"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

BEZIRGANYAN, P.A.; ZAZYAN, Z.F.; AVUNDZHYAN, V.I.

Bent crystals with two radii of curvature of reflecting planes.
Zav.lab. 29 no.11:1382-1383 '63. (MIRA 16:12)

1. Yerevanskiy gosudarstvennyy universitet.

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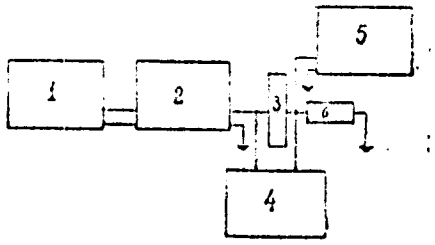
L 09[illegible]1-67
ACC NR: AP6028593

Fig. 1. Block diagram of quartz oscillations: 1 -- signal generator, 2 -- amplifier, 3 -- quartz, 4 -- voltmeter, 5 -- oscilloscope, 6 -- resistance.



obtained from a signal generator. The electric alternating field was directed along the X axis. A narrow x ray beam directed along the Z axis was incident on the XY plane, and the x ray film was placed perpendicular to the primary beam. The experiment has shown that the excited oscillations influenced only the intensity of the Lane spots located on the upper part of the Lane pattern (above the equatorial line), showing that the oscillations were not actually aligned with the X direction but made some angle with the axis. This agrees with observation by others that in ordinary X-cut crystals the maximal amplitude occurs at 19° relative to the Y axis. It is concluded that the diffraction pattern will make it possible to determine the true direction of the piezoelectric oscillations with sufficient accuracy, and the Lane patterns can be used to determine the spatial distribution of the oscillation amplitudes and thus determine the spatial distribution of the elastic constants. This report was presented by Corr. Member AN ArmSSR N. M. Kocharyan 19 October 1965. Orig. art. has: 4 figures.
SUB CODE: 20/ SUBM DATE: 00/ ORIG REF: 001/ OTH REF: 006

Card 2/2

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

AVUNDZHYAN, Z. S. -- Cand Agr Sci -- "Description of the mowing and pasture soils of Razdanskiy (Akhtinskiy) Rayon of the Armenian SSR in connection with their radical improvements." Yerevan, 1960 (Committee of the Council of [redacted] Ministers Ar SSR for Higher and Secondary Specialized Education. Armenian Agr Inst.). (KL, 1-61, 200)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

TVERDOKHLEB, G.V.; AVVAKUMOV, A.A.

Effect of temperature on the changes in the coefficient of expansion of milk plasma. Izv.vys.ucheb.zav.; pishch.tekh. 2:155-157 '62. (MIRA 15:5)

1. Leningradskiy tekhnologicheskiy institut kholodil'noy promyshlennosti, kafedra tekhnologii moloka i molochnykh produktov.

(Milk--Analysis and examination)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

AVVAKUMOV, M.G. (Moskva)

Overhead chain conveyer. Shvein.prom. no.1:21-22 Ja-F '61. (MIRA 14:3)

(Conveying machinery)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

AVVAKUMOV, M. Ye.

GANNUSHKIN, M. S., Prof.; AVVAKUMOV, M. Ye., Docent; T. M. Zablotskiy, Instructor; Military Veterinary Academy.

"Lugol's Therapy of Strangles in Horses"

Bolezni Loshadey (Equine Diseases), Sbornik Rabot, Ogiz Sel'khozgiz, 1947, compiled by A. Yu. Branzburg and A. Ya. Shapiro under Editorship of A. M. Laktionova, State Press for Agric. Literature. Chapter V- Tests and Practice, p 258 TAB CON

-W-9922, 1 May 1950, p 6

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

AVVAKUMOV, Semen Grigoriyevich; TIMOFEYEV, Petr Timofeyevich;
ALEKSEYEVA, V.M., red.

Kanash. Cheboksary, Chuvashskoe knizhnoe izd-vo, 1965.
117 p. (MIRA 18:8)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

AVVAKUMOV, S. I.

VAKUMOV, S. I., ED.....Geroicheskii Leningrad, 1917-1942. Leningrad, Gospolitizdat, 1943. iv, 238, (2) p. (Leningradskii institute istorii VKP(b) Filial instit. Marksa-Engel'sa-Lenina).
DLC: DK568.A88

SO: LC, Soviet Geography, Part II, 1951/Unclassified

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

3 (7)

AUTHOR: Avvakumov, V. A. SOV/50-59-3-4/24

TITLE: Position of the Level of the Maximum Wind Velocities in the Different Parts of the Jet Streams (Polozheniye urovnya maksimal'nykh skorostey vetra v razlichnykh chastyakh struynykh techeniy)

PERIODICAL: Meteorologiya i gidrologiya, 1959, Nr 3, pp 27 - 29 (USSR)

ABSTRACT: Many meteorologists are of the opinion that the level of the maximum wind velocities is always 1-2 km below the tropopause. Applied to jet streams, especially to the cyclonic (cold) periphery this concept which is correct in general, becomes inaccurate. This fact is demonstrated in this paper on the basis of data. The work reported in this paper is based on aerological observations in Moscow and Minsk in the years 1952 - 1955 by using maps of baric topography. According to the maps AT_{300} and AT_{200} the jet streams and the position of the mentioned places with respect to the horizontal axis of the stream were determined. Moscow and Minsk may, with respect to their geographical position, well characterize the jet streams above the European part of the USSR. A total of 686 cases of jet

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streams were investigated. They were divided into 3 groups: 1) Cyclonic periphery: if the point was on the cold (left) part of the jet stream (according to the AT_{300} map). 2) The observation points are located on the axis or near the axis of the jet stream. It concerns those cases where the point lies in the range of the maximum condensation of the isohypses and of the maximum wind velocities. 3) Anticyclonic periphery: those cases are concerned where the observation point was on the warm (right) side of the stream. The range of the minimum temperatures in the upper troposphere (characteristic range according to I. A. Klemin) was assumed as tropopause. The results of the investigations showed that at the cyclonic periphery of the jet stream the level of the maximum wind velocities throughout the year is on the average above the tropopause. This is especially characteristic of the winter where this level is almost 400 m above the tropopause. Near the axis of the jet stream and at the anticyclonic periphery of this stream the level of the maximum wind velocities is on the average 1000 - 1500 m below the tropopause. It is a characteristic feature that the average relative height

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Position of the Level of the Maximum Wind Velocities in the Different Parts of the Jet Stream SOV/50-59-3-4/26

of the level of the maximum wind velocities as well as the height of the tropopause increase from the cyclonic periphery of the jet stream in the direction of the anticyclonic periphery. There are 2 tables.

Card 3/3

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

AVVAKUMOV, V.A.; BAKIROV, K.Kh.; DEMCHUK, L.V.; IVANOV, Yu.A.; NEVOLIN, N.V.; POPYTALOV, D.K.; SHAKHIDZHANOV, Yu.S.; EVENTOV, Ya.B.

New data on the geology of the Aktyubinsk part of the Ural Mountains region and western Mugodzhar Hills and the outlook for oil and gas. Sov. geol. 3 no. 11:68-84 N '60.

(MIRA 13:12)

1. Vsesoyuznyy nauchno-issledovatel'skiy geologorazvedochnyy neftyanoy institut.

(Aktyubinsk Province--Geology)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

AVVAKUMOV, V.A.; GRIDASOV, Yu.M.; KVENTOV, Ya.S.

New oil field in the Mortuk-Kumsay-Kenkiyak area in the Mugodzhar Hills region. Geol. nefti i gaza 4 no. 12:12-16 D '60. (MIRA 13:12)

1. Trest Aktyubnefterazvedka i Vsesoyuznyy nauchno-issledovatel'skiy geologo-razvedochnyy neftyanoy institut.
(Mugodzhar Hills region--Oil fields)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

ZHERNAKOV, P.I.; AVVAKUMOV, V.A.; PRONICHEVA, M.V.

Practice in using materials of aerophotography for the study of local structures in the Aktyubinsk area of the Ural Mountain region. Trudy VNIGNI no.34:132-135 '61. (MIRA 15:7)
(Aktyubinsk Province--Geology, Structural)
(Aeronautics in geology)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

NEVOLIN, N. V.; AVYAKUMOV, V. A.; KOZLOVA, Ye. F.; MATVEYEV, V. D.; SHAKHALOV, I. V.

Tectonics and prospects for finding oil and gas in the Mugodzhar Hills and adjacent regions. Sov. geol. 5 no.10:39-56 O '62. (MIRA 15:10)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut geofizicheskikh metodov razvedki.

(Mugodzhar Hills region—Petroleum geology)
(Mugodzhar Hills region—Gas, Natural—Geology)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

AVVAKUMOV, V.G.

Investigating the work of power condensers in networks containing higher harmonics. Trudy ORIET 41:55-66 '63.

Magnitude of the losses in condenser systems under nonbalanced voltage. Ibid.:157-160

Methodology of the testing for heat resistance of transverse capacitive compensation systems operating [illegible] taining higher harmonics. Ibid.:161-166

(MIRA 18:7)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

AVVAKUMOV, V.G., inzh.

Power losses in a single-phase power condenser with nonsinusoidal voltage. Elektrotekhnika 35 no.2:9-11 F '64. (MIRA 17:3)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

AVVAKUMOV, V.G., inzh.

Available power of a condenser system with unbalanced voltage. Izv. vys. ucheb. zav.; energ. 7 no.9:82-83 S '64. (MIRA 17:11)

1. Omskiy institut inzhenerov zheleznodorozhnogo transporta. Predstavlena kafedroy elektricheskikh zheleznykh dorog.

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

Avvakumov, V. I.

USSR/ Physics - Photography FD-1046

Card 1/1 : Pub. 153 - 17/23

Authors : Borin, A. V.; Makovskiy, A. F.; Odintsov, M. G.; Ivleva, S. A.; Avvakumov, V. I.

Title : Photographic material with constant value of the coefficient of contrast in the visible part of the spectrum.

Periodical : Zhur. tekh. fiz., 24, 1499-1502, Aug 1954

Abstract : Notes that photographic materials with constant coefficient of contrast independent of wave length are needed in solving a number of problems of spectral analysis and astrophysics. Investigates the possibility of obtaining such materials. Concludes that the absolute magnitude of contrast varies but the character of the dependence of the contrast coefficient, gamma, on wave length remains unchanged. Eight references, 4 USSR (e.g. A. V. Borin, D. Ya. Martynov, T. I. Smolko, 1952; A. V. Barin, Z. I. Gratsianskaya, 1948).

Institution : --

Submitted : 1 November 1953

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

AVVAKUMOV, V.I., SHLIKOV, L.G., ALTSHULER, Ye.A.

"Resonance Paramagnetic Absorption of Ultrasound in Some Salts of Rare-Earth and Iron Groups of Elements" Abstract

Conference on Physics of Magnetic Phenomena, 23-31 May 1956, Sverdlovsk, USSR

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

AVVAKUMOV, V. I. Cand Phys-Math Sci -- (diss) "Theory of Spin-Lattice Relaxation in [redacted] Paramagnetic Salts of [redacted] Iron-Group Elements With an Even Number of Electrons." Kazan', 1957. [redacted] 6 pp (including covers), 20 cm. (Kazan' Order of Labor Red Banner State Univ [redacted] im V. I. Ul'yanov-Lenin), 110 copies (KL, 17-57, 94)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

AUTHOR: Avvakumov, V. I.

126-2-2/30

TITLE: On the theory of spin-lattice relaxation in paramagnetic salts of elements of the iron group which have an even number of electrons. (Teoriya spin-reshetochnoy relaksatsii v paramagnitnykh solyakh elementov gruppy zheleza s chetnym chislom elektronov).

PERIODICAL: "Fizika Metallov i Metallovedeniye" (Physics of Metals and Metallurgy), Vol.IV, No.2, 1957, pp. 193-204 (U.S.S.R.)

ABSTRACT: General formulae are given for the time of spin-lattice relaxation in hydrated paramagnetic salts of elements of the iron group. A theoretical investigation is described for salts of all the elements of the iron group, the ions of which have an even number of electrons in the unfilled 3d-shell: Cr^{++}, Mn^{+++} $(3d^4\,{}^5D_0)$, Fe^{++} $(3d^6\,{}^5D_4)$, V^{+++} $(3d^2\,{}^3F_2)$ Ni^{+++} $(3d^8\,{}^3F_4)$.

It is assumed that the mechanism of spin-lattice interaction is connected with the modulation of the electric field by the vibrations of the lattice. The Kronig-Van-Vleck hypothesis as to the exact nature of this interaction is employed in the calculations. It is further assumed that at the point at which the magnetic ion is situated the crystal field has a predominantly cubic symmetry. This is

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

On the theory of spin-lattice relaxation in paramagnetic salts of elements of the iron group which have an even number of electrons. (Cont.) 126-2-2/30

sufficiently common in hydrated salts. However, since in real crystals a crystal field of lower symmetry is always superimposed on the cubic field, three cases are considered in which the field having the lower symmetry is a) tetragonal, b) trigonal, with an axis (C_3) directed down the spatial diagonal of the cube. The following model is assumed:-

1. The magnetic ion is surrounded by six near neighbours (complex XY_6; X - magnetic ion; Y - electric dipoles or charges) which are disposed at equal distances from the magnetic ion and have equal charges e or dipole moments μ. The crystal field due to these neighbours has a cubic symmetry.

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2. Distortions of the complex XY_6 due to more distant neighbours are small and equivalent to the superposition of a field of low symmetry on the cubic field at the point where the magnetic ion is situated.

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On the theory of spin-lattice relaxation in paramagnetic salts of elements of the iron group which have an even number of electrons. (Cont.) 126-2-2/30

It is shown that the time of spin-lattice relaxation is given by:

$$\tau = \frac{C_H}{\alpha} \sim \frac{\sum_{\eta'} \sum_{\eta''} (W_{\eta'} - W_{\eta''})^2}{\sum_k \text{spur} \left[\langle WA_k W - W^2 A_k - A_k W \right]^2}$$

for direct processes, and by

$$\tau = \frac{C_H}{\alpha} \sim \frac{\sum_{\eta'} \sum_{\eta''} (W_{\eta'} - W_{\eta''})^2}{\sum_k \text{spur} \left[A_k W - W A_k \right]^2}$$

for combinational diffusion of phonons, where

$A_k = (S_x^2 - S_y^2),\ S_k^2 - S_y^2),\ (S_k S_y + S_y S_x), (S_x S_z + S_z S_x), (S_y S_z + S_z S_y)$

and C_H is the specific heat of the spin-lattice system at constant magnetic field H, α the coefficient of thermal conductivity between the spin-system and the lattice, S is is the spin, $W_{\eta'}$ and $W_{\eta''}$ the energies corresponding to the

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

On the theory of spin-lattice relaxation in paramagnetic salts of elements of the iron group which have an even number of electrons. (Cont.) 126-2-2/30

spin levels τ' and η''.

a) Dependence on H: At constant field H, and provided $D \gg g\,H, \tau$ is independent of H. D, β, g occur in the "spin Hamiltonian" (cf. ref.5):-

$$W = \underline{H}_z + \underline{H}_{ss} + \underline{H}_{so} = DS_z^2 + \beta\,(g_\perp H_x S_x + g_\perp H_y S_y + g_\parallel H_z S_z)$$

and

$$W = DS_z^2 + E\,(S_y^2 - S_x^2) + \beta(g_x H_x S_x + g_y H_y S_y + g_z H_z S_z)$$

for axial and rhombic symmetry respectively. If $D \sim g\beta H$ then the dependence of τ on H is different for high and for low temperatures. At high temperatures the dependence is as given in ref.14 and has been experimentally confirmed.

b) Dependence on temperature: When direct processes are responsible for the relaxation, then $\tau \sim \frac{1}{T}$. If combinational diffusion of phonons is responsible for the relaxation then:

$$\tau \sim T^{-2} \quad (T \gg \Theta)$$

$$\tau \sim T^{-7} \quad (T < \Theta;\ \text{for salts of } Cr^{++},\ Mn^{+++},\ Ni^{++})$$

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

On the theory of spin-lattice relaxation in paramagnetic salts of elements of the iron group which have an even number of electrons. (Cont.) 126-2-2/30

$\tau \sim T^{-9}$ ($T < \Theta$; for salts of Fe^{++}, V^{+++})

c) Anisotropy of times of relaxation:- All the formulae obtained in this work indicate that this anisotropy should exist. Times of relaxation depend on the orientation of the magnetic field H relative to the axes of the crystal. The work was carried out under the superivision of Prof. S. A. Al'tshuler. There are one figure and one table and 17 references, of which 5 are Slavic.

Card 5/5

SUBMITTED: October 20, 1956.

ASSOCIATION: Physico-Technical Inst., Kazan Branch, Ac.Sc. (Fiziko-Tekhnicheskiy Institut Kazanskogo Filiala AN SSSR).

AVAILABLE:

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

AVVAKUMOV, V.I.

Dynamic character of the Jahn-Teller effect and its influence on the paramagnetic resonance of Cu^{2+}. Zhur.eksp.i teor.fiz. 37 no.4:1017-1025 O '59. (MIRA 13:5)

1. Kazanskiy filial Akademii nauk SSSR.
(Copper crystals)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

24.2110,24.2200,24.7900,
16.8100,5(4)

76969
SOV/56-37-6-9/55

AUTHORS: Avvakumov, V. I., Garif'yanov, N. S., Kazyrev, B. M., Tishkov, P. G.

TITLE: Paramagnetic Resonance and Paramagnetic Relaxation in Electrolyte Solutions

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 37, Nr 6, pp 1564-1569 (USSR)

ABSTRACT: Measurements were made of the paramagnetic resonance and paramagnetic relaxation in aqueous solutions of MnO_3, $MnCl_2$, $Cr(NO_3)_3$, and $Cu(NO_3)_2$. An analysis of the experimental results showed that the complex $Cu^{2+}Y_6$ has a structure of bipyramid stretched in the direction of one of the symmetry axes of the fourth order (cf. V. I. Avvakumov, Zhur. eskp. i teoret. fiz., 37, 1017, 1959). This effect for the hexahydrate complex in liquid solutions is dynamic in nature (cf. B. M. Kozyrev, Faraday Soc. Discussions, 19, 135, 1955). This means that

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

Paramagnetic Resonance and Paramagnetic Relaxation in Electrolyte Solutions

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SOV/56-37-6-9/55

in a given position of the ligand along the axes in a rectangular system of coordinates, the bipyramidal complex can be stretched in the direction of any three coordinates of the axes. All states in this case are energetically identical. In order to pass from one state into another, the system must overcome a potential barrier, which for the hexahydrate complex $\sim 1000\ cm^{-1}$. It was calculated that the transfer proceeds at a frequency of $\sim 10^{11} sec^{-1}$. At the same frequency the returning of the electron density of the magnetic ion also takes place. This leads to an averaging of the g-factor. The electric field of the violet modification of the salt $[Cr(H_2O)_6]^{3+}$ has in the main a cubic symmetry which, because of the effect of the particles of the second coordinational medium, contains an admixture of the fields of lower symmetry. The fluctuation of the fields caused by these particles is sufficiently slow. The existence of such fields was confirmed by comparing the observed

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

Paramagnetic Resonance and Paramagnetic Relaxation in Electrolyte Solutions

76969
SOV/56-37-6-9/55

width of lines in solutions with the period of the spin-lattice relaxation for 0.1 M solutions of Cr^{3+}($\Delta H \approx 200$ G, $\rho_1 \sim 10^{-8}$ sec). These fields are weaker than the axial fields in solid chromium alum, because the total spectral width in powdered alum is considerably wider than the width of a single line observed in solutions. In the green modification of Cr^{3+} salts, the paramagnetic resonance line is still wider because the complex $[Cr(H_2O)_4X_2]^+$ is less symmetrical. The magnetic complexes of Mn^{2+} in diluted solutions have nearly a pure cubic symmetry, whereas in nonaqueous $MnCl_2$ solutions there were observed very wide resonance lines at a given relaxation period. This was explained by the presence of a strong axial component of the crystal field, which is caused by the presence of ionic molecules of the type $X^- - Mn - X^-$. The experimental values ρ_1 for a given magnitude of H_o in the case of $Mn(NO_3)_2$ gradually increased upon dilution:

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

Paramagnetic Resonance and Paramagnetic Relaxation in Electrolyte Solutions

76969
SOV/56-37-6-9/55

approximately 50-60% with a change in the concentration by several moles up to 0.25 M. The anion had a small effect on the magnitude of this phenomenon. These data accord with the theory of S. A. Al'tshuler and K. A. Valiev (cf. Zhur. eksp. i teoret. fiz., 35, 974, 1958). The text contains a diagram of the setup; 4 graphs; and 14 references, 10 Soviet, 1 Dutch, 1 U.K., 2 U.S. The U.K. and U.S. references are: (1) U. Opik, M. H. L. Pryce, Proc. Roy. Soc., A238, 425, 1957; (2) B. R. McGarvey. J. Phys. Chem., 61, 1232, 1957; (3) H. J. Mc Connell. J. Chem. Phys., 25, 709, 1956.

ASSOCIATION: Phys.-Tech. Inst. of the Kazan Branch of Acad. Sciences USSR (Fiziko-tekhnicheskiy institut kazanskogo filiala Akademii nauk SSSR)

SUBMITTED: July 6, 1959

Card 4/4

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

86892

24.1200 (1138, 1134, 1158)

S/056/60/039/005/006/051
B029/B077

AUTHORS: Avvakumov, V. I., Garif'yanov, N. S., Semenova, Ye. I.

TITLE: Electron Paramagnetic Resonance and Paramagnetic Relaxation in Liquid and Undercooled Solutions of Ti^{+++} Salts

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 39, No. 5(11), pp. 1215 - 1220

TEXT: The authors detected an electron paramagnetic resonance in liquid solutions of $TiCl_3 6H_2O$ in glycerin and alcohol and also in undercooled solutions at 77° and 200°K at frequencies of 300 and 9640 megacycles. Moreover, they studied pyridine complexes of Ti^{+++}, and also specimens of silicate glass and boron glass which contained titanium compounds. The shape of the resonance lines obtained from polycrystalline specimens is determined mainly by the anisotropy of the g-factor. Table 1 shows how the line width ΔH depends on the concentration of Ti^{+++} in different solvents.

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Electron Paramagnetic Resonance and Paramagnetic Relaxation in Liquid and Undercooled Solutions of Ti^{+++} Salts

S/056/60/039/005/006/051
B029/B077

Concentration of the solvent in moles/l	ΔH, Oe		
	77°K	200°K	295°K
Glycerin solution $TiCl_3 \cdot 6H_2O$			
2	54	60	-
1	32	35	-
0.5	17	18	-
0.25	14	17	10
0.1	13	16	10
0.01	13	16	10

Concentration of the Solvent in moles/l	ΔH, Oe		
	77°K	200°K	295°K
Alcohol solution $TiCl_3 \cdot 6H_2O$			
1	63	-	-
0.5	35	-	20
0.25	27	-	10
0.1	17	-	10
0.05	16	-	10
0.01	16	-	10

The intensity of electron paramagnetic resonance decreases considerably during the transition from an undercooled state into a liquid state. For undercooled solutions of $TiCl_3 \cdot 6H_2O$ the line of electron paramagnetic resonance is very asymmetric and shows a second unresolved

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Electron Paramagnetic Resonance and Paramagnetic Relaxation in Liquid and Undercooled Solutions of Ti^{+++} Salts

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B029/B077

absorption maximum. For ν = 9460 Mc/sec Table 2 is valid:

$g_{\parallel}$	$g_{\perp}$	g_{eff}
77°K		290°K
Glycerin solution of $TiCl_3 \cdot 6H_2O$		
1.99	1.93	1.95
Alcohol solution of $TiCl_3 \cdot 6H_2O$		
2.00	1.90	1.94

When the temperature of the undercooled solution rises, the width of the line and the asymmetry of the curves decrease; when the liquid state is reached, the lines are symmetric and narrow. At ~400°K the frequency dependence vanishes. In parallel fields, an absorption $\chi''_s(H)$ exists at 300 megacycles in a 2 M solution of $TiCl_3 \cdot 6H_2O$ in glycerin at 77°K, which is caused by spin relaxation. At a double dilution of this solution, the intensity of absorption is nearly zero. More details are given. ΔH for curves of electron paramagnetic resonance in concentrated glycerin and alcohol solutions is caused by magnetic dipole-dipole interaction. In dilute solutions, the line width which is

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86892

Electron Paramagnetic Resonance and Paramagnetic Relaxation in Liquid and Undercooled Solutions of Ti^{+++} Salts

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B029/B077

independent of the concentration, is due to the anisotropy of the g-factor and the contribution of the magnetic moments from protons of surrounding molecules. The spin-lattice relaxation contributes to ΔH according to $\Delta H \sim 1/\rho_{\parallel} + 1/\rho_{1}$. The transition from the undercooled solution to the liquid state influences the motion which causes a decrease of the line width. At 9460 megacycles, the shape of the curves for electron paramagnetic resonance is typical of ions with a strong isotropic g-factor. The shift of spin-spin relaxation toward lower frequencies with a decrease in concentration indicates an increase of the spin-lattice relaxation time ρ_1. This was explained by the thermal reservoirs of N. Bloembergen and S. Wang. The absence of electron paramagnetic resonance in silicate and boron glass indicates the presence of tetravalent titanium in these types of glass. The authors thank B. M. Kozyrev for a discussion of the results, and Yu. M. Ryzhmanov for assistance in experiments. There are 1 table and 17 references: 5 Soviet and 12 US.

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86892

Electron Paramagnetic Resonance and Paramagnetic Relaxation in Liquid and Undercooled Solutions of Ti^{+++} Salts

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B029/B077

ASSOCIATION: Kazanskiy filial Akademii nauk SSSR (Kazan' Branch of the Academy of Sciences USSR)

SUBMITTED: June 17, 1960

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S/181/61/003/007/020/023
B104/B203

AUTHORS: Avvakumov, V. I., Garif'yanov, N. S., Salikhov, S. G., and Semenova, Ye. I.

TITLE: Paramagnetic resonance in $TiCl_3 \cdot 6H_2O$ and $Ti_2(SO_4)_3 \cdot 4H_2O$ layers

PERIODICAL: Fizika tverdogo tela, v. 3, no. 7, 1961, 2111 - 2114

TEXT: In a previous paper (ZhETF, 39, 11, 1215, 1960), the authors had studied the paramagnetic resonance absorption of $TiCl_3 \cdot 6H_2O$ and $Ti_2(SO_4)_3 \cdot 4H_2O$ salts dissolved in glycerin and alcohol at T = 77°, 200°, and 300°K. They had found an anisotropy of the g-factor. Here, they report on experiments with powdery (fine-crystalline) specimens. The experiments were made at 9594 Mc/sec and 270 Mc/sec at 77° and 200°K, with the same salts as indicated above and with specimens in which these salts were dissolved in diamagnetic Al salts at ratios of Ti:Al = 1:10 and Ti:Al = 1:100. The results shown in Fig. 1a reveal that the g-factor of Ti^{3+} is anisotropic at 77°K; g_1 = 1.91 and g_2 = 1.84. On heating,

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this line becomes symmetrical, and disappears completely above 200°K. Between T = 77°K and a temperature T_{up}, the form of this line is temperature dependent. T_{up} is supposed at 100 - 120°K. At T = 200°K, the line is symmetrical, the g-factor is 1.91±0.02, and the half-width of the line ΔH = 376 oersteds. At 270 Mc/sec, this line is symmetrical at T = 77°K, and the half-width is 81 oersteds. The dissolved specimens (1:100) have, at the higher frequency at 77°K, in contrast to the undissolved specimens, a symmetrical line with g_{eff} = 1.91±0.02 at a width ΔH = 203 oersteds. At 270 Mc/sec, this line is narrower (ΔH = 38 oersteds). With further dilution of the solution, g_{eff} and the line width remain constant. g_{eff} = 1.91±0.02 was determined on $Ti_2(SO_4)_3 \cdot 4H_2O$ at the higher frequency at 77°K (undissolved specimen). Here, the line is symmetrical, the width is 209 oersteds (Fig. 2a). Also here, the line width does not depend on temperature in a certain temperature range. T_{up} is estimated with 200°K. Above this temperature, this line becomes wider and disappears. In contrast to the above-mentioned chloride, the line width is almost equal at

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both frequencies. In the solution 1:10, the line width is 147 oersteds at the higher frequency, and 26.5 oersteds at the lower one. In a discussion of the results, it is stated that the line width at the higher frequency is determined by the anisotropy of the g-factor. The symmetry of lines of dissolved specimens at higher frequencies is explained by inhomogeneities of the intercrystalline field. The authors conclude that the line width of the undissolved specimens is determined by magnetic dipole-dipole interactions. The dependence of the line width on the concentration of magnetic particles is given as a proof. Since the paramagnetic resonance absorption can be observed at 77°K and over, the authors conclude that the lower orbital triplet of Ti^{3+}, which in the ground state is in a field with cubic symmetry, is strongly split by fields of lower symmetry. If the Ti^{3+} ion is in an octahedral environment, the crystal field can have no axial symmetry but only trigonal symmetry. It is also possible that the Ti^{3+} ion is in a tetrahedral environment. The authors thank S. A. Al'tshuler and B. M. Kozyrev for a discussion of the results. There are 2 figures and 4 references: 1 Soviet-bloc and 3 non-Soviet-bloc.

ASSOCIATION: Kazanskiy filial AN SSSR (Kazan' Branch of the AS USSR)
Kazanskiy gosudarstvennyy universitet im. V. I. Ul'yanova-

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AVVAKUMOV, V.I.; GARIF'YANOV, N.S.; SEMENOVA, Ye.I.

Electron paramagnetic resonance in trivalent titanium halides. Fiz. met. i metalloved. 12 no.4:624 O '61. (MIRA 14:11)

1. Kazanskiy filial AN SSSR.

(Titanium halides)

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S/051/62/013/004/014/023
E032/E414

AUTHOR: Avvakumov, V.I.

TITLE: Distortion of the complexes $Cr^{3+}(H_2O)_6$ and $Ni^{2+}(H_2O)_6$ and the splitting of spin levels of Cr^{3+} and Ni^{2+} due to the Jahn-Teller effect

PERIODICAL: Optika i spektroskopiya, v.13, no.4, 1962, 588-591

TEXT: It is noted that there are ions (e.g. Cr^{3+} and Ni^{2+}) for which the ground state in a field with cubic symmetry is non-degenerate with respect to the orbital angular momentum but degenerate with respect to the spin (four-fold degeneracy and three-fold degeneracy in the case of Cr^{3+} and Ni^{2+}, respectively). According to the Jahn-Teller theorem (Proc. Roy. Soc., A161, 1937, 220; Proc. Roy. Soc., A164, 1937, 117), this degeneracy should be removed by distortion. The aim of the present work was to compute the splitting of spin levels of Cr^{3+} and Ni^{2+} and to determine the character and degree of distortion of the complexes $Cr^{3+}(H_2O)_6$ and $Ni^{2+}(H_2O)_6$ due to the Jahn-Teller effect. The problem is solved essentially with the aid of the Van-Vleck theorem (Phys. Rev. 57, 1940, 426). Calculations show that owing to the Jahn-Teller effect the Cr and Ni complexes

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do not have the form of a regular octahedron and therefore the spin levels exhibit partial splitting. Approximate calculations indicate that the Cr^{3+} complex does not possess a stable form. The Ni^{2+} complex has the form of a bipyramid-octahedron elongated along the C_4 axis. In order to estimate the magnitude of the distortion of the Ni^{2+} complex it is compared with the distortion of $Cu^{2+}(H_2O)_6$ and it is found that the former is distorted to a greater extent (by a factor of 28). The spin-level splitting for the Cr complex is the same for all the possible distortions of the complex and is roughly equal to [illegible], which explains the fact that paramagnetic resonance has not been observed up to frequencies of the order of 10^{+10} sec^{-1}. It appears that this resonance should be observed at higher frequencies.

SUBMITTED: March 20, 1962

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L 65267-65 EWT(1)/EPF(c) IJP(c) WW/GG

ACCESSION NR: AR5014401

UR/0058/65/000/004/D048/D048

SOURCE: Ref. zh. Fizika, Abs. 4D367

AUTHOR: Avvakumov, V. I.

TITLE: A mechanism for averaging g-factors due to rotation

CITED SOURCE: Sb. Itog. nauch. konferentsiya Kazansk. un-ta za 1962 g. Kazan', Kazansk. un-t, 1963, 15-17

TOPIC TAGS: electron paramagnetic resonance, resonance line

TRANSLATION: The author examines the effect which rotation of anisotropic magnetic centers (molecules, ion complexes, etc.) has on the averaging of g-factors which determine the shape of an electron paramagnetic resonance line. An effective value is derived for the g-factor

$$g_{eff} = 1/9\,(g_{\parallel} + 4g_{\perp} + 4g_{av})$$

when the following simplifying assumptions are made: 1) the complexes may rotate with equal probability around any of their three axes; 2) each complex rotates with

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a constant angular velocity ω. g_{av} is expressed through $g_{\parallel}$ and $g_{\perp}$. At reasonable values for $g_{\parallel}$ and $g_{\perp}$, g_{eff} is approximately equal to the widely used expression

$$1/3\,(g_{\parallel} + 2g_{\perp})$$

Calculation shows that even with complete averaging $(\hbar\omega \gg \Delta g\beta H)$ the shape of the electron paramagnetic resonance lines remains asymmetric, and the asymmetry and width depend on the electron paramagnetic resonance frequency. V. Dyomin.

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23631
S/200/61/000/006/003/004
D206/D303

AUTHORS: Val'tsev, V.K., Avvakumov, Ye. G. and Pyr'yev, M.F.

TITLE: Distribution of lanthanoids in the fusion of ammonium nitrate in the process of zoned crystallization

PERIODICAL: Akademiya nauk SSSR. Sibirskoye otdeleniye. Izvestiya, no. 6, 1961, 71-74

TEXT: The purpose of this work was the study of the distribution of the reaction products of rare-earth oxides (La, Pr, Nd, Sa, Er and Y) with fused ammonium nitrate in the process of zoned crystallization. There appears to be little published information concerning the application of zoned crystallization for separating and purifying rare-earth elements, although the method has been employed by Sue et al (Ref. 1: P. Sue, I. Pauly, Bull. Soc. Chim. de France, No. 5, 593 (1958) for isolating other elements with similar chemical properties. Further research by V. Val'tsev and V. Kovyrzina (Ref. 5: Izv. sibir. otdel. Akad Nauk SSSR, No. 10, 1960) resulted in the development of a technique for obtaining the double nitrate of lan-

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23631

Distribution of lanthanoids... S/200/61/000/006/003/004
D206/D303

thanum and in certain data regarding its solubility in fused ammonium nitrate. The experimental procedure adopted by the authors comprises the initial solution of rare-earth oxides in molten ammonium nitrate; the cooling of the melt in an aluminum boat, with the formation of a semi-cylindrical slab having a length of 32 cm; the refusion of the slab at 170 - 190°C in a molybdenum-glass tube by means of a heater which is fitted with a thermocouple and rheostat to ensure smooth temperature control and which is moved over the slab at a speed of 0.82 cm/hr; the removal of the slab from the boat after a period of 45 hours; and the subsequent dissection of the slab into ten equal parts which are then analyzed for the rare-earths. During the passage of the salt slab through the molten zone the rare-earths are redistributed in such a way that their concentration at the end of the slab considerably exceeds the original value. The distribution curves for the nitrates of Nd, Sa and Y are shown graphically. The coefficient of enrichment (K) - necessary for comparing the behavior of elements in the process of zoned crystallization - was calculated from the ratio of their inital to final concentration. After three slab runs through the fused zone the dis-

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23631

Distribution of lanthanoids... S/200/61/000/006/003/004
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tribution of elements at the end of the slab is in direct linear relationship to their atomic weights (A): K = 0.063A - 7.33. This relationship also holds for a slab of heterogeneous composition prepared in a slightly different manner. Coefficients of separation - the ratio of the enrichment coefficients for certain pairs of elements - were found in order to appraise the possibility of purifying particular elements. They reach a maximum when nitrates are crystallized in a heterogeneous slab, after no less than nine runs through the fused zone. The pairs Sa - Y and Nd - Sa were therefore subjected to zoned purification under these conditions which are evidently the most favorable for purifying certain pairs of rare-earth elements. A relatively pure separation is effected in the case of samarin and yttrium: the yttrium content rises from 97.1% to 99.2%, while the samarin concentration falls from 2.9% to 0.8%. The removal of neodymium from yttrium, however, was not successfully accomplished. This is believed to be due to the fact that the distribution of rather large amounts of rare-earths in ammonium nitrate differs from the normal distribution specified by existing equations (Ref. 6: Metody polucheniya chistykh metallov (Methods of Obtaining

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Pure Metals), Sb. perevodov (Collection of translations), IL, 1957) which are only applicable in the case of a low concentration of impurities in a slab in the process of zoned crystallization. The authors conclude that their method is only suitable for separating some elements of the yttrium and cerium groups; it is not recommended for purifying mixtures consisting of elements from other rare-earth groups with very similar properties. There are 3 figures, 1 table and 6 references: 2 Soviet-bloc and 4 non-Soviet-bloc. The references to the English-language publications read as follows: J.K. Marsh, J. Chem. Soc. No. 1, 2051 (1946); R.C. Vickery, J. Chem. Soc. No. 10, 2508 (1949); T. Meller, V. Aftandialian, J. Amer. Chem. Soc. 76, 5249 (1954).

ASSOCIATION: Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR (Organic Chemistry Institute of the Siberian Division, AS USSR) Novosibirsk

SUBMITTED: September [illegible], 1960

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27733
S/200/61/000/009/003/003
D219/D301

52300

AUTHOR: Avvakumov, Ye. G.

TITLE: Distribution coefficients of lanthanoids in ammonium nitrate during zoned recrystallization

PERIODICAL: Akademiya nauk SSSR. Sibirskoye otdeleniye, Izvestiya, no. 9, 1961, 117-119

TEXT: According to A.N. Kirintsev (Ref. 1: Zh. fiz. khim., 23., no. 6, 1422, 1959) and (Ref. 2: Matematicheskaya teoriya protsessov zonnoy plavki (Mathematical Theory of the Processes of Zoned Fusion), Novosibirsk, 1960), the relationship of the admixture-concentration coefficient along the slab length to the number of runs, the original concentration and the length of the molten zone is expressed by

$$C_x = C_0 \left\{ 1 - e^{-\frac{\lambda x}{b}} \left[\left(1 + \eta + \frac{1}{2!}\eta^2 + \dots + \frac{1}{(n-1)!}\eta^{n-1} \right) - \right. \right.$$

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$$-\left(\lambda^{n} + \lambda^{n-1}\eta + \lambda^{n-2}\frac{1}{2!}\eta^{2} + \ldots \lambda\frac{1}{(n-1)!}\eta^{n-1}\right)\Bigg]\Bigg\}, \qquad (1)$$

where $\eta = \lambda\frac{x}{b}e^{-\lambda}$, x is the distance from the beginning of the slab, b is the width of the molten zone, C_0 is the original admixture-concentration and n is the number of runs. When $x \rightarrow 0$ the equation becomes

$$C_{x \rightarrow 0} = C_0 \lambda^{n} \qquad (2)$$

and may serve for calculating the magnitude of λ which corresponds to the distribution coefficient K. Using the data of V.K. Val'tsev et al (Ref. 4: Izv. Sibirsk. Otdel. AN SSSR, no. 6, 1961) for distributing the reaction-products of rare-earth elements with ammonium nitrate during its zoned recrystallization, the authors found the values of λ from Eq. (2) and then carried out a calculation from Eq. (1). This was done for the slab's initial

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part; for the end set crystallization takes place, and the distribution is thereby described by another equation which in the case of one run has the form

$$C = \lambda C_0 (1-g)^{\lambda - 1} \quad (3)$$

where λ, C and C_0 have the same values as in equation (1), g being the slab's crystallized part. The slab, devided into 10 sections, was passed three times through the molten zone at a speed of 0·82 cm/hr. Tests were made for La, Pr, Nd, Sm, and Er, the values found for λ amounting to 0·92, 0·90, 0·86, 0·83 and 0·75 respectively. These experimental data are considered to be satisfactorily described by Eq. (1), and it is concluded that

$$\lambda = -0{\cdot}0076m + 1{\cdot}97 \quad (4)$$

where m is the atomic weight of the rare-earth element. The author also notes the tendency for the distribution coefficient to decrease as the

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S/181/62/004/012/012/052
B104/B102

P 956

AUTHORS: Kirgintsev, A.N., and Avvakumov, Yu.G.

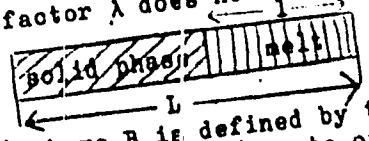
TITLE: Investigation of the capture of nonisomorphous impurities by a growing crystal from the melt

PERIODICAL: Fizika tverdogo tela, v. 4, no. 12, 1962, 3427-3434

TEXT: It is shown that during the growth of an ingot at constant rate in one direction, the impurity distribution can be described by

$$y(p)=\lambda(p)\frac{1-\frac{c_2'}{c_{20}}}{1-p}, \qquad p=1-\frac{l}{L} \qquad y(p)=\frac{\Delta c_2'}{\Delta c_1'}\frac{c_{10}}{c_{20}},$$

or, if the equilibrium separation factor λ does not depend on the concentration, by $y(p) = \lambda(1-p)^{\lambda-1}$.



λ is determined from the relation $\lambda = 1 - \exp(-Bv)$ where B is defined by the type of impurity and the intermixing of the melt; v is the rate of growth of the crystal. Here, c_1' and c_2' are the amounts of basic substance and impurity in

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the solid phase, c_{10} and c_{20} are the initial amounts of basic substance and impurity in the ingot. To check these equations, distribution of the nitrates of silver, barium and lanthanum was studied during the oriented crystallization of ammonium nitrate. The crystals were grown by the Bridgman method, the melt being intermixed by a stirrer to ensure an even distribution of the impurities. $\lambda = 1 - \exp(-0.265v)$ was obtained for barium nitrate, $\lambda = 1 - \exp(-0.138v)$ for lanthanum nitrate, and $\lambda = 1 - \exp(-0.103v)$ for silver nitrate. It follows therefrom that λ does not depend on the charge of the impurity cation but on its size. The smaller the difference between the radii of the basic-substance cations and the impurity cations, the more easily the impurities are captured by the growing crystal. For B the result was $B = -0.500 + 0.535r_k$, where r_k is the radius of the impurity cation. λ decreases with decreasing r_k. The dependence of λ on r_k and the fact of its not depending on the charge of the impurity cation is explained by the large radius of the NO_3^- anion limiting the effect of its charge to the directly adjacent neighbor anions. There are 10 figures and 2 tables.

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L 13013-63 EWP(q)/EWT(m)/BDS AFFTC/ASD JD/JG

ACCESSION NR: AP3002908 S/0219/63/000/001/0152/0154

AUTHOR: Val'tsev, V. K.; Ivvakumov, Ye. G.; Py*r'yev, N. F.; Kravchenko, L. Kh.

TITLE: Separation of lanthanides in ammonium nitrate with the help of zone crystallization. Part 3

SOURCE: AN SSSR. Sibirskoye otdeleniye. Izvestiya. Seriya khimicheskikh nauk, no. 1, 1963, 152-154

TOPIC TAGS: zone crystallization, La, Nd, Er, Sm, Gd, Yt, lanthanide separation

ABSTRACT: The possibility of separating La, Nd, Er, Sm, Gd, and Yt as double sulfates from ammonium nitrate melts by zone crystallization was investigated. Separation was indicated after only 3 passes of the molten zone at 0.82 cm/hr, using ammonium sulfate as precipitant; the lanthanide double sulfates settled out in the central portion of the bar. (Ammonium oxalate was also effective as precipitant.) The lighter element is more concentrated in the latter part of the ingot; it dissolves more readily in the NH sub 4 NO sub 3 than the heavy element and passes to the end of the ingot. Optimum conditions for selective separation (selection of precipitant, length of ingot, number of passes, lanthanide concentration, etc.) remain to be worked out. Orig. art. has: 2 tables and 2 fig.

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Association: Inst. of Inorganic Chemistry, Siberian Dept., AN SSSR

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

KIRGINTSEV, A.N.; AVVAKUMOV, Ye.G.

Equations for fusibility curves of simplest binary systems. Report No.2. Izv. SO AN SSSR no.7 Ser.khim.nauk no.2:8-19 '63. (MIRA 16:10)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR, Novosibirsk.

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

L 41572-65 EWT(1)/EWT(m)/EWA(d)/EPR/T/EWP(t)/EWP(z)/EWP(b)/EWA(h) Pz-6/
Ps-4/Peb IJP(c) JD/JW/JG/AT

ACCESSION NR: AP5009425 S/0289/64/000/003/0073/0077 46 45 B

AUTHOR: Kirgintsev, A.N.; Avvakumov, Ye. G.

TITLE: Equations of the fusibility curves of semiconducting compounds

SOURCE: AN SSSR, Sibirskoye otdeleniye. Izvestiya. Seriya khimicheskikh nauk, no. 3, 1964, 73-77

TOPIC TAGS: semiconductor fusibility, melting point curve, free energy, enthalpy, entropy, aluminum alloy, antimony alloy, gallium alloy, indium alloy, arsenic alloy

ABSTRACT: The authors derive equations for the fusibility curves of semiconducting compounds using the chemical potentials of the components and the changes in free energy, enthalpy and entropy. The theoretical and experimental data are compared by means of graphs for the systems aluminum - antimony, gallium - antimony, indium - antimony, gallium - arsenic, and indium - arsenic. In general, a satisfactory agreement was observed. Some general characteristics of the fusibility equation derived,

$$n_0 \ln \frac{T_0}{T} = \ln \frac{1}{x_1 x_2}$$

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L 41572-65

ACCESSION NR: AP5009425

are examined. Orig. art. has: 6 figures, 1 table and 23 formulas.

ASSOCIATION: Institut neorganicheskoy khimii Sibirskogo otdeleniya Akademii nauk SSSR, Novosibirsk (Institute of Inorganic Chemistry, Siberian Branch, Academy of Sciences, SSSR)

SUBMITTED: 26Jun63 ENCL: 00 SUB CODE: IC, TD

NO REF SOV: 003 OTHER: 000

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Card 2/2

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

ACCESSION NR: AP4028447

S/0181/64/006/004/1167/1171

AUTHORS: Kirgintsev, A. N.; Avvakumov, Ye. G.

TITLE: Some patterns of capture of nonisomorphous impurities during crystallizations of potassium nitrate from a melt

SOURCE: Fizika tverdogo tela, v. 6, no. 4, 1964, 1167-1171.

TOPIC TAGS: potassium nitrate, impurity capture, impurity distribution, crystal growth

ABSTRACT: The authors studied the distribution of different nonisomorphous impurities during directional crystallization of potassium nitrate. The impurities were: $LiNO_3$, $AgNO_3$, $CsNO_3$, $Ca(NO_3)_2$, $Ba(NO_3)_2$, $Cd(NO_3)_2$, $Y(NO_3)_3$, $La(NO_3)_3$, KCNS, K_2SO_4, and $K_2Cr_2O_7$. The dependence of the distribution on the crystallization rate under conditions of constant stirring was examined. The separation factors of the impurities were determined, and it was found that the equation previously derived by the authors (FTT, 4, 3427, 1962), expressing the dependence of the separation factor of such nonisomorphous impurities on the crystallization rate during con-

Card 1/2

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

ACCESSION NR: AP4034944

S/0181/64/006/005/1547/1548

AUTHORS: Kirgintsev, A. N.; Avvakumov, Ye. G.

TITLE: The concentration dependence of the separation factor

SOURCE: Fizika tverdogo tela, v. 6, no. 5, 1964, 1547-1548

TOPIC TAGS: separation factor, crystal growth, concentration dependence

ABSTRACT: The authors used the equation $y = \lambda(1-p)^{\lambda-1}$ to determine the separation factor λ during crystal growth (y is the relative concentration and p is the relative length of the rod). This equation is transformed to a logarithmic expression, $\log y = \log \lambda + (\lambda-1) \log (1-p)$, which, when graphed, will give the value of λ, either from the slope or from the intersection with the ordinate axis at $p = 0$. These should give the same value but do not at the low values obtained by the second method ($\lambda < 0.5$). If the first method gives λ_2, the second λ_1, it may be stated that the difference between the two becomes progressively greater as λ_1 becomes smaller, and when λ_1 falls below 0.2, λ_2 becomes negative. This peculiarity is due to the fact that, when $\lambda_1 < 0.5$, the separation factor depends

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

KIRGINTSEV, A.N.; AVVAKUMOV, Ye.G.

Effect of the rate of crystallization on the effectiveness of zone purification. Izv. SO AN SSSR no.7 Ser. khim. nauk no.2: 44-47 '64 (MIRA 18:1)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR, Novosibirsk.

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

KIRGINTSEV, A.N.; AVVAKUMOV, Ye.G.

Determination of distribution coefficients from data of oriented crystallization. Fiz. tver. tela 7 no.5:1583-1584 My '65. (MIRA 18:5)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR, Novosibirsk.

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

KIRGINTSEV, A.N.; AVVAKUMOV, Ye.G.

Thermodynamics of fused salts with a common ion. Usp. khim. 34 no. 1154-175 Ja '65. (MIRA 18:4)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR.

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

KARGINTSEV, A.N.; AVVAKUMOV, Ye.G.; KULESHOV, I.M.

Separation factors of radioactive fission elements in the process of directed crystallization of sodium nitrate. Radiokhimiia 7 no.1:3-7 '65. (MIRA 18:6)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

KIRGINTSEV, A.N.; AV'IAKUMOV, Ye.G.

Relation between separation factors in binary and ternary systems. Radiokhimiia 7 no.1:107-110 '65. (MIRA 18:6)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

KIRGINTSEV, A.N.; AVVAKUMOV, Ye.G.

Method for stirring the melt in directed crystallization. Kristallografiia 10 no.3:449-450 My-Je '65. (MIRA 18:7)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR.

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

L 64325-65 EWT(m)/T/EWP( )/EWP(b)/EWA(c) JI

ACCESSION NR: AP5012590 UR/0181/65/007/005/1583/1584

AUTHOR: Kirgintsev, A. N.; Avvakumov, Ye. G. 16

TITLE: On the determination of the distribution coefficients from data on directed crystallization 16

SOURCE: Fizika tverdogo tela, v. 7, no. 5, 1965, 1583-1584

TOPIC TAGS: crystal growing, crystallization, distribution coefficient

ABSTRACT: The authors derive a formula for the coefficient of distribution of an impurity between the melt and the solid phase (polycrystal or single crystal) when the crystal is obtained by directed crystallization, in which the initial part of the ingot crystallizes under conditions which do not correspond to the conditions of the remaining and larger part of the ingot. This formula was used without proof in earlier work on this subject by the authors (FTT v. 6 1167 and 1547, 1964) and some misprints in the earlier articles are also pointed out. Orig. art. has: 1 figure and 6 formulas.

ASSOCIATION: Institut neorganicheskoy khimii SO AN SSSR, Novosibirsk (Institute of Inorganic Chemistry SO AN SSSR)

SUBMITTED: 28Dec64 ENCL: 00 SUB CODE: SS

NR REF SOV: 003 OTHER: 000

Card 1/1

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

KIRGINTSEV, A.N.; AVVAKUMOV, Ye.G.; VULIKH, A.T.

Behavior of alkali metal impurities in the crystallization of cesium salts from a melt. Dokl. AN SSSR 164 no.6:1315-1318 O '65. (MIRA 18:10)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR. Submitted March 29, 1965.

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

KIRGINTSEV, A.N.; AVVAKUMOV, Ye.G.

Intercrystalline capture of a nonisomorphous mixture in oriented crystallization of a substance from a melt. Izv. AN SSSR. Neorg. mat. 1 no.5:638-642 My '65. (MIRA 18:10)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR.

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

L 21118-66 EWT(1)/EWT(m)/T IJP(c) WW/JWD/GG

ACC NR: AP6011962 SOURCE CODE: UR/0070/65/010/003/0449/0450

AUTHOR: Kirgintsev, A. N.; Ayvakumov, Ye. G.

ORG: Institute of Inorganic Chemistry, Siberian Branch, AN SSSR (Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR)

TITLE: Method of mixing a melt during oriented crystallization

SOURCE: Kristallografiya, v. 10, no. 3, 1965, 449-450

TOPIC TAGS: crystal growth, crystal growing, crystallization

ABSTRACT: A layer developes near the surface of a crystal growing in a melt that is either richer or leaner than the melt and interferes with proper crystal growth and its degree of purity. The mixing method proposed, intended to eliminate the layer, consists of spinning the partially filled crystal-growing ampoule about its own longitudinal axis. Comparative tests were made of various mixing methods with potassium nitrate samples. Test results indicate that a rotating mixer and spinning of the ampoule gives almost similar and better results than mixing by gas bubbles or by vibration, the latter method having no appreciable effect. Orig. art. has: 2 figures. [JPRS]

SUB CODE: 20 / SUBM DATE: 23May64 / ORIG REF: 003 / OTH REF: 001

Card 1/1 dla

UDC: 548.52

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

KIRGINTSEV, A.N.; AVVAKUMOV, Ye.G.

Capture of impurities in oriented and volume crystallization. Zhur. neorg. khim. 10 no.9:2187-2191 S '65. (MIRA 18:10)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR.

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

AVVAKUMOV, Ye.K.

Visual evaluation of the air flow about a rotating centrifugal pot in a free space. Izv. vys. ucheb. zav.; tekh. tekst. prom. no. 4: 127-134 '65. (MIRA 18:9)

1. Moskovskiy tekstil'nyy institut.

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

AVVAKUMOV, Ye.S.

Determining the amount of air entering through the thread guide into the spinning centrifugal pot rotating in a free space. Izv. vys. ucheb. zav.; tekh. tekst. prom. no.1:117-122 '65. (MIRA 18:5)

1. Moskovskiy tekstil'nyy institut.

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

BERG, L.G.; SIDOROVA, Ye.Ye.; VLASOV, V.V.; SOZIN, Yu.I.; AVVAKUMOVA, K.N.

Cadmium nitrate tetrahydrate and the products of its dehydration. Zhur. neorg. khim. 9 no.3:538-546 Mr '64. (MIRA 17:3)

1. Khimicheskiy institut AN SSSR i Kazanskiy filial AN SSSR.

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

A

ACC NR: L 11520-66 EWT(m)/EWP(j) RPL WW/RM
AP6001870

SOURCE CODE: UR/0190/65/007/012/2146/2149

AUTHORS: Kuznetsov, Ye. V.; Fayzullina, D. A.; Fayzullin, I. N.; Prosolova, T. N.; Avvakumova, N. I.

ORG: Kazan' Chemico-Technical Institute im. S. M. Kirov (Kazanskiy khimiko-tekhnologicheskiy institut)

TITLE: Interaction of aromatic disulfochlorides with dimethylol-containing organophosphorus compounds. 2nd communication in the series Phosphorus-containing polysulphonates

SOURCE: Vysokomolekulyarnye soyedineniya, v. 7, no. 12, 1965, 2146-2149

TOPIC TAGS: polymer, ~~polymerization~~, organic phosphorus compound, organic sulfur compound, sulfonic acid, organic synthetic process

ABSTRACT: This work was performed to extend the previously reported results of Ye. V. Kuznetsov, D. A. Fayzullina, and R. P. Tyurikova (Vysokomolek. soyed., 7, 761, 1965) and particularly to investigate the possibility of synthesizing linear polysulphonates on the basis of aromatic disulfochlorides and dimethyl-containing phosphorus organic compounds. The following phosphorus-containing polysulfonates based on bis-methylolphosphinic acid, propyl-, isopropyl-, isobutyl-, dimethylolphosphines and benzene-, toluene-, chlorobenzene-, diphenyl-, naphthalinedisulfochlorides were synthesized. The reactions were carried out either in the melt or

Card 1/2

UDC: 541.64+678.86

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L 11520-66

ACC NR: AP6001870

in n-heptane at 70—130°. Several physical properties, e.g., refractive index, solubility, viscosity, etc. were studied, and the results were tabulated. It was found that polysulfonates derived from bis-methylol-phosphinic acid hardened when treated with diisocyanate. Orig. art. has: 2 tables and 4 equations.

SUB CODE: 07,11/ SUBM DATE: 29Jan65/ ORIG REF: 003/

Card 2/2

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

AVVAKUMOVA, Ye. N.

Avvakumova, Ye. N. - "Procedures for Increasing the Effectiveness of Nitrogenation of Peas and Clover." Moscow State U imeni M. V. Lomonosov. Soil Biology Faculty. Moscow, 1956 (Dissertation for the Degree of Candidate in Biological Sciences).

So: Knizhnaya Letopis', No. 10, 1956, pp 116-127

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

PETROSYAN, A.P.; AVVAKUMOVA, Ye.N.

Cytological and cytochemical changes in nodule forming bacteria in nodules. Dokl. AN Arm. SSR 39 no.1:49-52 '64. (MIRA 17:8)

1. Institut mikrobiologii AN ArmSSR. Predstavleno akademikom AN ArmSSR V.O.Gulkanyanom.

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

ACCESSION NR: AP4045258 S/0252/64/039/002/0081/0085

AUTHOR: Avvazyan, Yu. M.; Sedrakyan, D. M.

TITLE: Excitation of electromagnetic waves by a charged particle moving in a planar semi-infinite wave guide

SOURCE: AN ArmSSR. Doklady, v. 39, no. 2, 1964, 81-85

TOPIC TAGS: charged particle, electromagnetic radiation, wave guide, electromagnetic wave, electromagnetic field, Maxwell equation, electrodynamics

ABSTRACT: The authors consider the excitation of electromagnetic waves inside a semi-infinite, planar wave-guide, the waves being generated by a charged particle moving within the wave guide with uniform velocity. Moreover, a formula is derived for the field of radiation infinitely far out in the plane of the wave-guide. More exactly, let a particle have charge e, and let the particle move with constant velocity $\vec{v}$ in the (x, y) plane so that it does not bisect the wave front of the wave-guide, and let it be at position $\vec{a}$ with reference to the origin at t = o. The equations of the planes bounding the wave-guide have the form $y = \pm b$, $x < o$, $-\infty < z < +\infty$. Maxwell's equations are then used, along with various integration techniques, to derive the field created at large distances from the origin. (See

Card 1/3

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ACCESSION NR: AP4045258

ENCLOSURE: 01

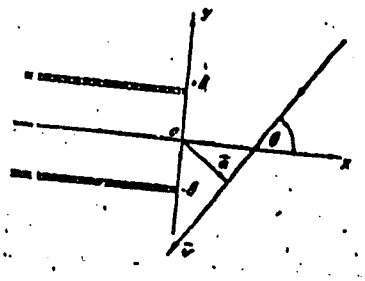

Fig. 1. Motion of a charged particle in a planar semi-infinite wave guide.

Card 3/3

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

AVVAKUMOVA, Ye.N.

Some biological characteristics of the relationship between nodule bacteria and leguminous plants. Vop. mikrobiol. no.2: 131-142 '64. (MIRA 18:3)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

AWGUSTINIK, A. I. [Avgustinik, A. I.]

The structure of porcelain. Szklo 12 no.12:364-370 D '61.

1. Leningradski Technologiczny Instytut im. Iensowieta, Katedra Ceramiki, [Leningrad].

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

AWSTRIC, Roman, lek. med.; JANKAU, Oskar,

Crossed ectopy of the kidney. Pol. przegl. chir. 37 no.4:Suppl: 437-441 Ap'65.

1. Z Oddzialu Urologicznego Szpitala Miejskiego w Slupsku (Ordynator: lek. med. R. Awstric).

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

AVYAGIN, Boris Borisovich; PINSKER, Z.G., doktor khim. nauk, prof. otv. red.

[Electron diffraction and structural crystallography of clay minerals] Elektronografiia i strukturnaia kristallografiia glinistykh mineralov. Moskva, Izd-vo "Nauka," 1964. 281 p. (MIRA 18:3)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

AVZDEYKO, G. V.,

Avzdeyko, G. V., G. I. Lovtsyus, A. V. Lovtsyus - The Method of Locating Lead in Radioactive Minerals.

The Sixth Session of the Committee for Determining the Absolute Age of Geologic Formations at the Department of Geologic-Geographical Sciences (OGGN) of the USSR Academy of Sciences at Sverdlovsk in May 1957

Izv. Ak Nauk SSSR, Ser. Geol., No. 1, 1958, p. 115-117 author Pekarskaya, T. B.

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

AVZDEYKO, G. V. Avzdeyko, G. V.

Avzdeyko, G. V., G. I. Lovtsyus, A. V. Lovtsyus--Sublimation as a Method for Determining Isotope Contents of Lead.

The Sixth Session of the Committee for Determining the Absolute Age of Geologic Formations at the Department of Geologic-Geographical Sciences (OGGN) of the USSR Academy of Sciences at Sverdlovsk in May 1957

Izv. Ak Nauk SSSR, Ser. Geol., No. 1, 1958, p. 115-117 author Pekarskaya, T. B.

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

AVZHIYEV, G. [Avdzhiev, G.]; KOYEN, R. [Koen, R.]

Phagotyping of the B paratyphoid bacteria in Bulgaria. Trudy epidemiol mikrobiol 8:9-11 '61 [publ.'62].

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

SHAKHNO, I.V.; PLYUSHCHEV, V.Ye.; AVZHIYEVA, Ye.M.

System $Na_2Cr_2O_7$ - $Cs_2Cr_2O_7$ - H_2O at 25° and 50°C.

Zhur. neorg. khim. 10 no.5:1237-1240 My '65. (MIRA 18:6)

1. Moskovskiy institut tonkoy khimicheskoy tekhnologii imeni Lomonosova.

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

SHAKHNO, I.V.; PLYUSHCHEV, V.Ye.; AVZHIYEVA, Ye.M.

The system Na_2CrO_4 - Rb_2CrO_4 - H_2O at 25 and 50°C. Zhur. neorg. khim. 10 no.2 552-555 F '65. (MIRA 18:11)

1. Moskovskiy institut tonkoy khimicheskoy tekhnologii imeni Lomonosova. Submitted April 10, 1964.

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

AVZURAGOV, A.A.; VESELOVA, N.D.

Use of polyacrylamide for the sizing of wool warp. Tekst.prom. 23 no.8:55-56 Ag '63. (MIRA 16:9)

1. Nachal'nik tekhnicheskogo otdela Bryanskogo kamvol'nogo kombinata (for Avzuragov). 2. Starshiy insh. tekhnicheskogo otdela Bryanskogo Kamvol'nogo kombinata (for Veselova).
(Sizing (Textile)) (Acrylamide)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

AZZURAGOVA, G.A.

Remote results following air contusion of the ear and working capacity. Vest. otrinolar., Moskva 14 no.1:34-37 Jan-Feb 52. (CIML 21:4)

1. Candidate Medical Sciences. 2. Of the Expert Clinic of Leningrad Scientific-Research Institute of Certification of Work Capacity and Work Placement of Invalids (Director--Prof. V.M. Shaverin).

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

BARSUKOV, O.A.; AVIYANOV, V.S.

Metal - water shielding for point neutron sources. Atom. energ. 16 no.1:40-48 Ja '64. (MIRA 17:2)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102620016-3

L 27895-65 EWT(m)/EWA(d)/EWP(t)/EWP(b)/EWA(h) JD/WB

ACCESSION NR: AP4012224 S/0089/64/016/001/0040/0048 15 B

AUTHORS: Barsukov, O.A.; Avetynov, V.S.

TITLE: Metal and water protection against neutron point sources 19

SOURCE: Atomnaya energiya, v.16, no.1, 1964, 40-48

TOPIC TAGS: Bolzman kinetic equation, Monte Carlo method, elimination cross section, resonance neutron, threshhold detector, 20 group approximation, beta radiation, gamma radiation, homogeneous medium, neutron point source, two layer medium, multilayer media

ABSTRACT: One of the two basic methods of determining the required neutron shielding is based on the phenomenological theory of the elimination cross section which provides an empirical estimate of a particular shielding. The other method is based on the Bolzman kinetic equation and statistical tests, and is also known as the Monte Carlo method. As both methods have their drawbacks, a third is suggested whereby the neutron flux is conditionally divided into two components: an unscattered part, described by the exponential law; and a scattered

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portion defined by a diffusion equation whose solution is simple and well known (G.I. Marchuk. Numerical Methods of Calculating Nuclear Reactors. Moscow, Atomizdat, 1958). In one of the experiments all the energy was divided into 20 groups, as the spectrum of the Po-Be-neutron source is highly complicated and covers an energy region of ~0.9-11 Mev in which the neutron cross sections are subject to considerable change. A study of the space-energy distribution of neutrons in multilayer media made it possible to follow the changing neutron spectrum in any multilayer system. It was also possible to follow the changing neutron energy spectrum originating from a point source in a homogeneous finite medium consisting of iron or water. A two-layer iron-and-water shielding was found to be more effective than a multilayer shielding where the overall thickness of the iron layer is the same. The results of these investigations were used to design a neutron container about half the size and weight of the standard plan installation and equally effective. Orig. art. has: 12 figures and 2 tables.

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ASSOCIATION: none

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L 06451-67 EWT(m)/EWP(t)/ETI IJP(c) JD/JR

ACC NR: AP6024539 SOURCE CODE: UR/0089/66/021/001/0027/0035

AUTHOR: Barsukov, O. A.; Avzyanov, V. S.; Ivanov, V. N.

ORG: none

TITLE: Study of spectra and doses produced in an iron-water shield by a monoenergetic neutron source

SOURCE: Atomnaya energiya, v. 21, no. 1, 1966, 27-35

TOPIC TAGS: reactor shielding, reactor neutron flux, radiation dosimetry

ABSTRACT: Results are presented of many-group calculations of the passage of neutrons emitted by monoenergetic sources through water (62 cm), iron (62 cm), and 10 cm of iron surrounded by 52 cm of water. The spectrum of the neutrons after passing through these shields is calculated in the 20-group diffusion-transport approximation, using a difference factorization method modified by the authors earlier (Atomnaya energiya v. 10, 478, 1961). The data on the various neutron parameters and the energy dependence of the microscopic cross sections were taken from various published sources. A detailed investigation was made of the high-energy region of the spectrum, and revealed certain signularities in the migration and slowing-down of the neutrons in the shields. Dose curves are plotted for neutrons with different energies on the basis of the computation data. The results also make it possible to determine the neutron distributions for sources with arbitrary spectra. It is concluded that the use of iron is not justified at all at energies below 1 Mev and that at energies near 10 Mev the

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addition of iron reduces the neutron dose by one-half order of magnitude. Orig. art. has: 8 figures and 1 formula.

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