AUTHORS: Kogan, V. S., Lazarev, B. G., Bulatova, R. F. 56-1-42/56

TITLE: On the Phase Diagram of the System Hydrogen - Deuterium (O diagramme sostoyaniya sistemy vodorod-deyteriy)

PERIODICAL: Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, 1958, Vol. 34, Nr 1, pp. 238-240 (USSR)

ABSTRACT: At first reference is made to papers dealing with the same subject. In the Congress on Physics of Low Temperatures held in June 1956 in Leningrad reports were also made on the results of investigations of the crystal-structure of the mixtures of hydrogen-isotopes. The solid solutions in such a system only exist in limited domains of concentration. The present paper gives more accurate data on this system which were obtained on the basis of the thermal analysis of the hydrogen-deuterium mixtures. The mixtures produced of pure isotopes were condensed in a calorimeter immersed in liquid hydrogen. After the evacuation the mixture was slowly heated in the temperature interval 14 - 19°C. The thermal analysis showed a horizontal part on the solidus curve at 16,4°K. By a comparison of the data of the thermal analysis with the results of the X-ray photographs at a temperature of 4,2°K the approximate boundaries of the domain of the separation

Card 1/3

in layers could be determined and the phase diagram hydrogen--deuterium in general could be outlined. The existence of the peritectic surface in crystallizations of the mixtures at concentrations of from 26 to 52 per cent by volume of hydrogen was visually verified. In parallel with the thermal analysis the X-ray structure investigations of the hydrogen--deuterium mixtures and of the pure isotopes were continued. A certain perfection of the method of photographing permitted the removal of the parasitic lines. The roentgenograms contain 2 hydrogen-lines which correspond to the distances $d \sim 3,15$ Å and $d \sim 2,79$ Å between the planes. Of the deuterium-lattice only one line with $d \sim 2,94$ Å exists. Due to the high decrease of the intensity of scattering no lines exist under large angles. There exists a concentration range in which the solid mixtures of hydrogen and deuterium are two-phase. The problem of the exact structure of hydrogen and deuterium still remains unsolved. In any case the lattices of hydrogen and deuterium are different. The results obtained here indicate a separation in layers in the solid mixtures of the hydrogen isotopes and correspond to the conclusions drawn by Prigozhin (reference 3) on the existence of a critical temperature, below which the isotope mixtures

On the Phase Diagram of the System Hydrogen - Deuterium 56-1-42/56

must split up in layers. There are 1 figure and 4 references, 2 of which are Slavic.

ASSOCIATION: Physical-Technical Institute AN Ukrainian SSR
(Fiziko-tekhnicheskiy institut Akademii nauk Ukrainskoy SSR)

SUBMITTED: October 5, 1957

AVAILABLE: Library of Congress

Card 3/3

SOV/120-59-1-42/50

AUTHORS: Kogan, V. S., Selivanov, V. P., Bulatova, R. F.

TITLE: A Microfocus X-ray Tube with an Adsorption Pump (Ostrofokusnaya rentgenovskaya trubka s adsorbtsionnym nasosom)

PERIODICAL: Pribory i tekhnika eksperimenta, 1959, Nr 1, pp 145-147 (USSR)

ABSTRACT: The focus in this tube is about 100 μ across; the electron optics are not described, but a detailed drawing of the tube is given, without dimensions. The main design details of the tube are stated to be given in Ref (1). The main attention is given to the pump, which consists of a trap cooled in liquid nitrogen and filled with 200 g of charcoal. Provision is made to heat the charcoal to 100°C under vacuum to regenerate it. The apparatus is fitted with a fore-vacuum pump, but not with a diffusion pump. It is stated that a vacuum better than

Card 1/2

A Microfocus X-ray Tube with an Adsorption Pump

10^{-5} mm Hg is reached in less than 5 min. The paper contains 2 figures and 7 Soviet references.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN USSR (Physico-technical Institute of the Academy of Sciences, Ukr.SSR)

SUBMITTED: January 10, 1958.

24(0) SOV/30-59-2-42/60

AUTHOR: Khalatnikov, I. M., Doctor of Physical and Mathematical Sciences

TITLE: Investigations of Low-temperature Physics (Issledovaniya po fizike nizkikh temperatur)

PERIODICAL: Vestnik Akademii nauk SSSR, 1959, Nr 2, pp 98-100 (USSR)

Bulatova, R.F.

ABSTRACT: The 5th All-Union Conference on this problem took place in Tbilisi from October 27 to November 1, 1958. It was attended by physicists from Moscow, Khar'kov, Leningrad, Tbilisi, Sverdlovsk, and Kiyev. 4 fields of low-temperature physics were discussed: superliquidity of liquid helium II, supraconductivity, antiferromagnetism, magneto-resistive effect. The following reports and communications were heard: A. A. Abrikosov, L. P. Gor'kov reported on the investigation of the properties of supraconductive alloys. A. A. Abrikosov, L. P. Gor'kov, I. M. Khalatnikov spoke of properties of supraconductors in the high-frequency magnetic field. D. V. Shirkov and Chen' Chun'-yan' and Chzhou Si-shin', two young Chinese scientists working at Moscow University, described investigations for determination of the influence exercised by the Coulomb (Kulon) interaction of charges on supraconductivity. V. V. Tolmachev explained the

Card 1/4

nature of the so-called collective excitations of the Bose type in supraconductors. D. N. Zubarev, Yu. A. Tserkovnikov spoke of the thermodynamics of supraconductors and B. T. Geylikman, V. Z. Kresin of the thermal conduction of supraconductors. Yu. V. Sharvin, V. P. Gantmakher reported on experimental work with supraconductors. N. V. Zavaritskiy spoke of the measurement of the anisotropy of thermal conductivity in the supraconductive state. In a series of reports problems of the superliquidity of helium were discussed, which was discovered in 1938 by P. L. Kapitsa and the theory of which was set up in 1941 by L. D. Landau. E. L. Andronikashvili and his collaborators investigated the properties of rotating helium. V. P. Peshkov spoke of the effect of the formation of the boundary between superliquid and non superliquid helium. Guan Vey-yan', collaborator of the Institut fizicheskikh problem (Institute of Physical Problems) investigated the properties of the so-called jump in temperature of Kapitsa. I. M. Lifshits, V. D. Peschanskiy investigated galvanomagnetic phenomena in strong magnetic fields for metals with open Fermi surfaces. B. Ye. Alekseyevskiy, Yu. P. Gaydukov experimentally investigated the resistance anisotropy of gold monocrystals in the

Card 2/4

magnetic field. L. S. Kan, B. G. Lazarev combine the presence of a temperature minimum with the structural state of the metal. M. Ya. Azbel' reported on the quantum theory of metallic conductivity in the alternating electromagnetic and constant magnetic field. A. S. Borovik-Romanov reported on the weak ferromagnetism in antiferromagnetic samples of $MnCO_3$. N. M. Kreynes, Ye. A. Turov investigated the magnetic anisotropy of the antiferromagnetic monocrystals $CuSO_4$ and $CoSO_4$. R. A. Alikhanov reported on neutronographic investigations of antiferromagnetics. Ye. I. Kondorskiy and collaborators reported on the susceptibility of nickel and nickel-copper alloys at low temperatures. M. I. Kaganov, V. M. Tsukernik reported on kinetic phenomena in ferromagnetics at low temperatures. A. I. Akhiyezer, V. G. Bar'yakhtar, and S. P. Peletminskiy spoke of computations of the relaxation of the magnetic moment in ferromagnetic dielectrics at low temperatures. T. I. Sanadze spoke of observation results of paramagnetic resonance of terbium in the $TbNO_3 \cdot 6H_2O$ nitrate. G. R. Khutsishvili gave a theoretical analysis of the orientation of the nuclear spin in the Overhauser (Overkhauzer)

Card 3/4

effect in nonmetals. B. N. Samoylov, V. M. Reynov and collaborators reported on obtaining orientated nuclei. R. F. Bulatova, V. S. Kogan and B. G. Lazarev showed that hydrogen isotopes in solid state have different structures. I. A. Gindin, B. G. Lazarev, Kh. D. Starodubov and V. I. Khotkevich detected polymorphism in a number of metals at low temperatures. E. L. Andronikashvili, V. P. Peshkov and M. P. Malkov reported on the stage of development of foreign scientific research work in the field of low-temperature physics. At the end of the Conference P. L. Kapitsa spoke of his successful development of investigations in the field of low-temperature physics. The participants of the Conference visited the Institut fiziki Akademii nauk Gruzinskoy SSR (Physics Institute of the Academy of Sciences of the Gruzinskaya SSR) and the Physics Faculty of Tbilisi University as well as the building of the new research atomic reactor near Tbilisi.

24 (7), 24 (2)

AUTHORS: Kogan, V. S., Lazarev, B. G., Bulatova, R. F.

SOV/56-37-3-15/62

TITLE: Diffraction of X-Rays in Polycrystalline Samples of Hydrogen Isotopes

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 37, Nr 3 (9), pp 678-683 (USSR)

ABSTRACT: The authors already showed (Ref 1) that the diffraction picture of X-rays on polycrystalline samples of hydrogen, deuterium, and their mixtures depends on the isotope composition of the sample. In this connection the authors believed an investigation of tritium (which is similar to deuterium as regards weight, but to hydrogen with respect to the energy spectrum - half-integral spin -) to be of interest. In figure 1 the experimental arrangement, in which the X-ray pictures of the solid samples of hydrogen isotopes were recorded, are shown and discussed. Figure 2 shows the tritium X-ray picture (copper lines were used as comparison standards) and figure 3 the X-ray pictures of D_2 and H_2. A comparison of the interference patterns indicates the existence of isotopic polymorphism. The difference in the structure of

Card 1/3

hydrogen and deuterium and the similarity of the structure of the latter to that of tritium shows that the polymorphism is not due to a difference in the energy spectra but to a difference in the atomic weight. The observed differences in the structure of hydrogen isotopes are in accordance with the hydrogen-deuterium state diagram investigated in reference 1. A table shows the data obtained concerning the structural parameters of the hydrogen isotopes. Tritium and deuterium have a tetragonal lattice with c/a = 1.73 and a = 3.3 and 3.35 Å respectively, hydrogen has a tetragonal lattice with c/a = 0.82 and a = 4.5 Å or a hexagonal lattice with c/a = 1.73 and a = 3.7 Å. The densities at 4.2°K for tetragonal hydrogen are 0.09 and for hexagonal hydrogen 0.089, for deuterium 0.205, and for tritium 0.324 (for comparison the data obtained by other authors are also given). Figure 6 shows an enlarged X-ray picture of a mixture of hydrogen and deuterium (80 vol% D_2), in which the lines of the solid solution of hydrogen in deuterium are clearly discernible. The results obtained are discussed, and the authors thank M. N. Massalitin for the production of the cryostat used. There are 6 figures, 1 table, and 6 references, 2 of which are Soviet.

Diffraction of X-Rays in Polycrystalline Samples of Hydrogen Isotopes SOV/56-37-3-15/62

SUBMITTED: April 29, 1959

Card 3/3

21(0)
AUTHOR: Chentsov, R. SOV/53-67-4-7/7

TITLE: The Fifth All-Union Conference on the Physics of Low Temperatures (5-ye Vsesoyuznoye soveshchaniye po fizike nizkikh temperatur)

PERIODICAL: Uspekhi fizicheskikh nauk, 1959, Vol 67, Nr 4, pp 743-750 (USSR)

ABSTRACT: This Conference took place from October 27 to November 1 at Tbilisi; it was organized by the Otdeleniye fiziko-matematicheskikh nauk Akademii nauk SSSR (Department of Physico-mathematical Sciences of the Academy of Sciences, USSR), the Akademiya nauk Gruzinskoy SSR (Academy of Sciences, Gruzinskaya SSR), and the Tbilisskiy gosudarstvennyy universitet im. Stalina (Tbilisi State University imeni Stalin). The Conference was attended by about 300 specialists from Tbilisi, Moscow, Khar'kov, Kiyev, Leningrad, Sverdlovsk, and other cities as well as by a number of young Chinese scientists at present working in the USSR. About 50 lectures were delivered which were divided according to research fields.

V. Various Questions.

One of the most interesting lectures delivered at this Conference was that by I. A. Gindin, B. G. Lazarev, Ya. D. Starodubov and V. I. Khotkevich (KhPTI) on the polymorphism of metals at low temperatures; P. L. Kapitsa commented on this topic during the discussion. R. F. Bulatova, V. S. Kogan and B. G. Lazarev (KhPTI) investigated the system hydrogen-deuterium by the methods of low-temperature-radiography, thermal analysis, and the visual observation of crystallization. Kh. I. Amirkhanov, Sh. Kh. Amirkhanova and R. I. Bashirov investigated the thermomagnetic properties of compounds of the type $A^{III}B^{V}$ and $A^{II}B^{VI}$, and dealt with the phenomenon of the "photon

Card 9/11

wind" predicted by Gurevich; the investigation was carried out at the Dagestanskiy filial AN SSSR (Dagestan Branch, AS USSR). N. M. Reynov and A. P. Smirnov (LPTI - Leningrad Physico-technical Institute) gave a report on the measurement of the electricity limit of tin- and indium polycrystals at very low temperatures (1°K), and N. M. Reynov and E. I. Krivko (LPTI) spoke about attempts made to find the expected diamagnetic resonance on polarons in cuprous oxide. G. R. Khutsishvili (TGU i Institut fiziki AN Gruzinskoy SSR - Tbilisi State University and Institute of Physics AS Gruzinskaya SSR) carried out a theoretical investigation of the Overhauser effect in non-metals. Lomkadze investigated the electron- and nuclear (proton) resonance in diphenylpicryl hydracyl at helium temperature. B. N. Samoylov spoke about experiments he carried out concerning the orientation of Co^{60}- and Au^{198}-nuclei (in iron) at extremely low temperatures. B. P. Zakharchenya and Ye. F. Gross (LPTI) investigated the absorption spectrum of a cuprous oxide crystal in the magnetic field at helium temperature and observed the effect of magneto-optical oscillations. V. P. Peshkov and M. P. Malkov gave information concerning scientific work of Soviet scientists in foreign countries (zagranichnaya nauchnaya komandirovka), and E. V. Shpol'skiy spoke about the abstracting journal "Fizika". The head of the department for problems of the physics of low temperatures, Academician P. L. Kapitsa and the President of the Academy of Sciences Gruzinskaya SSR, Academician N. I. Muskhelishvili closed the Conference. The 6. All-Union Conference on the Physics of Low Temperatures will be held in June and July 1959 in the city of Sverdlovsk.

Card 10/11

88468

S/056/60/039/006/061/063
B006/B063

24.7100

AUTHORS: Bulatova, R. F., Kogan, V. S., Lazarev, B. G.

TITLE: Crystal Structure of Solid Deuterium

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 39, No. 6(12), p. 1853

TEXT: Previous studies (Refs. 1,2) have shown that H_2 and D_2 have a tetragonal, body-centered lattice with c/a = 0.82 and c/a = 1.73, respectively. Tritium has the same structure as deuterium. The crystal structure of HD has now been studied using the same experimental arrangement as described in Ref. 1, and a brief report thereon is made in this "Letter to the Editor". Like D_2 and H_2, HD shows one single line in the X-ray diagram. Calculations assigned HD to the space group C_4^5 (tetragonal and body-centered). a = 3.39 A, c = 5.86 A, c/a = 1.73 gave a density of 0.146 g/cm^3 at 4.2°K. This value is in good agreement with results obtained by other research workers. There are 6 references: 5

Card 1/2

88469

Crystal Structure of Solid Deuterium

S/056/60/039/006/061/063
B006/B063

Soviet and 1 US.

SUBMITTED: October 1, 1960

Card 2/2

89199

S/056/61/040/001/004/037
B102/B204

24.7100

AUTHORS: Kogan, V. S., Lazarev, B. G., Bulatova, R. F.

TITLE: Differences in the lattice constants of neon isotopes

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 40, no. 1, 1961, 29-31

TEXT: The authors know of only one single case in which the attempt had been made to find differences in the lattice parameters of elements heavier than helium. On Li^6 and Li^7 a difference of 0.0015 A was found to exist, a value which is near the limit of measuring accuracy. Theoretically, the differences of the lattice parameters of the isotopes of noble gases, i.e. the differences of the molar volumina in the solid phase have repeatedly been investigated; for neon, one obtained the following at 0^oK: $\Delta V/V = 0.6\%$. An experimental study was the purpose of the present paper. By means of X-ray analysis, the structures of Ne^{20} (99% pure) and of Ne^{22} (98% pure) were examined. The specimens freed from air and helium impurities, were obtained in form of polycrystalline layers, viz., the neon isotope was precipitated from the gaseous phase onto a copper capillary

Card 1/4

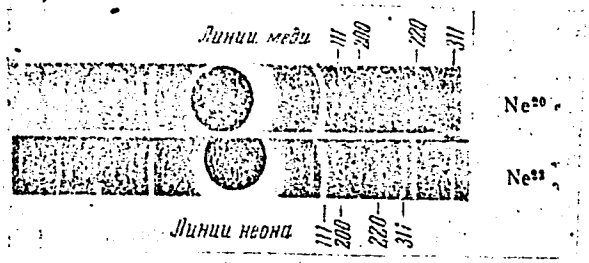
tube, which was cooled from the inside by means of liquid helium. The experimental arrangement for the X-ray examination of such a specimen is described in Ref. 5. A typical X-ray diagram recorded by means of this device, on which also the Cu lines are visible, is shown in the figure. The X-ray diagrams were photometrized, the distances between the maxima of the interference lines were measured with an accuracy of ± 0.03-± 0.05 mm. The corrections for sample thickness were carried out according to Kurdyumov. The results of the studies are shown in the table; the data of the lattice parameters are accurate up to $\pm$ 0.004 A. Both isotopes have face-centered cubic lattices; for the light isotope, a = 4.471 A , and for the heavy one, a = 4.455 A; $\Delta V/V = (1.1 \pm 0.5)\%$. The line intensities found in the X-ray diagrams deviated considerably from the calculated values. Thus, in Cu - K_α and Fe - K_α radiations, the intensity of the (200) lines compared with those of the (111) lines were considerably lower than calculated, the intensity of the (222) line of the Fe - K_α-radiation was higher. This is explained by the fact that the neon precipitated from the gaseous phase upon the capillary tube has a texture, in which the [111] axis is radially orientated toward the capillary tube. The intensity ratios of the same interference lines - $I_{hkl}(Ne^{22})/I_{hkl}(Ne^{20})$ is higher and grows more

Differences in the lattice ...

quickly with increasing scattering angle than would have been theoretically expected. By way of a summary it is said that the $\Delta V/V$-value obtained shows good agreement with theoretical results considering the energy differences of zero vibrations. By far greater differences of the molar volumes of the Ne isotope - compared to the Li isotopes - are ascribed to the difference in the binding forces in the neon and lithium lattices. B. Ya. Pines is mentioned in the paper. There are 1 figure, 1 table, and 8 references: 2 Soviet-bloc and 6 non-Soviet-bloc.

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk Ukrainskoy SSR (Institute of Physics and Technology of the Academy of Sciences Ukrainskaya SSR)

SUBMITTED: July 6, 1960



Card 3/4

Differences in the lattice ...

hkl	1 Интенсивность для Ne^{22}		θ (Ne^{20})	θ (Ne^{22})	a (Ne^{20}), KX	a (Ne^{22}), KX
	2 расчет	3 измерено				
(111)	100	100				
(200)	48	8				
(220)	27	21	29°06'	29°13,5'	4,470	4,459
(311)	25	20,5	34°48'	34°57'	4,472	4,456
(222)	6,4					
(400)	4,2					
(331)	7,0					
(420)	6,4	10,5	50°26,4'	50°38,3'	4,470	4,456
(422)	4,9	8	57°29'	57°53'	4,471	4,451
(333)(511)	6,0	10,5		63°55,5'		4,452
				4 Среднее:	4,471	4,455

Legend to the table: Results of evaluation of X-ray diagrams of Ne^{20} and Ne^{22} (Cu - K_α radiation); 1) intensity for Ne^{22}, 2) calculated, 3) experimental, 4) mean values.

Card 4/4

S/185/62/007/007/003/010
I048/I248

AUTHORS: Kogan, V.S., Lazarev, B.G., and Bulatova, R.F.

TITLE: The phase diagram of the system liquid-solid formed by the hydrogen isotopes

PERIODICAL: Ukrains'kyy fizychnyy zhurnal, v.7, no.7, 1962, 732-736

TEXT: The phase diagram of the system H_2-D_2 at temperatures from 4 to 20°K was obtained using X-ray analysis of the polycrystalline specimen (at $\leq$ 4.2°K) thermal analysis of the mixture (at 14-20°K). Both H and D have a tetragonal lattice but the axis ratio c/a is < 1 in the case of H and > 1 in the case of D. The solubility of H in the D lattice at 4.2°K is 20% by vol., that of

BULATOVA, R.F.; GRIGOR'YEV, V.N.; KOGAN, V.S.

Microcolumn for separating and analyzing mixtures of hydrogen isotopes. Atom. energ. 12 no.5:428-429 My '62. (MIRA 15:5)
(Hydrogen--Isotopes) (Chemical apparatus)

BULATOVA, R. F.; KOGAN, V. S.

Temperature dependence of isotopic effects in the structural properties of hydrogen isotopes. Zhur. eksp. i teor. fiz. 46 no. 3:840-842 Mr '64. (MIRA 17:5)

1. Fiziko-tekhnicheskiy institut AN UkrSSSR.

L 31965-65 EWT(m)/EPF(c)/T/EWP(t)/EWP(b) Pr-4 IJP(c) JD

ACCESSION NR: AP5004385 S/0056/65/048/001/0130/0132

AUTHOR: Bulatova, N. F.; Kogan, V. S.

TITLE: Stratification of the H_2--HD and D_2--HD systems in the solid phase

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 48, no. 1, 1965, 130-132

TOPIC TAGS: hydrogen, deuterium, solid phase, solubility, isotopic substitution

ABSTRACT: An x-ray diffraction method was used to determine approximately the solid-state solubility limits of the isotopic solutions of hydrogen and deuterium. Samples of H_2--HD and D_2--HD isotopic mixtures were prepared by condensing them from the gaseous phase on to a copper substrate colled from the inside by liquid helium. In view of the limited number of rings exhibited by the diffraction patterns, the presence of stratification could be established only from the intensity, width, and profile of the diffraction lines. The results show that the solubility in these two systems is limited, just as in the D_2--H_2 system investigated by the authors previously (with B. G. Lazarev, ZhETF, v. 34, 239, 1958). The stratifica-

Card 1/2

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ACCESSION NR: AP5004385

tion region found in the systems investigated is not symmetrical with respect to the concentration, the maxima of the stratification curves lying in the region of 30% of the lighter isotope. "The authors thank Academician B. G. Lazarev of AN UkrSSR for his interest in this work." Orig. art. has: 4 figures.

ASSOCIATION: None

SUBMITTED: 25Jul64 ENCL: 00 SUB CODE: SS

NR REF SOV: 004 OTHER: 005

Card 2/2

BULATOVA, K. Kh.

2

Mechanism of the reduction of complex ions. II. Effect of salts of nickel, cobalt, and chromium, or reactions of displacement of metals. Ya. D. Fridman and K. Kh. Bulatova (Kirgiz Branch Acad. Sci. U.S.S.R.). *Zhur. Obshchei Khim.* (J. Gen. Chem.) 20, 1533-42(1950); cf. *C.A.* 43, 923d.—The inhibition, by salts of Ni, Co, or Cr, of the displacement of a nobler metal from its salts by a less noble metal, is attributed to complex-ion formation. Thus, in the complex cation $[Ni(H_2O)_6]^{++}$ the effective at. no. of Ni is $28 + 2 \times 6 - 2 = 38$, i.e. with 2 electrons in excess of the nearest inert gas. Consequently, this ion is capable only of losing electrons, i.e. is a reductant, not an oxidant. On the other hand, the Ni ← OH_2 bond results in a weakening of the O—H bond, and, consequently, the reduction of H^+ ions to H is facilitated. Whether a metal such as Zn will predominantly evolve H_2, according to $Zn + 2H^+ \rightarrow Zn^{++} + H_2$, or displace from its salts the metal M, according to $Zn + M^{++} \rightarrow Zn^{++} + M$, depends on the relative free energies of these 2 processes. The condition for predominant evolution of H_2 is $\log ([Me^{++}]/[H^+]^2) < n(E_H - E_M)/0.06$, where E designates the standard potentials of H and M, resp. With the overvoltage η taken into account, the condition for simultaneous evolution of H_2 and displacement of metal M is $\log ([Me^{++}]/[H^+]^2) = n(E_H - E_M - \eta)/0.06$. If, owing to the weakening of the O—H bond in the $[Ni(H_2O)_6]^{++}$ complex, evolution of H_2 is facilitated, i.e. η is lowered, evolution of H_2 must acquire predominance over displacement of metal, i.e. the latter process will be inhibited. This was observed in the displacement of Sn^{++} by Zn in the concn. range $Sn^{++}/[H^+]^2 \leq 10^{4}$. Addn. of $NiCl_2$ lowers the degree of pptn. of Sn without changing the shape of the curve. The effectiveness of $NiCl_2$ in inhibiting the displacement of Sn from $SnCl_4^{--}$ varies with the nature of the displacing metal, increasing in the order Mg, Al, Zn.

Salts of Cr and Co have the same effect as Ni, the effectiveness increasing in the order $CrCl_2 < NiCl_2 < CoCl_2$, i.e. in the order of decreasing ionic radius, and without regard to the standard potentials. The same salts lower the degree of displacement of Pb from $PbCl_2$ by Zn, but do not affect the displacement of metal from $BiCl_3$ or $CuCl_2$, in accordance with the prediction that inhibiting effects of Ni salts can be expected only in the concn. ranges $[Bi^{+++}]^2/[H^+]^3 < 10^{-40.3}$ and $[Cu^{++}]/[H^+]^2 < 10^{-18}$, resp. An anomaly is found in the case of $SbCl_3$ from which the pptn. of Sb by Zn is strongly inhibited by $NiCl_2$ even outside of the concn. range $([Sb^{+++}]^2/[H^+]^3 < 10^{-9})$ where such an effect can be expected. This anomaly is evidently due to a sp. interaction between $SbCl_3$ and $NiCl_2$, not to a promotion of the evolution of H_2.

N. Thon

BULATOVA, T. I.

"Protection of the Central Nervous System From the Action of Toxins Depending on the Titre of Antitoxins in the Blood." Sub 28 Jun 51, Acad Med Sci USSR.

Dissertations presented for science and engineering degrees in Moscow during 1951.

SO: Sum. No. 480, 9 May 55.

111. Mechanism of Passive Immunity in Toxinemic Diseases

"The Protection of the Central Nervous System Against the Action of Perfringens and Oedematiens Toxins In Relation to the Titer of Antitoxin in the Blood," by T. I. Bulatova and K. I. Matveyev, Institute of Epidemiology and Microbiology imeni N. F. Gamaleya, Academy of Medical Sciences USSR (director, Prof S. N. Muromtsev), Byulleten' Eksperimental'noy Biologii i Meditsiny, No 3, Mar 57, pp 71-75

The authors state that "the necessity for an experimental investigation of the protection of the central nervous system by passive and active immunization against toxinemic infections became absolutely apparent after the appearance of a number of reports by clinicians on the fact that large doses of immune serum were capable of curing even severe cases of tetanus, diphtheria, gas gangrene, and botulism."

The unsatisfactory results of serotherapy using small doses of serum are felt to be due to the fact that the antibodies do not penetrate through the hematoencephalitic barrier from the blood into the spinal fluid and that the central nervous system is thus inadequately protected by passive immunity. The article disputes the concept of the hematoencephalitic barrier which holds that there is an interrelationship between the spinal fluid, the blood, and the central nervous system, i.e., that the exchange between the blood and the central nervous system proceeds through the spinal fluid, and not through blood-carrying capillaries. Instead, it is maintained that "the penetration of various substances into the central nervous system depends not on the composition of the spinal fluid, but on the permeability of blood-carrying capillaries and on the concentration of these substances in the blood."

Experiments were carried out on actively and passively immunized rabbits with perfringens and oedematiens toxins to determine the effects of intravenous administration of large doses of these toxins on the immunological state of the central nervous system and to see if the animals' central nervous systems acquired resistance to the action of the toxins even when practically no antibodies had penetrated into the spinal fluid. The procedures used in the experiments are described. The results are presented on two charts showing (1) the survival of passively immunized rabbits after suboccipital administration of perfringens and oedematiens toxins and (2) the survival of actively immunized rabbits after suboccipital administration of perfringens and oedematiens toxins.

The results showed that the nervous system was better protected against the usual neurotoxic phenomena elicited by these toxins the higher the titer of antitoxin in the blood. It was found that, the higher the titer of antitoxin in the blood, the more the antibodies penetrated into the brain tissues through the walls of the capillaries, and yet, at the time the antibody content of the brain tissues was highest, there were practically no antibodies in the spinal fluid. Thus these findings corroborated the observations of clinicians that the greater the dose of serum administered in the treatment of gas gangrene the greater was the therapeutic effect obtained. (U)

[illegible] : USSR

[illegible] : Diseases [illegible]
[illegible]teria [illegible]

[illegible] : RZhBiol., [illegible]

AUTHOR : Matveyev, [illegible]

INST. : -

[illegible] : Outbreak [illegible]

[illegible] : Veterinar [illegible]

ABSTRACT : At a wild [illegible]
succumbed [illegible]
ture of s[illegible]
Administr[illegible]
and B typ[illegible]
was demon[illegible]
disease c[illegible]
type C wh[illegible]
in the US[illegible]
the Biryu[illegible]

Card: 1/2

COUNTRY : USSR
CATEGORY : Diseases
Bacteria
JOUR. : RZhBiol., [illegible]
AUTHOR :
INST. :
TITLE :

PUB. :

ABSTRACT : strain was [illegible]
cont'd.

Card: 2/2

BYCHENKO, B.D.; MATVEYEV, K.I.; BULATOVA, T.I.; DAVYDOVA, N.V.

Serological groups of Clostridium perfringens studied by precipitation reaction. Zhur.mikrobiol.epid. i imun. 30 no.1:81-85 Ja '58. (MIRA 12:3)

1. Iz Instituta epidemiologii i mikrobiologii imeni Gamalei AMN SSSR.

(CLOSTRIDIUM PERFRINGENS,
serol. type, precipitation reaction (Rus))

BYCHENKO, B.D.; BULATOVA, T.I.

Indentification of Clostridium perfringens type F. Zhur.mikrobiol. epid. i imun. 30 no.1:85-90 Ja '58. (MIRA 12:3)

1. Iz Instituta epidemiologii imeni Gamalei AMN SSSR.
(CLOSTRIDIUM PERFRIGENS,
F, identification (Rus))

MATVEYEV, K.I.; BULATOVA, T.I.; SERGEYEVA, T.I.

Immunizing minks against botulism [with summary in English].
Veterinariia 35 no.8:42-46 Ag '58. (MIRA 11:9)

1. Institut epidemiologii i mikrobiologii imeni N.F. Gamaleya AMN SSSR.
(Minks--Diseases and pests) (Botulism)

MATVEYEV, K.I., BULATOVA, T.I.

Effect on the organism of sublethal doses of tetanus toxin administered repeatedly [with summary in English]. Biul. eksp.biol. i med. 46 no.9:49-52 S'58 (MIRA 11:11)

1. Iz Instituta epidemiologii i mikrobiologii imeni N.F. Gamalei (ispolnyayushchiy obyazannosti dir. - prof. S.N. Muromtsev) AMN SSSR, Moskva. Predstavlena deystvitel'nym chlenom AMN SSSR L.Z. Zil'berom.

(TETANUS,
toxin, eff. of sublethal repeated admin. on animals (Rus))

17(2) SOV/16-60-3-4/37

AUTHORS: Bulatova, T.I., Kabanova, Ye.A.

TITLE: The Identification of Clostridium Botulinum With Luminescent Sera

PERIODICAL: Zhurnal mikrobiologii, epidemiologii i immunobiologii, 1960, Nr 3, pp 18 - 22 (USSR)

ABSTRACT: The aim of subject work was to study the suitability of the fluorescent serum method for detecting the Clostridium botulinum, even in a mixed culture. Fluorescent sera, labeled with fluorescein isocyanate, were prepared from the globulin fraction of botulism antiserum B and were tested with various bacteria. Cl. botulinum A and B strains gave off a specific luminescence, particularly bright in the case of the B. strain. No luminescence was observed with Cl. botulinum C and E, Cl.perfringens, Escherichia coli or Bacillus megatherium. In the tests with Cl. sporogenes, three of 17 strains showed specific luminescence, two showed no luminescence and twelve showed individual fluorescing spores against a general background of non-luminescence. All luminescent strains agglutinated with botulism antiserum B. No definite relationship could be established between the agglutination reaction and the intensity of luminescence. The author concludes that

Card 1/2

The Identification of Clostridium Botulinum With Luminescent Sera

the fluorescent sera method can only be used as a rough guide in the detection of Cl. botulinum. Further work on the problem is required. There are: 2 tables, 1 photograph and 8 references, 4 of which are Soviet and 4 English.

ASSOCIATION: Institut epidemiologii i mikrobiologii imeni Gamalei AMN SSSR (Institute of Epidemiology and Microbiology imeni Gamaleya of the AMN, USSR)

SUBMITTED: August 15, 1959

ZELEVINSKAYA, S.A.; BULATOVA, T.I.; LARINA, I.A.

Study of the immunological effectiveness of complex immunization against gas gangrene, tetanus and botulism in experiments on monkeys. Biul.eksp.biol.i med. 53 no.6:59-62 Je '62. (MIRA 15:10)

1. Iz otdela ranevykh infektsiy (zav. - dyestvitel'nyy chlen AMN SSSR G.V.Vygodchikov) Instituta epidemiologii i mikrobiologii imeni N.F.Gamalei (dir. - prof. O.V.Baroyan) AMN SSSR, Moskva. Predstavlena deystvitel'nym chlenom AMN SSSR G.V.Vygodchikovym.
(VACCINATION) (GAS GANGRENE) (TETANUS) (BOTULISM)

MATVEYEV, K.I.; BULATOVA, T.I.; SERGEYEVA, T.I.

Mass immunization of minks against botulism in wild animal state breeding farms in the U.S.S.R. Zhur.mikrobiol., epid. i immun. 32 no.11:138-139 N '61. (MIRA 14:11)

1. Iz Instituta epidemiologii i mikrobiologii imeni Gamalei AMN SSSR.

(BOTULISM--PREVENTIVE INNOCUIATION) (MINKS)

BLAGOVESHCHENSKIY, V.A.; KUL'BERG, A.Ya.; BULATOVA, T.I.; KORN, M.Ya.

Production of a specific fluorescent anthrax serum. Zhur.mikrobiol., epid. i immun. 33 no.3:18-23 Mr '62. (MIRA 15:4)

1. Iz Instituta epidemiologii i mikrobiologii imeni Gamalei AMN SSSR.
(ANTHRAX) (SERUM) (ANTIGENS AND ANTIBODIES)

BULATOVA, T.I., kand.med.nauk; SITNIKOVA, N.N., nauchnyy sotrudnik; SERGEYEVA, T.I., nauchnyy sotrudnik

Prevention and treatment of botulism. Med. sestra 20 no.6:23-26 Je '61. (MIRA 14:7)

1. Iz Institut epidemiologii i mikrobiologii imeni N.F.Gamalei AMN SSSR, Moskva.

(BOTULISM)

BULATOVA, T.I.

Method of analyzing raw materials, semiprocessed, and ready products for Cl. botulinum. Kons. i ov. prom. 17 no.8:35-36 Ag '62. (MIRA 17:1)

1. Institut epidemiologii i mikrobiologii imeni N.F. Gamaleya AMN SSSR.

PAK, Z.P.; BULATOVA, T.I.

Distribution of a labelled preparation of botulinus toxin in the body of white mice. Farm. i toks. 25 no.4:478-482 Jl-Ag '62. (MIRA 17:10)

1. Kafedra farmakologii (zav. - prof. V.V. Vasil'yeva) II Moskovskogo gosudarstvennogo meditsinskogo instituta imeni Pirogova i laboratoriya indikatsii (zav. - prof. K.I. Matveyev) Instituta epidemiologii i mikrobiologii N.F. Gamalei.

L 34682-65 EWA(b)/EWT(1) JK

ACCESSION NR: AP5009929 UR/0016/64/000/007/0079/0084

AUTHOR: Bulatova, T. I.

TITLE: Characteristics of serological methods of botulinus toxin detection

SOURCE: Zhurnal mikrobiologii, epidemiologii i immunobiologii, no. 7, 1964, 79-84

TOPIC TAGS: serum, toxicology, antigen, bacteria, biochemistry

Abstract: It was experimentally established that in addition to an antigen-toxin, strictly specific in neutralization reactions on animals, toxic filtrates of types A and B botulism pathogens contained a group soluble bacterial antigen, because of which cross reactions (precipitation and indirect hemagglutination) are observed between antibotulin sera and types A and B toxins as well as between the antitoxin sera of types A and B and the non-toxic filtrates of Cl. sporogenes and putrificus.

Group soluble antigen contained in the filtrates of botulinum toxins of the A and B types and in the filtrates of Cl. sporogenes and putrificus differed in its nature from the group somatic O-antigen of these bacteria, the first of these being thermolabile and the second, thermostable.

Botulinus toxins and their corresponding antibodies, and the group bac-

Card 1/3

L 21682-65

ACCESSION NR: AP5009929

2

terial soluble antigens and their corresponding antibodies participate in the indirect hemagglutination and other serological reactions (ring precipitation and complement fixation). The end result of the reactions depends on the interactions of the group soluble antigen with corresponding antibodies.

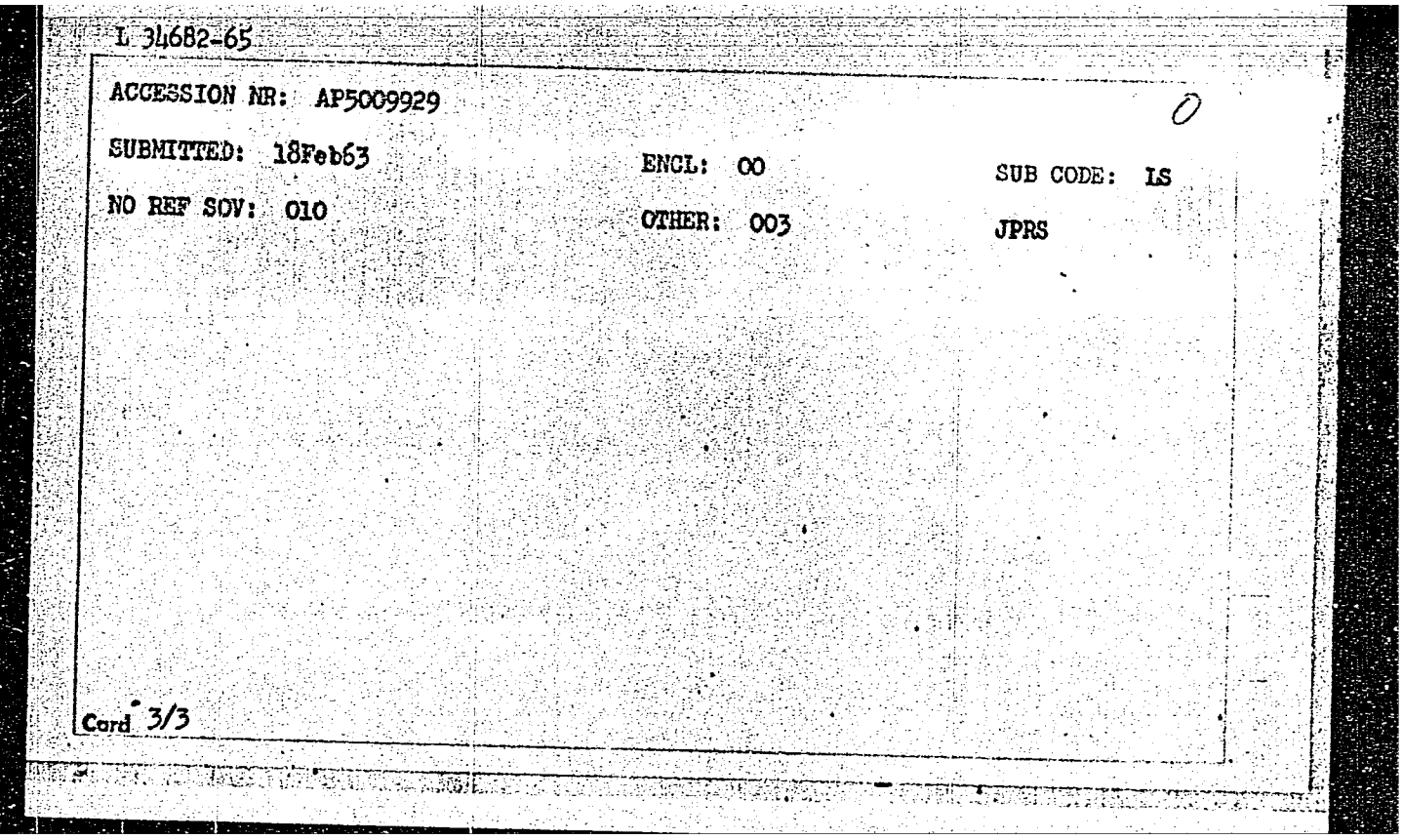
Of the in vitro serological investigation methods suggested for the detection of botulins, indirect hemagglutination proved to be the most sensitive reaction. However it may be used only as an orientating signal diagnostic method to establish the presence of toxins in materials in which Cl. sporogenes and putrificus are not encountered. Hence it is unsuitable for detecting botulinus toxins in food.

The treatment of filtrates of Cl. botulinum, type E, with pancreatin causes an increase of the specific toxicity by 100-1000 times, while the antigen reaction of these filtrates, developed in the reaction of indirect hemagglutination, remains unchanged.

The fluorescent-serological method as yet cannot be used for the detection of Cl. botulinum and its toxins. Orig. art. has: 3 tables.

ASSOCIATION: Institut epidemiologii i mikrobiologii im. Gamalei AMN SSSR (Institute of Epidemiology and Microbiology, AMN SSSR)

Card 2/3



L 34682-65

ACCESSION NR: AP5009929

SUBMITTED: 18Feb63 ENCL: 00 SUB CODE: LS

NO REF SOV: 010 OTHER: 003 JPRS

Card 3/3

ACCESSION NR: AP4018287 S/0241/64/009/002/0080/0085

AUTHOR: Kaulen, D. R.; Bulatova, T. I.

TITLE: Seroprophylaxis and serotherapy of bacterial intoxications in irradiated animals

SOURCE: Meditsinskaya radiologiya, v. 9, no. 2, 1964, 80-85

TOPIC TAGS: seroprophylaxis, serotherapy, bacterial intoxication, botulin toxin, diphtheria toxin, bone marrow cell transplantation, X-irradiation, peroral toxin administration, intravenous toxin administration

ABSTRACT: Botulin intoxication seroprophylaxis and serotherapy were investigated in two groups of irradiated mice in the first of two experimental series. The first group of X-irradiated mice (350 to 550 r) was passively immunized with varying amounts of botulin antitoxin 1 hr to 6 days after irradiation and was administered botulin toxin on the 7th to 9th days to test effectiveness of the seroprophylaxis. The second group of irradiated mice was administered botulin toxin after irradiation and botulin antitoxin 3 hrs later to

Card 1/3

ACCESSION NR: AP4018287

test the effectiveness of serotherapy. In the second series lethally X-irradiated guinea pigs (625 r) were treated with transplanted bone marrow cells and were administered diphtheria toxin on the 1st or 20th day after irradiation to test passive immunity. Results show that effectiveness of seroprophylaxis in botulin intoxication decreases 1½ to 4 times depending on radiation dose and route of administration, with peroral administration of botulin toxin least effective. With serotherapy 50% of the irradiated animals can be saved by intravenous administration of an antitoxin dose 1070 times larger than the control dose, and with peroral administration of an antitoxin dose only 28 times larger. Higher effectiveness of intravenous administration in seroprophylaxis and higher effectiveness of peroral administration in serotherapy are not actually contradictory. With peroral toxin administration in seroprophylaxis large doses of toxin leave because of increased intestine wall permeability and enter the blood stream and thereby reduce passive immunity. With peroral administration in serotherapy the rate at which the toxin enters the organism is the deciding factor. Bone marrow cell transplantation increases strength of passive immunity to diphtheria insignificantly (1.4 times), but restores effectiveness of seroprophylaxis to normal by the 20th day

Card 2/3

ACCESSION NR: AP4018287

after irradiation. Orig. art. has: 4 tables.

ASSOCIATION: Institut epidemiologii i mikrobiologii im. N. F. Gamalei, AMN SSSR (Institute of Epidemiology and Microbiology, AMN SSSR)

SUBMITTED: 03Aug63 DATE ACQ: 18Mar64 ENCL: 00

SUB CODE: LS NR REF SOV: 004 OTHER: 003

Card 3/3

BULATOVA, T.I.

Nonspecific reaction of indirect hemagglutination in the detection of botulism toxins in food products. Zhur. mikrobiol., epid. i immun. 41 no.1:96-101 Ja '64. (MIRA 18:2)

1. Institut epidemiologii i mikrobiologii imeni Gamalei AMN SSSR, Moskva.

ADAMOV, A.K.; [illegible]

Use of antibotulin alizaric suspension agglutinins for a rapid detection of botulism pathogens. Zhur. mikrobiol., epid. i immun. 41 no.10:66-70 '64. (MIRA 18:5)

L 13098-66 EWT(1)/EWA(j)/T/EWA(b)-2 JK

ACC NR: AP6006639 SOURCE CODE: UR/0016/65/000/001/0005/0010

AUTHOR: Bulatova, T. I.

ORG: Institute of Epidemiology and Microbiology im. N. F. Gamaleya, AMN SSSR (Institut epidemiologii i mikrobiologii, AMN SSSR)

27

B

TITLE: Antigenic properties of type E Cl. botulinum protoxin

SOURCE: Zhurnal mikrobiologii, epidemiologii i immunobiologii, no. 1, 1965, 5-10

TOPIC TAGS: microbiology, toxicology, biochemistry, mouse, antigen

ABSTRACT: Experiments with 12 strains of type E Cl. botulinum revealed that this microbe produced toxin and protoxin in liquid culture media. Protoxin changed into toxin under the influence of some enzymes. The titer of the toxin increased considerably after activation, the activation index ranging from 10 to 1,000. An equal amount of antitoxic units was required to neutralize equal volumes of crude type E toxin before and after activation by the enzymes, but the lethal activity of the toxin after activation increased 10-100-fold, i.e., the antigenic properties of the protoxin were equal to those of the toxin. The indirect hemagglutination reaction was obtained from type E botulinus toxin before and after activation in the same dilutions, although the activity of the toxin increased many times after inactivation, further evidence that protoxin and toxin are alike. The presence of antigenic properties in type E protoxin was also suggested by the data obtained from a study of the antitoxin-binding capacity of type E toxin

Card 1/2 UDC: 576.851.553.097.29.097.2

L 13098-66
ACC NR: AP6006639

and toxoid. The toxoid obtained from type E botulinus toxins, both inactivated and activated by pancreatin or Cl. sporogenes, was found to possess the same anti-toxin-binding properties when the reaction was tested in white mice. Orig. art. has: 2 tables. [JPRS]

SUB CODE: 06 / SUBM DATE: 10Mar64 / ORIG REF: 003 / OTH REF: 004

Card 2/2

L 63388-65 EWT(1)/EWA(j)/EWA(b)-2 JK

ACCESSION NR: AP5020096 UR/0015/65/000/008/0079/0084
576.851.553.097.2(47)

AUTHOR: Bulatova, T. I.; Matveyev, K. I.

TITLE: Antigen structure of toxins of *Cl. botulinum*, type C strains, isolated in the SSSR

SOURCE: Zhurnal mikrobiologii, epidemiologii i immunobiologii, no. 8, 1965, 79-84

TOPIC TAGS: clostridium botulinum, clostridium botulinum toxin, antigen, botulism

ABSTRACT: Type C strains of *Cl. botulinum* isolated in the SSSR from mink were found to belong to subtype C_β. The type C No. 91 strain, used in the manufacture of therapeutic and diagnostic sera and toxoids, belongs to subtype C_α. Botulins produced by types C_α, C_β, and D consisted of 3 toxic constituents (C_α, C_β, and D), with the basic constituent present in the largest quantity. There was a cross neutralization reaction between botulinus sera and toxins of types C_α, C_β, and D because the toxins had common antigens. The sera of types C_α and C_β neutralized the toxins of types C_α and C_β. The homologous toxin was completely neutralized by an equivalent amount, but neutralization of the heterologous toxin required 2½ times

Card 1/2

L 63388-65

ACCESSION NR: AP5020096

2

as much serum. The author concluded that correct identification of the causative agent of botulism isolated from the soil, sick persons, cadavers, etc. made it necessary to include the sera of types C and D along with those of types A, B, C, and E in the sets of diagnostic antitoxic, type-specific antibotulinus sera. Orig. art. has: 1 figure, 1 table.

ASSOCIATION: Institut epidemiologii i mikrobiologii im. Gamalei AMN SSSR (Institute of Epidemiology and Microbiology, AMN SSSR) 55

SUBMITTED: 17Apr64 ENCL: 00 SUB CODE: LS

NO REF SOV: 004 OTHER: 006

Card 2/2

ACC NR: AP6032245 SOURCE CODE: UR/0016/66/000/009/0066/0070

AUTHOR: Bulatova, T. I.; Matveyev, K. I.; Samsonova, V. S.

ORG: Institute of Epidemiology and Microbiology, AMN SSSR, Moscow (Institut epidemiologii i mikrobiologii AMN SSSR)

TITLE: Cl. botulinum Type C toxin formation in symbiotic culture

SOURCE: Zhurnal mikrobiologii, epidemiologii i immunobiologii, no. 9, 1966, 66-70

TOPIC TAGS: bacteria toxin, ~~Cl botulinum type C~~, botulinus toxin, toxin formation, toxin, bacteria, BOTULISM

ABSTRACT: A study of toxin formation by *Cl. botulinum* type C was performed as part of an evaluation of this strain for use in preparing toxoids and antisera. The original stain was weakly toxic but after growth with another species of *Clostridia* its toxogenicity increased. Similar results occurred when the bacteria were grown with cells of another genus. Physical properties of mixed and control cultures were different; better toxin-forming conditions existing in the former cultures. [WA-50; CBE No. 12]

SUB CODE: 06/ SUBM DATE: 30Jun65/ ORIG REF: 004/ OTH REF: 007/

Card 1/1 UDC: 576.851.553.095.38.097.29

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307420017-7"

ACCESSION NR: AP4012182 S/0191/64/000/002/0007/0008

AUTHOR: Usmanova, N. F.; Golubeva, A. V.; Bulatova, V. M.; Sivograkova, K. A.

TITLE: Styrene copolymer SAM

SOURCE: Plasticheskiye massy*, no. 2, 1964, 7-8

TOPIC TAGS: SAM styrene copolymer, physical mechanical property, dielectric property, thermal stability, injection molding, compression molding, styrene copolymer

ABSTRACT: A study of the physicomechanical properties of copolymer SAM shows that this plastic, in comparison with styrene, has better heat stability (by about 25°) and maintains the other physicomechanical properties of styrene. Copolymer SAM has high dielectric properties over an extended time and temperature interval. It may be processed by regular methods applicable to thermoplastics. The conditions for injection molding, extruding, and compression molding copolymer SAM are presented. "Investigation of the dielectric properties of the copolymer was conducted by Candidate of physical and

Card 1/2

ACCESSION NR: AP4012182

mathematical sciences, B. I. Sazhin, whom we thank." Orig. art. has: 3 figures and 1 table.

ASSOCIATION: none

SUBMITTED: 00 DATE ACQ: 26Feb64 ENCL: 00

SUB CODE: MT NO REF SOV: 000 OTHER: 000

Card 2/2

BERGER, G.S.; BULATOVA, Ye.V.; GRUZDEVA, R.Ye.; TSVIT, M.M.

Additional concentration of tantalite by flotation. TSvet.met. 34 no.10:25-27 O '61. (MIRA 14:10)

1. Kazakhskiy nauchno-issledovatel'skiy institut mineral'nogo syr'ya.
(Tantalite) (Flotation)

SUBBOTINA, N.N.; ALEKSEYCHIK-MITSKEVICH, L.S.; BARANOVSKAYA, O.F.; BULATOVA, Z.I.; BULYNNIKOVA, S.P.; DUBROVSKAYA, N.F.; KISEL'MAN, E.N.; KOZLOVA, G.E.; KUZINA, V.I.; KRIVOBORSKIY, V.V.; USHAKOVA, M.V.; FREYMAN, Ye.V.

[Cretaceous and Paleogene Foraminifera in the West Siberian Plain] Foraminif[illegible] melovykh i paleogenovykh otlozhenii Zapadno Sibirskoi nizmennosti. Leningrad, Nedra, 1964.455 p. (Leningrad. Nauchno-issledovatel'skii geologorazvedochnyi institut. Trudy, no.234). (MIRA 18:1)

1. Vsesoyuznyy neftyanoy nauchno-issledovatel'skiy geologorazvedochnyy institut, Leningrad; Sibirskiy nauchno-issledovatel'skiy institut geologii, geofiziki i mineral'nogo syr'ya; Novosibirskoye territorial'noye geologicheskoye upravleniye i Tyumenskoye territotial'noye geologicheskoye upravleniye.

VOLKOVA, Ye.A.; DUBROV, Ye.F.; SOKOLOV, O.N.; Prinimali uchastiye: PEYBO, I.V.; BULATOVA, Zh.M.; VIKULIN, B.K., glavnyy red.; CHASHNIK, V.M., otv.red.; REYKHERT, L.A., vedushchiy red.; DODONOVA, L.P., red.; KONDYURINA, Ye.N., red.; FEDOROV, S.S., tekhn.red.

[Problems in acoustical logging] Voprosy akusticheskogo karotazha. Leningrad, Gostoptekhizdat, 1962. 151 p. (Geofizicheskoe priborostroenie, no. 13). (MIRA 16:8)
(Prospecting—Geophysical methods)

BULATOVA, Z.I.; VOYTSEL', Z.A.; GORBOVETS, A.N.; IVANOVA, Ye.A.; KAZ'MINA, T.A.; KISEL'MAN, E.N.; KLIMKO, S.A.; KLIMOVA, I.G.; KOZYREVA, V.F.; KORNEVA, F.R.; KOSTITSINA, R.P.; KRUGLOVA, Z.M.; STRIZHOVA, A.I.; MARKOVA, L.G.; TARASOVA, A.S.; USHAKOVA, M.V.; FILIPPOVA, Ye.A., ved.red.; TROFIMOV, A.V., tekhn.red.

[Mesozoic and Cenozoic stratigraphy of the West Siberian Lowland] Stratigrafiia mezozoia i kainozoia Zapadno-Sibirskoi nizmennosti. Moskva, Gos.nauchno-tekhn.izd-vo neft. i gorno-toplivnoi lit-ry, 1957. 147 p. (MIRA 12:2)

1. Gosudarstvennyy soyuznyy Zapadno-Sibirskiy nefterazvedochnyy trest.

(Siberia, Western--Geology, Stratigraphic)

BULATOVA, Z. I.: Master Geolog-Mineralog Sci (diss) -- "Material on the study of the foraminifera of the Alba-Turonian deposits of the west Siberian lowland". Tomsk, 1959. 12 pp (Tomsk Order of Labor Red Banner Polytech Inst im S. M. Kirov), 150 copies (KL, No 12, 1959, 126)

BULATOVA, Z.I.

Two types of complexes of Foraminifera with Gaudryina filiformis Berthelin in Western Siberia. Trudy SNIIGGIMS no.2:37-40 '59. (MIRA 12:11)

(Siberia, Western--Foraminifera, Fossil)

BULATOVA, Z.I.

Some Reophacidae from Cretaceous sediments in the West Siberian Plain. Trudy SNIIGGIMS no.23:5-13 '62. (MIRA 16:9)
(West Siberian Plain--Foraminifera, Fossil)

3(1)

AUTHOR: Bulatova - Kalikhevich, F.F. SOV/33-35-6-12/18

TITLE: The Determination of the Coefficient of Atmospheric Dispersion of the Pulkovo Normal Astrograph

PERIODICAL: Astronomicheskiy zhurnal,1958,Vol 35,Nr 6,pp 925-930 (USSR)

ABSTRACT: The author presents her determination of the coefficient of atmospheric dispersion of the Pulkovo normal astrograph, obtained by the Blazhko method described in detail by A.M. Lozinskiy [Ref 3]. This method has been slightly modified by the author in order to measure differences of star coordinates. The result is $\Delta\beta'' = 0''.51 \pm 0''.007$ for stars of 10.5 photographic magnitude and spectral class A1 - G6. A list of other determinations of $\Delta\beta''$ by several authors is presented. The author mentions V.V. Lavdovskiy [Ref 5], I.A. Balanovskiy [Ref 6] and S.K. Kostinskiy [Ref 7]. She thanks Professor A.N. Deych for suggestions.

Card 1/2

The Determination of the Coefficient of Atmospheric Dispersion of the Pulkovo Normal Astrograph SOV/33-35-6-12/18

There are 1 figure, 6 tables and 13 references, 7 of which are Soviet, 2 are American, 2 English, and 2 German.

ASSOCIATION: Glavnaya astronomicheskaya observatoriya Akademii nauk SSSR (Astronomical Principal Observatory of the AS USSR)

SUBMITTED: August 29, 1957

Card 2/2

BULATOVIC, S.

BULATOVIC, S. How to care for peach trees raised on the same site during the first three years.

Vol 2, no. 10, Oct. 1954
POLJORRIVREDA
AGRICULTURE
Beograd

SO: MONTHLY LIST OF EAST EUROPEAN ACCESSIONS, (EEAL), LC, VOL, 4, no. 9
Sept.1954, Encl.

BULATOVIC, Spasoje, dr., lecturer. (Zemun - Novi Beograd, Soliter A/III)

Some prospective peach varieties and their technological value. Tehnika Jug 17 no.2:353-356 F '62.

1. Agricultural Faculty of the University of Beograd.

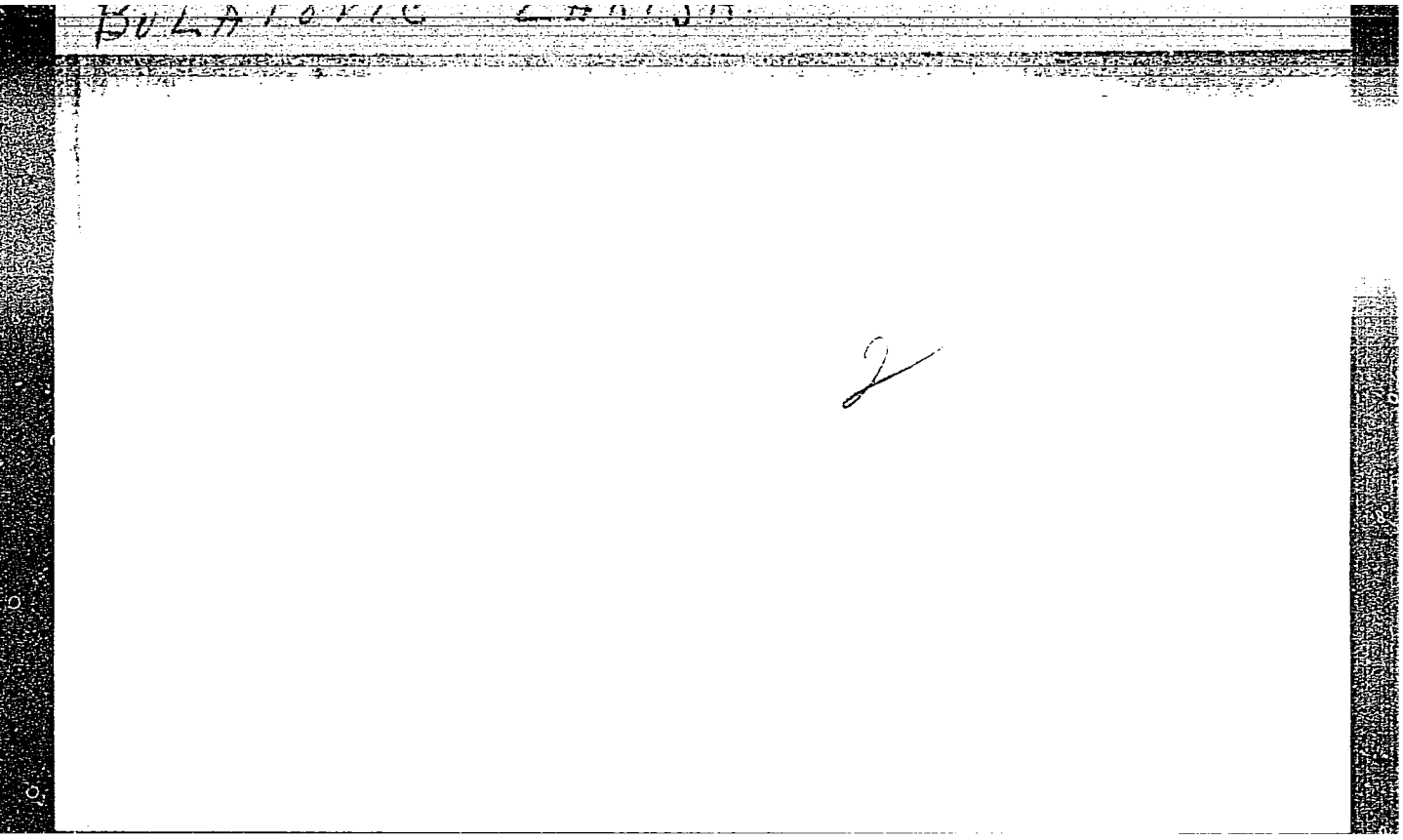
(Peach—Varieties)

BULATOVIC, Z.

Translation of Title: On Tracing back of the Solution of a Fourth Degree Equation to the Solution of a Third Degree Equation

Bulatović, Z. Über die Zurückführung der Auflösung der Gleichung vierten Grades auf die Auflösung einer Gleichung dritten Grades. Bull. Soc. Math. Phys. Serbie 1, no. 3-4, 131-132 (1949). (Serbian. German summary)

Source: Mathematical Reviews, Vol 11 No. 10



BULATOVSKAYA, B.Ya., nauchnyy sotrudnik,; BULYGINA, Ye.I., klinicheskiy ordinator.

Lymphangioma of the nose. Vest. oto-rin. 18 no.1:68 Ja-F '56 (MLRA 9:6)

1. Iz Sverdlovskogo nauchno-issledovatel'skogo instituta vosstanovitel'noy khirurgii, travmatologii i ortopedii.
(NOSE--TUMORS) (ANGIOMA)

BULATOVSKAYA, B.Ya.

Modification of Rud'ko's apparatus. Stomatologiia 35 no.3:56. My-Je '56. (MLRA 9:9)

1. Iz Sverdlovskogo nauchno-issledovatel'skogo instituta VOSKhITO (dir.-nauchnyy rukovoditel' instituta chlen-korrespondent AMN SSSR prof. F.R.Bogdanov)
(SURGICAL INSTRUMENTS AND APPARATUS)

BULATOVSKAYA, B. Ya. Cand Med Sci -- (diss) "Treatment of congenital clefts of the upper lip." Sverdlovsk, 1959. 15 pp (Min of Health RSFSR. Perm' State Med Inst), 250 copies (KL, 43-59, 127)

BULATOVSKAYA, B.Ya., nauchnyy sotrudnik

Surgical correction of a deformity of the alae nasi after surgery in congenital harelip. Vest.otorin. 21 no.3:79-82 My-Je '59. (MIRA 12:9)

1. Iz Sverdlovskogo instituta travmatologii i ortopedii (nauchnyy rukovoditel' - chlen-korrespondent AMN SSSR zasluzhennyy deyatel' nauki prof.F.R.Bogdanov).

(HARELIP, surg.
postop. deform. of alae nasi, management (Rus))
(NOSE
postop. deform. of alae nasi after harelip surg., management (Rus))

BULATOVSKAYA, B.Ya.

Effect of congenital cleft palate and harelip on child development. Pediatriia 37 no.6:63-67 Je '59. (MIRA 12:9)

1. Iz Sverdlovskogo instituta travmatologii i ortopedii (dir. - chlen-korrespondent AMN SSSR zasluzhennyy deyatel' nauki prof. F.R.Bogdanov).

(CLEFT PALATE, physiol.
child. develop. (Rus))
(HARELIP, physiol.
same)

BULATOVSKAYA, B.Ya., nauchnyy sotrudnik

Frequency of various forms of congenital fissures of the upper lip and their classification. Stomatologiia 38 no.3:42-43 My-Je '59. (MIRA 12:8)

1. Iz Sverdlovskogo instituta travmatologii i ortopedii (dir. - prof.F.R.Bogdanov).
(HARELIP)

BULATOVSKAYA, B.Ya.

Dispensary care of children with congenital harelip and cleft palate in Sverdlovsk and Sverdlovsk Province. Vop.okh.mat. i det. 5 no.1:86-88 Ja-F '60. (MIRA 13:5)

1. Iz Sverdlovskogo instituta travmatologii i ortopedii (dir. - nauchnyy rukovoditel' chlen-korrespondent AMN SSSR zasluzhennyy deyatel' nauki prof. F.R. Bogdanov).
(SVERDLOVSK PROVINCE--CHILDREN--ABNORMITIES AND DEFORMITIS)
(PALATE, CLEFT) (HARELIP)

BULATOWSKA, B.J.

Outpatient treatment of children with congenital facial fissures. Czas. stomat. 18 no.8/9:899-901 Ag-S '65.

1. Z Oddzialu Chirurgii Szczekowej Swierdlowskiego Instytutu Naukowo-Badawczego Traumatologii i Ortopedii (Dyrektor: Kandydat Nauk Medycznych Z.P. Lubiegina [Z.P. Lubegina]; Kierownik: Kandydat Nauk Med. W.I. Szczypaczewa [V.I. Shchypacheva]).

BULATSKAYA, T.F.

Laminar boundary layer in a multicomponent gaseous mixture on the lateral surface of a body. Sbor. rab. VTs MGU 4:115-[illegible] '65. (MIRA 18:9)

BULATOVSKI, P.

"EFKA Protective Filters. Fotokemijska." p. F33, (KEMIJA U INDUSTRIJI, Vol. 3, no. 9, Sept. 1954. Zagreb, Yugoslavia.)

SO: Monthly List of East European Accessions, (EEAL), LC, Vol. 4, No. 5, May 1955, Uncl.

JAKOBOVIC, V.; BULATOVSKI, P.

Influence of the thickness of photographic emulsion on the contrast of the X-ray picture. Kem ind 9 no.9:F-53--F-54 S '60.

1. "Fotokemika", Zagreb. 2. Clan Redakcijskog odbora, "Fotokemijska industrija" (for Jakobovic).

BULATOVSKI, Petar

Manufacture and use of optical filters. Kem ind 12 no.2:67-72 Fe '63.

1. "Fotokemika", Zagreb.

24.3900 1020, 1051, 1106
17.1450

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D251/D301

AUTHORS: Weber, Karlo, Doctor and Bulatovski, Pero, Engineer

TITLE: Optical protective filters for welders

PERIODICAL: Kemija u industriji, no. 6, 1960, 27-32

TEXT: This article contains general information on optical protective filters for welders and on methods of testing them. Production of protective filters, especially those with gelatine layers is to be introduced in Yugoslavia in the near future. According to the authors an ideal protective filter should absorb ultraviolet and infrared light and considerably attenuate visible light. The Save - zna komisija za standardizaciju (Federal Commission for Standardization) has issued under the designation "JUS Z. B1. 030" a Yugoslav standard for the "Stitnik za elektrovarioce" (Protector for Electric Welders). This standard prescribes protective measures for welders stressing the protection of eyes, head and neck against direct and indirect effects of visible, ultraviolet and infrared light. The standard also gives a table of data on protective filters which are

Card 1/10

Optical protective filters for welders

built into corresponding protectors. Data deal with the optical thickness of filters for visible light, differentiating between the minimum, maximum and the standard thickness. Thus, for example, for electric welding by currents of 30 to 75 amp, a minimum optical thickness of 2.36 to 2.79, a standard optical thickness of 2.572 to 3.000 and a maximum optical thickness of 2.78 to 3.21 are prescribed for visible light. Filters with the optical thickness within corresponding limits are marked with "shadow numbers" and are so sold. The standard table also gives data on transmission (in %) of the total visible light, again differentiating between the minimum standard and the maximum transmission. Further, data are given on the permitted maximum transmission of the total infrared and ultraviolet light for the following wavelengths: 313 m_{μ}, 334 m_{μ}, 365 m_{μ} and 405 m_{μ}. All these data are given for 12 types of protective filters with the "shadow numbers" from 3 to 14. According to the Yugoslav standard a protective filter with a "shadow number" of 7 will have a minimum optical thickness for visible light of 2.36. By employing

Y/002/60/000/006/001/001
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Optical protective filters for welders

E = log Jo - log J (1), derived from Lambert's law, and where E = the optical thickness of extinction, Jo = light intensity entering the filter, and J = light intensity passing through the filter, it can be computed that this filter will transmit only 0.44% of the total visible light. According to the same standard a protective filter for welders will have a maximum thickness of 5.78 and a corresponding transmission of visible light of only 0.00017%. Such filters are used in the electric welding by currents of more than 400 amp. As regards the quality control of protective filters, the Yugoslav standard prescribes that every 2 out of the first 100 pieces and 1 out of the further 100 pieces should be checked. The testing of filters, however, is not listed in the standard and the selection of testing methods is left to manufacturers or establishments concerned. Optical filters for welders with gelatine layers will have chiefly three components for light absorption, including two components for the practically total absorption of ultraviolet and infrared light and one component for attenuating considerably visible

Y/002/60/000/006/001/001
D251/D301

Optical protective filters for welders

light. Organic dyes, for example, yellow dyes melted in the gelatine layer for the absorption of ultraviolet light, are used as components for absorbing ultraviolet and infrared light. Infrared light is usually well absorbed by salts of some heavy metals such as iron. The attenuation of visible light is carried out differently, but it is always required to attenuate equally the entire spectrum of visible light. For this purpose a "gray" agent of higher concentration is added in order to achieve the corresponding high absorption of visible light. As "gray" agents for the uniform attenuation of the entire visible light, appropriate black organic dyes or Indian ink are also used. Two methods of testing protective filters, i.e. photographic spectral photometry and photometry with photomultipliers are used. The former method is based on the Reciprocity Law - one of the fundamental photochemical laws of photographic layers, formulated by $J1\ t1 = J2\ t2 = J3\ t3 = \ldots = \text{const}$ (2), where J1, J2, J3 = the light intensity acting on the photographic layer, and t1, t2, t3 = . . . = the corresponding values of exposure, which after

Optical protective filters for welders

the development produces the same darkening values (D =const.). Eq 2 can be applied to determine the optical thickness of filters in the following form: Jo to = J t (2a), where Jo and to = light intensity acting on the photographic layer without filter and exposure. In this case as a light source a "Vitalux" lamp, producing numerous intensive mercury spectral lines with wavelengths of up to 300 mμ, was used. Pictures were made by the universal "Zeiss" spectrograph, and the "Efka 20" film of the "Fotokemika" was used as a photomaterial. Only six spectra are photographed below the scale, including the first four without filter with exposures of 0.1, 0.2, 0.5 and 1 sec, and the last two with a protective filter and exposures of 180 and 115 hours. It is also clear that values used for t_o are very small and for t very high. The tested protective filter had a very high optical thickness. The spectral boundary between visible and ultraviolet light is at number 40 on the scale. It is also clear that the light source has a greater number (about 10) of spectral lines in the ultraviolet region of the spectrum, that is, below 400 mμ. None of these lines is visible in spectra made with the protective filter, meaning that the same filter absorbs so completely

Optical protective filters for welders

that an exposure even of 180 hours has no photochemical effect on the photographic layer. The same is valid for ultraviolet and blue mercury spectral lines with wavelength of 404.7 and 435.8 m_μ. On the contrary, green and yellow mercury spectral lines with wavelengths of 546.1 and 577.0/579.1 m_μ pass through the protective filter acting on the photographic layer. As a result of this spectral photograph it can be established that the tested protective filter practically absorbs completely ultraviolet, violet and blue light, and transmits very weak components of green and yellow light. This spectral photograph further permits the calculation of the optical thickness of the protective filter for green light with a wavelength of 579 m_μ by using equation 2 a. For this purpose the attenuation (D) of mercury spectral lines in all spectra was photometrically measured. Results obtained are graphically illustrated in Fig. 2. The Reciprocity Law cannot be applied to this problem without corresponding corrections. A modification of this law known as the Schwarzschild Law is expressed by the exponential equation $Jo\ to^p = J\ t^p$ (3)

Optical protective filters for welders

where p = the Schwarzschild exponent. The application of the photographic method of testing protective filters requires experimental determination of numerical values for the Schwarzschild exponent. In this case, ow ing to very long exposures, the usual methods of determining the above exponent are faced with constant experimental difficulties. The following method was, therefore, used: By means of an appropriate photomultiplier transmission of the protective filter, to which the spectral photograph refers, was measured for visible light. The photomultiplier had a maximum sensitivity in the green region of the spectrum. By this measurement the following value was obtained J = 0.0281. Values for J were then computed from Eq 3, by using experimental data from the spectral photograph and giving various values to exponent p. Results thus obtained are shown in Table 2 and are also graphically illustrated in the logarithmic measure in Fig. 5. A value obtained for the Schwarzschild exponent was p = 0.53. Since homogenous glass protective filters for welders are not produced in Yugoslavia, the production of filters

21917

Y/002/60/000/006/001/001
D251/D301

Optical protective filters for welders

with gelatine layers is to be organized. These layers must be dyed with organic dyes and Indian ink and the filters must be produced in accordance with the JUS standard. The above standard gives no method for the optical testing of filters. Only values for the optical thickness and light transmission, visible, ultraviolet and infrared, required for certain types of filters, are listed. By means of the spectrographic photograph it was established that filters sufficiently absorb ultraviolet radiation and considerably attenuate visible light. By studying results obtained on the basis of the spectrographic photo it was also established that considerably low values of transmission for protective filters are obtained from the equation of the Reciprocity Law. The Schwarzschild equation, however, gives good results if the exponent p = 0.53. The photomultiplier ensures good results for the optical thickness of protective filters in the visible region of the spectrum. Unlike the spectrographic method which requires very long exposures, over 100 hours, the photomultiplier operates fast. This equipment could also

Card 8/10

21917

Y/002/60/000/006/001/001
D251/D301

Optical protective filters for welders

be used for controlling the production of protective filters for welders. Determining the optical thickness of protective filters was impossible in the infrared region of the spectrum. The normal spectral photometers for infrared radiation cannot be used for this purpose either, owing to the very high optical thickness of filters and a photomultiplier for infrared radiation was not available. There are 3 figures, 1 table and 6 non-Soviet-bloc references.

Tablica 2.

p	J	log J
1	$2.1 \cdot 10^{-5}$	−4.67778
0.9	$9.7 \cdot 10^{-5}$	−4.01435
0.8	$4.5 \cdot 10^{-4}$	−3.34600
0.7	$2.1 \cdot 10^{-3}$	−2.67778
0.6	$9.8 \cdot 10^{-3}$	−2.00950
0.5	$4.5 \cdot 10^{-2}$	−1.34125

Table 2

Card 9/10

Optical protective filters for welders

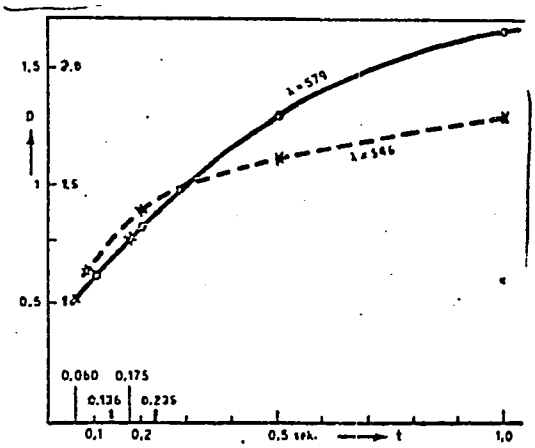

Fig 2. Dependance of the thickness of attenuation of spectral lines (D on the exposure (t)

Card 10/10

21917
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D251/D301

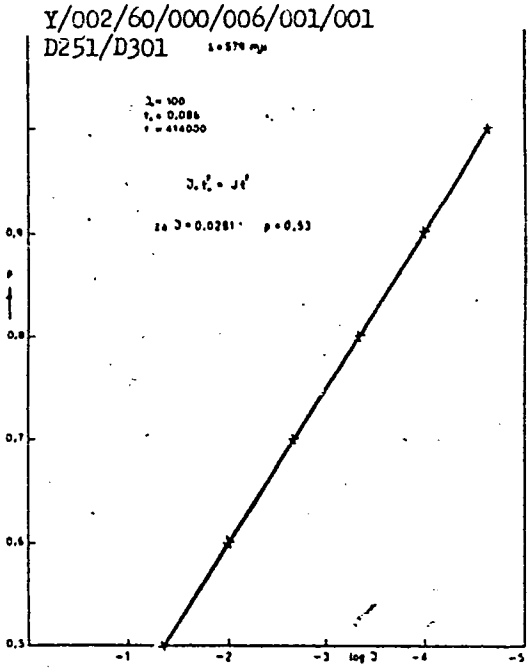

Fig 5. Illustration of the logarithmic function p-J

S/056/62/042/006/015/047
B104/B102

AUTHORS: Kogan, V. S., Bulatoz, A. S.

TITLE: The temperature dependence of the isotopic effect in nickel lattice

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42, no. 6, 1962, 1499-1501

TEXT: The isotopic effect on Ni^{58} and Ni^{64} was investigated by means of x-ray analysis at nitrogen temperature and room temperature. At nitrogen temperature the lattice parameter of the lighter isotope is larger than that of the heavier ($\Delta a = 0.0005 \pm 0.0002$ Å). At room temperature the isotopic effect approaches zero but has a negative sign ($\Delta a = -0.0002 \pm 0.0002$ Å). The diminution of the isotopic effect can be explained by reference to the Debye theory of a solid body, but inversion of the isotopic effect does not follow from this theory. A comparison of the data on the isotopic effect for nickel with earlier data for other isotopes shows that in lattices with similar binding forces the relative change in the molar volume increases almost linearly with $\Delta M/M$. For

Card 1/2

metals the slope of the straight line is twice as steep as for lattices with binding forces of the Van der Waals type. B. G. Lazarev, Academician of the AS UkrSSR, is thanked for his interest. There is 1 figure.

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk Ukrainskoy SSR (Physicotechnical Institute of the Academy of Sciences Ukrainskaya SSR)

SUBMITTED: January 30, 1962

BULATSEL, A.M.

DERKACH, V.S.; BELAYA, O.S.; BULATSEL', A.M.; KVYAT, K.M.; TURMAN, Ye.P.; KRAMMER, Ye.V.; ZVYAGINTSEVA, A.M.

Effectiveness of combined antibiotic therapy for chronic dysentery. Zhur.mikrobiol.epid.i immun. no.3:54-59 Mr '55. (MLRA 8:7)

1. Iz mikrobiologicheskogo otdela (zav. prof. V.S.Derkach) Khar'kovskogo instituta vaktsin i syvorotok (dir. kandidat biologicheskikh nauk G.P.Cherkas) i profil'nykh yasley Kar'kova.

(DYSENTERY, BACILLARY, therapy,
antibiotics, combined ther.)
(ANTIBIOTICS, therapy,
dysentery, combined ther.)

5.3831

78230
SOV/80-33-3-31/47

AUTHORS: Starobinets, G. L., Sevost'yanova, L. I., Bulatskaya, G. N.

TITLE: Sulfo Cation Exchangers Based on Polybutadienes

PERIODICAL: Zhurnal prikladnoy khimii, 1960, Vol 33, Nr 3, pp 690-694 (USSR)

ABSTRACT: Sulfonation of polybutadiene rubber and its vulcanizates containing 2, 10, 18, and 26% bound sulfur, gave sulfo cation exchangers with an ion exchange capacity of 1.4 to 3.2 mg equiv/g. The sulfonation was made in a water bath at 100° C, in a six-fold excess of 98% H_2SO_4 (based on weight). The reaction took from 40 hr (for cation exchanger containing 2% S), to 55 hr (for one containing 26% S). Exchangers thus obtained were chemically stable, swelled little, and were mechanically and thermally resistant. A clear separation of a mixture of Ca and Ba ions was achieved using sulfo exchanger containing 18% sulfur in a chromatographic

Card 1/2

Sulfo Cation Exchangers Based on Polybutadienes

78230
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elution column. There are 4 figures; and 9 references, 1 U.S., 1 German, and 7 Soviet. The U.S. reference is: J. Phys. Chem., 58, 456 (1954).

ASSOCIATION: Minsk, The V. I. Lenin Belorussian State University (Minsk, Belorusskiy gosudarstvennyy universitet imeni V. I. Lenina)

SUBMITTED: June 24, 1959

Card 2/2

ACCESSION NR: AT4006714 S/3043/63/000/002/0146/0161

T. A. para 17.7

AUTHOR: Budak, B. M.; Bulat*skaya, T. F.; Vasil'yev, F. P.

TITLE: Numerical solution of a boundary problem for the system of nonlinear integro-differential equations of a supersonic boundary layer

SOURCE: Moscow. Universitet. Vy*chislitel'ny*y tsentr. Sbornik rabot, no. 2, 1963. Chislenny*ye metody* v gazovoy dinamike, 146-161

TOPIC TAGS: boundary value problem, integrodifferential equation, nonlinear equation, supersonic boundary layer, body of revolution, numerical method, computing process scheme, iteration method, variable step net, numerical method convergence, boundary layer, axisymmetric flow, viscous fluid flow

ABSTRACT: A system of equations describing a supersonic boundary layer on a slender body of revolution within an axially symmetric flow of a viscous, heat-conducting gas is rewritten in Dorodnitsy*n variables ξ and η, and the boundary conditions under which the system is to be solved are established. The solution of the boundary value

Card 1/3

ACCESSION NR: AT4006714

problem is sought in the form:

$$u = \psi(\xi),\ i = i(\xi),\ \xi = \frac{\sqrt{R}\,\eta}{2M\sqrt{\xi}}, \qquad (1)$$

where u and i are velocity and enthalpy functions of the boundary layer respectively, R is the Reynolds number, and M is the Mach number. After substituting (1) into the system of equations and boundary conditions, the boundary value problem for Volterra's nonlinear integro-differential equation is derived. It is to be solved simultaneously with the cubic equation expressing the condition for the existence of solutions of (1). An iterative difference method is used to solve the problem. The scheme for the difference approximation of the boundary value problem and the iterative process for solving it are described in detail. Pecularities of difference approximations of the derivatives, integrals, and particular blocks of the calculation process are presented. Problems of selecting given functions, constants, and initial approximations, also their effect on the number of

Card 2/3

ACCESSION NR: AT4006714

iterations needed to attain a given accuracy of approximation, are analyzed. In order to test this method, the known Blasius case of a boundary layer was calculated and results compared with ones derived by other numerical methods. A series of particular variants of the problem are calculated by means of the described method, and the results are analyzed. Orig. art. has: 47 formulas and 4 figures.

ASSOCIATION: none

SUBMITTED: 00 DATE ACQ: 16Dec63 ENCL: 00

SUB CODE: AI NO REF SOV: 004 OTHER: 002

Card 3/3

L 00358-66 EWT(1)/EWP(m)/FCS(k)/EWA(1) WW

ACCESSION NR: AT5013286 UR/3043/65/000/004/0115/0129

AUTHOR: Bulatskaya, T. F.

TITLE: Laminar boundary layer on lateral faces of bodies within multicomponent gas mixtures

SOURCE: Moscow. Universitet. Vychislitel'nyy tsentr. Sbornik rabot, no. 4, 1965. Chislennyye metody v gazovoy dinamike (Numerical methods in gas dynamics), 115-129

TOPIC TAGS: supersonic flow, boundary layer flow, inhomogeneous gas, boundary layer theory, laminar boundary layer

ABSTRACT: The present article outlines a method for the calculation of a multicomponent gas mixture boundary layer on lateral surfaces of objects. The rate of chemical reactions within the boundary layer is assumed negligibly small. The diffusion rate is calculated by means of the approximate Wilke formulas (Chem. Engng. Progr., 1950, v. 46, no. 2) as well as using relationships from the exact kinetic theory (the Stefan-Maxwell relation). A comparison of results obtained in different approximations shows that they agree mutually within 3%. "The author expresses her deep gratitude to N. A. Anfimov for the discussion of the formulation of the problem and consultations during the

Card 1/2