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84375
S/106/60/000/006/008/013
A169/A026

The Long-Distance Tropospheric Propagation of Ultrashort Waves

the earth's surface, is of great practical importance, since it permits a determination of the mean signal levels of routes, whose terminal points are located in different geographic districts, by the value of ε_0 without that special measurements have to be made. The value of ε_0 can be easily determined from meteorological data. In some experiments, however, a correlation between the mean signal level and ε_0 was not found. Consequently, problems in predicting the mean signal levels in different geographic districts on the basis of meteorological data necessitate further research. Up to now, the effect of meteorological conditions on the signal level in long-distance tropospheric propagation of ultrashort waves has not yet been sufficiently studied. In the majority of cases, the passage of a front causes a decrease in the signal level, which can be explained by a greater perturbation of the troposphere. In some cases, however, the signal level increases during the passage of a front, caused by a reflection of waves at the border between cold and warm air layers. There are 13 figures and 3 references: 2 English and 1 Soviet.

SUBMITTED: March 3, 1960

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Kalinin, A.I.

82180
S/106/60/000/07/04/005

9,9000

AUTHOR: Kalinin, A.I.

TITLE: The Long-Distance Tropospheric Propagation of Ultrashort Waves (A Theoretical Discussion of Experimental Results)

PERIODICAL: Elektrosvyaz', 1960, No. 7, pp. 38 - 46

TEXT: The author presents a theoretical discussion of experimental data on the long-distance tropospheric propagation of ultrashort waves which he described in a previous paper (Elektrosvyaz', 1960, No. 6). The long-distance propagation of ultrashort waves is caused by nonuniformities of the troposphere, re-radiating the electromagnetic energy, a part of which will arrive in the area of reception. These nonuniformities are caused by the complicated structure of the troposphere, resulting from fluctuations of temperature, humidity and air pressure, as well as from the turbulent motion of the air and air layer formation. The turbulent motion of the air is caused by irregular heating and uneveness of the earth's surface. The theory of turbulency was developed by the Soviet scientists A.N. Kolmogorov and A.M. Obukhov. The layer formation in the troposphere is caused by gravitational forces and by the different density of the air at different altitudes. These layer formations are more stable and have

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The Long-Distance Tropospheric Propagation of Ultrashort Waves (A Theoretical Discussion of Experimental Results)

larger horizontal dimensions than the turbulent air masses. The dielectric constant of the air fluctuates within certain ranges and at irregular intervals, depending upon the structure of the troposphere and the state of the air. The irregular decrease of the dielectric constant with increasing altitude was established by measurements with aircraft refractometers. The layer formation limits the turbulent motion of the tropospheric air, but in turn, the air turbulency causes a perturbation of the air layer formation. Presently, numerous papers are available, in which attempts were made to give a theoretical explanation of experimental data on tropospheric long-distance propagation of ultrashort waves. These theories can be divided into a coherent and into an incoherent class. A detailed discussion of these theories is not given. The experimental results obtained on the tropospheric long-distance propagation of ultrashort waves are discussed from the viewpoints of the aforementioned classes of theories, especially: 1) the dependence of the mean signal level on the distance and the antenna height; 2) the connection between the mean signal level and the value of the dielectric constant of the air on the ground and with a vertical gradient, including seasonal changes of the signal level; 3) the dependence of the signal level on the wavelength; 4) the effect of the type of

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The Long-Distance Tropospheric Propagation of Ultrashort Waves (A Theoretical Discussion of Experimental Results)

radio wave polarization; 5) the widening of the directivity pattern of antennas and the phenomena of antenna gain loss. The available experimental results on the long-distance propagation of ultrashort waves and the operation of the first radio relay lines based on this phenomenon lead to the conclusion that such communication lines can be established on a larger scale. However, a sufficiently complete theory, quantitatively describing all regularities established by experimental investigations, has not yet been found. So far, not even an agreement of opinions has been obtained on the mechanism of such a long-distance propagation. There are 8 diagrams.

SUBMITTED: April 2, 1960

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"APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8

S/108/60/015/06/01/006
B007/B014

AUTHOR: Kalinin, A. I., Member of the Society (/NURIE)

TITLE: Statistical Distribution of the Fading Depth at the Intervals of Radio Relay Lines

PERIODICAL: Radiotekhnika, 1960, Vol. 15, No. 6, pp. 3-9

TEXT: In a preceding paper (Ref. 1) the author gave a graphic-analytical method for the drawing of integral curves of the fading-depth distribution and an analytical formula for the stability curves corresponding to operations within the limits of the first interference leaf. In the article under review, the author derives a general formula for the integral curves of the fading-depth distribution and the limiting formulas for these curves. As in Ref. 1, it is assumed that the fading is caused by interference of the direct wave and by the wave reflected from the earth's surface. The non-linear dependence of the dielectric constant ε of the air upon the height and the non-homogeneity of ε in the horizontal direction are taken into account by introducing the effective vertical

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gradient of ε of the air which was obtained from radiotechnical measurements (Ref. 2). In Ref. 3 the author showed that the field-attenuation factor of a free space V is expressed by two parameters, p(g) and μ. These parameters are determined from formulas (1) - (2) and/or (5). At $p(g) < 1$, formula (8) holds for the relation between V and p(g), whereas formula (9) holds for $p(g) > 1$. Next, formula (23) is derived for the period T(V) within which the attenuation factor is smaller than V. The total time T(V) is composed of $T_o(V)$ and $T_n(V)$. The former is the time in which the attenuation factor is smaller than V because the point of reception is in the zone $p(g) < 1$. $T_n(V)$ is the time in which the attenuation factor is smaller than V because the point of reception is near the interference minima ($p(g) > 1$). Formula (26) is derived for $T_n(V)$; the value of $T_n(V)$ determined from this formula is substituted into formula (23), and formula (30) is obtained. When m is great (number of the interference maximum), $T_o(V)$ in formula (30) is negligible, and one obtains formula (32). Assuming that $|\Phi_n| = 1$, one obtains formula (33): $T(V) = f(A, m)V$. $|\Phi_n|$ is the modulus of the reflection coefficient for

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the n-th minimum. $|\Phi|$ is the modulus of the coefficient of reflection from the earth's surface. The limits of the series f(A, m) are then determined. Fig. 2 gives a diagram for the determination of the function f(A, m). Stability curves for lines of 40, 60, and 80 km and waves of 8 and 16 cm are shown in Figs. 3-6. These curves were drawn on the assumption that the earth is a perfect sphere. It is shown that with sufficiently long lines and small wavelengths the actual stability curves will be found between the two curves described by formulas (40) and (41). There are 6 figures and 5 Soviet references.

SUBMITTED: May 25, 1959

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S/109/61/006/005/004/027
D201/D303

6,4200

AUTHOR: Kalinin, A.I.

TITLE: Influence of earth in the long-distance tropospheric propagation of ultrashort waves

PERIODICAL: Radiotekhnika i elektronika, v. 6, no. 5, 1961, 723 - 727

TEXT: In his previous work (Ref. 1: Kogerentnaya Teoriya dal'nego troposfernogo rasprostraneniya ul'trakorotkikh voln, Elektrosvyaz' 1959, 6, 41) the author showed that the experimentally determined mechanism of the tropospheric propagation of ultrashort waves may be explained by the waves being reflected from the upper half space according to an exponential dependence of the specific inductive capacitance of air ε on the height h above the earth's surface. In the present article the author solves the problem of determining the mean value of the field intensity in tropospheric propagation of USW, based on the hypothesis of a coherent reflection from the

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stratified inhomogeneities of the troposphere, on the exponential dependence of specific inductive capacitance of the air on the height and taking into account the diffraction around the earth's surface. The problem is solved by assuming the vertical antenna to be at the surface of an ideally conducting earth. The solution is further based on results given by V.A. Fok (Ref. 4: Diffraktsiya radiovoln vokrug zemnoy poverkhnosti (Diffraction of Radio Waves around the Earth's Surface) Izd. AN SSSR, 1946) who for a vertical radiator placed at the surface of an ideally conducting earth and for $y \gg 1$ (y - height h in dimensionless units) obtained the following expression for the attenuation function

$$U(y) = \sqrt[4]{\frac{x^3}{4y}} \exp\left(i \frac{2}{3} y^{3/2}\right) V_1(z), \qquad (6)$$

where x - distance in dimensionless units: $x = \frac{R}{R_0}$, R_0 - the 'standard' distance

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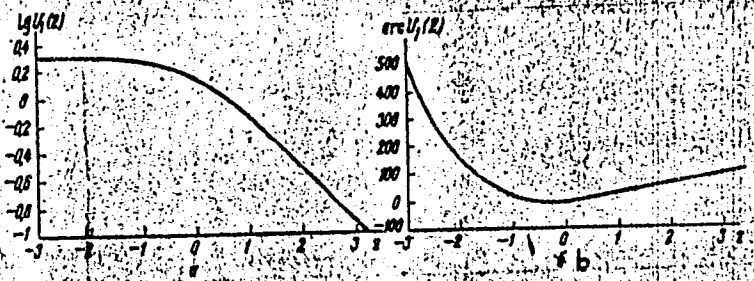
$$R_0 = \sqrt[3]{\frac{a_e^2 \lambda}{\pi}}, \quad (8)$$

$$z = \frac{x}{2} - \sqrt{y}. \quad (9)$$

(where λ is the wavelength and a_e - the equivalent radius of the earth) and $V_1(z)$ - the attenuation function of a plane wave, the graphs of which are given in Fig. 2a, b,

Fig. 2a, b.



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Influence of earth in ...

as taken from the work by P.A. Azrilyant, and M.G. Belkina (Ref. 5: Chislennye rezul'taty teorii diffraktsii radiovoln vokrug zemnoy poverkhnosti (Numerical Results of the Theory of Diffraction of Radiowaves around the Earth's Surface) Izd. Sovetskoye Radio, 1957). Taking again the results obtained by V.A. Fok (Ref. 4: Op.cit.) for large values of z, $V_1(z)$ becomes eventually after several mathematical transformations and in good approximation

$$|V| = 2{,}24\frac{1}{2\pi}\frac{a^2\lambda g}{R^3}\exp\left(\frac{R^3 g}{8a_e\Delta\varepsilon_0}\right). \qquad (27)$$

where g is the value of the gradient of the inductive capacitance of air near the earth's surface. The value of the modulus of the attenuation factor in Eq. (27) differs from the corresponding value of /V/ in the previous work by the author only by a constant factor 2.24. If for the given case the transition region between the two semi-spaces be ideally short, the above factor should have been 4. It follows that the spread in the transition region produces a

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24460

9,9300 (1344)

S/109/61/006/006/001/016
D204/D303

AUTHORS: Armand, N.A., Vvedenskiy, B.A., Kalinin, A.I., Kolosov, M.A., Sokolov, A.V., Shabel'nikov, A.V., and Shirey, R.A.

TITLE: A survey of work on the tropospheric propagation of ultrashort radiowaves

PERIODICAL: Radiotekhnika i elektronika, v. 6, no. 6, 1961, 867 - 885

TEXT: The large body of experimental work done in this field has been aided by the perfecting of apparatus and auxiliary instruments and given impetus by the need for more knowledge to assist the development of telephony, television and radio communications. The authors examine the following: 1) Relations between field strength and distance; 2) Signal level and frequency: the theoretical picture is confused, state the authors, but most experimental work suggests that P_r/P_o (P_r - received power, P_o - value in

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A survey of work on the ... S/109/61/006/006/001/016
D204/D303

free space) declines as the frequency rises. No uniform value of $P_r(\lambda)$ has been found as yet, probably because of the changeability of the tropospheric structure and meteorological conditions; 3) Signal and time: Signal fading may be rapid or slow. Most information concerns 300 - 500 km traces. Slow fading is caused by the appearance or disappearance of inversion layers, large irregularities and changes in the value of $d\varepsilon/dh$. Usually the signal strength is greater in the evening and at night, clearer in summer than in winter and at shorter (100-150 km) rather than longer (400 - 500 km) distances. The amplitude is related to frequency; also, as it combines with slow fading, the average amount of fading increases reaching, according to some sources, a maximum at 100-130 km. Others maintain that it declines with increase in distance to an equal summer and winter value of 3 - 10 db at 900 km; 4) Loss of antennae amplification: The phenomenon occurs beyond the horizon and means that for an antenna with an amplification coefficient G, exceeding 35-40 db, amplification is less than in free space. To account for this there are two hypotheses: (1) Spreading of radio-

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A survey of work on the ...

waves in a statistically non-homogeneous medium leads to distortion of the wave front in the plane of the receiving antenna and thus the energy absorbed is less than in the absence of amplitude and phase fluctuation, (2) elementary waves with various random angles of approach may reach the receiving antenna. These hypotheses have been investigated but comparison of results is hampered by differences in experimental conditions. For a 300 km trace the amplification loss increases with increase in the average amplification of receiving and transmitting antennae and with an increase of D to 300 - 500 km and f = 2290 megacycles. At greater distances the loss falls; 5) Signal distortion: Work in this field either treats the troposphere as an ideal quadruple network or aims to determine the amplitude correlation of the signal components on different frequencies in the transmitted spectrum. If with antennae with low directivity the amplitude of delayed waves is diminished by diffraction weakening of the earth's surface and the "directivity" of the troposphere, then at antennae with narrow patterns the amplitude of these waves decreases because of the di-

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A survey of work on the ...

rectivity of the antenna. The maximum transmitted frequency band depends on the width of the directivity pattern of the antenna. The random nature of the tropospheric radiation means that signal distortion has a random pattern as experiments in the USSR have confirmed. Two separated antennae in space diminish distortion and guarantee a large carrying capacity of tropospheric radio links; 6) Radio-meteorological research: Refractometric measurements have dealt with the structure of the troposphere and, in particular, the value of $\varepsilon(h)$, $(\Delta\varepsilon)^2$ and the area of turbulence

$$l\sqrt{(\Delta\varepsilon)^2}$$

usually varies within the range 0.3 - 3N units and irregular layers are usually 1 - 300 m thick. "Jump" intensity in these regions is usually 2 - 50 or 60 N units, large especially in the "invisible clouds". It was stated that at a height h = 3000 m and more $(\Delta\varepsilon)^2/l$ is too small to explain distant fields and its alteration with height does not give the necessary value of $P_r(D)$. The authors

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then deal with incoherent scatter and globular irregularities: In the last few years much attention has been devoted to the conception of incoherent scatter. Two chief theories have been established: One which gives for the frequency subordinate of P_r/P_o, a coefficient of $\lambda^{-4/3}$, and the theory of "disturbance of the gradient", which gives λ. The second approaches more closely to the experimental facts, and is generally preferred. Maxwell's equations for statistically non-homogeneous layers above a spherical earth have not yet been resolved and a solution must combine the theory of diffraction spread with pereoptical theory. All theories, in essence, approach those of a "radar form type"

$$\frac{P_r}{P_o} = QD^2 \int_V \frac{\sigma(\theta)}{R_1^2 \, R_2^2} \, dV, \qquad (1)$$

where Q is a constant factor; $\sigma(\theta)$ - "scatter area" - a junction for the influence of fluctuation ϵ and its relation to λ and the

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gradient $d\varepsilon/dh$; with this formula theory discrepancy concerns basically the value of σ. σ, moreover, can be expressed simply as

$$\sigma(\theta) = \frac{b}{\sin^{\frac{m}{2}}(\theta)},$$

where θ - radiation angle, equal to the angular distance between transmitter and receiver; b - expression giving ratios of 1, $d\varepsilon/dh$ and others to $(\Delta\varepsilon)^2$. For whole even numbers $m > 2$ this accords well with a general formula and is integrated with formula 2 to give

$$\frac{P_r}{P_o} = Q\ b\ A_m\ D^{-m+3}, \qquad (2)$$

where A_m depends on m. If $b \simeq h^{-n}$, then $D^{-m+3-2n}$ replaces D^{-m+3}; m can be substituted by nearest even whole number, in cases of close approximation. Current theories give results approximate to

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A survey of work on the ...

was obtained, where Φ is a complicated function, analogous to the high factors of classical diffraction theory, containing frequency responses and "jump" ratios $[d\varepsilon/dh]_0$, α - another function of type $A - B \ln \lambda$ related to parameters, whose size A and B does not depend on λ. Though not strictly accurately descriptive of the fluctuation character of the field the equation gives the necessary experimental ratio $P_r(D)$. There are 9 figures and 119 references: 24 Soviet-bloc and 97 non-Soviet-bloc. The four most recent references to the English-language publications read as follows: Radio transmission by ionospheric and tropospheric scatter, Proc. I.R.E., 1960, 48, 1, 112; I.H. Vogelman, I.L. Ryerson, M.H. Bickelhaupt, Proc. I.R.E., 1959, 47, 5, 688; L.A. Ames, E.T. Martin, E.J. Rogers, Proc. I.R.E., 1959, 47, 5, 769.

SUBMITTED: July 27, 1960

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"APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8

ACCESSION NR: AP4042500 S/0106/64/000/007/0001/0012

AUTHOR: Kalinin, A. I.; Troitskiy, V. N.; Shur, A. A.

TITLE: Statistical characteristic of a signal during long-range propagation of ultrashort waves

SOURCE: Elektrosvyaz', no. 7, 1964, 1-12

TOPIC TAGS: tropospheric wave attenuation, slow signal fading, signal statistical characteristic, wide band transmission, spacial correlation radius, frequency correlation radius, fading statistical distribution

ABSTRACT: The results are presented of an investigation of long-range tropospheric propagation. Measurements were made at 30—40-cm wavelengths along routes 159, 303, 448, 630, and 730 km in length and at 8—9-cm wavelengths along routes 85, 205, and 303 km in length. Receiver-transmitter equipment and antennas used made it possible to measure the attenuation factor V = -118 db for the 30—40-cm wavelength along the 730 km route and V = -106 db for the 8 to 9-cm wavelength along the 303 km route. The error of measuring signal-level values did not exceed ±1.5 db. According to the experiments,

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ARMAND, N.A.; VVEDENSKIY, B.A.; GUSYATINSKIY, I.A.; IGOSHEV, I.P.; KAZAKOV, L.Ya.; KALININ, A.I.; KOLOSOV, M.A.; LEVSHIN, I.P.; LOMAKIN, A.N.; NAZAROVA, L.G.; NEMIROVSKIY, A.S.; PROSIN, A.V.; RYSKIN, E.Ya.; SOKOLOV, A.V.; TARASOV, V.A.; TRASHKOV, P.S.; TIKHOMIROV, Yu.A.; TROITSKIY, V.N.; FEDOROVA, L.V.; CHERNYY, F.B.; SHABEL'NIKOV, A.V.; SHIREY, R.A.; SHIFRIN, Ya.S.; SHUR, A.A.; YAKOVLEV, O.I.; ARENBERG, N.Ya., red.

[Long-distance tropospheric propagation of ultrashort radio waves] Dal'nee troposfernoe rasprostranenie ul'trakorotkikh radiovoln. Moskva, Sovetskoe radio, 1965. 414 p. (MIRA 18:9)

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L 4706?-65 EWT(1)/EWA(h) Pf-4/Peb

ACCESSION NR: AP5010381 UR/0108/65/020/004/0045/0049

AUTHOR: Kalinin, A. I. (Active member); Matyushin, A. T. (Active member)

TITLE: Some possibilities of compound correction of the amplitude-frequency characteristic of an amplifier

SOURCE: Radiotekhnika, v. 20, no. 4, 1965, 45-49

TOPIC TAGS: amplifier, electron tube amplifier, rf amplifier, amplitude frequency characteristic, amplitude correction

ABSTRACT: As an autotransformer-type 4th and 5th order correction circuit based on the "smooth approximation" method suggested by F. A. Müller (PIRE, v. 42, no. 3, 1954) is difficult to materialize (because of the high coupling coefficient required), this article proposes the "Chebyshev approximation" which ensures a maximum frequency band. The general solution of the Chebyshev equation being too difficult to achieve, a particular problem is solved by

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ACCESSION NR: AP5010381

determining the coefficients in the equation for the frequency-distortion modulus by a trial-and-error method. In preliminary experiments, with a 4th order correction, a frequency band of 100 Mc was obtained (gain, 40 db; irregularity, ±1 db) which amounted to about 90% of the theoretical limit. It is believed that, with a permissible irregularity of 1.5 db, the full theoretically possible frequency band can be materialized; with an irregularity of 1 db, the band is narrower but is still 30--40% wider than that obtainable from the "smooth approximation" method. Orig. art. has: 6 figures and 11 formulas.

ASSOCIATION: Nauchno-tekhnicheskoye obshchestvo radiotekhniki i elektrosvyazi (Scientific and Technical Society of Radio Engineering and Electrocommunications)

SUBMITTED: 21Mar63 ENCL: 00 SUB CODE: EC

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L 19371-66 EWT(m) DIAAP GS/RM

ACCESSION NR: AT5013654

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543.53 + 66.074.7:546.284

AUTHOR: Kalinin, A. I.; Kuznetsov, R. A.; Moiseyev, V. V.

10 B+1

TITLE: Radioactivation analysis of silicon dioxide by means of ion exchange chromatography. Part 4. Separation of elements on an anion exchanger from solution of hydrofluoric acid and a mixture of hydrofluoric and hydrochloric acid

SOURCE: AN SSSR. Otdeleniye obshchey i tekhnicheskoy khimii. Radiokhimicheskiye metody opredeleniya mikroelementov (Radiochemical methods for determining trace elements); sbornik statey. Moscow, Izd-vo Nauka, 1965, 176-179

TOPIC TAGS: column chromatography, anion exchange resin, radioactivation analysis, silica analysis, halide separation

ABSTRACT: The salts of arsenic, phosphorus, tungsten, antimony, molybdenum, tin, and tantalum are characterized by a complex chromatographic behavior due to their tendency to hydrolyze and to the existence of these ions in several stable oxidation states. In order to minimize the hydrolysis, solutions of HF and HF-HCl mixtures were used for the ion-exchange separation on the AV-17 resin (see Figs. 1 and 2 of the Enclosure). The procedure employed is described. To determine the extent of separation of the elements, radioactive

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ACCESSION NR: AT5013654

tracers in artificial mixtures were employed. A complete separation was achieved if the activity of the separated fractions did not exceed 10^5 counts per min. The time required for the separation of P, As, W, Sb, Sn, Mo, and Ta was 1.5 to 2 hours. Orig. art. has: 2 figures and 1 table.

ASSOCIATION: None

SUBMITTED: 07Apr64 ENCL: 02 SUB CODE: IC, GC

NO REF SOV: 002 OTHER: 003

Card 2/4

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ACCESSION NR: AT5013654 ENCL: 01

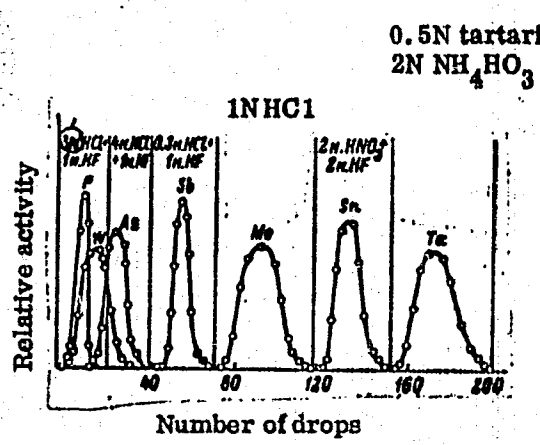

Fig. 1. - Separation of antimony, molybdenum, tin, and tantalum on an anion exchanger in Cl^- form (AV-17 resin, column diameter 2 mm, height of resin layer, 60 mm).

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L 19371-66

ACCESSION NR: AT5013654

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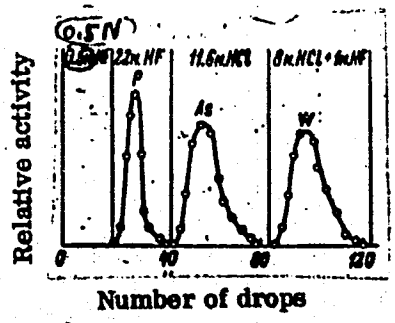

Fig. 2. - Separation of phosphorus, arsenic, and tungsten on an anion exchanger in F^- form (resin AV-17, column diameter 2mm, height of resin layer 60 mm).

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L 19352-66 EWT(m)/ETC(f)/EWG(m)/EWP(t) IJP(c) DS/JD/JG/GS/RM

ACCESSION NR: AT5013655 UR/0000/65/000/000/0180/0181
543.53 + 66.074.7:546.284

AUTHOR: Kalinin, A. I.; Kuznetsov, R. A.; Moiseyev, V. V.; Sokolova, M. N.

TITLE: Radioactivation analysis of silicon dioxide by means of ion-exchange chromatography. Part 5. Separation and determination of alkaline earth metals

SOURCE: AN SSSR. Otdeleniye obshchey i tekhnicheskoy khimii. Radiokhimicheskiye metody opredeleniya mikroelementov (Radiochemical methods for determining trace elements); sbornik statey. Moscow, Izd-vo Nauka, 1965, 180-181

TOPIC TAGS: column chromatography, cation exchange resin, alkaline earth metal, radioactivation analysis, neutron bombardment, silica analysis, calcium sepraration, strontium separation, barium separation

ABSTRACT: A chromatographic method was used to separate calcium, strontium, and barium isolated from samples of silica bombarded with neutrons. The procedure involved the successive elution of the elements adsorbed on a KU-2 cation exchanger (in the NH_4^+ form) with solutions of trilon B of various pH values. The elution curves are shown in Fig. 1 of the Enclosure. The degree of separation was checked on artificial mixtures containing radioactive tracers. A practically complete separation of Ca, Sr, and Ba and

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their separation from a large amount of sodium was achieved. The sensitivity of the radioactivation determination of Ca, Sr, and Ba (involving the use of an end-window counter) is: 10^{-7} g for Ca, 9×10^{-8} g for Sr, and 2×10^{-8} for Ba (the samples had been subjected to a flux of 10^{14} neutrons/cm^2.sec for 24 hrs.). Although this sensitivity is not very high, the determination has important practical applications. Orig. art. has: 1 figure and 1 table.

ASSOCIATION: None

SUBMITTED: 07Apr64 ENCL: 01 SUB CODE: IC,GC

NO REF SOV: 003 OTHER: 004

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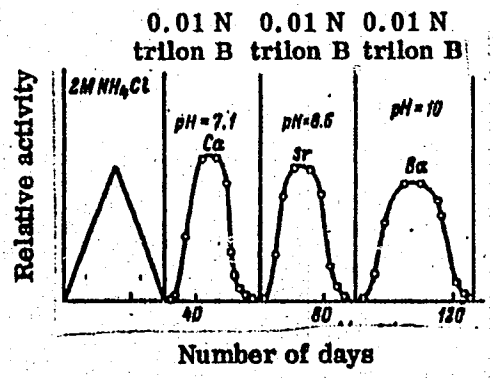

Fig. 1. - Separation of calcium, strontium, and barium on KU-2x15 cation exchange resin in NH_4^+ form (column diameter 2 mm, height of resin layer 100 mm).

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L 42988-65 EWT(1)/EWT(m)/T/EWA(h) Pz-6/Peb IJP(c) AT

ACCESSION NR: AP5006536 S/0056/65/048/002/0767/0769

AUTHOR: Akimov, Yu. K.; Kalinin, A. L.; Nikitin, V. A.; Pantuyev, V. S.; Sviridov, V. A.; Sidorov, A. I.; Khachaturyan, M. N.

TITLE: A method for studying elastic pp-scattering in the high energy region using semiconductor counters

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 48, no. 2, 1965, 767-769

TOPIC TAGS: proton scattering, high energy proton scattering, proton semiconductor counter

ABSTRACT: The possibility of studying high energy proton elastic scattering in the region of weak transmitted impulses $1.5\cdot10^{-3}\,\mathrm{GeV}^2/c^2 \leqslant -t \leqslant 1.5\cdot10^{-1}\,\mathrm{GeV}^2/c^2$ using semiconductor nuclear particle detectors is shown experimentally. The experiments were conducted on the synchrophasotron at the Joint Institute of Nuclear Investigations. The proposed method is applicable for investigations in the region of weak transmissions for any reaction of the type $a+b \to c+d$. In fig. 1 of the Enclosure (case a), a sharp peak is seen for protons transmitted with an energy of 2.2Mev.

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ACCESSION NR: AP5006536

The peak width at the semi-peak points, covering about 330Mev or 15%, was determined basically by Coulomb scattering of protons transmitted to the target and by test geometry. For comparison (case *b*), the distribution of particles emitted from the same target under identical conditions, along mean free paths in a 25% photographic emulsion, is given. The peak for elastically scattered protons has a halfwidth of $\Delta E/E \approx 18\%$, i.e., somewhat wider scattering than obtained with a semiconductor counter. "In conclusion the authors thank L. I. Lipidus and I. V. Chuvilo for interest in the work, and also V. F. Kushniruk and L. N. Strunov for assistance in the experiment." Orig. art. has: 1 figure, 1 formula.

ASSOCIATION: Ob"yedinenyy institut yadernykh issledovaniy (Joint Institute of Nuclear Investigations)

SUBMITTED: 03Dec64 ENCL: 01 SUB CODE: NP, EC

NO REF SOV: 001 OTHER: 001

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ACCESSION NR: AP5006536 ENCLOSURE: 01

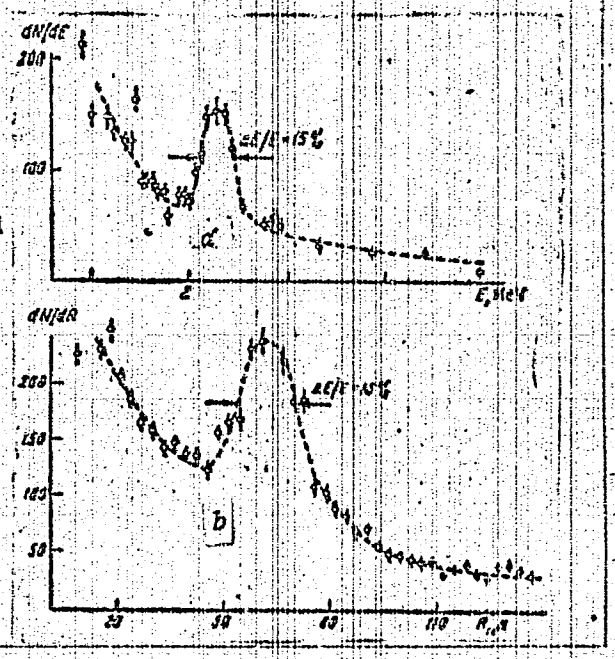

Fig. 1. Spectra of particles emitted at an angle of 87.7° from a target $(CH_2)_n$ bombarded by a beam of 10Gev protons: *a*--energy distribution measured with a semiconductor counter; *b*--distribution by mean free paths in a 25% diluted gelatin photoemulsion

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ACC NR: AM5027749 Monograph UR/ 20

Armand, N. A.; Vvedenskiy, B. A.; Gusyatinskiy, I. A.; Igoshev, I.P.; Kazakov, L. YA.; Kalinin, A. I.; Nazarova, L. G.; Nemirovskiy, A. S.; Prosin, A.V.; Ryskin, E. YA.; Sokolov, A. V.; Tarasov, V.A.; Tashkov, P. S.; Tikhomirov, YU. A.; Troitskiy, V. N. Fedorova, L. V.; Chernyy, F. B.; Shabel'nikov, A. V.; Shirey, R. A.; Shifrin, YA. S.; Shur, A. A.; YAkovlev, O. I.; Kolosov, M. A.; Lovchin, I. P.; Lomikin, A. M.

Upper tropospheric propagation of ultrashort radio waves (Dal'noye troposfernoye rasprostraneniye ul'trakorotkikh radiovoln) Moscow, Izd-vo "Sovetskoye radio", 1965. 414 p. illus., biblio. 4000 copies printed.

TOPIC TAGS: radio wave propagation, tropospheric radio wave, radio communication, space communication, tropospheric scatter communication, signal processing, signal distortion, field theory

PURPOSE AND COVERAGE: This monograph is intended for specialists working in the field of radiowave propagation, designers of long-distance radio communication systems, and teachers and students of the advanced courses in schools of higher technical education. The monograph contains, for the most part, heretofore unpublished results of Soviet experimental and theoretical investigations in the field of long-distance tropospheric ultrashortwave propagation.

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Problems of investigating the troposphere by means of refractometers, the mean level of signals, meteorological conditions and topography, fluctuation of arrival angles and distortions of antenna directivity patterns, losses in antenna gain, and quick and slow fadings of signal levels are discussed. The statistical characteristics of the signals at diversity reception in time, space, frequency and angle as well as the distortion of signals in the communication systems are also investigated. The long-distance propagat- theory is analyzed, and the engineering method of calculating field intensity at long-distance tropospheric propagation is given. At present, there is no theory of Long-Distance Tropospheric Propagation which can be applied effectively enough in practice. Thus, in the investigation of that propagation, considerable attention has to be paid to experiments. The special characteristics of geographical conditions of the territory involved should be taken into consideration during the analysis of experimental data and in their practical application because the conditions of propagation in arctic and tropical climates differ from those existing over seas and continents. A considerable part of the monograph deals with the investigations of long-distance tropospheric propagation carried out over dry land routes, 800 km long, in the central part of the USSR under the general supervision of B. A. Vvedenskiy and A. G. Aronberg (up to 1957). V. I. Siforov investigated problems con-

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nected with distortions and fluctuations of signals. References follow each chapter.

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USSR/Medicine - Gas Gangrene Feb 53

"Concerning the Rapid Detection of B. perfringens," A.M. Kalinin, Ye.F. Rosenfel's, S.M. Lisyanskaya, Chair of Microbiol, State Order of Lenin Inst for Advanced Training of Physicians imeni S.M. Kirov, Leningrad

"Zhur Mikrobiol, Epidemiol, i Immunobiol" No 2, pp 59, 60

Describes detection of B. perfringens in various media both in the presence and absence of bacterial antagonists. Finds the use of peptone-milk medium (proposed in 1944 by A. M. Kalinin) of advantage for this diagnostic procedure.

246T14

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Settling of mineral soils in railroad embankment beds. Transp.stroi. 7 no.8:21-22 Ag '57. (MIRA 10:12)

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Stan. i instr. 34 no.9:33 S '63. (MIRA 16:11)

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KALININ, A.P., kandidat meditsinskhikh nauk

Lymphosarcoma of the colon. Vop. onk. 2 no.1:95-97 '56 (MLRA 9:4)

1. Iz akushersko-ginekologicheskoy kliniki (dir.-prof. N.Ye. Sidorov) i 2-y khirurgicheskoy kliniki (dir.-dotsent V.N. Pomosov) Kazanskogo gosudarstvennogo instituta dlya usovershenstvovaniya vrachey imeni V.I. Lenina.

(COLON, neoplasms
lymphosarcoma)
(LYMPHOSARCOMA
colon)

APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8"

"APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8

KALININ, A.P. (Kazan', ul. Nekrasova, d. 11, kv. 5)

Cases of metastases of gastric cancer. Vop. onk. 3 no.1:93-96 '57 (MLRA 10:4)

1. Iz II kafedry khirurgii (zav.-prof. P.V. Kravchenko) Kazanskogo gosudarstvennogo instituta usovershenstvovaniya vrachey im. V.I. Lenina.

(STOMACH NEOPLASMS, case reports
metastases to uterus, surg.)
(UTERUS NEOPLASMS, case reports
metastatic from stomach, surg.)

APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8"

"APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8

KALININ, A.P.

Reduction gear driving for a feeding rack. Zhur.vys.nerv.deiat. 7 no.1:146-147 Ja-F '57. (MIRA 10:10)

1. Vtoraya kafedra khirurgii Kazanskogo gosudarstvennogo instituta dlya spetsializatsii i usovershenstvovaniya vrachey i kafedra patofiziologii Kazanskogo meditsinskogo instituta.
(REFLEX, CONDITIONED
reductor control of feeding racks for prod. of reflexes (Rus))

APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8"

"APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8

KALININ, A.P., kandidat meditsinskikh nauk

Stomach resection for bleeding neurinoma. Khirurgiia 33 no.2:108-109 F '57. (MLRA 10:6)

1. Iz 2-y kafedry khirurgii (zav. - prof. P.V.Kravchenko) Kazanskogo gosudarstvennogo instituta usovershenstvovaniya vrachey imeni V.I. Lenina i Kanashskoy lineynoy bol'nitsy (nachal'nik G.V.Kalechits).
(GASTRECTOMY, in various dis.
hemorhagic neurilemmoma of stomach (Rus))
(NEURILEMMOMA, surg.
hemorrhagic of stomach, gastrectomy (Rus))
(STOMACH NEOPLASMS, surg.
hemorrhagic neurilemmoma, gastrectomy (Rus))

APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8"

"APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8

KALININ, A.P., kand.med.nauk

Genital tuberculosis and tuberculosis of the peritoneum [with summary in French]. Probl.tub. 36 no.3:98-100 '58 (MIRA 11:5)

1. Iz akushersko-ginekologicheskoy kliniki (dir. - prof. N.Ye. Sidorov) i votoroy khirurgicheskoy kliniki (dir. - prof. P.V. Kravchenko) Kazanskogo instituta usovershenstvovaniya vrachey im. V.I. Lenina.

(TUBERCULOSIS, FEMALE GENITAL, in pregn.
with postpartal tuberc. peritonitis (Rus))
(PERITONITIS, etiol. & pathogen.
postpartal, caused by tuberc. of genitalia (Rus))

APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8"

"APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8

KALININ, A.P., kand.med.nauk (Kazan')

Morphological criteria of malignant degeneration of benign adenomas of the thyroid gland. Probl.endok. i gorm. 5 no.3: 51-56 My-Je '59. (MIRA 12:9)

1. Iz 2-y kafedry khirurgii (zav. - prof.P.V.Kravchenko) Kazanskogo gosudarstvennogo instituta usovershenstvovaniya vrachey imeni V.I.Lenina (dir. - prof.I.V.Danilov) i morfologicheskogo otdela (zav. - prof.Ye.I.Tarakanov) Vsesoyuznogo instituta eksperimental'noy endokrinologii (dir. - prof.Ye.A. Vasyukova).

(THYROID GLAND, neoplasms
adenoma, morphol. criteria of malignant degen. (Rus))

APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8"

"APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8

KALININ, A.P., kand.med.nauk; VOLOGINA, N.A. (Kazan')

On the problem of hyperinsulinism. Probl.endok.i gorm. 5
no.5:93-96 S-O '59. (MIRA 13:5)

1. Iz Kazanskoy psikhonevrologicheskoy bol'nitsy (glavnyy vrach F.F. Davletshin) i II kafedry khirurgii (zav. - prof. P.V. Kravchenko) Kazanskogo gosudarstvennogo instituta usovershenstvovaniya vrachey imeni V.I. Lenina.
(HYPERINSULINISM case reports)

APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8"

"APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8

KALININ, A.P., kand.med.nauk

Forcible eventration with avulsion of part of the small intestine in toxicoinfectious psychosis. Kaz.med.zhur. 40 no.4:80-81 Jl-Ag '59. (MIRA 13:2)

1. Iz 2-y kafedry khirurgii (zaveduyushchiy - prof. P.V. Kravchenko) i kafedry akusherstva i ginekologii (zaveduyushchiy - prof. N.Ye. Sidorov) Kazanskogo Gosudarstvennogo instituta dlya spetsializatsii i usovershenstvovaniya vrachey imeni V.I. Lenina.

(INTESTINES--WOUNDS AND INJURIES)
(PSYCHOSES)

APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8"

"APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8

RADBIL', O.S., dotsent; KALININ, A.P., kand.meditsinskikh nauk

Clinical use of royal jelly. Kaz. med. zhur. 41 no.3:87-91 My-Je '60. (MIRA 13:9)

1. Iz 2-y kafedry terapii (zav. - dotsent O.S.Radbil') i 2-y kafedry khirurgii (zav. - prof. P.V.Kravchenko) Kazanskogo gosudarstvennogo instituta dlya usovershenstvovaniya vrachey im. V.I. Lenina.
(ROYAL JELLY)

APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8"

"APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8

KALININ, A.P.

Putty for attaching a salivary balloon. Zhur. vys. nerv. deiat. 10 no. 3:479-480 My-Je '60. (MIRA 14:2)

1. Second Chair of Surgery, Kazan' Institute for Medical Advanced Training and Chair of Pathophysiology, Kazan' Medical Institute.
(CONDITIONED RESPONSE) (PHYSIOLOGICAL APPARATUS)

APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8"

"APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8

KALININ, A.P., kand.med.nauk; TSAREV, N.P.

Complications after vaccination. Sov.med. 25 no.1:127-130 Ja '61. (MIRA 14:3)

1. Iz kafedry khirurgii i neotlozhnoy khirurgii (zav. - prof. P.V. Kravchenko) Kazanskogo gosudarstvennogo instituta usovershenstvovaniya vrachey imeni V.I.Lenina i Kanashskoy lineynoy bol'nitsy (nachal'nik G.V.Kalechits).

(VACCINATION)

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"APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8

KALININ, A.P., kand.med. nauk ; BALABOLKIN, M.I. (Moskva)

Troell-Junet syndrome. Vrach. delo no.9:145-147 S '63. (MIRA 16:10)

1. Khirurgicheskoye otdelenie (zav. - prof. O.V.Nikolayev) Vsesoyuznogo nauchno-issledovatel'skogo instituta eksperimental'noy endokrinologii.
(ACROMEGALY) (GOITER)

APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8"

"APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8

KALININ, A.P., kand. med. nauk; TALANTOV, V.V.

Schoenlein-Henoch disease and thyrotoxicosis. Sov. med. 27 no.11:92-96 N '63 (MIRA 18:1)

1. Iz khirurgicheskogo otdeleniya (zav. - prof. O.V.Nikolayev) Vsesoyuznogo nauchno-issledovatel'skogo institua eksperimental'-noy endokrinologii (direktor - prof. Ye.A. Vasyukova).

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"APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8

PINSKIY, S.B. (Irkutsk, ul. Marata, 25, kv.14); KALININ, A.P. (Moskva, V-36, 1-ya Cheremushkinskaya ul., 13, korp. 2, kv.50)

Cancer of the thyroid gland in children. Vop. onk. 10 no.3: 72-77 '64. (MIRA 17:8)

1. Iz khirurgicheskogo otdeleniya (zav. - prof. O.V. Nikolayev) Vsesoyuznogo instituta eksperimental'noy endokrinologii (dir. - prof. Ye.A. Vasyukova).

APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8"

"APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8

KALININ, A.P., kand. med. nauk; PINSKIY, S.B. (Moskva)

Pathology of the thyroglossal duct. Probl. endok. i gorm. 10 no.1:25-28 Ja-F '64. (MIRA 17:10)

1. Khirurgicheskoye otdeleniye (zav. - prof. O.V. Nikolayev) Vsesoyuznogo instituta eksperimental'noy endokrinologii (dir.- prof. Ye.A. Vasyukova).

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"APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8

NIKOLAYEV, O.V., prof.; KALININ, A.P., kand. med. nauk; VEYNBERG, E.G.

Surgical treatment of hyperinsulinism. Khirurgiia 40 no.2:134-140 F '64. (MIRA 17:7)

1. Khirurgicheskoye otdeleniye (zav. - prof. O.V. Nikolayev) Vsesoyuznogo instituta eksperimental'noy endokrinologii (direktor - prof. Ye.A. Vasyukova), Moskva.

APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8"

"APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8

PEREPUST, L.A.; IOFFE, B.N.; KALININ, A.P. (Moskva)

Roentgenological data on the state of the adrenal glands in Itsenko-Cushing disease and diencephalic syndrome pursuing the course of Itsenko-Cushing disease. Probl. endok. i gorm. 9 no.6: 75-80 N-D '63. (MIRA 17:11)

1. Iz rentgenologicheskogo otdeleniya (zav. - dokter med. nauk M.I. Santotskiy) i khirurgicheskogo otdeleniya (zav. - prof. O.V. Nikolayev) Vsesoyuznogo instituta eksperimental'noy endokrinologii (dir. - prof. Ye.A. Vasyukov).

APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8"

"APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8

ODINOKOVA, V.A. ; KALININ, A.P. (Moskva)

Hurthle cell tumors of the thyroid gland. Arkh. pat. 26 no.4:41-45 '64. (MIRA 18:7)

1. Patologoanatomicheskiy otdel (zav. - chlen-korrespondent AMN SSSR prof. A.P.Avtsyn) Moskovskogo oblastnogo nauchno-issledovatel'skogo klinicheskogo instituta imeni Vladimirskogo i khirurgicheskoye otdeleniye (zav. - prof. O.V.Nikolayev) Vsesoyuznogo instituta eksperimental'noy endokrinologii.

APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8"

"APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8

NIKOLAYEV, O.V., prof.; KALININ, A.P., kand. med. nauk; KAZEYEV, L.M.

Clinical aspects, diagnosis and surgical treatment of pheochromocytoma. Khirurgiia 40 no.7:83-87 Jl '64.

(MIRA 18:2)

1. Khirurgicheskoye otdeleniye (zav. - prof. O.V. Nikolayev) Vsesoyuznogo instituta eksperimental'noy endokrinologii (dir. - prof. Ye.A. Vasyukova), Moskva.

APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8"

"APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8

KALININ, A.P.; BALABOLKIN, M.I.

Syndrome of hypercorticalism in malignant tumors of different organs.
Vop. onk. 11 no.10:114-120 '65. (MIRA 18:10)

APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8"

"APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8

KALININ, A.P.; SHAKHNOVSKAYA, V.F.; ZARETSKIY, M.M.

Pregnancy and labor in Itsenko-Cushing's disease. Probl. endok. i gorm. 11 no.6:13-17 N-D '65. (MIRA 18:12)

1. Terapevticheskoye otdeleniye (zav. - kand. med. nauk A.G.Vasil'yeva) i khirurgicheskoye otdeleniye (zav. prof. O.V.Nikolayev) Instituta eksperimental'noy endokrinologii AMN SSSR, Moskva.

APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8"

"APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8

RADBIL', O.S., prof.; KALININ, A.P., kand. med. nauk

Antibacterial action of royal jelly. Veterinariia 41 no.22-24 D '64.
(MIRA 18:9)

APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8"

"APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8

KALININ, A.P., mekhanik kranov; TATARINOV, V.A., mekhanik kranov

Speeding up tracklaying operations. Put' i put. khoz. 9 no.10:26 '65. (MIRA 18:10)

1. Stantsiya Bryansk II, Moskovskoy dorogi.

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"APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8

KALININ, Anatoliy Semenovich

(L'vov State Veterinary-Zootechnical Inst) Academic Degree of Doctor of Veterinary Sciences, based on his defense, 3 July 1954, in the Council of the Kazan' State Veterinary Inst imeni Bauman, of his dissertation entitled: "Cythological composition and myelogram of the sternal pucture content of the healthy horse."

Academic degree and/or title: Doctor of Sciences

SO: Decisions of VAK, List no. 24, 26 Nov 55, Byulleten' MVO SSSR, No. 20, Oct 57, Moscow, pp 22-24, Uncl. JPRS/NY-471

APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8"

"APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8

1. KALININ, A. S.

2. USSR (600)

4. Looms

7. Unit repairs of weaving equipment. Tekst. prom. 12 no. 10, '52.

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

APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8"

"APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8

KALININ, A.S.

Some characteristics of the greisenisation process in the Komsomol'sk deposit. Dokl. AN SSSR 157 no.6:1379-1381 Ag '64. (MIRA 17:9)

1. Irkutskiy gosudarstvennyy nauchno-issledovatel'skiy institut redkikh metallov. Predstavleno akademikom D.S. Korzhinskim.

APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8"

"APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8

Orthoclase-quartz vein complex in a molybdenum deposit.
Dokl. AN SSSR 159 no.1:102-105 N '64. (MIRA 17:12)

1. Institut zemnoy kory Sibirskogo otdeleniya AN SSSR.
Predstavleno akademikom D.S. Korzhinskim.

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"APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8

KALININ, A. T. and MINKEVICH, A. N.

"Development of the Process of Liquid Carburizing (Cyaniding) Steel," pp 81/99 in Modern Methods of Heat Treating Steel by Com Inzhenera i Tekhnika imeni F E Dzerzhinskovo. Gosudarstvennoye Nauchno-Tekhnicheskoye Izdatel'stvo Mashinostroitel'noy Literatury, Moscow (1954) 404 pp.

Evaluation B-86350, 30 Jun 55

APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8"

"APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8

Feuto

Form

1. Sintin—a new carburizer for gaseous cementation. A. T. Kafinin, M. N. Kunyavskii, and A. Yu. Zaliaeva. Mezhdunov. Vyborotsia Mrtall. 1936, No. 11, 40-9.—During cementation, hydrocarbons used for it are decomposed to C_2H_4 and CH_4 or form aromatics and coke, both types of reactions being undesirable from the carburization standpoint. According to their tendency towards decomposition, they can be ranged as paraffins, olefins, naphthenes, and aromatics; while in the light of their tendency towards condensation, this order is reversed. Since natural gas is scarce in Russia, synthetic hydrocarbons were made by the $2nH_2 + nCO \rightarrow C_nH_{2n} + nH_2O$ reaction and then hydrogenated to C_nH_{2n+2} (process not described), forming a mixt. of paraffins, b. 100–350° called Sintin. Its carburizing characteristics were compared with those of other carburizers and were found to be better. J. D. Gat

Moscow Automechanics Inst. NTT

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"APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8

KALININ, A. T.

18

Gas cyanidation and cementation. A. T. Kalinin, A. V. Zaitseva and N. M. Kamtanakaya. U.S.S.R. 105,426, Apr. 25, 1957. Nitridation is carried out in triethanolamine, the activity of which is controlled by addition of [illegible]

4E2C

APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8"

"APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8

KALININ, A. T.

ASSONOV, Aleksandr Denisovich, kand.tekhn.nauk; KALININ, A.T., kand.tekhn. nauk, retsenzent; PASTERNAK, N.A., kand.tekhn.nauk, red.; YEGORKINA, L.I., red.izd-va; EL'KIND, V.D., tekhn.red.

[Technology of the heat treatment of automobile parts] Tekhnologiia termicheskoi obrabotki detalei avtomobilia. Moskva, Gos. nauchno-tekhn.izd-vo mashinostroit. lit-ry, 1958. 263 p. (MIRA 11:4)
(Metals--Heat treatment)
(Automobile industry)

APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8"

"APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8

KHAININ, A. T.

USSR / BOOK EXPLOITATION SOV/1598

Moscow. Dom nauchno-tekhnicheskoy propagandy im. F.E. Dzerzhinskogo

Sovremennyye splavy i ikh termicheskaya obrabotka (Contemporary Alloys and Their Heat Treatment) Moscow, Mashgiz, 1958. 339 p. 12,000 copies printed.

Additional Sponsoring Agency: Obshchestvo po rasprostraneniyu politicheskikh i nauchnykh znaniy RSFSR.

Ed. (Title page): Ya. A. Geller, Doctor of Technical Sciences; Ed. (Inside book): V.V. Zhdanovskiy, Engineer; Tech. Ed.: B.I. Model'; Managing Ed. for Literature on Metal Working and Tool Making: E.D. Beysel'man, Engineer.

PURPOSE: The book is intended for engineering and technical personnel of heat-treatment shops and test laboratories of machine-building plants.

COVERAGE: This collection of 25 articles, compiled by 33 authors, aims to acquaint the reader with modern practice in the heat treatment of steels. The authors are primarily concerned with the development of various types of structural, tool, and heat-resistant steels and with the use of their alloying elements. Materials-handling equipment is described at some length. The treatment of alloys, particularly those of titanium, also comes within the scope of the collection. The book is thoroughly diagrammed, and a good deal of the material is shown in graphical form. Among the problems dealt with are the minimization of deformations, the introduction of the automatic control of heat-treating equipment, together with fully mechanized tool manufacture, and the optimum properties of different alloying elements. There are numerous tables and drawings. Bibliographic listings placed at the end of chapters are predominantly Soviet. The articles comprising this collection are reports delivered at a conference held in the Scientific and Technical Propaganda House imeni F.E. Dzerzhinskiy in Moscow.

Contemporary Alloys and Their Heat Treatment SOV/1598

Fural'man, Yu. S. Proper Selection of Steels for Case-hardened Parts 93

Gnilitsev, V.T. Initial Data for Selecting Regimes for the Carburizing and Heat-Treatment of Case-hardened Parts 104

Kaliein, A.Z. A Modern Carburizing Agent for Gas Carburizing and Cyaniding 116

Bakhmetiev, A.S., O.N. Mashkarinova, and V.V. Ilinyov. Properties and Heat Treatment of Boron-alloyed Spring Steels 132

Geller, Yu. A. Improvements in the Composition and Heat Treatment of Tool Steels 149

Valkov, A.M. An Investigation of R1603 Low-alloy Steel as a Material for Cutting Tools 171

Ivanov, A.G. New Types of High-speed Steel 175

Golovin, S.F. Hardening and Tempering of High-speed Steels With Induction Heating 178

Card 4/5

APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8"

"APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8

SOV/137-59-3-7025

Translation from: Referativnyy zhurnal. Metallurgiya, 1959, Nr 3, p 299 (USSR)

AUTHOR: Kalinin, A. T.

TITLE: New Developments in the Technology of Gas Carburizing and Gas Nitriding (Novoye v tekhnologii gazovoy tsementatsii i gazovogo tsianirovaniya)

PERIODICAL: V sb.: Materialy Soveshchaniya glavn metallurgov z-dov i in-tov avtomob. prom-sti. Nr 3 Moscow, 1958, pp 95-127

ABSTRACT: Modern domestic and foreign methods of obtaining controlled carburization atmospheres are described together with such automatic devices for regulation of C_x potential as the endothermic generator and the "Carbotronic" apparatus, employed if natural gas is available, and soot-free liquid carburizers and the "Carboohm" device employed if natural gas is not available. A GIAP-3 catalyzer replacing granulated Ni, which proved inadequate, was tested in the endothermic generator at the thermo-chemical laboratory of the NIITavtoprom. The GIAP-3 permits the generation of gas at the relatively low temperature of 950°C instead of 1100°. Graphs were plotted representing the dew point and the gas composition as

Card 1/2

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SOV/137-59-3-7025

New Developments in the Technology of Gas Carburizing and Gas Nitriding

functions of the air/natural-gas ratio. The GIAP-3 loses its activity as it is gradually contaminated with S. For purposes of decontamination of the gas two absorber units based on ZnO and operating at a temperature of 400° were tested together with GIAP-10 (ZnO pellets) and a spent Zn-Cr catalyzer of methanol synthesis. The latter is inexpensive (~1000 rubles per ton) and proved to be more profitable. Synthol was successfully tested as a liquid carburizer, but isobutyl was found to be even better because it does not produce soot in the process of cracking. The following hydrogen-free compounds containing additions of alcohol serving to reduce the amount of soot were tested for purposes of gas nitriding: Urotropine, pyridine, aniline, and orthotoluidine. The following compounds containing hydrogen were also tested: Formanide, nitrobenzene, and triethanolamine. The latter proved to be the most suitable. The C potential may be controlled by means of adding water and alcohol to the triethanolamine. Muffle-less furnaces are recommended when soot-free carburizers and nitriding agents are employed.

A. S.

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SOV/137-58-10-21282

Transaltion from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 10, p 120 (USSR)

AUTHORS: Gurevich, I. L., Dybovskiy, R. K., Kalinin, A. T., Veselov, B. P.

TITLE: Liquid Carburizer for Gas Carburization of Steel (Zhidkiy karbyurizator dlya gazovoy tsementatsii stali)

PERIODICAL: Materialy Mezhvuz. nauchn. soveshchaniya po vopr. novoy tekhn. v neft. prom-sti, 1958, Vol 3, pp 206-223

ABSTRACT: An investigation was conducted on the gas carburization (GC) of specimens of Nr-20 and 18KhGT-grades of steel in a laboratory furnace and in a small type Ts-25 shaft kiln using various liquid carburizers (C); lamp kerosene was used as the standard C. It is indicated that at GC temperatures of 925 - 930°C, a duration of 1.5 hours or 5 hours and at the optimum feeding rate for each C, the employment of alkane C ensures advantages over the use of aromatic C in the total depth of the layer, the magnitudes of the transitional and eutectoid zones, and the degree of carburization of a control wire 1.5 mm in diameter. The best results were obtained using synthol with a boiling-point range of 48 - 246°. When sooty products of decomposition of C are present in the muffle, GC showed that alkane C,

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Liquid Carburizer for Gas Carburization of Steel

especially synthols with 48 - 246° and 69 - 302° boiling-point ranges, decrease the carburizing capacity less than the aromatic C. The greatest evolution of coke-soot was produced by the aromatic C. Comparative data on GC of machine parts of the DT-54-type tractor of 18KhGT-grade steel in continuous furnaces of the heat-treatment shop of the KhTZ [Khar'kovskiy Traktornyy Zavod (Khar'kov Tractor Plant)] showed that compared to the employment of kerosene the increase in the productivity for 100 - 231°, 101 - 305°, and 195 - 312° fractions are by 24, 51, and 40%, respectively, while the decreases in the amount of the coke-soot deposition are by 50, 35, and 41%, respectively. When synthols are used, a loose soot is produced which is easily washed off with the oil in quenching tanks, corrosion produced by the presence of S is prevented, and the consumption of C per operation is decreased. Technical specifications (TU 574 - 55) are developed for two types of C: synthol 100 - 300° for continuous furnaces and synthol 100 - 230° for shaft kilns.

1. Steel--Carbonization 2. Kerosene--Performance

L. F.

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NOVIKOVA, A.Ya.; LEVITANSKAYA, N.M.; KALININ, A.T.

Defects of the cyanide hardening layer and factors contributing to their formation. Avt.prom. no.3:39-41 Mr '61. (MIRA 14:3)

1. Nauchno-issledovatel'skiy eksperimental'nyy institut avtotraktornogo elektrooborudovaniya i priborov.
(Cyanide process)

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"APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000620030011-8

KALININ, A.T., kand. tekhn. nauk; MARKOV, L.A., red.; ALEKSEYEVA, T.V., tekhn. red.

[Use of controlled atmospheres in heat treatment] Primenenie kontroliruemykh atmosfer pri termicheskoi obrabotke; obzor. Moskva, TSentr. in-t nauchno-tekhn. informatsii mashinostroeniia, 1961. 99 p. (MIRA 14:10)

(Furnaces, Heat-treating) (Protective atmospheres)

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S/129/61/000/008/015/015
E073/E535

AUTHORS: Kalinin, A.T., Candidate of Technical Sciences, Ivanyuk, M.Ya., Engineer and Ovanesyan, S.A., Engineer

TITLE: Sulphiding in baths without using cyanide salts

PERIODICAL: Metallovedeniye i termicheskaya obrabotka metallov, 1961, No.8, pp.56-58

TEXT: Sulphiding is not used on a wide enough scale in the Soviet Union in view of difficulties encountered with application of cyanide salts. To overcome these difficulties NIITavtoprom developed a technology which does not involve the use of cyanide salts. Gas sulphiding did not yield positive results due to the fact that toxic gases with an unpleasant smell formed. In the process of liquid cyaniding (at 560-580°C) the poisonous salt KCN is substituted by KCNO and the process of sulphiding will proceed according to the reactions

$$KCNO + Na_2S \rightarrow KCNS + Na_2O \quad (3)$$

$$KCNS + Fe + 1/2O_2 \rightarrow FeS + KCNO, \quad (4)$$

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and during the process carbon and nitrogen will also form in accordance with the reaction

$$2KCNO + O_2 \rightarrow CO + 2N + K_2CO_3 \quad (2)$$

In NIITavtoprom the cyanate was obtained from the two salts: urea (55%) and potash (45%) in accordance with the following reaction

$$2CON_2H_4 + K_2CO_3 \rightarrow 2KCNO + 2NH_3 + CO_2 + H_2O \quad (5)$$

The urea and the potash are introduced in small quantities into an iron crucible heated to 350-380°C. During the fusion process salammoniac and carbon dioxide are generated and a 98% potassium cyanate is obtained. When the crucible is three-quarters full the temperature is increased to 500°C and sodium sulphide is added. The bath is ready for operation when the sulphide sulphur in the melt reaches 0.2-2%. The content of potassium cyanate in the melt should not be below 30%. The effect of this process was tried out on piston rings in repaired truck engines. It was found that by means of this treatment the service life of the

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Sulphiding in baths ...

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E073/E535

piston rings increased from the standard 10-12000 km to 30000 km. Details are given on the sequence of operations of this sulphiding process. For components which must not be heated to temperatures exceeding their tempering temperature, a chemically active low temperature bath was developed consisting of 90% KCNS + 10% NH_4CNS. The sulphiding process is carried out in a gaseous medium formed by the decomposition of ammonium thiocyanate salts. As a result, the melt retains its fluidity and no ballasts form. This process is suitable, for instance, for worm gears and other case-hardened components.

ASSOCIATION: NIITavtoprom

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