25691
S/181/61/003/007/013/023
B102/B214

24.2700

AUTHORS: Samoylovich, A. G., and Korenblit, L. L.

TITLE: Thermoelectric eddy currents in an anisotropic medium

PERIODICAL: Fizika tverdogo tela, v. 3, no. 7, 1961, 2054-2059

TEXT: The present paper describes a theoretical investigation of thermoelectric currents in an anisotropic, nonuniformly heated medium. Assuming that a temperature gradient exists, closed thermoelectric currents must appear in such a medium, and the density of these currents can serve as a measure of the anisotropy of the thermo-emf. In such a medium, the thermo-emf between two arbitrary points 1 and 2 is given by the contour integral $V_{12} = -\frac{1}{q}\int_1^2 (\nabla\bar{\mu}\vec{dl})$; $\bar{\mu} = \mu + q\phi$ is the electrochemical potential, μ the chemical potential of the carriers with charge q, ϕ the electric potential, and $\vec{dl} = dx\vec{i}_1 + dy\vec{i}_2 + dz\vec{i}_3$. Current density and heat flux are given by $\vec{j} = -\frac{1}{q}\sigma\nabla\bar{\mu} - \sigma\alpha\nabla T$,

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and $\vec{W}=-\chi\nabla T+T\alpha\vec{j}$. From the continuity conditions it follows that, div $\vec{j}=0$, and div $(\chi\nabla T)+(\rho\vec{j}\vec{j})-T$ div $(\alpha\vec{j})=0$. In the general case, ρ, σ, χ (thermal conductivity), and α (differential thermo-emf) are tensors of second rank. The boundary conditions used are: $V_{12}=\int_1^2(\alpha\nabla T d\vec{l})$ for $\vec{j}=0$, and $V_{12}=\int_{T_1}^{T_2}\alpha(T)dT$. In the one-dimensional case in which the temperature of the sample and its characteristics depend only on one coordinate, ξ, one has $V_{12}=\int_{\xi_1}^{\xi_2}\alpha[T(\xi)]\left\{\frac{dT}{d\xi}\right\}d\xi$.

The case the "two-dimensional" and, all the more, that of the "three-dimensional" inhomogeneous isotropic medium is distinguished from the one-dimensional case by the fact that, even when div $\vec{j}=0$, thermoelectric eddy currents can exist in this medium. This follows trivially also from the fact that such an inhomogeneous, nonisothermal medium can be regarded as the totality of closed multicomponent microscopic thermoelements. Now, homogeneous, anisotropic bodies are considered. Also here, "one-dimensional" and "two-dimensional" systems can be realized, and it can be shown that in

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a "two-dimensional" anisotropic medium thermoelectric eddy currents $j \sim (\alpha_1 - \alpha_2)$ must appear, even in the thermally steady state if div $\vec{j} = 0$. "One-dimensional" systems in this sense are, for example, a thin and not closed wire or filament when it is inhomogeneous or anisotropic, or a sample of regular form (rectangular plate, bar), if $T = T(x)$ where x is the longitudinal coordinate of the specimen. "Two-dimensional" is such a specimen (bar or plate) if $\chi_{12} \neq 0$ (inhomogeneous temperature field); in this case, an eddy current $j \sim \chi_{12}(\alpha_1 - \alpha_2)$ can appear. The situation is analogous if x forms an acute angle with the principal axis of the crystal. The "two-dimensionality" in this sense is determined by the anisotropy of χ and σ. For the eddy current one obtains: $j \sim \left(\frac{\sigma_1}{\chi_1} - \frac{\sigma_2}{\chi_2}\right)(\alpha_1 - \alpha_2)$. The case of a disc of an anisotropic single crystal, in which a temperature gradient exists (see Fig. 1) is discussed in detail. If the positive temperature difference is denoted by $\Delta T = T_1 - T_0$ and $x\mu/q$ by γ, one obtains from the relations shown in Fig. 1:

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$$\psi = -\frac{\Delta T}{2\ln\frac{R_1}{R_0}}\left[(\alpha_1+\alpha_2)\ln\frac{\rho}{R_1}+(\alpha_1-\alpha_2)\frac{\cos 2\varphi}{2}\times\right. \tag{12}$$

$$\left.\times\left(1-\frac{\rho^2}{R_1^2+R_0^2}-\left(\frac{R_0}{\rho}\right)^2\frac{R_1^2}{R_1^2+R_0^2}\right)\right],$$

When taking into account div $\vec{j}=0$ and the corresponding boundary conditions, one obtains

$$\left.\begin{aligned} j_x &= -\frac{\sigma}{\rho}\left[\cos\varphi\left(\rho\frac{\partial\psi}{\partial\rho}+\alpha_1\frac{\Delta T}{\ln\frac{R_1}{R_0}}\right)-\sin\varphi\frac{\partial\psi}{\partial\varphi}\right], \\ j_y &= -\frac{\sigma}{\rho}\left[\sin\varphi\left(\rho\frac{\partial\psi}{\partial\rho}+\alpha_2\frac{\Delta T}{\ln\frac{R_1}{R_0}}\right)+\cos\varphi\frac{\partial\psi}{\partial\varphi}\right]. \end{aligned}\right\} \tag{18}$$

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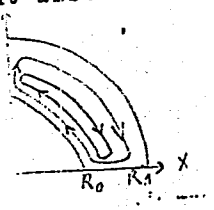
and

$$j_x = \frac{\sigma}{\rho}\frac{\Delta T}{2\ln\frac{R_1}{R_0}}(\alpha_1-\alpha_2)\cos\varphi \times \left[-\cos 2\varphi + \frac{\rho^2}{R_1^2+R_0^2} + (\cos^2\varphi - 3\sin^2\varphi)\left(\frac{R_0}{\rho}\right)^2 \frac{R_1^2}{R_1^2+R_0^2}\right],$$

$$j_y = \frac{\sigma}{\rho}\frac{\Delta T}{2\ln\frac{R_1}{R_0}}(\alpha_1-\alpha_2)\sin\varphi \times \left[-\cos 2\varphi - \frac{\rho^2}{R_1^2+R_0^2} + (3\cos^2\varphi - \sin^2\varphi)\left(\frac{R_0}{\rho}\right)^2 \frac{R_1^2}{R_1^2+R_0^2}\right]. \quad (19)$$

The current distribution in the disc is periodic with the period 2π in relation to φ. The magnetic moment due to the eddy currents may be used for indicating the anisotropy of the thermo-emf in such samples. There are 2 figures



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and 2 references: 1 Soviet-bloc and 1 non-Soviet-bloc.

ASSOCIATION: Institut poluprovodnikov AN SSSR Leningrad (Institute of Semiconductors, AS USSR, Leningrad)

SUBMITTED: February 15, 1961

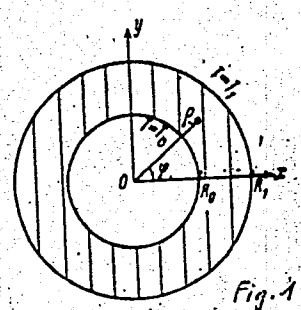

Fig. 1

Fig. 1

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24.7200 (1144, 1153, 1160)

AUTHORS: Samoylovich, A. G., Korenblit, I. Ya., Dakhovskiy, I. V., and Iskra, V. D.

TITLE: Solution of the kinetic equation for anisotropic electron scattering

PERIODICAL: Fizika tverdogo tela, v. 3, no. 10, 1961, 2939-2952

TEXT: Elastic electron scattering is studied theoretically under the following assumptions: The considered system is under the influence of an external electric field and a temperature gradient. The electron energy spectrum is given by $\varepsilon = \sum_{i=1}^{3} \frac{\hbar^2 k_i^2}{2m_i}$. Electric field and temperature gradient are weak, no magnetic field exists. The kinetic equation is given as

$$\hat{D}n_{\mathbf{k}}^{(0)} + \hat{R}n'_{\mathbf{k}} = 0. \qquad (1.2)$$

$$\hat{R}n'_{\mathbf{k}} = \sum_{\mathbf{k}'} W_{\mathbf{k}\mathbf{k}'}(n'_{\mathbf{k}'} - n'_{\mathbf{k}}), \qquad (1.3).$$

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$n_{\vec{k}}^{(0)}$ denotes the equilibrium distribution function, $n_{\vec{k}}^{1}$ the nonequilibrium correction to it, $\hat{D}n_{\vec{k}}^{(0)}$ the free term

$$\hat{D}n_{\vec{k}}^{(0)} = \frac{1}{\hbar}\frac{\partial n_{\vec{k}}^{(0)}}{\partial \varepsilon}\left[\sum_i \frac{\partial \mu}{\partial x_i}\frac{\partial \varepsilon}{\partial k_i} + \frac{\varepsilon-\mu}{T}\sum_i \frac{\partial T}{\partial x_i}\frac{\partial \varepsilon}{\partial k_i} - e\sum_i \frac{\partial \varepsilon}{\partial k_i}\mathcal{E}_i\right], \quad (1,4)$$

of the kinetic equation, μ the chemical potential, $\mathcal{E}$ the external electric field, $\hat{R}$ the collision operator: $\hat{R}n_{\vec{k}}^{1} = \sum_{ij}\chi_i(\varepsilon)\nu_{ij}k_j$, with

$n_{\vec{k}}^{1} = \sum_i \chi_i(\varepsilon)k_i$ (1.5) and

$$\sum_{k'} W_{kk'}(k_i' - k_i) = \sum_j \nu_{ij}(\varepsilon)k_j; \quad (1,7)$$

Since (1.5) and (1.7) are not valid in every case, the authors tried to establish a method which makes it possible to find out in which cases (1.5) and (1.7) hold true and to solve the kinetic equation also when the aforementioned conditions are not valid. First, "deformed" coordinates are introduced in the quasimomentum space and the free term

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Solution of the kinetic equation...

(1.4) is transformed into $\hat{D}n_{\vec{k}}^{(0)} = \sum_m D_m Y_{1m}(\vartheta_0\varphi_0)$ so that the kinetic equation goes over into an infinite system of linear algebraic equations. The solution has to be sought as an expansion into spherical harmonics $n_{\vec{k}}^{1} = \sum_{km} X_{km}(\epsilon)\cdot Y_{km}(\vartheta_0\varphi_0)$. The collision operator is then given by

$$\hat{R}n_k' = -\sum_{jkmp} X_{km}(\epsilon) B_{jk}(mp) Y_{jp}(\vartheta_0\varphi_0), \qquad (2,8)$$

$$-\sum_{jp} B_{jp}(mp) Y_{jp}(\vartheta_0\varphi_0) = \hat{R} Y_{km}(\vartheta_0\varphi_0). \qquad (2,9)$$

and $\sum_{km} B_{jk}(pm) X_{km} = D_p \delta_{j_1}$, or, for $B_{jk}(pm) = B_{jk}(m)\delta_{mp}$, $\sum_k B_{jk}(m) X_{km} = D_m \delta_{j_1}$ (2.11). The coefficients $B_{jk}(pm)$ are found to be

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$$B_{jk}(pm)=\frac{4\sqrt{2m_1m_2m_3}}{(2\pi\hbar)^3}i^{m-p}\sum_{s=0}^{j}\sqrt{\frac{(2j+1)(2k+1)(j-s)!(k-s)!}{(j+s)!(k+s)!}}\times$$

$$\times\int d\Omega\int_0^{\frac{\pi}{2}}d\theta\sin\theta\cos\theta W(\theta\gamma)P_j^s(\cos\theta)P_k^s(\cos\theta)P_{jp}^l(\cos\theta)\times \qquad (3.33)$$

$$\times P_{km}^p(\cos\theta)e^{i(m-p)\gamma};$$

$d\Omega=\sin\theta d\theta d\gamma$.

where j and k are odd numbers. An iteration method is employed for the determination of X_{1m} in the system (2.11). The quickly converging series

$$X_{1m}=D_m\sum_l\frac{Z_{l-1}^2}{\Delta_l(m)\Delta_{l-1}(m)}, \qquad (4,6)$$

$$Z_{l-1}(m)=\begin{vmatrix} B_{31}(m) & B_{33}(m)\ldots\ldots B_{3,2l-3}(m) \\ \cdots\cdots\cdots\cdots\cdots\cdots \\ \cdots\cdots\cdots\cdots\cdots\cdots \\ B_{2l-1,1}(m) & B_{2l-1,3}(m)\ldots B_{2l-1,2l-3}(m) \end{vmatrix}; Z_0=1. \qquad (4,7)$$

is derived. The authors have used this method before to investigate electron scattering from impurity ions and acoustic phonons (results published elsewhere). Finally, a method of solving the kinetic equation,

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Solution of the kinetic equation...

which is based on the use of eigenfunctions of R is discussed in brief. There are 12 references: 9 Soviet and 3 non-Soviet. The reference to the English-language publication reads as follows: J. M. Ziman, Canad. Journ. Phys., 34, 1256, 1956.

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30774
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24.7200 (1144,1153,1160)

AUTHORS: Samoylovich, A. G., Korenblit, I. Ya., Dakhovskiy, I. V., and Iskra, V. D.

TITLE: Anisotropic scattering of electrons from ionized impurities and acoustic phonons

PERIODICAL: Fizika tverdogo tela, v. 3, no. 11, 1961, 3285-3298

TEXT: In continuation of two previous papers (Ref. 1: FTT, 3, 10, 1961 and Ref. 2: DAN SSSR, 139, 355, 1961) the authors theoretically investigated inelastic electron scattering from impurity ions and acoustic phonons in cubic crystals. First the probability of scattering from impurity ions in a cubic crystal with isotropic dielectric constant is calculated in Born's approximation:

$$W(\theta\theta\varphi) = \frac{2\pi}{\hbar} N |V_{kk'}|^2 = \frac{\pi^3 e_0^4 N \hbar^3}{2\varepsilon^2 m_3^2 \pi^2 \left[\left(\cos^2\theta + \frac{m_1}{m_3}\sin^2\theta\right)\cos^2\theta + \gamma^2\right]^2}. \quad (1.6)$$

ε is the dielectric constant, $\gamma = \hbar^2/8a^2 m_3 \varepsilon$, a - shielding radius,

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N - number of impurity ions per cm^3, $V_{\vec{k}\vec{k}'}$ - transition matrix element

[Abstracter's note: Denotations and basic equations are taken from Ref. 1. It is impossible to follow the calculations if Ref. 1 is not available.]

In the next section the coefficients $B_{jk}(m)$ and the first terms of the X_{1m} series are determined approximately. The following results were obtained:

$$B_{jk}(0)=\frac{\pi C}{4}\ln\frac{1}{\gamma^2}\frac{m_3^2}{m_1^2\beta^3}\sqrt{(2j+1)(2k+1)}\times$$

$$\times\sum_{s=0}^{j}\frac{(j+s)!!\,(k+s)!!\,(j-s)!!\,(k-s)!!}{(k+s-1)!!\,(j+s-1)!!\,(k-s-1)!!\,(j-s-1)!!}; \qquad (2.8)$$

with

$$C=\frac{\pi N e_0^4 m_1}{\sqrt{2}\,\pi^2 m_3^{3/2}\varepsilon^{3/2}}; \qquad (2.2);$$

The approximate value $B_{jk}(0)$ $B_{jk}(0)$.

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$$X_{10}=\frac{D_0}{B_{11}(0)}(1+0.72+0.015+0.00018+\ldots). \qquad (2.9),$$

$$X_{11}=\frac{D_1}{B_{11}(1)}(1+0.72+0.015+\ldots). \qquad (2.12)$$

The third section deals with the relaxation time tensor for scattering from impurity ions. Relaxation time is assumed to be isotropic:

$$\tau^{-1}=\frac{N\pi e_0^4}{\varkappa^2\sqrt{2m^*\varepsilon^3}}\left(\ln\frac{1+\gamma^2}{\gamma^2}-\frac{1}{1+\gamma^2}\right). \qquad (3.9).$$

The non-vanishing components of the τ-tensor are given by

$$\left.\begin{aligned}\tau_{33}&=\chi_0=\frac{1}{B_{11}(0)}(1+g_0),\\ \tau_{11}=\tau_{22}&=\chi_1=\frac{1}{B_{11}(1)}(1+g_1).\end{aligned}\right\} \qquad (3.7)$$

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with

$$X_{1m} = D_m \chi_m, \tag{3.1}$$

$$\chi_m = \frac{1}{B_{11}(m)}\left[1 + \frac{B_{13}^2(m)}{B_{11}(m)B_{33}(m) - B_{13}^2(m)}\right], \tag{3.2}$$

Thus for $B_{11}(m)$

$$B_{11}(0) = \frac{3\pi N e_0^4 \sqrt{2m_3}}{8\varkappa^3 \varepsilon^{3/2} m_1 \beta^3}\left\{2\left(\operatorname{arc\,tg}\beta - \frac{\beta}{1+\beta^2}\right)\ln\frac{1}{\gamma^2} - 2\operatorname{arc\,tg}\beta \ln(1+\beta^2) + \right.$$
$$\left. + 4L(\operatorname{arc\,tg}\beta) + (1+\beta^2)\left[\operatorname{arc\,tg}\beta + \frac{\beta(\beta^2-1)}{(1+\beta^2)^2}\right]\gamma^2\right\}, \tag{3.10}$$

$$B_{11}(1) = \frac{3\pi N e_0^4 \sqrt{2m_3}}{8\varkappa^3 \varepsilon^{3/2} m_1 \beta^3}\left\{[(\beta^2-1)\operatorname{arc\,tg}\beta + \beta]\ln\frac{1}{\gamma^2} - \right.$$
$$- 2\beta^2 \operatorname{arc\,tg}\beta - (\beta^2-1)\operatorname{arc\,tg}\beta \ln(1+\beta^2) + 2(\beta^2-1)L(\operatorname{arc\,tg}\beta) + \tag{3.11}$$
$$\left. + \frac{1+\beta^2}{2}\left[(3\beta^2-1)\operatorname{arc\,tg}\beta + \frac{\beta(3\beta^2+1)}{1+\beta^2}\right]\gamma^2\right\};$$

with the Lobachevskiy function $L(t) = -\int_0^t \ln\cos x\,dx$. As has already been shown in Ref. 1, all fluxes can be expressed by the relaxation

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time tensor. Its components depend only on energy. In section 4 the probability electron of scattering from acoustic phonons is determined by means of the deformation potential.

$$W(\vartheta\varphi)=\frac{\pi kT}{2\rho V\hbar}\sum_{\alpha}\frac{1}{\Omega_{\alpha}^{2}(\vartheta\varphi)}\left[\sum_{il}D_{il}(\eta_i e_l^{\alpha}+\eta_i e_i^{\alpha})\right]^2, \tag{4.7}$$

$$\eta_1=\sqrt{m_1}\sin\vartheta\cos\varphi,\quad \eta_2=\sqrt{m_2}\sin\vartheta\sin\varphi,\quad \eta_3=\sqrt{m_3}\cos\vartheta. \tag{4.8}$$

is found, where D_{il} is the tensor of the deformation potential constants, e^{α} the polarization vector, ρ the crystal density, V its volume, $\Omega_{\alpha}(\vartheta\varphi)$ is a certain function of the angles ϑ and φ. In section 5 the properties of the coefficients

$$B_{jk}(pm)=\frac{4\sqrt{2m_1m_2m_3\varepsilon}}{(2\pi\hbar)^3}i^{m-p}\sum_{\text{symm.}}\mathcal{L}_{jk}^{p}\mathcal{R}_{jk}^{p}(pm), \tag{5.1}$$

with

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$$\mathcal{L}^{s}_{jk}=2\sqrt{\frac{(j-s)!\,(k-s)!}{(j+s)!\,(k+s)!}}\int_0^{\frac{\pi}{2}} d\theta \sin\theta\cos\theta\, \dot{P}^{s}_{j}(\cos\theta)\, P^{s}_{k}(\cos\theta), \qquad (5.2)$$

$$\mathcal{L}^{s}_{jk}(pm)=\int d\Omega \bar{P}^{j}_{sp}(\cos\theta)\, \dot{\bar{P}}^{k}_{sm}(\cos\theta)\, e^{i(m-p)\varphi}, \qquad (5.3)$$

are investigated. The $\mathcal{L}^{(0)}_{jk}$ and $\mathcal{L}^{(2)}_{jk}$ are tabulated for some j and k values. In the last section the relaxation time tensor is calculated for electron scattering from acoustic phonons in Ge, Si and Bi_2Te_3. For k = j = 1 and $W(\vartheta,\varphi) = W(\vartheta,\pi+\varphi)$ the general formulas are given:

$$\begin{cases} B_{11}(00)\,X_{10}=D_0, \\ B_{11}(11)\,X_{11}+B_{11}(1,-1)\,X_{1,-1}=D_1, \\ B_{11}(-1,1)\,X_{11}+B_{11}(-1,-1)\,X_{1,-1}=D_{-1}. \end{cases} \qquad (6.1)$$

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$$n'_k = \tilde{n}'_k = \frac{D_0 Y_{10}(\vartheta_0\varphi_0)}{B_{11}(00)} + \frac{D_{-1}B_{11}(11) - D_1 B_{11}^*(1,-1)}{B_{11}^2(11) - |B_{11}(1,-1)|^2} Y_{1,-1}(\vartheta_0\varphi_0) + \frac{D_1 B_{11}(11) - D_{-1}B_{11}(1,-1)}{B_{11}^2(11) - |B_{11}(1,-1)|^2} Y_{11}(\vartheta_0\varphi_0). \quad (6.2)$$

$$B_{11}(1,-1) = |B_{11}(1,-1)| e^{i\psi} \quad (6.3)$$

$$\tau_{11} = \frac{B_{11}(11) - |B_{11}(1,-1)|\cos\psi}{B_{11}^2(11) - |B_{11}(1,-1)|^2}; \quad \tau_{22} = \frac{B_{11}(11) + |B_{11}(1,-1)|\cos\psi}{B_{11}^2(11) - |B_{11}(1,-1)|^2};$$
$$\tau_{33} = \frac{1}{B_{11}(00)}; \quad \tau_{12} = \sqrt{\frac{m_1}{m_2}} \frac{|B_{11}(1,-1)|\sin\psi}{B_{11}^2(11) - |B_{11}(1,-1)|^2}; \quad (6.4).$$
$$\tau_{21} = \frac{m_2}{m_1}\tau_{12}.$$

Then they are applied first to Ge and Si, then to Bi_2Te_3. There are 5 figures, 5 tables, and 14 references: 9 Soviet and 5 non-Soviet. The three references to English-language publications read as follows: R. B. Dingle, Phil. Mag., 46, 831, 1955; F. Ham. Phys. Rev. 100, 1251,

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S/181/61/003/011/006/056
B102/B138

Anisotropic scattering of electrons ...

1955; J. R. Drabble a. R. Wolfe. Proc. Phys. Soc. B69, 1101, 1956.

ASSOCIATION: Institut poluprovodnikov AN SSSR Leningrad (Institute of Semiconductors AS USSR, Leningrad)

SUBMITTED: May 9, 1961

Card 8/8

24.7900 1482, 1395, 1163, 1144

30061
S/048/61/025/011/005/031
B108/B138

AUTHORS: Kudinov, Ye. K., and Samoylovich, A. G.

TITLE: The energy spectrum of carriers in ferro- and antiferromagnetics

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 25, no. 11, 1961, 1339-1342

TEXT: Some antiferromagnetics show semiconductor mechanism of conduction below their Curie point, and metal conduction above it. This peculiar behavior is due to the magnitude of the activation energy ΔE_a which means that the s-electrons do not participate in conduction. This activation energy is explained with the aid of a polar conduction model. The activation energy will change with the magnetization of the sublattice if the width of the band of polar states depends on magnetic ordering. The width of the band of the singly excited polar states as a function of magnetization is determined for a crystal with one excess electron. It is assumed that the orbit of this electron is

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somewhat above the orbits of the atomic electrons and that the atomic shell is filled up. The splitting of the excited level in the band is considered by means of the Hamiltonian

$$\hat{H} = \sum_{\alpha\alpha';\sigma} F_{\alpha\alpha'} a^{+}_{\alpha\sigma} a_{\alpha'\sigma'}$$

where σ is the spin index. The α's indicate the rest of the quantum numbers describing the electron. In approximation to the nearest neighbors, the energy band is obtained as $\Delta E_a = \frac{F_{\beta 1;\beta 2}}{\sqrt{2S+1}} f(\vec{k})$ where the function $f(\vec{k})$ depends only on the geometrical structure of the lattice. $F_{\beta 1;\beta 2} = F_{f_n \beta 1; f_n \beta 2}$, f_n denotes the radius vector of the n-th lattice site. The analogous formula for ferromagnetic ordering in a ferromagnetic consisting of two equal sublattices is $\Delta E_F = F_{\beta 1;\beta 2} f(\vec{k})$. In the paramagnetic case, the energy band is

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$$\Delta E_n = \frac{F_{\beta_1;\beta_2}}{(2S+1)^2}\left\{\left(\sum_{S_z=-S}^{+S}\sqrt{S+S_z+1}\right)^2+\left(\sum_{S_z=-S}^{+S}\sqrt{S-S_z}\right)^2\right\}/(k). \quad (6)$$

When the lower edge of the band of the polar states overlaps the lower edge of the non-polar band, the conduction mechanism will be of a metallic character. The results of the above considerations show that the band width increases in transition from the antiferromagnetic to the paramagnetic state, making possible the change from semiconductor to metal-type conductivity. A change from semiconductor to metal-type conductivity is possible in transition from the ferromagnetic to the paramagnetic state. There are 2 tables.

ASSOCIATION: Institut poluprovodnikov Akademii nauk SSSR (Institute of Semiconductors of the Academy of Sciences USSR)

Card 3/3

SAMOYLOVICH, A.G.; KORENBLIT, I.Ya.; DAKHOVSKIY, I.V.

Anisotropic scattering of electrons on ionized impurities. Dokl. AN SSSR 139 no.2:355-358 Jl '61. (MIRA 14:7)

1. Institut poluprovodnikov AN SSSR. Predstavleno akademikom A.A. Lebedevym.

(Electrons--Scattering)

S/181/63/005/003/012/046
B102/B180

AUTHORS: Samoylovich, A. G., and Rabinovich, Ye. Ya.

TITLE: Diamagnetism of conduction electrons in weak-coupling approximation

PERIODICAL: Fizika tverdogo tela, v. 5, no. 3, 1963, 778-782

TEXT: The diamagnetic susceptibility of conduction electrons in alkaline metals is calculated in weak-coupling approximation (cf. also D. Pines, Solid State Physics, 1, 425, N. Y. 1955). The statistical sum of the conduction electrons in a permanent magnetic field is given by

$Z = \mathrm{Sp}\left[\exp - \beta(\mathcal{H}_0 + V(\vec{r})\right]$, where $\mathcal{H}_0$ is the free-electron Hamiltonian in the magnetic field and $V(\vec{r})$ the periodic lattice potential, considered as perturbation. Z is calculated in second approximation with respect to $V(\vec{r})$: $Z = Z_0 + Z_2$, where

$$Z_0 = \mathrm{Sp}[e^{-\beta \mathcal{H}_0}], \quad (3)$$

$$Z_2 = \frac{\beta^2}{2}\int_0^1 ds\, \mathrm{Sp}[V(\mathbf{r})e^{-\beta\mathcal{H}_0(1-s)}V(\mathbf{r})e^{-\beta\mathcal{H}_0 s}]. \quad (4)$$

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Diamagnetism of conduction electrons ...

From the expression obtained for $Z(\beta)$ the thermodynamic potential is determined by means of

$$-\Omega = \frac{1}{2\pi i}\int_{\sigma-i\infty}^{\sigma+i\infty} \frac{e^{\mu\beta}}{\beta^3} Z(\beta)\, d\beta. \qquad (12)$$

(approximation for strongly degenerate electron gas), and therefrom the magnetic susceptibility is obtained, using the relation $\chi = -\frac{1}{H}(\partial\Omega/\partial H)_{\mu}$. When the chemical potential is calculated from the electron concentration $N = -(\partial\Omega/\partial\mu)_{T,V}$ the final result reads

$$\chi = -\left(\frac{m}{2\pi\hbar^2}\right)^{3/2}\frac{1}{\sqrt{\pi}}\frac{h^2e^2}{6m^2c^2}\left\{2\mu_0^{1/2} + \frac{1}{4}\sum_g |V_g|^2\left[\frac{1}{\mu_0\sqrt{\eta}}\ln\frac{\sqrt{\eta}-\sqrt{\mu_0}}{\sqrt{\eta}+\sqrt{\mu_0}} + \right.\right. \qquad (20)$$

$$\left.\left. + \frac{1}{\sqrt{\mu_0}\,(\eta-\mu_0)} - \frac{\pi^2\hbar^2(g_x^2+g_y^2)}{2m\sqrt{\mu_0}\,(\eta-\mu_0)^2}\right]\right\}.$$

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Diamagnetism of conduction electrons ...

$\mu_o = \frac{\pi^2}{8\pi^2 m}\left(\frac{3N}{8\pi}\right)^{2/3}$. For an alkaline metal, where $N = 2/a^3$, and $g_i = n_i/a$, $i=x,y,z$,

$$\chi = \chi_0\left\{1 + \left(\frac{ma^2}{2\pi^2\hbar^2}\right)^2 \sum_{\mathbf{n}} |V_{\mathbf{n}}|^2 \left[\frac{\frac{4}{3}|\mathbf{n}|^2\left(\frac{\pi}{6}\right)^{2/3}}{\left[|\mathbf{n}|^2 - \left(\frac{6}{\pi}\right)^{2/3}\right]^2} + \right.\right.$$

$$\left.\left. + \frac{\pi}{6|\mathbf{n}|}\ln\frac{|\mathbf{n}| + \left(\frac{6}{\pi}\right)^{1/3}}{|\mathbf{n}| - \left(\frac{6}{\pi}\right)^{1/3}} - \frac{2\left(\frac{\pi}{6}\right)^{2/3}}{|\mathbf{n}|^2 - \left(\frac{6}{\pi}\right)^{2/3}}\right]\right\}, \quad (21)$$

where χ_o is the diamagnetic susceptibility of the free electrons; the second term is the contribution due to the action of the lattice field, and takes the Van Vleck paramagnetism and all other effects of the lattice field into account. For alkaline metals this contribution is a positive one. Numerical estimates are given for metallic lithium.

Card 3/4

ASSOCIATION: Institut poluprovodnikov AN SSSR, Leningrad (Institute of Semiconductors AS USSR, Leningrad)

SUBMITTED: October 1, 1962

Card 4/4

SAMOYLOVICH, A.G.; NITSOVICH, M.V.

Scattering on dipoles. Fiz. tver. tela 5 no.10:2981-2984 O '63.
(MIRA 16:11)

1. Chernovitskiy gosudarstvennyy universitet.

ACCESSION NR: AP4040931 S/0185/64/009/006/0617/0628

AUTHOR: Samoylovy*ch, A. G. (Samoylovich, A. G.), Nitsovy*ch, V.M. (Nitsovich, V.M.)

TITLE: Theory of conductivity in semiconductors with a narrow impurity zone.

SOURCE: Ukrayins'ky*y fizy*chny*y zhurnal, v. 9, no, 6, 1964, 617-628

TOPIC TAGS: Semiconductors impurity band, impurity conduction, compensated semiconductor, doped semiconductor, Hall coefficient, thermal E.M.F., electrical conductivity, electron tunneling, electron hopping, quasi-impulse method

ABSTRACT: Transport phenomena are considered for doped and compensated semiconductors with a narrow impurity zone located within the intrinsic forbidden zone. The work of Mott and Twose (Adv. Phys. 10, No. 38, 107, 1961) is expanded and refined. Introductory remarks explain that narrow impurity zones cannot be treated as bands in the Bloch wave scheme, but that localized wannier functions and a Heitler-London scheme must be used. Further, since the zone is so complicated, havind different effective masses at top and bottom, the effective mass approach breaks down. Feynmann's method is used to untangle the non-commuting energy operators that appear in expansions of exponential thermodynamic functions. The repulsive forces of filled (charged) compensating impurities on

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ACCESSION NR: AP4040931

the impurity charge carriers is a prime consideration in the derivations. Its net effect is to contribute to the degeneracy of the charge carrier (electron) gas. This phenomena, as well as the effect of electron spin, was overlooked by Price in his appendix to the article of H. Koenig and G. R. Gunter-Monr sic (J. Phys. Chem. Solids, 2, 263, 1952) and the oversight lead to incorrect results.

The conductivity sigma, all constant R and thermal E. M. F alpha were calculated from the general results. At low temperatures, where impurity effects predominate, the slopes of the theoretical expressions for R and sigma agree closely with experimental results. The theoretically calculated activation energy of 1.1×10^{-3} eV also agrees closely with the experimental value of 1.6×10^{-3} eV. The theoretical hold best for low compensation ratios. It is concluded from the close fits of theoretical and experimental curves [experimental data from H. Fritzsche, K. Lark-Horowitz, Phys. Rev. 113, 999, 1959] that the anomalies in the thermal dependencies of the transport coefficients are manifestations of the repulsive effects of compensators and the correlation of electrons at low temperatures. The Mott scheme of impurity conduction involved a "hopping" between filled and empty impurity sites in which the phase relations between the initial and final electron states were not preserved. The authors' method of calculation, that of "quasi-impulses" [quasi-momentum?], required that phase relations be preserved.

Card 2/3

ACCESSION NR: AP4040931

The authors demonstrated that their method lead to meaningful results. Orig. art. has 29 numbered equations and 2 graphs.

ASSOCIATION: Chernivets'ky*y derzhuniversy*tet (Chernovits State University)

SUBMITTED: 06Jul63 ENCL: 00

SUB CODE: SS, EC NO REF SOV: 004 OTHER: 008

Card 3/3

B'R

ACCESSION NR: AP4043544 S/0020/64/157/004/0841/0844

AUTHORS: Samoylovich, A. G.; Gvozdovskiy, I. V.

TITLE: On the scattering of carriers by optical vibrations

SOURCE: AN SSSR. Doklady*, v. 157, no. 4, 1964, 841-844

TOPIC TAGS: crystal lattice vibration, scattering cross section, kinetic equation, electric conductivity, thermal emf, distribution function

ABSTRACT: Earlier investigations of the interaction between current carriers and optical vibrations at low temperatures was connected either with insufficiently founded assumptions or with numerical methods of solving the kinetic equation. The authors propose to calculate the electric conductivity and thermal emf at low temperatures by a regular method free of any special assumptions, which makes use of some elementary procedures employed in the solution of

Card 1/2

ACCESSION NR: AP4043544

finite-difference equations. It is based on expanding the non-equilibrium addition to the electron distribution function (given in integral form by Fujita and Abe, J. Math. Phys. v. 3, no. 3, 1962) in spherical functions and making use of their orthogonality. The method proposed makes it possible to increase the temperature interval in which the electric conductivity and thermal emf can be calculated, and can be generalized to include any dispersion law. The integrals contained in the final solutions can be evaluated approximately by a quadrature method. This report was presented by A. A. Lebedev. Orig. art. has: 12 formulas.

ASSOCIATION: Chernovitskiy gosudarstvenny*y universitet (Chernovtsy* State University)

SUBMITTED: 06Mar64 ENCL: 00

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

Card 2/2

L 14987-66 EWT(1)/EWT(m)/EWP(w)/T/EWP(t)/EWP(b) IJP(c) JD/AT

ACC NR: AP5028554 SOURCE CODE: UR/0126/65/020/005/0663/0672

AUTHOR: Samoylovich, A. G.; Pinchuk, I. I.

ORG: Chernovtsy State University (Chernovitskiy gosuniversitet)

TITLE: Theory of galvanomagnetic effects in metals of the bismuth type

SOURCE: Fizika metallov i metallovedeniye, v. 20, no. 5, 1965, 663-672

TOPIC TAGS: bismuth, galvanomagnetic effect, tensor analysis, metal physics, solid state physics, electron, electric theory

ABSTRACT: The interaction of electrons with phonons in bismuth is described by the deformation potential in which the scattering of electrons by phonons is assumed to be elastic. A calculation is made of the relaxation time tensor and the galvanomagnetic tensors and the dependence of the Hall tensor on the magnetic field is established. Data on the Fermi surface of bismuth are reviewed (see fig. 1). A theoretical derivation of the relaxation time tensor for electrons and electron "holes" based on the elastic tensor c_{ij} is presented. The kinetic equations for magnetic fields are determined and a calculation for the temperature dependent electrical con-

UDC: 539.292 : 537.312.01

Card 1/4

ductivity are given. The relaxation time tensor for the electrons is:

$$\tau_{11} = \frac{1}{B_{11}(0,0)}; \quad \tau_{22} = \frac{B_{11}(1,1) + |B_{11}(1,-1)|\cos 2\eta_1}{B_{11}^2(1,1) - |B_{11}(1,-1)|^2},$$

$$\tau_{33} = \frac{B_{11}(1,1) - |B_{11}(1,-1)|\cos 2\eta_1}{B_{11}^2(1,1) - |B_{11}(1,-1)|^2}; \quad \tau_{23} = \sqrt{\frac{m_2}{m_3}} \times$$

$$\times \frac{|B_{11}(1,-1)|\sin 2\eta_1}{B_{11}^2(1,1) - |B_{11}(1,-1)|^2}; \quad \tau_{32} = \frac{m_3}{m_2}\tau_{23}.$$

where $B_{kl}(nm) = \frac{\sqrt{2\varepsilon m_1 m_2 m_3}}{2(\pi\hbar)^3} i^{m-n}\sqrt{(2l+1)(2k+1)}\int \sin\theta\, d\theta\, d\varphi \int_0^{\pi/2} d\Theta \sin\Theta \times$

$$\times \cos\Theta\, W(\theta,\varphi) P_l^0(\cos\Theta) P_k^0(\cos\theta) P_{0n}^k(\cos\theta) P_{0m}^{l*}(\cos\theta) e^{i(m-n)\varphi}. \quad (1.6)$$

1 is the angle of inclination of the electrons of the ellipsoid in the YZ plane,

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ACC NR: AP5028554

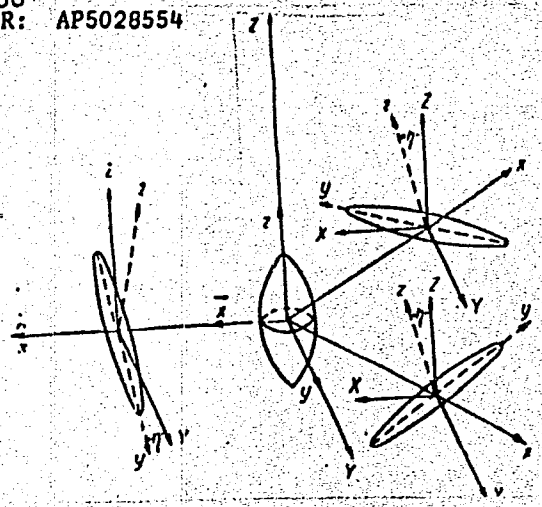

Fig. 1. Fermi surface in bismuth. X, Y, Z - laboratory system of coordinates; x, y, z - principal axes of the mass ellipsoids.

m_i is component of mass. The relaxation time for the electron "holes" is calculated to be:

$$\bar{\tau}_{11} = \bar{\tau}_{22} = \frac{1}{\bar{B}_{11}(0,0)}; \quad \bar{\tau}_{33} = \frac{1}{\bar{B}_{11}(1,1)},$$

$$\bar{\tau}_{11} = \bar{\tau}_{22} = \bar{\tau}_0 \bar{\omega}_{11}; \quad \bar{\tau}_{33} = \bar{\tau}_0 \bar{\omega}_{33},$$

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ACC NR: AP5028554

where 0 is obtained from 1.8 substituting m_1, m_2, m_3 for $\bar{m}_1 = \bar{m}_2$ and $\bar{m}_3$. In the kinetic equations, the function $X_i(\varepsilon)$ must be calculated. It is obtained from the tensor coefficients a.

$$X_i(\varepsilon) = \tau_0 \sum_k a_{ik} K_k + \tau_0^2 \sum_{k,l} a_{ikl} H_l K_k + \tau_0^3 \sum_{klm} a_{iklm} H_l H_m K_k + \\ + \tau_0^4 \sum_{klmn} a_{iklmn} H_l H_m H_n K_k.$$

The tensor coefficients a for both the electrons and electron "holes" are presented. Calculations for the electrical conductivity are based on electric conductivity tensors and magnetic conductivity tensors. The results of the experimental findings are to be presented in another paper. Orig. art. has: 2 figures, 3 tables, 30 equations.

SUB CODE: 20/ SUBM DATE: 17Feb65/ ORIG REF: 007/ OTH REF: 003

Card 4/4

SAmoylovich, A.I.

24(0); 5(4); 6(2) PHASE I BOOK EXPLOITATION SOV/2215

Vsesoyuznyy nauchno-issledovatel'skiy institut metrologii imeni D.I. Mendeleyeva

Referaty nauchno-issledovatel'skikh rabot; sbornik No. 2 (Scientific Research Abstracts; Collection of Articles, Nr 2) Moscow, Standartgiz, 1958. 139 p. 1,000 copies printed.

Additional Sponsoring Agency: USSR. Komitet standartov, mer i izmeritel'nykh priborov.

Ed.: S. V. Reshetina; Tech. Ed.: M. A. Kondrat'yeva.

PURPOSE: These reports are intended for scientists, researchers, and engineers engaged in developing standards, measures, and gages for the various industries.

COVERAGE: The volume contains 128 reports on standards of measurement and control. The reports were prepared by scientists of institutes of the Komitet standartov, mer i izmeritel'nykh priborov pri Sovete Ministrov SSSR (Commission on Standards, Measures, and Measuring Instruments under the USSR Council of Ministers). The participating institutes are: VNIIM - Vsesoyuznyy nauchno-issledovatel'skiy metrologii imeni D.I. Mendeleyeva (All-Union Scientific Research Institute of Metrology imeni D.I. Mendeleyev) in Leningrad; Sverdlovsk branch of this institute; VNIIK - Vsesoyuznyy nauchno-issledovatel'skiy institut Komiteta standartov, mer i izmeritel'nykh priborov (All-Union Scientific Research Institute of the Commission on Standards, Measures, and Measuring Instruments), created from MGIMIP - Moskovskiy gosudarstvennyy institut mer i izmeritel'nykh priborov (Moscow State Institute of Measures and Measuring Instruments) October 1, 1955; VNIIFTRI - Vsesoyuznyy nauchno-issledovatel'skiy institut fiziko-tekhnicheskikh i radiotekhnicheskikh izmereniy (All-Union Scientific Research Institute of Physicotechnical and Radio-engineering Measurements) in Moscow; KhGIMIP - Khar'kovskiy gosudarstvennyy institut mer i izmeritel'nykh priborov (Khar'kov State Institute of Measures and Measuring Instruments); and NGIMIP - Novosibirskiy gosudarstvenyy institut mer i izmeritel'nykh priborov (Novosibirsk State Institute of Measures and Measuring Instruments). No personalities are mentioned. There are no references.

Card 10/27

L 02365-67 EWT(1)/EEC(k)-2/T/EWP(k) IJP(c) WG
ACC NR: AP6032005 SOURCE CODE: UR/0115/66/000/009/0028/0030

AUTHOR: Leykin, A. Ya.; Samoylovich, A. I.; Solov'yev, V. S. 51 B

ORG: none

TITLE: A stable cw gas laser 15

SOURCE: Izmeritel'naya tekhnika, no. 9, 1966, 28-30

TOPIC TAGS: cw laser, gas laser, metrology

ABSTRACT: A stable, single-frequency, dc-excited He-Ne laser has been developed by the Kharkov Institute of Measures and Measuring Instruments for use in metrology. Because of the required single-frequency characteristic, the amplifying medium is designed to damp both higher-order oscillations and extraneous longitudinal modes; emission is confined to the TEM_{q00} type of oscillations. This provides for a minimum of 4—5 axial modes being generated simultaneously within the Doppler width of the $3s_2$—$2p_4$ line. The damping of all the longitudinal modes except those at line center is accomplished by specifying losses which are introduced into the resonator cavity by various elements. The resonator cavity (Fig. 1) contains a small-diameter capillary (1.5 mm) for the

Card 1/3 UDC: 621.375.9

given cavity configuration which insures losses ten times higher for transverse than for basic oscillations. The 300-mm discharge gap

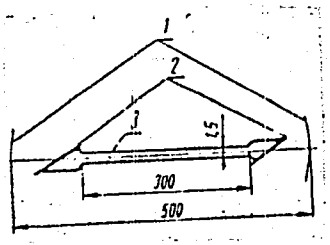


Fig. 1. Resonator cavity configuration

1 - Mirrors; 2 - Brewster windows; 3 - capillary.

insures emission conditions for only one longitudinal type of oscillations at the given gain of 12%—13% and a pumping level only slightly exceeding threshold. The resonator cavity is formed by spherical mirrors with dimensions $R_1 = R_2 = 580$ mm. A stable output power of

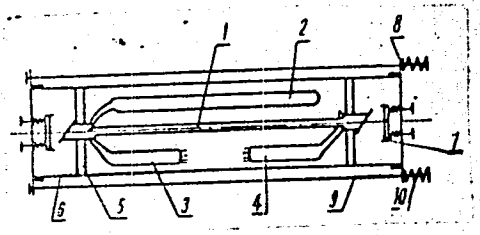


Fig. 2. Laser configuration

1 - Discharge tube; 2 - reserve tube; 3 and 4 - cathode and anode tubes; 5 - holders; 6 - quartz tube; 7 - mirror holders; 8 - end flanges; 9 - steel couplers; 10 - springs

L 02365-67
ACC NR: AP6032005

0.3—0.5 mm in several modes or 0,05—0.1 mm in a single oscillating mode was obtained. Study of the laser emission spectrum with a Fabry-Perot interferometer with scanning mirrors, and with a 150 mm Fabry-Perot standard revealed that four oscillating modes can be generated simultaneously; by lowering the pumping power level, the number of modes can be reduced to two. The laser emission can be brought down to a single mode by reducing both pumping power and mirror rotation. [JR]
Orig. art. has: 3 figures.

SUB CODE: 20/4/ SUBM DATE: none/ OTH REF: 002

Card 3/3 vmb

SAMOYLOVICH, A.L., professor [deceased]

Combined infections of tuberculosis and brucellosis. Probl. tub. no.5:66-67 S-O '54. (MLRA 7:12)

1. Iz Krasnodarskogo krayevogo nauchno-issledovatel'skogo tuberkuleznogo instituta.
(BRUCELLOSIS, complications, tuberc.)
(TUBERCULOSIS, complications, brucellosis)

L 04488-67 EWT(1) GW

ACC NR: AP6021869 (A) SOURCE CODE: UR/0210/66/000/001/0010/0020

AUTHOR: Krylov, S. V.; Krylova, A. L.; Mishen'kin, B. P.; Mishen'kina, Z. R.; Samoylovich, A. S.

ORG: Institute of Geology and Geophysics, Siberian Section, AN SSSR (Institut geologii i geofiziki Sibirskogo otdeleniya AN SSSR); Novosibirsk Geophysical Trust (Novosibirskiy geofizicheskiy trest)

TITLE: Structure of the earth's crust in the center and in the southeast of the West Siberian lowland according to data from isolated seismic soundings

SOURCE: Geologiya i geofizika, no. 1, 1966, 10-20

TOPIC TAGS: geology, tectonics, gas fuel, crude petroleum, seismology, earth crust

ABSTRACT: Features of the methodology used for regional seismic investigations of the earth's crust in the West Siberian lowland along the Ob' and Ket' rivers are reported. The composite section of the earth's crust along a line from Khanty-Mansiysk to Ust-Ozernoye is cited. Conclusions, the results of an analysis of the seismic section and of the natural geophysical fields, are drawn concerning the basic outlines of the structure of the core of the territory investigated. The dependency of the characteristics of lithology, tectonics, and regional oil and gas bearing properties of the platform mantle on the plutonic structure is stressed. Orig. art. has: 1 map and 1 diagram showing the seismic section of the earth's crust.

SUB CODE: 08 / SUBM DATE: 07 Aug 65 / ORIG REF: 020

Card 1/1 egh UDC: 551.14 : 550.834 (571.1)

AYRAPETOV, V.A.; SAMOYLOVICH, B.I.

Effect of automatic control on the acceleration of transportation turnover and an increase in the capacity of tank farms. Transp. i khran. nefti i neftprod. no.6:29-31 '64. (MIRA 17:9)

1. Nauchno-issledovatel'skiy i proyektnyy institut po kompleksnoy avtomatizatsii proizvodstvennykh protsessov v neftyanoy i khimicheskoy promyshlennosti.

LEYTMAN, Yu.S.; SAMOYLOVICH, B.I.; KERBITSKIY, B.N.; LYAPINA, I.I.

Economic effectiveness of the use of a DU-1 vapor tension controller in a system for stabilizing gasoline. Izv.vys.uchab.zav.; neft' i gaz 7 no.4:101-104 '64. (MIRA 17:5)

1. Azerbaydzhanskiy institut nefti i khimii imeni Azizbekova i Nauchno-issledovatel'skiy i proyektnyy institut po kompleksnoy avtomatizatsii proizvodstvennykh protsessov v neftyanoy i khimicheskoy promyshlennosti.

SAMOYLOVICH, B.I.

Effect of automation and remote control on the reduction of the cost of gas transportation. Gaz. prom. 7 no.12:49-51 '62
(MIRA 17:7)

SAMOYLOVICH, B.I.; LEYTMAN, Yu.S.; LYAPINA, L.I.; KOPYSITSKIY, T.I.

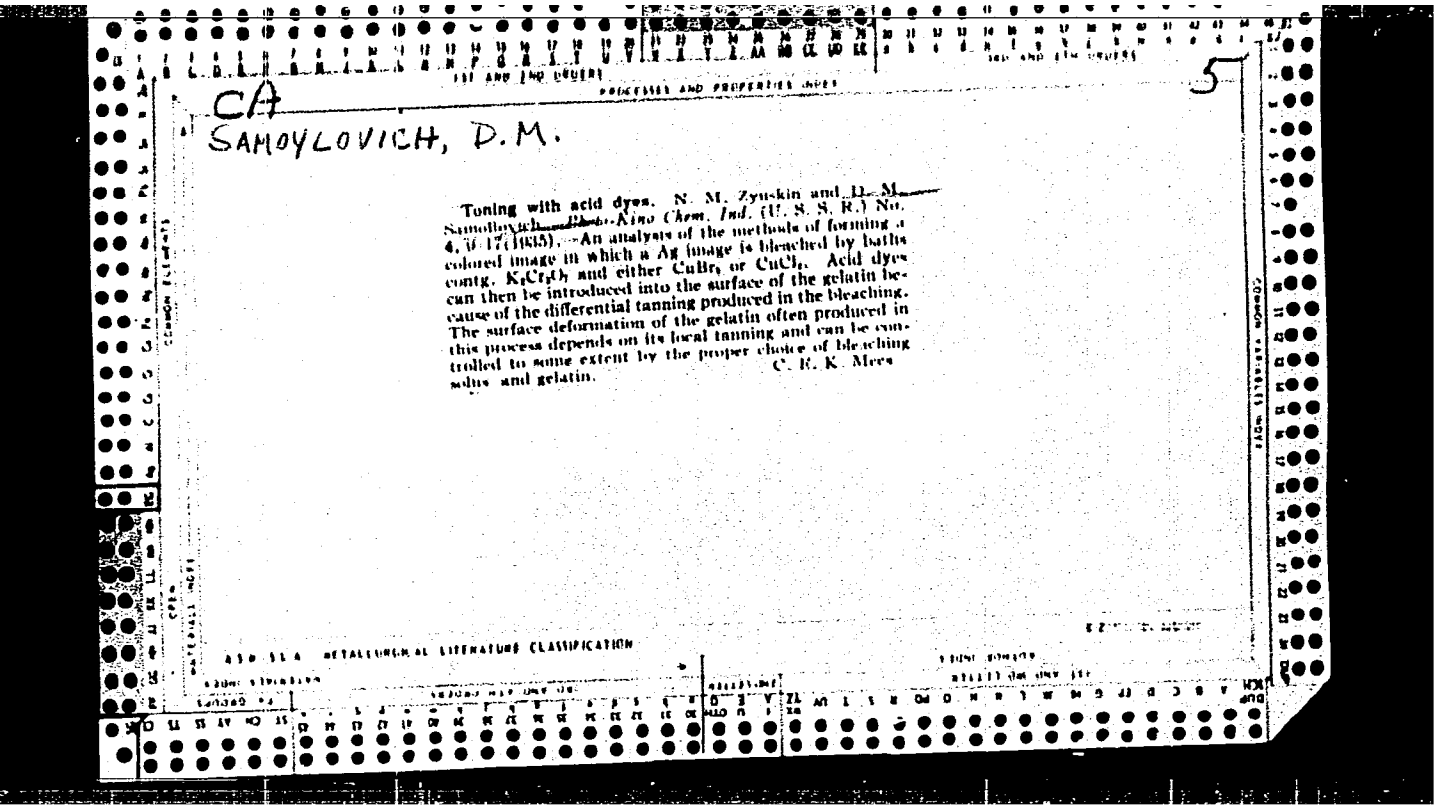
Economic efficiency of the introduction of an automatic-temperature control system in the reactor of a catalytic cracking device. Izv. vys. ucheb. zav.; neft' i gaz 6 no.8:83-86 '63. (MIRA 17:6)

1. Azerbaydzhanskiy institut nefti i khimii imeni M. Azizbekova i Nauchno-issledovatel'skiy i proyektnyy institut po kompleksnoy avtomatizatsii proizvodstvennykh protsessov v neftyanoy i khimicheskoy promyshlennosti.

SAMOYLOVICH, B.I.

Effect of automatic and remote control on the reduction in capital expenditures on petroleum products pipelines. Transp. i khran. nefti i neftprod. no.6:27-29 '64. (MIRA 17:9)

1. Nauchno-issledovatel'skiy i proyektnyy institut po kompleksnoy avtomatizatsii proizvodstvennykh protsessov v neftyanoy i khimicheskoy promyshlennosti.

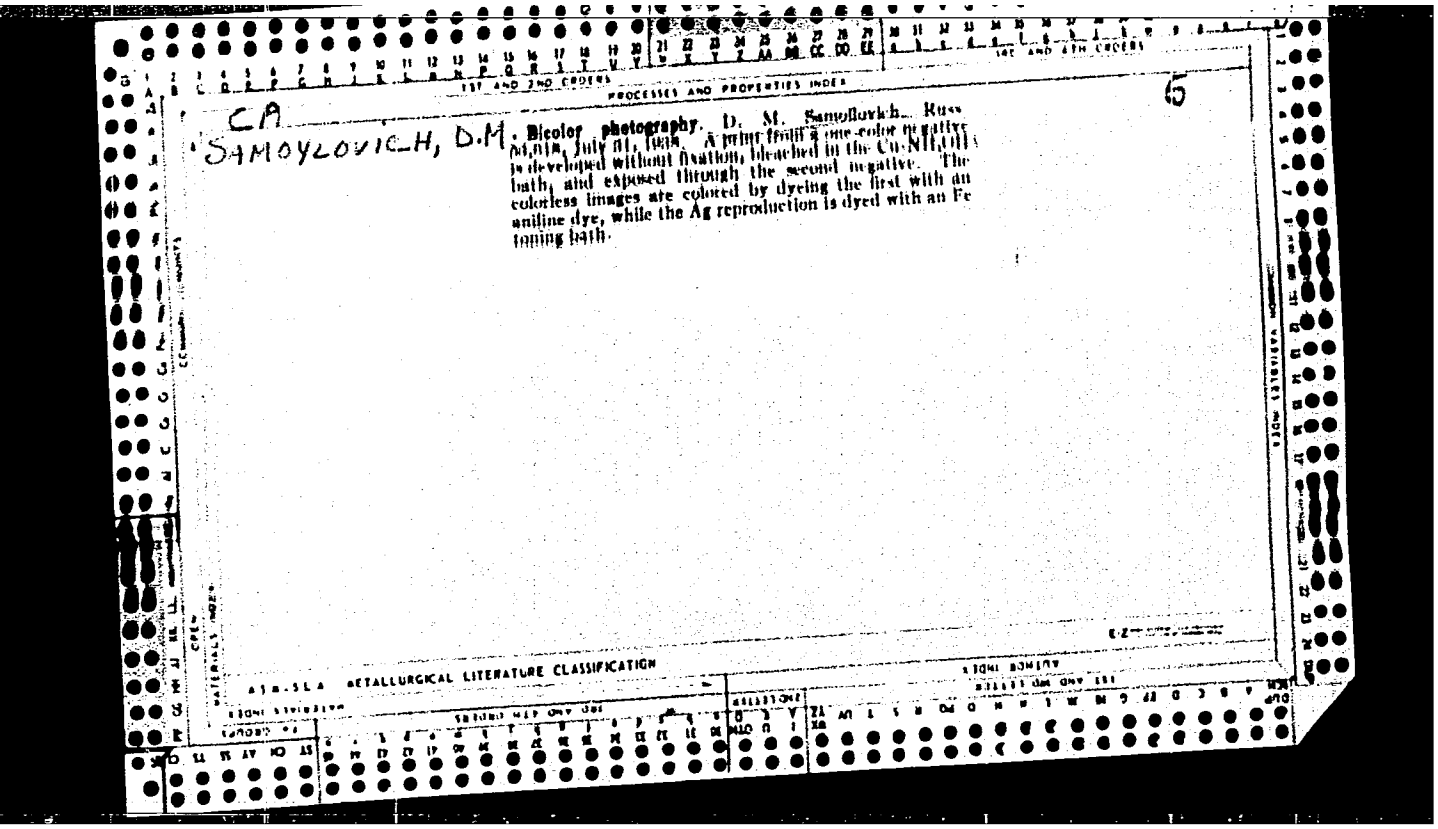


CA

SAMOYLOVICH, D.M.

5

Toning with acid dyes. N. M. Zyuskin and D. M. Samoilovich. *Khim. Khim. Ind.* (U. S. S. R.) No. 4, 6-17 (1935). —An analysis of the methods of forming a colored image in which a Ag image is bleached by baths contg. $K_2Cr_2O_7$ and either $CuBr_2$ or $CuCl_2$. Acid dyes can then be introduced into the surface of the gelatin because of the differential tanning produced in the bleaching. The surface deformation of the gelatin often produced in this process depends on its local tanning and can be controlled to some extent by the proper choice of bleaching solns. and gelatin. C. R. K. Mees



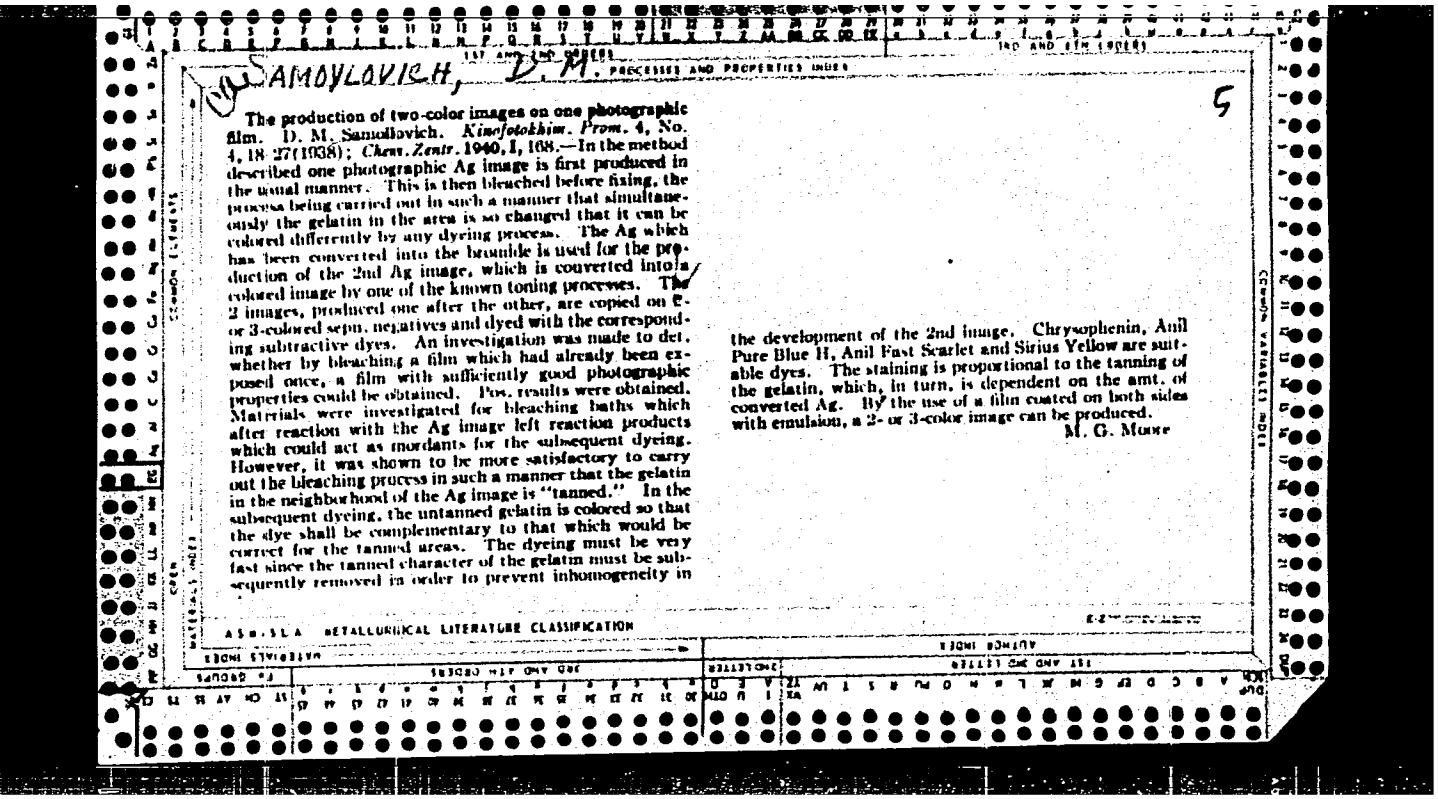
CA

SAMOYLOVICH, D.M.

5

Bicolor photography. D. M. Samoĭlovich. Russ. 46,118, July 31, 1936. A print from a one-color negative is developed without fixation, bleached in the Cu-NH$_4$Cl bath, and exposed through the second negative. The colorless images are colored by dyeing the first with an aniline dye, while the Ag reproduction is dyed with an Fe toning bath.

A13-SLA METALLURGICAL LITERATURE CLASSIFICATION

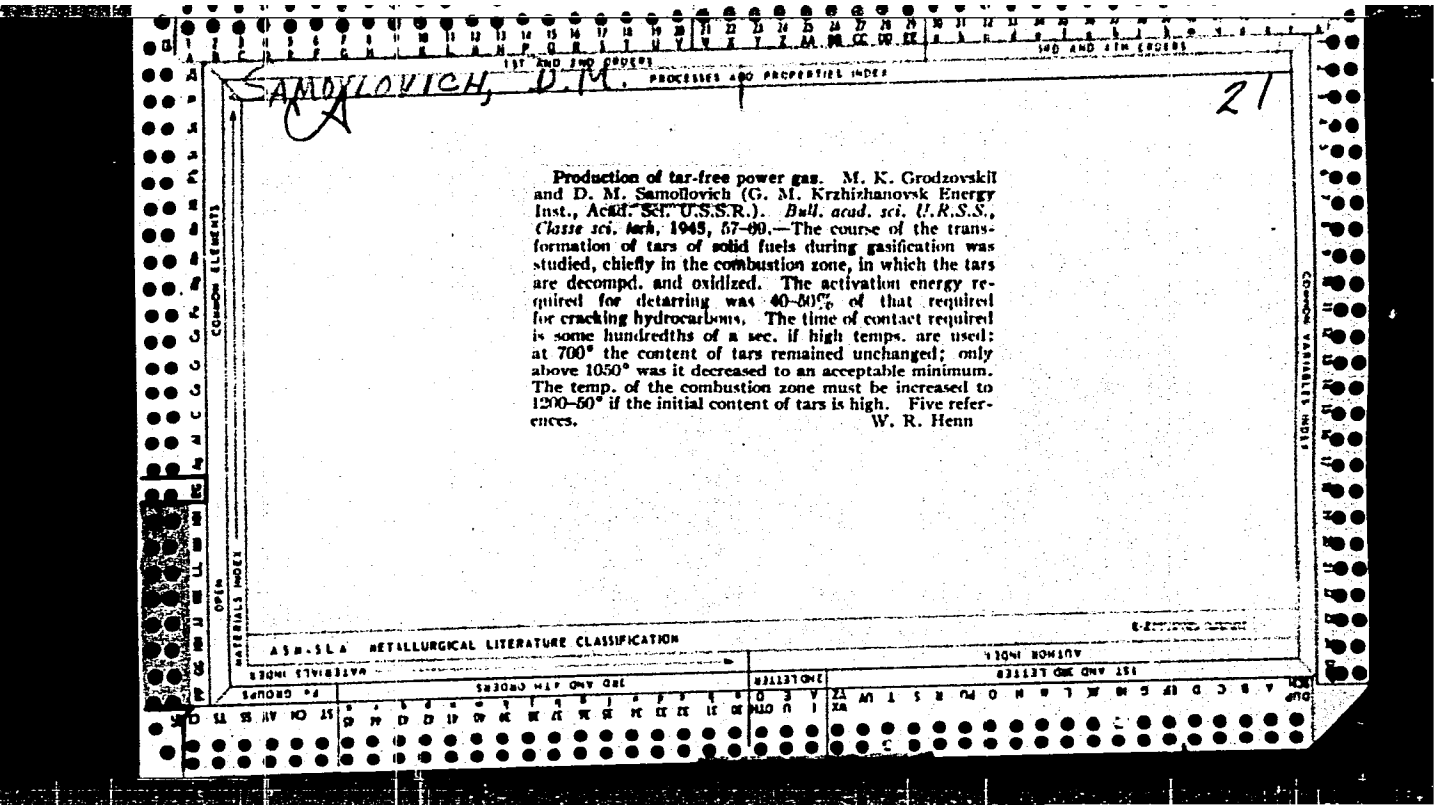


SAMOYLOVICH, D. M.

5

The production of two-color images on one photographic film. D. M. Samoilovich. *Kinofotokhim. Prom.* 4, No. 4, 18-27(1938); *Chem. Zentr.* 1940, I, 168.—In the method described one photographic Ag image is first produced in the usual manner. This is then bleached before fixing, the process being carried out in such a manner that simultaneously the gelatin in the area is so changed that it can be colored differently by any dyeing process. The Ag which has been converted into the bromide is used for the production of the 2nd Ag image, which is converted into a colored image by one of the known toning processes. The 2 images, produced one after the other, are copied on 2- or 3-colored sepn. negatives and dyed with the corresponding subtractive dyes. An investigation was made to det. whether by bleaching a film which had already been exposed once, a film with sufficiently good photographic properties could be obtained. Pos. results were obtained. Materials were investigated for bleaching baths which after reaction with the Ag image left reaction products which could act as mordants for the subsequent dyeing. However, it was shown to be more satisfactory to carry out the bleaching process in such a manner that the gelatin in the neighborhood of the Ag image is "tanned." In the subsequent dyeing, the untanned gelatin is colored so that the dye shall be complementary to that which would be correct for the tanned areas. The dyeing must be very fast since the tanned character of the gelatin must be subsequently removed in order to prevent inhomogeneity in the development of the 2nd image. Chrysophenin, Anil Pure Blue H, Anil Fast Scarlet and Sirius Yellow are suitable dyes. The staining is proportional to the tanning of the gelatin, which, in turn, is dependent on the amt. of converted Ag. By the use of a film coated on both sides with emulsion, a 2- or 3-color image can be produced.

M. G. Moore



SAMOYLOVICH, D. M.

21

Production of tar-free power gas. M. K. Grodzovskii and D. M. Samollovich (G. M. Krzhizhanovsk Energy Inst., Acad. Sci. U.S.S.R.). *Bull. acad. sci. U.R.S.S., Classe sci. tech.*, 1945, 57–60.—The course of the transformation of tars of solid fuels during gasification was studied, chiefly in the combustion zone, in which the tars are decompd. and oxidized. The activation energy required for detarring was 40–50% of that required for cracking hydrocarbons. The time of contact required is some hundredths of a sec. if high temps. are used: at 700° the content of tars remained unchanged; only above 1050° was it decreased to an acceptable minimum. The temp. of the combustion zone must be increased to 1200–50° if the initial content of tars is high. Five references. W. R. Henn

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

SAMOYLOVICH, D. M.

PA 51/49T56

USSR/Nuclear Physics - Varitrons Jul 49
Nuclear Physics - Cosmic Rays

"Observation of Varitrons of Various Masses in Photographic Plates," A. I. Alikhanyan, D. M. Samoylovich, I. I. Gurevich, Kh. P. Babayan, K. I. Gerasimova, Inst of Phys Problems, Acad Sci USSR, Phys Inst, Acad Sci Armenian SSR, 3 pp

"Zhur Eksper i Teoret Fiz" Vol XIX, No 7 p. 664-6

Introduces results of studying separate traces of charged cosmic particles. Traces used were at least 200 microns long. Ends of traces lay in the emulsion film. These tests again confirmed

51/49T56

[redacted]

USSR/Nuclear Physics - Varitrons (Contd) Jul 49

existence of varitrons with masses up to 10,000 times the mass of an electron. Submitted 9 Apr 49.

[redacted]

51/49T56

SAMOYLOVICH, D. M.

PA 51/49T55

USSR/Nuclear Physics - Varitrons Jul 49
Nuclear Physics - Cosmic Rays

"Disintegration of Heavy Varitrons," A. I. Alikhanyan, D. M. Samoylovich, I. I. Gurevich, Kh. P. Babayan, Phys Inst, Acad Sci Armenian SSR, Inst of Phys Problems, Acad Sci USSR, 4 pp

"Zhur Eksper i Teoret Fiz" Vol XIX, No 7
p 667-70

Results of investigations of traces caused by cosmic particles in photographic emulsions. Established that at least six groups of trajectories were caused by varitrons with masses 180-200, 320-350, 650-700, 950-1,000, 3,500-4,000 and 8,000-

[redacted]

51/49T55

USSR/Nuclear Physics - Varitrons (Contd) Jul 49

10,000 times the electron mass. Submitted 9 Apr 49.

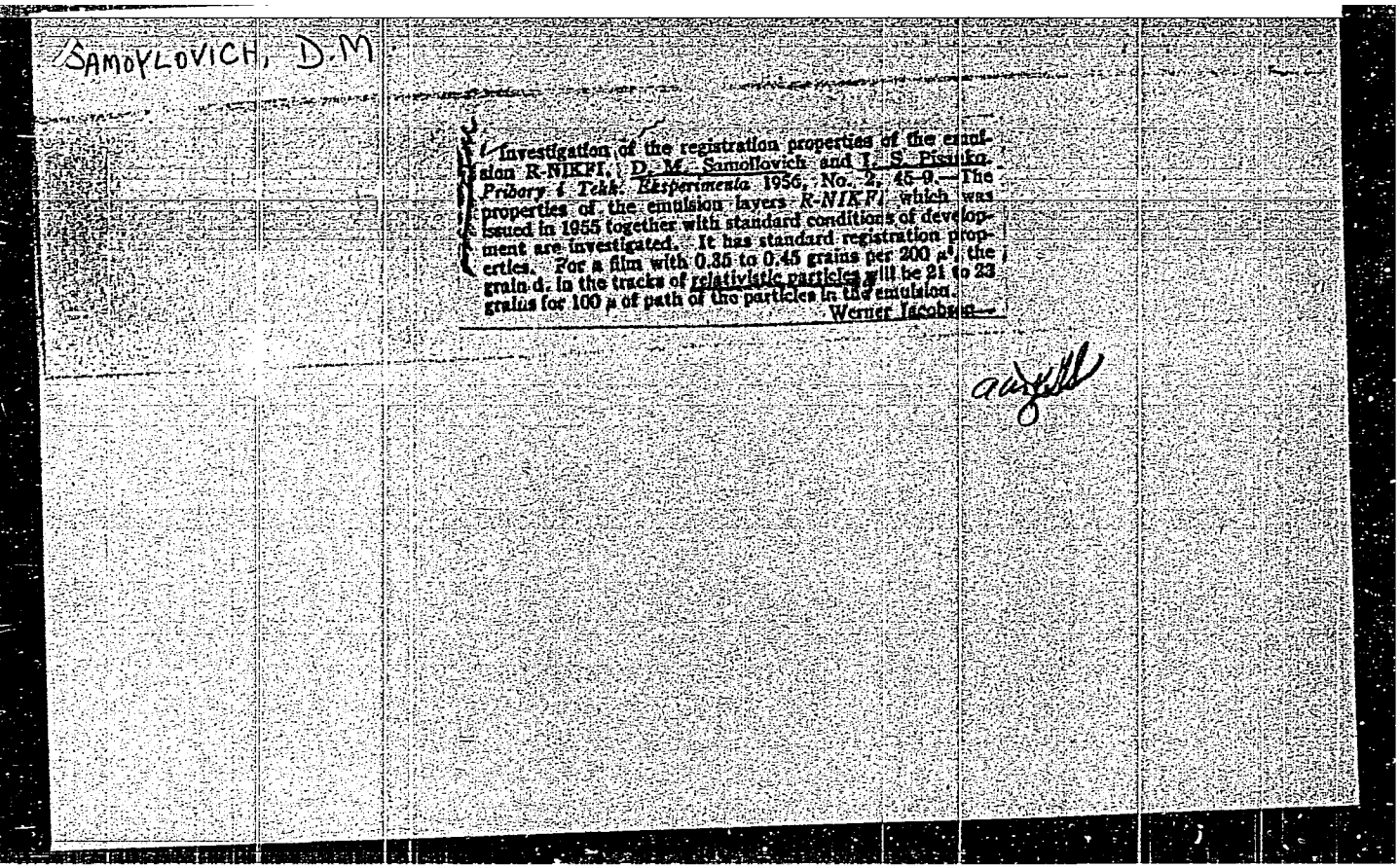
[redacted]

51/49T55

SAMOYLOVICH, D.M.; BARANOVA, Ye.S.

Pasting emulsion layers on glass plates. Prib. i tekh. eksp. no.1:100-102 Jl-Ag '56. (MLRA 10:2)

(Photographic-emulsions)



SAMOYLOVICH, D.M.

Investigation of the registration properties of the emulsion R-NIKFI. D. M. Samoilovich and I. S. Pisu'kin. *Pribory i Tekh. Eksperimenta* 1956, No. 2, 45–9.—The properties of the emulsion layers *R-NIKFI*, which was issued in 1955 together with standard conditions of development are investigated. It has standard registration properties. For a film with 0.35 to 0.45 grains per 200 μ^2, the grain d. in the tracks of relativistic particles will be 21 to 23 grains for 100 μ of path of the particles in the emulsion.

Werner Jacobi

SAMOYLOVICH, D.M., BARINOVA, Ye.S.

Acidic fixing agents for nuclear emulsions. Prib.i tekh.eksp.no.3: 46-49 N-D '56. (MLRA 10:2)
(Photography, Particle track)

120-3-12/40

AUTHOR: Samoylovich, D.M.

TITLE: An Apparatus for and the Process of Drying of the Photographic Layers of Emulsion Plates (Apparatura i protessess vysushivaniya fotograficheskikh sloyev emul'sionnykh kamer)

PERIODICAL: Pribory i Tekhnika Eksperimenta, 1957, Nr 3, pp.47-51 (USSR)

ABSTRACT: The process of drying of stripped emulsions НИКФИ-Р, 450-500 microns thick, after photographic treatment is considered. The drying is carried out without sticking the emulsions on to glass. A special drying chamber is described which can be used in order to prevent distortions exceeding a tolerable value. The emulsions investigated were of circular form, 10 cm in diameter, and 450 to 500 microns thick. The thickness of the emulsion was measured at 10 points throughout the process of drying and with an accuracy of ±5 μ. Similar measurements were carried out on the diameter of the emulsion (accuracy ± 0.1 mm). The following schedule is recommended. The emulsion is placed successively in a series of baths of gradually increasing concentration of ethyl alcohol. The alcohol baths contain about 5% of glycerine by volume. The alcohol concentrations used were 30, 50 and 70% by volume respectively, and

Card 1/2

An Apparatus for and the Process of Drying of [illegible]

one hour is spent in each. During this process the thickness of the emulsion decreases from 950 μ to 650 μ . When the emulsion assumes its original dimensions it is stuck on to a glass support using a special glue. The drying immediately after removal from the alcohol bath is carried out in the special drying chamber described, in which the temperature, humidity, and the air flow can be accurately controlled. Some 80 hours are spent in the drying cupboard at room temperature and gradually decreasing humidity. Measurements carried out on tracks in emulsions dried in the above way have shown that the distortion in the plane parallel to the surface of the emulsion is negligible. E.S. Barinova, Yu.G.Martynov and I.M.Efremova collaborated. There are 6 diagrams, no tables and 9 references, 4 of which are Russian, 3 English and 2 French.

SUBMITTED: January 7, 1957.

AVAILABLE: Library of Congress.

Card 2/2 1. Photographic emulsions-Processing

SAMOYLOVICH, D. M.

120-5-6/35

AUTHORS: Samoylovich, D. M., Barinova, Ye.S., and Martynov, Yu.G.

TITLE: Reduction of Distortions in Emulsion Layers During Development and Fixing (Umen'sheniye iskazheniy emul'-sionnykh sloyev pri fotograficheskoy obrabotke)

PERIODICAL: Pribory i Tekhnika Eksperimenta, 1957, No. 5, pp. 30-35 (USSR)

ABSTRACT: The swelling of nuclear emulsions under different conditions was studied and the results are given for the NIKFI-R emulsions. It was found that in favourable conditions development (including the hot stage) cannot substantially deform the emulsion and that the distortion occurs mainly during fixing and subsequent washing. Curves of swelling versus various physical parameters are given. It is shown that stripped emulsions developed without backing (such as glass) can be used for measuring mean angles due to multiple scattering of protons up to 500 MeV.
There are 8 figures, 2 tables and 8 references, 3 of which are Slavic.

SUBMITTED: March, 22, 1957.

AVAILABLE: Library of Congress

Card 1/1

SAMOYLOVICH, D. M. and ZHORDANSKIY, A. N.

"Emulsion En Couches Multiples De Sensibilite Variee Pour L'enregistrement Des Particules Chargees."

paper presented at Program off the Second internationational Colloquium on Corpuscular Photography. Montreal, 21 Aug - 7 Sep 1958.

Encl: B-3,114,647

SAMOYLOVICH, D. M., BARINOVA, Ye. S. and PISANKO, I. S.
Sci. Res. Inst. Cinephotography.

"Etude Sur Les Proprietes D'enregistrement des Emulsions Nucleaires de Types R."

paper presented at the Second Intl. Colloquium on Corpuscular Photography. Montreal, 21 Aug - 7 Sep 1958.

Encl: B-3,114,647.

SAMOYLOVICH, D. M., SMIRNITSKIY, V. A., SUKHOV, S. A., RYABOV, V. D. and RULEV, A. V.

"Appareil Pour Le Developpemnt Semi-Automatique Des Grands Empilements D'emulsion Nucleaire."

paper presented at the Second Intl. Colloquium on Corpuscular Photography. Montreal, 21 Aug - 7 Sep 1958.

Encl: B-3,114,647.

SOV 77-3-4-11/23

AUTHORS: Samoylovich, D.M.; Belogorodskiy, M.I.; Barinova, Ye.S.

TITLE: Increasing the Sensitivity of Type R Emulsions (Povysheniye chuvstvitel'nosti emul'siy tipa R)

PERIODICAL: Zhurnal nauchnoy i prikladnoy fotografii i kinematografii, 1958, Vol 3, Nr 4, pp 284 (USSR)

ABSTRACT: The authors attempt to explain the fact that in type R photographic films treated with triethanolamine, the sensitivity and the fog increase, by postulating a dual mechanism for the triethanolamine. This increases the pH of the solution and at the same time has a reducing effect on the silver halide grains. To test the assumption, type R emulsion from the Zavod tekhnicheskikh plastinok (Industrial Films Plant) of the Mosgorsovnarkhoz was treated with a solution of caustic soda. Fog and sensitivity increased considerably. The centers of sensitivity probably have a selective adsorption with regard to the hydroxyl ions which may lead to the formation of AgOH or other intermediate compounds, more easily reducible than silver halide. There are 4 references, 3 of which are Soviet and 1 Canadian.

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Increasing the Sensitivity of Type R Emulsions SOV 77-3-4-11/23

ASSOCIATION: Zavod tekhnicheskikh plastinok (Industrial Films Plant) of Mosgorsovnarkhoz.

SUBMITTED: March 16, 1958.

1. Photographic emulsions--Sensitivity 2. Photographic emulsions --Test results 3. Caustic soda--Performance 4. Triethanolamine --Performance

Card 2/2

SOV/120-59-4-11/50

AUTHORS: Samoylovich, D. M., Smirnitskiy, V. A., Sukhov, S. A., Ryabov, V. D., [redacted] A. V.

TITLE: An Installation for the Semi-Automatic Photographic Processing of Large Emulsion Stacks

PERIODICAL: Pribory i tekhnika eksperimenta, 1959, Nr 4, pp 58-62 (USSR)

ABSTRACT: This large scale and elaborate apparatus may be used to develop and fix a 4 litre stack in 4 to 6 days. The working area of the developing apparatus is $2m^2$ and of the fixing apparatus 10 m^2. Five hundred emulsions each 400 μ thick may be developed in 2 to 3 days, while the fixing takes 45 to 50 hours or 75 to 80 hours, depending on whether the emulsions are glass-backed or not. The entire installation occupies an area of 200 m^2. Various gadgets are described, such as thermostated containers, plate holders, special fixing dishes, etc. The basic process of development and fixing employed is

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An Installation for the Semi-Automatic Photographic Processing of Large Emulsion Stacks

conventional and has been described by the authors in Refs 2-7. There are 7 figures and 7 references, of which 1 is English and the rest are Soviet.

SUBMITTED: May 14, 1958.

SAMOYLOVICH, D.M.; BARINOVA, Ye.S.; VLASOV, A.A.; YUKHNOVSKAYA, O.P.

Increase of the sensitivity and development compensation in type "R" emulsions in glued condition. Zhur.nauch.i prikl.fot.i kin. 5 no.2:142-143 Mr-Ap '60. (MIRA 14:5)

1. Zavod tekhnicheskikh plastinok, Moskva.
(Photographic emulsions)
(Photography--Developing and developers)

SAMOYLOVICH, D.M.; BARINOVA, Ye.S.; VLASOV, A.A.; YUKHNOVSKAYA, O.P.

Investigating the sensitivity of emulsion R under various processing conditions. Zhur.nauch.i prikl.fot.i kin. 5 no.1:56-57 Ja-F '60. (MIRA 13:5)

1. Zavod tekhnicheskikh plastinok, Moskva.
(Photographic emulsions--Testing)

BARKOV, L.M.; SAMOYLOVICH, D.M.

Development of nuclear emulsions. Dokl.AN SSSR 136 no.5:1059-1062 F '61. (MIRA 14:5)

1. Predstavleno akad. A.P.Aleksandrovym.
(Photography, Particle track—Developing and developers)

SAMOYLOVICH, D. M., BARINOVA, Ye. S., and ARDASHEV (fnu)

"On the possibility of change of sensitivity of nuclear emulsion during irradiation"

Fourth International Colloquium on Photography (Corpuscular) - Munich, West Germany, 3-8 Sep 62

SAMOYLOVICH, D. M., ARDASHEV (fnu), BARINOVA, Ye. S., RYABOV, V. D., and YUKHNOVSKAYA, O.P.

"On the chemical ripening of the R emulsion"

Fourth International Colloquium on Photography (Corpuscular) - Munich, West Germany, 3-8 Sep 62

SAMOYLOVICH, D. M., and TARASENKOV

"Development of nuclear emulsion in the electric field"

Fourth International Colloquium on Photography (Corpuscular) - Munich, West Germany, 3-8 Sep 62

SAMOYLOVICH, D. M., BARINOVA, Ye. S., and KALASHNIKOVA [may be V. I. KALASHNIKOVA]

"On the structure and size of the sensitivity centers and the development centers of the R emulsion during the controlled disintegration of these centers"

Fourth International Colloquium on Photography (Corpuscular) - Munich, West Germany, 3-8 Sep 62

SAMOYLOVICH, D.M.

Developing of nuclear emulsions. Zhur.nauch.i prikl.fot.i kin 7 no.5:325-332 S-O '62. (MIRA 15:11)
(Photography, Particle track--Developing and developers)

BOGOMOLOV, K.S., red.; PERFILOV, N.A., red.; BELOVITSKIY, G.Ye., red.; DOBROSERDOVA, Ye.P., red.; ZHDANOV, G.B., red.; KARTUZHANSKIY, A.L., red.; LYUBOMILOV, S.I., red.; MINERVINA, Z.V., red.; RAZORENOVA, I.F., red.; ROMANOVSKAYA, K.M., red.; SAMOYLOVICH, D.M., red.; STARININ, K.V., red.; TRET'YAKOVA, M.I., red.; UVAROVA, V.M., red.; SHUR, L.I., red.; POPOVA, A.K., red.; VEPRIK, Ya.M., red.; VERES, L.F., red. izd-va; KUZNETSOVA, Ye.B., red. izd-va; POLYAKOVA, T.V., tekhn. red.

[Nuclear photography; transactions] IAdernaia fotografiia; trudy tret'ego Mezhdunarodnogo soveshchaniia. Moskva, Izd-vo Akad. nauk SSSR, 1962. 474 p. (MIRA 15:6)

1. Colloque International de Photographie Corpusculaire. 3d, Moscow, 1960. 2. Nauchno-issledovatel'skiy kinofotoinstitut, Moskva (for Bogomolov, Uvarova, Romanovskaya, Starinin). 3. Predsedatel' Organizatsionnogo komiteta Tret'yego Mezhdunarodnogo soveshchaniya po yadernoy fotografii. 1960, Moskva (for Bogomolov). 4. Zamestitel' predsedatelya Organizatsionnogo komiteta Tre'yego Mezhdunarodnogo soveshchaniya po yadernoy fotografii. 1960, Moskva (for Perfilov). 5. Radiyevyy institut im. V.G.Khlopina Akademii nauk, Leningrad (for Shur, Perfilov). 6. Institut sovetskoy torgovli im. F.Engel'sa (for Kartuzhanskiy). 7. Ob"yedinennyy institut yadernykh issledovaniy, Dubna (for Lyubomilov). 8. Institut atomnoy energii im. I.V.Kurchatova Akademii nauk SSSR, Moskva (for Samoylovich).

(Photography, Particle track)

24.6610

S/020/62/145/003/008/013
B125/B102

AUTHORS: Samoylovich, D. M., Barinova, Ye. S., and Ardashev, I. V.

TITLE: Possibility of changing emulsion sensitivity by irradiation

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 145, no. 3, 1962, 557 - 559

TEXT: The sensitivity of an emulsion can be very strongly affected by irradiation in the presence of free hydrogen ions. 400μ thick samples of P(R) type emulsion without backing were immersed in solutions of various acids (of pH values from 1 to 5). One hour later they were exposed to γ-rays and neutrons from a Po-Be source, stored for 12 hours at pH 7, and then developed. The density of the proton and electron tracks is constant at pH 3, and depends neither on the kind of acid used nor on the pH value of its solution. Decreasing the pH value from 3 to 2 greatly reduces the density of the tracks, and relativistic particles are not recorded at all. Exposing the same emulsion to 8.6 BeV protons from the Dubna synchrocyclotron and treating it for two hours with sulphuric and nitric acid does not appreciably reduce the density of the tracks of relativistic particles down to pH2. Between pH2 and pH1 the relativistic

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S/020/62/145/003/008/013
B125/B102

tracks decrease very rapidly in density and number. The tracks due to nuclear decay resist treatment of the latent image with acid solutions of pH1. After irradiating the layer, (third series of experiments), the density of the recoil proton tracks is unchanged down to pH2 and reduced by about 10% at pH1. The reversible reduction of sensitivity in the presence of hydrogen ions depends on the competitive capture of electrons by Ag^+ ions and mobile free H^+ ions during the formation of the latent image. The irreversible reduction of sensitivity depends on the release of atomic silver in the acids. This irreversible process is infinitesimal when the emulsion is sensitized with gold. There are 2 figures.

PRESENTED: February 26, 1962, by I. K. Kikoin, Academician

SUBMITTED: February 10, 1962

S/020/62/145/004/014/024
B178/B102

AUTHORS: Samoylovich, D. M., Kalashnikova, V. I., and Barinova, Ye. S.

TITLE: Structure and dimensions of the sensitivity centers and development centers of high-sensitivity P (R)-type nuclear emulsions

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 145, no. 4, 1962, 778-781

TEXT: R-type nuclear emulsions 400 μ thick without backing were studied. The parameter characterizing the effect of dilute acids on the sensitivity and the latent image was the density of the specks in the relativistic particle tracks. The nature of the sensitivity of the emulsion can be inferred from the dependence of the sensitivity on the treatment of the layers. The studies were made with an amidol developer. On treatment with acid of pH 1 the decrease in sensitivity is ≥ 30 %. The stability of the grain can be explained by assuming that 70 % of the grains form centers when sensitized with gold. These centers are stable to acids. 30 % of the grains have sensitivity centers consisting of silver. The fast particles used were electrons, protons (8.6 Bev), and relativistic muons. The specimens were

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treated with acid of pH<7 and then washed with distilled water. It has been found that the silver of the development centers and of the sensitivity centers begins to dissolve at pH 3. In about 1/3 of all nuclei the number of silver atoms in the centers of the latent image exceeds only slightly the smallest number necessary for development. 25-30 % of the nuclei have formation centers that cannot be dissolved even in some tens of hours. Probably 10 silver atoms exist per formation center. There are 4 tables.

PRESENTED: February 26, 1962, by I. K. Kikoin, Academician

SUBMITTED: February 10, 1962

SAMOYLOVICH, D.M.; TARASENKOV, V.G.

Developing type "R" nuclear emulsions in the electrodialyzer. Zhur.nauch. i prikl. fot. i kin. 8 no.2:151-152 Mr-Ap '63. (MIRA 16:3)
(Photography, Particle track—Developing and developers)

SAMOYLOVICH, D.M.; ARDASHEV, I.V.; BARINOVA, Ye.S.; RYABOVA, R.V.; YUKHNOVSKAYA, O.P.

Investigating the chemical ripening of type R emulsions. Zhur. nauch. i prikl.fot. i kin. 8 no.5:359-361 S-O '63. (MIRA 16:9)

KALASHNIKOVA, V.I.; SAMOYLOVICH, D.M.; PEVCHEV, Yu.P.; FINOGENOV, K.G.

Effect of the electric field on the density of the blackening of photographic emulsions. Zhur.nauch. i prikl.fot. i kin. 9 no.6: 464-466 N-D '64. (MIRA 18:1)

1. Moskovskiy inzhenerno-fizicheskiy institut.

SAMOYLOVICH, D.M.; ARDASHEV, I.V.; BARINOVA, Ye.S.

Comparative hypersensitization of nuclear emulsions by triethanolamine and by other alkaline sensitizing agents. Zhur. nauch. i prikl. fot. i kin. 10 no.2:91-93 Mr-Ap '65.
(MIRA 18:5)

SAMOYLOVICH, D.M.; ARDASHEV, I.V.; BARINOVA, Ye.S.

Sensitivity specks of emulsions sensitized subsequently by gold and triethanolamine. Zhur. nauch. i prikl. fot. i kin. 10 no.1:16-22 Ja-F '65. (MIRA 18:4)

POPOV, P.G.; SAMOYLOVICH, F.A.

Classification of environmental factors and the mechanism of their effect on man; criticism of P.G.Mezernitskii's system. Vop.kur. fizioter. i lech. fiz.kul't. 21 no.2:21-26 Ap-Je '56. (MLRA 9:9)

1. Iz kafedr fiziki (zav. - dotsent P.G.Popov) i gospital'noy terapii (zav. - prof. K.A.Patsevich) Kubanskogo meditsinskogo instituta (dir. prof. V.K.Suprunov)
(PHYSIOLOGY)
(MAN--INFLUENCE OF ENVIRONMENT)

Samoylovich, F.A.

SAMOYLOVICH, F.

Conference on theory and practice for health resort physicians of the Krasnodar Territory. Vop.kur.fizioter. i lech.fiz.kul't. 22 no.6:90-91 N-D '57. (MIRA 11:2)

(KRASNODAR TERRITORY--HEALTH RESORTS, WATERING PLACES, ETC.)

SAMOYLOVICH, F.A., Cand Med Sci—(diss) "Experience of ~~the~~ sanitarium climatic treatment of ~~the hypertonic disease~~ hypertension patients at the Gelendzhik health resort." Tuapse,1958. 16 pp (Min of Health RSFSR. Kuban' State Med Inst im Red Army), 250 copies (KL,45-58, 153)

SAMOYLOVICH, F.A.

Fourth Conference on Research and Practice of the Krasnodar Territorial Health Resort Administration. Vop. kur. fizioter. i lech. fiz. kul't. 25 no. 5:475-477 S-O '60. (MIRA 13:10)
(THERAPEUTICS, PHYSIOLOGICAL)

SAMOYLOVICH, Fedor Aronovich; LOTYSHEV, I.P., red.

[In the land of health resorts] V krae kurortov. Krasnodar, Krasnodarskoe knizhnoe izd-vo, 1964. 183 p. (MIRA 18:3)

SAMOYLOVICH, G.D., inzh.; IL'YASHEVSKIY, V.B., inzh. (Chelyabinsk)

Improved equipment for automatic welding of sections. Stroi. truboprov. 5 no.7:20-22 Jl '60. (MIRA 13:9)
(Pipelines—Welding)

S/095/60/000/008/001/001/XX
A053/A026

AUTHOR: Samoylovich, G.D. Engineer (Chelyabinsk)

TITLE: Welding and Assembling at Low Temperatures

PERIODICAL: Stroitel'stvo Truboprovodov, 1960, No. 8, pp. 12 - 13

TEXT: The CMY -6 (SMU-6) (Welding and Assembling Administration - 6) is in charge of the work in the Ural mountains done under severe climatic conditions. Its annual output amounted in 1960 to 500 km of welded pipelines. During the season from May to September pipes are insulated and laid, which leaves a large volume of welding and assembling work for the winter. To ensure continuous operation at all stages of work a special system adapted to conditions in winter has been elaborated and is described. The section of a pipeline extends over 50 - 70 km. To each section two truck-mounted cranes are attached. Sites for welding bases are selected in locations sheltered and convenient for transportation of material and assembled pipe sections. There are 2 bulldozers per section for road building and clearing. Each welding base is equipped with two automatic installations for welding pipe sections 11.5 m long and two or three installations for welding pipe sections 6 m long. SMU-6 employs two kinds of automatic welding

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S/095/60/000/008/001/001/XX
A053/A026

Welding and Assembling at Low Temperatures

installations, e.g., with stationary and with movable rotary devices. Pipe sections are moved on rails to the welding booth which is connected with other premises housing electric equipment etc. and a 60 kw power station driven by Diesel engine КДМ-46 (KDM-46). In the booth the welding head is suspended from the ceiling and is lowered onto the pipe with a lever. Work inside the booth in which temperature is maintained 10°C above outside temperature, work can be carried out during any kind of weather, also in two shifts. To save work in having to move pipe sections to the welding booth an alternative design provides for movable heated booths mounted on slides. Adequate steps are taken for preventing snow from getting inside the pipes. Flux is dried in special driers made to the design of engineer K.A. Skvortsov. Movable filling stations for fuel are mounted on sledges in accordance with the design of Engineer V.M. Izhogin. Movable repair shops consisting of three wagons being pulled separately cover an area of 52.5 m^2 and consist of a power station, a machine shop and a smith shop. The best trucks for transportation of pipe sections up and down the line are the МАЗ -501 (MAZ-501) with a double-axle trailer and MAZ-502 with dumping trailer, capable of transporting two pipe sections 35 m long each with a diameter of 820 mm. Tractor С -80 (S-80) has a capacity of three 820-mm pipe sections, supported by sledges. SMU-6 has also complex teams for continuous centering and welding of pipes; the

Card 2/3

SAMOYLOVICH, G. G.

Permanent Com. Aero-Surveys, Acad. Sci., (-1943-)

"Aerophotosurvey for Scientific Investigation of the Forests,

Iz. Ak. Nauk SSSR, Ser. Geograf. i Geofiz., No. 4, 1943.

SAMOYLOVICH, G. G.

21908. SAMOYLOVICH, G. G.
NOVYY metody (aviametody) dlya izecheniya geograficheskogo rasprostraneniya lesov. Trudy Vtorogo Vsesoyuz. georg. s" yezda. T.P.M., 1948, s. 436-42.

SO: Letopis' Zhurnal'nykh Statey, No. 29, Moskva, 1949.

SAMOYLOVICH, G.G.

Samoylovich, G.G. and Ogorodov, N.V. "Experience from comparing the results of photo interpretation of various categories of timber and seledtive appraisal", Trudy Lesotekhn. akad. im. Kirova, No. 63, 1948, p. 127-32.

SO: U-3042, 11 March 53, (Letopis 'nykh Statey, No. 9, 1949)

SAMOYLOVICH, G. G.

Aeronautics in Forestry

Use of aviation in estimating the blooming stage of pine plantings. Les. Khoz. 5 no. 4 (43), 1952

2

9. Monthly List of Russian Accessions, Library of Congress, August 1953, Uncl.

SAMOYLOVICH, G.G.; ANUCHIN, N.P., professor, doktor sel'skokhozyaystvennykh nauk, retsenzent; BONCH-BRUYEVICH, M.D., doktor tekhnicheskikh nauk; retsenzent; KELL', N.G., redaktor; BAYTIN, A.A., redaktor; VOLKHOVER, R.S., tekhnicheskiy redaktor

[The use of aviation and aerial photography in forestry; forestry aviation and aerial photography] Primenenie aviatsii i aerofotos"emki v lesnom khoziaistve; lesnaia aviatsiia i aerofotos"emka. Moskva, Goslesbumizdat, 1953. 476 p. (MLRA 9:11)
(Aeronautics in forestry)

SAMOYLOVICH, G.G.

Measurement of tree and plantation heights by means of aerial photography. Trudy Lab.aeromet. 3:96-109 '54. (MLRA 8:8)
(Aeronautics in forestry)

SAMOYLOVICH, Georgiy Georgiyevich

Academic degree of Doctor of Agricultural Sciences, based on his defense, 5 October 1955, in the Council of Leningrad Order of Lenin Forestry Technological Acad imeni Kirov, of his dissertation entitled: "Employment of Aviation and Aerial Photography for the Study of Forests."

Academic degree and/or title: Doctor of Sciences

SO: Decisions of VAK, List no. 1, 7 Jan 56, Byulleten' MVO SSSR, Uncl. JPRS/NY-548

Samoylovich, G.G.

USSR/Forestry. Forestry and Forest Cultivation. J-3

Abs Jour: Referat Zh-Biol., No 6, 1957, 22567

Author : Samoilovich, G.G.
Inst : 0
Title : Identification of Trees by Aerial Photography, and Measurement of their Size.

Orig Pub: Geogr. sb., 1955, 5, 177-206

Abstract: For natural investigation, a planting was chosen which later was measured. Within the limits of each measured section, all the trees were numbered. For each tree a card was assigned on which were marked its diameter at chest height, its height; the form of its crown was sketched in. Field data served as original material for comparison with data obtained by measurements by aerial photography. Dead wood trees were positively identified only by their shadows. As the thickness of woodland increased, the difficulty of recognition also increased. Trees

Card : 1/2 -12-