

Hydrobiology

USSR

UDC 62-506.2:534.618.3

NEPROSHIN, A. Yu., and NIKOLAYEV, A. S.

"Spawning Sounds of the Red Salmon"

Moscow, Rybnoye Khozyaystvo, No 6, 1971, pp 14-16

Translation: As is known, the sound activity of fish depends on their biological state, behavioral peculiarities, season of the year, time of day, and other causes, and attains its maximum during the spawning period. Inasmuch as salmon during its lifetime inhabits different media -- fresh water and salt water -- it has become necessary to investigate both these periods of its life.

Studies in fresh water were performed in Kuril'skoye Lake in southern Kamchatka. The largest run of red salmon in the Far East passes annually into the lake for spawning up the Ozerneya River from the Sea of Okhotsk. Kuril'skoye Lake is one of the most important spawning grounds in Kamchatka. Furthermore, only red salmon (and an insignificant number of loach [char] spawn in the lake, which greatly simplifies the deciphering of sounds of biological origin.

1/9

USSR

NEPROSHIN, A. Yu., and NIKOLAYEV, A. S., Rybnoye Khozyaystvo, No 6, 1971, pp 14-16

According to T. V. Yegorova (1968), the spawning of red salmon lasts from the end of July to the middle of February. True, in recent years, according to M. M. Selifonov, spawning has begun in early September. The red salmon arrive at the spawning grounds with insufficiently mature sexual products (roe and milt in the third and fourth stage of development). Appearing in the lake, the fish for some time stay in large accumulations in the vicinity of pits and near the river mouth where water temperature is higher than at greater depths.

From the 7th to the 15th of August, 1969, we tested the intensity of bio-acoustical fields of different sectors of the lake in places of accumulation of the red salmon. The number of specimens in the shoal by visual observation varied between 20 and 200. In all sectors various sounds of the types of "tsok," "chok," "klak," "krou," squeaks, and so forth, were recorded.

In the spawning ground at the source of Ozernaya River and in the estuary of Gavryushka, where red salmon were coming to spawn in a steady stream, intensive sounds of the type of "tuk," "ta-ta-ta," and "gkh" were noted.

2/9

- 3 -

USSR

NEPROSHIN, A. Yu., and NIKOLAYEV, A. S., Rybnoye Khozyaystvo, No 6, 1971, pp 14-16

A barium titanate hydrophone with a sensitivity of 30 microvolts/microbar was used as sound pickup. Electrical signals were transmitted from it to an amplifier over a coaxial cable 110 meters long. The amplifier, of a semiconductor type, had an inherent noise level of 5-7 microvolt at the input and an amplification factor of 750. The signals were recorded by a Soviet portable "Romantik" tape recorder.

At a site where a shoal of the fish was found the hydrophone was lowered from the launch to a depth of 1.5-2 meters and connected by cable to equipment on shore. Recordings were made every hour for a period of 24 hours, each recording lasting 10 to fifteen minutes.

The 24-hour station made it possible to establish the first appearance of the spawning sounds, the time of their maximal intensity and decrease, the nature of the sounds, and the values of the sound pressure at the point of reception. The spawning sound signals begin appearing at about 10 or 11 o'clock, increasing in intensity toward noon, and then decreasing and stopping altogether by 23 o'clock. Occasionally during the night sounds of the "gkh" type are noted, accompanying, as a rule, the "tuk" and "ta-ta-ta" sounds.

3/9

USSR

NEPROSHIN, A. Yu., and NIKOLAYEV, A. S., Rybnoye Khozyaystvo, No 6, 1971, pp 14-16

The presence of a shoal in daytime was recorded visually, and at night -- by splashes and noise. Control was carried out by means of the dynamic loud-speaker of the tape recorder.

The "tuk" type sounds are observed both singly and in series, with 10 to 15 pulses to a series. The level of the signals exceeded that of the noise bandwidth by 25-30 decibels. The value of the sound pressure, computed taking into account the hydrophone's sensitivity and the transmission factor of the receiving channel, was 7 dynes per square centimeter. Signals of the "ta-ta-ta" type represent a continuous shot noise and always precede the appearance of the "tuk" sound. Then an exchange of messages takes place at times assuming the form of a characteristic communication by tapping of two, and more seldom three, specimens (Figure 1). The number of pulses in such a signal varies from units to hundreds. This type of signal exceeds the noise level by as much as 15 decibels. The sound pressure is 2 dynes per square centimeter.

4/9

USSR

NEPROSHIN, A. Yu., and NIKOLAYEV, A. S., Rybnoye Khozyaystvo, No 6, 1971, pp 14-16

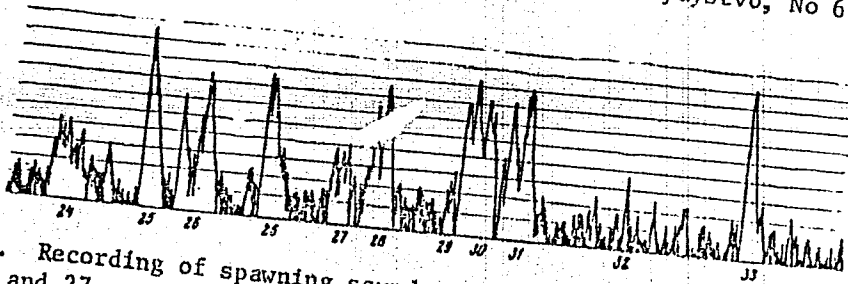


Figure 1. Recording of spawning sounds of the red salmon
Key: 24 and 27 are signals of the "krr" type accompanying the spawning signals; 29 and 32 are the males' "ta-ta-ta" signals; 25, 30, 31, and 33 are the "tuk" signals of the females; 26 and 28 are the combined sounding of the "tuk" and "ta-ta-ta" signals.
Spectral analysis of the signals demonstrated that the "tuk" sounds possess a narrow spectral distribution. This signal attains its maximum value at frequencies of 100 to 150 Hz, after which its level diminishes abruptly to

5/9

USSR

NEPROSHIN, A. Yu., and NIKOLAYEV, A. S., Rybnoye Khozyaystvo, No 6, 1971, pp 14-16

zero at a frequency of 500 to 700 Hz (Figure 2,a). The "ta-ta-ta" signals differ strongly in amplitude and possess a complex spectrum, extending to frequencies of 3,000 to 40,000 Hz (Figure 2,b).

The third type of signals is heard as "gkh" with an aspiration. Their relative level reaches 10 to 15 decibels (Figure 2,c).

The main characteristics of the signals listed above are given in the table.

It is well known that the main sound-producing organ in most fish is the swim bladder. In red salmon the swim bladder is quite large, resembles a bag in shape, and is located under the kidneys and spinal column.

When compared to the biological sounds which had regularly been observed over a period of many years in the Black Sea by Ye. V. Shishkova (1956, 1967), it may be assumed that the source of the spawning sounds of red salmon is also the swim bladder.

6/9

USSR

NEPROSHIN, A. Yu., and NIKOLAYEV, A. S., Rybnoye Khozyaystvo, No 6, 1971, pp 14-16

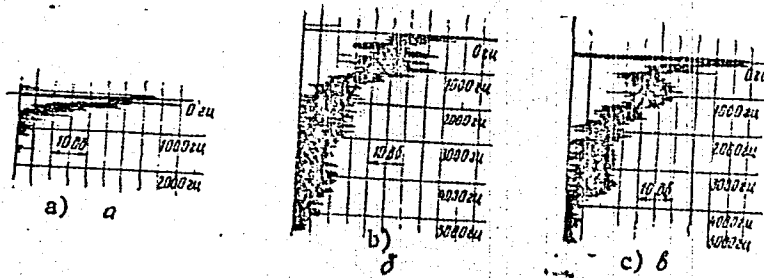


Figure 2. Spectral distribution of signals; a - "tuk"; b - "ta-ta-ta"; c - "gkh."
Key: 1. Hz; 2. decibels

For many fish, including red salmon, spawning is preceded by a lengthy period during which spawning pairs are formed and convenient sites for spawning found.

USSR

NEPROSHIN, A. Yu., and NIKOLAYEV, A. S., Rybnoye Khozyaystvo, No 6, 1971, pp 14-16

As to intraspecies relationships connected with the function of propagation, red salmon may be classified in the biological category of "pair fish" (N. Tinbergen, 1969). As is well known, for these fish signals of sex recognition and attraction of specimens of the opposite sex are very important.

As may be concluded from the data obtained, the sounds of "ta-ta-ta," being of a nature of invitation, belong to the males, which is confirmed by the high frequency distribution of the spectrum of these signals. Such a shift of the spectrum in the direction of high frequencies is explained by the smaller dimensions of the swim bladder in males.

However, as demonstrated by studies made during the life of the red salmon in the sea, the female fish are also acoustically active. It may be assumed that signals of the "tuk" type belong to the females of the red salmon, which is confirmed by the low-frequency nature of the spectrum of the signals peculiar to a large volume of the swim bladder.

8/9

USSR

NEPROSHIN, A. Yu., and NIKOLAYEV, A. S., Rybnoye Khozyaystvo, No 6, 1971, pp 14-16

Another important significance of the prespawning sounds is not excluded. They may indicate for the fish the location of the spawning grounds and thereby promote an even distribution of the spawning pairs, decreasing the possibility of loss of the roe from the digging over of the nests.

Analysis of the studies completed permits the conclusion that the red salmon are acoustically active. In order to establish a connection between the sound signals and behavior of individual specimens during spawning, it is necessary to carry out thorough observations with the use of multichannel acceptance recording equipment combined with underwater moving picture photography.

9/9

USSR

UDC 639.2.081.7

SHISHKOVA, Ye. V., NIKOLAYEV, A. S., and SIZOV, I. I.

"Noises Produced by Kamchatka Crabs"

Moscow, Rybneye Khozyaystvo, No 3, Mar 71, pp 22-25

Abstract: Since sonic devices are not very useful for locating crabs at the bottom of the sea, the feasibility of detecting the presence of crabs by recording ocean sounds was investigated. The study was performed off the west coast of Kamchatka. Ocean sounds were recorded by means of hydrophones lowered into water in areas known to be inhabited by schools of crabs, while similar sound records were taken from an aquarium kept onboard a ship and filled with crabs caught in the same area. Analysis of the records revealed that crabs produce specific high-frequency noises which tend to form brief "explosion waves" as a result of many crabs joining in brief choir-type vocalizations. Due to the specific pattern and an intensity 8-20 decibels above the ocean background noise, the method appears to be useful for practical application.

1/1

NIKOLAYEV A.V.

METALLURGY

JPRS C1521 20 Feb 77
PLASMA-ARC HEATING

(1)

Article by A. V. Nikolayev, Moscow, *Plazmennyye Protsessy v Metallurgii i Tekhnologii Nefermeticheskikh Materialov*, Kustren, 1975, pp 20-32

Various technological processes, based on plasma-arc heating, are presently being developed and industrially adopted. Such processes include the melting of metals, reduction of oxides, welding and cutting, heating of powder for the purpose of imparting special properties to it and for making various coatings from it etc. In these processes the material is heated by the energy released in an arc discharge. Two characteristic cases should be distinguished: heating by plasma produced by discharge, i.e. outside the electric field, and heating in the discharge itself, under the conditions of electric field.

In the former case heating is the result of thermal conductivity, convection and radiation. In the latter case the basic component of heat exchange is transmission of energy to the material by charged particles traveling in an electric field.

Typical examples of material processing in the absence of a field are heating of powder in a plasma stream, cutting of nonconducting materials and other processes.

Good illustrations of the heating of material in the field of discharge are the heating of hydrogen as a chemical reagent in a plasma stream and plasma-arc cutting and melting of metal.

In the former case the powder is used chiefly as a result of thermal conductivity and convection, and this heating may be expressed through the Nusselt, Reynolds, Prandtl, Lewis and other criteria. When an electric field is applied on the heat exchange zone the rate of transfer of energy to the material will depend, in addition to these parameters, on such properties as the intensity of the electric and magnetic fields, charge of the particles, total current, work function, ionization potential etc.

The energy indices of plasma-arc heating in gaseous and condensed phases are discussed in this article.

USSR

NIKOLAYEV, A. V., GRIBANOVA, I. N., KHOL'KINA, I. D., NORTSEVA, A. A.,
MAMATYUK, T. V.

"Phosphorus and Sulfur-Containing Sorbents. V. Organothiophosphorus Sorbents"

Novosibirsk, Izvestiya Sibirskogo Otdeleniya Akademii Nauk SSSR -- Seriya
Khimicheskikh Nauk, No 1, 1973, pp 79-83

Abstract: Data are presented on the synthesis, physical-chemical evaluation and sorptive power of organothiophosphorus sorbents -- cation-exchange resins and "mixed" complexites.

Two types of phosphorus and sulfur-containing sorbents were synthesized. The first type were cations with the functional group $-P(S)(OH)_2$. The sorbents of the second type were "mixed" complexites containing the cation-exchange functional groups and $-P(S)(OR)_2$ where R are alkyls. The physical-chemical characteristics and sorptive powers of the synthesized sorbents are given with special attention to the selectivity of the sorbents and their sorptive power with respect to extracting gold from acid solutions.

The "mixed" complexites were distinguished by a somewhat reduced sorption rate apparently as a result of an increase in steric factors. For the cation-exchange resins a small reduction in the degree of sorption of gold was

1/2

USSR

NIKOLAYEV, A. V., et al., Izvestiya Sibirskogo Otdeleniya Akademii Nauk SSR --
Seriya Khimicheskikh Nauk, No 1, 1973, pp 79-83

observed with an increase in the hydrochloric acid concentration in the aqueous
phase; for the "mixed" complexites there was some increase in the degree of
sorption in the 0.5-3.0 normal HCl range.

2/2

- 2 -

2

UDC 547.241

USSR

MIRONOVA, Z. N., TSVETKOV, Ye. N., PETROVSKAYA, L. I., NEGREBETSKIY, V. V.,
NIKOLAYEV, A. V., and KABACHNIK, M. I., Institute of Inorganic Chemistry,
Siberian Division, Academy of Sciences USSR, and Institute of Heteroorganic
Compounds, Academy of Sciences USSR

"Synthesis Starting With Tetraoxymethylphosphine Chloride; Aminomethyl-
phosphines and Their Oxides"

Leningrad, Zhurnal Obshchey Khimii, Vol 42(104), Vyp 10, 1972, pp 2152-2158

Abstract: Eleven aminomethylphosphines, general formula $R_nP(CH_2NR'2)_{3-n}$ were synthesized from tri(acetoxymethyl)phosphine, whose synthesis the authors have previously reported, and secondary amines in aqueous methanol in the presence of potassium hydroxide. This synthetic pathway is said to have fewer difficulties than those described previously, and to proceed via a saponification mechanism. The yield, boiling point, refractive index, density, observed and calculated molar refraction, percentages of C, H, and P, and formula are reported. Using hydrogen peroxide in acetone the phosphines were oxidized to their corresponding oxides. Several previous synthetic pathways are listed and some of the constants are reported for ten of these. Proton magnetic resonance and double resonance
1/2

2

USSR

MIRONOVA, Z. N., et al., Zhurnal Obshchey Khimii, Vol 42(104), Vyp 10, 1972, pp 2152-2158

were used for confirmation of structure; the chemical shift and spin-spin coupling constant of the PCH_2N interaction are given for eleven of the compounds synthesized. An intense doublet at $1130\text{-}1165\text{ cm}^{-1}$ in the IR spectrum of tri(dimethylaminomethyl)phosphine is interpreted as an indication of rotational isomerism. All operations with trivalent phosphorus compounds were conducted under argon.

2/2

USSR

UDC 547.241

MIRONOVA, Z. N., TSVETKOV, Ye. N., NIKOLAYEV, A. V., and KABACHNIK, M. I.,
Institute of Inorganic Chemistry, Siberian Branch of the Academy of
Sciences, USSR and Institute of Metalorganic Compounds, Academy of
Sciences, USSR

"Syntheses Based on Tetra(hydroxymethyl)phosphonium Chloride"

Leningrad, Zhurnal Obshchey Khimii, Vol 43 (105), No 3, Mar 73, pp 534-538

Abstract: Reaction of tri(chloromethyl)phosphine with alkoxides of higher alcohols yields the oxides of methyl-di(alkoxymethyl)phosphine which are effective extracting agents for uranium and thorium salts from sulfate solutions. It has been shown that the oxide of methyl-di(methoxymethyl)-phosphine reacts with potassium hydroxide at about 150°C splitting along the phosphorus-carbon bond to yield methylmethoxymethylphosphinic acid. Higher homologues split at 200-250° forming the respective methylalkyl ether and a salt of methylalkoxymethylphosphinic acid. The acids were isolated in form of benzhydrylammonium salts.

1/1

USSR

UDC 541.49

NIKOLAYEV, A. V., YAKOLEVA, N. I., GAL'TSOVA, E. A., and MAZALOV, L. N.

"Correlation of the Extraction Properties of Organophosphorus Compounds with A Charge At the Phosphorus Atom"

Novosibirsk, Izv. Sibirskogo Otdeleniya Akademii Nauk SSSR,
Ser. Khimicheskikh Nauk, No 6, 1972, pp 118-119

Abstract: Organophosphorus compounds are used extensively for extraction of uranyl nitrate, plutonium and americium. The experimental investigation was conducted on the efficiency of extraction and distribution coefficients of organophosphorus compounds as a function of charge on the phosphorus atom. Fitting the newly obtained data, as well as some of the data reported in literature by the method of least squares a linear relationship is found between the logarithm of the effective extraction constants and the charge on the phosphorus atom. A test of the equation shows that for all cases the correlation coefficient is 0.99.

1/1

USSR

UDC 632.95

ARDATOVA, A. N., and NIKOLAYEV, A. V."Determination of Granosan in Grain"

Tr. 2-go Vses. soveshch. po issled. ostatkov pestitsidov i profilakt. zagryazheniya iml produktov pitaniya, kornov i vnesh. sredy (Transactions of the Second All-Union Conference on the Study of Pesticide Residues and Prevention of Their Contamination of Food Products, Fodder and the External Environment), Tallinn, 1971, pp 265-266 (from RZh-Khimiya, No 13, 10 Jul 72, Abstract No 13N505 by T. A. Belyayeva)

Translation: Some 20-40 g of grain are treated twice with 40-60 ml 2.5 N HCl (acid), 15 min. each time with shaking, and filtered. EtHgCl is extracted from solution with 3 x 10 ml CHCl₃. The extracts are filtered and the total filtrate volume is brought to 50 ml. Ten milliliters of acetate buffer (pH 4.5) and 5 ml of distilled water are added to 5 ml of extract and titrated with an 0.001 percent solution of dithizone.

1/1

Extraction and Refining

USSR

UDC 669.778.053.4.094

NIKOLAYEV, A. V., GINDIN, L. M., SOKOLOV, A. P., ZAKHAROV, V. F., KHOMAYKO, I. A.

"Leaching Antimony out of the Khovu-Aksinsk Arsenates of Cobalt-Nickel Concentrates by Caustic Soda Solutions"

V sb. Sintez, ochistka i analiz neorgan. materialov (Synthesis, Purification and Analysis of Inorganic Materials -- collection of works), Novosibirsk, Nauka Press, 1971, pp 171-174 (from RZh--Metallurgiya, No 4, Apr 72, Abstract No 4G309)

Translation: The technological scheme for refining arsenate concentrates was developed using the method of two-stage leaching out in NaOH solutions under optimal conditions: 1) the first leaching out stage: initial NaOH concentration 250 g/l, S:L = 1:4, temperature 80°, duration 1 hour; 2) second leaching out stage: initial NaOH concentration 250 g/l, S:L = 1:4, temperature 80°, duration 2 hours. Aqueous repulping of the hydroxide cake took place under these conditions: S:L = 1:7, temperature 60°, duration 2 hours. The separation of the trisodium arsenate or regeneration of the alkali from trisodium phosphate by lime was carried out under the following conditions: S:L = 1:4-5 (with respect to lime), temperature 90°, duration 1.5 hours. The extraction of As in the solution was 98.5-99%. Nonferrous metals convert in practice wholly to the hydroxide concentrates, extraction of the metal in which is: 99.9% Co, 99.9%

1/2

USSR

NIKOLAYEV, A. V., et al., Sintez, ochistka i analiz neorgan. materialov, Novosibirsk, Nauka Press, 1971, pp 171-174

Ni, and 99.7% Cu. The concentrate yield is 48-55% by weight of the arsenate concentrate. The technological scheme was checked on a semiindustrial scale.

2/2

- 17 -

USSR

UDC 541.183.24

NIKOLAYEV, A. V., BOGATYREV, V. L., ZHURKO, F. V., VULIKH, A. P., SOKOLOVA, S. I., LYUBMAN, N. YA., Institute of Inorganic Chemistry, Siberian Department, Academy of Sciences of the USSR

"Ion Exchange Equilibrium Between Ionite Grains"

Moscow, Doklady Akademii Nauk SSSR, Vol 198, 1971, No 1, pp 138-140

Abstract: Known formulas to determine the equilibrium state in the case of inter-grain affinity can be applied only if the inter-bond exchange by counterions takes place by the predominantly simple mechanism involved in direct contact between grain surfaces. If other factors besides contact play any considerable role (such as ionite hydrolysis), these must be considered as well, and be brought into the formula for equilibrium state. The authors derive empirically several formulas for ion exchange between ionite grains.

1/1

- 2 -

USSR

UDC 541.127

NIKOLAYEV, A. V., Academician, BOGATYREV, V. L., and ZHURKO, F. V., Institute of Inorganic Chemistry, Siberian Department of the Academy of Sciences USSR, Novosibirsk

"Mechanism and Kinetics of Ion Exchange Between Ionite Grains"

Moscow, Doklady Akademii Nauk, SSSR, Vol 200, No 4, 1971, pp 886-889

Abstract: This study examines intergranular counterion exchange occurring only on direct contact of the swollen grains of ion exchangers in completely deionized water. An example is intergranular counterion exchange in the contact of monofunctional strongly ionized resins in such ionic forms where hydrolysis is practically ruled out. An electrochemical model of the exchange interaction of two ionite grains with the participation of electric double layers is given, and the principal factors influencing the exchange process rate are considered.

1/1

Extraction and Refining

UDC 546+541.121.536.7

USSR

NIKOLAYEV, A. V., et al.

"Ekstraktsiya Neorganicheskikh Veshchestv," "Nauka," Novosibirsk, 1970

Abstract: This book is devoted to the description of extraction equilibria of simple and polycomponent systems, covering the problems of thermochemistry, thermodynamics, phase equilibria and extractive capability during isolation of inorganic substances.

The study is of interest to a wide circle of specialists -- chemists, scientific and engineering-technical workers, and students of chemical specialties.

Translation: Table of Contents	3
Foreword	
Diagrams of distribution, separation and salting out	6
I. Types of distribution diagrams	6
I-1. General concepts	11
I-2. Tri-component extraction systems	14
I-3. Quaternary components extraction systems	14
I-3-1. Salting out coefficient	
I-3-2. Distribution diagrams for cases when one substance goes into the extract	15

USSR

NIKOLAYEV, A. V., et al., "Ekstraktsiya Neorganicheskikh Veshchestv,"
"Nauka," Novosibirsk, 1970

I-3-2a.	Distribution diagrams with an inactive second component ($D_{sal} = 1$)	17
I-3-2b.	Distribution diagrams in case of salting out according to linear equation ($D_{sal} = a+bc > 1$)	19
I-3-2v.	Real salting out rules (connection of D_{sal} with the concentration of the fourth component)	21
I-3-3.	Distribution diagrams when two substances go into the extract	25
I-3-3a.	Distribution diagrams of the first (dominant component)	26
I-3-3b.	Distribution diagrams of the second component (being salted out from the extract)	27
I-3-3v.	Distribution diagrams for two components going into the extract similar in their interaction strength	35
I-3-3g.	Distribution diagrams when a complex compound goes over into the extract from components	39

2/12

15

USSR

NIKOLAYEV, A. V., et al., "Ekstraktsiya Neorganicheskikh Veshchestv,"
"Nauka," Novosibirsk, 1970

II. Salting out curves, coefficients and diagrams	42
II-1. Coefficients and curves of salting out from aqueous phase (D_{sal}^v)	42
II-2. D_{sal}^o and corresponding salting out curves	44
II-3. Salting out digrams	45
II-4. Diagram types for salting out from aqueous phase	45
II-5. Diagrams for salting out from organic phase	51
II-6. Mixed types of salting out diagrams	54
III. Separation coefficients, curves and diagrams	55
III-1. Introduction	56
III-2. Theoretical separation curves ($D_{sal} = 1$)	61
III-3. Separation diagrams	
III-3-1. Separation diagram for the system $Ce(NO_3)_4^-$ $UO_2(NO_3)_2-H_2O-TBP$	62
III-3-2. Separation diagram for the system $UO_2(NO_3)_2^-$ $HNO_3-(C_4H_9)_2PO(OC_4H_9)-H_2O$	63

3/12

USSR

NIKOLAYEV, A. V., et al., "Ekstraktsiya Neorganicheskikh Veshchestv,"
"Nauka," Novosibirsk, 1970

III-3-3.	Separation diagram for the system $\text{FeCl}_3\text{-HCl-}$ $\text{H}_2\text{O-(C}_2\text{H}_5)_2\text{O}$	63
III-3-4.	Separation diagram for the system $\text{UO}_2(\text{NO}_3)_2\text{-}$ $\text{HNO}_3\text{-H}_2\text{O-TBP}$	64
III-3-5.	Separation diagram for the system $\text{Th}(\text{NO}_3)_4\text{-}$ $\text{HNO}_3\text{-H}_2\text{O-TBP}$	65
III-3-6.	Separation diagram for the system $\text{Ce}(\text{NO}_3)_4\text{-}$ $\text{HNO}_3\text{-H}_2\text{O-TBP}$	67
III-3-7.	Separation diagram for the system $\text{UO}_2(\text{NO}_3)_2\text{-}$ $\text{Th}(\text{NO}_3)_4\text{-H}_2\text{O-TBP}$	67
III-3-8.	Separation diagram for the system $\text{HNO}_3\text{-}$ $\text{La}(\text{NO}_3)_3\text{-H}_2\text{O-TBP}$	68
III-3-9.	Separation diagram for the system $\text{Ce}(\text{NO}_3)_4\text{-}$ $\text{Th}(\text{NO}_3)_4\text{-H}_2\text{O-TBP}$	69
III-4.	Combination of the separation diagram with the distribution diagram (types of separation diagrams)	71
III-5.	Actual separation curves and isoconcentrational crosssections of some separation diagrams	74

4/12

14 -

USSR

NIKOLAYEV, A. V., et al., "Ekstraktsiya Neorganicheskikh Veshchestv,"
"Nauka," Novosibirsk, 1970

IV. Extraction rays and lines	81
IV-1. General determinations and concepts	81
IV-2. Actual extraction rays and extraction processes characterized by them	85
IV-2a. Extraction of one component	85
IV-2b. Systems with a domineering component (two components are extracted)	88
Extraction rays in the system $Ce(NO_3)_4-HNO_3-$ H_2O-TBP	91
The system $Th(NO_3)_4-HNO_3-H_2O-TBP$	93
The system $Zr(NO_3)_4-HNO_3-H_2O-TBP$	95
IV-3. Extraction rays and separation of components	95
IV-3-1. Extraction rays converging at the pole	96
IV-3-2. Separating extraction rays (no poles)	96
IV-3-3. Extraction ray shows a pole in the composition field (not on the coordinate axis)	97
IV-3-4. Extraction rays in separation diagrams of different types	97

5/12

USSR

NIKOLAYEV, A. V., et al., "Ekstraktsiya Neorganicheskikh Veshchestv,"
"Nauka," Novosibirsk, 1970

IV-4. Extraction rays and distribution diagrams	98
IV-4-1. One component extracted	98
IV-4-2. Rays on diagrams with two components being extracted.	98
IV-4-2a. Diagram rays of the dominating component	98
IV-4-2b. Diagram rays for extraction of a ternary complex compound	99
IV-5. Extraction rays and separation diagrams	99
IV-6. Some notes on the composition and properties of organic phases	100
IV-7. Calculation of repeated extraction	103
V. Separation orders during extraction	108
V-1. Separation orders	108
V-2. The effect of the radius and the charge of an ion on the extraction (position of the elements in separation orders)	113
VI. Graphic methods for the calculation of extraction processes	115
Literature	124

6/12

USSR

NIKOLAYEV, A. V., et al., "Ekstraktsiya Neorganicheskikh Veshchestv,"
"Nauka," Novosibirsk, 1970

Thermochemistry of extraction systems	126
I. Thermal effects during extraction	129
II. Thermochemistry of binary systems	139
III. Thermochemistry of ternary systems	
IV. Connection of the thermochemical data with extractability and extraction capability	145
Literature	150
Phase equilibria and thermodynamics of binary, ternary and polycomponent systems during extraction	151
I. Conditions for stratification and stability	151
I-1. Stability conditions for binary phases	
I-2. Stability conditions for ternary and polycomponent systems	155
I-3. Stratification conditions and solubility curve	156
I-4. The effect of the ternary component of mutual solubility of two liquids	160

7/12

USSR

NIKOLAYEV, A. V., et al., "Ekstraktsiya Neorganicheskikh Veshchestv,"
"Nauka," Novosibirsk, 1970

I-5. Derivation of stratification diagrams from thermodynamic potential isotherms	161
II. Types of binary diagrams with stratification	161
II-1. Binary systems with upper critical solution temperature	161
II-2. Binary systems solubility diagrams with a stratification curve showing a lower critical solubility temperature	164
II-3. Systems with a closed stratification curve	166
II-4. Systems with a tendency to form a lower critical temperature of solution	167
II-5. Effect of the pressure on the type of stratification field	169
II-5-1. Transition through a simple eutectics	169
II-5-2. Transition through quaternary phase composition	170
II-5-3. Transition through formation of a compound	170
III. Mutual solubility in the systems water-phosphorus-organic extractor	171

8/12

USSR

NIKOLAYEV, A. V., et al., "Ekstraktsiya Neorganicheskikh Veshchestv,"
"Nauka," Novosibirsk, 1970

III-1.	The effect of the ether radical on the mutual solubility of liquids	176
III-2.	On the nature of the hydrates of organophosphorus extractors and their effect on the formation of lower critical temperature of solution	180
IV.	Phase equilibria in extraction systems	186
IV-1.	Extraction equilibria -- exceptional case of phase equilibria	186
IV-2.	Distribution of the component between phases without chemical interaction	186
IV-3.	Distribution of the component between phases in systems with chemical interaction of the components	189
IV-4.	System uranyl nitrate - water - BEDBP	203
V.	Quaternary extraction systems	209
V-1.	Metrics of quaternary diagrams with stratification	209
V-2.	Some characteristics of the quaternary systems $UO_2(NO_3)_2$ HNO_3-H_2O-TBP and $UO_2(NO_3)_2-HNO_3-H_2O-BEDBP$	211

9/12

USSR

NIKOLAYEV, A. V., et al., "Ekstraktsiya Neorganicheskikh Veshchestv,"
"Nauka," Novosibirsk, 1970

Literature	219
Extraction of uranyl salts with neutral oxygen-containing extracting agents	222
I. Extraction of uranyl nitrate with ethers, esters, and with ketones	222
II. Extraction of uranyl salts with neutral organophosphorus extracting agents	225
III. Extraction of uranyl salts with organic N-oxides	229
IV. Extraction of uranyl salts with dialkylsulfoxides	240
Literature	241
Correlation of the extracting capability and the dependence on the structure on extracting agent	244
I. Correlation of the extracting capability with Hammet-Taft- Kabachnik constants	244
II. Correlation of the extracting capability of organophosphorus compounds and their physico-chemical properties	249
III. Correlation between physico-chemical constants and the structure of extracting agents	251

10/12

USSR

NIKOLAYEV, A. V., et al., "Ekstraktsiya Neorganicheskikh Veshchestv,"
"Nauka," Novosibirsk, 1970

Literature	
Description of some extraction systems	257
I. Extraction system $\text{HNO}_3\text{-NH}_4\text{NO}_3\text{-H}_2\text{O-TBP}$	257
II. Extraction system $\text{La}(\text{NO}_3)_3\text{-NH}_4\text{NO}_3\text{-H}_2\text{O-TBP}$	261
III. Extraction system $\text{La}(\text{NO}_3)_3\text{-HNO}_3\text{-H}_2\text{O-(C}_4\text{H}_9\text{O)PO}$	272
IV. Distribution in the system $\text{La}(\text{NO}_3)_3\text{-NH}_4\text{NO}_3\text{-8N HNO}_3\text{-H}_2\text{O-TBP}$	282
V. Extraction system $\text{Ce}(\text{NO}_3)_4\text{-HNO}_3\text{-H}_2\text{O-TBP}$	287
VI. Extraction system $\text{Th}(\text{NO}_3)_4\text{-HNO}_3\text{-H}_2\text{O-TBP}$	295
VII. Extraction system $\text{UO}_2(\text{NO}_3)_2\text{-Th}(\text{NO}_3)_4\text{-(1.5M)HNO}_3\text{-H}_2\text{O-TBP}$	302
Literature	309
Distribution, separation and swelling diagrams for ion exchange processes	311
Introduction	311
I. Investigation of the ion exchange processes by the ray method	312
I-1. Method for the construction and analysis of the distribution diagram	312
I-2. Ion exchange system $\text{NH}_4\text{Cl-HCl-cation exchanger (dry)-H}_2\text{O}$	313

11/12

USSR

NIKOLAYEV, A. V., et al., "Ekstraktsiya Neorganicheskikh Veshchestv,"
"Nauka," Novosibirsk, 1970

I-3. Ion exchange system $\text{NH}_4\text{Cl-HCl}$ -cation exchanger (swollen)- H_2O	316
I-4. Ion exchange system $\text{CaCl}_2\text{-HCl}$ -cation exchanger (KU-2)- H_2O	319
A. Distribution diagram for the calcium ion	322
B. Distribution diagram for the hydrogen ion	323
I-5. Ion exchange system $\text{MgSO}_4\text{-H}_2\text{SO}_4$ -cation exchanger- H_2O	325
A. Distribution diagram for the magnesium ion	325
B. Distribution diagram for the hydrogen ion	328
I-6. Method for the construction and analysis of the separation diagram	329
Separation diagram for the system $\text{H}^+, \text{Mg}^{2+} \parallel \text{R}^-, \text{SO}_4^{2-}\text{-H}_2\text{O}$	
II. Investigation of the swelling of ion exchangers in electrolytes solution by the ray method	331
II-1. Method of construction and analysis of swelling diagram	331
II-2. Swelling diagram of the cation exchanger KU-2 in the system $\text{H}^+, \text{Mg}^{2+} \parallel \text{R}^-, \text{SO}_4^{2-}\text{-H}_2\text{O}$	332
Conclusion	333
Literature	334

USSR

UDC 546.779

NIKOLAYEV, A. V., SOKOLOVA, V. K., and VOLKOV, V. V.

"Calculation of Isotope Accumulation of Transplutonium Elements under Neutron Irradiation of Different 'Starting' Materials"

Leningrad, Radiokhimiya 12, No 3, 1970, pp 481-486

Abstract: The accumulation of transplutonium elements can be achieved by prolonged irradiation of targets in high-density neutron beams, which is expensive. Consequently, the processes taking place in the irradiated targets must first be theoretically studied. Most important are: accumulation and transformation of transplutonium isotopes and "contamination" of the target with fission products. Calculation of the accumulation allows one to evaluate the yields and to optimize the irradiation conditions. So far, ^{240}Pu has not been studied as possible "starting" material. The accumulation of transplutonium elements from the most probable isotopes, ^{239}Pu , ^{240}Pu , and ^{241}Am , by neutron irradiation was studied. The calculated results obtained from evaluations of heat evolution in the targets and target contamination by fission products were also studied.

1/1

USSR

UDC 541.183.24

GRIBANOVA, I. N., KHOL'KINA, I. D., POLOVINKIN, YU. N., and
NIKOLAYEV, A. V., Institute of Inorganic Chemistry, Siberian
Branch, Academy of Sciences USSR

"The Radiation-Chemical, Chemical, and Mechanical Stability of
Porous Organophosphorus Cation Exchangers"

Moscow, Zhurnal Fizicheskoy Khimii, Vol 44, No 7, Jul 70, pp 1752-
1755

Abstract: The stability of organophosphorus cation-exchange resins
derived from styrene-divinylbenzene copolymers ("phosphone" resins)
under the action of gamma-rays during irradiation in H₂O, 2N HNO₃,
and air was studied. Changes in the adsorption capacity for Na⁺
and UO₂⁺⁺ upon irradiation and in other properties were determined.
The radiation stability of the porous resins was higher than that
of the non-porous. It increased with increasing degrees of cross-
linking. The higher stability of porous resins, which had a higher
content of divinylbenzene, was due to greater possibilities of
structurization counteracting decomposition during irradiation.
The porous resins also had a higher resistance to the action of
acids (5N HNO₃ and 5N H₂SO₄) in tests continued for 1.5-3 mos.
1/2

USSR

GRIBANOVA, I. N., et al., Zhurnal Fizicheskoy Khimii, Vol 44,
No 7, Jul 70, pp 1752-1755

The detachment of active groups took place mainly by cleavage of C-C, not C-P bonds. The mechanical strength of the resins, which was determined by grinding tests, depended on the density of cross-linking and the thickness of walls between pores. The data obtained on the resins are tabulated in relation to the content of divinylbenzene in the resins and the amount of iso-octane used in their synthesis. The authors thank N. YR. BUYANOVA for her assistance in the experiments.

2/2

Radiation Chemistry

USSR

UDC 541.123.6:546.741

NIKOLAYEV, A. V., RYABININ, A. I., and AFANAS'YEV, Yu. A.

"Extraction of Nitrates of Rare Earths, Thorium and Uranium, Using Undiluted Tributyl Phosphate"

Moscow, Radiokhimiya, Vol 12, No 2, 1970, pp 326-335

Abstract: Securing full information on quantitative functions of distribution coefficients (D) from concentrations of the extract, coextracts, and salting-out components requires plotting of the complete distribution diagram when studying an extraction system. Otherwise, a broad interval between experimental points can leave peculiarities of system behavior undetected. A table listing distribution coefficients of rare earth nitrates in the systems $\text{Ln}(\text{NO}_3)_3\text{-H}_2\text{O}\text{-(C}_4\text{H}_9\text{O)}_3\text{PO}$ at 25° showed that D as a function of concentration for all elements studied (Pr, Sm, Gd, and Lu) passes through a maximum in the 0.8-1.5 M concentration interval. Another table listed distribution coefficients of nitrates in the systems $\text{Me}(\text{NO}_3)_3\text{-HNO}_3\text{-H}_2\text{O}\text{-(C}_4\text{H}_9\text{O)}_3\text{PO}$ at 25° for the elements La, Pr, Sr, Gd, Ho, Lu, Ce(IV), and Th. Tabled data showed that nonmonotonicity with the maximum of D for samarium is observed at nitrate concentrations ≤ 0.5 M. With an increase

1/2

USSR

NIKOLAYEV, A. V., et al., Radiokhimiya, Vol 12, No 2, 1970, pp 326-335

in concentration past 0.5 M, the nonmonotonicity is complicated by the observation that at 0.8 M the maximum in D exists not only for samarium, but also for holmium.

2/2

- 57 -

1/2 023 UNCLASSIFIED PROCESSING DATE--13NOV70
TITLE--EXTRACTION OF SOME ACIDS BY TRI,N,OCTYLAMINE -U-
AUTHOR--(04)-NIKOLAYEV, A.V., KOLESNIKOV, A.A., GRISHIN, G.M., GRANKINA,
Z.A.
COUNTRY OF INFO--USSR
SOURCE--DJKL. AKAD. NAUK SSSR 1970, 191(5), 1074-6 CHEM
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--AMINE, ACID, POTENTIOMETRIC TITRATION, IR SPECTRUM, CHEMICAL
ANALYSIS
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3006/1111 STEP NO--UR/0020/70/191/005/1074/1076
CIRC ACCESSION NO--AT0134797
UNCLASSIFIED

UNCLASSIFIED

PROCESSING DATE--13NOV7C

2/2 023

CIRC ACCESSION NO--AT0134797

ABSTRACT/EXTRACT--(U) GP-0-

ABSTRACT. THE SYSTEMS TRI,N,OCTYLAMINE, H
SUB2 O, ACID WERE STUDIED BY USING THE ACIDS HCL, H SUB3 PO SUB4, HNO
SUB3, AND H SUB2 SO SUB4. POTENTIOMETRIC TITRIN. AND IR METHODS WERE
USED TO ANALYZE THE PHASES. IN THIS SYSTEM THERE IS A LARGE REGION IN
WHICH 3 LIQ. PHASES COEXIST: AN AQ. AND 2 ORG. PHASES. ONE ORG. PHASE
CORRESPONDS TO THE HYDRATED SALT OF TRIOCTYLAMINE AND THE CORRESPONDING
ACID AND THE OTHER PHASE TO THE PURE AMINE. THE IR DATA ESTABLISHED THE
INTER PRESENCE OF INTERACTION BETWEEN THE SALT AND WATER USING THE HCL
SALT AS EXAMPLE.
USSR.

UNCLASSIFIED

1/2 012 UNCLASSIFIED PROCESSING DATE--13NOV70
 TITLE--CALCULATION OF THE ABSOLUTE ENERGY OF X RAY EMISSION TRANSITIONS OF
 A HYDROGEN CHLORIDE MOLECULE IN AN APPROXIMATION OF THE UNIFIED ATOM
 AUTHOR--(05)-NIKOLAYEV, A.V., MAZALOV, L.N., MURAKHTANOV, V.V., SADOVSKIY,
 A.P., GUZHAVINA, T.I.
 COUNTRY OF INFO--USSR

N

SOURCE--DOKL. AKAD. NAUK SSSR 1970, 191(1), 144-7

DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--HYDROGEN CHLORIDE, X RAY EMISSION, ELECTRON SHELL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
 PROXY REEL/FRAHE--2000/0595

STEP NO--UR/0020/70/191/001/0144/0147

CIRC ACCESSION NO--AT0124282

UNCLASSIFIED

UNCLASSIFIED

PROCESSING DATE--13NOV70

2/2 012

CIRC ACCESSION NO--AT0124282

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE ENERGY OF EMISSION TRANSITIONS WERE STUDIED FOR THE HCL MOL. TAKING INTO ACCOUNT THE DISTORTION OF THE ORBITALS DUE TO HOLES. THE RESULTS OF CALCNS. FOR 7 POSSIBLE HOLE CONFIGURATIONS ARE TABULATED. IT IS CONCLUDED THAT THE ENERGY BOUND IN THE DISTORTION OF THE ORBITAL IS RATHER LARGE AND CANNOT BE IGNORED, PARTICULARLY FOR HOLES IN THE INTERNAL SHELLS. FACILITY: INST. NEORG. KHIM., NOVOSIBIRSK, USSR.

UNCLASSIFIED

1/2 022 UNCLASSIFIED PROCESSING DATE--27NOV70
TITLE--LOW PRESSURE ARC DISCHARGE STABILIZED BY A PLASMA JET -U-
AUTHOR-(03)-GAGANOV, YU.I., NIKOLAYEV, A.V., RYKALIN, N.N.
COUNTRY OF INFO--USSR
SOURCE--MOSCOW, FIZIKA I KHIMIYA OBRABOTKI MATERIALOV, NO 1, JAN-FEB 70,
PP 23-26
DATE PUBLISHED-----70
SUBJECT AREAS--PHYSICS
TOPIC TAGS--LOW PRESSURE EFFECT, ARC DISCHARGE, PLASMA JET
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3007/1665 STEP NO--UR/0472/70/000/001/0023/0026
CIRC ACCESSION NO--AP0136926
UNCLASSIFIED

UNCLASSIFIED

PROCESSING DATE--27NOV70

2/2 022

CIRC ACCESSION NO--AP0136926

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE RESULTS OF AN EXPERIMENTAL STUDY OF THE ENERGY CHARACTERISTICS OF A DC ARC AT 5-10 TORR, STABILIZED BY AN ARGON PLASMA JET, ARE STUDIED. THE ARC WAS EXCITED BETWEEN A COPPER CATHODE AND ANODE (50 AND 100 MM DIAMETER, RESPECTIVELY). IT WAS FOUND THAT THE REGION OF STABLE ARCING UNDER LOW PRESSURE WITH A DIFFUSIVE CATHODE SPOT DEPENDS ON THE AMPERAGE USED, THE CRITICAL RANGE OF WHICH IS 180-200 A.

FACILITY: INSTITUTE OF METALLURGY, USSR ACADEMY OF SCIENCES.

UNCLASSIFIED

USSR

UDC 542.91+669.2./8

N
NIKOLAYEV, A. V., Academician, and FOKIN, A. V., Corresponding Member of the Academy of Sciences USSR

"Direction of the Synthesis of Extractants for Nonferrous Metallurgy"

Moscow, Zhurnal Vsesoyuznogo Khimicheskogo Obshchestva imeni D. I. Mendeleev, Vol 15, No 4, 1970, pp 364-369

Abstract: An analysis is made of the advantages of extraction processes and the properties of organic substances used as extractants. The possibility of modifying extractants by changing their chemical structure is shown and qualities (selectivity, low solubility, chemical stability, low cost, easy regeneration, etc.) are determined which the extractant should possess for effective commercial use. A dependence is shown between the extracting ability of a substance and its solubility and stability, on the one hand, and the price of the recovered metal, and the prospects of reprocessing low-concentration solutions by producing inexpensive extractants with low solubility on the other hand. An analysis is made of the loss of extractants, consideration is given to the economic feasibility of their use for the recovery of metals of different concentration. Measures are presented for the reduction of the cost of extractants through use of raw materials from wastes of the chemical, petroleum, and wood chemical industries.

1/2

USSR

NIKOLAYEV, A. V., et al, Zhurnal Vsesoyuznogo Khimicheskogo Obshchestva imeni D. I. Mendeleev, Vol 15, No 4, 1970, pp 364-369

A price table of the more important extractants is given, and methods are presented for a systematic synthesis of new extractants for primary metals.

2/2

1/2 019 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--X RAY EMISSION K SUBBETA SPECTRA OF SULFUR IN SOME SULFUR
CONTAINING COMPOUNDS AND THEIR RELATION TO THE STRUCTURE OF THESE
AUTHOR--(05)-NIKOLAYEV, A.V., MAZALOV, L.N., SADOVSKIY, A.P., GALTSOYA,
E.A., MURAKHTANOV, V.V.
COUNTRY OF INFO--USSR
SOURCE--DOKL. AKAD. NAUK SSSR 1970, 190(5), 113-16, CHEM.
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--X RAY EMISSION, SPECTRUM, SULFUR, CARBON DISULFIDE, MOLECULAR
ORBITAL, MOLECULAR STRUCTURE, PALLADIUM COMPOUND, COORDINATION
CHEMISTRY, CHEMICAL BONDING, SULFIDE
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--1995/1588 STEP NO--UR/0020/70/190/005/1113/1116
CIRC ACCESSION NO--AT0116996
UNCLASSIFIED

2/2 019

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AT0116996

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE X RAY EMISSION SPECTRA WERE REPORTED FOR CS SUB2 AND R SUB2 S WHERE R WAS SELECTED FROM ME, ET, BU, C SUB6 H SUB13, AND C SUB8 H SUB17. THE ELECTRON DS. WERE CALCD. AT THE S ATOMS IN THESE SUBSTANCES BY USING THE HUECKEL APPROXN. OF THE LCAOMO METHOD. FROM THE TABULATED DATA THE CHARGE ON THE S ATOM DECREASES IN COMPODS. IN WHICH IT IS POSSIBLE TO HAVE A PI BOND BETWEEN S AND THE ATTENDANT RADICAL. THE S CHARGE VALUES WERE AS FOLLOWS FOR R SUB2 S MOLS.: BU 1.975, ET 1.974, ME 1.974, PH 1.913; THE INDICES OF FREE VALENCE OF THE S ATOM WERE, RESP., 1.045, 1.045, 1.043, AND 0.844. SPECTRA WERE ALSO REPORTED FOR THE PRODUCTS OF EXTN. OF PDCL SUB2 BY R SUB2 S WHERE R EQUALS PH OR C SUB6 H SUB13. IN THESE CASES THE PD-S BOND FORMATION CHANGES THE NATURE OF THE EMISSION SPECTRUM DRASTICALLY RELATIVE TO R SUB2 S OWING TO ELECTRON REDISTRIBUTION AND THEIR COORDINATION WITH PD. FACILITY: INST. NEORG. KHIM., NOVOSIBIRSK, USSR.

UNCLASSIFIED

1/2 015 UNCLASSIFIED PROCESSING DATE--23OCT70
TITLE--THERMOGRAPHIC STUDY OF THE LOWER FLUORIDES OF XENON -U-
AUTHOR--(03)-NIKOLAYEV, A.V., OPALOVSKIY, A.A., NAZAROV, A.S.
COUNTRY OF INFO--USSR
SOURCE--IZV. SIB. OTD. AKAD. NAUK SSSR, SER. KHIM. NAUK 1970, (1), 171
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--THERMOGRAPHIC ANALYSIS, FLUORIDE, XENON COMPOUND, INERT GAS,
ENDOTHERMIC EFFECT
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--1997/1517 STEP NO--UR/0289/70/000/001/0171/0171
CIRC ACCESSION NO--AP0120298
UNCLASSIFIED

PROCESSING DATE--23OCT70

UNCLASSIFIED

2/2 015

CIRC ACCESSION NO--AP0120298

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE THERMOGRAPHIC METHOD FOR CHARACTERIZATION OF THE LOWER FLUORIDES OF XENON (XEF SUB2; XEF SUB4) WAS USED. THERE ARE TWO MIN. ON THE DIFFERENTIAL CURVES CORRESPONDING TO THE ENDOTHERMIC EFFECTS. THE 1ST MIN. 136 PLUS OR MINUS 3DEGREES FOR XEF SUB2 AND 117 PLUS OR MINUS 3DEGREES FOR XEF SUB4 CORRESPOND TO THE M.P.S. OF THE COMPOS. THE 2ND MIN. OF THE CURVE 155 PLUS OR MINUS 3DEGREES XEF SUB2 AND 146 PLUS OR MINUS 3DEGREES FOR XEF SUB4 CORRESPOND TO THE QUICK PROCESS OF EVAPN. OF THE MELTED FLUORIDES ACCOMPANYING BY HIGH HEAT ABSORPTION. THE LARGE HEATS OF EVAPN. OF FLUORIDES ARE IN GOOD AGREEMENT WITH THE TEMP. OF THEIR ENDOTHERMIC EFFECTS.
FACILITY: INST. NEORG. KHIM., NOVOSIBIRSK, USSR.

UNCLASSIFIED

1/2 008 UNCLASSIFIED PROCESSING DATE--23OCT70
TITLE--FLUORINE-19 NMR SPECTRA OF SOLUTIONS OF XENON TETRAFLUORIDE IN
IODINE PENTAFLUORIDE -U-
AUTHOR-(04)-NIKOLAYEV, A.V., OPALOVSKIY, A.A., NAZAROV, A.S., TRETYAKOV,
G.V.
COUNTRY OF INFO--USSR
SOURCE--DOKL. AKAD. NAUK SSSR 1970, 191(3), 629-31
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--XENON COMPOUND, FLUORIDE ISOTOPE, IODINE COMPOUND, NMR
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--1997/1071 STEP NO--UR/0020/70/191/003/0629/0631
CIRC ACCESSION NO--AT0119930
UNCLASSIFIED

2/2 008

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AT0119930

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. PRIME19 F CHEM. SHIFTS AND
LINEWIDTHS OF NMR SIGNALS OF SOLNS. OF XEF SUB4 IN IF SUB5 AT 30DEGREES
ARE GIVEN. ABSENCE OF LOW FIELD MULTIPLTS OF IF SUB5 WAS PROBABLY DUE
TO RAPID EXCHANGE OF THE AXIAL F ATOMS IN IF SUB5 WITH THE EQUATORIAL F
ATOMS IN THE PRESENCE OF XEF SUB4. THE RESULTS POINT TO A MOL. NATURE
OF THE SOLN. OF XEF SUB4 IN IF SUB5 AND TO STRONGER INTERACTION BETWEEN
COMPONENTS OF THE XEF SUB4 IF SUB5 SYSTEM COMPARED WITH XEF SUB4 HF.

FACILITY: INST. NEORG. KHIM., NOVOSIBIRSK, USSR.

UNCLASSIFIED

AP9053061

UR 0289

PRIMARY SOURCE: Izvestiya Sibirskogo Otdeleniya, AN SSSR,
Seriya Khimicheskikh Nauk, Nr 12(162), Nr 5,
pp 33-38

A. V. Nikolayev, A. I. Riabinin

SOME REGULARITIES OF THE EXTRACTION
OF THE RARE ELEMENTS AND NITRIC ACID
IN SYSTEMS $Ln(NO_3)_3 - HNO_3 - H_2O - TBP$

12
5
19

Six quaternary extraction and solubility systems of the type $Ln(NO_3)_3 + HNO_3 + H_2O + TBP$ ($Ln - La, Pr, Sm, Gd, Ho, Lu$), have been investigated at 25°. The isoconcentrates by lanthanides nitrates and nitric acid of the coefficient distributing is given.

su

1/1

1949 1817

18

AP9053079

UR 0289

PRIMARY SOURCE: Izvestiya Sibirskogo Otdeleniya, AN SSSR,
Seriya Khimicheskikh Nauk, Nr 12(162), Nr 5,
pp 38-42

A. V. Nikolaev, K. E. Mironov,
E. V. Karaseva, A. I. Ryabinin

EXTRACTION IN THE SYSTEM
 $Nd(NO_3)_3-HNO_3-H_2O-(C_4H_9O)_3PO$ at 25°C

The extraction of neodymium and nitric acid with tributyl phosphate in the above system at 25°C was studied. Distribution coefficients of neodymium, praseodymium or samarium as well as the extraction of HNO_3 in the corresponding systems were compared. Extraction has been compared of neodymium, praseodymium and samarium nitrates from aqueous solvents without acid.

14
5
1
20
/oa

41

1949 1835

18

AP 9053088

N

UR 0289

4

PRIMARY SOURCE: Izvestiya Sibirskogo Otdeleniya, AN SSSR, Seriya Khimicheskikh Nauk, Nr 12(162), Nr 5, pp 148-151

V. G. Torgov, V. N. Andrievsky, E. N. Gilbert, I. L. Kotlyarevsky, V. A. Mikhailov, A. V. Nikolaev, V. A. Pronin, D. D. Trozenko

19
3
1
25

THE EXTRACTION OF Pd AND Pt (IV) FROM NITRIC, HYDROCHLORIC AND SULPHURIC ACID SOLUTIONS BY ORGANIC SULFIDES

The extraction of tracer amounts of Pd and Pt (IV) from nitric, hydrochloric and sulphuric acid solutions by 0.5 M solution of organic sulfides (R_2S where $R=C_4H_9-C_8H_{17}$, C_6H_5 and thiophane) in benzene has been studied. The dialkylsulfide extraction can be used in separation Pd from Pt (IV) from nitric and hydrochloric acid solutions and for simultaneous extraction Pd and Pt from sulphuric acid solutions.

or

1/1

1949 1847

18

USSR

UDC 621.791.75.001:537.523.5

N
GAGANOV, YU. I., NIKOLAYEV, A. V., RYKALIN, N. N., Moscow;
Institute of Metallurgy, USSR Academy of Sciences

"Low-Pressure Arc Discharge Stabilized by a Plasma Jet"

Moscow, Fizika i Khimiya Obrabotki Materialov, No 1, Jan-Feb 70,
pp 23-26

Abstract: The results of an experimental study of the energy characteristics of a dc arc at 5-10 torr, stabilized by an argon plasma jet, are studied. The arc was excited between a copper cathode and anode (50 and 100 mm diameter, respectively). It was found that the region of stable arcing under low pressure with a diffusive cathode spot depends on the amperage used, the critical range of which is 180-200 a.

1/1

- 3 -

1/2 006 UNCLASSIFIED PROCESSING DATE--13NDV70
TITLE--IDENTIFICATION OF PSEUDOMONAS SP. AND THE EFFECT OF GROWTH
CONDITIONS ON ASPARTASE AND GLUTAMINASE ACTIVITY -U-
AUTHOR--(03)-MARDASHEV, S.R., YEREMENKO, V.V., NIKOLAYEV, A.YA.
CCUNTRY OF INFO--USSR
SOURCE--MIKROBIOLOGIYA, 1970, VOL 39, NR 1, PP 11-17
DATE PUBLISHED-------70
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES
TOPIC TAGS--PSEUDOMONAS, ENZYME ACTIVITY
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1990/1414 STEP NO--UR/0220/70/039/001/0011/0017
CIRC ACCESSION NO--AP0109476
UNCLASSIFIED

2/2 006

UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--A0109476

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE BACTERIAL CULTURE WITH ASPARTASE AND GLUTAMINASE ACTIVITY WAS IDENTIFIED AS PSEUDOMONAS FLUORESCENS AG. PRODUCTION OF BOTH ENZYMES WAS INDUCED BY ASPARAGINE IN MEDIA WITH GLYCEROL, GLUCOSE, ACETATE, PYRUVATE, CITRATE, SUCCINATE, FUMARATE, MALATE AND MALONATE AS SOLE CARBON AND ENERGY SOURCES AS WELL AS IN MEDIA WITH PEPTONE, UREA AND AMMONIUM AS SOLE NITROGEN SOURCES BUT WAS NOT INDUCED IN MEDIA WITH NITRATE AND ACID CASEINE HYDROLYSATE. OPTIMAL PH FOR ASPARTASE PRODUCTION WAS 7.0 AND FOR GLUTAMINASE PRODUCTION, 7.5. BOTH ENZYMES WERE INDUCED AT PLUS 20DEGREES, PLUS 25DEGREES AND PLUS 30DEGREES.

UNCLASSIFIED

USSR

UDC 535.215.1

NIKCLAYENA, A.Z., NEKRASHEVICH, I.G.

"Effect Of Gallium Arsenide Structure On Surface Photoelectric Effect In The X-ray Region Of The Spectrum"

V sb. Materialy Vses. soveshchaniya po defektam struktury v poluprovodn. 1969, Ch.2
(Materials Of An All-Union Conference On Structural Defects In Semiconductors. 1969.
Part 2. -- Collection Of Works), Novosibirsk, 1970, pp 204-208 (from RZh--Elektronika
i yeye primeneniye, No 12, December 1970, Abstract No 12A24)

Translation: Photoemission was investigated in the soft x-ray region of the spectrum of the surfaces $[111]_A$ and $[111]_B$ of GaAs, processed by mechanical grinding and chemical polishing in an etchant of the composition $H_2O_2:H_2SO_4:H_2O(2:6:5)$. The dependence is shown of the quantum yield on the angle of incidence of the x-rays with a potential at the collector of plus 100 and minus 100 v (in the second case, slow secondary electrons are excluded from the measurements). It is obvious from a comparison of the curves presented that the quantum yield from surface $[111]_B$, in the presence of all values of the angle of slip of the x-rays, exceeds the quantum yield from surface $[111]_A$. The authors explain this by the structure of the surface layer and the dependence of the effective cross section σ of the photoelectric interaction on the atomic number of the element ($\sigma_{As}/\sigma_{Ga} = 1.5$). 2 ill. 2 ref. N.S.

1/1

USSR

UDC 621.372.061

~~NIKOLAYEV, B. I.~~

"Problems of Engineering Synthesis of Optimal Reception Systems"

Radioelektronika v nar. kh-ve SSSR. Ch.1 -- V sb.(Radio Electronics in the National Economy of the USSR. Part 1 -- collection of works), Kuybyshev, 1970, pp 219-228 (from RZh-Radiotekhnika, No 4, Apr 71, Abstract No 4A106)

Translation: An algorithm for synthesizing radio systems is investigated. There are 2 illustrations and a 3-entry bibliography.

1/1

USSR

UDC 621.039.3

KOLOKOL'TSOV, N. A., MINENKO, V. P., NIKOLAYEV, B. I., SULABERIDZE, G. A.,
and TRET'YAK, S. A.

"Constructing Cascades for Separating Multicomponent Isotope Mixtures"

Moscow, Atomnaya energiya, Vol 29, No 6, Dec 70, pp 425-429

Abstract: At present, there is a great deal of interest in separation of isotope mixtures and consequently in the theory of building separating multicomponent cascades, with the requirement that isotopes of intermediate mass as well as those of extreme mass be separated. Nothing that the difficulty in designing these cascades is that the concentration of intermediate-mass isotopes tends to be a maximum inside the cascade, the authors discuss systems of continuous profile cascades for separating isotopes of intermediate mass, and the simulation of these cascades by actual flows consisting of constant-flow sections. The five steps required for this simulation process are outlined, and the modeling of a continuous profile cascade for the separation of tungsten isotopes, in the form of the gaseous compound WF_6 , is given as an example.

1/1

1/2 013 UNCLASSIFIED PROCESSING DATE--04DEC70
TITLE--SEPARATION OF LIQUID ORGANIC MIXTURES IN THERMAL DIFFUSION COLUMNS
-U-
AUTHOR--(03)-NIKOLAYEV, B.I., NIKOLAYEV, N.I., TUBIN, A.A.
COUNTRY OF INFO--USSR
SOURCE--TEOR. OSN. KHIM. TEKHNOL. 1970, 4(3), 432-5
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--HYDROCARBON SEPARATION, THERMAL DIFFUSION SEPARATION,
CHLOROBENZENE, HEXANE, HEPTANE, CARBON TETRACHLORIDE, CYCLOHEXANE,
TOLUENE, XYLENE
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY FICHE NO----FD70/605012/F08 STEP NO--UR/0455/70/004/003/0432/0435
CIRC ACCESSION NO--AP0140340

UNCLASSIFIED

2/2 013

UNCLASSIFIED

PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0140340

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. LIQ. ORG. MIXTS. WERE SEPD. IN THE
2 DIFFERENT THERMAL DIFFUSION COLUMNS EACH CONSISTING OF 2 COAXIAL
TUBULAR CYLINDERS OF DIFFERENT DIAMS. AND LENGTHS: PHCL,N,HEXANE,
PHCL,N,HEPTANE, PHCL,N,OCTANE, PHCL,N,DODECANE (COLUMN 1), CCL
SUB4,N,HEXANE, CYCLOHEXANE,N, HEXANE, C SUB6 H SUB6,N,HEXANE,
PHME,N,HEXANE, O,XYLENE,N,HEXANE (COLUMN 2). THE EFFICIENCY OF SEPN. IS
DETD. BY THE DIFFERENCE IN STRUCTURES OF MOLS. OF MIXT. COMPONENTS. IF
THERE IS NO DIFFERENCE, THE EFFICIENCY OF SEPN. DEPENDS ON THE
DIFFERENCES OF MOL. WTS., B.P., AND OTHER PHYS. PROPERTIES OF MIXT.
COMPONENTS. FACILITY: NAUCH.-ISSLED. FIZ.-KHIM. INST. IN.
KARPOVA, MOSCOW, USSR.

UNCLASSIFIED

UNCLASSIFIED

PROCESSING DATE--18SEP70

1/2 018
TITLE--IONIC COMPONENT OF THE CATHODIC SPUTTERING OF A COPPER SINGLE
CRYSTAL -U-
AUTHOR--(05)-BUKhanov, V.M., YURASOVA, V.YE., SYSOYEV, A.A., SAMSONOV,
G.V., NIKOLAYEV, B.I.
COUNTRY OF INFO--USSR

SOURCE--FIZ. TVERD. TELA 1970, 12(2), 394-7

DATE PUBLISHED-----70

SUBJECT AREAS--MATERIALS, PHYSICS

TOPIC TAGS--COPPER CRYSTAL, NEON, ION, CATHODE SPUTTERING, METAL SINGLE
CRYSTAL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAme--1984/0144

STEP NO--UR/0181/70/012/002/0394/0397

CIRC ACCESSION NO--A0054940
UNCLASSIFIED

2/2 018

UNCLASSIFIED

PROCESSING DATE--18SEP70

CIRC ACCESSION NO--AP0054940

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. INVESTIGATION IS DESCRIBED OF THE ANGULAR AND ENERGY DISTRIBUTIONS OF SECONDARY POS. IONS, KNOCKED OUT FROM THE (100) FACE OF CU BY NE IONS WITH ENERGIES OF 5 AND 20 KEV.

89

UNCLASSIFIED

AA0038341

NIKOLAYEV, D.N.
UR 0482

Soviet Inventions Illustrated, Section I Chemical, Derwent,

1/70

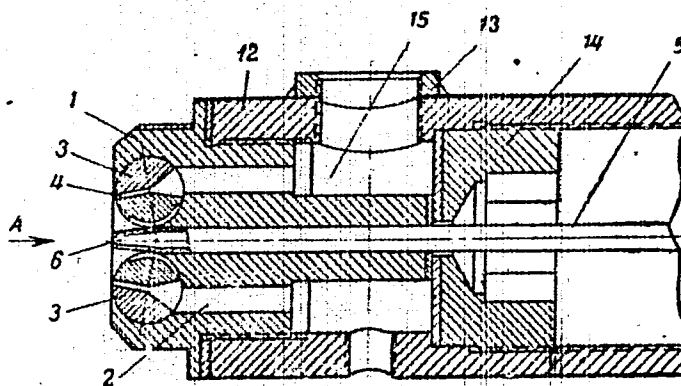
238739 SPINNERET e.g. for the production of fibres from viscous liquids, consisting of a body (1) with channels (2) for supplying air, a nozzle (3) which are made in the form of rotatable cylinders, with slot-like openings (4) on the production head, and a tube (5) for supplying the fused material. One end of this tube connects with an extruder (not shown in diagram) while the other end terminates in the slit aperture (6). A toothed wheel is provided for rotating the cylinders. Molten polymer from the extruder comes down the tube (5) and flows out of the slit (6). At the same time compressed air, usually preheated, is fed through the connection (13) into the circular channel (15), and then through (2) into (3). The flat jet of air at sub-sonic speed comes from the opening (4) and strikes the flat jet of the melt at an angle. Rotation of the movable sections of the head ensures that a stream of the desired degree of fineness is obtained.

1/3

1

19731453

AA0038341



1.6.67 as 1161774/28-12. D.N.NIKOLAEV & A.T.STEPANETS
TEXTILE-MACHINERY INST. (19.8.69) Bul 10/10.3.69.
Class 32a. Int.Cl.C 03b

19731454

10

AA0038341

AUTHORS: Nikolayev, D. N.; and Stepanets, A. T.

Vsesoyuznyy Nauchno - Issledovatel'skiy Institut
Legkogo i Tekstil'nogo Mashinostroyeniya

3/3

19731455

1/2 017 UNCLASSIFIED PROCESSING DATE--04DEC70
TITLE--FIRST SOVIET SUPERSONIC WAR PLANES -U-
AUTHOR--~~NIKOLAYEV, G.~~ N
COUNTRY OF INFO--USSR
SOURCE--SOTSIALISTICHESKAYA INDUSTRIYA, SEPTEMBER 11, 1970, P 3, COLS 6-9
DATE PUBLISHED--11SEP70
SUBJECT AREAS--AERONAUTICS
TOPIC TAGS--AIRCRAFT PERSONNEL, AIRCRAFT DESIGN/(U)LA176 AIRCRAFT
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3008/1672 STEP NO--UR/0533/70/000/000/0003/0003
CIRC ACCESSION NO--AN0138648
UNCLASSIFIED

PROCESSING DATE--04DEC70

UNCLASSIFIED

2/2 017

GIRC ACCESSION NO--AN0138648

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE ARTICLE COMMEMORATES THE 70TH BIRTHDAY OF S. A. LAVOCHKIN, DIED IN 1960, ONE OF THE SOVIET PIONEERS IN SUPERSONIC AIRCRAFT CONSTRUCTION. LAVOCHKIN DESIGNED SWEEP WING, 45 DEGREES, AIRPLANE, "LA-176", WAS THE FIRST SOVIET BUILT AIRCRAFT TO BREAK THE SOUND BARRIER IN DECEMBER 26, 1948. IT WAS THE PROTOTYPE FOR SWEEP WING, 55 DEGREES, INTERCEPTORS WITH THIN WINGS DESIGNED AS FUEL TANKS. THE LAST TEN YEARS OF HIS LIFE, LAVOCHKIN WORKED ON THE DEVELOPMENT OF NEW HARDWARE EMPLOYING LARGE ELECTRONIC SYSTEMS. SOME OF HIS IDEAS ARE STILL VALID AND ARE FINDING WIDE USES.

UNCLASSIFIED

Surgery

USER

UDC 577.44

POLYAKOV, V. A., Professor, NIKOLAYEV, G. A., Corresponding Member, Academy of Sciences, USSR, and VOLKOV, M. V., Academician, Academy of Medical Sciences USSR

"Biological Welding and Tissue Cutting"

Moscow, Priroda, No 12, 1972, pp 40-45

Abstract: Present methods of cutting tissues, both soft and hard (bones) involve a great deal of physiological trauma to the tissues and the entire organism, and in many instances delay healing. In 1964 studies were commenced at the Moscow Higher Technical College on the application of ultrasound waves to the cutting of biological tissues, as well as their "welding" (fusion). In essence, the approach consisted of transforming ultrasound energy into mechanical oscillations by means of wave guides, which may be variously shaped for different tasks. In the cutting of biological tissues such wave guide "scalpels" move with an amplitude of about 80μ , and the temperature in the immediate zone varies from 50-170°. Approximation (welding, fusion) of tissues may be accomplished with the appropriate wave guide in the case of bones by solubilizing the collagen matrix and permitting it to fuse. In the latter procedure an adhesive, cyacrin is employed which was developed in 1963 by A. M. Polyakova and O. V. Smirnova.

1/2

USSR

POLYAKOV, V. A., et al, Priroda, No 12, 1972, pp 40-45

Cyacrin is a sterile and nontoxic substance and is gradually resorbed in the living organism. Ultrasound enhances the polymerization of cyacrin and its penetration into the body tissue to a depth of 40-200 μ . The strength of such fused bony tissues varies from 320-580 kg/cm². Histologic studies conducted on animals have shown that tissues sectioned in this manner heal normally, going through all of the characteristic cellular stages. The application of these procedures to man began 5 years ago, and up to the present time over 800 patients have been treated in such manner in surgery of soft and bony tissues. Although attention must be given to unforeseen side effects or disadvantages that may become apparent, it seems that the application of the ultrasound procedures should open up new therapeutic vistas in surgery.

2/2

- 68 -

USSR

UDC 546.185 + 547.412

PRONS, V. N., GRINBLAT, M. P., KLEBANSKIY, A. L., NIKOLAYEV, G. A.

"Rearrangement of Fluoroalkoxyhalocyclophosphazenes"

Leningrad, Zhurnal Obshchey Khimii, Vol 40, No 9, Sep 70, p 2128

Abstract: Heating a mixture of hexakis-(pentafluoropropoxy)-cyclophosphazene (I) and tris-(pentafluoropropoxy)-trichloro-cyclophosphazene (II) taken at a 1:1 ratio to 250° for 40 hrs in a sealed tube leads to the formation of 12% tetrakis-(pentafluoropropoxy)-dichlorocyclophosphazene (III) and a trace of pentakis-(pentafluoropropoxy) monochlorocyclophosphazene (IV). Increasing the reaction time brings up the ratio of (III) and (IV) to about the level of (I) and (II). A similar disproportionation reaction occurs with hexakis-(heptafluorobutoxy)-cyclophosphazene and tris-(heptafluorobutoxy)-trichlorocyclophosphazene.

1/1

- 68 -

1/2 017

UNCLASSIFIED

PROCESSING DATE--04DEC70

TITLE--WELDING IN MACHINE BUILDING -U-

AUTHOR--NIKOLAYEV, G.A.

COUNTRY OF INFO--USSR

SOURCE--MOSCOW, VESTNIK MASHINOSTROYENIYA, NO 3, 1970, PP 19-23

DATE PUBLISHED-----70

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

TOPIC TAGS--WELDING TECHNOLOGY, MACHINE INDUSTRY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--3003/1979

STEP NO--UR/0122/70/000/003/0019/0023

CIRC ACCESSION NO--AP0130754

UNCLASSIFIED

2/2 017

UNCLASSIFIED

PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0130754

ABSTRACT/EXTRACT--(U) GP-0-
OF APPLICATION ARE INVESTIGATED.
ARE DISCUSSED.

ABSTRACT. BASIC WELDING METHODS IN THE AREA
PROBLEMS FACING THE WELDING INDUSTRY

UNCLASSIFIED

USSR

UDC: 621.791:693.8

N
NIKOLAYEV, G.A., Moscow Higher Technical School imeni N. E. Bauman

"Scientific Research of the Moscow Higher Technical School in the Field of Weldment-Design Strength"

Kiev, Avtomaticheskaya Svarka, No 5, May 70, pp 29-32

Abstract: A survey is made of the scientific research performed at the Moscow Higher Technical School during the last decade in the field of weldment-design strength. As a result of the study of residual strains and stresses in welding, a method was developed for determination of elastic-plastic strains and inherent stresses in thin plates of limited and unlimited sizes with shifts of the linear heat source, taking into account its rate, change of physicommechanical properties of the metal in heating and cooling, and structural and phase transformations. The method is based on the use of hydrostatic stresses, and body and surface forces applied to volume elements, with subsequent solution of boundary-condition problems by computer. The school has conducted research on a large variety of subjects, including investigations on residual stresses and strains in the welding of thick aluminum alloys, the effect of structural changes in weld joints of steels on residual strains, determination of welding strains in thin-walled constructions, the effect of low temperature during operation on the strength of weldment designs, strengthening of weld joints by rolling, the effect of various defects on the mechanical properties of weld joints, the strength of weld joints

1/2

USSR

NIKOLAYEV, G.A., *Avtomaticeskaya Svarka*, No 5, May 70, pp 29-32

of polymers, with and without stress concentrators, under static, variable, and impact loads, resistance of joints to formation of hot and cold cracks, weld joint quality control, etc. This research has been conducted in close cooperation with many institutes and enterprises, especially the Institute of Electric Welding imeni Ye. O. Paton.

2/2

USSR

UDC 533.6.07+536.24+536.33

KONIKOV, A. A., NIKOLAYEV, G. N., and POLYAKOV, Yu. A. (Moscow)

"Heat Exchange Behind a Reflected Shock Wave in a Two-Phase Gas-Dynamic Stream"

Moscow, Izvestiya Akademii Nauk SSSR, Mekhanika Zhidkosti i Gaza, No 2, 1973, pp 127-136

Abstract: Measurements were made of the heat fluxes into a wall that reflected a shock wave that propagated in air containing a suspension of aluminum oxide particles having a size on the order of 1 micron. A shock tube was used, provided with a special pneumatic system for creating a gas-dust medium. The equipment used for measuring the heat fluxes was based upon the employment of thin-film resistance thermometers, and satisfied the requirements that were dictated by the short duration of the working process.

The range of shock-wave velocities in the two-phase medium embraced values of V_g from 3 to 6 km/sec. Radiant and conductive heat fluxes to the reflecting wall were measured. The measurement results were compared with the data of control experiments with pure air and with calculated values of heat fluxes from nondusty air at equal shock-wave velocities. It was
1/2

USSR

KONIKOV, A. A., et al., Izvestiya Akademii Nauk SSSR, Mekhanika Zhidkosti i Gaza, No 2, 1973, pp 127-136

established that the radiation of shock-heated gas is intensified by an order of magnitude as a consequence of the ionization of aluminum atoms that appear as a result of thermal decay of the aluminum oxide vapors. 5 figures. 9 references.

2/2

- 14 -

USSR

UDC 615.916:546

MARKOV, G. I., NIKOLAYEV, G. M.

"Variation in Content of Ascorbic Acid in the Adrenal Glands of White Rats Under the Effect of Aluminum-Chromium Catalyst"

V sb. Toksikol. i gilyena produktov neftekhimii i neftekhim. proiz-v (Toxicology and Hygiene of the Products of Petrochemistry and Petrochemical Production--Collection of Works), Yaroslavl', 1 1972, pp 148-150 (from RZh--Farmakologiya. Khimioterapevticheskiye Sredstva. Toksikologiya, No 3, Mar 73, Abstract No 3.54.636)

Translation: In rats subjected to aluminum-chromium catalyst in a concentration of 0.00044 mg/liter (recalculated for chromium anhydride) for 30-90 days, a reduction in the vitamin C content in the cellular elements of the adrenal glands was detected. USSR, Yaroslavl', Medical Institute.

1/1

USSR

UDC 577.3

NIKOLAYEV, G. M., Department of Biophysics

"A Study of the State of Water in Partially Dried Yeast by the Nuclear Magnetic Resonance Method"

Moscow, Vestnik Moskovskogo Universiteta, Vol 6, Nov-Dec 70, pp 124-126

Abstract: A large portion of intracellular water is so-called free water, which is similar to regular liquid water. Only a small portion is bound by biopolymers and differs from regular water. This study was performed on commercial samples of *Saccharomyces cerevisiae* yeast which were dried to contain 13% and 3% water. This residual water content was determined by drying the samples at 105°C to a constant weight, and it was investigated by means of spin echo amplitude and the resonance absorption of protons, using the nuclear magnetic resonance method. The lipid fraction in yeast cells was determined by the Folch method. The results obtained on yeast samples with 13% water yielded a curve composed of three distinct components with characteristic time intervals for the spin relaxation of protons. This indicated that water molecules were present in the yeast in several physical states differing considerably from each other in internal motion. The proportion of molecules in each of the three fractions was 8:1:1. After further drying of

1/2

USSR

NIKOLAYEV, G. M., Vestnik Moskovskogo Universiteta, Vol 6, Nov-Dec 70,
pp 124-126

the yeast to 3% water content, the number of protons in the first fraction decreased five-fold, did not change in the second fraction, and increased by one-third in the third fraction. The second fraction of protons was derived mainly from yeast lipids. Denaturation of the biopolymers of yeast cells was accompanied by a change in the physical state of water molecules bound by these biopolymers.

2/2

UNCLASSIFIED
 1/2 022
 TITLE--CHANGES IN THE ACETYLCHOLINESTERASE ACTIVITY IN MOTOR ENDINGS OF
 STRIATED MUSCLES IN HYPOXIC HYPOXIA -U-
 AUTHOR--NIKOLAYEV, G.M.
 COUNTRY OF INFO--USSR
 SOURCE--ARKH. PATOL. 1970, 32(3), 61-5
 DATE PUBLISHED-----70
 SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES
 TOPIC TAGS--HYPOXIA, ACETYLCHOLINESTERASE, ENZYME ACTIVITY, MUSCLE TISSUE
 CONTROL MARKING--NO RESTRICTIONS
 DOCUMENT CLASS--UNCLASSIFIED
 PROXY REEL/FRAE--1998/0061
 CIRC ACCESSION NO--AP0120761
 STEP NO--UR/9056/70/032/003/0061/0065
 UNCLASSIFIED

UNCLASSIFIED

PROCESSING DATE--16OCT70

2/2 022

CIRC ACCESSION NO--AP0120761
ABSTRACT/EXTRACT--(U) GP-0-

ABSTRACT. THE EFFECTS OF HYPOXIA

CORRESPONDING TO AN ALTITUDE OF 8000-10,000 M ON THE
ACETYLCHOLINESTERASE ACTIVITY IN MYONEURAL SYNAPSES WERE STUDIED ON 25
RATS. AFTER 30-60 MIN OF EXPOSURE A CHANGE IN LOCALIZATION OF ENZYMIC
ACTIVITY AND ENZYME ACTIVE INCLUSIONS IN THE PROTOPLASM OF MUSCLE FIBERS
IN THE REGION OF MYONEURAL SYNAPSES WAS OBSERVED. FACILITY:
YAROSLAV. MED. INST., YAROSLAVL, USSR.

UNCLASSIFIED

USSR

UDC: 616-008.922.1.04-07:616.74-018.861-008.931:577.153.9-074

NIKOLAYEV, G.M., Chair of Pathological Physiology, Yaroslavl' Medical Institute and Toxicology Laboratory, NIIMSK

"Change in Acetylcholinesterase Activity in the Motor Endings of Striated Muscle During Hypoxic Hypoxia"

Moscow, Arkhiv Patologii, No 3, 1970, pp 61-65

Abstract: Study of muscle preparations from white rats kept in a pressure chamber at a simulated altitude of 8,000-10,000 m for 30-60 min showed shifts in the localization and degree of acetylcholinesterase activity in the motor endings. The region of the end-plates was stained with varying degrees of intensity, reflecting differences in acetylcholine activity. The motor endings were abnormally small and compact, and without their familiar loop-like shape. They seemed to be in a state of "spasm." Moderate enzymatic activity of the sarcolemma or sarcoplasm, was noted in the muscle fibers near the motor endings which made the striations less distinct. On the surface of the motor endings and immediately adjacent to them, granules of different shapes (apparently neurosecretions of the myoneural synapse) could be seen. Another change noted after hypoxia was the absence of a clear-cut boundary of enzymatic activity in the structure of the motor ending, creating the impression that the ending had disappeared, and that enzymatic activity was localized in the muscle fiber or its sheath.

1/1

- 72 -

UDC 681.3

USSR

BELOV, A. F., VINOKUROV, YU. S., NIKOLAYEV, G. N.

"Device for Storing Stationary Electric Signals"

USSR Author's Certificate No 310253, filed 22 Jul 69, published 1 Oct 71 (from RZh --Avtomatika, Telemekhanika i vychislitel'naya tekhnika, No 4, Apr 72, Abstract No 4A528P)

Translation: A device proposed for storing stationary electric signals contains a storage unit, a number register, an address register, a coding unit, a programming unit, a generator, and an output unit. There is 1 illustration.

1/1

- 9 -

1/2 025 UNCLASSIFIED PROCESSING DATE--23OCT70
TITLE--MINIMAL HEAT LOADS DURING BOILING ON SUBMERGED SURFACES -U-
AUTHOR--(02)-NIKOLAYEV, G.P., SKRIPOV, V.P. N
COUNTRY OF INFO--USSR
SOURCE--IZV. VYSSH. UCHEB. ZAVED., ENERG. 1970, 13(1), 82-7
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY, PHYSICS
TOPIC TAGS--BOILING, CARBON DIOXIDE, HEPTANE, SULFUR COMPOUND, FLUORINE
COMPOUND, SURFACE PROPERTY, HEXENE, CRITICAL POINT
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--1997/1037 STEP NO--UR/0143/70/013/001/0082/0087
CIRC ACCESSION NO--AT0119904
UNCLASSIFIED

2/2 025

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AT0119904

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. MIN. HEAT LOADS DURING BOILING ON
SUBMERGED SURFACES CLOSE TO CRIT. REGION WERE MEASURED FOR CO SUB2, SF
SUB6, C SUB7 H SUB16, AND C SUB6 H SUB12 AND THE VALUES OBTAINED WERE
COMPARED WITH VALUES OBTAINED BY CALCN. ACCORDING TO SEVERAL PUBLISHED
FORMULAS.
FACILITY: URAL. POLITEKH. INST. IM. KIROVA.
SVERDLOVSK, USSR.

UNCLASSIFIED

ELECTRICAL ENGINEERING
Cryogenics and Superconductivity

UDC: 537.312.62

USSR

GRUZIN, P. L., BYCHKOV, Yu. F., YEVSTYUKHINA, I. A., KRUGLOV, V. S.,
NIKOLAYEV, I. N.

"The Mössbauer Effect in Nb₃Sn as a Function of Heat Treatment"

Moscow, Sverkhprovodyashchiye splavy i soyedin.--sbornik (Superconductive Alloys and Compounds--collection of works), "Nauka", 1972, pp 42-47 (from RZh-Radiotekhnika, No 12, Dec 72, abstract No 12D549 [résumé])

Translation: The superconductive compound Nb₃Sn displays the so-called "degradation effect" -- an appreciable reduction in T_c when the annealing or sintering temperature is raised to 2000°C. An investigation was made of the influence of heat treatment in a vacuum on the parameters of nuclear gamma resonance. With a rise in annealing temperature a considerable reduction was observed in the width of the NGR line and isomer shift, together with a reduction in absorption probability. The narrowing of the NGR line is due to an increase in the degree of ordering of the structure of the compound Nb₃Sn. It is shown that the degree of ordering can be determined from the absorption probability for different states if the degree of ordering and absorption probabilities are known for two other states. With an

1/2



USSR

GRUZIN, P. L. et al., Sverkhprovodyashchiye splayv i soyedin., "Nauka", 1972, pp 42-47

increase in heat-treat temperature, a change was observed in the density of the 5S-electrons on the Sn nucleus. It is shown that the NGR method is very sensitive to the other tin-containing phases in Nb₃Sn. Three illustrations, one table, bibliography of seven titles.

2/2

UDC 669.1:539.166

USSR

NIKOLAYEV, I. N., MAKAROV, V. A., PUZEY, I. M., and PAVLYUKOV, L. S., Moscow Engineering Physics Institute, Institute of Precision Alloys, and Central Scientific Research Institute of Ferrous Metallurgy imeni I. P. Bardin

"Mossbauer Effect in Fe-Ni-Mn Invar Alloys"

Sverdlovsk, Fizika Metallov i Metallovedeniye, Vol 35, No 6, June 73, pp 1305-1307

Abstract: The Mossbauer effect was studied for nuclei of Fe^{57} in five samples $Fe_{65.5}(Ni_{1-x}Mn_x)_{34.5}$ in the interval $0.2 < x < 0.8$. After melting, the samples were annealed for five hours at $1000^{\circ}C$ and hardened. The resulting alloys were rolled into foil and annealed again for 0.5 hours at $700^{\circ}C$. Geometry of transmission was used in two modes of spectra measurements: constant velocities and constant accelerations. The method of spectra interpretation was done by determining the positions of centers of gravity of all samples at temperatures above $100^{\circ}K$ with an accuracy of ± 0.006 mm/sec. A $Co^{57}(Cr)$ was used at room temperature while sample temperature was varied from 4.2 to $370^{\circ}K$. A diagram of the magnetic states of the alloys was produced from the temperature relationship of the Mossbauer spectra, which revealed alloys

1/2

USSR

NIKOLAYEV, I. N., et al., Fizika Metallov i Metallovedeniye, Vol 35, No 6, Jun 73, pp 1305-1307

$Fe_{65.5}Ni_{5.5}Mn_{29}$, $Fe_{65.5}Ni_{26}Mn_{8.5}$, and $Fe_{65.5}Ni_{28}Mn_{5.5}$. The first alloy above was antiferromagnetic and is a doublet with a relatively small average and super-thin magnetic field. An anomaly was noted in the behavior of $\epsilon(T)$ which was explained by the fact that the relative shift in the spectrum is compensated by a chemical shift that decreases the total shift with reduced temperature. In this case the decrease in isomeric chemical shift signifies an increase in the density of s-electrons in Fe^{57} nuclei and that there is a change in the electron configuration of the iron atoms during the transition from the paramagnetic to the ferromagnetic state. YE. G. PONYATOVSKIY and G. T. DUBOVKA rendered assistance in this work. 2 figures, 5 bibliographic references.

2/2

- 51 -

USSR

UDC 621.378.33+535.8:535.241.13

NIKOLAYEV, I. V., KOBLOVA, M. M.

"Modulation of Optical Radiation on a Wavelength of 10.6 μ "

Moscow, Kvantovaya Elektronika, No 2, 1971, pp 57-64

Abstract: The authors investigated the optical and electro-optical properties of crystals of gallium arsenide (GaAs), and of cadmium sulfide, selenide and telluride (CdS, CdSe and CdTe) which are transparent on a wavelength of 10.6 μ . The crystals were studied to see if they could be used to modulate emission from lasers operating on a mixture of CO₂, He and N₂. The effectiveness of the crystals is compared with respect to the results of measurements. Computational formulas are presented and modulator designs are described. It was found that emission from a CO₂ laser can be modulated and that cadmium telluride is a promising material for this purpose. Further research is needed to find more effective materials and to develop circuits which enable a reduction in the controlling voltage using the same electro-optical materials. Six illustrations, two tables, bibliography of ten titles.

1/1

NIKOLA

Kuliyev, T. A., Husnel', Ye. R., Farygin, V. N.	Electron-beam Light Modulator	234
Husnel', Ye. R., Pary- kin, V. N., Solomatin, V. S., Agilov, V. B.	Internal Modulation of a Gas Laser	239
Pankratov, V. M., Pet- rova, I. V., Ponom- reny, I. P., Fomichay, N. N.	Visible and Infrared Light Modulator Based on a Lithium Metasilicate Crystal with 90° Orientation	248
Pankratov, V. M., Petrova, I. V., Ponomareva, I. P., Zudchay, N. N.	Wide Band Light Modulator Based on a Lithium Metasilicate Crystal with 90° Orientation	253
Haglich, L. N.	Phase Relations of the Synchronous Mode of Laser Emission with Modulated Dielectric Constant of the Resonator	258
Derjugin, I. A., Solomko, A. A.	Nonlinear Distortions in Microwave Modulators of Laser Emission	262
Kovlova, M. K., Nikolayev, I. V.	Utilization of Gallium Arsenide Crystals for Modulation of Radiation with a Wavelength of $\lambda \sim 10.6$ microns	268
Ton'ko, V. D.	Some Types of Parady Modulators and Their Nonlinear Distortions	273
Don'ko, V. D.	Method of Simultaneous Determination of the Frequency Characteristics of the Photoreceiver and Parady Modulator	278
Bilidenko, B. F., Obonenko, Yu. L.	Application of a Reflection Acoustic Cell for Synchronization of the Pulse Laser Emission	280
Smagolov, Yu. D., Kajstrov, Ye. G.	Wideband Light Detector	283
Pyg, A. S., Shtekin, N. P.	Sensitivity and Inertia of a Photodiode Light Receiver with Parametric Amplifier	293
Plyun', A. S., Muk'kov, G. I.	High-Frequency and Low Inertia Photoreceiver Light Detector with Superhigh-Frequency Bias ...	299

36

TECHNICAL TRANSLATION

ARM | FSTC/HT-23-2015-72

29 Nov 72

ENGLISH TITLE: PROBLEMS OF LASER BEAM DATA TRANSMISSION
PROCEEDINGS OF THE FIRST ALL-UNION CONFERENCE, KIEV,
SEPTEMBER 1968

FOREIGN TITLE: ПРОБЛЕМЫ ПЕРЕДАЧИ ИНФОРМАЦИИ ЛАЗЕРНЫМ ИЗЛУЧЕНИЕМ

AUTHOR: I. A. DENUCIN, ET AL.

SOURCE: KIEV ORDER OF LENIN STATE UNIVERSITY
IHEM T. G. SCHERCHENKO

Translated for FSTC by AGSI

NOTICE

The contents of this publication have been translated as presented in the original text. No attempt has been made to verify the accuracy of any statement contained herein. This translation is published with a minimum of copy editing and graphics preparation in order to expedite the dissemination of information.

Approved for public release. Distribution unlimited.

- First Page -

USSR

UDC: 51

NIKOLAYEV, K. G., PLUZHNIKOV, L. N.

"Application of the Method of 'Branches and Boundaries' to the Problem of Locating the Enterprises of a Production Unit"

Moscow, Inzh. mat. metody v fiz. i kibernet.---sbornik (Engineering Mathematics Methods of Physics and Cybernetics---collection of works), vyp. 2, Atomizdat, 1973, pp 107-118 (from RZh-Matematika, No 8, Aug 73, abstract No 8V569 by Yu. Finkel'shteyn)

Translation: The paper examines the problem of selecting the optimum variant of locating a given set of enterprises on a delineated section. The section may have any shape; the enterprises are rectangular. The presence on the section of sites where construction is forbidden is not excluded. The goal function is a sum of terms representing the nature of the terrain (situation), cost of communications (connections), effectiveness of integration and blocking, compactness in locating the objects.

For solution of the problem, the authors propose an algorithm of branches and boundaries which accounts for the specifics of the problem,

1/2

USSR

NIKOLAYEV, K. G., and PLUSHNIKOV, L. N., Inzh. Mat. metody v fiz. i kibernet. vyp 2, Atomizdat, 1973, pp 107-118

and two approximating modifications of this algorithm. To reduce the number of branches, the authors introduce two simplifying assumptions: 1. The optimum solution is reached if the objects are located in one or more compact groups situated in the vicinity of one or more specially selected points of the territory. 2. As a step of the solution, we take only the optimum position of each object relative to those already located on preceding steps rather than any position. The authors present a detailed analysis and geometric illustration of an example with four objects for the exact and two approximating methods. Remarks are presented on storage economy in the computation process.

2/2

- 58 -

USSR

NIKOLAYEV, K. G., PLUZHNIKOV, L. N.

"Application of the Method of Branches and Bounds to the Placement of Enterprises in an Industrial Center"

Inzh. mat. metody fiz. i kibernet. [Engineering and Mathematical Methods in Physics and Cybernetics -- Collection of Works], No 2, Moscow, Atomizdat Press, 1973, pp 107-118 (Translated from Referativnyy Zhurnal - Kibernetika, No 8, 1973, Abstract No 8 V569 by Yu. Finkel'shteyn)

Translation: The problem is studied of selecting the optimal version of placement of a fixed set of enterprises in a given area. The area may have arbitrary shape, the enterprises are shaped as rectangles. It is not excluded that there may be areas where construction cannot be undertaken. The goal function is the sum of the components representing the nature of the terrain (situation), cost of connecting lines (connections) effectiveness of cooperation and blocing and compactness of placement of the objects.

An algorithm in branches and bounds considering the specifics of the problem and two approximate modifications of the algorithm are suggested for solution of the problem. In order to reduce the number of branches, the authors

USSR

NIKOLAYEV, K. G., PLUZHNIKOV, L. N., Inzh. mat. metody fiz. i kibernet., No 2, Moscow, Atmoizdat Press, 1973, pp 107-118

utilize two simplifying assumptions. 1. The optimal solution is achieved if the objects are place in one or a few compact groups around one or a few specially points in the territory. 2. Each step in the solution using the method of branches and bounds consists not of arbitrary placement of some object, but rather of its optimal placement relative to the objects already placed in earlier steps. An example with four objects is discussed in detail and geometrically illustrated for the precise and to approximate methods. Certain considerations are presented concerning savings of machine memory required for calculation.

2/2