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corbonate, ther. of paralysis agitans)
(PARALYSIS AGITANS, therapy,
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*nervous system dis.)
(NERVOUS SYSTEM, diseases,
*ther., muscle relaxants)

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(PSYCHOLOGY, PATHOLOGICAL)

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(MENTAL DISORDERS, blood in, lipids (Rus))
(LIPIDS, in blood, in ment. disord (Rus))

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EXCERPTA MEDICA Sec 7 Vol 13/11 Pediatrics Nov 59

2944. THE IMPORTANCE OF THE ISOPOTIC METHOD OF DETERMINING THE ABILITY OF BLOOD SERUM PROTEINS TO FIX Fe^{59} IN HEALTHY CHILDREN AND IN THOSE WITH HYPOCHROMIC ANAEMIA (Russian text) - Zhilinskaya M.V. - PEDIATRIYA 1958, 9 (54-58) Tables 2

The ability of serum proteins to fix Fe was determined by the isotopic method in 20 healthy children and in 35 patients with hypochromic anaemia. The coefficient of the level correlation of easily isolated serum Fe (by Barkan's method) and the ability of serum proteins to fix Fe^{59} was a stable value in healthy children and equalled 2 points. The coefficient of correlation of the above mentioned indices in children with hypochromic anaemia proved higher in 30 patients (3-4 points) and lower in 5 children (less than one point).

Sci Res Pediatrics Inst
Min Health RSFSR.

ZHILINSKAYA, M. V.

USSR/Medicine - Infectious Diseases Mar/Apr 51

"Investigation of Dynamics of Cerebrospinal Liquid in Meningitis," M. V. Zhilinskaya, Clinic Infectious Diseases, First Moscow Order of Lenin Med Inst at Krasnosovet Hosp of Infectious Diseases

"Nevropatol i Psikhiat" Vol XX, No 2, pp 22-24

Early sharp break of protein curve in epidemic cerebrospinal meningitis indicates effectiveness of sulfa drug-penicillin therapy. Clinical observations confirm Koltypin and Vlasov's theory that protein curve of lumbar liquid indicates deg of immunity and permits forecast of outcome of disease.

186T79

USSR/Medicine - Infectious Diseases (Contd) Mar/Apr 51

According to Koltypin, curve of type 1 (ascending followed by sharp descent) indicates recovery; type 2 (gradual descent)--recovery; type 3 (ascent)--death; type 4 (wavy)--uncertain outcome. In epidemic cerebrospinal meningitis (meningococcus) type 2 was subdivided into 2 subtypes differing in slope; types 3 and 4 absent; there was new type (prolonged stable level followed by drop). In purulent meningitis (pneumococci, Pfeiffer bacilli, streptococci, staphylococci, and of unknown etiol) there were all 4 types.

186T79

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(ANEMIA, HYPOCHROMIC, in inf. & child.
vitamin B12 ther. in young child. (Rus))
(VITAMIN B12, ther. use
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77323
SOV/57-30-1-2/18

AUTHORS: Golant, V. Ye., Zhilinskiy, A. P.

TITLE: Propagation of Electromagnetic Waves in Waveguides Filled With Plasma

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1960, Vol 30, Nr 1, pp 16-24 (USSR)

ABSTRACT: Propagation of electromagnetic waves through waveguides filled with gaseous discharge plasma is ulilized in constructions of ultrahigh frequency commutation devices and in plasma investigations. One would like, therefore, to establish a relationship between the propagation constant of these electromagnetic waves and the complex conductivity of plasma. This problem in the cases of real plasma must take into account the varying conductivity of plasma in the waveguide due to varying concentrations of electrons in the plasma. In the present paper, the authors investigate wave propagation through a uniform waveguide filled with plasma homogeneous along the axis of the waveguide. Waveguide boundaries and plasma conductivity are then independent of the

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longitudinal waveguide coordinates. Method used is analogous to those used by Slater, and by Sul and Walker (see ref). The authors started from Maxwell's equations:

$$\left.\begin{aligned} \operatorname{rot} \mathbf{E}_t + \mu_0 \frac{\partial \mathbf{H}_t}{\partial t} = 0; \quad \operatorname{div} \mathbf{H}_t = 0; \\ \operatorname{rot} \mathbf{H}_t - \varepsilon_0 \frac{\partial \mathbf{E}_t}{\partial t} = \mathbf{i}_t; \quad \varepsilon_0 \operatorname{div} \mathbf{E}_t = \rho_t; \quad \mathbf{i}_t = \sigma \mathbf{E}_t. \end{aligned}\right\} \quad (1)$$

where $\mathbf{E}_t$ and $\mathbf{H}_t$ are strength of the electric and magnetic fields; $\mathbf{i}_t$ is current density; ρ_t = instantaneous value of the space charge density; σ is conductivity of the medium; ε_0 and μ_0 are dielectric and magnetic permeability. Using the usual boundary conditions on the infinitely conducting wall, splitting the fields into space and time components, the authors proceed to define transverse compponents of the field $\mathbf{E}_\perp$ and $\mathbf{H}_\perp$, and the longi-

tudinal components E_z and H_z. Introducing orthogonal transverse components E_k and H_k of the normal modes existing in the absence of plasma, one represents the transverse field by:

$$E_\perp = \sum_k a_k E_k;\ H_\perp = \sum_k b_k H_k. \tag{8}$$

The equations are obtained in the usual way as:

$$a_k(\gamma_k^2 - \gamma^2) = -\frac{\gamma}{P_k}\int_{(F)} \sigma E_\perp E_k dF + \frac{\gamma}{P_k}\int_{(F)} \sigma E_z E_{kz} dF \tag{14}$$

$$b_k(\gamma_k^2 - \gamma^2) = -\frac{\gamma}{P_k}\int_{(F)} \sigma E_\perp E_k dF + \frac{\gamma_k}{P_k}\int_{(F)} \sigma E_z E_{kz} dF. \tag{15}$$

Here, γ and γ_m are the wave propagation constants;

P_k is the normalization constant. E_z and the E_{kz}'s are related by means of the following equation:

$$E_z + \frac{\sigma}{j\omega\varepsilon_0} E_z = \sum_k b_k E_{kz}. \qquad (16)$$

where ω is the field frequency. To solve (14) and (15), the authors assume σ to be proportional to a small parameter, and expand the coefficients and the propagation constant according to:

$$a_k = \sum_s a_{k(s)};\ b_k = \sum_s b_{k(s)};\ \gamma = \sum_s \gamma_{(s)};\ \mathbf{E} = \sum_s \mathbf{E}_{(s)}, \qquad (17)$$

They use perturbation theory and calculate the $a_{k(s)}$'s to the first approximation and the $\gamma_{(s)}$'s to the second approximation. When a plasma is introduced,

the general complex propagation constant:

$$\gamma = \alpha + j\beta, \tag{26}$$

must now contain both real and complex parts, due to the complex specific conductivity:

$$\dot{\sigma} = \sigma_r + j\sigma_i \tag{28}$$

which causes a phase shift $\Delta\beta = \beta - \beta_0$ and damping in the waveguide. In the first approximation they are:

$$\Delta\beta_{(1)} = \beta_{(1)} = \frac{\omega\mu_0}{2\beta_0 C}\int_{(F)} \sigma_i E_0^2 dF; \tag{29}$$

$$\alpha_{(1)} = \frac{\omega\mu_0}{2\beta_0 C}\int_{(F)} \sigma_r E_0^2 dF; \tag{30}$$

and in the second:

$$\Delta\beta_{(2)} = \beta_{(2)} = \frac{1}{2\beta_0 C^2}\left\{\frac{\omega^2\mu_0^2}{4\beta_0^2}\left[\left(\int\limits_{(F)}\sigma_r E_0^2 dF\right)^2 - \left(\int\limits_{(F)}\sigma_i E_0^2 dF\right)^2\right] + \right.$$

$$+ \omega^2\mu_0^2 \sum_{k\neq 0}\frac{1}{\beta_0^2+\gamma_k^2}\left[\left(\int\limits_{(F)}\sigma_i E_0 E_k dF\right)^2 - \left(\int\limits_{(F)}\sigma_r E_0 E_k dF\right)^2\right] +$$

$$\left. + \frac{\mu_0}{\varepsilon_0}\sum_l \frac{\gamma_l^2}{\beta_0^2+\gamma_l^2}\left[\left(\int\limits_{(F)}\sigma_i E_0 E_l dF\right)^2 - \left(\int\limits_{(F)}\sigma_r E_0 E_l dF\right)^2\right]\right\}; \qquad (31)$$

$$\alpha_{(2)} = \frac{1}{\beta_0 C^2}\left\{-\frac{\omega^2\mu_0^2}{4\beta_0^2}\left(\int\limits_{(F)}\sigma_i E_0^2 dF\right)\left(\int\limits_{(F)}\sigma_r E_0^2 dF\right) + \right.$$

$$+ \omega^2\mu_0^2 \sum_{k\neq 0}\frac{1}{\beta_0^2+\gamma_k^2}\left(\int\limits_{(F)}\sigma_i E_0 E_k dF\right)\left(\int\limits_{(F)}\sigma_r E_0 E_k dF\right) -$$

$$\left. - \frac{\mu_0}{\varepsilon_0}\sum_l \frac{\gamma_l^2}{\beta_0^2+\gamma_l^2}\left[\left(\int\limits_{(F)}\sigma_r E_0 E_l dF\right)\left(\int\sigma_i E_0 E_l dF\right)\right]\right\}. \qquad (32)$$

where k now denotes TE waves and l the TH waves. The authors discuss the case when the frequency of electron collisions with neutron particles is much higher than collisions with ions. They also discuss the possibility that the plasma is conducted through the waveguide by means of dielectric tubes. One could try to develop relations for unperturbed fields in the waveguide with the tubing but without the plasma. However, this problem often does not allow exact solutions, and in the case of small tube thickness one can again analyze its contribution to the phase shift and damping by means of the perturbation theory. Finally, the authors calculated the cylindrically symmetrical case. The geometry of the problem is given in Fig. 1.

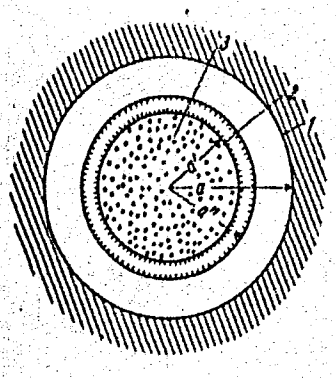

Fig. 1. Cross section of waveguide filled with plasma: (1) waveguide wall; (2) dielectric container; (3) plasma.

The authors assumed the fundamental unperturbed mode to be TE_{11} whose electrical field solutions are known to be:

$$E_{0r} = E_M \frac{I_1\left(1.84\frac{r}{a}\right)}{r} \sin\varphi; \quad E_{0\varphi} = E_M \frac{1.84 I_1'\left(1.84\frac{r}{a}\right)}{a} \cos\varphi \qquad (52)$$

where r and φ are radial and azimuthal coordinates, respectively; a = radius of the waveguide; I_1 = Bessel function of the first order. Its critical wavelength is:

$$\lambda_{0cr} = 3.412a. \qquad (53)$$

They performed calculations for the case of uniform filling of plasma:

$$n = \text{const for } r < a' \qquad (54)$$

and for the often encountered "diffuse" distribution of electrons over the cross section:

$$n = n_M I_0\left(2.405\frac{r}{a'}\right) \qquad (55)$$

where I_0 = Bessel function of the zero order; a' = inner radius of the discharge tube. Results are shown on Figs. 2-4. The authors calculated the phase shift and damping for the case of a plasma in which the frequency of electron collisions with gas atoms does not depend on their velocity. Components of the specific high frequency conductivity of plasma are then given by Brown relations:

Propagation of Electromagnetic Waves in Waveguides Filled With Plasma

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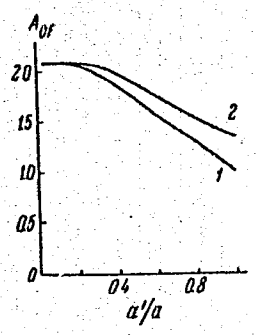

Fig. 2. (1) n = const; (2) $n = n_M I_0(2.405\ r/a')$.

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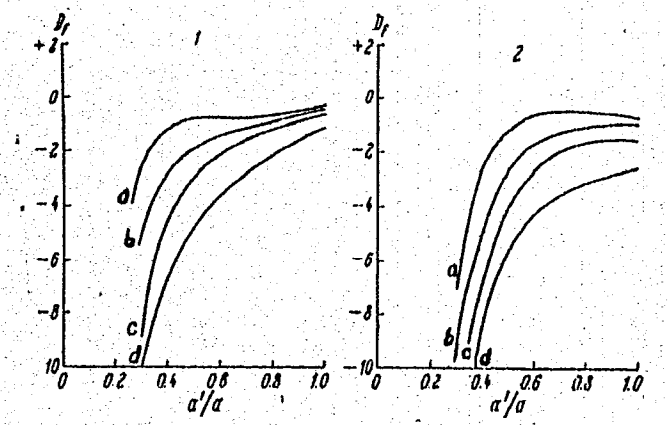

Fig. 3. (1) n = const; (2) $n = n_M I_o(2.405\ r/a')$.
(a) $a/\lambda = 0.58$; (b) $a/\lambda = 0.46$; (c) $a/\lambda = 0.39$;
(d) $a/\lambda = 0.33$.

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Propagation of Electromagnetic Waves in Waveguides Filled With Plasma

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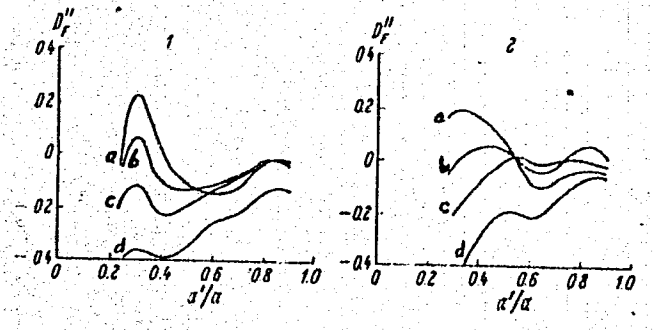

Fig. 4. (1) n = const; (2) $n = n_M I_o(2.405\ r/a')$. (a) $a/\lambda = 0.58$; (b) $a/\lambda = 0.46$; (c) $a/\lambda = 0.39$; (d) $a/\lambda = 0.33$; coefficient D_F'' calculated for $\frac{a''-a'}{a} = 0.1$.

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$$\sigma_i = -\varepsilon_0 \omega_n^2 \frac{\omega}{\omega^2 + \nu_{col}^2}; \quad \sigma_r = \varepsilon_0 \omega_n^2 \frac{\nu_{col}}{\nu_{col}^2 + \omega^2}, \tag{56}$$

where ν_{col} = electron-atom collision frequency,
ω_n = plasma frequency.

$$\omega_n^2 = \frac{ne^2}{\varepsilon_0 m}, \tag{57}$$

e and m = charge and mass of electron.

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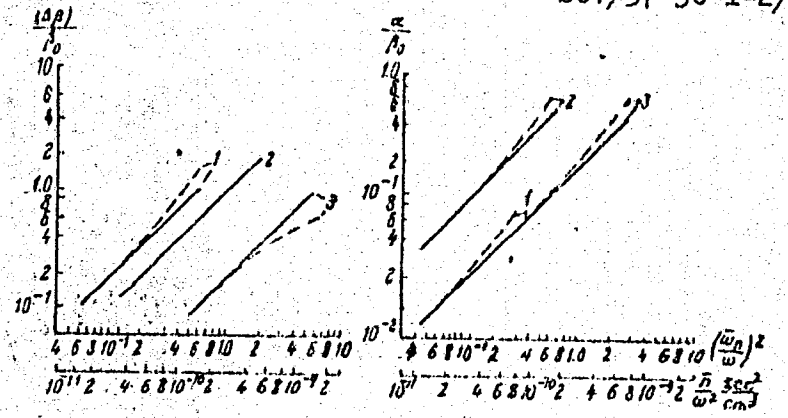

Fig. 5. Phase shift and damping versus electron concentration in the plasma $n = n_M I_o(2.405\ r/a')$; $a/\lambda = 0.39$; $a'/a = 0.7$; $\frac{a''}{a'} \frac{\varepsilon}{\varepsilon_o} < 0.1$. (1) $\frac{\nu_{col}}{\omega} = 0.1$; (2) $\frac{\nu_{col}}{\omega} = 1$; (3) $\frac{\nu_{col}}{\omega} = 10$; full lines are from first approximations; dashed lines contain second order approximation corrections.

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Curves in Fig. 5 enable one to determine the limits of applications of the first perturbation approximation for the case considered. L. N. Ivanovskiy helped during computations. There are 5 figures; and 5 references, 3 Soviet, 1 U.S., 1 U.K.or U.S. The U.S. and possible U.K. references are: J. Slater, Microwave Electronics, Sov. radio, M., 1951; G. Sul and L. Walker, Problems of Waveguide Propagations of Electromagnetic Waves in Cyrotropic Media, IL., M., 1955.

ASSOCIATION: Leningrad Politechnic Institute imeni M. I. Kalinin (Leningradskiy politekhnicheskiy institut imeni M. I. Kalinina)

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20663

9,1300 (also 1532)
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B104/B204

AUTHORS: Golant, V. Ye., Zhilinskiy, A. P., Krivosheyev, M. V., and Nekrutkina, G. P.

TITLE: Propagation of centimetric waves by a waveguide filled with the plasma of a positive column discharge

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 31, no. 1, 1961, 55-62

TEXT: The studies which are the subject of the present report were carried out with a plasma produced in helium and argon at pressures from 0.05 to 10 mm Hg. The phase constant and the damping of homogeneous waveguides filled with plasma were determined for 3-cm and 10-cm waves. For the 3-cm wave range, two experimental arrangements were used, while one was used for the 10-cm wave range. Fig. 1 shows schemes of these arrangements. The phase shift in the waveguide was measured with a phase bridge, and damping was determined by a substitution method. Results are given in Figs. 3, 4. In evaluating the experimental results, a comparison is made with the results of a theoretical investigation by Golant et al. (Ref. 11). The relations

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$$\left.\begin{aligned}\Delta\beta &= \frac{\lambda_w}{2\lambda}\zeta\frac{A_{oF}}{F}\sigma_{1i}\int ndF,\\ \Delta\alpha &= \frac{\sigma_{1r}}{\sigma_{1i}}\Delta\beta.\end{aligned}\right\} \quad (1)$$

were obtained in first perturbation-theoretical approximation for the damping and phase constants. λ_w and λ are the wavelengths in the waveguide and in the free space; $\zeta = \sqrt{\mu_o/\varepsilon_o}$ is the wave impedance of the free space; n is the electron concentration; F is the plasma cross section; A_{oF} is a form factor; σ_{1i} and σ_{1r} are the reactive and active components of the specific high-frequency conductance of the plasma per electron. The relations

$$\Delta\beta = \frac{\lambda_w}{\lambda}\cdot\frac{A_{oF}}{F}\cdot\frac{\sigma_{1i}}{\sigma_{1n}}\cdot\frac{I}{E_n} \quad (5)$$

$$\Delta\alpha/\Delta\beta = \sigma_{1r}/\sigma_{1i}$$

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are obtained, which establish a connection between the components of conductance and the discharge current. These relations permit the determination of $\Delta\beta$ and $\Delta\alpha$ if the electron distribution over the plasma cross section determined by the form factor A_{oF}, the longitudinal field in the positive column, and the components of conductance are known. A_{oF} was determined previously on the assumption of a diffuse electron distribution in the positive column. Furthermore, the relations

$$\frac{\sigma_{1i}}{\sigma_{1n}} = \frac{\omega/\nu}{1 + (\omega/\nu)^2} \quad \text{and} \quad \sigma_{1i}/\sigma_{1r} = \omega/\nu \qquad (6)$$

were substituted in formulas (5); σ_{1n} is the specific conductance in a constant field per electron. As follows from the comparisons shown in Figs. 3, 4, and 5, the deviation never attains more than 30%. The ratio $\Delta\beta/\Delta\alpha$ shows better agreement with experimental values. This is explained by the fact that this ratio is independent of the spatial electron distribution and the strength of the longitudinal field. There are 7 figures and 17 references:

Card 3/ 4

20663

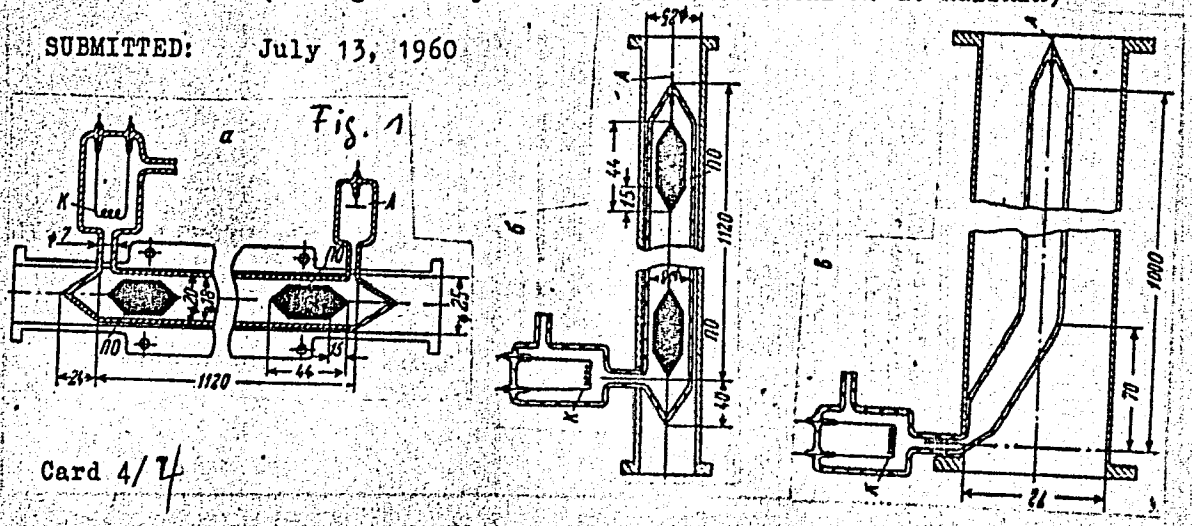
Propagation of centimetric waves ... S/057/61/031/001/008/017
B104/B204

8 Soviet-bloc and 8 non-Soviet-bloc.

ASSOCIATION: Leningradskiy politekhnicheskiy institut im. M. I. Kalinina
(Leningrad Polytechnic Institute imeni M. I. Kalinin)

SUBMITTED: July 13, 1960

Fig. 1



Card 4/4

20664

9,1300 (also 1532)
24.2120 (1049, 1482, 1502)

S/057/61/031/001/009/017
B104/B204

AUTHORS: Golant, V. Ye., Zhilinskiy, A. P., Krivosheyev, M. V., and Chernova, L. I.

TITLE: Propagation of centimetric waves in waveguides filled with the plasma of a positive column discharge. II

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 31, no. 1, 1961, 63-70

TEXT: In an earlier paper, the authors dealt with the results obtained by studying wave propagation in a waveguide filled with the plasma of a positive column discharge at low field strengths of the high-frequency field. With increasing field strength of the high-frequency field, the characteristics determining wave propagation in the waveguide begin to depend on this field strength. This dependence is examined with reference to papers (Ref. 2) in which the propagation of radiowaves in the ionosphere had been studied. In their theoretical considerations, the authors proceed from the assumption of the plasma being placed in a homogeneous field. Herefrom it follows on the basis of assumptions already made in older papers, and which obviously hold here, that the energy distribution of

Card 1/ 4

electrons is Maxwellian, and that the concentration distribution of electrons over the cross section and electron temperature do not change. The homogeneous longitudinal field, however, is changed by the presence of a high frequency field and the following concentration distribution of electrons takes place in the positive column:

$$\int ndF = I/\sigma_{1n}E'_{con} = I/\sigma_{1n}E_n\sqrt{1 - \frac{1}{2}\frac{\sigma_{1r}}{\sigma_{1n}}\frac{E^2_{hf}}{E^2_{con}}} \quad (5).$$

n is here the electron concentration, I the discharge current, E_{con} the field strength of the constant field, E_{hf} the amplitude of the high-frequency field, σ_{1n} the plasma conductivity in the constant field per electron, σ_{1r} the active component of high-frequency conductivity per electron. A similar expression is given for the increase of the discharge current produced by applying the high-frequency field. From these formulas it may be seen that the application of a homogeneous high-frequency field to a positive column discharge in steady-state conditions does not modify electron

temperature, but leads to a decrease of the longitudinal constant field and to an increase of the concentration of charged particles. The authors state that in first perturbation-theoretical approximation, the wave propagation constant changes proportional to the electron concentration, when a plasma is introduced into a waveguide. The changes in the phase constant $\Delta\beta^*$ and the damping constant $\Delta\alpha^*$ in the presence of a high-frequency field are determined in first perturbation-theoretical approximation by the relation

$$k = \Delta\alpha^*/\Delta\alpha = \Delta\beta^*/\Delta\beta \quad (7),$$

where $\Delta\alpha^*$ and $\Delta\beta^*$ were determined at a given high-frequency field strength, and $\Delta\alpha$ and $\Delta\beta$ at an infinitely low high-frequency field strength. The experimental determination of the dependence of the phase constant upon field strength was carried out by means of the facilities described in the previous paper (Ref. 1). The results obtained are graphically represented in Figs. 2-5. As may be seen, deviations between theoretical and experimental values for helium are below 15%, and for argon below 30%. The causes for these deviations are said to be

changes in the flux of force, inhomogeneities of the field, inexact determination of field longitudinal components, and of conductivities . Finally, the use of nonlinear effects for the stabilization of the power of super-high frequencies occurring in a waveguide filled with a plasma is discussed. Fig. 9 shows the scheme of such a stabilizer. This scheme represents a power divider made from three-decibel slit-bridges. The superhigh-frequency signal is divided between the input channels, and the ratio of the power-flows in the various output channels is determined from the phase difference between the waves passing through the upper and lower waveguides. If a waveguide contains a gas discharge- and phase shifter, a possibility offers itself in that power range in which nonlinear interaction effects of the plasma with the superhigh-frequency field occur, of stabilizing the power flow at the output of the power divider. There are 9 figures and 8 references: 6 Soviet-bloc.

ASSOCIATION: Leningradskiy politekhnicheskiy institut im. M. I. Kalinina
(Leningrad Polytechnic Institute imeni M. I. Kalinin)

SUBMITTED: July 13, 1960

S/057/62/032/001/017/018
B111/B102

26.1410

AUTHORS: Golant, V. Ye., and Zhilinskiy, A. P.

TITLE: Experimental study of the diffusion decomposition of a plasma in a magnetic field. II

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 32, no. 1, 1962, 127 - 129

TEXT: The authors measured the dependence of the diffusion rate in a helium plasma on pressure (0.02 - 0.8 mm Hg) and on the longitudinal magnetic field (up to 2400 oe). The measurements were made in pulsed operation (20 cps, pulse duration 1-2 μsec); in the intervals between the pulses the plasma electron concentration was measured by the waveguide method. The diffusion coefficients measured are in good agreement with a formula calculated in Ref.1 (V. Ye. Golant and A. P. Zhilinskiy, ZhTF, 30, 745, 1960). It is found that the transverse escape rate of charged particles in the magnetic field is considerably higher than the diffusion rate calculated from collisions between electrons and atoms. The plasma decomposition constant was found to depend practically linearly both on the magnetic field and on pressure. The orbital velocity of charged particles along the

Card 1/2

magnetic lines of force can be determined from bipolar diffusion. The plasma decomposition rate increases with decreasing effective longitudinal diffusion length:

$$\frac{1}{\tau} - \frac{1}{\tau_\infty} = \frac{D_\parallel \pi^2}{L^2} \; ; \quad D_\parallel = \frac{530}{p} \; \text{cm}^2/\text{sec}.$$

Hence the longitudinal escape rate corresponds to bipolar diffusion. There are 3 figures and 2 Soviet references.

ASSOCIATION: Leningradskiy politekhnicheskiy institut im. M. I. Kalinina (Leningrad Polytechnic Institute imeni. M. I. Kalinin)

SUBMITTED: July 4, 1961

GANICHEV, A.A. ; GOLANT, V.Ye.; ZHILINSKIY, A.P.; KHOTIMSKIY, B.Z.; SHILIN, V.N.

Diffusion of charged particles of a disintegrating plasma in a magnetic field. Zhur. tekh. fiz. 39 no.1:77-88 Ja '64. (MIRA 17:1)

1. Leningradskiy politekhnicheskiy institut imeni M.I.Kalinina.

ACCESSION NR: AP4009923 S/0057/64/034/001/0077/0088

AUTHOR: Ganichev,A.A.; Golant,V.Ye.; Zhilinskiy,A.P.; Khotimskiy,B.Z.; Shilin,V.N.

TITLE: Investigation of the diffusion of charged particles in a decaying plasma in a magnetic field

SOURCE: Zhurnal tekhnicheskoy fiziki, v.34, no.1, 1964, 77-88

TOPIC TAGS: plasma, plasma decay, diffusion, charged particle diffusion, diffusion in magnetic field, ambipolar diffusion, helium plasma, helium plasma decay, helium ion diffusion

ABSTRACT: Previous measurements (V.Ye.Golant and A.P.Zhilinskiy,ZhTF,32,127,1962) have shown an anomalously high rate of decay of plasma in a longitudinal magnetic field when the diameter of the discharge tube is small. In order to investigate this phenomenon, the decay of spectroscopically pure helium plasmas was observed in glass and quartz discharge tubes with diameters ranging from 0.4 to 6.6 cm. Longitudinal magnetic fields up to 6000 Oe were employed with the smaller discharge tubes, and fields as high as 1300 Oe were employed with the largest tube. The plasmas were formed by hot cathode pulse discharges in He at pressures from 0.05 to 1.5 mm Hg.

Card 1/3

ACC. NR: AP4009923

The decay was followed by observing the shift of the resonant frequency of a microwave resonant cavity surrounding part of the discharge tube. In some cases the change in the Q of the cavity was also followed in order to obtain information about electron collision rates. Wavelengths in the neighborhoods of 3 and 30 cm were employed. Transverse diffusion coefficients were calculated from the observed decay curves with the aid of suitable assumptions concerning the longitudinal diffusion. The transverse diffusion coefficients obtained for plasmas in discharge tubes with diameters of 4 cm or greater agreed well with theoretical values. Those for plasmas in smaller discharge tubes did not, the observed transverse diffusion coefficients being greater than the theoretical by a quantity that is roughly independent of the magnetic field. The following possible causes for this anomalous behavior are briefly discussed and rejected: impurities in the gas; enhanced electron temperatures; disturbance of the ambipolar diffusion mechanism by magnetic field inhomogeneities. The authors consider it most likely that an instability develops and gives rise to anomalous transverse diffusion. The excitation of oblique drift waves or ionic-acoustic waves, and the development of small scale flute instability are mentioned as possibilities. During the experiments it was noted that even a very small misalignment of the discharge tube with respect to the magnetic field would greatly increase the plasma decay rate. The diffusive decay of a plasma in a rec-

Card 2/3

ACC.NR: AP4009923

tangular discharge tube in an oblique magnetic field is treated theoretically. It is shown that when the angle between the discharge tube axis and the magnetic field lies between certain limits, the ambipolar diffusion mechanism is disturbed and the electrons diffuse primarily along the magnetic field while the ions diffuse mainly transversely to it. The relation between obliquity to the magnetic field and plasma decay rate calculated for a rectangular discharge tube accounts reasonably well for the effect observed with cylindrical tubes. "The authors express their deep gratitude to V.V.Bulanin, who participated in some of the experimental investigations. The authors are deeply grateful to O.P.Bochkova, in whose laboratory the spectrum analysis of the gas was conducted." Orig.art.has: 28 formulas, 8 figures and 2 tables.

ASSOCIATION: Leningradskiy politekhnicheskiy institut im.M.I.Kalinina (Leningrad Polytechnic Institute)

SUBMITTED: 09Jul63 DATE ACQ: 10Feb64 ENCL: 00

SUB CODE: PH NR REF SOV: 012 OTHER: 003

Card 3/3

GOLANT, V.Ye.; DANILOV, O.B.; ZHILINSKIY, A.P.

Plasma decomposition in a toroidal magnetic field. Zhur. tekh. fiz. 33 no.9:1043-1054 S '63. (MIRA 16:11)

1. Leningradskiy politekhnicheskiy institut imeni Kalinina.

GOLANT, V.Ye.; ZHILINSKIY, A.P.

Diffusion decay of a plasma in a magnetic field. Part 3. Zhur. tekh. fiz. 32 no.11:1313-1318 N '62. (MIRA 15:11)

1. Leningradskiy politekhnicheskiy institut imeni M.I.Kalinina.
(Plasma (Ionized gases)) (Magnetic fields)

ACC NR: AP5028318 JD/GG/AT SOURCE CODE: UR/0057/65/035/011/2034/2041

AUTHOR: Golant, V.Ye.; Zhilinskiy, A.P.; Liventseva, I.P.; Sakharov, I.Ye.

ORG: Leningrad Polytechnic Institute im. M.I.Kalinin (Leningradskiy politekhnicheskiy institut)

TITLE: Electromagnetic radiation from an electron beam traversing a plasma in a magnetic field

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 35, no. 11, 1965, 2034-2041

TOPIC TAGS: helium plasma, plasma beam interaction, plasma, plasma oscillation, plasma wave, cyclotron resonance, electron beam

ABSTRACT: The authors have investigated the microwave (3 cm wavelength) fields in and radiation from plasmas produced by 20 to 900 mA beams of 0.8 to 2 keV electrons traversing helium at pressures from 5×10^{-3} to 1×10^{-1} mm Hg in the presence of a 2kOe or weaker uniform longitudinal magnetic field. The plasmas were produced in a 5 cm diameter 40 cm long glass tube containing at one end an electron gun producing a 0.5 cm diameter beam. The electron gun was operated with 2 μsec pulses at a repetition rate of 50/sec. The radial distribution of the longitudinal microwave electric field was determined with the aid of a uhf probe consisting of a section of twinlead with 4 mm spacing, and the radiated microwaves were received with an open ended wave-

Card 1/2 UDC: 533.9

ACC NR: AP5028318

guide section located close to the discharge tube. The uhf signals were recorded with a superheterodyne receiver with a 2 Mc passband and a sensitivity of 5×10^{-12} W. One conductor of the uhf probe was employed also as a Langmuir probe to determine the plasma density. The discharge tube contained in the end opposite the electron gun an anode and a directly heated cathode, with the aid of which a gas discharge plasma could be produced. This plasma was employed to calibrate the Langmuir probe in the presence of the magnetic field and in some other auxiliary experiments. The plasma produced by the electron beam was found to extend far beyond the limits of the beam. The microwave field strength and radiation intensity were investigated as functions of the magnetic field strength, gas pressure, beam current, and electron energy, and the results are presented graphically and discussed. The intensity of the uhf radiation varied greatly with the conditions of operation, but such radiation was observed at magnetic field strengths an order of magnitude lower than that corresponding to the electron cyclotron resonance, and in some cases in the absence of a magnetic field. Further work will be required to elucidate the nature of the coupling between the longitudinal plasma oscillations and the transverse electromagnetic waves which makes the radiation possible. Orig. art. has: 9 figures. [15]

SUB CODE: ME, EM/ SUBM DATE: 18Feb65/ ORIG REF: 011/ OTH REF: 006/ ATD PRESS: 4143

BVK

Card 2/2

USSR /Chemical Technology. Chemical Products and Their Application I-31

Fermentation industry

Abs Jour: Referat Zhur - Khimiya, No 9, 1957, 32913

Author : Sobolev N.K., Zhilinskiy A. Yu.

Title : Experimental Viniculture at the Martynovskiy State Farm.

Orig Pub: Vinodeliye i vinogradarstvo SSSR, 1956, No 7, 19-22

Abstract: Experience with grape processing in 1955 has shown that it is possible to produce on the left banks of the Don high grade wines ranging from light ones, blending the delicate aroma of steppe land, to the heavy, ruby-red Tsimlyanskoye wines.

Card 1/1

BANDALETOV, S.; ZHILINSKIY, O.; KOLOTILIN, N.; LYAPICHEV, G.; MUKHAMED-ZHANOV, S.

Urgent problems in the further development of geological science in Kazakhstan. Vest. AN Kazakh. SSR 13 no.2:94-97 F '57. (Kazakhstan--Geological research) (MLRA 10:6)

ZHIKINSKIY, G. B.

Chemical Abst.
Vol. 48 No. 6
Mar. 25, 1954
Water, Sewage, and Sanitation

3
(2)

Subterranean waters of granite ranges of North Near-Balkhash region. G. B. Zhilinskii and S. M. Shapiro. *Vestnik Akad. Nauk Kazakh. S.S.R.* 10, No. 7 (Whole No. 100), 75–82(1953).—A general description is given of the climatic and geographic factors that affect the formation of subterranean waters of the region; a geol. map of the area is shown. G. M. Kowalapoff

10/12/54 MH

ZHILINSKIY, G. B.

USSR/Agriculture - Minerals

Card : 1/1 Pub. 123 - 7/19

Authors : Zhilinskiy, G. B., Cand. of Geological-Mineralogical Sciences

Title : Mineral raw materials resources for needs of agriculture

Periodical : Vest. An Kaz. SSR 12, 51 - 56, December 1953

Abstract : Resolution by the Central Committee of the Communist Party of the USSR to encourage better relationship between science and agriculture and to make full use of local mineral raw materials resources for the needs of Soviet agriculture.

Institution : Acad. of Sc. Kaz. SSR, Alma-Ata

Submitted : ...

ZHILINSKIY, G. B.

"Device for the Plotting of Vertical Stopes," Razvedka i Okhrana Nedr, No. 2, pp 54-56, 1954

SO: W-31429, 2 Sep 55

6

USSR/Geology - Minerals

Card 1/1 : Pub. 123 - 9/17

Authors : Zhilinskiy, G. B., Cand. in geological and mineralogical science

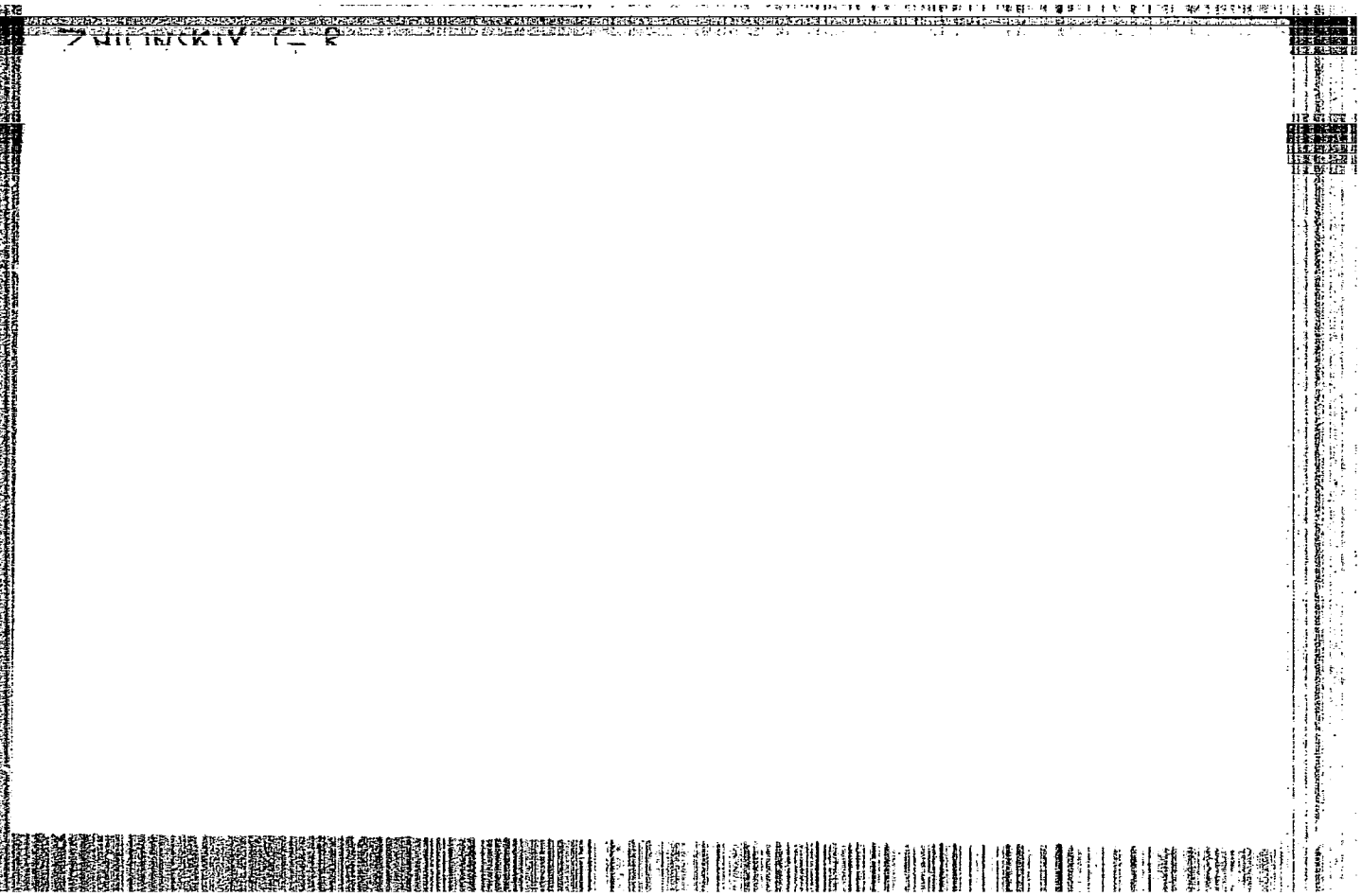
Title : About conditions of heavy mineral concentrations in an alluvium and the efficiency of research by the Schlich method

Periodical : Vest. AN Kaz. SSR 11/3 (108), 60-65, Mar 1954

Abstract : Conditions under which concentrations of heavy minerals take place in alluvial deposits are described. Suggestions for a greater efficiency of research, using the so-called Schlich method, are given. Diagrams.

Institution : .....

Submitted : .....

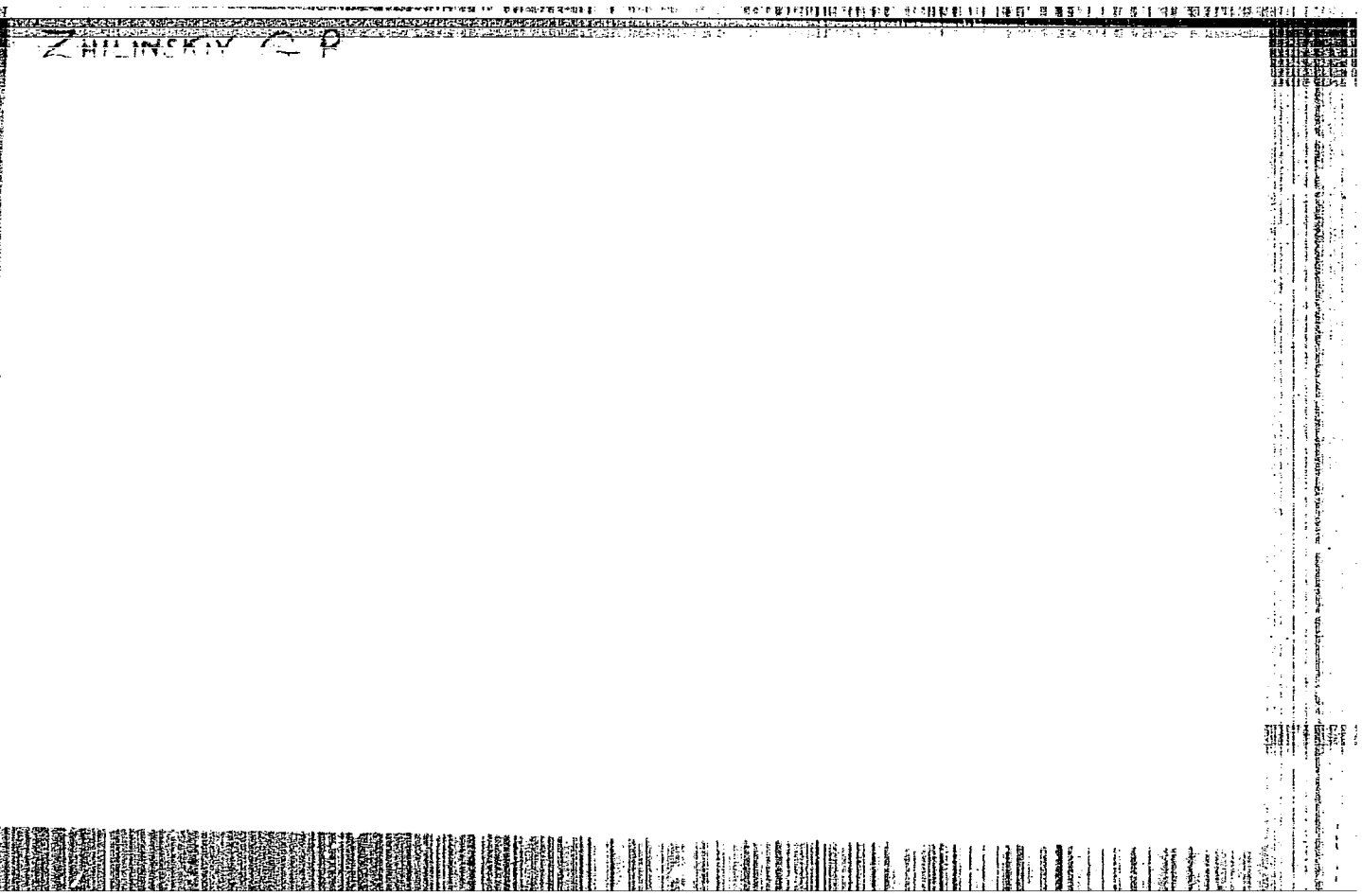


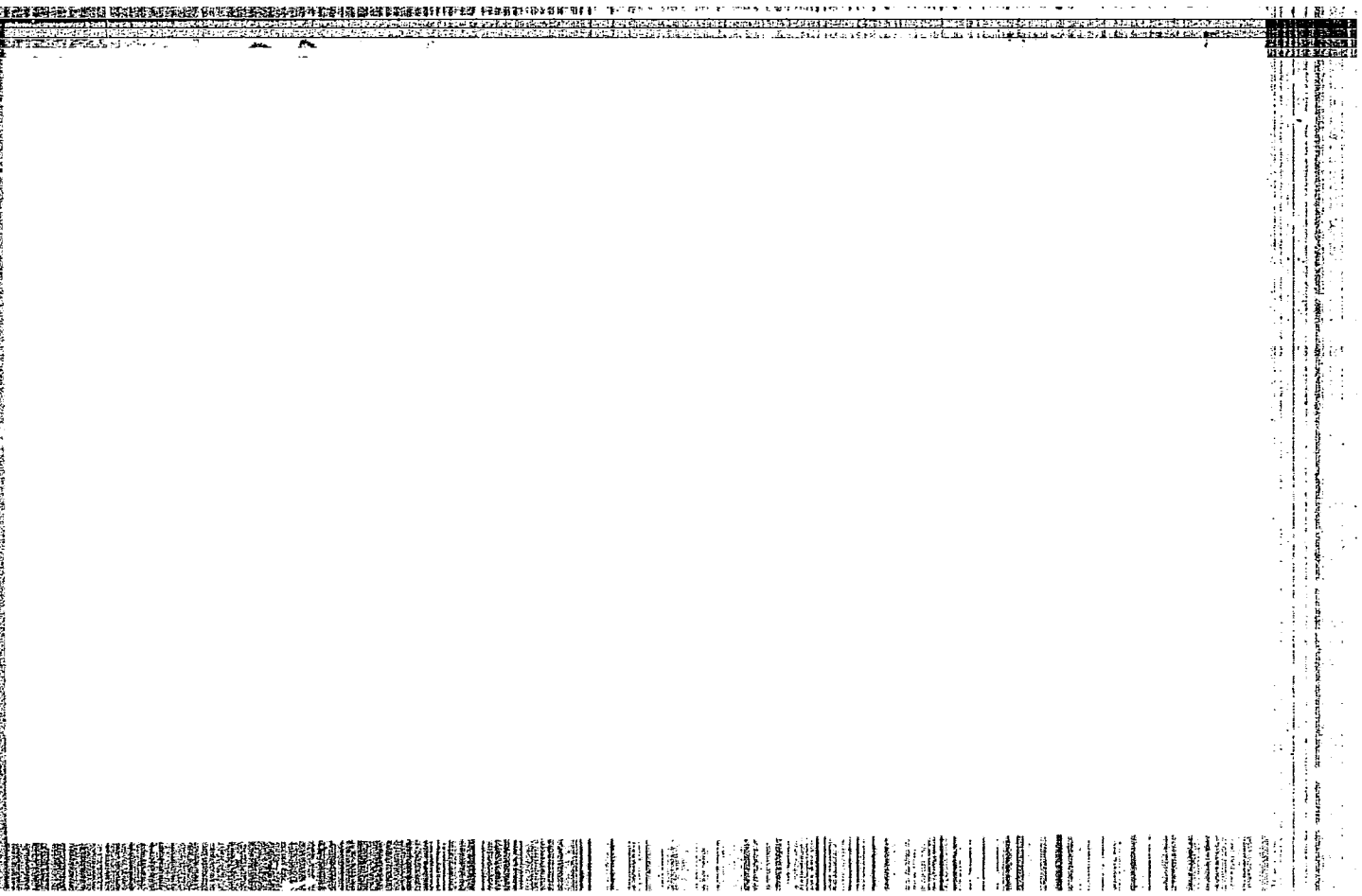
APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064810014-5"

"Role of Colloids in Endogenic Ore Formation"
Izv. AN Kazakh SSR, Ser. Geol., No 134, No 18, 10-155, 1954

The author describes the phenomena which can serve as proof of the participation of colloidal solutions in endogenic ore formation. He gives a brief survey of modern notions on the evolution of ore-forming solutions. He presents his conclusion concerning the complexity of theprocesses governing the formation of endogenic minerals by references to A. G. Betekhtin, S. S. Smirnov, F. V. Chukhrov, and Ye. A. Radkevich on the important role of colloidal state of endogenic ore-forming solutions. (RZhGeol, No 6, 1954)

SO: Sum. 492, 12 May 55





APPROVED FOR RELEASE: 07/19/2001 CIA-RDP86-00513R002064810014-5"

ZHILINSKIY, G.B.

Some genetic characteristics of tin ore occurrence in central Kazakhstan. Izv.AN Kazakh.SSR.Ser.geol. no.20:104-114 '55. (MLRA 9:8)

(Kazakhstan--Tin ores)

ZHILINSKIY, G.B.

Zonal distribution of alluvial deposits. Vest.AN Kazakh.SSR 12 no.2:77-81 F '56. (MLRA 9:6)

1.Predstavlena deystvitel'nym chlenom AN KazSSR I.I.Bok.
(Alluvium)

ZHILINSKIY, G.B.

Ancient alluvial deposits of central Kazakhstan. Razved.i okh. nedr 22 no.10:1-10 O '56. (MLRA 9:12)

1. Institut geologicheskikh nauk Akademii nauk Kazakhskoy SSR.
(Kazakhstan--Alluvium)

ZHILINSKIY, G.B.

General ore slimes maps. Izv.AN Kazakh.SSR.Ser.geol. no.22: 66-81 '56. (MLRA 9:8)

(Ore deposits)

ZHILINSKIY, G. B.

with S. K. Kalinin, E. Ye. Fayn, and I. G. Grinman "Spectroscopic Determination of Rare Earths in Minerals"

Transactions of the Inst. of Nuclear Physics, Kazakh SSR, Acad. Sci. Trudy, v. i., Alma-Ata, Izd-vo AN Kaz SSR, 1958,

This vol. contains results of research at the Inst. of Nuclear Physics for the years 1954-56.

ZINOV'YEVA, V.K.; ZHILKINA, M.I.; SHVEDOV, V.P.; YAKOVLEVA, G.V.

Method of extracting strontium from the soil and the determination of Sr^{90}. Radiokhimiia 1 no.5:613-615 '59. (MIRA 13:2)
(Strontium--Analysis)

ZHILINSKIY, G.B., dr. geologo-mineralogicheskikh nauk

Current problems of the metallogenetic science. Vest. AN Kazakh. SSR 21 no.5:9-12 My '65. (MIRA 18:7)

ZHILINSKIY, G.B., doktor geologo-mineralogicheskikh nauk, zasluzhennyy deyatel' nauki KazSSR, laureat Leninskoy premii, prof.

When the prognosis of the prospecting maps comes true. IUn. tekh. 7 no.8:19-22 Ag '63. (MIRA 16:10)

ZHILINSKIY, G.B.

Tin deposits in Indonesia. Izv.AN Kazakh.SSR. Ser.geol.nauk no.1: 17-35 '63. (MIRA 16:8)

1. Institut geologicheskikh nauk AN KazSSR, Alma-Ata.
(Indonesia—Tin ores)

S/081/62/000/005/014/112
B158/B110

AUTHOR: Zhilinskiy, G. B.

TITLE: Basic trends and some results in the development of geochemical studies in Kazakhstan

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 5, 1962, 118, abstract 5G6 (Sb. "Nauka Sov. Kazakhstana". Alma-Ata AN KazSSR, 1960, 60 - 74)

TEXT: This is a survey of the work on regional geochemistry, geochemistry of processes, geochemistry of rare and dispersed elements, the development of new geochemical methods for prospecting mineral deposits and determining absolute age. [Abstracter's note: Complete translation.]

Card 1/1

S/081/62/000/003/029/090
B150/B101

AUTHOR: Zhilinskiy, G. B.

TITLE: Some rules governing the distribution of germanium in iron ore deposits

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 3, 1962, 127, abstract 3G93 (Izv. AN KazSSR. Ser. geol., no. 2 (43), 1961, 70 - 77)

TEXT: By means of spectrum analysis a study is made of the distribution of Ge in deposits of sedimentary-metamorphic Fe-Mn formation (tabular data are not shown). For checking purposes about 100 chemical and microchemical determinations of Ge were made in different minerals, rocks, and ores. Complex Fe-Mn ores are referred to a powerful stratum of Upper Devonian and Lower Carboniferous sedimentary rocks. Mn ores in general play a secondary part. Brief details are given of the mineralogical composition and the genesis of the deposits studied. Curves are plotted reflecting the distribution of Ge in the ores assayed with a different content of Fe. Besides having the greatest concentration of Ge, the ore assays containing 40% and more of Fe also differ by a more uniform

Card 1/3

distribution of this element. Based on an analysis of the pure minerals - hematite, magnetite, siderite, braunite, psilomelane, galena, sphalerite, pyrite and arsenopyrite - it is established that the only minerals carrying Ge in the ores studied are magnetite (more) and hematite (less). In the assays of concentrated carbonaceous rocks no Ge was found. Correlative curves are submitted showing the interdependence of the distribution of Ge with the principal chemical components of the iron ores studied (Fe, Mn, S, P). A direct correlative dependence is observed between Fe and Ge, which is less clearly expressed in the hematite ores, but more so in the magnetite ores. The same dependence between the content of Ge and Fe is also established in the ferrous rocks. In the case of Mn and P there is inverse dependence. With a very small content of Ge and S in iron ores a clear direct dependence is observed between these elements. With an increase of concentration (> 0.30%) of Ge and S inverse dependence is revealed. The author comes to the conclusion that Ge in the iron ores studied is geochemically combined only with Fe and, possibly, is present in the form of germanates, which are near to the mineral stottite. On the basis that the hematites with the largest impregnation of Ge are of the earliest generation and the least impregnated hematites are of the latest,

the assumption is made of a partial redistribution of the primary concentration of Ge under the influence of the metamorphism of the ores.
[Abstracter's note: Complete translation.]

Card 3/3

ZHILINSKIY, G.B.

Some regularities in the distribution of germanium in iron.
Izv. AN Kazakh. SSR. Ser. geol. no.2:70-77 '61. (MIRA 14:7)
(Germanium) (Iron ores)

ZHILINSKIY, G.B., doktor geolog-mineralogicheskikh nauk;
SEYFULLIN, S. Sh., kand.geogol-mineralogicheskikh nauk

Relation between the amount of organic carbon and copper, lead, and zinc in Dzehzkazgan ores. Vest.AN Kazakh SSR 17 no.6:54-56 Je '61. (MIRA 14:6)

(Dzehzkagan--Ore deposits)
(Organic matter)

SATPAYEV, K.I.; BOK, I.I.; ZHILINSKIY, G.B.

Problems in the development of metallogeny. Sov. geol. 3 no. 9:45-56 S '60. (MIRA 13:11)

1. Akademiya nauk KazSSR.
(Ore deposits)

ZHILINSKIY, G.B., doktor geologo-mineralogicheskikh nauk

Metallogenic research by Kazakhstan geologists. Vest.AN Kazakh. SSR 16 no.10:22-27 O '60. (MIRA 13:10)
(Kazakhstan--Mineralogy)

SATPAYEV, K.I.; POLOSUKHIN, A.P.; BAISHEV, S.B.; CHOKIN, Sh.Ch.; BORUKAYEV, R.A.; AKHMEDSAFIN, U.M.; KUSHEV, G.L.; SHCHERBA, G.N.; MONICH, V.K.; MEDOYEV, G.TS.; LAVROV, V.V.; BARBOT-DE-MARNI, A.V.; GALITSKIY, V.V.; ZHILINSKIY, G.B.; KAYUPOV, A.K.; KAZANLI, D.N.; KOLOTILIN, N.F.; MUKHAMEDZHANOV, S.M.; SATPAYEVA, T.A.; VEYTS, B.I.; GAZIZOVA, K.S.; CHOLPANKULOV, T.Ch.; PARSHIN, A.V.; BYKOVA, M.S.; MITRYAYEVA, N.M.; VOLKOV, A.N.; CHAKABAYEV, S.Ye.; YARENSKAYA, M.A.; KHAYRUTDINOV, D.Kh.

On the 60th anniversary of the birth of I.I. Bok, Academician of the Academy of the Kazakh S.S.R. Vest.AN Kazakh.SSR 14 no.10:95-96 O '58. (MIRA 11:12)

(Bok, Ivan Ivanovich, 1898-)

BANDALETOV, S.M.; BESPALOV, V.F.; BOGATYREV, A.S.; BOK, I.I.; GALITSKIY, V.V.; ZHILINSKIY, G.B., IVSHIN, N.K.; KAZANLI, D.N.; KAYUPOV, A.K.; KONEV, A.K.; KUSHEV, G.L.; LYAPICHEV, G.F.; MEDOYEV, G.Ts.; MONICH, V.K.; MYAGKOV, V.M.; NIKITIN, I.F.; NOVOKHATSKIY, I.P.; SATPAYEV, K.I.; SHLYGIN, Ye.D.; SHCHERBA, G.N.

Eminent geologist of Kazakhstan. Vest. AN Kazakh.SSR 15 no.1: 94-95 Ja '59. (MIRA 12:1)
(Borukaev, Ramazan Aslanbekovich, 1899-)

ZHILINSKIY, G. B., Doc Geol-Min Sci -- (diss) "Stanniferousness of Central Kazakhstan (stanniferous formations and their places in the general metallogeny of the region)." Alma-Ata, 1957. 39 pp; 5 sheets of tables (Acad Sci Kazakh SSR, Inst Geol Sci), 150 copies. List of author's works, pp 38-39 (KL, 1-58, 115)

KALININ, S.K.; FAYN, E.Ye.; GRINMAN, I.G.; ZHILINSKIY, G.B.

Spectrographic determination of rare earths in minerals. Trudy Inst.iad.fiz.AN Kazakh.SSR 1:288-295 '58. (MIRA 12:2)
(Rare earths--Spectra)

15-57-1-940

Translation from: Referativnyy zhurnal, Geologiya, 1957, Nr 1, p 150 (USSR)

AUTHOR: Zhilinskiy, G. B.

TITLE: Reconnaissance Concentrate Maps (Obzornyye shlikhovyye karty)

PERIODICAL: Izv. AN KazSSR, ser. geol. 1956, Nr 22, pp 66-81.

ABSTRACT: There is a fundamental difference between primary (detailed) and reconnaissance concentrate maps. The technique of constructing a reconnaissance map has its peculiar features. The author describes in detail the construction of such maps, what they contain, the method of treating and recording the concentrate data on the maps, outlining concentrate aureoles, the segregation of promising areas, and the preparation of explanatory notes.

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ZHILINSKIY, German Borisovich -- awarded sci degree of Doc Geologo-Mineralogical Sci for the 14 Dec 57 defense of dissertation: "Tin resources of Central Kazakhstan (tin-bearing formations and their place in the general metals endowment [metallogeniy] of the region" at the Council, Inst of Geol Sci, AS, KaSSR; Prot No 17, 21 Jun 58.
(BMVO,12-58,20)

3(5) PHASE I BOOK EXPLOITATION SOV/2243

Zhilinskiy, German Borisovich

Olovonosnost' Tsentral'nogo Kazakhstana; olovonosnyye formatsii i ikh mesto v obshchey metallogenii regiona (Tin-bearing Possibilities of Central Kazakhstan; Tin-bearing Formations and Their Position in the General Regional Metallogeny) Alma-Ata, Izd-vo AN Kazakhskoy SSR, 1959. 209 p. Errata slip inserted. 1,000 copies printed.

Sponsoring Agency: Akademiya nauk Kazakhskoy SSR. Institut geologicheskikh nauk.

Resp. Ed.: N.G. Sergiyev, Corresponding Member of the Kazakh SSR Academy of Sciences, Professor; Ed.: L.S. Rzhondkovskaya; Tech. Ed.: Z.P. Rorokina.

PURPOSE: The book is intended for geologists and engineers engaged in tin exploration and mining.

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Tin-bearing Possibilities (Cont.) SOV/2243

COVERAGE: The book deals with the geology of tin-bearing formations in Central Kazakhstan. All deposits are described and evaluated as to the content of tin. Mineralogical peculiarities and petrochemical features of tin-bearing intrusions and a genetic classification of lode and alluvial tin deposits are provided. Admixtures of other elements in tin ores are treated to a considerable length. Both lode and placer formations, even if not of direct economic significance, are treated in detail. The metallogeny of such formations is discussed, including rock alteration, migration and mineralization processes. Genesis of all individual occurrences is analyzed and explained. A short history of discoveries is given in the introduction. The leading geologists are mentioned chronologically. The chronology is divided into two periods. Period I, extending from 1935 to 1942: A.V. Birin, P.A. Ostrovskiy, Ye. A. Flerov, M.N. Al'tgauzen, Yu. S. Vyazovoy, I.A. Grechukhin, S.P. Yershov, F.S. Kostyuk, D.M. Pavlenko, N.M. Salov, and L. Ye. Khazanovich. Period II, extending from 1948 to 1953: G.V. Tsaplin, M.Ts. Medoyev, V.G. Volobuyev, M.A. Zhukov, M.N. Grinval'd, A.N. Glushkov, S.M. Zharin, P.G. Nikitin, M.G. Popov, A.A. Rostorguyev, A.V. Stepanov, S. Sermagulov, M.A. Yurchenkov, V.M. Shul'ga, and

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Ye.A. Flerov. Most of the prospecting was carried out by the Sredazolovo Combine. The author thanks M.P. Rusakov and I.I. Bok, both of the Kazakh Academy of Sciences; N.G. Sergiyev and Ye.D. Shlygin, corresponding members of the Kazakh Academy of Sciences; G.N. Shcherba, V.V. Lavrov, and V.K. Monich, Doctors of Geological and Mineralogical Sciences; I.G. Magak'yan of the Armenian Academy of Sciences; Kh.M. Abdullayev of the Uzbek Academy of Sciences; Professor V.A. Sokolov; and Ye.A. Radkevich, V.S. Koptev-Dvornikov, Iv.F. Grigor'yev, A.D. Kalenov, and I.I. Chupilin, Doctors of Geological and Mineralogical Sciences. There are 193 references: 180 Soviet, 12 English and 1 French.

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Sixtieth birthday of Academician Kanysh Imantaevich Satpaev. Vest. AN Kazakh. SSR 15 no.4:58-61 Ap '59. (MIRA 12:7)
(Satpaev, Kanysh Imantaevich, 1899-)