Investigation of Complex Plutonium Oxalate Compounds by the Polarographic Method. 89-1-7/29

the polarographical data the constant for $[Pu(C_2O_4)]^{-4}$ were determined as follows:

$[Pu(C_2O_4)_3]^{-3}$: K = 2,2 . 10^{-11}

$[Pu(C_2O_4)_4]^{-5}$: K = 2,4 . 10^{-12}

$[Pu(C_2O_4)_4]^{-4}$: K = 33 . 10^{-28}

There are 4 figures, 6 tables, and 9 references, 1 of which is Slavic.

SUBMITTED: August 29, 1957.

AVAILABLE: Library of Congress.

Card 2/2

Fomin, V.V.

CHEMISTRY AND PHYSICAL CHEMISTRY OF REACTOR MATERIALS AND PROCESSES

"Study of Complex Oxalates of Plutonium by a Polarographic Method," by V. V. Fomin, S. P. Vorob'yev, and M. A. Andreyeva. Atomnaya Energiya, No 1, January 1958, pp 57-62.

A study of the composition and stability of complex ions of tri- and quadri-valent plutonium in oxalate solutions. If the potassium oxalate solutions have a pH of 3.5 to 6, the complexes $Pu\ (C_2O_4)_4^{-4}$ (predominant quantity) and $Pu\ (C_2O_4)_4^{-5}$ are formed. Under these conditions, Pu^{+4} gives a clearly-pronounced reversible reaction wave, suitable for quantitative polarographic determination of the plutonium. The oxidation-reduction potential of this reaction in one mole of potassium oxalate is 0.205 v. At a pH of 6 to 8, there simultaneously exist in the solutions two complexes of Pu^{+4}.

Bibliography of 9 titles.

Card: 1/1

Fomin, V.V.

78-2-42/43

AUTHORS: Fomin, V. V., Mayorova, Ye. P.

TITLE: The Extraction of Nitrous Acid in 1 Molar-Benzene Solution of Tributylphosphate (Ekstraktsiya azotnoy kisloty 1 mol rastvorom tributilfosfata v benzole)

PERIODICAL: Zhurnal Neorganicheskoy Khimii, 1958, Vol. 3, Nr 2, pp.540-541 (USSR)

ABSTRACT: The extraction of NHO_3 in 1 molar-benzene solution of tributylphosphate in HNO_3-concentrations higher than 3,5 Mol/l was investigated. For the distribution coefficients HNO_3 the following equations are given:

$$\alpha = \frac{c_{or}}{c_v} = \frac{\left[HNO_3 . TBP\right]_{or} + 2\left[(HNO_3)_2 \cdot TBP\right]_{or}}{(HNO_3)_v} =$$

$$= K_o \left[HNO_3\right]_v \left[TBP\right]_{or} + 2\ KoO\left[HNO_3\right]_v^3 \left[TBP\right]_{or} \qquad \text{and}$$

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78-2-42/43

The Extraction of Nitrous Acid in 1 Molar-Benzene Solution of Tributylphosphate

$$\alpha = \frac{K_o \left[HNO_3\right]_v \left(1 + 2 K \left[HNO_3\right]_v^2\right)}{1 + K_o \left[HNO_3\right]_v^2 + K_o K \left[HNO_3\right]_v^4}$$

K is calculated for $K_o = 0,22$ and for the distribution coefficient = 0,19. Values of 0,002 were found for K. The found values for α are in good agreement with the experimentally found values. E. g. for $\alpha = 0,10$ experimentally $\alpha = 0,10$ is found, for $\alpha = 0,017$ - $\alpha = 0,16$, for $\alpha = 0,21$ - $\alpha = 0,23$. There are 1 table, and 1 reference, which is Slavic.

SUBMITTED: June 17, 1957

AVAILABLE: Library of Congress

Card 2/2

AUTHORS: Mayorova, Ye. P., Fomin, V. V. SOV/78-3-8-35/48

TITLE: The Extraction of Thorium by Means of Tributylphosphate (Ekstraktsiya toriya tributilfosfatom) III. The Effect of SO_4^{2-} Ions on the Distribution of Thorium (III. Vliyaniye ionov SO_4^{2-} na raspredeleniye toriya)

PERIODICAL: Zhurnal neorganicheskoy khimii, 1958, Vol. 3, Nr 8, pp. 1937-1954 (USSR)

ABSTRACT: Experiments with SO_4^{2-} ions were carried out to determine the stability constant of thorium; these experiments supplied the distribution coefficients of thorium between the aqueous phase, containing the ions H^+ and NO_3^-, and the solvent tributyl phosphate in benzene. The ionic force in the aqueous solution being in equilibrium is kept constant in all experiments (1,7). The experiments demonstrated that sulfuric acid is not extracted by tributyl phosphate. The experiments carried out to determine the distribution coefficient of thorium were carried out at the following ratios:

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SOV/78-3-8-35/48

The Extraction of Thorium by Means of Tributylphosphate. III. The Effect of SO_4^{2-} Ions on the Distribution of Thorium

$[H^+]$ = 0,3 mole/l, $[NO_3^-]$ = 1,7 - 0,3 mole/l, $[HSO_4^-]$ = 0,01 - -0,05 mole/l.

The complex ions of thorium with two addenda contain only one SO_4^{2-} group and not more than three NO_3^- groups.

The stability constant of complex ions of the molecules $Th(SO_4)^{2+}$, $Th(SO_4)_2$, $Th(NO_3).(SO_4)^+$, $Th(NO_3)_2SO_4$ and $Th(NO_3)_3SO_4^-$ were calculated and the following values were found: 200, 2500, 1950, 1100 and 500.

There are 10 figures, 14 tables, and 7 references, 2 of which are Soviet.

SUBMITTED: November 15, 1957

Card 2/2

SOV/78-3-9-2/38

AUTHORS: Fomin, V. V., Dmitriyeva, N. A., Reznikova, V. Ye.

TITLE: Preparation and Properties of Plutonium Halides (Poluoheniye i svoystva galogenidov plutoniya) I. On Plutonium Chlorides (I. O khloridakh plutoniya)

PERIODICAL: Zhurnal neorganicheskoy khimii, 1958, Vol 3, Nr 9, pp 1999-2005 (USSR)

ABSTRACT: The chlorination of plutonium at increased CCl_4 pressure was investigated. When chlorinating micro-quantities of thorium and plutonium, it was ascertained that the sublimation of the developed plutonium chloride in a CCl_4 current at low temperature proceeds like that of thorium. In the chlorination of UO_2 and PuO_2 by carbon-tetrachloride vapors uranium dioxide at a temperature of 350-450°C is transformed into uranium tetrachloride. At about 500°C plutonium oxide is transformed into plutonium-III-chloride. The specific weight of $PuCl_3$ is 5,33 g/cm^3. In the vaporization of hydrochloric solutions of plutonium-IV-

Card 1/2

SOV/78-3-9-2/38

Preparation and Properties of Plutonium Halides. I. On Plutonium Chlorides

chloride at 70-100°C in the air, a compound is separated in which the ratio Pu : Cl is 2 : 3. In vacuum this compound separates water and oxygen. The possibilities of preparing plutonium-III-chloride by thermodynamical methods were discussed. In the chlorination of plutonium oxide in the presence of rubidium chloride a red-orange substance is formed. The adsorption spectrum of this compound indicates the presence of the Pu-IV-ion in solution. This experiment demonstrates that the preparation of complex chloride of tetravalent plutonium by the dry method is possible. There are 1 figure, 5 tables, and 12 references, 4 of which are Soviet.

SUBMITTED: April 11, 1958

Card 2/2

SOV/78-3-9-17/38

AUTHORS: Fomin, V. V., Mayorova, Ye. P., Krapivin, M. I., Yudina, V. G.

TITLE: The Extraction of Plutonium-(IV) With Tributyl Phosphate (Ekstraktsiya plutoniya (IV) tributilfosfatom) I. The Dependence of the Distribution Coefficient on the Concentration of Tributyl Phosphate (I. Zavisimost' koeffitsiyenta raspredeleniya ot kontsentratsii tributilfosfata)

PERIODICAL: Zhurnal neorganicheskoy khimii, 1958, Vol 3, Nr 9, pp 2113-2116 (USSR)

ABSTRACT: The dependence of the distribution coefficient in the extraction of plutonium-IV compounds with tributyl phosphate was investigated. In the calculation of the distribution coefficient the term "true distribution coefficient" was introduced. The distribution coefficient for n-experiments is given in the case of subsequent extractions taking into account the apparent and the true distribution coefficient by the equation (11):

$$\alpha^{(n)} = \frac{\alpha^{0}(1 - p)}{(1-p)+p(\alpha^{0}+1)^{2}} \qquad (11)$$

Card 1/2 The extraction of plutonium-IV compounds was carried out with a

SOV/78-3-9-17/38

The Extraction of Plutonium-(IV) With Tributyl Phosphate. I. The Dependence of the Distribution Coefficient on the Concentration of Tributyl Phosphate

1,5 mol solution of tributyl phosphate in benzene at 2,0 mol HNO_3. The true distribution coefficient of plutonium was calculated from the experimental results for the determination of the distribution coefficient of plutonium with concentrated tributyl phosphate. The not extracted residue was investigated with respect to the α-radiation, and it was found that besides Pu^{239} also Am^{241} exists. There are 2 figures, 2 tables, and 2 references, 1 of which is Soviet.

SUBMITTED: August 3, 1957

Card 2/2

SOV/78-3-10-2/35

AUTHORS: Fomin, V. V., Reznikova, V. Ye., Zaytseva, L. L.

TITLE: The Production of Plutonium Tribromide and Some of Its Properties (Polucheniye i nekotoryye svoystva tribromida plutoniya)

PERIODICAL: Zhurnal neorganicheskoy khimii, 1958, Vol 3, Nr 10, pp 2231-2235 (USSR)

ABSTRACT: The spectra of absorption of solid plutonium tribromide were taken at the temperature of liquid nitrogen. A method was described according to which plutonium tribromide can be produced by acting HBr on plutonium (IV)-oxalate at a temperature of 500°C. The specific weight of plutonium tribromide thus produced is 5,54 ± 0,02. The density of plutonium tribromide depends on the composition of the compounds which are treated with HBr. The values vary between 5,0 g/cm^3 and 5,8 g/cm^3. The hygroscopic properties of plutonium tribromide were analyzed and it was found that the bromide does not show a perceptible moisture absorption after it has been kept over sulfuric acid for 7 hours. The existence of two crystal hydrates of $PuBr_3$ was found and their spectra of absorption were taken. It was found that $PuBr_3$

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SOV/78-3-10-2/35

The Production of Plutonium Tribromide and Some of Its Properties

and its crystal-hydrate compounds decompose when α-rays act on them. The decomposition of bromides by action of α-radiation is observed by the appearance of bromine vapor over $PuBr_3$.

There are 3 figures, 1 table, and 5 references, 3 of which are Soviet.

SUBMITTED: April 14, 1958

Card 2/2

66396

24.3430 SOV/58-59-10-23678

Translation from: Referativnyy Zhurnal, Fizika, 1959, Nr 10, p 273 (USSR)

AUTHORS: Korovina, I.A., Lipis, L.V., Fomin, V.V.

TITLE: On the Ultraviolet Absorption Spectra of Plutonium Compounds

PERIODICAL: Fiz. sb. L'vovsk. un-t, 1958, Nr 4(9), pp 175 - 180

ABSTRACT: The spectrum of solutions of Pu (VI) and Pu (IV) in 2 n. perchloric and hydrochloric acids in the 200 to 400 mμ region consists of one intensive band which is apparently caused by transitions of the 5f-6d type. Its position and absorption coefficient ε ($mole^{-1} \cdot l \cdot cm^{-1}$) in $HClO_4$ and HCl are respectively 210, 50,000 and 3,600 mμ for Pu (VI) and 213, 2,650 and 2,550 mμ for Pu (IV). Two bands of 236 and ~ 216 mμ are observed in the spectrum of the hydrochloric acid solution of Pu (III). When nitric acid is added to the Pu (IV) solution, the band maximum shifts toward the greater wavelengths (a shift of 48 mμ in 1 n. HNO_3), its intensity decreases, and a new band with a maximum of ~ 320 mμ and an ε of ~ 500 emerges. In 2 n. H_2SO_4, on the other hand, as a result of the formation of a sulfatic complex, the 213 mμ band shifts to 209 mμ, and its

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66396

On the Ultraviolet Absorption Spectra of Plutonium Compounds SOV/58-59-10-23678

intensity increases. In addition, absorption appears in the 250 to 260 m μ region. When the Pu (IV)/$H_2C_2O_4$ ratio changes from 1 : 0 to 1 : 1 (the concentration of Pu remaining constant), ε increases linearly from 2,650 to 4,500. The constant of the Pu $(IV) + HC_2O_4^- \rightleftarrows PuC_2O_4^{2+} + H^+$ reaction is equal to $(3.0 \pm 1.8) \cdot 10^5$. (Khim.-tekhn. in-t im. Mendeleyeva, Moscow).

D. Suglobov

Card 2/2

AUTHORS: Kartushova, R. Ye., Rudenko, T. I., Fomin, V. V. SOV/89-5-1-2/28

TITLE: The Thermal Dissociation of the Oxalates of Quadrivalent and Trivalent Plutonium (Termicheskoye razlozheniye oksalatov chetyrekhvalentnogo i trekhvalentnogo plutoniya)

PERIODICAL: Atomnaya energiya, 1958, Vol. 5, Nr 1, pp. 24-28 (USSR)

ABSTRACT: By means of a recording pyrometer developed by Kurnakov, the process of thermal dissociation (pyrolysis) of various types of plutonium was investigated. The state of intermediate products was determined in the Berg type gas pyrette, by potentiometric titration as well as by the method developed by Penfield (Penfil'd). It was found that the freshly precipitated oxalate of Pu (IV) loses 3 molecules of water at 100° C. From oxalates which had been stored for 3-4 days 1,5 to 2,7% $CO+CO_2$ are in addition separated at 100° C as a result of dissociation caused by the effect of the plutonium α-rays. At the same time partial reduction to trivalent plutonium takes place. Within the temperature range of from 170-200° C 2 molecules of water and 13% $CO+CO_2$ are, in addition, separated. The plutonium is reduced to the trivalent state mainly by the formation of $Pu_2(C_2O_4)_3.H_2O$.

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The Thermal Dissociation of the Oxalates of Quadrivalent and Trivalent Plutonium SOV/89-5-1-2/28

At 380° C the oxalate is transformed into plutonium dioxide. At 140° C the oxalate of Pu (III) is completely freed from water and goes over into plutonium oxide at 270° C in the air. In an inert medium dissociation of the oxalate takes place at 330° C accompanied by the formation of an oxalate carbonate. At 460° C the oxalate carbonate is dissociated and the trivalent plutonium is oxidized to quadrivalent plutonium, while, at the same time, a dioxide is formed. There are 4 figures, 4 tables, and 6 references, 2 of which are Soviet.

SUBMITTED: December 14, 1957

1. Plutonium--Decomposition 2. Plutonium oxylates--Chemical reactions 3. Titration--Applications 4. Gamma rays--Performance

Card 2/2

KOROVINA, I.A.; LIPIS, L.V.; FOMIN, V.V.

Ultraviolet absorption spectra of plutonium compounds. Fiz. sbor. no.4:175-180 '58. (MIRA 12:5)

1. Moskovskiy ordena Lenina khimiko-tekhnologicheskiy institut imeni D.I.Mendeleyeva.
(Plutonium compounds--Spectra)

5(2) SOV/20-123-4-31/53

AUTHORS: Zaborenko, K. B., Kolosov, I. V., Fomin, V. V.

TITLE: Determination of the Composition and the Stability Constants of Lead Chloride Complexes by Experiments on the Distribution of the Radioactive Isotope Between Precipitate and Solution (Opredeleniye sostava i konstant ustoychivosti khloridnykh kompleksov svintsa iz opytov po raspredeleniyu radioaktivnogo izotopa mezhdu osadkom i rastvorom)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 123, Nr 4, pp 688 - 690 (USSR)

ABSTRACT: A true thermodynamic equilibrium can be obtained in the distribution of a trace element(m)between the precipitate and the solution of an isomorphous compound of the macrocomponent (M) (Ref 1). The authors considered the co-crystallization to be a reversible exchange reaction of ions of the same valence and derive the equilibrium constant of this reaction (Equation 1). However, all activity coefficients are constant in the case of a low concentration of the microcomponent (m) in the solid phase and at an ionic strength of the solution

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Determination of the Composition and the Stability Constants SOV/20-123-4-31/53
of Lead Chloride Complexes by Experiments on the Distribution of the Radio-
active Isotope Between Precipitate and Solution

which is kept practically constant. For this reason, the concentration can be substituted for the activities, by including all activity coefficients in the equilibrium constant. The equation (1) may also be used in the case of the distribution of isomorphous ions of the macrocomponent between the surface and the solution (primary ion exchanging adsorption. It was proved that (Ref 1) the presence of ions forming complexes with M or m changes the distribution "constant". Furtheron the value calculated according to equation (1) is called distribution coefficient, with the analytical concentration determined experimentally being substituted for the equilibrium concentration. The change of this coefficient in dependence on the concentration of the complex forming ion points to the existence of complex ions in the solution (examples are given in references 2,3). It can be proved that the change D is entirely determined by the change of the activity. The authors suggested a method of calculation as mentioned in the title. They investigated the distribution in

Card 2/4

Determination of the Composition and the Stability Constants SOV/20-123-4-31/53 of Lead Chloride Complexes by Experiments on the Distribution of the Radioactive Isotope Between Precipitate and Solution

the system $SrSO_4$-Pb^{212}-SO_4-HCl (methods of references 1,4,5). If the experimental results are expressed by the formula $D = \frac{x}{y} \frac{1-y}{1-x}$ (2), where x and y are the shares of the micro and macrocomponents in the precipitate, and 1-x and 1-y the corresponding shares in the solution, then D_o=K in the absence of the complex former; if, however, in the presence of the complex former the analytical concentration is substituted in formula (2) the distribution coefficient will be a function of the concentration of the ions of the complex former. After various calculations the authors obtained the formula for the distribution coefficient:

$$\frac{D_o}{D} - 1 = \sum \beta_j \left[Cl' \right]^j \quad (5).$$

As may be seen,

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equation (5) is similar to the known equations for ion exchange

Determination of the Composition and the Stability Constants SOV/20-123-4-31/53
of Lead Chloride Complexes by Experiments on the Distribution of the Radioactive Isotope Between Precipitate and Solution

and extraction. There are 10 references, 7 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University imeni M. V. Lomonosov)

PRESENTED: July 12, 1958, by V. I. Spitsyn, Academician

SUBMITTED: July 5, 1958

Card 4/4

Fomin, V.V.

Ginzburg, F.L.

21 (0), 5 (0)

AUTHOR: Shchebetkovskiy, V. N. SOV/89-7-2-17/24

TITLE: All-Union Symposium on Radiochemistry (Vsesoyuznyy simpozium po radiokhimii)

PERIODICAL: Atomnaya energiya, 1959, Vol 7, Nr 2, pp 175-176 (USSR)

ABSTRACT: A symposium was held in Leningrad from 3 to 5 March 1959. More than 200 participants from different institutes in Moscow, Leningrad, Kiyev, Novosibirsk, Tbilisi and Gor'kiy attended it. Twentyeight papers were read. The following are mentioned: I. Ye. Starik: On the problem of the molecular state of micromasses of radioactive elements in solutions; I. Ye. Starik, N. I. Ampelogova, F. L. Ginzburg, L. I. Il'menkova, I. A. Skul'skiy, L. D. Sheydina: Condition of radioactive elements occurring in microconcentrations of solutions (Zr, Am, Pa, Po). M. S. Yakovleva, M. A. Shurshalina: Application of the dialysis method for examination of uranium carriers in natural bodies of water; V. I. Paramonova, Ye. F. Latyshev: Complex formation of the multivalent ruthenium with chlorine ions. K. B. Zaborenko, A. V. Zaval'skaya, V. V. Fomin: Determination of the composition and the instability constants by ion exchange of the cerium oxalate complexes. A. I. Moskvin: Complex formation of plutonium and americium with the anions of

Card 1/3

ethylene diamine tetra acetic acid (EDTA) and oxalic and phosphoric acid. A. M. Trofimov, L. N. Stiganova: A new method for the determination of ion charges of radioactive elements in solutions by application of ion exchanging resins of different swelling capacities. N. B. Vysokoostrovskaya, A. M. Trofimov, B. N. Nikol'skiy: Confirmation of the non-existence of complex formation between potassium and EDTA by application of the ion exchange and the potentiometric methods. V. M. Vdovenko, Ye. A. Smirnova: Determination of the conditions of compounds to be extracted in the organic phase (hydration of uranyl nitrate with ester). V. M. Vdovenko, N. P. [illegible]: Degree of hydration of nitric acid in dibutyl ether of the diethylene glycol. V. M. Vdovenko, A. S. Krivokhatskiy: Degree of solvation of the nitric acid in the dibutyl ether of the diethylene glycol. A. K. Lavrukhina: Determination of the dependency of the distribution coefficients between the organic and the watery phases in order to determine the condition of the substance in the solution and to fixate the concentration range at which complex formation starts. V. I. Kuznetsov, P. D. [illegible] lectured on extraction of hexavalent tungsten with aniline from hydrochloric media. An. N. Nesmeyanov on substitution of hydrogen in benzol by the recoil

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atoms P^{32}, As^{76} and Sb^{124}. B. G. Dzantiyev lectured on the recoil atoms from the reactions of $Li^6(n,\alpha)T$, $N^{14}(n,p)C^{14}$ in a medium of cyclic hydrocarbons. [illegible] lectured on the influence of the NO_3 and H^+ ions on the reduction velocity of hexavalent plutonium under the influence of its own α-radiation. In the course of thorough discussions it was established that the comprehension of the condition of radioactive elements in solution are of eminent importance for the whole range of radio chemistry. More studies have to be made in this field as were made before. A better coordination of all the institutes which are occupied with this problem will yield good results in the future.

PHASE I BOOK EXPLOITATION SOV/5084

International Conference on the Peaceful Uses of Atomic Energy. 2d, Geneva, 1958.

Doklady sovetskikh uchenykh. [t.4] Khimiya radioelementov i radiatsionnykh prevrashcheniy (Reports of Soviet Scientists. v. 4.: Chemistry of Radioelements and Radiation Transformations) Moscow, Atomizdat, 1959. 323 p. 8,000 copies printed. (Series: Its: Trudy)

Ed. (Title page): A. P. Vinogradov, Academician; Ed.: V. I. Labaznov; Tech. Ed.: Ye. I. Masel'.

PURPOSE: This collection of articles is intended for scientists and engineers interested in the applications of radioactive materials in science and industry.

COVERAGE: The book contains 26 separate studies concerning various aspects of the chemistry of certain radioactive elements and the processes of radiation effect on matter. These reports discuss present-day methods of reprocessing irradiated nuclear fuel, research in the chemistry of mercury, thorium, uranium, plutonium, and americium, problems related to the sorption and burying of radioactive wastes, the radiolysis of aqueous solutions and of organic compounds, the mechanism of polymer chain grafting, and the effect of radiation on natural and synthetic rubbers. V. N. Prusakov edited the present volume. Most of the reports are accompanied by references. Contributors to individual investigations are mentioned in annotations to the Table of Contents.

[illegible]

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5(4)

AUTHORS: Fomin, V. V., Zagorets, P. A., Morgunov, A. F.

SOV/78-4-3-33/34

TITLE: The Extraction of Sulfuric Acid With Benzene Solution of Trioctyl Amine (Ekstraktsiya sernoy kisloty rastvorom trioktilamina v benzole)

PERIODICAL: Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 3, pp 700-701 (USSR)

ABSTRACT: The extraction of sulfuric acid by benzene solutions of trioctyl amine (TOA=R) was investigated at different acidity. For the investigation of polymerization the cryoscopic method was used. It was found that in the case of low acidity of the solution $(RH)_2SO_4$ is formed which, with increasing concentration, polymerizes in the organic phase. In the case of excessive sulfuric acid the normal sulfate passes over into acid sulfate $[RHHSO_4]_3$ which forms polymers from 3.3 - 3.4 molecules. The polymerization constants calculated hold only in the case of the polymers $[(RH)_2SO_4]_2$ or $[(RH)_2SO_4]_3$. There are 2 tables and 3 references, 2 of which are Soviet.

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The Extraction of Sulfuric Acid With Benzene Solution of Trioctyl Amine SOV/78-4-3-33/34

ASSOCIATION: Moskovskiy ordena Lenina khimiko-tekhnologicheskiy institut im. D. I. Mendeleyeva (Moscow Lenin Order Chemical-technological Institute imeni D. I. Mendeleyev)

SUBMITTED: October 12, 1958

Card 2/2

5(2), 21(1) SOV/78-4-5-1/46

AUTHORS: Alenchikova, I. F., Zaytseva, L. L., Lipis, L. V., Fomin, V. V.

TITLE: Separation and Investigation of the Physico-chemical Properties of Plutonyl-chloride (Vydeleniye i izucheniye fiziko-khimicheskikh svoystv khloristogo plutonila)

PERIODICAL: Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 5, pp 961-962 (USSR)

ABSTRACT: The synthesis of plutonyl chloride was carried out by the vacuum vaporization of a plutonyl chloride solution at room temperature. Plutonyl chloride was isolated in form of greenish-yellow crystals of the composition $PuO_2Cl_2.6H_2O$. By means of electrons and infrared absorption spectra of the plutonyl chloride crystals it was proved that this compound contains PuO_2^{2+}-ions and that no Pu(IV) is present. The spectra of the crystals were photographed by means of the spectrograph ISP-51 (the camera had a focal length of 270 mm) within the range of 4200 - 9800 Å. After a longer storage of the plutonyl chloride preparation the infrared- and electron adsorption

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SOV/78-4-5-1/46

Separation and Investigation of the Physico-chemical Properties of Plutonyl-chloride

spectra undergo a considerable change. Absorption lines occur in such spectra which are characteristic of Pu^{4+}. Under the action of a α-radiation a reduction of Pu(VI) into Pu(IV) takes place. The analysis values of plutonyl chloride are shown in a table and the absorption spectra of various solutions and of the obtained crystal of the plutonyl chloride are shown by figures 1 - 4. There are 4 figures, 1 table, and 2 references, 1 of which is Soviet.

SUBMITTED: April 7, 1958

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5(2) SOV/78-4-10-17/40

AUTHORS: Fomin, V. V., Zagorets, P. A., Morgunov, A. F., Tertishnik, I.I.

TITLE: Extraction of Iron Chloride by Means of Dibutyl Ether

PERIODICAL: Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 10, pp 2276-2286 (USSR)

ABSTRACT: The extraction of $FeCl_3$ from hydrochloric acid solutions by means of organic solvents was discussed frequently (Refs 1-16), but no paper gave the structure of the solvates which $FeCl_3$ forms there in the organic phase. On passing HCl through a solution of $FeCl_3$ in anhydrous isopropyl ether Lorin et al (Ref 9) obtained an insoluble precipitate of the composition $HFeCl_4 \cdot 2E$ (E = ether), which dissolved on addition of water. There are no indications available with respect to the solvation of the compound dissolved. In order to investigate the composition of such solvates, the dependence of the partition coefficient on the concentration of the extracting agent on dilution with an inert solvent and maintenance of all other conditions was investigated. This method is based on the fact that

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the extraction is considered a chemical reaction: $Fe^{3+}_{aqu} + H^{+}_{aqu} + xE_{org} + yH_2O \rightleftharpoons HFeCl_4.xE.yH_2O_{org}$ (org=organic phase). If the concentration of the ions H^+ and Cl^- is kept constant and no polymerization occurs, the logarithm of the partition coefficient must be a linear function of the equilibrium concentration of the ether. In order to be able to maintain the concentration of H^+ and Cl^-, it must be known, how far the acid is extracted by the ether. Therefore the first part of this paper deals with the extraction of HCl by dibutyl ether (DBE) and by mixtures of DBE and CCl_4 and DBE and benzene (Tables 1-3, Figs 1-3). The results indicate that in the organic phase the compound HCl.DBE occurs which is also confirmed by cryoscopy. Then, the extraction of $FeCl_3$ with the same solvents is investigated (Tables 6-7, Fig 4). On extraction from 10-n HCl the trisolvate $FeCl_3.xHCl.3DBE.yH_2O$ is formed in the organic phase. If DBE is diluted with benzene, the partition coefficient is directly proportional to the third power of the DBE activity, whereas on dilution with CCl_4 the partition coefficient decreases more rapidly than would correspond with the

SOV/78-4-10-17/40

Extraction of Iron Chloride by Means of Dibutyl Ether

calculated activity of DBE. There are 4 figures, 10 tables, and 22 references, 4 of which are Soviet.

ASSOCIATION: Moskovskiy khimiko-tekhnologicheskiy institut im. D. I. Mendeleyeva (Moscow Institute of Chemical Technology imeni D. I. Mendeleyev)

SUBMITTED: July 2, 1958

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5(2)

05866

SOV/78-4-11-19/50

AUTHORS: Mayorova, Ye.P., Fomin, V.V.

TITLE: The Influence Exercised by Sulphate Ions on the Distribution Coefficient of Macroquantities of Thorium in the Extraction by Tributyl Phosphate

PERIODICAL: Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 11, pp 2511-2514 (USSR)

ABSTRACT: In previous papers (Refs 1-3) the authors calculated the stability constants of the ions $Th(NO_3)_j^{4-j}$, $Th(SO_4)_k^{4-2k}$ and $Th(NO_3)_j.(SO_4)_k^{4-j-2k}$ as well as the reaction constant for the formation of the compound $Th(NO_3)_4.2TBPh$ (TBPh = tributyl phosphate). These experiments were made with microquantities of thallium. The authors dealt with the problem as to whether the resultant constants held also for the extraction of weighable thorium quantities by means of TBPh from sulphate-nitrate solutions of an ionic strength of 1.7. The ionic strength was kept constant by corresponding additions of $NaClO_4$. The experimental and the calculated coefficients

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05866

The Influence Exercised by Sulphate Ions on the Distribution Coefficient of Macroquantities of Thorium in the Extraction by Tributyl Phosphate

SOV/78-4-11-19/50

are compared in table 1. Herefrom it may be seen that a change in the composition of the solution does not affect the values of the constants at constant ionic strength. The coefficients obtained therefore hold also for weighable amounts of thorium. There are 1 table and 3 Soviet references.

SUBMITTED: August 18, 1958

Card 2/2

FOMIN, Vladimir Vladimirovich; ALYAB'YEV, A.F., red.; MAZEL', Ye.M., tekhn.red.

[Chemistry of extraction processes] Khimiia ekstraktsionnykh protsessov. Moskva, Gos.izd-vo lit-ry v oblasti atomnoi nauki i tekhniki, 1960. 165 p. (MIRA 14:3)
(Extraction (Chemistry))

LIPIS, L.V.; POZHARSKIY, B.G.; FOMIN, V.V.

Spectrophotometric study of the processes involving complex formation by tetravalent plutonium in nitric acid solutions. Zhur. struk. khim. 1 no.2:135-144 Jl-Ag '60. (MIRA 13:9)
(Plutonium compounds--Spectra)

LIPIS, L.V.; POZHARSKIY, B.G.; FOMIN, V.V.

Complex formation by tetravalent plutonium in sulfuric acid solutions. Zhur. strukt. khim. 1 no.4:417-424 N-D '60.
(MIRA 14:2)

(Plutonium compounds)

~~5(2)~~ 5.1110

68122
SOV/78-5-1-42/45

AUTHORS: Fomin, V. V., Morgunov, A. F.

TITLE: Extraction by Means of a Binary Extracting Mixture

PERIODICAL: Zhurnal neorganicheskoy khimii, 1960, Vol 5, Nr 1, pp 233-234 (USSR)

ABSTRACT: In the present paper the authors investigated the extraction of $UO_2(NO_3)_2$ and HNO_3 by means of cyclohexanone, methyl-isobutyl ketone (hexone) and their mixture as well as the extraction of $FeCl_3$ by means of ethers and their mixtures. Figure 1 shows the dependence of the logarithm of the distribution coefficient α on the logarithm of concentration S of the extracting agent. The determination was carried out at 20±0.2°. It was attempted to extract $FeCl_3$ by means of diisopropyl ether (DPE) and diisoamyl ether (DAE). In the extraction of uranyl nitrate and nitric acid there is a linear dependence of the logarithm of α on the logarithm of concentration of the ketones (Kt) with a concentration of up to 4 moles/l of the latter. For the straight section it holds that $\alpha = KS^n$ according to the formation of one solvate with n molecules of the ex-

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SOV/78-5-1-42/45

Extraction by Means of a Binary Extracting Mixture

tracting agent per 1 molecule of the extracted substance. The formation of the solvates $HNO_3 \cdot 2Kt$, $UO_2(NO_3)_2 \cdot 4Kt$ may be seen from the slope of the straight. The solvate $HFeCl_4 \cdot 4DPE$ results in the extraction of $FeCl_3$, whereas in the case of DAE (n=2.5) either the formation of two solvates ($HFeCl_4 \cdot 2DAE$ and $HFeCl_4 \cdot 3DAE$) or a considerable change of the activity coefficients in the organic phase is assumed. Figure 2 illustrates the dependence of the distribution coefficient upon the composition of the organic phases for the extraction with the benzene solution of two extracting agents. In all cases this distribution coefficient was greater than the sum of distribution coefficients of the individual components wherefrom the formation of mixed solvates was concluded. There are 2 figures and 2 Soviet references.

ASSOCIATION: Moskovskiy ordena Lenina khimiko-tekhnologicheskiy institut im. D. I. Mendeleyeva (Moscow "Order of Lenin" Institute of Chemical Technology imeni D. I. Mendeleyev)

SUBMITTED: July 3, 1959

Card 2/2

~~56995~~ 69035

S/078/60/005/05/10/037
B004/B016

21.1320
5.2200

AUTHORS: Yegorov, G. F., Fomin, V. V., Frolov, Yu. G., Yagodin, G. A.

TITLE: Solvate Forms of Zirconium- and Hafnium Nitrates With Tributyl Phosphate

PERIODICAL: Zhurnal neorganicheskoy khimii, 1960, Vol. 5, No. 5, pp. 1044-1050

TEXT: In the introduction, the authors mention in brief the problems dealt with: preparation of zirconium with a minimum hafnium content, investigation of the mechanism of the $(C_4H_9O)_3PO$ (TBP) extraction, investigation of the solvate form. Next, they describe the purification of the reagents. The partition coefficients of Zr and Hf were determined by means of Zr^{95} and [illegible] Hf^{181}. The resultant Nb^{95} was separated from Zr^{95} by means of MnO_2. The extractions were carried out at 20° and at a zirconium- and hafnium concentration of 10^{-5} moles/l. First of all, the extraction of nitric acid by tributyl phosphate (TBP) at different acidity and concentration of the NO_3^-

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~~65935~~ 69535

Solvate Forms of Zirconium- and Hafnium
Nitrates With Tributyl Phosphate

S/078/60/005/05/10/037
B004/B016

ions was investigated. In this connection, the authors refer to papers by A. S. Solovkin (Ref. 2), A. M. Rozen (Ref. 6), V. V. Fomin, and Ye. P. Mayorova (Refs. 3,4,7). The existence of the complexes $TBP.HNO_3$ and $TBP.2HNO_3$ assumed by the last-mentioned authors in Ref. 7, and the values of their instability constants (0.22 and 0.00044) were confirmed experimentally (Table 1). Xylene was used as the solvent for TBP. The dependence of the nitric-acid extraction on the concentration of hydrogen ions and in the presence of $NaNO_3$, NH_4NO_3, $LiNO_3$ or $Mg(NO_3)_2$ is shown in table 2. The mechanism assumed of HNO_3 extraction holds in a wide range also in the presence of an excess of NO_3^- ions. It is proved for the extraction of Zr and Hf that the partition coefficients α are proportional to the concentration of free TBP in the organic phase. The number of solvating TBP molecules was determined from the dependence of $\log\alpha$ on $\log(TBP)_{org}$. Experimental data for zirconium are presented in table 3, for hafnium in table 4. It resulted that partition coefficients of Zr and Hf increased with increasing TBP con-

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69535

Solvate Forms of Zirconium- and Hafnium Nitrates With Tributyl Phosphate

S/078/60/005/05/10/037
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centration in the organic phase. On the basis of the diagram log α, log(TBP) (Fig. 1), the formation of the solvate $Me(NO_3)_4 \cdot TBP$ results, for low TBP concentrations and the solvate $Me(NO_3)_4 \cdot 2TBP$ for higher TBP concentrations. At HNO_3 concentrations of 5 moles/l the formation of more complicated complexes is assumed, which, however, was not further investigated. Figs. 2,3 depict the dependence of the partition coefficients of Zr and Hf on the hydrogen-ion concentration and the concentration of the added nitrates. The α-values decrease with decreasing hydrogen-ion concentration. This decrease, however, depends on the type of the added nitrate. In the presence of NH_4^+ and Na^+, bivalent ions, ZrO^{2+}, or $Zr(OH)_2^{2+}$ are dissolved. The deviation of the dependence of α from linearity in the presence of Li^+ and Mg^{2+} is explained by a stronger hydration of these ions. There are 3 figures, 4 tables, and 7 references, 6 of which are Soviet.

SUBMITTED: February 4, 1959

Card 3/3

FOMIN, V.V.; KARTUSHOVA, R.Ye.; MAYOROVA, Ye.P.

Study of the extraction of nitric acid, perchloric acid, and uranyl nitrate with tributyl phosphate solutions, using the method of isomolar series. Zhur.neorg.khim. 5 no.6:1337-1344 Je '60.
(Extraction (Chemistry)) (MIRA 13:7)
(Butyl phosphate)

FOMIN, V.V.; MASLOVA, R.N.; ZAYTSEVA, L.L.

Study of the extraction of nitric acid using the method of isomolar series. Zhur.neorg.khim. 5 no.6:1383-1384 Je '60. (MIRA 13:7)
(Nitric acid) (Extraction (Chemistry))

FOMIN, V.V.; MORGUNOV, A.F.

Extraction of ferric chloride hydrates with ethers. Zhur.neorg. khim. 5 no.6:1385-1386 Je '60. (MIRA 13:7)

1. Moskovskiy ordena Lenina khimiko-tekhnologicheskiy institut im. D.I.Mendeleyeva.
(Extraction (Chemistry)) (Iron chloride)

FOMIN, V.V.; MORGUNOV, A.F.; KOROBOV, I.V.

Extraction of nitric acid with cyclohexane and methyl isobutyl ketone. Zhur. neorg. khim. 5 no.8:1846-1851 Ag '60.
(MIRA 13:9)

1. Moskovskiy khimiko-tekhnologicheskiy institut im. D.I.Mendeleyeva.
(Ketone) (Nitric acid) (Cyclohexane)

S/078/60/005/010/006/021
B004/B067

AUTHORS: Lipis, L. V., Pozharskiy, B. G., Pozharskaya, M. Ye., Fomin, V. V.

TITLE: Complex Sulfates of Tetravalent Plutonium With Alkali Metals

PERIODICAL: Zhurnal neorganicheskoy khimii, 1960, Vol. 5, No. 10, pp. 2190-2203

TEXT: The authors produced complex plutonium alkali metal sulfates by dissolving plutonium sulfate in 1 N H_2SO_4, saturating the solution with alkali sulfate, centrifuging after 24 hours, removing the excess alkali sulfate by washing with 1 N H_2SO_4, and removing the excess H_2SO_4 by washing with alcohol and, finally, with ether. The complex salts of Pu(IV) with Na, K, Rb, Cs, and NH_4 were produced. Tables 1-5 give the analyses of these compounds. On the basis of the analyses, the following formulas are obtained: $Na_6Pu(SO_4)_5 \cdot H_2O$; $(NH_4)_6Pu(SO_4)_5 \cdot 2\text{-}4H_2O$, $K_4Pu(SO_4)_4 \cdot 2H_2O$, $Rb_4Pu(SO_4)_4$, and $CsPu(SO_4)_4$. The production of a pure

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Complex Sulfates of Tetravalent Plutonium With Alkali Metals

S/078/60/005/010/006/021
B004/B067

complex salt with lithium failed since it could not be separated from $LiSO_4$. The complex salts are readily soluble in water and mineral acids. Table 6 gives the pH values at which the precipitation of basic sulfate sets in. The solubility of potassium-plutonium sulfate in nitric acid (Table 7), in sulfuric acid (Table 8), and in 3, 5, and 10% solutions of K_2SO_4 in 1 N H_2SO_4 (Table 9) was radiometrically determined at 25°C.

Hydrolysis occurred on dissolution in water. Figs. 1-7 show the microphotographs of the absorption spectra of the complex salts and of $Pu(SO_4)_2$ recorded by an ИСП-51 (ISP-51) spectrograph at -195.8°C and by an Молл К-15 (Moll K-15) microphotometer. The spectra differ from one another as well as from the spectrum of plutonium sulfate. The spectra of the pentasulfate complexes of Na and NH_4, as well as of the tetrasulfate complexes of K, Rb, and Cs show certain similarities. On the basis of the spectrum, a content of at least six sulfate groups is assumed for the impurely prepared lithium complex salt. The spectrum and color of the complex salts of rubidium and cesium changed when stored in air, whereas no change was observed in hermetically sealed samples. There are 7 figures, 9 tables, and 4 references: 3 Soviet and 1 US.

Card 2/3

MASLOVA, R.N.; FOMIN, V.V.

Extraction of nitric acid and water with ethyl n-propyl ether and n-propyl ether. Zhur. neorg. khim. 6 no.3:738-745 Mr '61. (MIRA 14:3)

(Nitric acid) (Ether) (Extraction(Chemistry))

2

21725

S/078/61/006/007/002/014
B107/B217

21.4100

X

AUTHORS: Alenchikova, I. F., Zaytseva, L. L., Lipis, L. V., Nikolayev, N. S., Fomin, V. V., Chebotarev, N. T.

TITLE: Properties of plutonyl fluoride complexes

PERIODICAL: Zhurnal neorganicheskoy khimii, v. 6, no. 7 1961, 1513-1519

TEXT: The object of the present study was the production and investigation of plutonylfluoride complexes with alkali metals. The systems $PuO_2F_2 - MeF - H_2O$ with Me = Na, K, NH_4, Rb, Cs were investigated in the range Me/Pu = 1 to 50 by means of electron absorption spectra. The latter were recorded by means of the ИСП-51 (ISP-51) spectrograph at the boiling temperature of liquid nitrogen. The compounds prepared were analyzed; Table 1 provides a list of the compounds produced as well as the analytical values. The compounds $MePuO_2F_3 \cdot H_2O$ are isotopic and of cubic symmetry. Fig. 2 shows schematically the powder diagrams, obtained in the РКУ-86 (RKU-86) camera with chromium radiation, for the following compounds (lattice constant in brackets): $KPuO_2F_3 \cdot H_2O$ (8.126 Å), $RbPuO_2F_3 \cdot H_2O$

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S/078/61/006/007/002/014
B107/B217

Properties of plutonyl ....

(8.458 Å), $CsPuO_2F_3 \cdot H_2O$ (8.916 Å). Furthermore, a series of isotopic compounds $Me_2PuO_2F_4$ exists; Fig.3 shows the powder diagrams for $K_2PuO_2F_4$ and $(NH_4)_2PuO_2F_4$ in schematical form. The compound $Cs(PuO_2)_2F_5 \cdot 3H_2O$ was also found; the radiogram is very rich in lines (Fig.9) and indicates a low symmetry. The absorption spectra are characterized by the bands for Pu^{VI} between 8280 and 8330 Å, as well as between 6200 and 5600 Å. The stability of the compound $MePuO_2F_3 \cdot H_2O$ was found to decrease on the transition from sodium to cesium. There are 11 figures, 4 tables, and 15 references: 2 Soviet-bloc and 13 non-Soviet-bloc. The reference to English-language publication reads as follows: H. H. Anderson. Paper 6, 21 cf the Transuranium Elements, 14B, New York, 1949.

SUBMITTED: May 30, 1960

Card 2/62

FOMIN, V.V.

5.4000,16.7100 P.2

78337
SOV/89-8-3-22/32

AUTHOR: Seryakova, I. V.

TITLE: Symposium on Extraction Theory. News in Science and Technology

PERIODICAL: Atomnaya energiya, 1960, Vol 8, Nr 3, pp 269-270 (USSR)

ABSTRACT: The symposium on theory of extraction processes was held on December 3-4, 1959, at the (Institute of Geochemistry and Analytical Chemistry imeni V. I. Vernadskiy AS USSR (Institut geokhimii i analiticheskoy khimii imeni V. I. Vernadskiy AN SSSR). The aim was to evaluate the most important problems of the extraction theory. There were five papers on questions of chemistry and thermodynamics of extraction equilibria, on the influence of the nature of extragents and salting-out agents, on the composition of the extracted compounds and their interaction with molecules of water and the extragent. V. I. Kuznetsov reported on "The Chemistry of Extraction Processes," based on the theory of action analytical organic reagents. He attempted to compare

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Symposium on Extraction Theory. News in Science and Technology

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the tendency of ions to form extracting compounds with the quantity z/n of that ion, where z is the charge of the ion, and n is the number of atoms in that ion K. B. Yatsimirskiy and M. M. Senyavin were critical of such an oversimplified approach. V. V. Fomin presented a paper on "Extraction Equilibria," in which the investigated those chemical reactions in which the extragent participates in both phases. He notes that an element during the extraction process need not lose its hydrophilic nature. A. A. Lipovskiy and V. A. Mikhaylov together with the author discussed the merits of the accepted view of the oxonium mechanism of extraction of elements. The paper by A. V. Nikolayev, N. M. Sinitsyn, and A. M. Shubina, "Donor-Acceptor Properties of Extragents," dealt with the influence of the nature of organic solvent on extraction. According to their data, an increase in dipole moments augments the degree of element extraction. N. N. Basargin pointed out in the discussion that in the case of elements having a tendency to build covalent bonds, the result may be just the opposite.

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Symposium on Extraction Theory. News in Science and Technology

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V. G. Timoshev discussed the decisive role of donor-acceptor properties of phosphorus-containing extragents. The salting out in extraction processes was investigated in the paper by O. Ya. Samoylov and V. I. Tikhomirov using statistical inquiry into the thermal motion of molecules. Basically, the explanation given took into account the dehydrating properties of salting-out cathions. A. A. Nemodruk pointed out during discussion that one should take into account also the anion concentration of the salting-out agent and other factors. A. M. Rozen presented in his paper the use of thermodynamics in describing the extraction equilibria. It was noted during discussion that many thermodynamic quantities should be measured in tests at different temperatures. V. M. Vdovenko, A. K. Babko, D. D. Suglobov, I. R. Krichevskiy, and A. A. Chaykhorskiy participated also in the general discussion. The symposium determined the main course of future investigations of the theory of extracting processes, in particular: to explain the reasons for the selectivity of the solubility of anorganic and organic compounds in various solvents; to

Card 3/4

Sumposium on Extraction Theory. News in Science and Technology

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SOV/89-8-3-22/32

expend the investigations of solvation, and particularly, hydration of ions and molecules, to study further the chemism and thermodynamics of extraction equilibria; and to expand inquiries determining the composition and nature of the extracting compounds. The symposium recommended the establishment of a permanent seminar dealing with the theory of extraction. The basic materials of this symposium will be published in 1960 by Atomizdat.

Card 4/4

S/830/62/000/001/010/012
E111/E592

AUTHORS: Fomin, V.V., Mayorova, Ye.P. and Kartushova, R.Ye.

TITLE: Determination of the number of theoretical stages of an extraction column by an analytical method

SOURCE: Ekstraktsiya; teoriya, primeniye, apparatura. Ed. by A.P. Zefirov and M. M. Senyavin. Moscow, Gosatomizdat, 1962, 188-201

TEXT: An analytical method of calculating extraction for two macro-components present simultaneously is developed and exemplified by the extraction of uranyl nitrate and nitric acid with tributyl phosphate (TBP). The mass balance equations for uranium and nitric acid for each nth stage of the extraction column are formulated, together with all the equilibrium constants, activity coefficients and dissociation constant of the fundamental reaction controlling this type of extraction, viz:

$$UO^{2+}_{2\,aq.} + 2NO^-_{3\,aq.} + 2TBP_{org.} \rightleftarrows UO_2(NO_3)_2 \cdot 2TBP_{org.};$$

$$H^+_{aq.} + NO^-_{3\,aq.} + TBP_{org} \rightleftarrows HNO_3 \cdot TBP_{org.};$$

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Determination of the number of ... S/830/62/000/001/010/012
E111/E592

$$2H^+_{aq.} + 2NO^-_{3\ aq.} + TBP_{org.} \rightleftarrows (HNO_3)_2 \cdot TBP_{org.}$$

The main difficulty in calculating the number of theoretical stages lies in the reaction forming solvates of nitric acid and uranyl nitrate with TBP. Because of the large errors involved, the constants for the acid were assumed to remain unchanged. Calculated values were found to be in good agreement with experimental results, viz. for initial uranium and acid concentrations of 1.26 and 2 M, respectively. An appendix is included giving a working example for calculating a theoretical stage. There are 6 figures and 6 tables.

Card 2/2

FOMIN, V.V.; MAYOROVA, Ye.P.; KARTUSHOVA, R.Ye.

Determination of the number of theoretical stages of an extraction column by the analytical method. Ekstr.; teor.,prim.,app. no.1:188-201 '62. (MIRA 15:11)
(Extraction apparatus)

FOMIN, V.V.; MASLOVA, R.N.

Extraction of uranyl nitrate from nitric acid solutions by normal ethers. Ekstr., teor.,prim.,app. no.2:19-33 '62.
(MIRA 15:9)

(Uranyl nitrate) (Ethers)

FOMIN, V.V.; KARTUSHOVA, R.Ye.; MAYOROVA, Ye.P.

Extraction of uranium by mixtures of tributyl phosphate and diisoamyl ester of methylphosphonic acid. Ekstr.; teor.,prim.,app. no.2:37-46 '62. (MIRA 15:9)
(Uranium) (Butyl phosphate) (Phosphonic acid)

S/186/62/004/005/003/009
E075/E135

AUTHORS: Maslova, R.N., and Fomin, V.V.

TITLE: Study of the mechanism of extractive processes. IV. Solvation and hydration of uranyl nitrate in benzene solutions of simple ethers

PERIODICAL: Radiokhimiya, v.4, no.5, 1962, 550-560

TEXT: A study was made of the dependence of distribution coefficients (α') of tracer quantities of uranyl nitrate on the concentration of ether in the organic phase during extraction with ethers and benzene. The ethers investigated were: dibutyl (DBE), dipropyl (DPE), ethylpropyl (EPE), and methylbenzyl ether (MBE). For a constant composition of the equilibrium aqueous phase lg α' varies linearly with the concentration of free extractant. The composition of uranium nitrate solvates $UO_2(NO_3)_2 \cdot (H_2O)_h \cdot (R_2O)_n$, where R_2O - ether molecule in the organic phase, was determined from the slopes of the extraction curves and from cryoscopic data. The two methods gave similar values for the number n of ether molecules bound in the solvate. For DBE and EPE the values were

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2.7 to 2.2 and 3.04 to 3.1 respectively. The values of n do not depend on the acidity of the aqueous solution. The number of water molecules bound in the solvate (h) was determined for undiluted ethers and for ether-benzene mixtures. The degree of hydration of $UO_2(NO_3)_2$ falls with decreasing concentration of ethers in the original benzene-ether mixture. Comparing n and h for $UO_2(NO_3)_2$ it was established that trisolvates are formed with EPE and DPE. The value of h changes from about 3 for undiluted EPE to 2.5 for the equimolar mixture of EPE and benzene. The values of $2 < h < 3$ are explained by the existence of di- and trihydrates of $UO_2(NO_3)_2$. In general, for the mixtures of aliphatic ethers with benzene containing excess ether, the hydratosolvates contain equal numbers of molecules of water and ether. Dilution with benzene gives less hydrated solvates. For undiluted MBE, $n \simeq 4$ and $h \simeq 3$. Dilution reduces h to 2.3 and n to 3.3. The dependence of activity coefficients of hydratosolvates on the molar proportion of benzene N in the solvent mixture is given by
$f = 1 - N_{benzene}/A$, where the reciprocal of hydratosolvate activity is f, and A = 1 for EPE and 1.3 for DPE. The molar

activity coefficients for tracer quantities of $UO_2(NO_3)_2$ in 6.3 M and 4.25 M HNO_3 are 2.15 and 1.41 respectively. The latter activities agree well with those calculated from the constants for the extraction of $UO_2(NO_3)_2$ with MBE from 4.3 M HNO_3. Assuming that the organic phases are ideal solutions, the constants for the formation of the hydratosolvates were calculated to be 4.3×10^{-4}, 9.0×10^{-4}, 9.2×10^{-4} and 2.8×10^{-4} for $UO_2(NO_3)_2 \cdot 2 H_2O \cdot 3$ MBE, $UO_2(NO_3)_2 \cdot 3 H_2O \cdot 4$ MBE, $UO_2(NO_3)_2 \cdot 3 H_2O \cdot 3$ EPE, and $UO_2(NO_3)_2 \cdot 3 H_2O \cdot 3$ DPE respectively.

There are 2 figures and 5 tables.

SUBMITTED: July 5, 1961

MORGUNOV, A.F.; FOMIN, V.V.

Hydration of complex halogen acids of metals during extraction with ethers. Zhur.neorg.khim. 7 no.4:948-950 Ap '62.
(MIRA 15:4)

1. Moskovskiy khimiko-tekhnologicheskiy institut im. D.I.Mendeleyeva.
(Complex compounds) (Halides) (Ethers)

FOMIN, V.V.

"Problems involved in the mechanism of extraction." (reply to the remarks by IU.G.Frolov and A.V.Ochkin). Zhur.neorg.khim. 7 no.6:1490 Je '62. (MIRA 15:6)
(Extraction (Chemistry)) (Frolov, IU.G.) (Ochkin, A.V.)

S/078/62/007/007/002/013
B179/B101

AUTHORS: Zaytseva, L. L., Lipis, L. V., Fomin, V. V., Chebotarev, N. T.

TITLE: Production and properties of some uranyl fluoride complexes

PERIODICAL: Zhurnal neorganicheskoy khimii, v. 7, no. 7, 1962, 1538-1547

TEXT: The precipitates formed in the reaction between 6.08 M CsF solution and 0.63 M UO_2F_2 solution were investigated in the range of concentration (C) $c_{Cs^+} : c_{UO_2^{2+}} = 0.5 - 20$ by means of absorption spectroscopy, X-ray analysis, and chemical analysis. Three Cs-UO_2-fluoride complexes were formed: $CsUO_2F_3$ at C = 0.5 - 1.5; $Cs_2UO_2F_4 \cdot H_2O$ at C = 2-3; $Cs_3UO_2F_5$ at C = 6 - 20 and a mixture of $Cs_2UO_2F_4 \cdot H_2O$ with $Cs_3UO_2F_5$ at C = 3 - 5. $CsUO_2F_3$ is a finely crystalline, yellow substance soluble in diluted HNO_3, poorly soluble in H_2O; it hydrolyzes in aqueous solution. Both $Cs_2UO_2F_4 \cdot H_2O$ and $Cs_3UO_2F_5$ form green crystals, are soluble in H_2O

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Production and properties of some... S/078/62/007/007/002/013
B179/B101

and undergo hydrolysis. All three compounds are insoluble in alcohol, ether, and acetone. The solubility of cesium uranyl fluoride complexes in H_2O increases in the order $CsUO_2F_3$, $CsUO_2F_3 \cdot H_2O$, $Cs_2UO_2F_4 \cdot H_2O$, $Cs_3UO_2F_5$. $Cs_2UO_2F_4 \cdot H_2O$ forms in vacuum evaporation of 0.63 M UO_2F_2 and 6.08 M CsF solutions at the molecular ratio of 1:2. $CsUO_2F_3 \cdot H_2O$ forms in slow evaporation of these solutions in the air. $Cs_2UO_2F_4 \cdot H_2O$ forms in slow evaporation of saturated UO_2F_2 and CsF solutions at the molecular ratio of 1:2 in the air. At the molecular ratio of 1:1, $CsUO_2F_3$ readily precipitates only from concentrated UO_2F_2 and CsF solutions; diluted solutions give a mixture of $CsUO_2F_3$ and $CsUO_2F_3 \cdot H_2O$. The interplanar spacings of the crystals $CsUO_2F_3$, $CsUO_2F_3 \cdot H_2O$, $Cs_2UO_2F_4 \cdot H_2O$, and $Cs_3UO_2F_5$ were calculated and the wavelengths of the principal absorption bands were measured; these range between 4200 and 6000 Å. There are 8 figures and 8 tables.

SUBMITTED: December 24, 1960

Card 2/2

MORGUNOV, A.F.; FOMIN, V.V.

Extraction of ferric chloride with ethers and ketones. Dependence of the distribution coefficient on the concentration of ferric chloride. Zhur.neorg.khim. 8 no.2:508-515 F '63. (MIRA 16:5)

1. Moskovskiy khimiko-tekhnologicheskiy institut imeni D.I. Mendeleyeva.
(Iron chlorides) (Extraction (Chemistry))

FOMIN, V.V.; POTAPOVA, V.T.

Extraction of nitric acid with amines. Zhur.neorg.khim. 8 no.4: 990-1002 Ap '63. (MIRA 16:3)
(Nitric acid) (Amines) (Extraction (Chemistry))

FOMIN, V.V.

Remark on B.Z. Iofa and G.M. Dakar's article: "Extraction of complex acids by oxygen-containing solvents. Part 2: Calculation of the equilibrium constants of antimony (V) hydrolysis in hydrochloric acid solutions and the study of the mechanism of its extraction by di-n-butyl ester." Radiokhimiia 6 no.3: 378-380 '64. (MIRA 18:3)

ACCESSION NR: AP4043658 S/0056/64/047/002/0771/0773

AUTHORS: Anisovich, V. V.; Moskalev, A. N.; Fomin, V. V.

TITLE: Influence of logarithmic singularities on the parameters of certain resonances

SOURCE: Zh. eksper. i teor. fiz., v. 47, no. 2, 1964, 771-773

TOPIC TAGS: resonance scattering, omega meson, sigma particle, pion, rho meson

ABSTRACT: The purpose of this note is to call attention to the fact that resonances in the systems $\rho\pi$ (A-resonance), $\omega\pi$ (B-resonance), and $\Sigma\pi$ (Y_0^*-resonance) were investigated in the past in the majority of cases under conditions in which the spectra of the particles $\rho\pi$, $\omega\pi$, and $\Sigma\pi$, in the region of resonant values of energy could be strongly influenced by logarithmic singularities of the type indicated by I. J. R. Aitchison, (Phys. Rev. v. 133, B1257, 1964).

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ACCESSION NR: AP4043658

Arguments are presented in favor of assuming that the observed large width of the A-resonance is indeed connected with the presence of such singularities. The decrease in the probability of $\omega\pi^+$ production in the vicinity of 150 MeV, which has effectively led to a decrease in the observed resonance width, is also ascribed to this singularity. In the case of the $\Sigma\pi$ resonance, it is quite possible that the λ_{1405} resonance does not exist at all. "The authors express deep gratitude to V. M. Shekhter for a discussion of several problems and to N. B. Brovtsy*na for carrying out the numerical calculations." Orig. art. has: 2 figures and 2 formulas.

ASSOCIATION: Fiziko-tekhnicheskiy institut im. A. F. Ioffe Akademii nauk SSSR (Physicotechnical Institute, Academy of Sciences SSSR)

SUBMITTED: 24Apr64		ENCL: 00
SUB CODE: NP	NR REF SOV: 001	OTHER: 011

L 11969-66 EWT(m) DIAAP

ACC NR: AP6001164 **SOURCE CODE:** UR/0367/65/002/003/0562/0564

AUTHOR: Anisovich, V.V.; Fomin, V.V. Deceased

55 25 B

ORG: Physicotechnical Institute im. A. F. Ioffe, Academy of Sciences SSSR (Fiziko-tekhnicheskiy institut Akademii nauk SSSR)

1455

TITLE: Effect of singularities of triangular diagrams with decay masses on mass spectra of the systems $\pi + \Delta_{1238}$, $\pi + \Sigma_{1385}$ and $\pi + \phi$.

SOURCE: Yadernaya fizika, v. 2, no. 3, 1965, 562-564

TOPIC TAGS: pi meson, meson interaction, proton

ABSTRACT: The influence of logarithmic singularities arising in the triangular diagrams shown in Fig. 1 on the corss sections of the reactions $\pi^- + p \rightarrow \pi + \Delta_{1238}$ and $K + p \rightarrow \pi + \Sigma_{1385}$ and on the mass spectrum of the system $\pi + \phi$ was studied. It is shown that these diagrams can lead to anomalies in the cross sections (or in mass spectra) amounting to as much as 10 to 20% of the background at $M_{\pi\Delta_{1238}} = 2.38$ GeV, $M_{\pi\Sigma_{1385}} = 2.62$ GeV, and $M_{\pi\phi} = 1.4$ GeV. The appreciable magnitude of these anomalies permits their experimental observation at the present time. Authors are grateful to N. B. Brovtsyna for

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2

L 11969-66

ACC NR: AP6001164

O

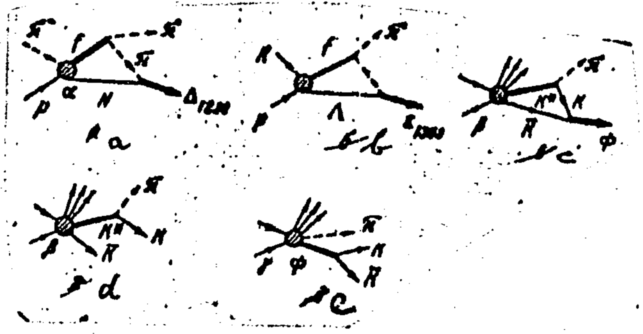

Fig. 1. Triangular diagram of reaction process.

assistance in performing the numerical calculations. Orig. art. has: 3 figures.

SUB CODE: 20 / SUBM DATE: 09Mar65 / OTH REF: 007

HW

Card 2/2

L 44280-65 EWT(m)/EPF(c)/EWP(j) Pc-4/Pr-4 RM

ACCESSION NR: AP5008002 S/0186/65/007/001/0014/0025

AUTHOR: Potapova, S. A.; Fomin, V. V.

TITLE: Distribution of n-dicresyl phosphate between aqueous solutions of nitric acid and various organic solvents

SOURCE: Radiokhimiya, v. 7, no. 1, 1965, 14-25

TOPIC TAGS: dicresyl phosphate, nitric acid, benzene, chloroform, carbon tetrachloride, distribution coefficient

ABSTRACT: This work presents data of cryoscopic investigations of aqueous and benzene solutions of n-dicresyl phosphate (n-DCP) and its distribution between aqueous solutions of nitric acid and benzene, chloroform and carbon tetrachloride. All studies on distribution were conducted with P^{32}-labeled n-DCP. Like dibutylphosphate n-DCP showed a great tendency to form dimers in the nonpolar solvents. The value of the dimerization constant of n-DCP in chloroform ($K = 0.97 \cdot 10^4$) is close to that in benzene ($K = 1.39 \cdot 10^4$) and is significantly less than the value in carbon tetrachloride ($K = 5.27 \cdot 10^4$) or the K for dibutylphosphate in chloroform.

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L 44280-65

ACCESSION NR: AP5008002

The dissociation constant of n-DCP is equal to 0.34-0.40 when the ionic strength is 1 and it decreases with an increase of the ionic strength. Distribution coefficients were obtained for monomeric n-DCP molecules between organic solvents and aqueous solutions of a nitric acid-lithium nitrate mixture with an overall ionic strength equal to 1.3 and 5. Orig. art. has: 4 figures and 9 tables.

ASSOCIATION: none

SUBMITTED: 06Jan64 ENCL: 00 SUB CODE: OC, GC

NO REF SOV: 001 OTHER: 002

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L 44281-65 EWT(m)/EPF(c)/EWP(j) Pc-4/Pr-4 RM

ACCESSION NR: AP5008004 S/0186/65/007/001/0033/0039

21

B

AUTHOR: Fomin, V. V.; Rudenko, T. I.

TITLE: Properties of solutions of tributylphosphate in benzene, carbon tetrachloride and n-decane. I. Heats of mixing and changes in volumes during mixing of anhydrous tributylphosphate with benzene, carbon tetrachloride and n-decane.

SOURCE: Radiokhimiya, v. 7, no. 1, 1965, 33-39

TOPIC TAGS: tributylphosphate, benzene, carbon tetrachloride, n-decane, calorimetry

ABSTRACT: The authors have undertaken a systematic investigation of the properties of binary systems consisting of tributylphosphate and three of the more frequently employed solvents--benzene, carbon tetrachloride and n-decane. The main purpose of the investigation was to determine the extent of the deviation of each system from an ideal system. Heat of mixing for different concentrations of the components was determined by means of a microcalorimeter (shown in fig. 1 of the Enclosure) at 25°C. It was found in the tributylphosphate-benzene and tributylphosphate-carbon tetrachloride systems that heat is liberated ($\Delta H < 0$) and the volume decreases while in the tributylphosphate-n-decane system heat is absorbed and the volume increases.

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L 44281-65

ACCESSION NR: AP5008004

It is concluded that tributylphosphate solutions in these three solvents cannot be viewed as ordinary solutions. The methods of investigation which were employed do not completely reveal the nature of the interactions in the systems considered, thus the results obtained represent only the first stage of the investigation of these systems. Orig. art. has: 5 figures and 7 tables.

ASSOCIATION: none

SUBMITTED: 17Feb64 ENCL: 01 SUB CODE: OC, GC

NO REF SOV: 008 OTHER: 004

Card 2/3

L 44804-65

ACCESSION NR: AP5011803 UR/0186/65/007/002/0228/0232

AUTHOR: Fomin, V.V.

5
B

TITLE: Cation exchange on vermiculite at high pressure and temperature

SOURCE: Radiokhimiya, V. 7, no. 2, 1965, 228-232

TOPIC TAGS: cation exchanger, ion exchange column, vermiculite, ionic radius, absorption capacity

ABSTRACT: Ion exchange on vermiculite was studied under standard conditions, and it was found that only magnesium and calcium ions are replaced by other ions, such as alkali metal ions, in the case of which the adsorbing capacity increases with the ionic radius (from potassium to cesium). Experiments were also carried out in an autoclave at 230C and 30 atm, using water and CsCl and $MgSO_4$ solutions. Under these conditions, depending upon the nature of the displacing cations, two different cation exchange reactions can take place; one of them, the displacement of iron ions by magnesium, does not occur at room temperature. The ability of part of the iron ions to be exchanged for magnesium ions is explained by structural considerations. It is postulated that the oxidation of ferrous ions to ferric ions in the course of vermiculitization not only caused

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L 44804-65

ACCESSION NR: AP5011803 0

a loss of part of the alkali metals, but also changed the arrangement of some magnesium ions; this change caused the latter to acquire a capacity for exchange. Orig. art. has: 6 tables.

ASSOCIATION: none

SUBMITTED: 01Jun64 ENCL: 00 SUB CODE: IC, MT

NO REF SOV: 010 OTHER: 008

MOB
Card 2/2

MORGUNOV, A.F.; FOMIN, V.V.

Hydration and solvation of ferric chloride during extraction by ethers and ketones. Zhur.neorg.khim. 11 no.1:226-227 Ja '66. (MIRA 19:1)

1. Moskovskiy khimiko-tekhnologicheskiy institut imeni D.I. Mendeleyeva. Submitted June 23, 1965.

ACC NR: AM6026751 (N) Monograph UR/

Fomin, Viktor Vasil'yevich

Hydroerosion of metals (Gidroeroziya metallov) Moscow, Izd-vo "Mashinostroyeniye," 1966. 290 p. illus., biblio., tables. 4000 copies printed.

TOPIC TAGS: hydroerosion, ~~hydroerosion~~ corrosion resistance, metal ~~hydroerosion~~ corrosion, ~~metal hydroerosion resistance~~, ~~alloy hydroerosion~~ metal oxidation

PURPOSE AND COVERAGE: This book, which summarizes the result of studies conducted at the Murmansk Higher Naval School, is intended for design and production engineers, and for research workers studying the resistance of metals and alloys to hydroerosion. The author discusses hydroerosion in metals and alloys and methods of increasing the contact strength and service life of machine parts operating at high speed in liquid media. The effect of metal and alloy structure on their erosion resistance is shown, and the effect of a variety of factors on the process of metal erosion are analyzed. The mechanism and general law governing this type of deterioration in metals, the principles governing the proper selection of construction materials, and methods of improving the erosion resistance of metal parts reviewed. The book contains a considerable amount of

Card 1/2 UDC: 620.193.19

ACC NR: AM6026751

experimental data which are said to be of great practical significance. There are 129 references, 96 of which are Soviet.

TABLE OF CONTENTS [abridged]:

SUB CODE: 11/ SUBM DATE: 23Feb66/ ORIG REF: 096/ OTH REF: 033

Card 2/2

FOMIN, V.Ye.

Profile of an abrasive worm for grinding gear cutters.
Stan. i instr. 36 no.7:27-29 Jl '65. (MIRA 18:8)

FOMIN, Ya.

On collective farms of the Nenets National Area. Sel'. stroi.
13 no.10:6 '58. (MIRA 11:10)

1. Nachal'nik Nenetskogo okruzhnogo otdela po stroitel'stvu v kolkhozakh, Arkhangel'skoy oblasti.
(Nenets National Area--Farm buildings)

FOMIN, Ya.

Device for the preliminary adjustment of brake shoes. Avt.transp. 4 no.8:51 Ag '62. (MIRA 16:4)

(Motor vehicles—Brakes)

S/106/63/000/002/001/007
A055/A126

AUTHORS: Levin, B.R., Fomin, Ya.A.

TITLE: Energy spectra of group signals in multichannel pulse systems

PERIODICAL: Elektrosvyaz', no. 2, 1963, 3 - 10

TEXT: The theory of the energy spectra of random pulse processes with a determined cadence interval is applied to sequences of pulse groups. The pulses in the group can be of different kinds. The analysis is limited to pulse group processes where the statistical characteristics of pulse groups are independent of their number (n) in the sequence, and the statistical characteristics of the "ensemble" of pulse groups depend only on their reciprocal position. Using the method evolved by one of them [Levin, Teoriya sluchaynykh protsessov i yeye primeneniye v radiotekhnike (Theory of random processes and its application in radio engineering), second edition, Sovetskoye Radio, 1960], the authors deduce a general expression (consisting of a continuous and a discrete part) for the energy spectrum $F(\omega)$ of a random sequence of groups of pulses with a determined cadence interval. They use this expression for the determination of the energy

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spectrum

$$F(\omega) = F_{chan}(\omega) + F_{synchr}(\omega) + F_{chan \times synchr}(\omega) \qquad (8)$$

of the group signal in a synchronous multichannel system with time-separation of channels, under the assumption that the signal consists of m identical channel pulses (n°1 to n°m) and one synchronizing pulse (n°0), the analysis being limited to the case where all the channels have identical statistical and physical characteristics. The authors next deduce three separate formulae giving the group energy spectrum in multichannel systems with pulse-amplitude, pulse-time and pulse-duration modulation, respectively, account taken of both the useful and parasitic modulation of pulses. There are 3 figures.

SUBMITTED: August 29, 1962

LEVIN, B.R.; FOMIN, Yu.A.

Dispersion of the time-modulation of coincidence pulses in presence of a strong signal. Elektrosviaz' 19 no.6:72-73 Je '65.

(MIRA 18:6)

LEVIN, B.R.; FOMIN, Ya.A.

Approximate determination of the distribution function of the transient duration of the envelope sum of determined signal and normal stationary noise under the threshold level. Radiotekhnika 18 no.5:22-28 My '63. (MIRA 16:8)

1. Deystvitel'nyye chleny Nauchno-tekhnicheskogo obshchestva radiotekhniki i elektrosvyazi imeni Popova.
(Information theory)

ACCESSION NR: AP4014671 S/0108/64/019/001/0013/0017

AUTHOR: Levin, B. R. (Active member); Fomin, Ya. A. (Active member)

TITLE: Distribution of duration of peaks of the sinusoidal-signal-plus-normal-noise envelope over the threshold level

SOURCE: Radiotekhnika, v. 19, no. 1, 1964, 13-17

TOPIC TAGS: communication theory, signal plus noise envelope, normal stationary noise, peak duration distribution

ABSTRACT: This is a continuation of a previous work (Radiotekhnika, v. 18, no. 5, 1963) based on S. O. Rice's findings (BSTJ, v. 37, no. 3, 1958). The unknown probability density and integral function of peak-duration distribution are represented analytically by an approximation method which involves these considerations: (1) In the region of short-duration peaks, the distribution function can be evaluated with sufficient accuracy by its first approximation;

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ACCESSION NR: AP4014671

(2) In the long-duration region, the function decreases exponentially; (3) The area under the distribution curve is equal to 1; (4) The first moment of the probability density is equal to a known value of the mean peak duration. Approximation formulas are presented. A "satisfactory agreement" is claimed between the data estimated by the above method and that experimentally obtained by V. I. Tikhonov (UFN, v. 78, no. 3, 1962). Orig. art. has: 3 figures and 12 formulas.

ASSOCIATION: Nauchno-tekhnicheskoye obshchestvo radiotekhniki i elektrosvyazi (Scientific and Technical Society of Radio Engineering and Electrocommunication)

SUBMITTED: 18Feb63 DATE ACQ: 07Feb64 ENCL: 00

SUB CODE: CO NO REF SOV: 003 OTHER: 001

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LEVIN, B.R.; FOMIN, Ya.A.

Use of time quantification of a random process in determining the duration of the distribution of its overshoots. Radiotekhnika 20 no.10:1-8 O '65. (MIRA 18:11)

1. Deystvitel'nyye chleny Nauchno-tekhnicheskogo obshchestva radiotekhniki i elektrosvyazi.

ACC NR: AT6022365 SOURCE CODE: UR/0000/66/000/000/0021/0029

AUTHOR: Levin, B. R.; Fomin, Ya. A.

ORG: none

TITLE: Using time quantization for determining the distribution of spike durations in the normal-noise envelope

SOURCE: Vsesoyuznaya nauchnaya sessiya, posvyashchennaya Dnyu radio. 22d, 1966. Sektsiya teorii informatsii. Doklady. Moscow, 1966, 21-29

TOPIC TAGS: signal noise separation, noise calculation

ABSTRACT: S. O. Rice (BSTJ, 1958, v. 37, no. 3) and other researchers solved the problem formulated in the title for the case of a high threshold and distribution of the spikes over it and the case of a low threshold and distribution of intervals between the spikes. The present article analyzes the spike distribution for any

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ACC NR: AT6022365

threshold level. The time-quantization method is based on replacing the initial continuous process with a ν-connected random sequence whose probabilistic characteristics are taken as approximate probabilistic characteristics of the initial process. In the article, formulas are derived for independent and singly-connected approximations to the spike-duration distribution, the between-spikes interval distribution, and the average duration and dispersion of spikes and intervals. The use of formulas is illustrated by an example involving a narrow-band stationary normal process with a correlation coefficient expressed as a Gaussian curve. Good agreement between the theoretical stepwise distribution and experimental points obtained by a Soviet researcher is noted. Orig. art. has: 2 figures and 19 formulas.

SUB CODE: 17, 09 / SUBM DATE: 28Apr66 / ORIG REF: 007 / OTH REF: 002

PROCESSES AND PROPERTIES INDEX

1ST AND 2ND ORDERS

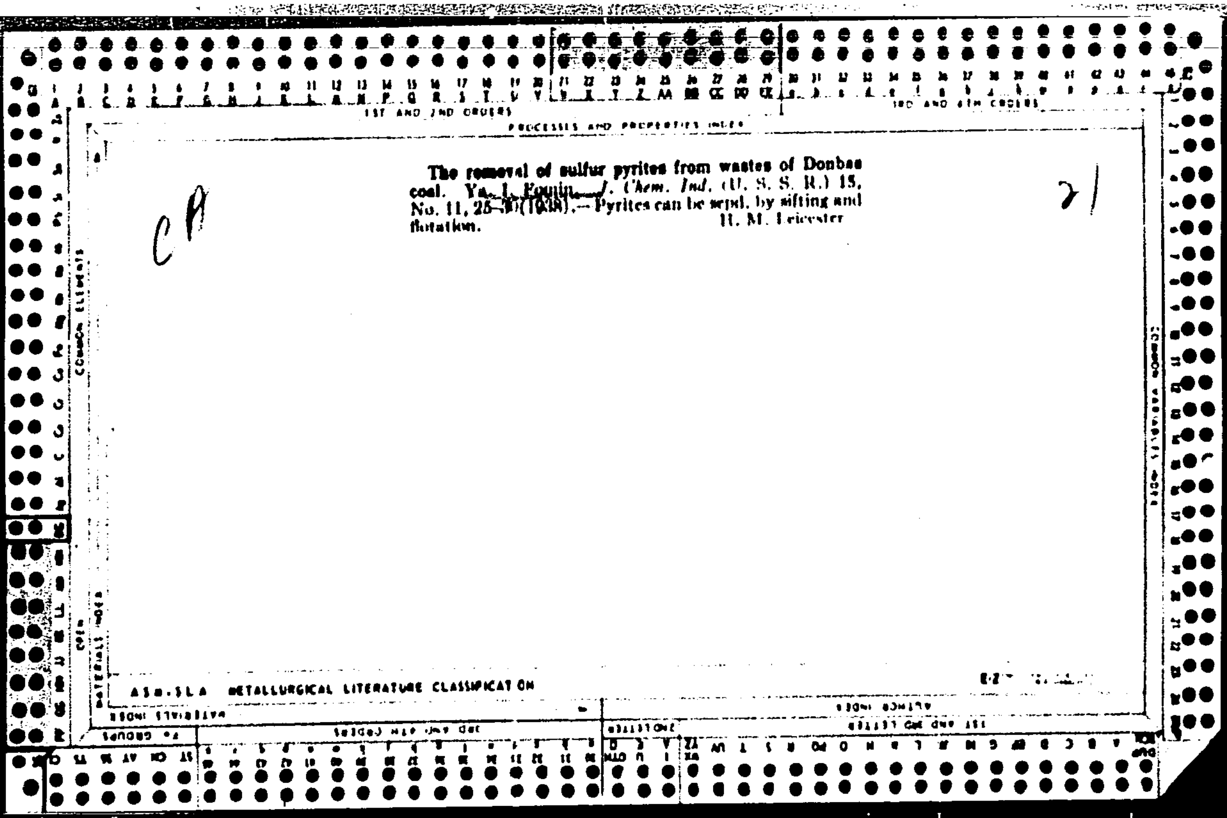
3RD AND 4TH ORDERS

C-1

21

Clarification of circulating waters used in washing coal by physicochemical means. Ya. I. Forsin. *Ugol* 1935, No. 118, 98-108.—The coal and shale breeze carried off by circulation water can be pptd. to some extent with Fe_2O_3 or $Ca(OH)_2$, the former being more efficient. However, the stream of the treated water must be slow to permit a proper sedimentation. The Dorr thickeners having the water overflowing the rims are best. The expts. are described in great detail. A. A. B.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



cA

The removal of sulfur pyrites from wastes of Donbas coal. Ya. I. Fomin. *J. Chem. Ind.* (U. S. S. R.) 15, No. 11, 25-30(1938).—Pyrites can be sepd. by sifting and flotation. H. M. Leicester

21

PROCESSES AND PROPERTIES INDEX

(3)

CENTRIFUGES FOR THE REMOVAL OF MOISTURE FROM COAL FINES. Ya. I. Fomin. (Koks i Khimiya, 1939, No. 6, pp. 3-7). (In Russian). A survey is made of the operating characteristics and efficiencies of both horizontal and vertical centrifuges including the Simplex, Hamborn, Carpenter and Wendell types. While the Carpenter centrifuge is regarded as preferable owing to its simple construction, efficiency, low wear of screens and low running speeds, it is nevertheless concluded that none of the types is capable of reducing the moisture content of washed coal below 4-6%, which is the maximum permissible in order to prevent the freezing together of the Donets coking coals.

METALLURGICAL LITERATURE CLASSIFICATION

FOMIN, Ya.I., gornyy inzh; LAKOTA, B.M., gornyy inzh; GRAZHDANTSEV, I.I., gornyy inzh; KUROVA, M.D., gornyy inzh.

Manganese ore dressing in heavy suspensions and flotation in industrial conditions. Gor.zhur. no.11:32-44 N '48.
(Manganese ores) (Ore dressing) (MIRA 11:11)

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

F

B

778. DETERMINATION OF ENRICHABILITY OF COAL. Fomin, Ya. I. (Ugol (Coal), July 1950, vol. 25, 27-32).

Derives a formula for determination of maximum coefficient of enrichability of coal, that is, its ability to be separated into low ash organic and high ash mineral parts by heavy liquid fractionation. Enrichability diagrams are presented, and their use for determination fo pptimum conditions of enrichment is explained.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

1. FOMIN, Ya. I.

2. USSR (600)

4. Coal - Donets Basin

7. Remarks on Eng. Fomenko's article "Classification of Donets coals according to their suitability for concentration." Reviewed by Ya. I. Fomin. Ugol' 27 no.10, 1952

9. Monthly List of Russian Accessions, Library of Congress, January 1953. Unclassified.

Enriching manganese slurries. Ya. I. Fomin and Z. S. Bogdanova. *Gornyi Zhur.* 1953, No. 3, 32-9; *Referat. Zhur., Khim.* 1955, Abstr. No. 50020.—During the enriching of Mn-ores, up to 30% of the Mn is lost in the slimes. Several Mn slimes are investigated searching for more convenient enriching methods. The samples are subjected to chem., mineralogical, granulometric, and gravitation analyses, and also to enrichment by gravitational, electromagnetic and flotation methods separately and in combinations. Recommended reagents are: oxidized kerosine, sulfate soap, and soda. In the basic flotation the liquid:solids = 2:1. Duration of the basic flotation is 20 min., the cleanup 5 to 10 min. The authors cite 3 recommended flotation schemes.

N. Vasileff

3

1-4E2c

FOMIN, Ya.I., kandidat tekhnicheskikh nauk

The performance of a jig. Gor.zhur. no.7:57-60 Jl '55. (MLRA 8:8)
(Ore dressing)