

Immunology

USSR

UDC 613.632:612.014.46

OLEFIR, A. I., Kiev Scientific Research Institute of Labor Hygiene and Occupational Diseases

"Effect of Chemical Agents on Acquired Immunity"

Kiev, Vrachebnoye Delo, No 7, 1971, pp 125-127

Translation: Exposure to industrial chemicals may result in the impairment of immunobiological reactivity, including acquired immunity (V. A. Mikhaylov and A. A. Gerasimenko, 1961; I. G. Fridlyand, 1967; T. M. Ardzhipanov, 1968; A. A. Nikul-tseva, 1968). Changes in antibody formation are closely linked to the epidemiological effect of compulsory vaccinations of industrial and agricultural workers as well as to the nature of postinfection immunity and the frequency of reinfection.

Determination of the level of specific antibodies as a sensitive integral indicator is widely used in toxicological and hygienic investigations, but it is quite difficult to compare the action of chemical products on immunogenesis in the search for specific toxicological and immunological patterns. The rate of antibody
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formation is used in most cases to characterize the unfavorable effect of different concentrations and doses of chemical compounds. The effort to detect toxicity as quickly as possible results in the administration of vaccine no more than once or twice, four to six antigenic stimuli every 4 to 6 days without revaccination or in repeated immunization only after the titers have dropped to the original levels (B. A. Kiryachko, 1958; L. M. Lur'ye, 1966; M. M. Kochanov, 1965; V. V. Kramsakov, 1968; A. G. Starodubova, 1968). The resulting data frequently do not permit an evaluation of acquired immunity as a whole. Moreover, different antigens, modes of administration, doses, and times of vaccination are used.

The limited amount of material available for comparing the effect of different classes of chemical agents on acquired immunity prompted us to study carbamic (carbin, sevin, dicresyl), thio-

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(EPTAM, yalan, tillam), and dithiocarbamic (maneb, TMTD) acids and forms of chlorine (DDT) and organophosphorus (chlorophos) compounds.*

Vaccinations were performed 2.5 to 3 months after the start of the experiment because, according to V. K. Navrotskiy (1959), preliminary exposure to chemical agents has a greater effect than exposure simultaneously with immunization (G. Ye. Poteryayeva, 1965) or after it (A. A. Nikul-tseva, 1967). It is likely that under industrial conditions also, vaccination or infection generally takes place after prolonged unfavorable exposure to environmental factors which alter the reticuloendothelial system by intoxication with pathological metabolic

* TMTD and DDT, which have cumulative properties, were administered orally (1/5 LD₅₀); the other pesticides were administered in doses of 1/20 LD₅₀ for 4.5 to 5 months.

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products (S. I. Ashbel' et al, 1964). Killed typhoid vaccine, which is very extensively employed in toxicological experiments, was used as antigen.

The vaccine was administered subcutaneously in 1.1 and 2 ml doses three times at 7-day intervals, followed by revaccination one month later, using one of the commonest vaccination schedules followed in immunology.

Comparison of the antilogarithms of the antibody titers in experimental groups (8 to 10 rats in each) with the control (25 animals) showed that 7 days after the first vaccination and exposure to sevin, EPTAM, tillam, and especially carbin, DDT, and chlorophos, antibody formation was depressed to 77 ± 1.5 instead of 456 ± 1.1 .* One week after the second immunization and exposure

* Statistically significant changes ($p < 0.05$) were taken into account in the analysis.

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to TMTD, antibody titers decreased, but they increased after exposure to tillam and chlorophos (in the other cases the results approached the control). The last two pesticides and DDT reduced the content of agglutinins by the 14th day after the 3rd immunization. Prior to revaccination and exposure to DDT and (to a lesser extent) chlorophos, sevin, dicresyl, and yalan, the antibody count dropped to one-half to one-fourth that of controls. Against a background of tillam intoxication, the agglutinin level increased by 1/5, suggesting a slowing of the increase in antibody content with a shift of the peak to the right. Two weeks after revaccination, the values under study approached the control level (20,385±1.3) in most of the subgroups, but in some cases (after exposure to dicresyl) they increased threefold or decreased (almost twofold after treatment with TMTD and more than 15-fold after treatment with chlorophos).

Experimental findings on the depression of immunogenesis after intoxication with carbamates, organochlorine and organophosphorous compounds, are in general agreement with the published data
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on the lowering of specific antibody levels under the influence of sevin, chlorophos, trichlorometaphos-3, hexachlorocyclohexane, lead, manganese, fluorine, potassium bichromate, hexachlorobutadiene, carbon tetrachloride, several hydrocarbons, and dichloroethane (E. V. Davydova, 1926; R. D. Gabovich and Ya. I. Mel'nik, 1951; V. K. Navrotsky, 1959, 1960, 1963; A. A. Atchabarov, 1961; L. Erban, 1962; Ye. N. Burkatskaya, 1963; G. M. Mulhametova, 1964, 1966; Z. Z. Bruskin, 1965; V. A. Zakordonets, 1966; M. Kuku et al, 1966; A. G. Pastova, 1968).

Besides the similar nonspecific effects exerted by the compounds under study, the experiments also revealed some differences between them. Chlorophos and DDT had a more pronounced inhibitory effect on antibody formation than did the derivatives of the carbamic, thio- and dithiocarbamic acids. The latter, in turn, impaired this function in varying degrees. For example, tillam thiocarbamate reduced the increase in antibody content over the longest period of time. The carbamates sevin, dicresyl,

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and EPTAM thiocarbamate suppressed the increase in agglutinins longer than did carbin (carbamate) or yalan (thiocarbamate). Maneb dithiocarbamate had no effect on the formation of immunity to typhoid.

Further analysis of the experimental results showed that inhibition of antibody formation is predominant in the initial stage of immunization and before revaccination. At other times this phenomenon was much less common, especially when carbamates were used.

The effect of the pesticides on immunogenesis was assessed, both from inhibition of antibody formation and from the duration of a high antibody level, after allowing for the possibility of a slow rise. V. K. Navrotsky (1960) and A. S. Faustov (1966) observed a substantial reduction in the duration of high agglutinin titers after exposure to a number of substances, specifically, gasoline, aromatic and diethylene hydrocarbons, sulfur

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dioxide, and carbon monoxide. In our experiments, 1 1/2 months after revaccination and poisoning with carbin, dicresyl, EPTAM, tillam, maneb, DDT, and chlorophos, the antibody content was lower than two weeks after revaccination, but higher than in the control (4700 ± 1). After the use of DDT and chlorophos, there was a further increase in the agglutinin titers to $17,270 \pm 1.2$ to $21,500 \pm 1.2$. Two and one-half months from the time of revaccination, this indicator was lower after the action of DDT, but slightly higher after maneb, while in the other subgroups it was indistinguishable from the control (31 ± 1.4). The overall duration of the appearance of agglutinins in serum was the same as in the control, but the titers after revaccination remained high somewhat longer in experimental animals. The possibility that toxic agents stimulate antibody formation in the later stages of immunogenesis cannot be ruled out. P. A. Samedova (1957) described a similar phenomenon following exposure to gasoline.

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To determine the effect of carbamates and some organofluorine and organophosphorus compounds on immunity to typhoid, the protective properties of rat sera taken two weeks after revaccination was studied in mice (210 animals). Different dilutions of these sera and a constant dose of the culture were used. The death rate of experimental mice was the same as for controls. The increase in the number of dead animals after treatment with yalan or tillam was statistically insignificant. The protective properties of immune sera were high not only after poisoning with carbamate pesticides, but after injection of DDT and chlorophos, which regularly reduced the antibody titers in the process of vaccination. A decrease in the number of antibodies probably does not always lead to a decrease in the protective properties of the serum, i.e., this process can sometimes be compensated. That is why one must be cautious in judging the effect of unfavorable environmental factors on the nature of acquired immunity.

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The published data and the results of our experiments show that the materials of toxicological hygienic studies can be compared provided that the vaccination schedules, antigens used, and time of starting immunization are standardized. To evaluate the adequacy of vaccination, one must study the protective properties of immune sera or the index of resistance. Observance of the above-mentioned conditions will make it possible to determine the extent to which chemical agents affect acquired immunity and help to collect information on the patterns of immunogenesis under industrial conditions.

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UDC 615.285.7.015.46

OLEFIR, A. I., Candidate of Medical Sciences, Kiev Institute of Labor Hygiene and Occupational Diseases

"The Effect of Chlorophos on Immunobiological Reactivity of Animals in an Experiment"

Moscow, Gigiyena i Sanitariya, Vol 3, Mar 71, pp 104-105

Abstract: The effect of chlorophos on natural immunological reactions was investigated. The study was performed on 45 rats receiving either a single dose of 500 mg of pure chlorophos per kilogram body weight (acute series) or repeated doses of 25 mg/kg for over 4 months (chronic series). The parameters analyzed included: beta-lysin in serum, complement and bactericidal activity of serum, phagocytosis by neutrophils and the reticuloendothelial system, bactericidal property of saliva, and E. coli flora on the skin. In the acute series, inhibition of immunological reactions developed later than the clinical signs of intoxication but lasted for a considerably longer period, especially the depression of reticuloendothelial phagocytosis. In the chronic series, clinical signs of intoxication were absent, while inhibition of immunological reactions developed in the second week, lasted throughout the experiment, and did not return to normal within the next two months. The
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OLEFIR, A. I., Gigiyena i Sanitariya, Vol 3, Mar 71, pp 104-105

most sensitive indexes -- reticuloendothelial phagocytosis, bactericidal property of the skin, serum lysin concentration, and digestion by neutrophilic cells -- are recommended for use in toxicological tests.

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1/2 025 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--ON THE EMBRYOTOXIC EFFECT OF EPHTAME -U-
AUTHOR--(03)--MEDVED, I.L., VINOGRADOVA, V.KM., OLEFIR, A.I.
COUNTRY OF INFO--USSR
SOURCE--VRACHEBNOYE DELO, 1970, NR 5, PP 140-143
DATE PUBLISHED-----70
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES
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DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--3002/1716 STEP NO--UR/0475'70/000/005/0140/0143
CIRC ACCESSION NO--AP0129084
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PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0129084

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EMBRYOTOXIC EFFECT OF EPTHAME (A DERIVATIVE OF THIOCARBAMINE ACID) WAS STUDIED IN 53 WHITE RATS AND 250 CHICK EMBRYONS. OBSERVATIONS ON THE DEVELOPMENT OF CHICK FETUSES AND RAT PROGENY OF THOSE RECEIVING THE DRUG DURING THE ENTIRE PERIOD OF PREGNANCY INDICATE THAT SMALL DOSES OF EPTHAME DID NOT EXERT ANY EMBRYOTOXIC EFFECT. FACILITY: INSTITUT GIGIYENY TRUDA I PROFZABOLEVANIY, KIYEV. FACILITY: INSTITUT INFEKTSIONNYKH BOLEZNEY MZ USSR, KIYEV.

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Immunology

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OLEFIR, A. I., Kiev Scientific Research Institute of Labor Hygiene and Occupational Diseases

"Investigation of Natural Immunity Under the Effect of Chemicals"

Kiev, Vrachebnoye Delo, No 2, 1970, pp 105-108

Abstract: Natural immunity under the effect of chemicals was studied. An analysis of literature on the subject reveals that in most cases one, two and sometimes three immunological indices were used to detect the effect of various chemicals on an organism, which does not give the complete picture in all cases. Rats were used in experiments to determine the most sensitive indices in carbamate pesticide intoxication. The indices used were the complementary and bactericidal activity of serum, the lysozyme and betalysine content of serum, the percentage of phagocytizing neutrophils, the phagocytic index, the degree of phagocytosis induced, absorption by the reticuloendothelial system, the index of skin bactericidal capacity, and the Escherichia coli content in the saliva and on the skin. It was concluded that nonspecific immunity factors (especially the absorptive and digestive activity of neutrophils, lysozyme content and skin bactericidal

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properties and microflor indices) are the most sensitive tests for determining the effects of chemicals on an organism. The immunobiological reactivity indices make it possible to detect changes in the early stages of intoxication, and to evaluate the duration of the restorative period. In order to determine the depth and degree of compensation of immunological reactivity shifts under toxic influences, not only do cellular, humoral and other indices of natural immunity require study, but the response to infection by pathogenic microbes also requires investigation.

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Acc. Nr: AP0052078

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PRIMARY SOURCE: Vrachebnoye Delo, '1970, Nr 2, pp 105-108

INVESTIGATION OF NATURAL IMMUNITY UNDER THE EFFECT
OF CHEMICAL SUBSTANCES

A. I. Olefir (Kiev)

A study of the immunobiological reactivity in rats under the effect of carbamine pesticides indicates that among factors of non-specific immunity the following are the most sensitive: digesting activity of neutrophils, lysozyme content, index of skin bactericidity and skin microflora.

The immunological indices make it possible to detect changes of early stages of intoxication and evaluate the duration of the restorative period.

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Pharmacology and Toxicology

USSR

UDC 615.917:547.495.2-099:612.017.1

OLEFIR, A. I., Candidate of Medical Sciences, Kiev Scientific Research Institute of Labor Hygiene and Occupational Diseases

"The Effect of Acute Poisoning With Carbamate Pesticides on Immunological Reactivity"

Kiev, Vrachebnoye Delo, No 4, 1973, pp 138-141

Abstract: Changes in humoral (bactericidal activity of serum and complement, lysozyme, and beta lysine concentration), cellular (phagocytosis and digestion of Staphylococci by neutrophils in vitro and phagocytosis by the reticulendothelial system), and cutaneous (concentration of E coli on skin and mucous membranes and bactericidal property of skin) factors of immunity as well as overall immunological reactivity were investigated in white rats after a single maximum tolerable dose of carbamates (sevin, carbin, and dicresyl), thiocarbamates (yalan, eptam, and tillam), and dithiocarbamates (maneb and TMTD). Clinical signs of poisoning (dyspnea, immobility, hemorrhagic discharge from the nose, and fall in body temperature) appear within 1 hr after administration of the pesticides and subside in 2 days. Except for dicresyl and yalan, the pesticides markedly reduce immunological reactivity by depressing humoral and cellular factors. Carbin, eptam, and maneb reduce immunoreactivity for 1 1/2

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OLEFIR, A. I., Vrachebnoye Delo, No 4, 1973, pp 138-141

week, sevin for over 2 weeks, and tillam and TMTD for over 2 months. These compounds also increase the animals' susceptibility to infection (injection of E coli under the foot aponeurosis). By and large, carbamates and thiocarbamates depress primarily humoral factors and dithiocarbamates predominantly cellular factors.

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UDC 577.1:615.7/9

BURKATSKAYA, YE. N., OSTROUKHOVA, V. A., KARPENKO, V. N., ANINA, I. A., OLEFIR, A. I.

"Characteristic Features of the Reactions of the Organism under the Prolonged Effect of Various Classes of Chemicals"

V sb. Nauch. osnovy sovrem. metodov gigiyen. normirovaniya khim. veshchestv v okruzhayushchev srede (Scientific Principles of Modern Methods of Hygienic Normalization of Chemicals in the Environment -- collection of works), Moscow, 1971, pp 135-141 (from RZh-Biologicheskaya Khimiya, No 14, Jul 72, Abstract No 14F2050)

Translation: On the basis of a study of the effect of organochlorine and organophosphorus and carbamate pesticides (experiments on rats) on certain biochemical systems of the organisms, the morphological composition of the blood and the immunological reactivity, it is considered that during hygienic normalization of chemicals as integral tests, the biochemical, hematologic and immunologic indexes can be used.

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UDC 612.017.1-06:614.72

OLEFIR, A. I., MINTSER, O. P., SOVA, R. YE., Candidates of Medical Sciences,
Institute of Labor Hygiene and Occupational Disease, Kiev

"Complex Evaluation of the State of Nonspecific Immunity under the Effect of
External Environmental Factors"

Moscow, Gigiyena Sanitariya, No 10, 1972, pp 85-89

Abstract: A complex evaluation was made of nonspecific immunity under the effect of environmental factors. The nature of the distribution of immunological tests was considered before beginning the evaluation. The natural immunity indexes of the described tests were found to be characterized by Poisson distribution. For the distribution of variables differing from normal, the difficulties of mathematical analysis are very large. Therefore, it was proposed that evaluation of the differences be used by each gradation of the investigated parameter individually. For the overall evaluation the R_x criterion was proposed:

$$R_x = E_{ti},$$

where t is the value of the Student criterion calculated by the usual procedure for each experimental point of the curve. The criterion means that the greater the value of t , the smaller the probability that the given difference is random.

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OLIFIR, A. I., et al., Gigiyena Sanitariya, No 10, 1972, pp 85-89

The sum of the values of t permits an integral characteristic of the parameter shift from the norm to be obtained. The biological value of a symptom or sign was also reflected in the evaluation, and for this purpose the variability of the parameter and importance of the test were used. The coefficients of biological significance Q were adopted which, on being taken into account, resulted in the following formula:

$$R_x = \sum t_i \frac{Q_i}{\text{tg } \alpha_i},$$

where $\frac{Q_i}{\text{tg } \alpha_i} = S_i$; S_i is the constant for each index. The final formula has the form:

$$R_x = \sum t_i S_i.$$

The complex evaluation of the level of nonspecific immunity is the summation of the deviations of the humoral, cellular and barrier immunities. Therefore:

$$R_x = G_x + C_x + T_x.$$

In determining the significance of the degrees of the deviations G_x , C_x , T_x , least and greatest numerical expressions were used, found after complex

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OLIFIR, A. I., et al., Gigiyena Sanitariya, No 10, 1972, pp 85-89

evaluation of the tests in analogs subjected to the chronic effect of a series of carbamate, organophosphorus and organochlorine pesticides in doses of 1/20 to 1/50 LD₅₀. The entire range of variation of the proposed criterion was divided into four levels by the method frequently used in physiological research [V. S. Genes, Nekotoryye prostyye metody kiberneticheskoy obrabotki dannykh diagnosticheskikh i fiziologicheskikh issledovaniy, (Some Simple Methods of Cybernetic Processing of Data of Diagnostic and Physiological Studies), Moscow, 1967].

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USSR

UDC 669.715'3:548.53:621.785.014

OLEFIRENKO, V. M.

"Effect of the Initial State and Heating Rate on Recrystallization of D16 Alloy"

V sb. Vopr. prochnosti i plastichnosti met. (Problems of Strength and Plasticity of Metals -- collection of works), Nauka i Tekhn. Press, Minsk, 1971, pp 27-28 (from RZh-Metallurgiya, No 4, Apr 72, Abstract No 4I641)

Translation: A study was made of the effect of the heating rate and state of the hardening phase on the recrystallization temperature of D16 and D16AM alloys and the process of dissolving the phases in Al. It was demonstrated that the high-speed heating (10-100 deg/sec) can be used for softening recrystallization annealing of the indicated alloys as intermediate operations: the solution of the phases is suppressed here.

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UDC 669.15-194.55:621.785.784

BODYAKO, M. N., SACHKOV, V. V., ASTAPCHIK, S. A., and OLEFIRENKO, V. M., Physicotechnical Institute, Academy of Sciences BSSR

"On the Question of Work Hardening and Softening of Martensite-Aged Steels"

Minsk, Akademiya Nauk BSSR, Izvestiya, Seriya Fiziko-Tekhnicheskikh Nauk, No 2, 1970, pp 46-50

Abstract: A study was made of phase and structural transformations in martensite-aged steel with increased content of cobalt and molybdenum under the conditions of fast continuous heating and after different regimes of cold and hot deformation. The steel had the following chemical composition (wt. %): C -- 0.022; Ni -- 12.4; Mo -- 10.8; Co -- 16.48; Ti -- 0.10; Al -- 0.08; Mn -- 0.02; Si -- 0.05; B -- 0.003; P -- 0.0045. Results are presented of the investigation of heat hardening and softening of martensite-aged steel after cold and hot deformation under conditions of electrical heating at rates up to 300 deg/sec.

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172 032 UNCLASSIFIED PROCESSING DATE--09OCT70
 TITLE--THERMAL TREATMENT AND PROPERTIES OF MARTENSITE AGING STEEL OF THE
 00N12K16M11 TYPE -U-
 AUTHOR-(04)-BODYAKO, M.N., ASTAPCHIK, S.A., YAROSHEVICH, G.B., OLEFIRENKO,
 V.M.
 COUNTRY OF INFO--USSR
 SOURCE--VESTSI AKAD. NAVUK BELARUS. SSR, SER. FIZ. TEKH. NAVUK 1970, (1),
 47-53
 DATE PUBLISHED-----70

SUBJECT AREAS--MECH., IND., CIVIL AND MARINE ENGR, MATERIALS
 TOPIC TAGS--STEEL HEAT TREATMENT, HIGH STRENGTH STEEL, HOT ROLLING,
 CRYSTAL STRUCTURE, MARTENSITIC STEEL, STEEL HARDENING, METAL
 AGING/(U)00N12K16M11 HOT ROLLED STEEL

CONTROL MARKING--NO RESTRICTIONS

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 PROXY REEL/FRAE--1994/1930

STEP NO--UR/0201/70/000/001/0047/0053

CIRC ACCESSION NU--AP0115742

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PROCESSING DATE--09OCT70

CIRC ACCESSION NO--AP0115742

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. BY TAKING INTO ACCOUNT THE RESULTS OF PREVIOUS WORK (B., ET AL., 1968), THE PRESENT WORK CONSTITUTES A FURTHER AND MORE DETAILED STUDY OF THE NATURE OF STRUCTURAL TRANSFORMATIONS AND PROPERTIES OF THE TITLE ALLOY. THE MATERIAL WAS HOMOGENIZED, FORGED, AGED, AND HARDENED. ANAL. OF THE DATA SHOWS THAT WITHIN THE AGING RANGE WHICH IS GENERALLY RECOMMENDED AS BEING THE OPTIMUM ONE, ONE CAN OBTAIN HIGH STRENGTH VALUES, NAMELY, 260-300 KG-MM PRIME2. THE PLASTICITY THEREBY IS VERY SATISFACTORY. UNDER REAL CONDITIONS DURING THE EXISTANT TECHNOL. OF MELTING AND HOT PROCESSING OF STEEL IT IS DIFFICULT TO PREVENT STRESS CONCNS., IN THE FORM OF BRITTLE IMPURITIES, FROM ENTERING THE MATERIAL. THE STRENGTHENING OF MARTENSITE DURING AGING IS ASSOCD. WITH THE EARLY STAGES OF FORMATION OF PARTICLES OF THE SECONDARY PHASE. THE DIFFERENCES BETWEEN LOW TEMP. AND HIGH TEMP. AGING ARE DISCUSSED. QUENCHING IS THE ONE PROCESS THAT WOULD MOST SIGNIFICANTLY REDUCE THE LARGE SCATTER IN THE PROPERTIES OF THE MATERIAL FROM SAMPLE TO SAMPLE. CORRECT MARTENSITE AGING OF HOT ROLLED STEEL 00N12K16M11 AT 480-520DEGREES FOR 3 HR WILL RESULT IN STRENGTH VALUES OF 260-300 KG-MM PRIME2, WITH SATISFACTORY PLASTICITY AND DUCTILITY VALUES. RAPID CONTINUOUS HEATING AT 950-1200DEGREES MAKES IT POSSIBLE TO OBTAIN A FINE GRAINED (5-30 MU) STRUCTURE. HOWEVER, NO SUBSEQUENT AGING PRODUCES SATISFACTORY PLASTICITY. FACILITY: FIZ. TEKH. INST., MINSK, USSR.

UNCLASSIFIED

USSR

UDC 517.91

OLEKHNİK, S. N., Chair of Mathematical Analysis

"On the Boundedness and Unboundedness of Solutions of Some Systems of Ordinary Differential Equations"

Moscow, Vestnik Moskovskogo Universiteta, Seriya I -- Matematika, Mekhanika, No 6, Nov-Dec 72, pp 34-44

Abstract: The article studies the behavior at infinity of solutions of the nonlinear system

$$\ddot{x}(t) + A(t)\dot{x}(t) + B(t)f(x(t)) = 0,$$

where the square matrices $A(t)$ and $B(t)$ are continuous on $[t_0, \infty)$ (unless there is the additional proviso of the condition of smoothness); $f(x)$ is a continuous column-vector with the coordinates $f_1(x), \dots, f_n(x)$; x is an n -dimensional vector. Some other systems are also considered: viz.,

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OLEKHNIK, S. N., Vestnik Moskovskogo Universiteta, Seriya I -- Matematika, Mekhanika, No 6, Nov-Dec 72, pp 34-44

$$\ddot{x}_i(t) + \sum_{j=1}^n a_{ij}(t) \dot{x}_j(t) + \sum_{j=1}^n b_{ij}(t) f_{ij}(x_j(t)) = 0$$

and

$$\ddot{x}_i(t) + \sum_{j=1}^n a_{ij}(t) \dot{x}_j(t) + \sum_{j=1}^n b_{ij}(t) x_j(t) = q_i(t).$$

It is assumed that the solutions are infinitely continuous. Sufficient conditions are established for the boundedness of all solutions and the existence of unbounded solutions.

The author thanks Professor B. P. DEMIDOVICH, under whose guidance the work was done.

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UDC 613(075.8)

ZIL'BER, D. A., (DECEASED), LOGINOVA, R. A., NOVIKOVA, I. M., OLEKHNOVICH,
A. I., OSTROVSKIY, M. M., and RAZUMOVSKIY, M. D.,

Gigiyena (Hygiene), Moscow, "Meditsina," 1970, 384 pp

Translation: Annotation: This textbook has been compiled for students of pharmaceutical institutes and pharmaceutical faculties of medical institutes in accordance with the hygiene teaching program. It contains materials corresponding to the nature of their future work. Such materials concern problems of hygiene in pharmacies, labor hygiene in galenical and chemicopharmaceutical enterprises, foundations of epidemiology and organization of antiepidemic measures, and sanitary education.

The indicated subjects are completely lacking in hygiene textbooks issued for students of therapeutic, sanitary, and other faculties of medical institutes.

Some facets of general hygiene are elucidated also in this textbook without which it is impossible for students to learn certain hygienic problems which are specific for them as future specialist pharmacists.

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Foreword

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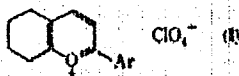
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Acc. Nr: **AP0048811** - Abstracting Service:
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Ref. Code:
UR 0366

90202f Synthesis of pyrylium salts by the cross condensation of ketones with ethyl orthoformate. ~~Drofenko, G. N.; Olekhovich, E. A.~~ (Rostov-na-Donu Gos. Univ., Rostov-on-Don, USSR). *Zh. Org. Khim.* 1970, 6(1), 192 (Russ). The reaction of cyclohexanone or cycloheptanone with HC(OEt)₃ and an appropriate MeCOAr (Ar = aryl group) in the presence of HClO₄ gave, resp., 2-phenyl-5,6-tetramethylenepyrylium chloride, 2-phenyl-5,6-pentamethylenepyrylium chloride, or their 2-(3,4-dimethoxyphenyl) analogs. The reaction involves the formation of HC⁺(OEt)₂ClO₄⁻ and its addn. to the cyclic ketones giving the intermediate 3-ethoxy-5,6-cycloalkylenepyrylium ions which



react with the aromatic ketones giving 2-arylpyrylium salts (e.g. I). CPJR

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REEL/FRAME
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Acc. Nr.

AP0053774

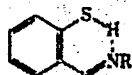
Abstracting Service:
CHEMICAL ABST.

5790

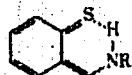
Ref. Code

UR0366

110953g Benzenoid-quinonoid tautomerism of azomethines and their structural analogs. III. Synthesis, structure, and thermochromism of N-substituted o-mercaptobenzaldimines. Minkin, V. I.; Olekhovich, L. P.; Nivorozhkin, L. E.; Zhdanov, Yu. A.; Kravzhanski, M. I. (Rostov-na-Donu Gos. Univ., Rostov-on-Don, USSR). *Zh. Org. Khim.* 1970, 6(2), 348-54 (Russ). The reaction of 2-NCSC₆H₄CHO with Na-S gave 2-HSC₆H₄CHO which was condensed with amines to give 2-HS-C₆H₄CH:NR (I), R is Ph, 4-C₆H₄OMe, 4-C₆H₄NMe₂, 2-C₆H₄OH, or Bu. Similarly, the condensation of 2-MeSC₆H₄CHO with amines gave 2-MeSC₆H₄CH:NR (II). The comparison of uv and ir spectra of I and II showed that I exist in their tautomeric



(I)



(II)

colored quinonoid forms (Ia) due to H bonding. The equil. between I and Ia depends on the polarity of the R group. Less nucleophilic R groups shift the equil. towards Ia.

CPJR

REEL/FRAME

19830837

1/2 009 UNCLASSIFIED PROCESSING DATE--02OCT70
TITLE--BENZENOID QUINOID TAUTOMERISM OF AZOMETHINES AND THEIR STRUCTURAL
ANALOGS. IV. TAUTOMERIC EQUILIBRIUM IN SOLUTIONS OF N SUBSTITUTED O AND
AUTHOR--(04)-MINKIN, V.L., OLEKHNOVICH, L.P., ZHDANOV, YU.A., DSTRUMOV,
YU.A.
COUNTRY OF INFO--USSR
SOURCE--ZH. ORG. KHIM. 1970 6(3) 549-54
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--BENZENE DERIVATIVE, TAUTOMERISM, AZO COMPOUND, MERCAPTAN,
IMINE, MOLECULAR ORBITAL, ISOMER
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1992/1534 STEP NO--UR/0366/70/006/003/0549/0554
CIRC ACCESSION NO--AP0112528
UNCLASSIFIED

UNCLASSIFIED

PROCESSING DATE--02OCT70

2/2 009

CIRC ACCESSION NO--AP0112528

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EFFECT OF R IN O-HSC SUB6 H
SUB4 CH:NR (I) (R IS ALKYL, PH, P-MEC SUB6 H SUB4, P-CLC SUB6 H SUB4,
P-ME SUB2 NC SUB6 H SUB4, P-O SUB2 NC SUB6 H SUB4, OR 2,NAPHTHYL) ON THE
EQUIL. BETWEEN I AND ITS THIOQUINOID ISOMER (II) IS SOLN. WAS DEDUCED BY
THE MO METHOD. THE INCREASE OF R ELECTRON REPELLING CHARACTER SHIFTS
THE EQUIL. TOWARDS II.

UNCLASSIFIED

1/2 017 UNCLASSIFIED PROCESSING DATE--02OCT70
TITLE--BENZENOID QUINOID TAUTOMERISM OF AZOMETHINES AND THEIR STRUCTURAL
ANALOGS. V. ACYLOTRONIC TAUTOMERISM OF S, ACETYL, P, THIOBENZALDIMINES -U-
AUTHOR-(04)-ZHDANDV, YU.A., MINKIN, V.I., OLEKHNOVICH, L.P., MALYSHEVA,
YE.N.
COUNTRY OF INFO--USSR
SOURCE--ZH. ORG. KHIM. 1970, 6(3) 554-9
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--BENZENE DERIVATIVE, TAUTOMERISM, ORGANIC SULFUR COMPOUND,
IMINE, AROMATIC AMINE, UV SPECTRUM, BOND ENERGY, MOLECULAR ORBITAL
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--1992/1533 STEP NO--UR/0366/70/006/003/0554/0559
CIRC ACCESSION NO--AP0112527
UNCLASSIFIED

2/2 017

UNCLASSIFIED

PROCESSING DATE--02OCT70

CIRC ACCESSION NO--AP0112527

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE REACTION OF 4-ACSC SUB6 H SUB4 CHO (I) WITH AROMATIC AMINES IN NONPOLAR SOLVENTS GAVE 4-ACSC SUB6 H SUB4 CH:NR (II) (R EQUALS H, 4-MEO, 4-NME SUB2, OR 4-NO SUB2). THE REACTION OF I WITH MORE BASIC ALKYL AMINES 4,HSC SUB6 H SUB4 CHO PLUS ACNHR. IN POLAR SOLVENTS (HCONME SUB2, MEON) I REACTS WITH AROMATIC AMINES TO GIVE ACNHR, ALSO. THIS IS DUE TO THE SHIFT OF THE BENZENDIO THIOQUINOID I EQUIL. TOWARDS THE THIOQUINOID FORM, WHICH IS HYDROLYZED (WITH H SUB2 O PRODUCED DURING THE REACTION) TO GIVE 4,HSC SUB6 H SUB4 CHO AND ACNHR. THIS WAS CONFIRMED BY STUDYING UV SPECTRA OF II (R EQUALS 4-OME) IN BENZENE-OP(NME SUB2) SUB3 MIXTS. THE EQUIL. OF NONACETYLATED II ANALOGS 4-HSC SUB6 H SUB4 CH:NR (III) IS SHIFTED MORE TOWARDS THE THIOQUINOID FORM IN POLAR SOLVENTS THAN II EQUIL. THE DIFFERENCE IS DUE TO WEAKENED C-N PI-BONDING ENERGY OF THE THIOQUINOID. II FORMS COMPARED WITH THESE FORMS OF III. THE LGAD-MD CALCNS. CONFIRMED THIS.

UNCLASSIFIED

USSR

UDC 621.385

MOLCHANOV, A. A., OLEKSENKO, P. F., SVECHNIKOV, S. V., and
SHARADKIN, A. M.

"Regenerative Optron Theory"

Kiev, Poluprovodnikovaya tekhnika i mikroelektronika, No. 6, 1971,
pp 91-100

Abstract: The optron is an optical-electronic device which, operated with positive feedback, is widely used as a basic element in many devices. The theoretical investigation of its static and dynamic operation modes is connected with the solution of algebraic or non-linear differential equations of a complex nature. The present paper analytically investigates the static and dynamic modes of the optron in regenerative optical feedback through the use of a power series approximation of the volt-brightness characteristic of the electroluminophor, with the electronic computer used at certain stages of the computation. As a result of the analysis, a condition of compatibility for the impedance moduli of the electroluminophor and the photoresistor is obtained, which can be used as the basis for engineering computations of the optron. It is

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MOLCHANOV, A. A., et al., Poluprovodnikovaya tekhnika i mikroelektronika, No 6, 1971, pp 91-100

found that the computation relationships found theoretically agree closely with the experimentally obtained expressions. The authors are connected with the Semiconductor Institute of the Ukrainian Academy of Sciences.

2/2

1/3 027 UNCLASSIFIED # PROCESSING DATE--230C770
TITLE--CERTAIN POSSIBILITIES OF APPLICATION OF PRINCIPLES OF OPTO
ELECTRONICS FOR IMPROVEMENT OF MEASURING INSTRUMENTATION -U-
AUTHOR--(05)-BOGOSLAVSKIY, G.E., MULCHANOV, A.A., OLEKSENKO, P.F.,
SVECHNIKOV, S.V., SITNIKOV, L.S.
COUNTRY OF INFO--USSR

SOURCE--MOSCOW, IZMERITEL'NAYA TEKHNIKA NO 1, JAN 70, PP 5-8

DATE PUBLISHED----JAN70

SUBJECT AREAS--METHODS AND EQUIPMENT, ELECTRONICS AND ELECTRICAL ENGR.,
PHYSICS

TOPIC TAGS--ELECTROOPTIC MEASURING EQUIPMENT, ELECTRIC MEASURING
INSTRUMENT, ELECTROLUMINESCENCE, PHOTORESISTOR

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1997/0393

STEP NO--UR/0115/70/000/001/0005/0008

CIRC ACCESSION NO--AP0119338

UNCLASSIFIED

2/3 027

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PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0119338

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THIS ARTICLE PRESENTS THE RESULTS OF INVESTIGATIONS ON THE POSSIBILITIES OF APPLYING THE PRINCIPLES OF OPTO ELECTRONICS TO THE DESIGN OF ELECTRIC MEASURING INSTRUMENTS AND CONVERTERS OF VARIOUS PHYSICAL VALUES INTO VOLTAGE AND FREQUENCY. THE ADVANTAGES OF OPTO ELECTRONIC METERING DEVICES WITH RESPECT TO POINTER TYPE INSTRUMENTS ARE STRESSED. ONE OPTO ELECTRONIC SHIFT REGISTER BASED ON THE USE OF AN INTERNAL PHOTO EFFECT PHENOMENON AND ELECTROLUMINESCENCE IS DESCRIBED AND ITS SCHEMATIC DIAGRAM IS GIVEN. THE DESIGN CALCULATIONS OF THIS REGISTER ARE PRESENTED. THEY ARE REDUCED TO A CALCULATION OF THE ELECTROLUMINESCENCE AND PHOTORESISTOR LAYERS PARAMETERS, TO DETERMINATION OF THE STRUCTURAL FEATURES RELATED TO THE TRANSMISSION OF LIGHT FLUX AND, CONSEQUENTLY, OF VOLTAGE. TESTS OF THE REGISTER PROTOTYPE, CONDUCTED JOINTLY BY THE INSTITUTE OF SEMICONDUCTORS OF THE UKRAINIAN ACADEMY OF SCIENCES AND THE DESIGN BUREAU OF THE KIEV "TOCHELEKTROPRIBOR" PLANT, CONFIRMED ITS EFFICIENCY. THE OPTO ELECTRONIC DEVICES, WHICH ARE THE DEVELOPMENT OF THE SHIFT REGISTER SUCH AS: 1) A METERING DEVICE WITH NO MECHANICAL JOINT, BUT WITH A CODED OUTPUT, ENSURING THE DELIVERY OF DATA TO A DIGITAL DEVICE; AND 2) A DEVICE FOR AUTOMATIC PARTICLE COUNTING AND DETERMINING THEIR SIZE, ARE DESCRIBED. THIS DEVICE ALLOWS THE SORTING OF DATA ON OBJECT PRESENCE AS WELL AS ON ITS SURFACE, WITHOUT USING A COMPLEX APPARATUS OF STATISTICAL APPROXIMATION, USED IN THE ANALOG DEVICES.

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PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0119338

ABSTRACT/EXTRACT--A WORKING MODEL OF AN OPTO ELECTRONIC DECODER FOR TWO DECADES, WITH OUTPUT ON GAS DISCHARGE INDICATORS OF 10 TIMES 40 TIMES 30MM OVERALL DIMENSIONS, WITHOUT HIGH VOLTAGE TRANSISTORS, WAS CONSTRUCTED RECENTLY BY THE INSTITUTE OF SEMICONDUCTORS TOGETHER WITH THE INDEPENDENT DESIGN BUREAU OF THE KIEV "TOCHELEKTROPRIBOR" PLANT. THE ADVANCED TECHNOLOGY OF SUCH DECODERS TOGETHER WITH THE REDUCTION OF THEIR DIMENSIONS MAKES IT POSSIBLE TO ENVISAGE THE REDUCTION OF THEIR PRICES. IT IS CONCLUDED THAT AMONG THE MULTIPLE WAYS OF IMPROVING THE MEASURING INSTRUMENTS, THE APPLICATION OF OPTO ELECTRONIC PRINCIPLES IS A VERY PROMISING ONE.

UNCLASSIFIED

USSR

UDC 621.383.8

KRETULIS, V. S., OLEKSENKO, P. F., SVECHNIKOV, S. V., Kiev

"An Optron With Direct Optical Coupling as an Electron-Optical Element"

Moscow, Avtomatika i Telemekhanika, No 8, Aug 1970, pp 141-152

Abstract: The authors consider the functional possibilities of an optron with direct optical coupling as a transducer of electrical amplification, multiplication, summation and differentiation signals. Expressions are derived for the transfer coefficient of the optron and its Q. Comparative parameters are given for optrons with various optron pairs. The structural singularities of various electron-optical two-terminal pair networks based on injection photodiodes, conventional photodiodes, phototransistors, photoresistors, thin-film electrophosphors, and thin-film photoresistors are considered. Experimental characteristics are given for electron-optical devices which perform operations of differentiation, signal multiplication and frequency multiplication, as well as the characteristics of a high-sensitivity device which converts DC voltage to AC voltage in the microvolt region.

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Acc. Nr.

AT0048613

Abstracting Service:
CHEMICAL ABST. 5/70

Ref. Code
UR0441



104935m Crystal structure of LiCu_3Sn . Kripyakevich, P. I.; Oleksiv, G. F. (L'viv, Derzh. Univ., Lvov, USSR). *Dopov. Akad. Nauk Ukr. RSR, Ser. A* 1970, 1, 63-5 (Ukrain). The x-ray diffraction study of Li-Cu-Sn alloys prep'd. by sintering a mixt. of pure Li, Cu, and Sn in an alumina crucible under fluxes of LiCl and LiF revealed the formation of the ternary compd. LiCu_3Sn with ReB_3 -type superstructure belonging to the space group $P6_3/mmc(D_{3h}^2)$ with $a = 4.303$, and $c = 7.637$ Å. The compd. belongs to the series of compds. MnCu_3Al , LiCl_3Al , LiCu_3Si , and LiCu_3Ge with changing type of packing. GPJW

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UDC 621.375.8

OLENSKIY, V. A., TIMASHEV, R. G.

"Problem of Optimizing the Noise Characteristics of a Multifrequency Parametric System"

Materialy nauchno-tekhnii konferentsii. Leningr. elektrotekh. in-ta svyazi. Vyp. 3
(Materials of the Scientific and Technical Conference. Leningrad Electrotechnical Communications Institute. Vyp. 3), Leningrad, 1970, pp 190-195 (from RZh-Radiotekhnika, No 8, Aug 70, Abstract No 8 D264)

Translation: The problem of optimizing the noise characteristics of a multi-frequency parametric system is formulated. Optimization equations are obtained the solution of which permits determination of the conditions insuring minimization of the noise/signal ratio at the system output for given power amplification of the signal.

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USSR

UDC 621.396.622

OLENSKIY, V. A., USTIMENKO, V. M.

"Amplification and Efficiency of a Nonregenerative Parametric Frequency Converter with a High Signal Level"

Materialy nauchno-tekhnicheskoy konferentsii. Leningr. elektrotekhn. in-t svyazi Vyp. 2
(Materials of the Scientific and Technical Conference. Leningrad Electrotechnical Communications Institute, Vyp. 2), Leningrad, 1970, pp 175-179 (from RZh-Radio-
tehnika, No 8, Aug 70, Abstract No 8 D262)

Translation: Equations are obtained which describe a nonregenerative frequency converter during operation in the high signal mode. Formulas are presented for the amplification coefficient and efficiency in the matching mode with respect to the pumping generator circuit. It is demonstrated that the amplification coefficient and the efficiency depend on the power level of the input signal.

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Biophysics

USSR

SUSLOVA, T. B., OLENEV, V. I., LORCHAGINA, M. V., and VLADIMIROV, Yu. A.,
Second Moscow Medical Institute imeni N. I. Pirogov

"Chemiluminescence Associated with the Formation of Lipid Peroxides in
Biological Membranes. IV. Role of the Change in Iron Valence in These Processes"

Moscow, Biofizika, Vol 15, No 4, Jul/Aug 70, pp 622-628

Abstract: In earlier studies it was shown that a suspension of mitochondria in the presence of iron ions develops luminescence as a result of the peroxidation of lipids. Experiments are described which indicate that mitochondria in suspension accumulate and partly reduce $FeCl_2$ or a complex of $Fe^{3+} + ADP$ when added to an incubation mixture. Catalytic agents (ortho- and pyrophosphates) increased the latent period and intensity of luminescence of the suspensions by accelerating the oxidation of Fe^{2+} with air. In the absence of phosphates, oxygen was utilized very slowly. The systems that reduce the oxidize iron, e.g., phosphates, probably also regulate the processes of peroxide oxidation of lipids in cells.

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USSR

UDC 621.762.4.001

RAKOVSKIY, V. S., BORZETSOVSKAYA, K. M., OLENINA, N. S., and BOLOTINA, T. A.,
All-Union Institute of Light Alloys

"Hot Deformation of Titanium Cermet Blanks"

Kiev, Poroshkovaya Metallurgiya, No 1, Jan 73, pp 88-92

Abstract: The possibility of increasing the density of titanium cermet blanks using upsetting, forging, and extruding was studied. The different processes of using powder metallurgy in an attempt to achieve an absolute density were compared with the same processes using VT1-00 titanium alloy. Chemical contents of the alloy and powder used were as follows:

	C	Fe	Si	O ₂	N ₂	H	Others
PTEC-1 powder	0.01	0.06	0.01	0.07	0.02	0.002	0.10
VT1-00 alloy	0.05	0.20	0.08	0.10	0.04	0.008	0.10

It was established that molding of titanium powder at very high pressures (6-7 t/cm²), exceeding the yield strength of titanium, followed by vacuum sintering at 1100-1200°C does not yield a blank with 100% density. According to mechanical properties, these blanks, in view of a residual porosity of 1/2

USSR

RAKOVSKIY, V. S., et al., Poroshkovaya Metallurgiya, No 1, Jan 73, pp 88-92

4-6%, substantially surpass cast and deformed titanium. In the study of increasing density of sintered titanium blanks by upsetting, forging, and extrusion, it was shown that use of a technological scheme, including cold molding and sintering with subsequent hot deformation, makes it possible to achieve a 100% density. The mechanical properties of the sintered samples were evaluated after hot deformation, and it was shown that their strength, ductility, and impact strength were close to that guaranteed by the technical specifications for VT1-00 alloy. 7 figures, 1 table.

2/2

1/2 026 UNCLASSIFIED PROCESSING DATE--23UC70
TITLE--ACTIVITY AND PHASE COMPOSITION OF A CHROMIUM CALCIUM NICKEL
PHOSPHATE CATALYST -U-
AUTHOR--(05)-IVASHINA, V.S., BUYANOV, R.A., OSTANKOVICH, A.A., OLENKOVA,
I.P., KOTELNIKOV, G.R. /
COUNTRY OF INFO--USSR
SOURCE--KINET. KATAL. 1970, 11(1), 160-5
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--CATALYST ACTIVITY, CATALYTIC DEHYDROGENATION, BUTENE,
BUTADIENE, NICKEL, X RAY DIFFRACTION STUDY, THERMAL ANALYSIS, CHROMIUM,
PHOSPHATE, CALCIUM
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--1997/0528 STEP NO--UR/0195/70/011/001/0160/0165
CIRC ACCESSION NO--AP0119447
UNCLASSIFIED

2/2 026

UNCLASSIFIED

PROCESSING DATE—23OCT70

CIRC ACCESSION NO--AP0119447

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE TITLE CATALYST WAS STUDIED BY USING X RAY DIFFRACTION, D.T.A., AND DIFFERENTIAL THERMOGRAPHY. THE CATALYST REPRESENTS A 1 PHASE SYSTEM OF NI PRIME2 POSITIVE AND CR PRIME2 POSITIVE SOLID SOLNS. IN A LATTICE OF CA PHOSPHATE. THIS SOLN. FORMS ON HEATING DURING CATALYST PREPN. THE CATALYTIC ACTIVITY OF THE CATALYST IN THE DEHYDROGENATION OF BUTENES TO BUTADIENE DEPENDS ON THE NI CATION CONC. IN THE LATTICE OF THE CATALYST. CA PHOSPHATE SERVES AS THE CATALY CARRIER AND THE CA-CR COMPN. IS CATALYTICALLY INACTIVE.

UNCLASSIFIED

Cytology

USSR

UDC 576.3:576.1:519.95

OLENOV, YU. M., Institute of Cytology, Academy of Sciences USSR, Leningrad

"Cytology, Evolutionary Theory, and Cybernetics"

Leningrad, Tsitologiya, No 10, 1971, pp 1,195-1,203

Abstract: The author examines different approaches to the study of the functional unity of the cell. He discusses in some detail the concept of "informational metabolism" (i.e., information exchanged between the components of the cell), homeostasis of systems of stochastic origin, dysteleology in cell organization, and adaptation as the central factor in the evolution of species. Adaptation to environmental conditions is impossible with internal coordination and precise mutual adjustment of the major vital processes. A knowledge of the structure and functions of DNA, genetic code, regulation of protein synthesis, and cybernetic principles is essential to gaining an understanding of the cell as an integral system.

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1/2 007 UNCLASSIFIED PROCESSING DATE--16OCT70
TITLE--GENETIC MECHANISM OF CELL DIFFERENTIATION -U-
AUTHOR--OLENOV, YU.M. ○
COUNTRY OF INFO--USSR
SOURCE--TSITOLOGIYA 1970, 12(1). 3-21 (RUSS)
DATE PUBLISHED-----70
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES
TOPIC TAGS--CELL PHYSIOLOGY, HUMAN GENETICS, GENE
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PRDXY REEL/FKAME--1990/0338 STEP NO--UR/9053/70/012/001/0003/0021
CIRC ACCESSION NO--AP0108636
UNCLASSIFIED

2/2 007

UNCLASSIFIED

PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AP0108636

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A REVIEW GIVING THE CHARACTERISTICS OF EPIGENOMIC CHANGES, WHICH ARE THE HERITABLE PATTERNS OF GENE REPRESSION AND DEREPRESSION AND ON WHICH THE PROCESS OF CELL DIFFERENTIATION IN ONTOGENESIS IS BASED. THE NATURE OF THE EPIGENOMIC CHANGES WAS DISCUSSED. 134 REFS. FACILITY: LAB. GENET. TUMOR CELLS, INST. CYTOL., LENINGRAD, USSR.

UNCLASSIFIED

USSR

UDC 546.161:541.183.12

KORNELLI, M. E., OLENOVICH, N. I., ENNAN, A. A., SURANOVA, Z. P., KUSHNIR, A. A., and MIKHAYLOVINA, S. K.

"Sorption of Fluoride Ion on Anionite EDE-10F in the Hydroxyl Form"

Kiev, Ukrainskiy Khimicheskij Zhurnal, Vol 38, No 11, 1972, pp 1172-1174

Abstract: The sorption of fluorine from solutions of NaF and HF by the anionite EDE-10pi in the hydroxyl form was studied. Resin in the hydroxyl form, air dried, was loaded into a polyethylene column, and sorption was accomplished by passing solutions of NaF and HF at varying rates of filtration. The anionite was then washed, first with distilled water and then with solutions of either NaOH or KOH. The degree of charging of the ionite during sorption from acidic solutions is significantly higher than that from weakly alkaline solutions (NaF). During the washing of the resin with water there appears a quantity of fluorine which cannot completely be attributed to the hydrolysis of the resin. This is brought about by molecular sorption or desorption from the sorbed material. The first filtrate fractions during elution with alkali have an acidic reaction, which points to desorption into solution of an acidic bifluoride ion, which in the process of sorption is taken up by the resin. This is 1/2

USSR

KORNELLI, M. E., et al., Ukrainskiy Khimicheskii Zhurnal, Vol 38, no 11, 1972, pp 1172-1174

supported by the bimodality of the elution curve during desorption with alkali, suggesting the presence in the ionite phase of 2 types of ions (F^- and HF_2^-).

By selecting the type of eluent and its concentration in solution during desorption of the fluoride ion from EDE-10P resin, one can obtain concentrated solutions of metal fluorides. Thus EDE-10P can be used for concentration of fluoride ions in analytical and applied chemistry.

2/2

USSR

UDC:620.197.3

OLESHCHENKO, V. I. and SHEVCHENKO, A. F.

"Inhibited Polymer-Based Protective Coatings"

Moscow, Stanki i Instrument, No 9, Sep 73, p 36

Abstract: Coating with inhibited polymer-base compositions is considered to be the most promising method for protection of metal products from corrosion during shipping and storage. Compositions and methods used abroad are briefly described. Tests performed in the USSR are reported. The tests indicated that compositions VAP-1 and VAP-2 are suitable for long-term storage of metal-cutting and wood-cutting tools.

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- 11 -

1/2 020 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--THE NAVOCAINAMIDUM INFLUENCE WITH ITS LOCAL USE ON THE EXPERIMENTAL
SPASM OF BRAIN VESSELS -U-
AUTHOR--(02)-ZLOTNIK, E.I., OLESHKEVICH, F.V.
COUNTRY OF INFO--USSR
SOURCE--ZDRAVGOKHRANENIYE BELORUSSII, 1970, NR 6, PP 39-41
DATE PUBLISHED--70
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES
TOPIC TAGS--BRAIN, BLOOD VESSEL, SELECTIVE DRUG EFFECT
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--3001/0907 STEP NO--UR/0477/70/000/006/0039/0041
CIRC ACCESSION NO--AP0126566
UNCLASSIFIED

2/2 020

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0126566

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE RESULTS OF A LOCAL USE OF NOVOCAINAMIDUM HAVE BEEN REPORTED WITH THE PURPOSE OF ELIMINATION AND PROPHYLAXIS OF THE EXPERIMENTAL SPASM OF THE BRAIN ARTERIES IN DOGS. NOVOCAINAMIDUM HAS BEEN MARKED TO BE AN EFFECTIVE MEANS OF PREVENTING AND ELIMINATION OF THE EXPERIMENTAL SPASM OF THE BRAIN ARTERIES. FACILITY: NEYROKHIRURGICHESKOYE OTDELENIYE BELORUSSKOGO N-1 INSTITUTA NEVROLOGII, NEYROKHIRURGII I FIZIOTERAPII I LABORATORIYA KORVOBRASHCHENIYA INSTITUTA FIZIOLOGII AN BSSR.

UNCLASSIFIED

USSR

UDC 613.644

OLESHKEVICH, L. A., Kiev Institute of General and Communal Hygiene

"Comparison of the Effects of Steady and Intermittent Noise of Moderate Intensity on Some Body Functions"

Moscow, Gigiyena i Sanitariya, No 8, 1973, pp 95-97

Abstract: Comparative studies on the effects of steady and intermittent noise at various frequencies (250, 500, 1000, and 3000 Hz) and of moderate intensity (60 to 80 dbA) on the central nervous system, hearing, and cardiovascular system showed that intermittent noise, regardless of the duration and intervals between exposures, had a less pronounced effect on the above parameters than did constant noise of the same intensities and spectral composition. Change in the duty factor of the noise from steady to 2 (1:1 ratio) produced a decrease in effect comparable to a lowering of the level of steady noise by 10 db.

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- 93 -

USSR

UDC 612.017.1.014.45

OLESHKEVICH, I. A., Kiev Institute of General and Communal Hygiene imeni
Marzeyev

"Change in Agglutinin Titers of Animal Blood in Response to Noise"

Moscow, Zhurnal Mikrobiologii, Epidemiologii, i Immunobiologii, No 2, 1973,
pp 134-135

Abstract: Rabbits were subjected to 8 hours of 80 or 60 dbA [expansion unknown] of noise daily for 1 month after being immunized with killed typhoid vaccine to determine the effects of noise on agglutinin accumulation. Among animals receiving 80 dbA agglutinin accumulation lagged significantly behind that in controls, the differences maximizing on the 14th day (1:452 O-antibody and 1:507 H-antibody titers vs. 1:2,560 and 1:2,148 in controls). Titers equalized at about 1:1,610-1:1,810 for both antibody types and both groups of animals by the 21st day, after which titers of the experimental group exceeded those of controls (1:2,875 O-antibody and 1:1,2349 H-antibody titers vs. 1:176 and 1:1,824 in controls on the 28th day). Dynamics of agglutinin accumulation among animals receiving 60 dbA were identical, but differences from controls were less pronounced. Thus it is shown that noise affects agglutinin accumulation negatively with the extent of deviation from normal accumulation depending on the intensity of noise.

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Ref. Code: UR 0246

PRIMARY SOURCE: Zhurnal Nevropatologii i Psikhiiatrii, 1970,
Vol 70, Nr 2, pp 212-216

AN ATYPICAL DEVELOPMENT OF THE HEMORRHAGIC PERIOD
IN COMPLICATIONS OF A RUPTURED ANEURYSM
BY AN ARTERIAL SPASM AND INTRACRANIAL HEMATOMA

E. I. Zlotnik, F. V. Oleshkevitch, M. V. Pavlovets

The authors describe 5 cases with sac aneurysms where an intracranial hematoma and cerebro-vascular spasm had a relatively light clinical expression. In 3 cases there was an improvement of the condition prior to the surgical period. The possible reasons conditioning such atypical states are being discussed.

REEL/FRAME
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Public Health, Hygiene and Sanitation

USSR

UDC 613.164:612.821.8

OLESHKIVICH, L. A., Kiev Scientific Research Institute of General and Communal Hygiene imeni A. N. Marzeyev

"Effect of Noise on Human Perception"

Kiev, Vrachebnoye Delo, No 3, 1973, pp 127-130

Abstract: A study was made to discover the subjective attitude of the population towards noise created by various elements of the railroads -- stations, lines and stations with marshalling yards. The noise intensities at a distance of 50 meters were on the average 80 dbA. Interrogation of 1,597 people revealed that the maximum number of complaints (68.9%) come from residents in the vicinity of marshalling yards where the noise is continuous, and the least number of complaints (36.9%) in the vicinity of the railroad lines which constitute a source of intermittent noise with a time ratio between noise and intervals between noise of 1:1. Older people are more sensitive to the noise than younger people, but the age difference is less than for people engaged in mental labor than for those engaged in physical labor. The complaints increase with age for people engaged in physical labor and they decrease with age for people engaged in mental labor. The actual harmful effect increases with age in both groups.

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USSR

UDC 669.295:621.762

USTINOV, V. S., OLESOV, YU. G., ANTIPIN, L. N., and DROZDENKO, V. A.

"Powder Metallurgy of Titanium"

Moscow, Poroshkovaya Metallurgiya, Titana, Izd-vo Metallurgiya, 1973, 248 pp

Translation of Introduction: Accelerated scientific and technical progress requires the creation of materials which satisfy the most diverse requirements of consumers. The methods of powder metallurgy are beginning to occupy an ever increasing place in the creation of such materials. In its time powder metallurgy has played a decisive role in the development of titanium production; the first finished products of titanium were produced by the methods of powder metallurgy. Later, because of the sharp increase in the quality of the metallothermic titanium sponge and the introduction of a vacuum-arc smelting technique, practically all semi-finished and finished products have begun to be manufactured from cast metal. This was also due to the fact that titanium was basically used in special branches of technology where the determining factors were guaranteed high mechanical and physical properties of the finished products, and questions of cost played a secondary role. Recently the powder metallurgy of titanium has received increasingly broader application in many branches of the national economy. The simplicity of the

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USTINOV, V. S., et al., Poroshkovaya Metallurgiya Titana, Izd-vo Metallur-
giya, 1973, 148 pp

technological scheme of this production, the possibility of a broad mechaniza-
tion and automation of the processes, and the sharp increase in the output of
suitable products all make powder metallurgy economically feasible, especially
if we take into account the relatively high cost of titanium and the familiar
difficulties involved in the question of treating waste. The development of
powder metallurgy of titanium is associated with the necessity of organizing
the production of powders which in their quality would satisfy the growing
requirements of consumers and have a relatively low cost. The properties of
titanium powders vary in significant ranges as a function of the method used
to produce them. At the present time we are familiar with a rather large
number of variations in the technological schemes for producing titanium
powders (1). The basic ones are electrolysis of melts with a soluble anode
from the titanium waste, grinding of solid titanium, and metallothermic
reduction of titanium compounds and have been introduced on an experimental-
industrialscale; they make it possible to produce titanium powders and its
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USSR

USTINOV, V. S., et al., Poroshkovaya Metallurgiya Titana, Izd-vo Metallurgiya, 1973, 248 pp

alloys which have been successfully tested by a number of consumers. The quality of the titanium powders plays a special role in the production of semi-finished and finished products from them with properties that are comparable to finished products produced from cast titanium. In this case a slight increase in the cost of the powders is often economically justified. For example, by the use of electrolytic powders that are more expensive than sponge titanium, an industrial technology has been created for the production of a number of structural parts using the methods of powder metallurgy. In this case the savings per 1 ton of finished products is 8-12 thousand rubles, with a cost for the electrolytic powder that is twice the cost for titanium sponge of higher grades (2). A number of finished products on a titanium base may be produced only by the methods of powder metallurgy; highly porous bodies, titanium-metalloid systems, several alloys on a titanium base, etcetera. Recently a new, effective method has appeared for the manufacture of materials by rolling or extrusion of the original powder batch, as a result of which we can economically manufacture such products as sheets, wire, pipes, and other titanium semi-finished products by omitting the operations of smelting the metal, casting the billets, and their subsequent treatment. For example, the

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USSR

USTINOV, V. S., et al., Poroshkovaya Metallurgiya Titana, Izd-vo Metallurgiya, 1973, 248 pp.

production of an additional electrode material for the welding of titanium may be accomplished by the extrusion of titanium powders with significant simplification of the technology, increase in the quality of the electrodes and reduction in their cost as compared with the manufacture by ordinary methods (3). Thus, power metallurgy of titanium is becoming one of the important directions in the development of the titanium industry. This monograph critically examines the domestic and foreign research work in the field of producing titanium powders and alloys on its base; the features and degree of perfection of the technology according to the different methods are taken into account. The authors express their appreciation to Professor A. B. SUCHKOV, Doctor of Technical Sciences, who made a number of valuable critical comments in reviewing the manuscript, and we shall be grateful to the readers who will express their own wishes and comments.

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USSR

USTINOV, V. S., et al., Poroshkovaya Metallurgiya Titana, Izd-vo Metallur-
giya, 1973, 248 pp

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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 oxycarbo-
nitride 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

SINYAYEVA, N. P., VASSERMAN, A. M., and OLESOV, YU. G.

"Determination of Oxygen in Powdered Titanium Materials"

Moscow, Tavetnyye Metally, No 6, 1972, p 80

Abstract: A method for determination of the oxygen in titanium powders, alloys, carbides, and hydrides is based on a pulsed heating principle developed at the Institute of Geochemistry and Analytical Chemistry imeni V. I. Vernadskiy of the Academy of Sciences USSR. Details of the method were published in the Journal of Analytical Chemistry, Vol 20, 1965, p 1359. The lower limit for determination of the oxygen concentration is 10^{-2} weight %. The variation coefficient for powdered Ti, its alloys, and carbides is 10%, for titanium hydrides 20%, and cast titanium 5%. The whole procedure takes approximately 10 min. The concentration of oxygen in powdered titanium materials depends on granulometric composition. In powders with large particles (500-80 μ) the concentration of oxygen varies between 0.03-0.15 weight %, and in powders consisting of particles smaller than 80 μ it is 0.15-0.70 weight %. The latter is attributed to a larger specific surface of particles and to the presence of adsorbed moisture. This moisture can be eliminated by drying the powders under a vacuum of not less than $1 \cdot 10^{-2}$ mm Hg.

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Titanium

USSR

UDC 669.295

KANYUK, A. I., OLESOV, Yu. G., and USTINOV, V. S.

"Economic Effectiveness of Titanium Powder Metallurgy"

Moscow, Tsvetnyye metally, No 5, May 72, pp 68-70

Abstract: A review is presented of the titanium industry in recent years and the effective utilization of cermets in the most advanced technological sectors, including the production of porous cermets (filters, getters, etc.), compact parts and intermediate products, and anticorrosive titanium powder coatings. Titanium cermet filters produced from electrolytic and hydrocalcium powder as well as from sponge waste have been widely used in the nonferrous metallurgy, chemical pharmaceutical, and food industries. The capacity of porous Ti for gas absorption promoted its potentials for sputter-ion super-high vacuum. General Electric Company initiated the mass production of bearing housings for GEF73 turbojet engines from unalloyed titanium powder produced from titanium sponge. The cost of bearing housings produced by hot powder pressing is 25-30% lower than that of similar parts--by forging of rods. The titanium institutes have come out with a new type of anticorrosive coating based on epoxy resin with titanium powder as the filler. The new coating offers high corrosion

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KANYUK, A. I., et al, Tsvetnyye metally, No 5, May 72, pp 68-70

resistance, chemical stability, high adhesion to metal and concrete, high bearing strength (2000 kg/cm²), long service life, and biological inertness. The economic effectiveness per ton of electrolytic powder used in the anticorrosive coating amounts to 8000-9000 roubles yearly. The article further outlines the production cost aspects of titanium powder and the enormous potentials of titanium powder metallurgy. (1 table, 13 bibliographic references)

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USSR

UDC 669.295.054.79

ANTIPIN, L. N., DROZDENKO, V. A., KOYGUSHSKIY, N. N., OLESOV, Yu. G.,
USTINOV, V. S., ZAPADNYA, V. I., VOLYNSKIY, V. V., and KALUZHSKAYA, E. L.

"The Technology for Obtaining Powders by the Electrolysis Method for
Liquid Metals With a Soluble Anode"

Moscow, Metallurgiya i Khimiya Titana (Institut Titana), Metallurgiya
Publishing House, Vol 6, 1970, pp 85-89

Translation: A technological chart for producing powders of titanium and
its alloys by the electrolysis method with a soluble anode is worked out.
Optimal technological conditions for obtaining powders by electrolysis
are selected. The chart has been adopted for introduction. The titanium
powders obtained do not differ, in impurity content, from the best grades
of titanium sponge. The effect of electrolyte temperature on the quali-
ties of the metal obtained and the chlorine content in it are studied.
The metal obtained is undergoing testing by users. Two illustrations,
two tables, and two bibliographic entries.

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USSR

UDC 546.21:546.821:543.25.062

SINYAYEVA, N. P., KUNIN, L. L., ~~OLESOV, Y. G.~~ and
VASSERIAN, A. M.

"Determination of Oxygen in Electrolytic Powders of Titanium
and Titanate Alloys by Impulsive Heating"

Moscow, Zavodskaya Laboratoriya, Vol 37, No 12, 1971,
pp 1419-1420

Abstract : The possibility of using the quick method of impuls-
ive heating for solving certain technological problems of powders
of titanium and titanate alloys is investigated. The method con-
sists in heating the specimen in a closed graphite capsule up
to 3,000 °C for 3 sec. in argon atmosphere. Carbon monoxide, separated from
specimens, mixes with argon and is determined by infrared absorption. The
duration of a single determination is 7-10 min., the sensitivity is $10^{-2}\%$ by
wt. by a weighed amount of 100 μ g. The impulsive heating method was applied
for the investigation of oxygen distribution in powders of titanium and
titanium-aluminum alloy, depending on the size of powder particles. Tabulated
investigation results show the dependence of oxygen content in powder of

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SINYAYEVA, N. P., et al., Zavodskaya Laboratoriya, Vol 37, No 12, 1971, pp 1419-1420

unalloyed electrolytic titanium and in titanium-aluminum alloy and of mechanical properties on the fraction size. The mechanical properties measured on specimens produced by vacuum caking at 1,200-1,500°C are also shown. Four tables, ten biblio. refs.

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USSR

UDC 621.762.04

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 pow-
ders 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 pre-
cipitation. 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 ex-
perimental set-up and the test procedure are described. The
effect of hydrogen content in the titanium hydride on the de-
gree of leaching of basic impurities (Fe, Cl, N) was investi-
gated. 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 pores 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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USSR

UDC: 669.295.5:536.771

RUBTSOV, A. N., OLESOV, Yu. G., CHERKASHIN, V. I., and SUCHKOV, A. B., Zaporozhe

"Activity of Aluminum, Vanadium, and Chromium in Binary Titanium Alloys"

Moscow, Izvestiya Akademii Nauk SSSR, Metally, no 6, Nov-Dec 70, pp 84-87

Abstract: Use was made of the electromotive force method to study the activities of aluminum, vanadium, and chromium as a function of temperature and the content of the alloying metal in Ti-Al, Ti-V, and Ti-Cr alloys. The activities of the three metals were determined in alloys not subjected to preliminary hydrogenation-dehydrogenation. The activity of titanium was determined in the same alloys subjected to the preliminary hydrogenation-dehydrogenation. It is noted that the rise in titanium activity in the hydrogenated alloy is related to the bond rupture between the atoms of titanium and those of the alloying metal. This permits separation of some components of titanium alloys from titanium by the use of hydrogenation and subsequent hydrometallurgical treatment as well as by hydrogenation and (after degassing) electrolytic refining. A table in the original article shows the concentration dependences of titanium activity in Ti-Al, Ti-V,

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RUBTSOV, A. N., et al, Izvestiya Akademii Nauk SSSR, Metal'y, no 6, Nov-Dec 70, pp 84-87

and Ti-Cr alloys (for 800°C) subjected to preliminary hydrogenation-dehydrogenation.

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USSR

UDC 669.295-492.8

VOROB'YEV, B. YA., OLESOV, YU. G., USTINOV, V. S., PETRUN'KO,
A. N., KONOVALOV, V. K., and ZAPADNYA, V. I.

"Assembly-Line Manufacture of Construction Parts From Titanium
Powder by the Metal-Ceramic Process"

Moscow, Tsvetnyye Metally, No 7, Jul 70, pp 65-66

Abstract: The titanium powder discussed in this article is made from reworking the wastes formed in the production of parts and semi-finished titanium materials by an electrolytic refining process. The article describes the metal-ceramic method by which the powder is first pressed into bricks and baked in a vacuum at 1100° C. The materials for the finished parts is then pressed on P-472, P-474, and D-2334 hydraulic equipment with a force of 100-250 tons, used normally for the production of plastic parts. The process for producing the finished parts is described and the hourly rates for making disks, rings, and flanges 57 mm in diameter and 12-15 mm high, are specified. The article is illustrated with a cross-sectional sketch of the modernized EVT-15 vacuum oven in which the parts are baked before finishing. Dimensions of the oven are given in this sketch,

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VOROB'YEV, B. YA., et al., Tsvetnyye Metally, No 7, Jul 70,
pp 65-66

and the various parts identified. A photograph of some of the
parts manufactured by the metal-ceramic process is also shown.

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USSR

UDC: 669.295-492

USTINOV, V. S., LOBANOV, V. S., OLESOV, Yu. G., KANYUK, A. I.,
and ZAPADNYA, V. I.

"Technical-Economic Problems and Prospects in the Development of
Titanium Powder Metallurgy"

Moscow, , Tsvetnyye Metally, No 8, Aug 70, pp 73-76

Abstract: The factor which has prevented the wide use of titanium has been the high cost of parts made from castings of the metal. In the industrial production of such parts and semi-finished products from titanium castings, 70-80% of the furnace charge is waste. Nor can the waste be reprocessed to bring it up to standard. However, the metal-ceramic method of producing such parts lends itself readily to automation, and the waste is less than 25% of the weight of the finished part. Thus, the economy in materials and labor is reflected in a substantial reduction of the production costs. One metallurgical plant (unidentified) has a method for recovering titanium dioxide with calcium hydride. The titanium powder then obtained, with a grain size of less than 40 microns, contains 0.2-0.3% H, 0.04-0.07 C, 0.05-0.08 Ca, 0.2-0.35 of Fe and Ni, 0.006 Cl, 0.2-0.25 O. The powder is used in

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USTINOV, V. S., et al., Tsvetnyye Metally, No 8, Aug 70, pp 73-76

electronics production as a getter, for the production of porous filters, and other products. Such products, however, suffer from poor mechanical properties because of the high content of impurities. Hydrogenation is a likely method of titanium powder production. The resulting powder is large-grained, but can be broken down to any desired size. Its wastes can be reprocessed on a large laboratory scale. Electrolysis of titanium production wastes with a soluble anode is also a promising method for obtaining titanium powder. The quality of the powder is good and the process is adaptable to industrial conditions of production. The authors present the results of computations they have made of the anticipated production costs of these methods.

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USSR

UDC 669.295.6

MEYERSON, G. A., OLESOV, YIL. 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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USSR

UDC 621.762.27

RUBTSOV, A. N., OLESOV, Yu. G., USTINOV, V. S., KISELEV, O. G., CHERKASHIN, V. I., and GLUKHOV, V. P., Dnepr Titanium-Magnesium Plant

"Production of Powders of Titanium Alloys and Refractory Titanium-Based Compounds From Titanium Alloy Waste"

Kiev, Poroshkovaya Metallurgiya, No 12, Dec 70, pp 18-23

Abstract: The method of electrolytic refining of titanium wastes can be used to produce high-quality titanium powder for further production use. Studies have established the following optimal electrolysis mode: anode and cathode current density 0.2-0.3 and 2.6-2.8 a/cm² respectively; temperature 870-890°C; cathode precipitate growth time 0.5-1 hr; titanium concentration in electrolyte 0.5-0.7%. The authors studied the production of electrolytic titanium powders from titanium sponge waste under near-optimal conditions. The quality of the electrolytic titanium powder was higher than that produced by hydride calcium thermal methods. Dehydrogenated powders of VT5 and VT6 alloys were produced, corresponding to the initial alloys in chemical composition.

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UDC 669.295.002.68

USSR

RUBTSOV, A. N., OLESOV, Yu. G., CHERKASHIN, V. I., ANTONOVA, M. M., and
LISKOVICH, V. A.

"New Methods of Reprocessing Titanium Material Wastes"

Moscow, Tsvetnyye Metally, No 5, May 70, pp 60-62

Abstract: Two new laboratory methods of reprocessing wastes from titanium production are described and evaluated. The first method involves electrolytic refining of dehydrated titanium alloys, and the second, hydrometallurgical separation of hydrated components of titanium alloys. Titanium alloy powders of a given chemical composition were produced by hydrogenation. The expediency of producing hard refractory compounds (carbides, nitrides, borides, etc.) from titanium and its alloys wastes is stressed. The new methods are undergoing further testing.

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USSR

UDC 621.762.2

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ANTIPIN, L. N., DROZDENKO, V. A., KOYGUSHSKIY, N. N., OLESOV, YU. G., USTINOV, V. S., ZAPADNYA, V. I., VOLYNSKIY, V. V., and KALUSHSKAYA, E. L.

"Technology of Production of Powders by Electrolysis of Melts With Soluble Anode"

Sb. tr. Vses. n.-i. i proyekt. in-t titana [Collected Works of All-Union Scientific-Research and Planning Institute for Titanium], 6, 1970, pp. 85-89, (Translated from Referativnyy Zhurnal-Metallurgiya, No. 1, 1971, Abstract No.1 G456 by the authors).

Translation: A technological plan is developed for the production of Ti and titanium alloy powders by electrolysis with a soluble anode. The optimal technological mode is selected for electrolytic powder production. The plan has been accepted for use. The Ti powders produced are equal in impurity content to the best types of Ti sponge. The influence of electrolyte temperature on properties of the Ti produced and on content of Cl is studied. The Ti produced has passed consumers' tests. 2 figures; 2 tables.

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1/2 040 UNCLASSIFIED PROCESSING DATE--13NOV70
TITLE--THERMOCHEMICAL INVESTIGATION OF A CHANGE IN THE ENTHALPY OF
TITANIUM DURING ITS TRANSITION INTO THE DEHYDROGENATED STATE -U-
AUTHOR-(03)-RUBTSOV, A.N., OLESOV, YU.G., CHERKASHIN, V.I.
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ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. D., ENTHALPY CHANGES (DELTA H), AND SP. SURFACE WERE STUDIED EXPTL. DURING THE REACTION TI PLUS XH FORMS AND IS FORMED FROM TIH SUBX AT X EQUALS 0-1.8. THE DELTA H WAS MINUS 10 KCAL-G ATOM FROM HEAT CHANGES DURING DISSOLVING SAMPLES IN 28 WT. PERCENT HCL AT 46DEGREES. DEHYDROGENATED SAMPLES WERE OBTAINED BY DEGASSING TIH SUBX AT 750DEGREES AND 10 PRIME NEGATIVE2 TORR, DECREASING PRESSURE TO 0.5 TIMES 10 PRIME NEGATIVE4 TORR, AND COOLING TO 0DEGREES. SAMPLES THUS OBTAINED HAD THE SAME D. AS THE ORIGINAL ONES OWING TO THE PRESENCE OF VACANCIES IN THE METAL LATTICE. BY ASSUMING A RANDOM DISTRIBUTION OF VACANCIES OF THE AT. SIZE IN THE LATTICE, AN EXPRESSION FOR CHANGES IN THE GIBBS FREE ENERGY WAS DEDUCED. THE SP. SURFACE INCREASES WITH INCREASE IN X AND IT REMAINS THE SAME AFTER THE SUBSEQUENT DEGASSING. ELECTRON MICROPHOTOGRAPHS CONFIRMED THE VACANCY MECHANISM OF THE FORMATION OF MACROPORES DURING THE DEHYDROGENATION.

FACILITY: DNEPR. TITANO-MAGNIVIYI ZAVDD, USSR.

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OLESOV, YU.G., MEYERSON, G.A., USTINOV, V.S., ZAPADNYA, V.I., SERVAYEVA, N.P., and
CHERKASHIN, V.I.

"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 A5-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, H, 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/cm², cathode current density of $0.8-1$ amp/cm², and electrolyte composed of 40% MgCl₂, 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/cm², 1-1.5% soluble titanium concentration in an MgCl₂ -- KCl -- NaCl -- TiCl₃ 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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OLESOV, Yu. G.

Powder metallurgy

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ECONOMIC EFFECTIVENESS OF POWDER METALLURGY OF TITANIUM

Article by A. I. Kamyk, Yu. G. Olesov, V. S. Ustinov; Moscow, Tsvetnyye Metally, Russian, No 5, 1972, pp 68-71

Powder metallurgy, in its time, played the deciding role in the development of the titanium industry; today it is again established as one of the most important trends in the development of the titanium industry. With powder metallurgy methods the raw materials can be used most efficiently, subsequent mechanical processing operations can be minimized, various compositions with given porosity, strength, heat- and corrosion resistance can be produced. Compared with the manufacture of parts from compacted metal, the use of powder metallurgy methods reduces wastes 5-7 times. All of this makes powder metallurgy an economical process, particularly as regards titanium, considering its relatively high cost and known difficulties involved in recycling wastes.

Expansion of effective use of powders and products made from them in the most advanced fields of industry, the most important of which we will also discuss, has also had an enormous impact on the development of titanium powder metallurgy.

Porous Cermet filters, Getters, and so forth

Metal ceramic titanium filters made of electrolytic and hydrocalcium powders and also of sponge wastes are used successfully in nonferrous metallurgy, chemistry, pharmaceutical and food industries.

The quality of filtrate, and consequently of industrial final products, is improved by using titanium filters for filtering titanium tetrachloride from vanadium oxytetrachloride -- complete filtration of solid suspension is achieved and the vanadium concentration does not exceed 0.001%; the filtration of magnesium decreases the iron concentration in it by 30-40%, decreases the hardness of titanium sponge by 7 HB units; by filtering nickel pulp (BH = 3-5, t = 65-80 C) the fineness of filtration is increased to 30 micron. Porous tubes (35-40% porosity, small fractions of sponge wastes are the initial material) also exhibit good filtering properties in the filtration of suspensions of the alumina industry [1-3].

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KOZLOV, V. A., DUSHIN, L. N., OLESOVA, A. I.

"Vacuum Distillation of a Polymetal Alloy"

Tr. Ural'sk. n.-i. i proyekt. in-ta medn. prom-sti (Works of the Ural'sk Scientific Research and Planning and Design Institute of the Copper Industry), 1971, vyp. 14, pp 201-206 (from RZh--Metallurgiya, No 4, Apr 72, Abstract No 4G303)

Translation: When reducing silicate slag from a melt of slurry from copper electrolytic production with the addition of CaO and Na₂CO₃, a polymetal alloy is obtained. The separation of the components of this alloy is possible by vacuum distillation. The process can be two stage or three stage. In the case of 3-stage distillation of the polymetal alloy, Pb and Sb are extracted in the commercial products, and Cu, Ag, and Ni are obtained in the form of intermediate products suitable for further refining. The degree of extraction of the metal in individual products by the scheme is 100% Pb, 84% Sb, and 94% Cu. In the case of the 2-stage process, the Pb and Sb are obtained in the form of an alloy: high-temperature distillation for driving off Pb, Sb, and Ag and low-temperature distillation for separating Pb and Sb from Ag.

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84231y Isentropic expansion characteristics of combustion products of Stavropol natural gas-gas-oxygen-potassium carbonate additive system. Rozhdensvenskii, I. B.; Olevinskii, K. K.; Shevelev, V. P. USSR *Teploenergetika* 1970, 17(2), 67-9 (Russ). The thermodynamics of the title process is discussed in relation to the usefulness of natural gas for magneto-hydrodynamic power generation. Phase, chem., and energy equil. are considered, and literature equations are used in calcg. a series of thermodynamic parameters for max. combustor gas temps. Dissocn., chem. reactions, and formation of pos. and neg. ions in the K₂CO₃-contg. system were included in the calens. Combustor gas temps., pressures, ds., flow rates, sound velocity, and the isentropic index (n) are given as functions of Mach no. for combustor pressures of 5-50 kg/cm², using 1-1.5 X theoretically required O. Then $n = \ln(p_k/p) / \ln(\rho_k/\rho)$ (where p and ρ are pressure and d., resp., and the subscripts refer to combustor conditions).
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GORBENKO, F. P., KUCHKINA, YE. D., and OLEVINSKIY, M. I.

"Extraction Recovery of Alkali Earth Elements from Rare Earth Elements"

Leningrad, Radiokhimiya, Vol 12, No 4, 1970, pp 661-664

Abstract: The authors discuss a method of extracting alkali earth elements from rare earth elements from an acid solution in the form of thiocyanate complexes. Extraction of a mixture of alkali earth elements was studied as a function of the acidity of the solution. It was found that the alkali earth elements are extracted from a comparatively acid solution. 50% is extracted from a 1 M solution with respect to HCl. Optimum acidity was taken as 0.1 M with respect to HCl. An investigation of the effect which the thiocyanate ion concentration has on the extraction process showed that maximum extraction takes place at a concentration of NaSCN equal to 2.4 M. To eliminate interference from rare earth elements in the extraction of alkali earth elements, ethylenediaminetetraacetic acid sodium salt was used for masking since it forms fairly stable complexes with rare earth metals in weakly acid solutions while the alkali earth elements do not form complexes under these conditions. The method may be used for individual determination of alkali earth elements after separation.