USSR

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Ya. METSAVEER, Institute of Cybernetics, Academy of Sciences Estonian SSR

"On the Scattering of Transient Echo Signals By Elastic Spherical Shells"

IZVESTIYA AN ESTONSKOY SSR, FIZIKA MATEMATIKA, 20/3, 1971, pp 295-299

Using the Fourier transformation for time and the Watson transformation for coordinates, the author employs the method of integral transformation to study the scattering of transient echo signals by an elastic spherical shell. The approximate far-field solution for the echo signals is obtained in closed form with asymptotic formulas for the Hankel and Legendre functions. On the basis of the obtained solution, the author proposes a system of equations for determining the shell parameters from the parameters of the echo signals.

This article is a further development of an earlier work by the author (Izvestiya AN Estonskoy SSR, Fiz,Matem, 19, p 415 (1970)).

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USSR

UDC 539.3:534.1

METSAVEER, Ya. A. and NIGUL, U. K.

"Determination of the Thickness and Radius of a Spherical Shell on the Basis of Echo Signals"

Moscow, Mekhanika Tverdogo Tela, No 6, Nov-Dec 72, pp 60-66

Abstract: The discussion concerns echo signals from an elastic spherical shell that are evoked in an unbounded ideal compressible fluid by the action of a sinusoidal sounding pulse of finite length. By mathematical simulation of the process of formation of the echo signal it is established that for a given material of the shell, depending upon the thickness of the shell and its radius a frequency range of the sounding pulse can be evolved, at which the elastic deformation of the shell exerts a substantial influence upon the structure and amplitude of the echo signal, as well as frequency ranges at which the echo signal from an elastic shell differs little from the echo signal from an absolutely rigid sphere of the same radius. It is shown that by selecting the frequency of the sinusoidal sounding pulse from the range of strong influence of the elastic deformation of a shell upon the echo signal, it is possible to determine on the basis of the echo signal not only the distance to the shell and its radius, but also the thickness of the shell.
1/2

USSR

METSAVEER, Ya. A. and NIGUL, U. K., Mekhanika Tverdogo Tela, No 6, Nov-Dec 72, pp 60-66

A procedure for conducting such a calculation is presented. Diagrams are presented for an aluminum shell. 5 figures. 6 references.

2/2

USSR

UDC 539.3:534.1

METSAVEER, Ya. A., Tallin

"The Echo Signal of a Finite Spherical Impulse from an Elastic Cylindrical Shell"

Moscow, Prikladnaya Matematika i Mekhanika, Vol 37, No 2, Mar - Apr 73, pp 274-284

Abstract: An approximate method is suggested for calculating the echo signal from a finite, centrally symmetrical pressure impulse striking an infinite elastic cylindrical shell in an unbounded ideally compressible fluid. The movement of the shell is described by using a linear theory of shells of the Timoshenko type. The problem is solved by the triple application of integral transforms (a Fourier transform over time and along the longitudinal coordinate, a Sommerfeld-Watson transform on the polar angle).

Articles by Huang and Wang (Journal of the Acoustical Society of America, Vol 48, No 1, Part 2, 1970, and Vol 50, No 3, Part 2, 1971) and by Kubenko (Dop. AN URSR, Series A No 3, 1970) covered the unstable interactions of spherical pressure impulses in a fluid with an elastic cylindrical shell, using a LaPlace transform over time, a Fourier transform on the longitudinal coordinate and either a Fourier transform or decomposition into a Fourier series on the polar angle. However, calculating the rapidly changing components by Fourier series is

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USSR

METSAVEER, Ya. A., Tallin, Moscow, Prikladnaya Matematika i Mekhanika, Vol 37, No 2, Mar - Apr 73, pp 274 - 284

difficult because of the slow convergence, while the use of a Fourier transform on the polar angle presents problems of application; the saddle point method used by these authors does not permit correct allowance for the effect of elastic waves propagating in the shell.

This work uses the Sommerfeld-Watson transform on the polar angle, permitting more exact application. Over time the LaPlace transform is replaced by a Fourier transform. The solution in space of a Fourier transform over time can be treated as the solution of the corresponding steady state problem, permitting the use of the accumulated experience in solving steady state problems and analyzing the solutions of transforms in space.

The work is an extension to the cylindrical shell of a method of developing algorithms reported by the author in preprint No 3, Institute of Cybernetics of the AN ESSR, Tallin, 1971. Previous developments were reported in Izv. AN ESSR, Physics and Mathematics, Vol 19, No 4, 1970, Vol 20, No 3, 1971, and Vol 21, No 3, 1972.
2/2

UDC 542.91+632.938

USSR

DOVLATYAN, V. V., and METSBURYAN, D. A., Armenian Agricultural Institute, Yerevan

"Synthesis of Pesticides. 2-Methylthio-4-alkyl(dialkyl)amino-6-/ α-hydroxy (methoxy)- β, β, β -trichloroethyl/amino-sym-triazines"

Yerevan, Armyanskiy Khimicheskiy Zhurnal, Vol 24, No 10, 1971, pp 924-927

Abstract: By reacting 2-chloro-4-alkyl(dialkyl)amino-6-amino-sym-triazines with thiourea in the presence of traces of HCl, the corresponding thiuronium salts were obtained. Their cleavage with KCN followed by methylation with Me_2SO_4 yielded 2-methylthio-4-alkyl(dialkyl)amino-6-amino-sym-triazines (I) which, on being reacted with chloral, formed 2-methylthio-4-alkyl(dialkyl) amino-6-(α -hydroxy- β, β, β -trichloroethyl)amino-sym-triazines. By methylation of the latter with Me_2SO_4, 2-methylthio-4-alkyl(dialkyl)amino-6-(α -methoxy- β, β, β -trichloroethyl)amino-sym-triazines (II) were synthesized. Compounds I (8 compounds) and II (8 compounds) together with their yields and decomposition or melting points are listed in tables. Results of testing of the pesticidal activity of the compounds prepared will be reported separately.

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USSR UDC 632.95

DOVLATYAN, V. V., METSBURYAN, D. A., SENEKERIMYAN, Ya. A., APRESYAN, M. A.

"Method of Producing α-oxy- or α-alkoxy- β,β,β-trichloroethylamino Derivatives of 1, 3, 5-triazine"

USSR Author's Certificate No 265112, filed 25/12/67, published 28/04/72 (Translated from Referativnyy Zhurnal Khimiya, No 24(II), 1972, Abstract No 24N625, by T. A. B.)

Translation: Derivatives of 1, 3, 5-triazine (I) having herbicidal and fungicidal properties are produced by the reaction of 2-Cl-4,6-$(NH_2)_2$-I (II) or 2-Cl-4-RNH-6-NH_2-I (R-alkyl) with CCl_3CHO (III) in the presence of an alkaline catalyst in an organic solvent with boiling, with subsequent treatment with $SOCl_2$ in an organic solvent with boiling, and treatment of the reaction products with ethanol in the presence of a base with boiling of the reaction mass. Example. To 1.3 g II and 0.32 g K_2CO_3, with water cooling, add 9.4 g III and 20 ml CCl_4, heat in a water bath six hours, separate the sediment, wash with water, dry in air, treat with boiling hexane and filter off 3.8 g 2-Cl-4.6-$[CCl_3CH(OH)NH]_2$-I m. p. >350°. To 4.81 g 2-Cl-4-EtNH-6-[CCl_3-$-CH(OH)NH$]-I in 15 ml CCl_4, with water cooling, add a solution of 2 g $SOCl_2$ in 10 ml CCl_4, heat in a water bath ten hours, evaporate, treat the residue

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USSR

DOVLATYAN, V. V., et al., USSR Author's Certificate No 265112, filed 25/12/67, published 28/04/72

with hexane, filter, producing 4.6 g 2-Cl-4-EtNH-6-($CCl_3CHClNH$)-I, m.p. 164-6°. To 16.27 g 2-Cl-4-MeNH-6-($CCl_3CHClNH$)-I in 5 ml ethanol, with cooling, add 3.95 g pyridine by drops, heat the reaction mass in a water bath six hours and let stand over night, evaporate, treat with water and filter off 13 g 2-Cl-4-MeNH-6-[$CCl_3CH(OEt)NH$]-I, t. decomp. 226°.

2/2

USSR

UDC 542.91+547.87

DOVLATYAN, V. V., METSBURYAN, Drb. A., Armenian Agricultural Institute, Yerevan

"Synthesis of Pesticides. Synthesis of Thiocarbamoylthio Derivatives of Symm-triazine"

Yerevan, Armyanskiy Khimicheskiy Zhurnal, Vol XXIV, No 2, 1971, pp 174-178

Abstract: In connection with the presence of the dialkyldithiocarbamic group in highly active fungicide molecules, a study was made of the synthesis of thiocarbamoylthio derivatives of symm-triazine. By interaction of cyanuric chloride with sodium dialkyldithiocarbamates, 2,4,6-tris-dialkylthiocarbamoylthio-symm-triazines were synthesized; 2-chloro-4-alkyl(dialkyl) amino or 2-chloro-4-methoxy-6-dialkylthiocarbamoylthio-symm-triazines were also synthesized by interaction of 2,6-dichloro-4-alkyl(dialkyl) amino or 2,6-dichloro-4-methoxy-symm-triazines with sodium dialkyldithiocarbamates. By interaction of 2-chloro-4,6-bis-alkyl(dialkyl)amino-symm-triazines with sodium alkyl(dialkyl)dithiocarbamates, 2-alkyl(dialky)thiocarbamoylthio-4,6-bis-alkyl(dialkyl)amino-symm-triazines were synthesized. The experimental procedures for obtaining the given compounds, yields, analysis data and melting points are tabulated. The results of testing the fungicidal and herbicidal activities will be published separately.

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USSR

DOVLATYAN, V. V., KHACHATRYAN, N. Kh., Armyanskiy Khimicheskiy Zhurnal, Vol XXIV, No 2. 1971, pp 167-173

(dialkyl) amino-symm-triazines are obtained. The experimental procedures for obtaining the mentioned compounds, their formulas, yields and physical and chemical properties are presented.

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USSR

BURTOV, A. I., GRUSHVITSKIY, R. I., METTER, E. Ya., PETROV, V. A., PLATONOV, V. V., SAVUTKIN, V. V., VEDESHENKOV, V. A., VOLKOV, A. F., ZENKIN, V. D., LIKHONINSKIY, V. S., and SOROKIN, G. K.

"Computer Device"

Moscow, Otkrytiya, izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, No 27, 1972, p 162, No (11) 351216

Translation: This patent describes a computing device containing resolving modules with decoupling cells at the power supply inputs. It also has a control block connected to the inputs of a switching block and an efficiency indicator. Every output of the switching block is connected to the control input of one of the decoupling cells, thus improving the reliability of the device.

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UDC: None

USSR

MEUNARGIYA, T. V.

"Symmetrical Bend of a Circular Plate of Variable Thickness"

Tbilisi, Soobshcheniya Akademii Nauk Gruzinskoy SSR, 64, No. 2, 1971, pp 293-296

Abstract: This article solves the problem of symmetrical bending in a circular plate whose thickness varies in accordance with the expression $h(r) = h_0(1 + \varepsilon H)$: where $h_0 = \frac{1}{2}(h_1 + h_2)$, $\varepsilon = (h_1-h_2)/(h_1+h_2)$, and $H = -1 + 2r^2/R^2$. Then, $h(R) = h_1 = \text{const}$, $h(0) = h_2 = \text{const}$, ε being a small parameter. To solve this problem, three different variants of shell theory are used: the classical theory, the equation of E. Reissner, and the equation of I. N. Vekua. The main function of this paper is to compare the results obtained by certain indications for estimating the framework of applicability of these variants in the theory of shells. The author concludes that Vekua's theory embraces a broader range of variation of the Poisson coefficient than the other two, while the Reissner range is between those of the Vekua and classical theories. The author is connected with the Tbilisi State University, Institute of Applied Mathematics.

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USSR

UDC 621.52:533.59:541.183

KAPITANSKIY, V.R., LIVSHITS, A.I., METTER, I.M.

"Diffusion Of Hydrogen Through Palladium At Low Pressures And Evacuation Of Hydrogen Through A Palladium Partition In The System Of A Hydrogen Generator"

V sb. Materialy nauch.-tekhn. konf. Leningr. elektrotekhn. in-ta svyazi. Vyp.4 (Materials Of Scientific-Technical Conference Of Leningrad Electrical Engineering Institute Of Communications. Issue 4 -- Collection Of Works), Leningrad, 1971, pp 166-170 (from RZh:Elektronika i yeye primeneniye, No 4, April 1972, Abstract No 4A49)

Translation: At a temperature of 520° C and pressure of $2 \cdot 10^{-5}$ mm of mercury, nonactivated palladium 0.3-mm thick gives an exhaust output of 0.1 l/sec per 1 cm^2 of the surface. The design of a nonactivated pump is described which gives an exhaust rate of ~3 l/sec at a temperature of ~500° C and a pressure of $3 \cdot 10^{-4} \div 5 \cdot 10^{-5}$ mm of mercury. On the whole the pump spent ~300 hours at the temperature range 500--700° C, during which all of its parameters remained unchanged. 6 ref. A.F.

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Immunology

UDC 616-006-092.4

USSR

VARDOSANIDZE, E. SH., and [redacted], Institute of Oncology, Ministry of Health Georgian SSR

"An Immunofluorescent Study of Surface Antigens Induced by Human Adenovirus Type 12 in Various Systems of Cell Cultures"

Tbilisi, Soobshcheniya Akademii Nauk Gruzinskoy SSR, Vol 63, No 3, 1971, pp 713-716

Abstract: Adenovirus type 12, incubated with other cells, induces the formation of surface antigens in human amniotic A-1 cells and in hamster embryonic cells, though not in mouse embryonic cells. This is revealed by the indirect fluorescent antibody method: after addition of specific antibodies (obtained from hamsters repeatedly vaccinated with adenovirus) to the culture, fluorescent rings are formed on human amniotic and hamster embryonic cells. These antibodies interact neither with the virus or its antigen nor with control cultures. It is therefore concluded that the adenovirus induces the formation of specific antigens on the membrane of the host cell, which may endow the cell with antitumor immunity.

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USSR

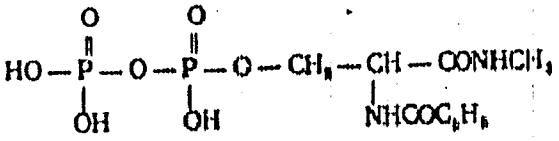
UDC: 547.466

AVAYEVA, S.M., RAS'KOVA, N.V., MEVKH, A.T., Laboratory of Bio-Organic Chemistry, Moscow State University imeni M.V. Lomonosov, Moscow, Ministry of Higher and Secondary Specialized Education RSFSR

"Synthesis of N-Benzoyl-O-Pyrophosphoserine Methylamide"

Moscow, Vestnik Moskovskogo Universiteta, Seriya II, Khimiya, Vol 11, No 1, Jan/Feb 70, pp 100-105

Abstract: Three methods of synthesizing N-benzoyl-O-pyrophosphoserine methylamide



were investigated. A method is also described for synthesizing this serylpyrophosphate with radioactive tracer atom 32 p for studying the mechanism of interaction of the compound with enzymes.

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Aeronautical and Space

USSR

UDC: 532.529

RAKHMATULIN, Kh. A., MEVLYUDOV, S. I.

"Supersonic Flow of a Two-Phase Mixture Around a Body"

V sb. Vopr. vychisl. i prikl. mat. Vyp. 9 (Problems of Computational and Applied Mathematics--collection of works. No 9), Tashkent, 1971, pp 166-175 (from RZh-Mekhanika, No 5, May 72, Abstract No 5B1204)

Translation: The problem of flow of a two-phase mixture around a thin foil or body of revolution at supersonic velocity is considered in the linear theory approximation. A model of interpenetrating motion of two (or three) interacting continuous media (components) is used. In this connection, in addition to the energy equation of the gas (or mixture), barotropy is assumed, i. e. it is assumed that the perturbation of pressure p is a known function of perturbation of the density of the two-component mixture $\rho = \sum_{n=1}^{N} \rho_n$, where ρ_n is the density of the corresponding component, and N is the number of components. In the solution, the entire region of the disturbed flow is broken down into two subregions (I) and (II). A two-velocity

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USSR

RAKHMATULIN, Kh. A., MEVLYUDOV, S. I., Vopr. vychisl. i prikl. mat. Vyp. 9, Tashkent, 1971, pp 166-175

model (N = 2) is applied to subregion (I) bounded by the head wave (by the characteristic in the linear approximation) and by the surface of the body. For subregion (II), bounded by the separation line and the body surface, a three-velocity model (N = 3) is used, the third component being the particles reflected from the surface of the body in accordance with the law of mirror reflection. Formulas are presented which give a solution in these regions. A series expansion with respect to the coordinate y normal to the oncoming flow is used to find the solution in region (II). Bibliography of 5 titles. A. N. Krayko.

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MEVLYUDOV, S I.

of the density perturbation of the mixture

$$\rho - \sum_{i=1}^{n} \rho_{0i}$$

where ρ_0 is the density of the corresponding component, and n is the number of components. In the solution, the entire region of the perturbed flow is divided into two subregions (I) and (II). To subregion (I), bounded by the bow wave (in the linear approximation, by a characteristic curve) and a dividing line (the trajectory of the particles reflected from the leading edge of the body), a two-velocity model is applied. To subregion (II), bounded by the dividing line and the body surface, a three-velocity model is applied in which the third component is the particles reflected from the body in accordance with the law of specular reflection. Formulas which yield a solution in the indicated regions are presented. When obtaining a solution in region (II), use is made of an expansion into a series along the z coordinate, which is normal to the free-stream flow.

Mevlyudov, S. I. Linear theory of supersonic flow around a slender body in a two-phase mixture. IN: Voprosy vychislitel'noy i prikladnoy matematiki, Tashkent, no. 9, 1971, 156-165. (RZhMekh, 5/72, no. 5312D3)

In a formulation analogous to the preceding work by Rakhmatulin and the author, a linear problem is considered of the flow of a two-phase mixture around a slender two-dimensional or axisymmetric body. The author in this work assumes that the equation

$$\sum_{m=1}^{n} \rho_m \left(\frac{\partial v_m}{\partial y} - \frac{\partial v_z}{\partial x} \right) = 0$$

MEVLYUDOV, S. I.

Krymova, S. G., and V. S. Nikolayev.
Experimental investigation of optimally balanced profiles in viscous supersonic flow. In: Uchenyye zapiski Tsentral'nogo aero-gidrodinamicheskogo instituta, v. 2, no. 5, 1971, 94-98. (RZhMekh, 5/72, no. 5B977)

The optimal shape of three classes of profiles with a given location of the balancing center of pressure were investigated in viscous hypersonic flow stream (M_∞ = 5.2, R = 150). The upper boundary of the gravity factor as a function of the location of the center of pressure is found for the profiles under consideration. The experimental results are compared with theoretical data calculated by one of the authors (Nikolayev Uchenyye zapiski Tsentral'nogo aero-gidrodinamicheskogo instituta, v. 1, no. 6, 1970, 67-74, RZhMekh, 1971, no. 10B274).

Rakhmatulin, Kh. A., and S. I. Mevlyudov.
Supersonic flow around a slender body in a two-phase mixture. In: Voprosy vychislitel'noy i prikladnoy matematiki, Tashkent, no. 9, 1971, 166-175. (RZhMekh, 5/72, no. 5B1204)

The problem of supersonic flow around a slender profile or body of revolution by a two-phase mixture is considered in an approximation of linear theory. A model of the interpenetrating motion of two or three interacting continuous media (components) is used. Instead of an equation of energy of the gas or mixture, an assumption of barotropicity is used: i.e., the pressure perturbation p is considered to be a known function

USSR UDC 532.501.117

RAKHMATULIN, Kh. A. and MEVLYUDOV, S. I., Order of Red Labor Banner Institute of Cybernetics, Academy of Sciences Uzbek SSR

"One Limiting Case in a Multiphase Flow Around Fine Solids"

Tashkent, Izvestiya Akademii Nauk, Uzbek SSR--Seriya Tekhnicheskikh Nauk, No 6, 1972, pp 31-35

Abstract: The relationship of pressure to average mixture density, revealed for single-velocity motion, has been applied to solve problems of multispeed flow of a solid and is used in this work. The path of a uniform steady-state flow of gas containing fine particles of a solid with velocity U_0 flows into a thin symmetrical shape. The particles, being reflected from a solid surface, form a boundary region II. The boundary line of flow of the reflected particles (interface line) divides the excitation region into two parts: I--that part bounded by the frontal wave and interface line (supersonic case) and II--the part bounded by the interface line and solid surface.

A three-speed model was applied to region II and taken through a mathematical treatment starting with the basic equations of mutual penetrating movements of multicomponent media and ending with the following solution:
1/2

USSR

RAKHMATULIN, Kh. A. and MEVLYUDOV, S. I., Izvestiya Akademii Nauk, Uzbek SSR--Seriya Tekhnicheskikh Nauk, No 6, 1972, pp 31-35

$$F'(t) \sim 1/(t^{1+\varepsilon}), \quad (\varepsilon > 0)$$

for $t \to$ infinity. 24 equations, 4 bibliographic references.

2/2

1/2 019 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--MUST THE BRAIN BE SPARED -U-

AUTHOR--MEYBAUM, V.

COUNTRY OF INFO--USSR

SOURCE--MOSCOW, LITERATURNAYA ROSSIYA, 9 JAN 70, P 20

DATE PUBLISHED--09JAN70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--BRAIN, CEREBRAL CORTEX, INFANT, PEDIATRICS, FATIGUE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3003/0288 STEP NO--UR/0729/70/000/000/0020/0020

CIRC ACCESSION NO--AP0129520
UNCLASSIFIED

UNCLASSIFIED PROCESSING DATE--30OCT7

2/2 019

CIRC ACCESSION NO--AP0129520

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. MANY PEOPLE BECOME SENILE PREMATURELY BECAUSE THEY OVERWORK THEIR BRAINS THROUGH INGNORANCE OF HO THE ORGAN FUNCTIONS, POOR ORGANIZATION OF DAILY ROUTINES, INADEQUATE REST, AND UNHEALTHY HABITS. INTELLECTUAL LOADS SHOULD BE PERIODICALLY SHIFTED (BY DOING DIFFERENT THINGS) IN ORDER TO REST (OR ENGAGE) DIFFERENT GROUPS OF NERVE CELLS IN THE CEREBRAL CORTEX. THE AUTHOR BELIEVES THAT THE BRAIN CAN AND SHOULD BE "SPARED" FROM THE EARLIEST DAYS OF LIFE. THE INFANT, FOR EXAMPLE, SHOULD NOT BE EXPOSED TO TOO MANY STIMULI OR, WHEN OLDER, GIVEN EXCESSIVE INSTRUCTION AT HOME. SCHOOL CHILDREN SHOULD BE GIVEN PHYSICAL TRAINING, VISIT PLACES AWAY FROM SCHOOL AS A BREAK IN THE DAILY ROUTINE, ETC. MEDICINE CAN DO MUC TO HELP PREVENT NERVOUS EXHAUSTION AND ITS SERIOUS CONSEQUENCES, BUT IT IS NOT PRESENTLY ORGANIZED TO DO SO.

UNCLASSIFIED

USSR

MEYBAUM, V.

"Must the Brain Be Spared?"

Moscow, Literaturnaya Rossiya, 9 Jan 70, p 20

Abstract: Many people become senile prematurely because they overwork their brains through ignorance of how the organ functions, poor organization of daily routines, inadequate rest, and unhealthy habits. Intellectual loads should be periodically shifted (by doing different things) in order to rest (or engage) different groups of nerve cells in the cerebral cortex. The author believes that the brain can and should be "spared" from the earliest days of life. The infant, for example, should not be exposed to too many stimuli or, when older, given excessive instruction at home. School children should be given physical training, visit places away from school as a break in the daily routine, etc. Medicine can do much to help prevent nervous exhaustion and its serious consequences, but it is not presently organized to do so.

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Vector Studies

USSR

UDC 599.323.4 Muridae

MEYER, M. N., ORLOV, V. N., and SKHOLL', Ye. D., Zoological Institute, Academy of Sciences, USSR; Institute of Cytology, Academy of Sciences, USSR and Moscow State University

"The Nomenclature of 46- and 54-Chromosome Voles of the Type Microtus Arvalis (Pall.) (Rodentia, Cricetidae)

Moscow, Zoologicheskiy Zhurnal, Vol 51, No 1, Jan 72, pp 157-161

Abstract: Microtus subarvalis Meier, Orlov, Skholl sp. n., a new species of common vole, is described. Morphologically, M. subarvalis sp. n. is very close to M. arvalis, differing from it only in the set of chromosomes (2n = 54, chromosomes are mostly acrocentric; in M. arvalis 2n = 46, chromosomes are mostly metacentric). Another point of distinction is the shape and dimensions of spermatozoa. Voles with 46- and 54-chromosomes interbreed readily, but always yield infertile progeny. The twin species have extensive ranges, which are to a considerable extent sympatric. M. arvalis apparently has greater distribution, and is encountered in more highly varied landscapes than is the case for M. subarvalis sp. n.

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UDC 621.438-155.001.5

USSR

MEYEROV, L.Z.

"Investigation of the Peripheral Turbine for a Turbo-Compressor"

Tr. Leningr. Politekhn. In-ta [Works of the Leningrad Polytechnic Institute], 1972, No 323, pp 61-64(from Referativnyy Zhurnal, No 6, Jun 72. 49. Turbostroyeniye. Abstract No 6.49.125)

Translation: An experimental study was made of the determination of characteristics of the TKR-11 mixed flow turbine, the exposure of the distribution of losses in individual parts of the flow section, and the possibilities of increasing the economic factors of the turbine. Compressed air, 305-333 °K, served as working agent. The experiments were carried out at constant degree of expansion, comprising 1.3-1.8. Six biblio. refs.

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1/2 008 UNCLASSIFIED PROCESSING DATE--16OCT70
TITLE--STATIC OPTIMIZATION OF MULTIVARIABLE SYSTEMS OF LARGE DIMENSIONALITY. II -U-
AUTHOR-(02)-MEYEROV, M.V., LITVAK, B.L.

COUNTRY OF INFO--USSR

SOURCE--AVTOMATIKA I TELEMEKHANIKA, 1970, NR 4, PP 133-139

DATE PUBLISHED--------70

SUBJECT AREAS--MECH., IND., CIVIL AND MARINE ENGR

TOPIC TAGS--NONLINEAR SYSTEM, ALGORITHM, AUTOMATIC CONTROL SYSTEM

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1996/1729 STEP NO--UR/0103/70/000/004/0133/0139

CIRC ACCESSION NO--AP0118707
UNCLASSIFIED

UNCLASSIFIED PROCESSING DATE--16OCT70

2/2 008

CIRC ACCESSION NO--AP0118707

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THERE ARE CONSIDERED CERTAIN NONLINEAR PROBLEMS OF THE STATIC OPTIMIZATION OF MULTIVARIABLE OBJECTS, THE PROBLEMS REDUCED TO THE PROBLEMS OF CONVEX PROGRAMMING AND TO THE MULTIEXTREMAL PROBLEMS OF SPECIAL KIND. THE ALGORITHMS OF SOLVING THE PROBLEMS CONSIDERED UNDER THE CONDITIONS OF LARGE DIMENSIONALITY ARE SUGGESTED.

UNCLASSIFIED

1/2 010 UNCLASSIFIED PROCESSING DATE--23OCT70

TITLE--STATIC OPTIMIZATION OF MULTIVARIABLE SYSTEMS OF BIG DIMENSIONALITY

-U-

AUTHOR-(02)-MEYEROV, M.V., LITVAK, B.L.

COUNTRY OF INFO--USSR

SOURCE--AVTOMATIKA I TELEMEKHANIKA, 1970, NR 3, PP 143-154

DATE PUBLISHED-------70

SUBJECT AREAS--MATHEMATICAL SCIENCES, MECH., IND., CIVIL AND MARINE ENGR

TOPIC TAGS--OPTIMAL AUTOMATIC CONTROL, ALGORITHM, LINEAR EQUATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1988/1473 STEP NO--UR/0103/70/000/003/0143/0154

CIRC ACCESSION NO--AP0106229

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UNCLASSIFIED PROCESSING DATE--23OCT70

2/2 010

CIRC ACCESSION NO--AP0106229

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE GENERAL STATEMENT OF THE PROBLEM OF THE STATIC OPTIMIZATION OF MULTIVARIABLE OBJECTS IS PRESENTED AND THE EXAPMLES OF CONCRETE PROBLEMS ARE GIVEN. THERE IS SUGGESTED THE ALGORITHM OF SOLVING LINEAR PROBLEMS OF THE TYPE CONSIDERED UNDER THE CONDITIONS OF BIG DIMENSIONALITY, THE ALGORITHM BASED ON THE UTILIZATION OF THE SPECIFIC CHARACTER OF THE PROBLEMS.

UNCLASSIFIED

UNCLASSIFIED PROCESSING DATE--16OCT70

1/2 007

TITLE--STATIC OPTIMIZATION OF SYSTEMS OF MULTIVARIABLE CONTROL OF LARGE DIMENSIONALITY. III -U-

AUTHOR-(02)-MEYEROV, M.V., LITVAK, B.L.

COUNTRY OF INFO--USSR

SOURCE--AVTOMATIKA I TELEMEKHANIKA, 1970, NR 5, PP 162-168

DATE PUBLISHED--------70

SUBJECT AREAS--ELECTRONICS AND ELECTRICAL ENGR., MATHEMATICAL SCIENCES

TOPIC TAGS--LINEAR EQUATION, ELECTRONIC CIRCUIT MODELING

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

STEP NO--UR/0103/70/000/005/0162/0168

PROXY REEL/FRAME--1993/0905

CIRC ACCESSION NO--AP0113740

UNCLASSIFIED

UNCLASSIFIED PROCESSING DATE--16DEC70

2/2 007

CIRC ACCESSION NO--AP0113740

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THERE IS SUGGESTED A METHOD OF SOLVING LINEAR PROBLEMS OF THE STATIC OPTIMIZATION OF MULTIVARIABLE OBJECTS ON ELECTRIC MODELLING NETS OR ON KNOWN MATRIX SCHEMES WITHOUT USING ANY ADDITIONAL DEVICES FOR THE MODELLING OF RESTRICTIONS. THE METHOD ALLOWS TO SOLVE THE PROBLEMS OF THE OPTIMIZATION OF THE CLASS CONSIDERED DURING MODELLING. THE PROBLEM OF THE ANALYTIC INVESTIGATION OF THE REQUIRED ACCURACY OF MODELLING IS ALSO CONSIDERED.

UNCLASSIFIED

USSR

UDC 51

MEYEROV, M. V., LITVAK, B. L.

"Mathematical Programming in Problems of Optimizing Multiconnected Systems"

V sb. Methody optimiz. sistem mnogosvyazn. regulir. (Methods of Optimizing Multiconnected Control Systems — collection of works), Moscow, Nauka Press, 1972, pp 5-20 (from RZh-Kibernetika, No 9, Sep 72, Abstract No 9V482)

Translation: A study was made of the methods of solving special classes of problems of linear and convex programming and multiextremal problems arising during statistical optimization of multiconnected systems.

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UDC 51

USSR

MEYEROV, M. V., AKHMETZYANOV, A. V.

"Algorithm for Solving a Class of Problems of Optimal Control of Technological Processes"

V sb. Metody optimiz. sistem mnogosvyazn. regulir. (Methods of Optimizing Multiconnected Control Systems -- collection of works), Moscow, Nauka Press, 1972, pp 44-51 (from RZh-Kibernetika, No 9, Sep 72, Abstract No 9V506)

Translation: A study was made of the class of problems of optimal control of technological processes which are a generalization of the problem of resource distribution. A solution algorithm is proposed which combines the method of dynamic programming (or certain other methods of finding the extremum) with the Danzig-Wolf expansion principle.

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1/2 029 UNCLASSIFIED PROCESSING DATE--23OCT70
TITLE--CYCLOTRON RESONANCE IN METALS IN THE CASE OF AN ARBITRARY SKIN EFFECT ANOMALY -U-
AUTHOR--MEYEROVICH, B.E.

COUNTRY OF INFO--USSR

SOURCE--ZHURNAL EKSPERIMENTAL'NOY I TEORETICHESKOY FIZIKI, 1970, VOL 58, NR 4, PP 1412-1420
DATE PUBLISHED--------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--CYCLOTRON RESONANCE, LARMOR RADIUS, EXTERNAL MAGENTIC FIELD, FREQUENCY CHARACTERISTIC, SKIN EFFECT, FREE PATH, METAL ELECTRICAL CONDUCTIVITY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1988/1708 STEP NO--UR/0056/70/058/004/1412/1420

CIRC ACCESSION NO--AP0106447

UNCLASSIFIED

UNCLASSIFIED PROCESSING DATE--23OCT70

2/2 029

CIRC ACCESSION NO--AP0106447

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A THEORY OF CYCLOTRON RESONANCE IS DEVELOPED FOR AN ARBITRARY RELATION BETWEEN THE LARMOR RADIUS OF THE CURRENT CARRIERS AND THE PENETRATION DEPTH OF THE FIELD IN THE METAL. A GENERAL EXPRESSION FOR VOLUME CONDUCTIVITY IN K SPACE IS OBTAINED WHICH IS CALID FOR ANY TYPE OF SKIN EFFECT ANOMALY. THE DEPENDENCE OF THE CONDUCTIVITY RESONANCE PROPERTIES ON THE HARMONIC NUMBER N IS INVESTIGATED. FOR A FIXED MAGNETIC FIELD THE DEPENDENCE IS WEAK ONLY FOR NOT VERY LARGE NUMBERS. WITH INCREASE OF FREQUENCY OF THE EXTERNAL FIELD, WHEN N BECOMES OF THE ORDER OF THE RATIO OF THE LARMOR RADIUS TO THE PENETRATION DEPTH, THE CONDUCTIVITY ABRUPTLY LOSES ITS RESONANCE PROPERTIES. FOR A GIVEN EXTERNAL FIELD FREQUENCY UNDER STRONGLY ANOMALOUS SKIN EFFECT CONDITIONS THE CONDUCTIVITY RESONANCE PROPERTIES WESKLY DEPEND ON THE HARMONIC NUMBER AS LONG AS THE LARMOR RADIUS IS SMALL COMPARED TO MEAN FREE PATH. IT IS SHOWN THAT IN SUFFICIENTLY PURE SAMPLES CYCLOTRON RESUNSNCE CAN BE OBSERVED AT THE FUNDAMENTAL FREQUENCY AS WELL AT THE HARMONICS, EVEN WHEN THE SKIN EFFECT IS NORMAL.

FACILITY: INST. FIZICHESKIKH PROBLEM, AN SSSR.

UNCLASSIFIED

Acc. Nr: AP0038052 Ref. Code: UR 0056

PRIMARY SOURCE: Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, 1970, Vol 58, Nr 1, pp 324-336

EFFECT OF SAMPLE SURFACE ON CYCLOTRON RESONANCE IN METALS

B. E. Meyerovich

The theory of cyclotron resonance in metals is developed for an arbitrary law of electron scattering by the surface. It is shown that cyclotron resonance significantly depends on this law. In the limiting case of nonspecular scattering (condition (3.8)) the results are the same as those obtained by Azbel and Kaner. In the limiting case of scattering close to specular electron scattering by the surface (condition (3.10)) a situation arises whose existence is discussed in Chambers paper. It is shown that for specular reflection of electrons by the metal, the surface impedance strongly drops due to the large contribution of surface electrons to the conductivity. The dependence of the impedance on the parameters is exactly the same as that previously considered by me for the case of a cylinder without a magnetic field, the cyclinder radius being equal to the Larmor radius.

11 REEL/FRAME 19731096 19 D8

USSR

UDC 621.165.251:534.1.001.5

RUNOV, B. T., DON, E. A., MEYEROVICH, L. B., SELYUGIN, B. S., and KOVAL', G. S.

"Vibration Condition of Bloc-Type Turbo-Units"

"Kotel'n. i turbin. ustanovki energ. blokov" (Boiler and Turbine Installations of Power Units) Moscow "Energiya", 1971, pp 192-201 (from Referativnyy Zhurnal-Turbostroyeniye, No 10, Oct 71, Abstract 10.49.46)

Abstract: It is suggested, on the basis of data from vibration studies carried out by the All-Union Institute of Heat Engineering im. F. E. Dzerzhinskiy, on more than 120 turbo-units with evalution of vibration parameters, to use the effective value of vibration speed as a criterion for evaluating the state of vibration of a turbo-unit. In accordance with developed GOST project, evaluation of vibration should be made by the largest measured value of the effective vibration speed of a bearing in accordance with the following scale: excellent - not higher than 1.8 mm/sec, good - not higher than 2.8 mm/sec, satisfactory - not higher than 4.5 mm/sec. 14 figures, 1 table.

USSR UDC: 611.12.577.1.591.105

MEYERSON, F. L., COLUBEVA, L. Yu., Institute of Normal and Pathological Physiology, Academy of Medical Sciences of the USSR, Moscow

"Influence of Preliminary Adaptation to Basic Environmental Factors on the Concentration of ATP and the Phosphorylation Potential in the Myocardium During Acute Overloading of the Heart"

Moscow, Doklady Akademii Nauk SSSR, Vol 210, No 4, 1973, pp 989-992

Abstract: Previous studies have shown that in the process of gradual adaptation to physical loads, high-altitude hypoxia and cold, the cells of the systems responsible for the adaptation, and in particular the heart cells, display activation of synthesis of nucleic acids and proteins, leading to an increase in the power of the system of mitochondria per unit of tissue mass. This restores the concentration of ATP and the phosphorylation potential to the normal level, and thus comprises a common fundamental link in the mechanism of adaptation to basic environmental factors. If this concept is valid, then preliminary adaptation to environmental factors should to a considerable extent prevent the effect which a drop in ATP concentration has on the increase of phosphorylation potential in cells under maximum work

USSR

MEYERSON, F. L., GOLUBEVA, L. Yu., Doklady Akademii Nauk SSSR, Vol 210, No 4, 1973, pp 989-992

intensity. In order to determine whether this preventive effect really exists, the authors studied the influence which preliminary adaptation to physical stresses and high-altitude hypoxia has on the concentration of ATP, phosphorylation potential, and the concentration of glycogen and lactate in the myocardium during acute overloading of the heart causing complete collapse of the aorta. The results of experiments showed that this effect does indeed take place. An analysis of these results and data of various other authors indicates that an increase in phosphorylation potential is a signal which activates the genetic apparatus of the cell and induces the development of structural changes which form the basis of long-term adaptation.

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Physiology

USSR

UDC 612.27+612.821.6

MEYERSON, F. Z., SOLOMATINA, Ye. S., VIKHLYAYEV, Yu. I. and KLYCUL', T. A., Laboratory of Experimental Cardiology, Institute of Normal and Pathological Physiology and Laboratory of Psychopharmacology, Institute of Pharmacology, Academy of Medical Sciences USSR, Moscow

"The Influence of Adaptation to Altitude Hypoxia on the Behavior of Animals in a Stress Situation"

Moscow, Zhurnal Vysshey Nervnoy Deyatel'nosti imeni I. P. Pavlov, Vol 23, Vyp 4, Jul/Aug 73, pp 751-756

Abstract: The influence of adaptation to hypoxia on the behavior of 40 rats in situations creating a conflict between the drinking and the defensive reflexes was studied. It was found that adapted animals made three times as many attempts to drink as controls, despite a painful electric shock. The experimental subjects showed a lower threshold of pain sensitivity, the same strength for the drinking reflex, the same motor activity in nonconflict situations and lower motor activity in conflict situations than controls. Therefore these factors are not considered possible causes for the change observed.

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USSR

MEYERSON, F. Z., et al., Zhurnal Vysshey Nervnoy Deyatel'nosti imeni I. P. Pavlov, Vol 23, Vyp 4, Jul/Aug 73, pp 751-756

Earlier findings also eliminate disturbance in the elaboration of defensive conditioned reflexes. It was further found that interrupting the drinking reflex required a shock of twice the voltage in experimental rats as in controls. The greater stability of the drinking reflex to pain is said to be caused by a greater force and concentration of excitation in the neuron system responsible for the drinking reflex, and a deeper inhibition of the neuron system responsible for the motor pain reaction. This may be caused by some general change in the functioning and metabolism of the brain.

2/2

USSR

UDC 616.127-002.4-08.039.71:616-008.221.1.04-003.96

MEYERSON, F. Z., GOMAZKOV, O. A., and SHIMKOVICH, M. V., Laboratory of Experimental Cardiology, Institute of Normal and Pathological Physiology, Academy of Sciences USSR, Moscow

"Prophylactic Effect of Adaptation to Altitude Hypoxia on the Development of Ischemic Myocardial Necrosis"

Moscow, Kardiologiya, No 10, 1972, pp 37-43

Abstract: Rats were placed in a pressure chamber for 5 hours a day, 5 times a week, over a period of 40 days, after which myocardial necrosis was induced in adapted and nonadapted animals by ligating the left coronary artery. Two days later only 10 of 21 nonadapted animals were alive compared with 11 of 12 experimental animals (52 and 8.4% mortality, respectively). Measurement of the size of the necroses resulting from ligation of the artery showed them to be 35% smaller in adapted animals. Thirty minutes after ligation the force of myocardial contraction, as measured by systolic pressure, was essentially the same in both groups, but after 24 hours it was 2-1/2 to 3 times greater in experimental rats. The mechanism of the prophylactic effect of adaptation to hypoxia is based on changes in the biochemical and morphological processes involved in the transport and utilization of oxygen.
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USSR

UDC 616.12-008.331.1.616-001.18

MEYERSON, F. Z., BARBARASH, N. A., DVURECHENSKAYA, G. Ya., and GORBUNOVA, L. A., Institute of Normal and Pathological Physiology, Academy of Medical Sciences USSR, and Kemerovo Medical Institute, Kemerovo

"Effect of Preliminary Adaptation to Cold on the Development of Experimental Hypertension"

Moscow, Doklady Akademii Nauk SSSR, Vol 210, No 5, 1973, pp 1,243-1,245

Abstract: It had been established in earlier work that adaptation of animals to altitude hypoxia on intermittent exposure inhibited the development of hypertension produced by the combined action of NaCl and desoxycorticosterone (DPCS). Experiments conducted on rats in this instance showed that adaptation to cold had a similar effect in inhibiting the development of salt-DOCS hypertension. Adaptation to cold was carried out by exposing the rats to a temperature of 0-4° for 6 hrs per day during 110 days. Salt-DOCS hypertension was induced by implanting to the animals 50 mg/100 g DOCS subcutaneously seven days after a nephrectomy on the left side, repeating the implantation after another seven days, and giving to the animals a 1% NaCl solution to drink instead of ordinary water. The arterial pressure of experimental

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MEYERSON, F. Z., et al., Doklady Akademii Nauk SSSR, Vol 210, No 5, 1973, pp 1,243-1,245

animals adapted to cold and treated with MaCl-DOCS increased briefly to the same level as that of unadapted animals in which hypertension was induced with NaCl and DOCS, but then dropped back to normal, while that of the control animals continued to increase. During the period following the first two weeks of the experiment, in which the arterial pressure of the cold-adapted animals was substantially lower than that of unadapted animals, the unadapted animals with NaCl-DOCS hypertension drank much more NaCl solution than the animals adapted to cold. The retention of Na in the aorta wall and the pressure effect of noradrenaline were lower for adapted than unadapted animals, while no difference in the blood-pressure lowering action of acetylcholine was observed. (Submitted by Academician V. N. Chernigovskiy, 15 Dec 72)

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USSR

UDC 612.017.2

MEYERSON, F. Z. and ANNAMUROVA, L. A., Institute of Normal and Pathological Physiology, Academy of Medical Sciences USSR

"Effect of Inhibitors and Stimulants of the Synthesis of Nucleic Acids and Proteins on Adaptation to High-Altitude Hypoxia"

Ashkhabad, Izvestiya Akad. Nauk Turkenskoy SSR, No 5, 1972, pp 8-15

Abstract: Experiments on rats confirmed the established fact that at 7000 m above sea level, oxygen consumption decreases markedly (by 30%) in unadapted animals. Injection of adapted animals with actinomycin 2703, an inhibitor of RNA synthesis, produced a decrease in oxygen consumption of the same magnitude as in unadapted animals. This decrease is ascribed to impaired biosynthesis in the mitochondria and lessened capacity of these organelles to utilize oxygen. Injection of rats adapted to high-altitude hypoxia with an anabolic hormonal preparation (nerobole) or with a combination of cofactors of nucleic acid synthesis (orotic acid, folic acid, and vitamin B_{12}) markedly reduced the amount of weight normally lost in hypoxia. In addition, the combination of agents increased the hemoglobin concentration and number of red blood cells while reducing the degree of reticulocytosis. Thus, the use of inhibitors and stimulants of nucleic acid synthesis can promote adaptation to high-altitude hypoxia.

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USSR

UDC 612.27+612.014.4+612.58

MEYERSON, F. Z., and GOMAZKOV, O. A., Institute of Normal and Pathological Physiology, Academy of Medical Sciences USSR, Moscow

"The Effect of Adaptation to Altitude Hypoxia and Cold on the Metabolic Effect of Noradrenalin in Rats"

Leningrad, Zhurnal Evolyutsionnoy Biokhimii i Fiziologii, Vol 6, No 3, May/Jun 70, pp 276-281

Abstract: In experiments on white rats adapted to altitude hypoxia or to cold, a study was made of metabolic response to introduction of sympathomimetic agents. Conditioning of the animals to altitude hypoxia (5,500 m, 40 days, room temperature) had no substantial effect on the oxygen demand level of the organism, but completely eliminated the rise in oxygen consumption observed in control rats after noradrenalin administration. In rats adapted to cold for long periods (60 days, 4-5°), the activating effect of noradrenalin and isopropylnoradrenalin on oxygen demand by the organism was markedly increased. The toxic dose of isopropylnoradrenalin (60 mg/kg of body weight) induced considerably greater lethality and damage to the contractile function of the myocardium in these animals than in the control group.

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USSR

UDC 612.275.1

MEYERSON, F. Z., ISABAYEVA, V. A., IVANSHINA, A. Z., KRUGLIKOV, R. I., and GLUKOV, G. M., Institute of Normal and Pathological Physiology, Academy of Sciences USSR, and Kirgiz State Medical Institute, Ministry of Health, Kirgiz SSR

"Formation and Retention of Conditioned Reflexes During Concentrated and Protracted Training of Animals of Two Different Genetic Lines in the Course of Adaptation to High-Altitude Hypoxia"

Frunze, Sovetskoye Zdravookhraneniye Kirgizii, No 4, Jul/Aug 70, pp 38-45

Abstract: Conditioned reflexes of avoidance and escape (from electric shocks) were [illegible] BALB/c and C57BL/6 mice in Moscow (control) and in a mountain locality ([illegible] above sea level). Reflexes were established 5, 10, 20, and 40 days after arrival by concentrated training (short intervals of time between presentation of stimuli) and protracted training (long intervals between stimulation). The C57BL/6 mice are known to adapt to hypoxia much better than the BALB/c mice. With concentrated training, the adapted C57BL/6 mice developed avoidance and escape r[illegible] three times more rapidly than before exposure to high altitude, whereas the [illegible] reflex formation in the BALB/c mice remained the same. With protracted training, the C57BL/6 mice developed the reflexes just as quickly as or even more quickly than before exposure to the high altitude. The situation

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USSR

MEYERSON, F. Z., et al, Sovetskoye Zdravookhraneniye Kirgizii, No 4, Jul/Aug 70, pp 38-45

was the opposite in Moscow. Here it took two to three times as long to form the reflexes in the BALB/c mice as in the C57BL6 mice. The degree of retention of the reflexes increased with increasing adaptation to hypoxia in both genetic lines and with both methods of training.

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USSR

MEYERSON, F. Z., ISABAYEVA, V. A., and IVANSHINA, A. Z., Institute of Normal and Pathological Physiology, Academy of Sciences, USSR

"Increasing the Development Rate and Degree of Retention of the Conditioned Reflexes of Animals Adapted to Altitude Hypoxia"

Moscow, Doklady Akademii Nauk SSSR, Vol 202, No 4, 1972, pp 982-984

Abstract: The aim of the project was to select the level of high-mountain hypoxia at which initial disturbances in conditioned-reflex activity in mice are minimal or are absent and positive shifts in cortical function during the process of gradual adaptation are expressed to a sufficient degree. The results obtained indicate that adaptation to the continuous action of moderate high-altitude hypoxia is accompanied by a considerable increase in the rate of development and degree of retention of conditioned reflexes by animals of different genetic lines. In an analysis of the mechanism of the phenomenon, two interrelated factors are to be noted. In the process of adaptation to high-altitude hypoxia, a pronounced activation of RNA and protein synthesis develops in the brain. This synthesis can probably result in a change of the stock of enzymes responsible for the synthesis and decomposition of acetylcholine, norepinephrine, serotonin, gamma-aminbutyric acid, and glutaminic acid.

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USSR

UDC 591.481.1:591.543

MEYERSON, F. Z., KRANTS, D., SADYRALIYEV, T. S., and AYNOKENOVA, R. R.,
Institute of Normal and Pathological Physiology, Academy of Medical Sciences USSR, Moscow

"Dynamics of Protein Synthesis in the Neurons and Glia of the Brain for Adaptation to High-Altitude Hypoxia"

Moscow, Doklady Akademii Nauk SSR, Vol 204, No 3, 1972, pp 759-762

Abstract: Adaptation is accompanied by acceleration of the development and an increase in the degree of retention of conditioned reflexes, an increase in the resistance of memory to electroshock and also an increase in the resistance of animals to sound stimulation causing convulsions. For correct evaluation of these facts it is necessary to discover in which cellular structures of the brain the above-described synthesis activation is realized since this permits an approach to the understanding of its specific role in the variations of the brain functions which are actually observed on adaptation to high-altitude hypoxia. Accordingly, an autoradiographic method was used to study the dynamics of protein synthesis in the gigantic pyramidal neurons and glial cells of the cerebral cortex and also in the neurons and glial cells of the supraoptical nucleus of the hypothalamus on adaptation to continuous and discontinuous

USSR

MEYERSON, F. Z., et al., Doklady Akademii Nauk SSR, Vol 204, No 3, 1972, pp 759-762

hypoxia. The experiments were performed on male Wistar rats weighing 140-160 grams. The data curves presented indicate that both in the cerebral cortex and in the supraoptical nucleus of the hypothalamus adaptation to continuous hypoxia is accompanied by theoretically the same changes in intensity of the protein synthesis as adaptation to discontinuous hypoxia. In both cases, gradually progressive activation of protein synthesis is observed in the cortical and hypothalamic neurons with a simultaneous increase in the size of the cells. In the glial cells the synthesis activation increases more steeply. It is greatest in the initial period of adaptation and is accompanied not by an increase but by a decrease in the size of the cell nuclei. Just as for adaptation to discontinuous hypoxia, the activation of the synthesis and an increase in the neuron size were more pronounced for the cortex than for the hypothalamus.

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USSR

UDC 571.15.041

MEYERSON, F. Z., PANCHENKO, L. F., GOLUBEVA, L. Yu., LYUBIMTSEVA, O. N., and PORTENKO, N. G., Institute of Normal and Pathological Physiology, Academy of Medical Sciences USSR, and Second Moscow Medical Institute imeni N. I. Pirogov, Moscow

"Activity of Lysosome Enzymes of the Myocardium on Adaptation to High-Altitude Hypoxia and in Heart Injuries"

Moscow, Doklady Akademii Nauk SSSR, Vol 195, No 2, 1970, pp 499-502

Abstract: Acute hypoxia causes labilization of lysosomes of the myocardium. It is assumed that the prophylactic effect in heart lesions of adaptation to high-altitude hypoxia involves an increase in the resistance of the lysosome system, together with an increased capacity to retain acid hydrolases in a latent state, so that these enzymes do not damage the tissue. To check the correctness of this assumption, the effects of adaptation to high-altitude hypoxia on the content of free and bound acid DNA-ase, acid RNA-ase and acid phosphatase in the myocardium were studied on rats without heart lesions, with heart hyperfunction produced by experimental coarctation of the aorta, and with sympathomimetic injury of the heart produced by administration of novodrine (isoproterenol) in a dose that produces necrotic

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MEYERSON, F. Z., et al, Doklady Akademii Nauk SSSR, Vol 195, No 2, 1970, pp 499-502

lesions. The rats were maintained for 6 hours per day over a period of 40 days at a pressure corresponding to an altitude of 6,000 m (the pressure was gradually reduced during the first week and then kept at this level). For rats without heart lesions, adaptation to high altitude hypoxia in this manner increased the total content of each of the three enzymes in the myocardium by 1/4-1/3 above that in controls. The content of the free enzyme fractions decreased by 20-30%, while that of the bound enzymes increased by a factor of approximately 2.5. Hyperfunction of the heart resulted in a decrease of the total content of all three enzymes, both when it was induced in rats after adaptation to high-altitude hypoxia and in rats that had not adapted. The decrease was lower for adapted than for unadapted rats, amounting to 35 vs. 47, 0 vs. 34, and 37 vs. 64% for acid DNA-ase, RNA-ase, and phosphatase, respectively. The smaller drop in the total content of lysosome enzymes in adapted animals was due to the fact that the content of the bound fraction was relatively greater. Similar relationships were found for rats in which heart lesions were produced by administration of isoproterenol (novodrine).

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USSR UDC 612.014.21.015.12:(616.12:612.273.2.017.2

MEYERSON, F. Z., PANCHENKO, L. F., GOLUBEVA, L. Yu., LYUBIMTSEVA, O. N., and PORTENKO, N. G. Laboratory of Experimental Cardiology Institute of Normal and Pathological Physiology USSR, and Chair of Biochemistry Medicobiological Faculty, Second Moscow Medical Institute imeni N. I. Pirogov

"The Role of the Lysosome System in the Prophylactic Effect of Adaptation to High-Altitude Hypoxia in Disorders of the Heart"

Moscow, Kardiologiya, Vol 10, No 7, Jul 70, pp 71-79

Abstract: It was previously determined that systematic adaptation of animals to intermittent high-altitude hypoxia increases the resistance of the heart to acute stress. In an extension of this work, the lysosome systems containing protein hydrolases (e.g., DNA-ase, RNA-ase, and phosphatase) were studied, using trained and untrained rats. In trained animals, sudden high-altitude hypoxia was found to result in a general increase in the levels of the three lysosome protein ases (to 124-135%), a decrease in the content of free protein ases (68.4-81.5%) and a marked increase in the level of bound protein ases (244-268%). In untrained animals, levels of all protein ases decreased except the level of bound RNA-ase, which increased to 140.2%. Similar results were obtained in the latter group under conditions of coarctation. Sudden hyperfunction of the heart in trained animals

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USSR

MEYERSON, F. Z., et al., Kardiologiya, Vol 10, No 7, Jul 70, pp 71-79

results in a release of free protein ases and a decrease in other ases. It is generally concluded that the binding of protein ases resulting from intermittent adaptation to high-altitude hypoxia increases the resistance of the cardiac lysosome system to acute stress.

USSR

UDC 577.15.041

MEYERSON, F. Z., MIRRAKHIMOV, S. M., AYDARALIYEV, A. A., and DZHUMUSHEV, M. D., Institute of Normal and Pathological Physiology, Academy of Medical Sciences USSR, Moscow, and Kirgiz State Medical Institute, Frunze

"Effect of Preliminary Conditioning on Oxygen Pressure in the Cerebral Cortex During Gradual High-Altitude Hypoxia"

Moscow, Doklady Akademii Nauk SSSR, Vol 195, No 1, 1970, pp 252-255

Abstract: Adaptation to the discontinuous action of high-altitude hypoxia has a significant effect on the resistance of the cerebrum to oxygen insufficiency. This effect is considered to be due to the combination of two mechanisms acting at two different levels. One of these mechanisms enhances the transport of oxygen to the brain. The dynamics of the oxygen pressure in the cerebrum of trained and untrained rats subjected to stepwise "ascent" in a pressure chamber was studied polarographically. The O_2 pressure was measured chrono-amperometrically with a 100-micron Pt electrode which had been inserted 500 microns deep into the rats' brains. For each experiment, the electrodes were calibrated in solutions of known O_2 content. Four series of experiments were run, with 11-12 animals in each series. In the first series, untrained animals were tested; in the other series, the

USSR

MEYERSON, F. Z., et al, Doklady Akademii Nauk SSSR, Vol 195, No 1, 1970, pp 252-255

animals were trained for periods of 10, 20, or 40 days. Training consisted of keeping the animals in the pressure chamber for 6 hours each day, with the pressure simulating that at an altitude of 1,000 m on the 1st day, 2,000 m on the 2nd day, 3,000 m on the 3rd day, 4,000 m on the 4th day, 5,000 m on the 5th and 6th days, 6,000 m on the 6th and 7th days, and 7,000 m for the remainder of the training period. Some measurements were made with the test animals at a simulated altitude of up to 12,000 m. The results of the measurements were tabulated. It was found that at a height of 4,000 m the drop in cerebral oxygen pressure is still almost the same for both trained and untrained groups. At greater altitudes, the difference between trained and untrained groups becomes more obvious. After 20 and 40 days of training, it was found that protein synthesis in the blood was increased by 60-80%. It is speculated that ATP may be used in the adaptation of the blood to the surrounding medium. It is concluded that, whereas up to a height of 6,000-7,000 m trained alpinists may not experience any discomfort, at higher altitudes disturbances in brain functions may occur.

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1/2 026 UNCLASSIFIED PROCESSING DATE--23OCT70
TITLE--EXPERIMENTAL PROPHYLAXIS OF ACUTE CARDIAC INCOMPETENCE BY PRELIMINARY TRAINING OF ANIMALS TO HYPOXIA OF HIGH ALTITUDE -U-
AUTHOR-(05)-MEYERSON, F.Z., MAYZELIS, M.YA., MARKOVSKAYA, G.I., GOLUBEVA, L.O., NOVIKOVA, N.A.
COUNTRY OF INFO--USSR

SOURCE--PATOLOGICHESKAYA FIZIOLOGIYA I EKSPERIMENTAL'NAYA TERAPIYA, 1970, VOL 14, NR 2, PP 49-54
DATE PUBLISHED--------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--HEART DISEASE, ALTITUDE CHAMBER, BIOMEDICAL CHAMBER, VENTRICULAR HYPERTROPHY, MYOCARDIUM

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1988/0144 STEP NO--UR/0396/70/014/002/0049/0054

CIRC ACCESSION NO--AP0105230

2/2 026 UNCLASSIFIED PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0105230

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. WISTAR RATS WERE TRAINED FOR 40 DAYS IN A BAROCHAMBER, 6 HOURS DAILY AT AN "ALTITUDE" OF SEVEN THOUSAND METERS. SUCH TRAINING LED TO ACTIVATION OF THE SYNTHESIS OF NUCLEIC ACIDS AND PROTEIN IN THE MYOCARDIUM OF THE LEFT, AND, PARTICULARLY, OF THE RIGHT CARDIAC VENTRICLE (WHICH SERVED AS THE BASIS OF HYPERTROPHY), AND TO INCREASE OF THE MAXIMAL POWER OF CONTRACTION OF THE VENTRICLES (OF THE LEFT, BY 18 PER CENT, AND OF THE RIGHT, BY 33 PER CENT). THIS TRAINING WAS CARRIED OUT FOR THE PURPOSE OF PREVENTION OF ACUTE CARDIAC INSUFFICIENCY PRODUCED BY OVERLOADING IN CORACTATION OF AORTA. PRELIMINARY TRAINING TO HIGH ALTITUDE HYPOXIA PROVED TO PREVENT OR TO REDUCE DISTURBANCES OF METABOLISM AND MYOCARDIAL FUNCTION WHICH USUALLY FOLLOWED INDUCTION OF AN EXPERIMENTAL DEFECT, AND CONSTITUTED THE BASIS OF CARDIAC INCOMPENTENCE. FACILITY: LABORATORIYA EKSPERIMENTAL'NOY KARDIOLOGII INSTITUTA NORMAL'NOY I PATOLOGICHESKOY FIZIOLOGII AMN SSSR, MOSKVA.

UNCLASSIFIED

USSR

UDC 616.12-008.46-092.9-084

MEYERSON, F. Z., MAYSELIS, M. YA., MARKOVSKAYA, G. I., [illegible], L. O., and NOVIKOVA, N. A., Laboratory of Experimental Cardiology, Institute of Normal and Pathological Physiology, Academy of Medical Sciences USSR

"Experimental Prophylaxis of Acute Cardiac Insufficiency by Preliminary Conditioning of Animals to High-Altitude Hypoxia"

Moscow, Patologicheskaya Fiziologiya i Eksperimental'naya Terapiya, No 2, 1970, pp 49-54

Abstract: A total of forty days of conditioning of [illegible] rats to hypoxia (6 hours daily at a simulated altitude of 7000 m) [illegible] fied the synthesis of nucleic acids and protein in the myocardium of the left and right ventricles (especially the latter), and increased the maximum force of ventricular contraction. [illegible] insufficiency induced by coarctation of the aorta [illegible] edema of the subcutaneous fatty tissue of the neck [illegible] untrained rats, but did not have this effect in trained animals. Cardiac insufficiency also produced metabolic disturbances [illegible] impaired myocardial contractility in untrained animals. In the

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MEYERSON, F. Z., et al., Moscow, Patologicheskaya Fiziologiya i Eksperimental'naya Terapiya, No 2, 1970, pp [illegible]

trained animals, however, these changes were nonexistent or occurred only in a mild form. The reasons for the high degree of resistance to acute cardiac insufficiency created by preliminary conditioning to hypoxia are discussed.

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USSR

UDC 615.12-092.616-008.922.1.04

GOMAZKOV, O. A., [illegible], N. V., and [illegible] E., [illegible] of the USSR Academy of Medical Sciences of [illegible]. Laboratory of Experimental Cardiology, Institute of Normal and Pathological Physiology, Academy of Medical Sciences USSR

"The Effect of Preliminary Conditioning to High-Altitude Hypoxia and Cold on the Development of Sympathomimetic Lesions of the Heart"

Moscow, Kardiologiya, No 2, 1972, pp 57-66

Abstract: The effects of conditioning to hypoxia and cold on resistance to the sympathomimetic agent isoproterenol and on [illegible] of myocardial contractility were studied. A large dose of isoproterenol (60 mg/kg) killed 90% of rats conditioned to cold (daily exposure for 60 days to a temperature of 0+5°), but only 20% of the controls. On the other hand, 100% of the animals conditioned to hypoxia (daily exposure for 60 days to a simulated altitude of 5000 m) survived injection of the drug. Myocardial contractility in cold-conditioned animals following injection of isoproterenol was [illegible] contractility in controls, but it deteriorated [illegible] the cold-conditioned animals. The general resistance of [illegible]

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[illegible], O. A., et al., Moscow, Kardiologiya, No [illegible], 197[illegible], pp [illegible]

these animals to [illegible]renol [illegible] due to their incr[illegible] [illegible] adrenergic reactivity, and to abnormally high oxygen consumption induced by the drug.

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APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202020011-1"

USSR UDC 577.4

MEYERSON, F. Z., MALKIN, V. B., ANNANUROVA, L. A., LOGINOVA, YE. V., and MAYZELIS, M. YA., Institute of Normal and Pathological Physiology, Academy of Medical Sciences USSR

"Effect of RNA Synthesis Inhibitor on the Development of Adaptation to High-Altitude Hypoxia"

Moscow, Izvestiya Akademii Nauk SSSSR, Seriya Biologicheskaya, No 3, May/Jun 72, pp 405-412

Abstract: The importance of increased nucleic acid and protein production in adaptation to high-altitude hypoxia was evaluated by administering actinomycin 2703 -- an RNA synthesis inhibitor -- to rats raised in 500 meter increments to 7,000 meters over a 25-day period in an altitude chamber (6 hrs/day exposure). Experiment variations included rats unadapted to hypoxia (control) (1), adapted over 25 days (2), unadapted and given actinomycin for 5 days (3), and adapted over 25 days and given actinomycin from the 20-25th days (4). Weight gain rate decreased in group 2 as compared to controls, weight decreased 7% in group 3, while weight decreased 16% in group 4 and 63% of the animals died during acute hypoxia generated by raising them to 11,000 meters at 80-100 meters/sec. Protein synthesis in the

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MEYERSON, F. Z., et al., Izvestiya Akdemii Nauk SSSR, Seriya Biologicheskaya, No 3, May/Jun 72, pp 405-412

heart and cerebral cortex increased in group 2, remained normal in group 3, but decreased in group 4, indicating that actinomycin is inhibitory only during adaptation to hypoxia. While O_2 consumption decreased 30% in group 1 at 7,000 meters, by the 25th day of adaptation the decrease diminished to 10% in group 2. Actinomycin produced no significant changes in group 3 as compared to controls. In group 4 however, actinomycin caused O_2 consumption to decrease 20 25%. Moreover the consumption decreased 22% at sea level for this group, indicating that something other than the O_2 transport system had been affected, since O_2 is readily available and there is no stress on the transport system. This idea is further supported by the fact that while the breathing rate decreased over the adaptation period, actinomycin caused it to rise again. Nor did the drug cause abnormal changes in erythrocyte and hemoglobin counts. Finally, animals given actinomycin and exposed to acute hypoxia died not during exposure but on the following day in an abundance of O_2. Thus it is suggested that actinomycin disrupts O_2 utilization -- i.e., mitochondrial function, rather that O_2 transport. The increased protein and nucleic acid production detected is a necessary part of adaptation to hypoxia, and it is inhibited by suppression of mitochondrial activity.

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UDC 612.273-014.33-015.33

MEYERSON, F. Z., POKOYNITSKIY, V. D., and YAMPOL'SKAYA, B. A., Institute of Normal and Pathological Physiology, Academy of Medical Sciences USSR, Moscow

"Role of the Biogensis of Mitochondria in the Adaptation of the Organism to Altitude Hypoxia"

Moscow, Doklady Akademii Nauk SSSR, Vol 203, No 4, 1972, pp 973-976

Abstract: A study was conducted of the synthesis of DNA, RNA, and protein in mitochondria and nucleic of the mycocardium in rats subjected to intermittent hypoxia produced by placing the animals for 6 hrs per day during 40 days into a chamber with a pressure corresponding to an elevation of 7,000 m. ^{3}H-Thymidine, ^{14}C-orotic acid, ^{14}C-lysine, ^{14}C-alanine, and ^{14}C-methionine were applied in studies of the biosynthesis. These compounds were injected intraporitoneally to the animals. As a result of adaptation to hypoxia, the rate of synthesis of DNA, RNA, and protein (as indicated by the incorporation of thymidine, orotic acid, and the amino acids, respectively) in mitochondria and of RNA and protein in cell nuclei increased. Activation of the synthesis of these substances was also observed after stressing of the organism by exposure to cold and as a result of physical effort; it is due in every instance to a shortage of macroergic substances, specifically

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MEYERSON, F. Z., et al., Doklady Akademii Nauk SSSRm Vol 203, No 4, 1972, pp 973-976

ATP. Offsetting of this shortage always takes place by activation of the biogenesis of mitochondria and an increase in apparatus of mitochondria involving accelerated synthesis in them of DNA that forms genetic matrices arises in response to a deficiency of energy and constitutes a general mechanism of long-range adaptation of the organism tothe environment. (Submitted by Academician V. V. Parin, 4 Apr 71)

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USSR

UDC 612.8.015.33:612.8.014.41

MEYERSON, F. Z., KRANTS, D., and SADYRALIYEV, T. S., Institute of Normal and Pathological Physiology, Academy of Medical Sciences USSR, Moscow

"Dynamics of Protein Synthesis in Rat Brain Neurons and Glial Cells During Adaptation to High-Altitude Hypoxia"

Leningrad, Tsitologiya, No 3, 1973, pp 324-329

Abstract: Protein synthesis was studied by the autoradiographic method in pyramidal and glial cells of the cerebral cortex and in neurons and glial cells of the supraoptic nucleus of the hypothalamus in rats exposed to intermittent hypoxia (6 hours a day in a pressure chamber) and continuous hypoxia (at an altitude of 3200 m in the Tyan Shan mountains). Adaptation to intermittent hypoxia produced essentially the same changes in protein synthesis as did adaptation to continuous hypoxia. In both cases, protein synthesis gradually increased in the cortical and hypothalamic nuclei while the cells and nuclei enlarged. In the glial cells, however, protein synthesis intensified more rapidly, reaching a peak in the initial stage of adaptation, but the cell nuclei shrank rather than enlarged. The article concludes with a discussion of the possible mechanism of the stimulation of protein synthesis by hypoxia and suggests possible reasons for the opposite changes in the size of the neurons and glial cells.

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USSR UDC 615.12-008.331.1-092.9-08-039.71:612.273.2.017

MEYERSON, F. Z., BARBARASH, N. A., and DAVYDOVA, T. M., Laboratory of Experimental Cardiology, Institute of Normal and Pathological Physiology, Academy of Medical Sciences USSR, and Chair of Normal Physiology, Kemerovo Medical Institute

"Preliminary Adaptation to Altitude Hypoxia as a Means of Preventing DOCA-Salt Hypertension in Rats"

Moscow, Kardiologiya, No 7, 1971, pp 14-22

Abstract: In one series of experiments, rats were exposed to intermittent hypoxia by being kept in a pressure chamber 6 hours daily for 48 days at simulated altitudes that were gradually increased from 1,000 m to 5,500 m. In another series, rats were exposed to natural hypoxia for 71 days continuously in a place situated 1,650 m above sea level. After 16 to 21 days DOCA-salt hypertension was induced by unilateral nephrectomy, substitution of a 1% sodium chloride solution for drinking water, and two subcutaneous implantations of DOCA powder. Preliminary adaptation to intermittent altitude hypoxia was found to have a definite prophylactic effect on the experimentally induced hypertension as shown by the fact that the elevation of pressure in the adapted animals was one-half that in the control. The results of exposure to continuous natural hypoxia were inconclusive.

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USSR

UDC 612.017.2-06.612.273.12

MEYERSON, F. Z., Institute of Normal and Pathological Physiology, Academy of Medical Sciences USSR, Moscow

"Mechanism of Adaptation of the Organism to Altitude Hypoxia and the Problem of Prophylaxis"

Moscow, Patologicheskaya Fiziologiya i Eksperimental'naya Terapiya, No 3, May/Jun 73, pp 7-15

Abstract: A review of the subject shows that the hypoxemia resulting from altitude hypoxia is compensated for in the course of adaptation by an increased efficiency of O_2 transport in the organism and improved utilization of O_2 effected by a higher rate of resynthesis of ATP, the level of which initially drops because of the O_2 deficiency. The higher rate of ATP synthesis is associated with an increase in the number of mitochondria. It was established in the author's laboratory that activation of the synthesis of nucleic acids and proteins plays an essential role in adaptation to hypoxia. Administration of actinomycin (an inhibitor of RNA synthesis) to rats subjected for 20-25 days to hypoxia corresponding to an altitude of 7000 m interfered with the increased synthesis of nucleic acids and proteins necessary for improved utilization of O_2, so that the animals perished. Under the action of actinomycin, utilization

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MEYERSON, F. Z., Patologicheskaya Fiziologiya i Eksperimental'naya Terapiya, No 3, May/Jun 73, pp 7-15

of O_2 by the adapted animals dropped not only at a pressure corresponding to 7000 m, but also under conditions corresponding to sea level. It was found in experiments on rats that in the process of adaptation to hypoxia the synthesis of mitochondrial RNA and DNA and also of proteins increased in the myocardium. A similar activation of the biosynthesis (that of RNA and proteins) took place in the brain, but set in more gradually because of the greater initial damage to the brain vs. the heart and because of the fact that hyperfunction of the brain is not required in hypoxia. An increase in the rate of synthesis of RNA and an activation of the biogenesis of mitochondria is induced not only in hypoxia as a reaction leading to an additional supply of ATP, but also by any other factors that bring about a deficiency of macroergic phosphates in cells, such as those which arise on muscular overstrain or on exposure to cold. Experimental studies in the laboratory indicated that adaptation to height hypoxia has a prophylactic effect in the following conditions: acute heart malfunction due to coarctation of the aorta, structural and functional deficiences in sympathomimetic and ischemic necroses of the myocardium, epileptiform spasms induced by sound, spasms induced by corazole, disturbance in the development of conditioned reflexes brought about by the administration of small doses of LSD. Some of the data obtained in these studies

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MEYERSON, F. Z., Patologicheskaya Fiziologiya i Eksperimental'naya Terapiya, No 3, May/Jun 73, pp 7-15

confirm the correctness of observations made earlier to the effect that adaptation to altitude hypoxia has a beneficial effect on patients with diseases of the brain.

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USSR UDC 612.821.2

MEYERSON, F. Z., ISABAYEVA, V. A., IVANSHINA, A. Z., KRUGLIKOV, R. I., and GLUSOV, G. M., Institute of Normal and Pathological Physiology of the USSR Academy of Medical Sciences, Moscow, and Medical Institute of the Ministry of Health Kirgiz SSR

"Conditioned Reflexes in Massive and Expanded Training of Animals of Two Different Genetic Lines in the Process of Adaptation to Altitude Hypoxia"

Moscow, Zhurnal Vysshey Nervnoy Deyatel'nosti imeni I. P. Pavlov, Vol 21, No 2, 1971, pp 470-477

Abstract: Mice of two genetic lines, BALB/c (I) and C57BL6 (II), were used in experiments to determine the comparative rate of development and degree of preservation of conditioned avoidance and escape reflexes in the process of the animals' adaptation to altitude hypoxia. The methods of massive and expanded development of conditioned reflexes -- the first at 20 second and the latter at 90 second intervals between pairings were used. The control experiments were carried out in Moscow; the experiments themselves, -- 5, 10, 30, and 40 days after the transfer of the animals to the Tuya Ashu mountain pass at an altitude of 3,200 meters. The reflexes were developed by placing the mice into the

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MEYERSON, F. Z., et al, Zhurnal Vysshey Nervnoy Deyatel'nosti imeni I. P. Pavlov, Vol 21, No 2, 1971, pp 470-477

main stem of a T-shaped labyrinth with passages permitting the animals to run to the illuminated sides of the T, and conducting an electric current to the floor of the area where the mice were initially placed. The degree of reflex preservation was determined by repeating the conditioning process to the initial criterion, and computing the preservation index on the basis of the difference in the number of pairings required to attain this criterion. The investigations established that under hypoxia the rate of the conditioning of both lines of animals by the massive method was substantially retarded in the beginning. In the course of adaptation to hypoxia, however, the rate of reflex development with the use of the massive method accelerated with the mice of line (1) attaining the initial level, and of line (2) considerably exceeding the level prior to that at the time of the arrival in the mountains. The expanded method when used for line (1) retarded and when used for line (2) had little effect on the conditioning rate. The degree of reflex preservation in both lines improved with the adaptation of the animals to hypoxia. It was further established that the mice of line (2) adapted to hypoxia conditions

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MEYERSON, F. Z., et al, Zhurnal Vysshey Nervnoy Deyatel'nosti imeni I. P. Pavlov, Vol 21, No 2, 1971, pp 470-477

more successfully than did the mice of line (1). The latter, within 20 days after their transfer to the high altitude began to lose weight, their motor activity diminished and their fur began to lose its gloss. They developed a mortality rate of 38 percent as compared with that of five percent of the mice of line (2). The various aspects of the results obtained in the investigations are discussed. The assumption is that the indicated differences between the two genetic lines of mice reflect the difference in their neurodynamic and consolidation processes. Two tables and 28 reference entries accompany the article.

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Acc. Nr.: AP0031639 Ref. Code: UR 0219

PRIMARY SOURCE: Byulleten' Eksperimental'noy Biologii i Meditsiny, 1970, Vol 69, Nr 1, pp 28-30

THE EFFECT OF TRAINING FOR ALTITUDINAL HYPOXIA ON THE INTENSITY OF PROTEIN SYNTHESIS IN THE BRAIN AND RESISTANCE OF ANIMALS TO SPASTIC FACTORS

Mayzelis, M.Ya.; Meyerson, F.Z.; Leykina, Ye.M.; Popko, N.A.; Gvirtsman, L.Ye.

Institute of Normal and Pathological Physiology of the AMS of the USSR and Moscow Research Institute of Psychiatry.

In tests staged on rats subject to study were the intensity of Methionine S^{35} incorporation in the cerebral proteins, the nucleic acids content in the brain cortex and also the reaction of the animals to the effect produced by spastic factors. It is shown that during intermittent training for altitudinal hypoxia the protein synthesis is activated, especially in the hemispheric cortex, the RNA level in the cortex rises and the resistance of the animals to the effect of spastic agents (pentylene tetrazol, audiogenic stimuli) increases.

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UDC 612.82.015.348-06:612.232

MAYZELIS, M. YA., MEYERSON, F. Z., LEYKINA, YE. M., POPKO, N. A., and GVIRTSMAN, L. YE., Laboratory of Experimental Cardiology, Institute of Normal and Pathological Physiology, Academy of Medical Sciences USSR, and Radiology Laboratory Moscow Scientific Research Institute of Psychiatry, Ministry of Health RSFSR

"The Effect of Training for Altitude Hypoxia on the Intensity of Protein Synthesis in the Brain and Resistance to Convulsants"

Moscow, Byulleten' Eksperimental'noy Biologii i Meditsiny, No 1, 1970, pp 28-30

Abstract: In the late stages of training, when the resistance of the experimental rats to hypoxia was high, protein synthesis increased steadily in the medulla, hypothalamus, and cortex. After the cessation of training, it gradually decreased. The increased protein synthesis in the cortex was paralleled by a rise in RNA concentration. At the same time, the animals exhibited resistance to convulsive doses of pentylenetetrazol and audiogenic stimulation.

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APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202020011-1"

USSR

UDC: 669.295.053.4.094(088.8)

PETRUN'KO, A. N., MEYERSON, G. A., ROGATKIN, A. A., PAMPUSHKO, N. A., OLESOV, Yu. G.

"Method of Processing of Iron-Titanium Concentrates"

USSR Author's Certificate Number 353992, Filed 12/07/70, Published 10/11/72 (Translated from Referativnyy Zhurnal Metallurgiya, No 8, 1973, Abstract No 8G212P, by G. Svodtseva).

Translation: A method of processing of Fe-Ti concentrates, consisting in reduction of the concentrates by carbon in an atmosphere of N_2 at 1200-1400°, leaching with HCl and chlorination of the residue. In order to increase the productivity of the process and reduction of the concentrate to oxicarbonitride containing 5-7% O_2, reduction is performed in a stream of rarefied N_2 with a residual gas pressure of 0.2-0.4 atm. abs. at 1200-1500°, while $FeCl_3$ is crystallized from the solution produced after leaching, then reduced by the hydrogen formed during leaching to Fe powder.

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USSR UDC: 669.295.48.053.4

LISKOVICH, V. A., MEYERSON, G. A., BOYKO, A. I., KANYUK, A. I.

"Processing of Untreated Titanium Alloy Wastes by the Hydrogenation-Hydrometallurgy Method"

Moscow, Tsvetnyye Metally, No 7, Jul 73, pp 38-41.

Abstract: The expediency and economic effectiveness of the use of combined modes of leaching of the products of hydrogenation of untreated titanium alloy wastes with solutions of nitric acid and caustic alkali for extraction of aluminum, vanadium and molybdenum into solution before final electric refining are demonstrated. The alloying elements were extracted from the hydrogenation products by leaching in a heated ball mill. The combination of the grinding action of the balls with the chemical action of the reagents intensifies the process. The optimal extraction conditions were found to be: mill rotation rate 80% of critical, liguid:solid ratio 20:1, ball load 30% of mill volume. The total economic effect of the recovery process is 546 rubles per ton of powder, or 331 rubles per ton of titanium waste.

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USSR

UDC 620.193.5

BALAKIN, E. I., ZHUK, N. P., MEYERSON, G. A., OPARA, B. K., and PASHKOVA, O. A., All Union Scientific Research Institute of Hard Alloys, Moscow Institute of Steel and Alloys

"The Method of Producing Ni + ThO_2 Composites and Its Hardening Oxide Content and Their Effect on Heat Resistance"

Ordzhonikidze, Izvestiya Vysshikh Uchebnykh Zavedeniy, Tsvetnaya Metallurgiya, No 3, 1973, pp 130-133

Abstract: The heat resistance of Ni with 2, 3.5, and 4.5% by vol ThO_2 was investigated on specimens of dispersion-hardened Ni produced by the method of joint precipitation of Ni and Th from its salt solutions (1) and by the method of precipitation of Ni salt on particles of preliminarily prepared ThO_2 sol (2). Subsequently, the mixes of precipitates were subjected to filtration, drying, and NiO calcination up to Ni in a hydrogen stream followed by compression of the powder-like material and burning of the bruquettes. The baked billets were hot-extruded at 1000° in one operation with 94% reduction. The composition Ni+3.5% by vol ThO_2 produced by method 1 was found to possess a heat resistance 1.1-2.0 times higher than the same composition produced by method 2. The stability decrease of ThO_2 in Ni with increasing temperature is demonstrated. Method 2, 1/2

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BALAKIN, E. I., et al., Izvestiya Vysshikh Uchebnykh Zavedeniy, Tsvetnaya Metallurgiya, No 3, 1973, pp 130-133

characterized by a slowly developing process of coagulation, is recommended as the most effective method from the standpoint of heat resistance. Two figures, six bibliographic references.

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USSR

UDC 669.295.48

SMIRNOV, Yu. R., LISKOVICH, V. A., KHAVSKIY, N. N., MEYERSON, G. A., BOYKO, A. I.

"Some Results of Investigation of Application of Ultrasound in Hydrometallurgical Processing of Titanium Alloy Wastes"

Primeneniye Ul'trazvuka v metallurg. Protsessakh [Use of Ultrasound in Metallurgical Processes -- Collection of Works], Moscow, 1972, pp 98-102, (Translated from Referativnyy Zhurnal, Metallurgiya, No 5, 1972, Abstract No 5 G267 by the authors)

Translation: Results are presented from studies of combined reagent modes of leaching of trinary Ti-Al-V alloy hydride with the application of US oscillations. The duration of the process and temperature decrease in comparison with leaching in an ordinary tank. However, the ultrasound causes undesirable overfine breakdown of some portion of the solid phase, hindering further treatment of the suspensions. 3 Figures; 2 Tables; 4 Biblio. Refs.

USSR

UDC 621.385.032.21 (088.8)

MEYERSON, G.A., IOFIS, N.A, NURMUKHAMEDOV, V.KH., SOLOVEYCHIK, A.I.

"Material For Cathodes"

USSR Author's Certificate No 299887, filed 2 Oct 68, published 7 June 71 (from RZh:Elektronika i yeye primeneniye, No 1, Jan 72, Abstract No 1A87P)

Translation: According to the invention, the cathode material differs from well-known materials in the fact that it consists of a solid solution of borides of rare earth and alkali-earth metals in which the borides in question are taken in the ratio: boride of rare-earth metal, from 60 to 95 molar percent; boride of alkali-earth metal, from 5 to 40 molar percent. The solid solutions of rare-earth and alkali-earth metals have smaller vapor pressures than separated borides and therefore evaporate more slowly than separated borides and consequently also their mixture. With a solution of a boride of an alkali-earth metal, e.g., BaB_6 in a boride of a rare-earth metal, e.g., LaB_6, in the solid solution which is formed a metallic type of conduction remains, the emissive properties of which are better than in a boride of rare-earth metal. A reduction of the work function with LaB_6 because of the diffusion of BaB_6 into LaB_6 is accounted for by the fact that at the cathode surface a monatomic film is produced of the more active metal Ba, the work function of which is lower than with La. Tests of the emissive properties of the solid solutions showed that during operation of the cathode at 1400-1550° C the current

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MEYERSON, G. A. et al, USSR Author's Certificate No 299887

density of the emission for a composition containing 40 molar percent BaB_6 the residual LaB_6 is twice as high and for a composition with 30 molar percent BaB_6 the residual LaB_6 is 1.5 times as high as with the same conditions for pure LaB_6. A.F.

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USSR

UDC 669.782.053.2

SHURSHAKOV, A. N., DERGUNOVA, V. S., MEYERSON, G. A., SIZOV, B. A.

"Study of the Effect of Boron Additives on the Carburization of Silicon"

Tugoplavk. karbidy -- V sb. (Refractory Carbides -- collection of works), Kiev, Naukova Dumka Press, 1970, pp 77-82 (from RZh-Metallurgiya, No 4, Apr 71, Abstract No 4G219)

Translation: The effect of boron additives on the carburization rate of molten Si and the growth of the carbide layer formed at the graphite-melt interface is investigated. On introducing boron additives in the amount of 14%, the thickness of the carbide layer at the graphite-melt interface increases, and the C content in the melt increases simultaneously. There are 3 illustrations, 1 table, and a 9-entry bibliography.

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USSR UDC 621.762.2

MEYERSON, G. A.

"Method of Obtaining Refractory Metal Powders"

Sovrem. probl. poroshk. metallurgii -- V sb. (Modern Problems of Powder Metallurgy -- collection of works), Kiev, Naukova Dumka Press, 1970, pp 38-53 (from RZh-Metallurgiya, No 4, Apr 71, Abstract No 4G437)

Translation: A brief description of basic methods of obtaining refractory metal powders is presented: reduction of H_2 and C oxides, metallothermal method, electrolysis of molten media. The technological process and some thermodynamic conditions of obtaining refractory metal powders are presented. There are 3 illustrations, 1 table, and a 26-entry bibliography. [MISiS].

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USSR

UDC 546.824'20l

MEYERSON, G. A., KREYN, O. YE., KIPARISOV, S. S., and NARVA, V. K., Moscow Institute of Steel and Alloys

"Production of Titanium Carbide"

Moscow, Izvestiya Akademii Nauk SSSR -- Neorganicheskiye Materialy, Vol 6, No 10, Oct 70, pp 1749-1752

Abstract: Equilibrium conditions for the reaction TiO + 2C = TiC + CO are studied, as a result of which an equation is derived for the temperature dependence of the equilibrium constant and optimum conditions are determined for the production of titanium carbide with a composition close to the stoichiometric. A study was made of the conditions for the production of titanium carbide at atmospheric pressure in an argon stream in a coal tube furnace. It was found that an increase in the argon flow rate corresponding to a decrease in the partial pressure of the resultant CO shifts the reaction into the region of lower temperatures. Titanium carbide with a composition close to stoichiometric was obtained in the coal tube furnace at 1750° C in the argon stream, as well as in a vacuum furnace at 1 mm Hg and 1700° C.

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UDC 621.762.04

USSR

MEYERSON, G. A., OLESOV, YU. G., and GLUKHOV, V. P., Moscow Institute of Steel and Alloys, Zaporozhye Titanium-Magnesium Combine

"Producing Titanium Powders by Hydrogenation of Electrolytic Titanium"

Ordzhonikidze, Tsvetnaya Metallurgiya, No 6, 1970, pp 74-77

Abstract: A procedure is developed for producing titanium powders with low and Fe and Cl content, using the hydrogenation of electrolytic titanium with subsequent processing of the hydride by an HCl solution and degassing of the obtained precipitation. Electrolytic titanium (-5 + 0.5 fraction, and 120 HB hardness) containing 0.2-0.22%Cl, 0.01-0.03%Fe, 0.02%N, and 0.04%O was tested on a laboratory installation consisting of two retorts placed in an electric shaft furnace. The experimental set-up and the test procedure are described. The effect of hydrogen content in the titanium hydride on the degree of leaching of basic impurities (Fe, Cl, H) was investigated. The results obtained make it possible to recommend a

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MEYERSON, G. A., et al, Tsvetnaya Metallurgiya, No 6, 1970, pp 74-77

technological procedure for producing high-purity titanium powders which consists of the following basic operations: hydrogenation of electrolytic titanium; sifting of -0.10 mm fraction; pulverization up to + 0.14 mm; leaching of -0.14 + 0.10 mm fraction by 3% HCl solution; and dehydrogenation of dry material in vacuum (1.10^{-3} mm Hg) by heating up to 850°. It was established that impurities such as Fe and N concentrate on the surface of the particles, while Cl concentrates in the internal pares of the titanium crystals. The residual 0.02-0.03% Cl content, practically speaking, does not depend on its initial content in the electrolytic titanium.

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UDC 621.762.01

USSR

MEYERSON. G. A.

"Metal Ceramic Technology for Manufacture of Compact Blanks of Refractory Metal Powders"

Sovrem. probl. poroshk. metallurgii [Modern Problems of Powder Metallurgy -- collection of works], Kiev, Nauk. dumka Press, 1970, pp. 242-253, (Translated from Referativnyy Zhurnal-Metallurgiya, No. 1, 1971, Abstract No.1 G443 by the author).

Translation: The technology of pressing and sintering of products of W, Mo, Ta, Nb, Zr, and Ti powders is described. 3 figures; 21 biblio. refs.

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USSR

UDC 669.295.6

MEYERSON, G. A., OLESOV, YU. G., GLUKHOV, V. P., and PETRUN'-KO, A. N., Zaporozh'ye

"Study of the Process of Hydrogenization of Electrolytic Titanium"

Moscow, Izvestiya Akademii Nauk SSSR, Metally, No 1, Jan 71, pp 48-51

Abstract: This work presents the results of laboratory and pilot-scale studies on the development of a technology for the production of hydride-saturated electrolytic titanium. The dependence of the degree of hydrogen saturation of electrolytic titanium on temperature in the 300-800°C temperature interval and on duration of the hydrogenation process is studied. In order to produce titanium hydride corresponding to the formula TiH_2, it is expedient to conduct the process of hydrogenation with a gradual decrease in temperature at steps of 70-100° from 650 to 250-300°C, with holding for 20-30 minutes after pressure stabilization in the retort.

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Acc. Nr. AP0049307 Abstracting Service: CHEMICAL ABST. 5-70 Ref. Code UR0226

103085x Experimental study of the pressing of powdery materials. Meerson, G. A.; Rasskazov, N. I.; Chulkov, V. P. (Mosk. Inst. Stali Splavov, Moscow, USSR). Poroshk. Met. 1970, 10(1), 21-9 (Russ). The powders of Cu, Fe, W, and WC were studied. The coeffs. of lateral pressure and internal friction of the powder during pressing were detd. by elec. resistivity tensometric measurements. The coeff. of the lateral pressure for plastic metals increases with increasing pressing pressure, although slower than according to the proportionality curve from the relative d. of the briquet. For low-plastic metals (W) and for brittle materials (WC), the coeff. of the lateral pressure somewhat increases within the low-pressure region, but at >~2 ton/cm² it becomes practically const. The coeff. of the lateral pressure decreases somewhat for the fine-grained or the oxidized powder of the given metal as compared to the non-oxidized and coarser powder, which is due to the increased inter-particle friction. The use of an inactive binder has no effect on the coeff. of lateral pressure, thus interlocking is the fundamental interaction between such powders. The internal friction coeff. decreases with increasing pressure at low pressing pressures and it remains const. at high pressing pressures.

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OLESOV, YU.G., MEYERSON, G.A., USTINOV, V.S., ZAPADNYA, V.I., SHEVAYEVA, M.P., and CHERKASHIN, V.F.

"Electrolytic Derivation of Titanium-Based Alloy Powders"

Moscow, Tsvetnyye Metally, No 5, May 70, pp 79-81

Abstract: Investigations were made of the possibility of obtaining titanium-alloy powders by electrolysis of melts with a soluble anode. Titanium-aluminum alloys were used as examples. The first experiments were conducted on a large laboratory electrolyzer (current up to 300 amps). A mixture of AO-aluminum and ChM-titanium sponge wastes was used as the anode material. Aluminum content in the charge was varied from 10 to 40%. The cathodic deposits were processed by a hydrometallurgical method, separated into four fractions: +0.56, -0.56 + 0.14, -0.14 + 0.07 and -0.07 mm, and analyzed for Al, Fe, Si, C, N, and O content. On the basis literature data and the investigations conducted, optimum conditions were determined: anode current density of 0.1-0.15 amp/cm^2, cathode current density of 0.8-1 amp/cm^2, and electrolyte composed of 40% $MgCl_2$, 35% KCl, and 25% NaCl containing 1-1.5% dissolved titanium in the form of lower chlorides. Subsequent investigations were conducted under plant conditions. After hydrometallurgical processing and drying, the cathode material was separated into +0.5, -0.5 + 0.08, and -0.08 mm fractions. It was established that with a rise in the aluminum

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OLESOV, YU.G., et al, Tsvetnyye Metally, No 5, May 70, pp 79-81

content in the starting material, the yield of fine particles grows. As a result of the experiments conducted, the basic technological parameters of obtaining titanium-aluminum powders in existing electrolyzers were determined: cell current of 3-3.5 kiloamperes, anode current density of 0.2-0.25 amp/cm^2, 1-1.5% soluble titanium concentration in an $MgCl_2$ -- KCl -- NaCl -- $TiCl_x$ electrolyte, working temperature of the melt at 550-580°C, and unit electrolysis time at 2-3 hours. These parameters ensure a stable current efficiency of 0.45-0.50 g/amp-hr and an 80-85% yield of metal powder fractions after disintegration. The data obtained from the experiments indicate that by electrolysis of melts with a soluble anode, it is possible to obtain powders from titanium-aluminum alloys of determined composition which possess adequately high mechanical properties in the baked state.

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1/2 033 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--PROCESSING OF WASTES OF TUNGSTEN, CHROMIUM, VANADIUM, MOLYBDENUM TOOL STEEL BY MEANS OF POWDER METALLURGY -U-

AUTHOR-(04)-MEYERSON, G.A., KIPARISOV, S.S., BOGODUKHOV, S.I., SMIRNOVA, M.M.

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CIRC ACCESSION NO--AP0119003

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EFFECT WAS STUDIED OF CRUSHING METHODS OF THE CHIPS INTO POWDER AND OF THE PRESSING AND SINTERING CONDITIONS ON THE DENSIFICATION PROCESS DURING SINTERING AND ON THE STRUCTURE AND THE PROPERTIES OF SINTERED STEEL. SINTERED HIGH SPEED W-CR-V-MO. STEEL (R18) POWDERS OF VARIOUS GRAIN SIZE WERE STUDIED. THE EFFECTS OF THE FOLLOWING FACTORS ON DENSIFICATION WERE DETD.; (A) USE OF POWDER WHICH WAS NOT REDUCED AFTER CRUSHING AND CONTG. 0.3-0.4PERCENT O; (B) ADDN. OF SOOT TO THE POWDER IN AN AMT. EQUIV. TO THE O CONTENT; (C) EXTENSIVE DRYING OF H; (D) HIGH PRESSING PRESSURE (UP TO 7-10 TON-CM PRIME2); (E) RAPID HEATING TO 1250DEGREES AND HOLDING THERE FOR 1-2HR. THE COMBINATION OF THESE FACTORS MADE IT POSSIBLE TO PRODUCE BRIQUETS WITH 97-8PERCENT RELATIVE D. A LEDEBURTIC EUTECTIC WAS FORMED DURING SINTERING AT 1200-1250DEGREES. THIS PHENOMENON WAS EXPLAINED BY THE FORMATION, AT THE START OF SINTERING, OF A LIQ. PHASE (WHICH LATER VANISHES) WITH THE IMPURITY OXIDES TAKING PART. SUBSEQUENT HOT FORGING OF THE SINTERED BILLETS ENSURES ZERO POROSITY. THE STRUCTURE OF THESE BILLETS IS SIMILAR TO THE STRUCTURE OF THE BILLETS FROM STEEL R18, BUT HAS SMALLER AND MORE UNIFORMLY DISTRIBUTED CARBIDES, WHICH IS REFLECTED IN THEIR HIGHER HARDNESS, REFRACTORINESS, AND HEAT COND. THE PHYS. MECH. AND CUTTING PROPERTIES OF BLADES MADE FROM SUCH STEEL ARE SOMEWHAT BETTER THAN THOSE FOR BLADES MADE FROM CAST AND PRESSURE WORKED STEEL R18. FACILITY: MOSK. INST. STALI SPLAVOV, MOSCOW, USSR.

UNCLASSIFIED

Titanium

USSR UDC 621.669.27

MEYERSON, G. A., KREYMER, G. S., GLUSHKOV, V. N., PANOV, V. S., Moscow Institute of Steels and Alloys

"Study of the Influence of Conditions of Production of Metallic Tungsten on the Properties of T15K6 Alloy"

Kiev, Poroshkovaya Metallurgiya, No 6, Jun 72, pp 31-35.

Abstract: The possibility is studied of producing fine-grained, homogeneous tungsten powder in commercial muffle furnaces using direct input of hydrogen, and the influence of the grain size of the tungsten powder produced on the physical, mechanical and cutting properties of the hard alloys is investigated. WO_3 was reduced to W in one stage in an industrial type GSPI muffle furnace. Direct input of hydrogen allows a homogeneous, fine-grained tungsten powder with adsorption of over 0.2 mg/g and mean grain size less than 1 micron to be produced. The properties of T15K6 alloy were studied as functions of sintering temperature. It was found that the alloy has a finer WC-phase grain structure and higher physical, mechanical and cutting properties than standard T15K6 alloy. The cutting properties are 10-30% higher than the standard alloy.

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USSR

UDC 669.295.3.82

MEYERSON, G. A., LISKOVICH, V. A., and BOYKO, A. I., Moscow, Zaporozh'ye

"Investigation of the Hydrometallurgical Reprocessing of Wastes of Titanium Alloys"

Moscow, Izvestiya Akademii Nauk SSSR, Metally, No 2, Mar-Apr 73, pp 44-49

Abstract: With reference to previous investigations on hydrogenation of titanium materials (Rubtsov, A. N., et al., "Naukova Dumka", 1971; Olesov, Yu. G., et al., "Tsvetnyye Metally", 1967, No 2), results of further studies on the reprocessing of off-grade wastes of titanium alloys by the hydrogenation-hydrometallurgy method are discussed. Effects of technological factors on the degree of recovery of Al, V, and Mo in the leaching process of hydrogenation of binary, ternary, and industrial VT6 and VT8 titanium alloys are investigated. Favorable effects of prehydrogenation and of leaching the wastes of VT6 alloy on the indices of subsequent electrolytic refining are ascertained. Five tables, ten bibliographic references.

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USSR

UDC 621.762:541.121.124

MEYERSON, G. A., BABICH, B. N., and KOZYREV, A. S., Moscow Institute of Steel and Alloys, Chair of Rare and Radioactive Metals and Powder Metallurgy

"Investigation of the Reduction Process of Chromium Oxide by Hydrogen in the Presence of Powdered Nickel"

Ordzhonikidze, Izvestiya Vysshikh Uchebnykh Zavedeniy, Tsvetnaya Metallurgiya, No 5, 1972, pp 83-88

Abstract: The analysis of thermodynamic and kinetic reduction conditions of finely dispersed chromium oxide by hydrogen in the presence of powdered nickel shows that in the region of γ-solid solutions the logarithm of the equilibrium constant drops linearly with increasing logarithm of chromium concentration. A precipitated mix of oxides which additionally contained 2.5% ThO_2 was used in studying the reduction kinetics in the 1100-1250°C temperature interval. Almost complete elimination of oxygen takes place after 7 and 4 hours at 1200 and 1250°C, respectively. In the initial reduction stage, the kinetics of the process are limited by the rate of chromium oxide interaction with hydrogen. With developing reaction and increasing chromium concentration in the resulting solid solution, the process of diffusion dissolution of chromium in nickel becomes limiting. The

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