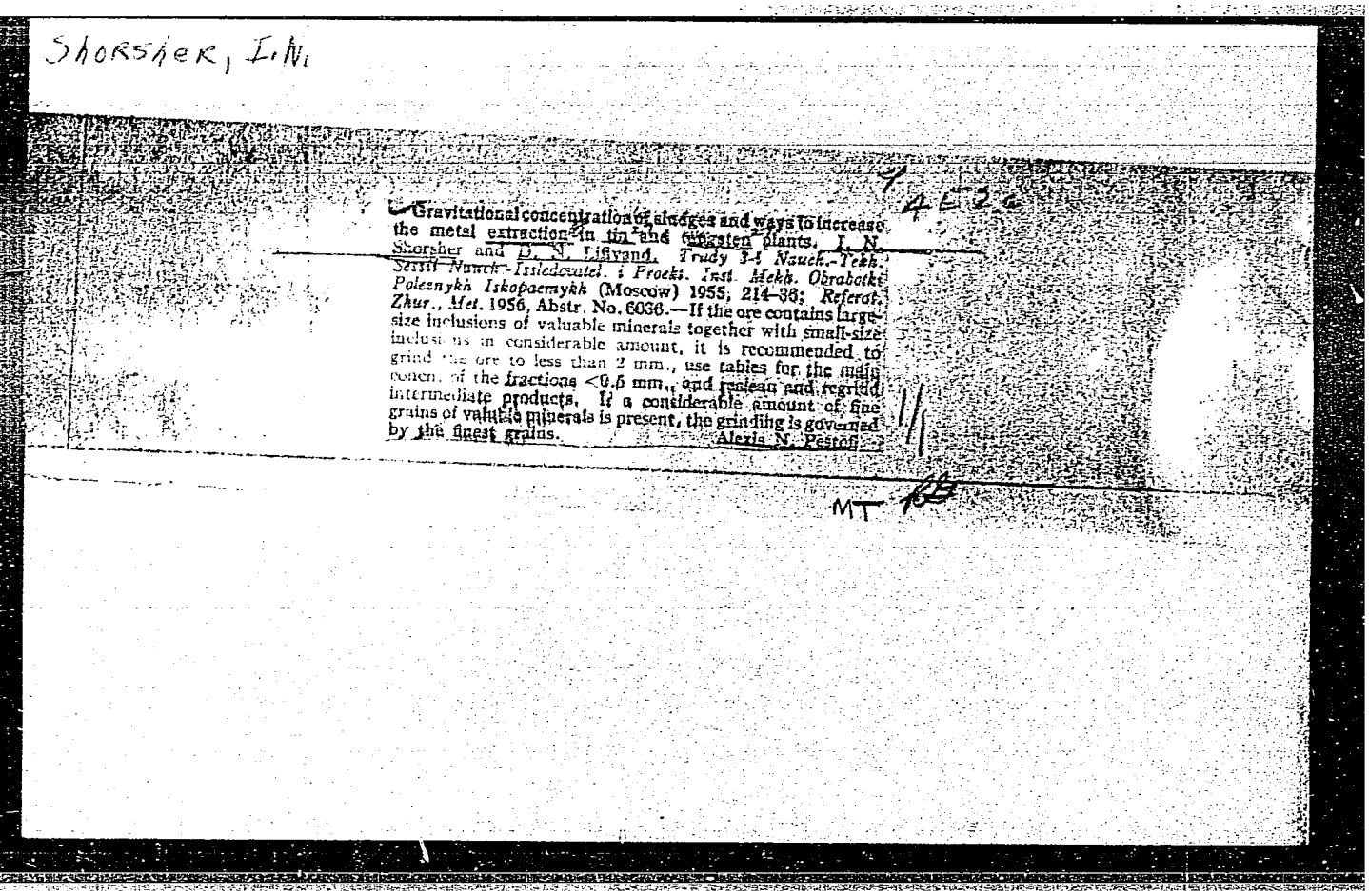


Flotation of smithsonite. I. N. Shorshier. U.S.S.R. 69,633, Nov. 30, 1947. In addn. to the commonly used reagents, Ca salts are used for the flotation of smithsonite.
M. H.



Systems and reagent cycles in the flotation of nonferrous

ANP.



Shorshek, I.N.

Gravitational concentration of sludges and ways to increase the metal extraction in tin and tungsten plants. I. N. Shorsher and D. S. Lifyand. *Trudy 3-i Nauch.-Tekh. Sessii Nauch.-Issledovatel. i Proekt. Inst. Mekh. Obrabotki Poleznykh Iskopaemykh* (Moscow) 1955, 214–38; *Referat. Zhur., Met.* 1956, Abstr. No. 6036.—If the ore contains large-size inclusions of valuable minerals together with small-size inclusions in considerable amount, it is recommended to grind the ore to less than 2 mm., use tables for the main concn. of the fractions <0.5 mm., and reclean and regrind intermediate products. If a considerable amount of fine grains of valuable minerals is present, the grinding is governed by the finest grains. Alexis N. Peston

4132

MT

SHORSHER, I. N.

137-1957-12-23014

Translation from: Referativnyy zhurnal, Metallurgiya, 1957, Nr 12, p 22 (USSR)

AUTHOR: Shorsher, I. N.

TITLE: A Method of Gravitational Testing of the Concentration Capacity of Rare Metal Ores (Metodika gravitatsionnykh ispytaniy obogatimosti rud redkikh metallov)

PERIODICAL: Kolyma, 1955, Nr 9, pp 15-19

ABSTRACT: A method for the gravitational testing of ores is presented. Author's comments for some types of ores are given.

A. Sh.

1. Metallurgy-USSR 2. Ores-Gravitation-Test methods

Card 1/1

SOV/137-57-11-20795

Translation from: Referativnyy zhurnal, Metallurgiya, 1957, Nr 11, p 22 (USSR)

AUTHOR: Shorsher, I.N.

TITLE: Flotation of Zinc Blende and Pyrite From Polymetallic Ores and Bulk Concentrates (O flotatsii tsinkovoy obmanki i pirita iz polimetallicheskikh rud i kollektivnykh kontsentratov)

PERIODICAL: Obogashcheniye rud, 1956, Nr 5, pp 7-11

ABSTRACT: A description is provided of a new method of depression of Fe sulfides and sulfoarsenides (arsenopyrite) in the zinc flotation cycle. This method consists of regular additions of small amounts of limestone to the tailings of lead-and-copper, lead, or copper flotation, with the purpose of preventing activation of Fe sulfides by copper sulfate. The pulp is mixed with the latter for a short time to activate the ZnS. Then a little cyanide is added to depress the sulfides of Fe and arsenopyrite. When the cyanide additions are small, the activated ZnS yields to flotation quite as energetically as do the Cu minerals. A number of specific examples of successful employment of the method, with data on the consumption of reactants, and indices thereof, is provided. A method, not previously

Card 1/2

Flotation of Zinc Blende and Pyrite (cont.)

described, of activating pyrite after prior depression in the lead-and-copper cycle, is communicated. CO_2 is utilized as an acid to fix the Ca ions, but to function less powerfully than hydrocyanic acid. A detailed description of the experimental results is provided.

I.M.

Shorsher, I. N.

1-4E2e

18 27 18

Flotation of molybdenum ores. I. N. Shorsher. U.S.S.R. 104,891, Feb. 25, 1957. Mo ore is subjected first to a basic flotation and then control flotations. The concentrates of the latter are returned to the head of the basic flotation or to the preceding control flotation and cleaning. The concentrate from the basic flotation before recleaning and the concentrate of the control flotation before return for reflotation are mixed with kerosine or some other hydrocarbon.

M. Hosch

fra RZ Chem

SHORSHER, I N

137-1958-3-4538

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 3, p 9 (USSR)

AUTHOR: Shorsher, I. N.

TITLE: On the Flotation of Slimy and Oxidized Copper Ores (O flotatsii mednykh shlamistykh i okislennykh rud)

PERIODICAL: Obogashcheniye rud, 1957, Nr 2, pp 3-16

ABSTRACT: At the Mekhanobr Institute studies were conducted in 1952 in order to develop a system for the concentration of kaolinized slimy ores of the Kounrad deposits. Investigations indicated that the dosage of Na_2S has a decisive effect on the extraction of Cu into the concentrate. The amount of Na_2S required is readily determined visually: an optimal charge of this reagent should produce a momentary depression (10-20 sec) followed by a progressively increasing mineralization of the froth. The employment of water glass is expedient in the case of slimy ores. In comparison with trimodular water glass the consumption of monomodular water glass is lower. The amount of lime charged into the mills of both stages is of great importance, if water containing Mg salts is used ("Balkhash water"). The employment of "aerofloat", in an amount of 45 g/t, accompanied by a reduction

Card 1/2

SHORSHER, I.N., kand. tekhn. nauk

Efficient flowsheets for the treatment of scheelite-molybdenum ores. Obog. rud 2 no. 2:70 '57. (MIRA 11:7)
(Scheelite)
(Molybdenum)
(Ore dressing)

SHORSHER, I. N., (Mekhanobr)

"The flotational separation of collective molybdenite-containing ores"

Report presented at the 14th Scientific and Technical Session of the Mekhanobr Inst., Leningrad, 29-30 July 1958

SHORSHER, I.N.

Separating by flotation molybdenite-containing concentrates.
Obog. rud 3 no.1:3-12 '58. (MIRA 11:10)
(Flotation) (Molybdenite)

SHORSHER, I.N.

Flotation of molybdenum-bismuth ores. Obog. rud 3 no.2:6-11 '58. (MIRA 11:11)
(Flotation) (Molybdenum ores) (Bismuth ores)

SHORSHER, I.N.

IM-21 collector. Obog. rud. 3 no.3:3-7 '58. (MIRA 12:1)
(Flotation) (Linoleic acid)

SHORSHER, I.N.; GALAKTIONOVA, K.N.

Flotation of iron ores with cation collectors. Obog.rud 3 no.5:3-9 '58. (MIRA 12:5)
(Flotation) (Iron ores)

SHORSHER, I.N.

Reducing the loss of metals in the discharge of thickeners. Obog. rud 3 no.6:50-52 '58. (MIRA 14:8)
(Flotation)

SHORSHER, I.N., kand. tekhn. nauk.

Finish dressing of molybdenum half-finished products. Biul. TSIIN tsvet. met. no.9:14-16 '58. (MIRA 11:6)
(Molybdenum--Metallurgy)

AUTHOR: Shorsher, I.N. SOV/136-58-12-3/22

TITLE: Joint Action of Collector-reagents in Flotation (K voprosu o sovmestnom deystvii reagentov-sobirateley pri flotatsii)

PERIODICAL: Tsvetnyye Metally, 1958, Nr 12, pp 11 - 14 (USSR)

ABSTRACT: The author states that the recent articles (Ref 1) of V.A. Glembotskiy and Glembotskiy et al (Ref 3) on the action of mixed collectors contained no reliable experimental evidence for the flotation of ores. His own experiments with M.I. Gorodetskiy (Ref 2) following work at the Institut gornogo dela AN SSSR (Mining Institute of the Ac.Sc.USSR) gave too great a divergence of experimental results for drawing valid conclusions for ores while Yu.I. Yeropkin (Mekhanobr) found no improvement in lead-ore flotation from using several instead of one xanthate in full-scale tests at the Zyryanovskaya Works. The author goes on to give detailed criticisms of Glembotskiy and his collaborators (Ref 2) disagreeing with many of their contentions, including the following: isopropyl xanthate is the best collector for the test ore; addition of butyl dithiophosphate to xanthates improves lead recovery in the

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lead flotation cycle while zinc recovery is maintained; that the combination of a fatty acid with a xanthate is of practical interest (an editorial note suggests that this may sometimes be so). Dealing with the combined use of collectors of one class but with different radical lengths, the author refers to his own work (Ref 5) and suggests that increased collection of mineral in the froth sometimes observed can be explained by decreased flocculation of grains. He produces evidence against Glembotskiy's views on collector adsorption from a paper by I.N. Plaksin and Ye.A. Anfimova (Ref 6), tabulating some of their results for chalcopyrite with mixed xanthates and a single xanthate, and maintains that the former failed to allow for the nature of such effects in evaluating his results: when these are corrected, sorption of all his xanthates is virtually the same. The author finds Glembotskiy's results on bubble adhesion and galenite flocculation entirely unconvincing. He concludes by stating that there is

Joint Action of Collector-reagents in Flotation

experimental evidence that no benefit results from the advocated use of mixed collectors in lead flotation from polymetallic ores.
There are 1 table and 5 Soviet references.

ASSOCIATION: Mekhanobr

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SHORSHER, I.N.

Reducing the loss of molybdenum in the separation of collective concentrates. Obog. rud 4 no.1:14-15 '59. (MIRA 14:8)
(Flotation) (Molybdenum)

SHORSHER, I.N.

Incorrect suggestions concerning the use of spiral separators. (MIRA 14:8)
Obog. rud 4 no.1:42-43 '59.
(Separators (Machines))

SHORSHER, I.N.

Molybdenum balance in ore dressing plants. Obog. rud 4 no.2:50 '59. (MIRA 14:8)

(Ore dressing) (Molybdenum)

AUTHOR: Shorsher, I.N. SOV/136-59-6-20/24

TITLE: Criticism of Several Published Articles on Enriching Ores (Kriticheskiye zamechaniya po nekotorym publikuyemym stat'yam po obogashcheniyu rud) (Letter to the Editor)

PERIODICAL: Tsvetnyye metally, 1959, Nr 6, pp 93 - 94 (USSR)

ABSTRACT: The articles criticised are Izv. AN SSSR, OTN, 1958, Nr 4, pp 16-22; Dokl. AN SSSR, 1958, 119, Nr 5, 961-963; Byull. tsvetnoy metallurgii TsIIN, 1958, Nr 1, pp 10-16 and a pamphlet by V.A. Glembotskiy, TsINTI GNTK, KazSSR, Alma-Ata, 1958. The authors of the first two articles assert that there is a relation between the crystal lattice energies and the flotation properties. The minerals are classified in three groups. If we take cerrusite as having a lattice energy of 100, the remaining five minerals in groups one and two vary within + 7.7 and -8.2, i.e. the difference between the first two groups is small. In group one, cerrusite has the best flotation properties, contrary to expectation, from energy considerations. The minerals in groups three differ from the others by having Fe as the predominant

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cation. This and not the value of lattice energy is the main difference. It is difficult to see what is meant by a natural hydrophobic nature since it has been shown that grains of cerrusite are covered by films of air (Refs 3, 4). In the articles, it is recommended that minerals are mixed with sodium sulphide for 20-30 min. It has been established, however, that long periods of sulphidisation are only necessary when excessive quantities of sulphide are used which impedes the action of the collector (Ref 4). Willow oil has been suggested as a collector for flotation of minerals difficult to flotate. It contains, however, organic acids and high phenols which will not flotate such minerals.
There are 5 Soviet references.

ASSOCIATION: Institut Mekhanobr

SHEVTSOVA, G.N.; SHORSHER, I.N.

Nitronic acid salts as collectors in the flotation of oxidized ores. Obog. rud 4 no.4:7-9 '59. (MIRA 14:8)
(Flotation--Equipment and supplies)

SHORSHER, I.N.

Improvement of flotation processes at the Balkhash Plant. (MIRA 14:8)
Obog. rud 5 no.1:3-6 '60.
(Balkhash--Flotation)

SHORSHER, I.N.

Improving the procedure of separation by flotation of molybdenite bearing concentrates. Obog.rud. 5 no.2:11-16 '60. (MIRA 14:8)
(Flotation) (Molybdenite)

KOMAROVSKIKH, P.V.; ANIKIN, M.F.; SHORSHER, I.N.

P. V. Komarovskikh and M. F. Anikin's letter to the editor entitled "Use of helical-type separators" and I. N. Shorsher's reply. Obog. rud 5 no.5:62-65 '60. (MIRA 14:8)

1. Sotrudniki Irkutskogo nauchno-issledovatel'skogo instituta redkikh metallov (for Komarovskikh, Anik[illegible]).
(Separators (Machines))

SHORSHER, I.N.

Improving the work indices of the "Sorskaya" molybdenum plant.
Obog. rud 6 no.3:7-11 '61. (MIRA 14:11)
(Krasnoyarsk Territory--Molybdenum ores)
(Flotation)

SHORSHER, I.N.

Purification of Ore-Dressing Plant waste waters from hydrocarbons. (MIRA 14:5)
TSvet. met. 34 no.5:76 My '61.

1. Nauchno-issledovatel'skiy i proyektnyy institut mekhanicheskoy obrabotki poleznykh iskopayemykh.
(Ore dressing) (Water—Purification)

S/137/61/000/011/038/123
A060/A101

AUTHOR: Shorsher, I. N.

TITLE: On some problems of flotation by cation collectors

PERIODICAL: Referativnyy zhurnal. Metallurgiya, no. 11, 1961, 8, abstract 11G58 ("Tr. Vses. n.-i. i proyektn. in-ta mekhan. obrabotki poleznykh iskopayemykh", 1960, no. 125, 57 - 62)

TEXT: On the basis of studies carried out upon cation collectors, it was established that it is possible to choose the synthesis of a mixture of amines with various radical length, varying between certain limits. This mixture will not be inferior to individual collectors in its flotation characteristics. It was also established that in flotating with a cation collector there occurs its sorption on the grain surface, which differs sharply from the sorption of oleate and xanthogenate ions on minerals well flotated by their respective collectors. A very easy washing off by water makes it possible to treat the process of its sorption as a nearly physical, in contrast to a chemical process of the sorption of oleate and xanthogenate. The possibility is indicated of a considerable lowering of the expenditure of cation collector by the use of recirculated water.

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S/137/62/000/003/030/191
A006/A101

AUTHOR: Shorsher, I. N.

TITLE: A scheme of testing the concentration ability of rare metal ores by the gravitation methods (for tin, tungsten, tantalum-niobium and other ores)

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 3, 1962, 7, abstract 3G52 (V sb. "Issled. po obogashcheniyu i tekhnol. polezn. iskopayemykh", Moscow, Gosgeoltekhizdat", 1961, 56-61)

TEXT: A scheme is presented for the testing of concentration ability, which is applicable when developing a system for the concentration of rare metal ores. A method is given for the refining of coarse gravitational concentrates.

A. Shmeleva

[Abstracter's note: Complete translation]

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S/137/62/000/003/034/191
A006/A101

AUTHOR: Shorsher, I. N.

TITLE: Flotation concentration of scheelite and molybdenum ores

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 3, 1962, 11, abstract 3G78 (V sb. "Issled. po obogashcheniyu i tekhnol. polezn. iskopayemykh", Moscow, Gosgeoltekhizdat, 1961, 61 - 66)

TEXT: During concentration flotation of scheelite ores, basic flotation is made with the aid of soda (0.65 kg/t), water glass (up to 0.7 kg/t), fat acid ($\leq$ 0.20 kg/t) and a frothing agent. Prior to the steaming operation, the concentrate is refined, and condensed to 60% solid. The concentrate is then steamed at 85 - 90°C by charging the least necessary amount of water glass within about 60 minutes. After steaming the concentrate is cooled and flotated again, and the frothy product is refined. The control-flotation concentrate contains much calcite; it must therefore be condensed and steamed together with the coarse concentrate of the basic process. The tails from refining are condensed, if there is a high amount of water glass, and they are directed to the tail section of control flotation. To reduce scheelite losses, it is expedient to direct the overflow

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S/137/62/000/003/034/191
A006/A101

Flotation concentration of scheelite and molybdenum ores

from condensing coarse concentrates to the top of control flotation of the basic process. A flotation method for separating barite from scheelite was developed and assimilated at the Chorukh-Dayron plant. To remove the apatite, the concentrates are lixiviated in HCl. Collector ИМ-21 (IM-21) is recommended for the flotation of scheelite ores; the collector is a mixture of linoleic and linolenic acids. Mo-ores are flotated with the use of any neutral oil as a collector (kerosene and others) and any strong reagent of this series as a frothing agent (pine oil, xylenol, etc.). Soda and water glass are often used as additional reagents in the basic flotation cycle. Mixing of the concentrates with kerosene prior to their refining increases Mo extraction. The pre-refining operation of the Mo-concentrate should be carried out after preliminary refining for the purpose of sulfide elimination so that the Mo content be raised by 20% and more. The technical and economical calculations indicate the expediency of the hydrometallurgical processing of Mo-containing wastes even if they contain 0.5% Mo. Na_2S or cyanide salts should be used as depressors of sulfide minerals with simultaneous charge of soda. When using Na_2S during the refining of Mo-concentrates it is expedient to introduce a collector; without it Na_2S exerts an increased depressing effect on MoS_2. To avoid over-refining of MoS_2, the introduction of stage flotation might prove expedient in the basic concentration cycle, if the

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S/137/62/000/003/034/191
A006/A101

Flotation concentration of scheelite and molybdenum ores

grist is sufficiently coarse prior to the initial flotation stage. The introduction of two cycles to basic flotation is planned to raise MoS_2 extraction from hard-to-flotate ores, namely: a top cycle, to obtain a concentrate which is refined to condition, and a tail cycle to obtain a product subject to hydrometallurgical processing.

A. Shmeleva

[Abstracter's note: Complete translation]

Card 3/3

S/137/62/000/003/035/191
A006/A101

AUTHOR: Shorsher, I. N.

TITLE: On the problem of molybdenum balance at concentration plants

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 3, 1962, 12, abstract 3083 ("Obogashcheniye rud", 1961, no. 2 (32), 25)

TEXT: On plants where the metal is calculated from its content in the ore, considerable discrepancies in the metal balance were observed. Apparently, the content of oxidized Mo in the ore increases at an analysis on account of the partial oxidation of Mo sulfide with hydrochloric acid in the presence of considerable amounts of Fe^{3+} salts transferred into the solution from mixed ores. This reduces the content of Mo sulfide, which is the cause of Mo sulfide discrepancy in the balance and of the artificial increase of commercial extraction at the plant. It is recommended to determine the Mo sulfide content in the ore from the difference between the total Mo content in the ore and the oxidized Mo in the tails.

A. Shmeleva

[Abstracter's note: Complete translation]

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SHORSHER, I.N.

Depression of zinc blende during the flotation of complex metal ores. Obog. rud 7 no.2:17-18 '62. (MIRA 16:4)
(Nonferrous metals) (Flotation)