

N. S. Kurnakov AS USSR)

"Some Special Features in the Behaviour of Ruthenium Micro-quantities During Its Extraction"

Isotopes and Radiation in Chemistry, Collection of papers of
2nd All-Union Sci. Tech. Conf. on Use of Radioactive and Stable Isotopes and
Radiation in National Economy and Science, Moscow, Izd-vo AN SSSR, 1958, 380pp.

This volume published the reports of the Chemistry Section of the
2nd AU Sci Tech Conf on Use of Radioactive and Stable Isotopes and Radiation
in Science and the National Economy, sponsored by Acad Sci USSR and Main
Admin for Utilization of Atomic Energy under Council of Ministers USSR
Moscow 4-12 Apr 1957.

NIKOLAYEV, A. V.

AUTHORS: Nikolayev, A. V., Sorokina, A. A., Maslennikova, A.S 78-1-29/43

TITLE: Cerium Extraction with Tributyl-Phosphate
(Ekstraktsiya tseriya tributilfosfatom).

PERIODICAL: Zhurnal Neorganicheskoy Khimii, 1958, Vol. 3, Nr 1,
pp. 160-164 (USSR)

ABSTRACT: After a short survey on respective literature (ref. 1-6) the authors state that diethylether is by far the best extractor (table 1). All extractors (with the exception of nitromethane) are explosive under the conditions of strong acidity. The acidity can be reduced to a great extent by salting out (table 2). The strong increase of extraction with the increase of acidity permits the conclusion that cerium-IV is extracted as a complex of the $H_2/Ce(NO_3)_6$ type. Cerium is precipitated from the ether phase with ammonium; the yield is about 90%. In the place of ammonia also hydrogen peroxide or other reducing substances can be used for extraction. In an HNO_3 milieu the reduction is made more difficult but it acquires a certain specific character (table 3). Subsequently, instructions are given for the production of pure 4-valent cerium as well as for its production from raw materials with a content of rare earths. Ce^{144} - Pr^{144} were used as radioactive indicators.

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Cerium Extraction with Tributyl-phosphate.

radioactive isotope Pr^{144} . The activity of the latter glass is therefore initially high decreases, however, after from 3-4 hours ($T_{1/2} = 17.4$ minutes). There remains only a quantity of Pr^{144} equivalent to Ce^{144} (table 10). In table 7 and others the balanced activity regarding Ce^{144} and Pr^{144} is mentioned. There are 10 tables and 6 references, 2 of which are Slavic.

ASSOCIATION: Chair of Radiochemistry, Moscow Institute of Non-Ferrous Metals and Gold in. M. I. Kalina (Kafedra radio-khimii Moskovskogo instituta tsvetnykh metallov i zolota imeni M. I. Kalinina).

SUBMITTED: June 18, 1957

AVAILABLE: Library of Congress

Card 3/3

78-3-4-31/38

AUTHORS: Kurnakova, A. G., Nikolayev, A. V.

TITLE: The Solubility Diagram of the Nitrates of Uranyl and Thorium With Salting-Out Components (Diagrammy rastvorimosti nitrato: uranila i toriya s vysalivatelyami)

PERIODICAL: Zhurnal Neorganicheskoy Khimii, 1958, Vol. 3, Nr 4 pp. 1028-1036 (USSR)

ABSTRACT: The solubility of nitrates of thorium and uranium was investigated by means of salting-out components like NH_4NO_3 , $\text{Ca}(\text{NO}_3)_2$, $\text{Mg}(\text{NO}_3)_2$, $\text{Zn}(\text{NO}_3)_2$, $\text{Cu}(\text{NO}_3)_2$, $\text{Fe}(\text{NO}_3)_3$, $\text{Al}(\text{NO}_3)_3$ in 1.5 n HNO_3 at 25 and 20°C. In the system NH_4NO_3 - $\text{UO}_2(\text{NO}_3)_2$ -1.5 n HNO_3 - H_2O the solubility diagram was investigated. The double salt $2\text{NH}_4\text{NO}_3 \cdot \text{UO}_2(\text{NO}_3)_2 \cdot 2\text{H}_2\text{O}$ forming in this system was isolated in purest form. With an increase of the concentration of ammonium nitrate the solubility of uranyl nitrate increases. The solubility of uranyl nitrate was also investigated with calcium-, magnesium-, copper- and zinc nitrate as salting-out

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78-3 4 51/55

The Solubility Diagram of the Nitrates of Uranyl and Thorium With Salting-Out Components

compounds at 25°C. The solubility in the system thorium-nitrate with nitrates of copper, iron and aluminum was determined. In the system $\text{Th}(\text{NO}_3)_4 \cdot \text{Cu}(\text{NO}_3)_2$ -1,5 n HNO_3 - H_2O the solubility curve has three sections: 1) $\text{Cu}(\text{NO}_3)_2 \cdot 3 \text{H}_2\text{O}$; 2) $\text{Th}(\text{NO}_3)_4 \cdot 4 \text{H}_2\text{O}$; 3) $\text{Th}(\text{NO}_3)_4 \cdot 6 \text{H}_2\text{O}$.

By the determination of the density of the solutions the distribution coefficients of uranium and thorium were determined in the above-mentioned systems. There are 17 figures, 8 tables, and 2 references.

SUBMITTED: May 9, 1957

Card 2/2

78-3-4-32/38

AUTHORS: Nikolayev, A. V., Kurnakova, A. G.

TITLE: Isoconcentration system $UO_2(NO_3)_2-NH_4NO_3-HNO_3-(C_2H_5)_2O-H_2O$
(Isokontsentratsiya sistemy $UO_2(NO_3)_2-NH_4NO_3-HNO_3-(C_2H_5)_2O-H_2O$)

PERIODICAL: Zhurnal Neorganicheskoy Khimii, 1958, Vol. 3, Nr 4, pp. 1037-1043
(USSR)

ABSTRACT: The system $UO_2(NO_3)_2-NH_4NO_3-HNO_3-(C_2H_5)_2O-H_2O$ is regarded as a pentacomponent system and in the extraction of uranium from this system the phase rules of pentacomponent systems are valid.
The salting-out effect in this system under addition of ammonium nitrate is explained in two ways:
1) by dehydration
2) by decreasing the dissociation of the compound to be extracted.
The distribution coefficient K_d of uranyl nitrate of aqueous solution under addition of salting-out compounds amounts to 0,7. The distribution coefficient does not change with the increase of the concentration of uranyl nitrate. The distri

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Isoconcentration system $UO_2(NO_3)_2-NH_4NO_3-HNO_3-(C_2H_5)_2O-H_2O$

but ion coefficient increases with the increase of the acid concentration and the ammonium nitrate concentration. The optimum extraction of uranyl nitrate lies in the range of double salts between ammonium nitrate and uranyl nitrate. ($2 NH_4NO_3 \cdot UO_2(NO_3)_2 \cdot 2 H_2O$).

The complete uranium extraction occurs in diluted uranium solutions and concentrated nitric acid solution as well as with an increase of the content of ammonium nitrate. There are 5 figures and 8 references, 3 of which are Soviet.

SUBMITTED: May 9, 1957

Card 2/2

NIKOLAYEV, A.V.

Diagrams and series of separation in extraction. Dokl. AN
SSSR 157 no.5:1156-1159 Ag '64. (MIPA 17:9)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya
AN SS . Chlen-korrespondent AN SSSR.

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NIKOLAYEV, A.V.

~~SECRET, I.O. 1~~

Специальный доклад на тему: "Состояние и перспективы развития науки и техники в области космических исследований".

Доклад подготовлен для 5-го Всесоюзного симпозиума по космическим исследованиям.

МОСКВА

30 мая 1968

5(4), 21(5)

SOV/78-4-4-43/44

AUTHORS:

Nikolayev, A. V., Shubina, S. M.

TITLE:

On the Isotope Exchange of Tributyl Phosphate With Tagged Phosphoric Acid (Ob izotopnom obmene tributilfosfata s bezmenoy fosfornoy kislotoy)

PERIODICAL:

Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 4, pp 956-958 (USSR)

ABSTRACT:

The authors investigated the exchange between tributyl phosphate and radioactive phosphoric acid as well as their derivatives. The contact times ranged from one minute to one month, and the investigation covered acid and alkaline solutions. The results are listed in table 1. The authors did not observe an exchange between radioactive phosphoric acid and tributyl phosphate. By a single washing out tributyl phosphate is almost completely freed from the β -activity of tagged phosphoric acid. There are 1 table and 2 references.

SUBMITTED:

February 11, 1958

Card 1/1

5(2), 21(0)
AUTHORS:

SOT/78-4-7-39/44

Nikolayev, A. V., Kurnakova, A. G., Ruyantsava, Z. G.

TITLE:

Some Data on the Chemistry of Protactinium (Nekotoryye dannyye po khimii protaktiniya)

PERIODICAL:

Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 7,
pp 1682-1686 (USSR)

ABSTRACT:

The work carried out by the authors developed simultaneously with similar investigations carried out in foreign countries, so that parts of it have already been published elsewhere (Refs 1-3). In the present article results hitherto not published are given. The protactinium Pa²³³ was obtained by irradiation (20 h) of solid thorium nitrate. Its half-life was about 27 days. An investigation was carried out of the co-precipitation of Pa by thorium precipitates, by MnO(OH)₂, Fe(OH)₃, and other carriers, as well as of the behavior of Pa during extraction. Table 1 gives the data of the co-precipitation of Pa²³³ with thorium- and calcium precipitates (thorium oxy-carbonate, - hydroxide, -peroxide, - oxalate, - iodate, -chromate, -salicylate, -fluoride, potassium-thorium sulfate,

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Some Data on the Chemistry of Protactinium

calcium oxalate and calcium carbonate). Thorium fluoride takes no Pa into the precipitate as shown by table 2. All precipitates mentioned are soluble in ammonium carbonate, where the entire activity of the Pa is dissolved. The method of "similar carriers" was used for the purpose of separating Pa from Th. It is based upon the precipitation of calcium oxalate of -carbonate from solutions of thorium bioxalate or -bi-carbonate, i.e. on the reaction with the same anion. This method is applicable also to other active nuclei (e.g. splinter nuclei). The co-precipitation of Pa by manganese dioxide was already published in reference 1. Table 3 shows the results obtained by the authors. It shows that in the case of a single precipitation it is worth while to increase the quantity of the carrier substance to 5 mg/ml. In the case of a double precipitation 1 mg/ml will be sufficient. 2-3% of the Pa are not co-precipitated. Precipitation, however, becomes much more complete if initial intensity is increased. Table 4 shows the filling results obtained in the case of a primary activity of $1.06 \cdot 10^8$ imp/min as against 10^6 imp/min shown in table 3. By using the complex formation with salicylic acid an extraction

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Some Data on the Chemistry of Protactinium.

method was worked out. Extraction is carried out with acetone, and the acetone- and water phases are separated into component parts by means of a saturated CaCl_2 -solution. A quantitative extraction with Th is carried out. By this method it is possible to extract also U(VI) and Pu(IV) and all 4-, 5-, and 6-valent elements. There are 4 tables and 3 references, 2 of which are Soviet.

SUBMITTED: February 11, 1958

Card 3/3

5(2)

SOV/78-4-8-40/43

AUTHORS:

Nikolayev, A. V., Sinitaya, N. N.

TITLE:

The Distillation of Ruthenium From Strongly Diluted Nitric Acid Solutions (*Distillatsiya izoslozheniya sil'no razbavlennykh azotmekialnykh rastvarov*)

PERIODICAL:

Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 8, pp 1935-1936 (USSR)

ABSTRACT:

In the presence of persulphate and Ag^+ ions radiatoruthenium may be distilled off to 98% RuO_4 without previous removal of nitric acid (Table 1). The better oxidizing effect, compared to sodium bromate, is explained by oxidation of silver into $Ag(II)$ and its reaction with Ru . A further advantage is that no gaseous bromine is formed. There are 1 table and 10 references, 6 of which are Soviet.

SUBMITTED:

March 16, 1959

Card 1/1

NIKOLAYEV, A.V.; SHITSYN, N.M.

Study of isotope exchange in some cobalt compounds. Izv. Sib. otd.
AN SSSR no.7:59-64 '59. (MIRA 12:12)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR.
(Cobalt--Isotopes)

5 (2)

AUTHORS:

Nikolayev, A. V., Corresponding Member SCV/20-127-1-31/65
AS USSR, Sinitsyn, N. M.

TITLE:

The Extraction of Ruthenium Nitrosonitrate by the Esters of
Butyl-phosphinic Acids (Ekstraktsiya nitrozonitrata ruteniya
efirami butilfosfinovykh kislot)

PERIODICAL:

Doklady Akademii nauk SSSR, 1959, Vol 127, Nr 1, pp 117 - 119
(USSR)

ABSTRACT:

The interest in new alkyl-phosphorus extracting agents for uranium, plutonium, and several other elements has lately increased considerably (Refs 1,2,10). They are able to extract uranium and plutonium from aqueous solutions better than tributylphosphate (TBPh) (Ref 1). Ruthenium is known to complicate considerably uranium- and plutonium regeneration, since it contaminates the organic phase with β - and γ -activity (Ref 3). Its behavior is investigated only in the case of extraction with TBPh (Refs 2-5,7,8). It is dissolved in the form of nitrosonitrate complexes in the dissolution of uranium blocks in HNO_3 . Therefore it was interesting to investigate the behavior of the first-mentioned substance in the extraction by

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The Extraction of Ruthenium Nitrosonitrate by the
Esters of Butyl-phosphinic Acids

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nitrosonitrate of radio-ruthenium in the series TBPh <BADE
<DADE increases. Therefrom it follows that the reactivity of the
free electron couple at phosphoryl oxygen increases with the
reduction of the number of ester groups in the extracting agent
molecule. This is caused by the reduction of the number of
electron-accepting groups ($-O-C_4H_9$), furthermore, by the
displacement of the electron cloud of the molecule to the phos-
phoryl oxygen on which the main interaction with the substance
to be extracted depends (Ref 9). Therefrom it follows that the
ability of the above discussed solvents to act as an extract-
ing agent could be considerably increased if a better electron-
emitting radical (Ref 11) were introduced in the place of the
ester group. There are 1 figure, 1 table, and 11 references,
7 of which are Soviet.

ASSOCIATION: Institut neorganicheskoy khimii Sibirskogo otdeleniya Akademii
nauk SSSR (Institute of Inorganic Chemistry of the Siberian
Branch of the Academy of Sciences, USSR)

SUBMITTED: March 26, 1959
Card 3/3

5(2,3), 21(5)

SOV/20-127-3-27/71

AUTHORS: Nikolayev, A. V., Corresponding Member, AS USSR, Shubina,
S. M., Sinitayn, N. M.

TITLE: Extraction of Nitric Acid by Derivatives of Butylphosphinic
Acids

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 127, Nr 3,
pp 578 - 580 (USSR)

ABSTRACT: The present information constitutes part of the work on the
extracting properties of some butyl-phosphine compounds:
tributylphosphate (TBPh), dibutyl ester of butylphosphinic
acid (BPhSE), butyl ester of dibutylphosphinic acid (DPhBE)
and tributylphosphine oxide (TBPhO). The acid derivatives
mentioned in the title are more efficient as extracting
agents than TBPh for important elements such as uranium and
plutonium. Since this extraction is usually carried out from
nitric solutions, it becomes necessary to investigate the
distribution of HNO_3 in the aqueous solutions and the so-
called organic solvents. No data have been published in this
connection (except on TBPh, Refs 2-4). This gave reason for

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Extraction of Nitric Acid by Derivatives of
Butylphosphinic Acids

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the present investigation. The dependence of the HNO_3 distribution on the concentration of used extracting agents and on the presence of uranyl nitrate in the solution, was studied here. Saturated, highly boiling hydrocarbons (SHC) and CCl_4 were used as diluents of the extracting agents.

According to the data given by table 1 showing the experimental results, the extraction of HNO_3 increases with an increased concentration of the extracting agent in the SHC. The HNO_3 extraction rapidly increases during the transition from TBP_h to TBP_hO in the series (Fig 1). An increase of more than 50% of the concentration of BP_hDE in the diluent, caused an abnormally reduced acid extraction, compared to other extracting agents of the same series (Fig 1 and Table 1). During the HNO_3 extraction with a 5% solution of TBP_hO in SHC a second organic phase was separated which apparently is a combination of TBP_hO and HNO_3 (Ref 2). When CCl_4 was used, this second phase did not occur; Table 2 gives the

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extraction results by means of the same extraction agents, in the presence of uranyl nitrate. Within the concentration sphere of the extracting agent 0~50%, the HNO_3 extraction is reduced according to the rule, in the series of TBPh to TBPhO. This is probably due to the increase in the extraction of the uranyl nitrate and thus also due to the displacement of HNO_3 from the organic phase to the aqueous phase. This displacement is the more intensive, the more effective the extraction of the extracting agent of uranyl nitrate (Tables 1 and 2). Consequently the presence of uranyl nitrate influences HNO_3 extraction less and less with a ~50% BPhDE concentration and is finally hardly noticeable. All this proves that the extractability forms the following series: TBPh < DPhDE < BPhDE < TBPhO; at the same time a combination of the acid and TBPhO can be isolated. Up to now it has been impossible to explain the abnormal behavior of BPhDE in its relation to HNO_3 in the presence of uranyl-nitrate

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Extraction of Nitric Acid by Derivatives of
Butylphosphinic Acids

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as well as in its absence. There are 1 figure, 2 tables,
and 4 references, 2 of which are Soviet.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii im. N. S. Kurnakova
Akademii nauk SSSR (Institute for General and Inorganic
Chemistry imeni N. S. Kurnakov of the Academy of Sciences,
USSR)

PRESENTED: April 27, 1959, by I. I. Chernyayev, Academician

SUBMITTED: April 27, 1959

Card 4/4

Reciprocal Influence of Rare-earth Elements When
Extracted With Tributyl Phosphate

55738

SOV/20-129-2-29/66

ytterbium. Regarding Nd and Sm, the extraction stability, on the other hand, is maintained up to concentration of 5% and probably somewhat beyond (Ref 4). This difference has a great practical importance, inasmuch as the separation of the yttrium elements is more likely to be successful with lower concentration. With higher concentrations, extraction almost equals that of the cerium group, viz. becomes worse. To obtain a simple explanation of the reciprocal influence, the action of cerium earths, especially didymium, on the extraction of Nd, Sm, Y, Ho, and Yb was determined by means of radio isotopes. Table 2 shows that a 2-5% didymium concentration is not effective in all cases. 20% of didymium diminishes the extraction of all mentioned elements except Yb. The effect decreases from Nd to Ho. In this connection it occurred to the authors that the yttrium earths, but primarily the cerium earths, may exert a stronger reciprocal influence. Indicator quantities of the above mentioned isotopes were introduced into an yttrium concentrate with a composition of Nd, Pr, Sm, La, Eu, Gd, Tb, Dy, Er, Tu, Lu, and V. Even a 2% concentration of this addition has a very noticeable effect.

Card 2/3

ВИСЛАВ, А.В.; СИНИЦЫН, Н.М.; ШУБИНА, С.М.

Donor-acceptor concepts in their application to extraction. Zhur.
strukt. khim. 1 no.3:319-323 8-0 '60. (MIRA 14:1)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR.
(Extraction (Chemistry))

NIKOLAYEV. A.V.; SHUBINA. S.M.; SINITSIN. N.M.

Extraction of the total radioactive isotopes with esters of butyl-
phosphonic acids. Radiokhimiya 2 no.1:3-5 '60. (MIRA 14:5)
(Phosphonic acid) (Radioisotopes) (Extraction (Chemistry))

NIKOLAYEV, A. V.; KURBAKOVA, A. G.; YAKOVLEV, I. I.

Study of extraction processes by means of physicochemical analysis. Zhur. neorg. khim. 5 no.8:1832-1839 Ag '60. (NIRA 13:9)
(Extraction (Chemistry))

NIKOLAYEV, A.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 geokhimi 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 he investigated those chemical reactions in which the extractant 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 Extractants," 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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SOV/89-8-1-22/32

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 cations. 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. Suglov, 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

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NIKOLAYEV, A.V.; MIKHAYLOVA, M.P.

Quaternary system FeCl_3 - HCl - H_2O - $(\text{C}_2\text{H}_5)_2\text{O}$. *Izv. Sib. otd.*
AN SSSR no. 3:46-53 '61. (MIRA 14:5)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR,
Novosibirsk.

(Iron chloride) (Extraction (Chemistry))

NIKOLAYEV, A.V.; STAROSTINA, L.I.; BYKHOV, S.M.

Solubility of some calcium and magnesium salts in the presence
of complexons. Izv. Sib. otd. AN SSSR no.9:52-55 '61.
(MIRA 14:10)

1. Institut neorganicheskoy khimii Sibirakogo otdeleniya AN
SSSR, Novosibirsk.

(Calcium salts)
(Magnesium salts)
(Acetic acid)
(Solubility)

NIKOLAYEV, A.V.; SOROKINA, A.A.; GOLUB', G.I.

Some chemical problems in the dissolution of renal calc: 11.
Izv. Sib. otd. AN SSSR no.10:74-79 '61. (MIRA 14:12)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN
SSSR, Novosibirsk.
(CALCULI, URINARY)

S/186/61/003/003/018/018
E071/E435

AUTHORS: Nikolayev, A.V., Tikhomirov, V.I., Rumyantseva, Z.G.
and Levin, B.V.

TITLE: Entrapment of Alkali Cations by Uranium Peroxide
Precipitates

PERIODICAL: Radiokhimiya, 1961, Vol.3, No.3, pp.372-373

TEXT: The authors investigated the entrapment of some cations of alkali metals during precipitation of uranium peroxide from uranyl sulphate solutions at 50 to 60°C with a large excess of hydrogen peroxide. The concentration of the starting solution was 20 g/l, pH = 2; of the final solution pH = 1. For the determination of sodium entrapment Na^{24} was used. The results obtained indicate that within the range investigated (0.01 to 0.02 M) the concentration of sodium in the starting solution has little influence on its entrapment in the precipitate (0.01 to 0.009% of the sodium present in the solution). For the determination of cesium its radioactive isotope was used (with and without a carrier). The experimental results indicate that: (a) entrapment of cesium by the peroxide precipitate is hundreds of times higher
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Entrapment of Alkali Cations ...

S/186/61/003/003/018/018
E071/E435

than that of sodium and undoubtedly can not be explained by the adsorption mechanism; (b) similarly to sodium, the percent entrapped is independent of concentration. According to the literature, potassium is also entrapped in uranium peroxide precipitates. Therefore, it can be assumed that the increase in the degree of entrapment increases with increasing ionic radius, or with the strength of the corresponding formations in the precipitate. There are 2 tables and 2 references: 1 Soviet-bloc and 1 non-Soviet-bloc. The reference to the English language publication reads as follows: G.W.Watt, S.L.Achorn, I.L.Marley, J.Am.Chem.Soc., 72, 8, 3541 (1950). ✓

SUBMITTED: May 24, 1960

Card 2/2

21337

21.3200

S/078/61/006/004/008/018
B121/B216

AUTHORS: Nikolayev, A. V., Shubina, S. M.

TITLE: Infrared spectroscopic study of the bond type of complexes of uranyl nitrate with derivatives of butyl phosphoric acid

PERIODICAL: Zhurnal neorganicheskoy khimii, v. 6, no. 4, 1961, 799-803

TEXT: The authors studied the type and position of the bonds of complexes formed by uranyl nitrate in the following extraction solvents: tributyl phosphate, the dibutyl ester of butyl phosphonic acid, and tributyl phosphine oxide. The infrared spectra of the extracting agent and their complexes with uranyl nitrate were taken in the frequency range of

700-3000 cm^{-1} . It was established that complex formation between uranyl nitrate and butyl phosphoric acid derivatives occurs through the P=O bond. The absorption spectra of the pure solvents show that the P=O absorption in the range of lower frequency shifts on passing from tributyl phosphate to tributyl phosphine oxide. Evaluation of the infrared spectra of solutions of the uranyl nitrate complexes formed with the

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Infrared spectroscopic study ...

S/078/61/006/004/008/018
B121/B216

extraction solvents used showed that the characteristic P-O frequency shifts in all cases to lower frequencies. The P-O-C absorption of the pure extraction solvents and the solutions of their complexes with uranyl nitrate remains practically unchanged, however, indicating that the P-O-C bond does not participate in the complexing of uranyl nitrate. The following stable complexes of uranyl with extraction solvents were isolated: $UO_2(NO_3)_2 \cdot 2(C_4H_9O)(C_4H_9)_2PO$ and $UO_2(NO_3)_2 \cdot 2(C_4H_9O)_3PO$.

The infrared spectra of these complexes taken in organic solution are presented in Figs. 5 and 7. There are 7 figures, 1 table, and 8 references: 6 Soviet-bloc and 2 non-Soviet-bloc.

SUBMITTED: March 16, 1960

Card 2/4

Infrared spectroscopic study ...

21337
S/078/61/006/004/008/018
B121/B216

Fig. 5: Infrared spectrum of the solid complex. Legend:
1) $\text{UO}_2(\text{NO}_3)_2 \cdot 2(\text{C}_4\text{H}_9\text{O})(\text{C}_4\text{H}_9)_2\text{PO}$; 2) spectrum of the paraffin oil.



Card 3/4

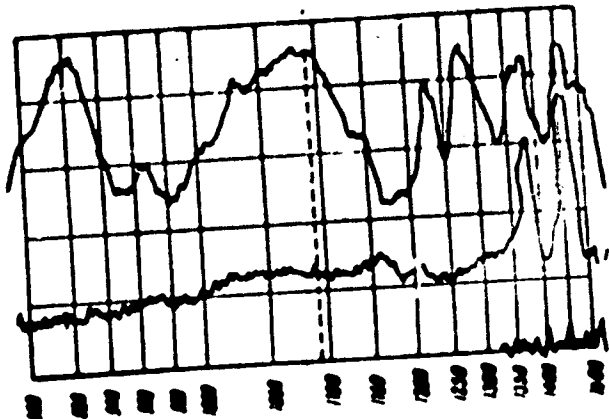
21337

S/078/61/006/004/008/018
B121/B216

Infrared spectroscopic study ...

Fig. 7: Infrared spectra.

Legend: 1) spectrum
of the solid complex
 $UO_2(NO_3)_2 \cdot 2(C_4H_9)_3PO_4$
2) spectrum of the
paraffin oil.



Card 4/4

NIKOLAYEV, A.V.; MIKHAYLOVA, H.P.

Diagram of the extraction of ferric chloride with ethyl ether.
Dokl. AN SSSR 136 no.2:364-365 '61. (DOKA 14:1)

1. Institut neorganicheskoy khimii Sibirovogo otdeleniya Akademii
nauk SSSR. Z. Chlen-korrespondent AN SSSR (for Nikolayev).
(Ether) (Iron chloride)

NIKOLAYEV, A.V., MIKHAYLOVA, M.P.

Method of determining the composition of an extracted complex. Dokl.
AN SSSR 136 no.5:1102-1103 P '61. (MIRA 14:5)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR.
2. Chlen-korrespondent AN SSSR (for Nikolayev).
(Extraction (Chemistry)) (Complex compounds)

Acceptor-donor concepts ...

S/850/62/000/002/001/002
J214/D308

and hence the extraction power of the agent increases. This was verified on U^{VI} , Th^{IV} , Pu^{IV} and Pu^{VI} . The introduction of an electronegative radical into the molecule of the agent will reduce the extraction power while the presence of highly branched chains will prevent the formation of the complex by steric hindrance. Similar arguments apply to the $R_{3-n}P(OR')_n$ type of extracting agent. An extracting agent must, therefore, be sufficiently polar to permit the formation of the complex but the polarity must not be such that the agent becomes water-soluble or that the resulting complex becomes insoluble in nonpolar solvents. It now remains to determine the permissible polarity limits. There are 2 figures and 4 tables.

Card 2/2

S/200/62/000/009/001/001
D204/D307

AUTHORS: Nikolayev, A.V., Rumyantseva, Z.G. and Levin, B.V.
TITLE: The utilization of salicylic acid for the purification and separation of thorium
PERIODICAL: Akademiya nauk SSSR. Sibirskoye otdeleniye. Izvestiya, no. 9, 1962, 39-45

TEXT: The extraction of Th as the salicylate from solutions containing other ions was studied to collect information regarding the degree of purification of Th attainable by this method. Th could be quantitatively precipitated in the presence of Al, Ca, Mg, Mn, Pb, Ni, Co and Cr, by salicylic acid, and without any coprecipitation of these elements. Ferric salicylate was however found to coprecipitate. At pH 4-5, addition of solid salicylic acid (A) to a solution containing 125 g U, 2.5 g Th, 0.25 g each of Mn, Pb, Ni, Cu, Ig and Cr, 1.0 g Al, 4.0 g Fe and 2.5 g Ca per liter resulted in a quantitative precipitation of Th and of Fe³⁺ salicylates. Pure Th salicylate could be obtained from a correspon-

Card 1/3

The utilization of salicylic acid ... 8/200/62/000/009/001/001
D204/D307

ASSOCIATION: Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR, Novosibirsk (Institute of Inorganic Chemistry of the Siberian Branch of the AS USSR, Novosibirsk)

SUBMITTED: December 19, 1961

✓

Card 3/3

S/200/62/000/010/001/002
D204/D307

The extraction system ...

ic phase corresponds to $\text{HNO}_3 \cdot 0.26\text{H}_2\text{O}$. Consideration of the variation of K_d with $[\text{NH}_4\text{NO}_3]$ showed that for 2-5% HNO_3 K_d increased rapidly with $[\text{NH}_4\text{NO}_3]$, while for 50-60% HNO_3 K_d of $[\text{NH}_4\text{NO}_3]$. Plots of K_d against $[\text{HNO}_3]$ showed that K_d decreased rapidly as $[\text{HNO}_3]$ rose from 0 to 15%, and decreased markedly with decreasing $[\text{NH}_4\text{NO}_3]$ (0-50%) in this region. At 50-60% HNO_3 , however K_d was independent of $[\text{HNO}_3]$ and varied little with $[\text{NH}_4\text{NO}_3]$. It is concluded that for up to 25% NH_4NO_3 the main extracted component is water (for low HNO_3). Above 25% NH_4NO_3 , and for very low % HNO_3 , K_d may be very high and independent of $[\text{NH}_4\text{NO}_3]$. Density measurements indicated that HNO_3 determines the density of the organic phases. There are 5 figures and 2 tables.

ASSOCIATION: Institut neorganicheskoy khimii sibirskogo otdeleniya AN SSSR, Novosibirsk (Institute of Inorganic Chemistry, Siberian Branch of the AS USSR, Novosibirsk)

SUBMITTED: June 18, 1962

Card 2/2

S/186/62/004/003/007/022
E071/E433

AUTHORS: Nikolayev, A.V., Torgov, V.G., Roman, V.K.,
Mikhaylov, V.A., Kotlyarevskiy, I.L.

TITLE: The synthesis and investigation of compounds of
uranyl salts with pyridine oxide derivatives

PERIODICAL: Radiokhimiya, v.4, no.3, 1962, 296-304

TEXT: The authors studied the interaction of pyridine oxide derivatives (pyridine-N-oxide); γ -nitropyridine oxide; α -picoline-N-oxide; 2,6-lutidine-N-oxide; 2,3,6-trimethylpyridine-N-oxide; 2,3,5,6-tetramethylpyridine-N-oxide and 2-methyl-6-phenylpyridine-N-oxide) with uranyl salts (nitrate, sulphate and chloride). The synthesis of compounds of uranyl salts with pyridine oxides was done by mixing 10 to 15% alcoholic solutions of a pyridine oxide with alcoholic solutions of uranyl salts in a ratio of uranyl salt : pyridine oxide = 1:3 (in the case of γ -nitropyridine oxide an aqueous solution was used). Altogether 11 complex compounds of uranyl salts with pyridine oxides were obtained and some of their properties investigated. The composition of the compounds was: $UO_2(NO_3)_2 \cdot 2PyOx$ ✓

Card 1/3

S/186/62/004/003/007/022
E071/E433

The synthesis and ...

$UO_2(NO_3)_2 \cdot 3PyOx$ (synthesized in aqueous medium); $UO_2SO_4 \cdot 2PyOx$;
 $UO_2Cl_2 \cdot 2PyOx$. Differential thermal analysis of the compounds
indicated that the first effect is an endothermic one, it is not
associated with any visual changes in the compounds (with the
exception of $UO_2(NO_3)_2 \cdot 2C_6H_7NO$ which melts at 160°C and
 $UO_2SO_4 \cdot 2C_5H_5NO$ which changes colour at 200°C) and is assumed as
being due to the splitting of one or two molecules of pyridine
oxide which can be accompanied by melting. The temperature of
this effect can be taken as a measure of the strength of the
complex. A steady decrease of this temperature in the series:
 $UO_2(NO_3)_2 \cdot 2C_5H_5NO$ (220°C), $UO_2(NO_3)_2 \cdot 2C_6H_7NO$ (160°C),
 $UO_2(NO_3)_2 \cdot 2C_7H_9NO$ (120°C) indicate that the introduction of
the methyl group in the α -position in respect of nitrogen leads to
a decrease in the strength of the bond $UO_2^{2+} \dots \bar{O} - \overset{+}{N} \llcorner$

The compounds are well soluble in water and little soluble in
organic solvents. Complexes with α -picoline oxide are somewhat
batter soluble in organic solvents. This is ascribed to lack of
symmetry in the α -picoline molecule. It is thought that this
Card 2/3

The synthesis and ...

S/186/62/004/003/007/022
E071/E433

non-symmetrical hydrophobization of α -picoline molecule can be enhanced by the introduction of one or two long alkyl chains and thus produce complexes well soluble in organic solvents and insoluble in water. A decrease in the polarity of the N \rightarrow O bond through the introduction of electrophilic substituents, e.g. halogens may have a similar effect. In this way compounds suitable as extracting agents could be obtained. This problem is being investigated. There are 4 figures and 7 tables. ✓

SUBMITTED: April 11, 1961,

Card 3/3

NIKOLAYEV, A.V.

Ghosts in a retort. Nauka i zhizn' 29 no.1:53-57 Ja '62.

(MIRA 15:3)

1. Direktor Instituta neorganicheskoy khimii Sibirskogo otdeleniya
AN SSSR. Chlen-korrespondent AN SSSR.

(Chemistry, Analytical)

NIKOLAYEV, A.V.; VASNEVASKAYA, A.G.; KOLSOV, A.S.; NIKOL'SKAYA, Yu.P.; MIRO, G.M.

Potassium of the upper horizons of salt deposits of the Kansk-Tasseyvo region. Dokl. AN SSSR. 144 no.6:1369-1372 Je '62.
(MIRA 15:6)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya Akademii nauk SSSR.
2. Chlen-korrespondent Akademii nauk SSSR (for Nikolayev).
(Krasnoyarsk Territory—Potassium salts)

S/020/62/145/005/013/020
B106/B144

AUTHORS: Nikolayev, A. V., Corresponding Member AS USSR, and Yakovlev,
I. I.

TITLE: Study of the system uranyl nitrate - water - nitric acid -
tributyl phosphate in the demixing region

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 145, no. 5, 1962, 1064-1067

TEXT: The equilibrium tetrahedron in the demixing region of the system
 $UO_2(NO_3)_2 - HNO_3 - \text{tributyl phosphate (TBP)} - H_2O$ was constructed by po-
tentiometric titration of the aqueous and organic phases using NaOH at
 $22 \pm 1^\circ$ to discover the general rules governing the extraction equilibria
(Fig. 1). There are 1 figure and 1 table.

ASSOCIATION: Institut neorganicheskoy khimii Sibirskogo otdeleniya Aka-
demii nauk SSSR (Institute of Inorganic Chemistry of the
Siberian Department of the Academy of Sciences USSR)

SUBMITTED: April 14, 1962
Card 1/2

S/020/62/146/001/010/016
B101/B144

AUTHORS: Nikolayev, A. V., Corresponding Member AS USSR, D'yachenko,
O. R., Afanas'yev, Yu. A.

TITLE: Joint extraction of uranyl nitrate and cerium(IV) nitrate
by tributyl phosphate (TBP)

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 146, no. 1, 1962, 102-103

TEXT: The partition coefficients K_U and K_{Ce} were determined in the
system $UO_2(NO_3)_2 - Ce(NO_3)_4 - 1.5 N HNO_3 - H_2O - TBP$ at $25^\circ C$. Results:
(1) Uranyl nitrate and cerium(IV) nitrate, separately, are extracted
almost equally by TBP. With 20.4 g/l $UO_2(NO_3)_2$ in the aqueous phase, K_U
was 15.2; with 223 g/l it was 2.60. With 40.3 g/l $Ce(NO_3)_4$ the K_{Ce} was
11.2; with 224 g/l it was 2.46. (2) In joint extraction of U(VI) and
Ce(IV), both the partition coefficients are smaller, and $K_{Ce} > K_U$.
Examples: With 19.9 g/l uranyl nitrate + 20.4 g/l cerium(IV) nitrate,

Card 1/2

8/020/62/147/002/014/021
B106/B101

AUTHORS: Nikolayev, A. V., Corresponding Member AS USSR, Mironov,
K. Ye., Karaseva, E. V.,

TITLE: The reaction of tri-n-butyl phosphate with nitric acid and water

PERIODICAL: Akademiya nauk SSSR. Doklady: v.147, no. 2, 1962, 380-383

TEXT: Specific gravity and viscosity of the liquid phases of the systems tri-n-butyl phosphate (TBP) - HNO₃, TBP - H₂O, and TBP - HNO₃ - H₂O were studied as a function of the composition so as to be able to predict the reaction of the TBP with HNO₃ and water. 1) TBP - HNO₃ system: The curve of the specific weights shows no particular points. The curve of the viscosities at 0°C reaches a maximum for a content of 65 mole-% HNO₃, but at 25°C this is hardly perceptible. The system is irrational; when the temperature is further reduced the maximum of the viscosity curve is shifted into correspondence with a system containing 50% HNO₃. The

Card 1/4

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-to not confirm the

-system. 3) TBP - HNO₃ - H₂O

- viscosity in the ternary system is reached

e
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The reaction of tri-n-butyl phosphate ... S/O20/62/147/002/014/021
B106/B101
in solutions with contents of about 23% HNO_3 and 35% H_2O . The data by
D. C. Tuck (Trans. Farad. Soc., 57, 1299 (1961)) indicate that the acid
used contained ~3% by weight H_2O . There are 3 figures. The most important
English-language reference is: E. Hesford, H. A. C., Mc Kay, J. Inorg. and
Nucl. Chem., 13, 156 (1960).

ASSOCIATION: Institut neorganicheskoy khimii Sibirskogo otdeleniya
Akademii nauk SSSR (Institute of Inorganic Chemistry of
the Siberian Department of the Academy of Sciences USSR)

SUBMITTED: August 1, 1962

Fig. 3. Diagram of the mutual solubility and projection of the viscosity
isotherms for the homogeneous liquid phase of the ternary system
TBP- H_2O - HNO_3 at +25°. Legend: K - TBP; K-critical point of solubility.

Card 3/4

NIKOLAYEV, A. V.; AFANAS'YEV, Yu. A.

Reciprocal influence of thorium and cerium (IV) nitrates in simultaneous extraction with tributyl phosphate. Dokl. AN SSSR 147 no.6:1900-1901 D '62. (MIRA 1641)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR, 2. Chlen-korrespondent AN SSSR (for Nikolayev).

(Thorium nitrate) (Cerium nitrate)
(Butyl phosphate)

NIKOLAYEV, A.V., otv. red.; OPALOVSKIY, A.A., kand. khim. nauk,
red.; NAZARYANTS, T.M., red.

[Physicochemical analysis] Fiziko-khimicheskii analiz; trudy.
Otv. red. A.V.Nikolaev, A.A.Opalovskii. Novosibirsk, Izd-vo
Sibirskogo otd-nia AN SSSR, 1963. 330 p. (MIRA 17:4)

1. Yubileynaya konferentsiya po fiziko-khimicheskomu analizu.
Novosibirsk, 1960. 2. Chlen-korrespondent AN SSSR (for
Nikolayev).

L 113009-63 EFF(c)/EWP(q)/EWT(m)/FS(a)/BDS AFFTC/ASD JD/ES/JG
ACCESSION NR: AP3002903 S/0289/63/000/001/0009/0013

AUTHOR: Nikolayev, A. V.; Durasova, E. A. 59
50

TITLE: Solubility of uranium peroxide

SOURCE: AN SSSR. Sibirskoye otdeleniye. Izvestiya. Seriya khimicheskikh nauk,
no. 1, 1963, 9-13

TOPIC TAGS: uranium peroxide, sulfuric acid, solubility

ABSTRACT: The solubility of uranium peroxide in water at temperatures of 25, 40, 60, and 100C has been determined. It was found that an increase in the temperature from 25 to 100C increases the solubility slightly, from 4.9 to 6.0 mg/l. The solubility of uranium peroxide was determined in sulfuric acid solutions at different pH values (1-3) at the same temperatures. The correlation between temperature and solubility is more pronounced in this case. The solubility of uranium peroxide increases considerably with decreasing pH. At 100C and pH = 1, it amounts to 10.7 g/l. The effect of an excess of hydrogen peroxide on the solubility of uranium peroxide in sulfuric acid solutions was investigated. It was found that the addition of hydrogen peroxide (in amounts of up to 0.2 mol/l) caused the amount of uranium dissolved to decrease considerably. At 100C and pH = 1, solubility is 11.5 mg/l. Orig. art. has: 4 figures and 7 tables.
Card 1/2/

Association: Inst. of Inorganic Chemistry, Siberian Department, AN SSSR

NIKOLAYEV, A.V.; DYADIN, Yu.A.; ANDREYEVA, N.A.

Solubility in the system $H_2C_2O_4 - (C_2H_5)_2 NH - H_2O$. Izv. SO AN
SSSR no.11 Ser.khim.nauk no.3:80-85 '63. (MIRA 17:3)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR,
Novosibirsk.

AFANAS'YEV, Yu.A.; NIKOLAYEV, A.V.

Thermochemical investigation of the system water - tributyl
phosphate at 25° C. Izv. SO AN SSSR no.11 Ser.khim.nauk no.3:
118-119 '63. (MIRA 17:3)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR,
Novosibirsk.

NIKOLAYEV, A.V.

Application of physicochemical analysis for extraction processes.
Trudy Khim. anal. khim. 14:31-46 '63. (MIRA 16:11)

L 12713-63
ACCESSION NR: AP3001406

possibility of a rapid extraction of cerium (IV) from 1 to 2M solutions of HNO sub
3. Orig. art. has: 1 table and 1 graph.

ASSOCIATION: Institut neorganicheskoy khimii Sibirskogo otdeleniya Akademii nauk
SSSR (Institute of Inorganic Chemistry, Siberian Department, Academy of Sciences
SSSR)

SUBMITTED: 22Feb63

DATE ACQ: 01Jul63

ENCL: 00

SUB CODE: 00

NO REF SOV: 009

OTHER: 002

Card 2/2

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

Extraction system $\text{Th}(\text{NO}_3)_4 - \text{HNO}_3 - \text{H}_2\text{O} - (\text{C}_4\text{H}_9\text{O})_3\text{PO}$ at 25°C
studied by means of extraction rays. Dokl. AN SSSR 152 no.5:1115-
1117 0 '63. (MIRA 16:12)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR.
2. Chlen-korrespondent AN SSSR (for Nikolayev).

NIKOLAYEV, A.V.; DYADIN, Yu.A.; YAKOVLEV, I.I.; MIRONOVA, Z.N.

Quinary system $UO_2(NO_3)_2 - (C_4H_9)_2 PO(C_4H_9O) - H_2O - HNO_3 - CCl_4$
at a constant relation of $(C_4H_9)_2 PO(C_4H_9O)$ to CCl_4 in the
demixing area. Dokl. AN SSSR 153 no.1:118-121 N 1963.
(MIRA 17:1)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya
AN SSSR. 2. Chlen-korrespondent AN SSSR (for Nikolayev).

NIKOLAYEV, A.V.; BOGATYREV, V.L.; VILIKH, A.I.

Study of ion exchange processes by means of physicochemical analysis.
Dokl. AN SSSR 153 no.2:360-362 N '63. (MIRA 16:12)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR.
2. Chlen-korrespondent AN SSSR (for Nikolayev).

MURASOVA, S.A.; NIKOL'YEV, A.V.

$UO_3 - H_2O_2 - H_2O$ system. Izv. SO AN SSSR no.7 Ser. khim. nauk
no.2:58-61 '64 (MIRA 18:1)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN
SSSR, Novosibirsk.

1972 1-15 INT(n)/SPT(n)-2000 4 0289 54 000 000 0060-0052

R. Mikhlayev, A.V. Ryabinin, A. Alkhasov, Y. A.

Mutual influence of uranyl nitrate and thorium nitrate during joint extraction with tributyl phosphate

AN SSSR, Sibirskoye otdeleniye, Seriya Khimicheskaya, no. 3, 1972, pp. 92

Keywords: tributyl phosphate, uranyl nitrate extraction, thorium nitrate extraction, partition coefficient, distribution coefficient, uranium

ABSTRACT: The authors studied the five-component extraction system $UO_2(NO_3)_2 - HNO_3 - H_2O - TBP - H_2O$ and the mutual influence of uranyl nitrate and thorium nitrate on the distribution coefficients of the components. It was found that the separation efficiency of uranyl nitrate extraction increases with increasing uranyl nitrate concentration in the organic phase. On the other hand, it was found that at low concentrations, uranyl nitrate can be displaced from the organic phase by thorium nitrate. At relatively high concentrations above 0.5 M, thorium nitrate has practically no effect on the extraction of uranyl nitrate. Comparison of the data

191871-65

ACCESSION NR: AP5009424

in accordance with those of previous investigators and led the authors to the conclusion that the
stability of the solvates formed by uranyl perchlorate lies in the series $UO_2^{2+} \cdot 2ClO_4^-$,
 $UO_2^{2+} \cdot Th(V), HNO_3$. (orig. art. contains figures and tables)

ASSOCIATION: Institut neorganicheskoy khimii Sibirskogo otdeleniya Akademii nauk
SSSR, Novosibirsk (Institute of Inorganic Chemistry, Siberian Branch, Academy of
Sciences, SSSR)

SUBMITTED: 10Jan64

ENCL: 00

SUB CODE: IC

NO REF SOV: 006

OTHER: 000

File
Card 2/1

L 01272-05 EWT(m)/EWP(j)/T P0-4 RN
LITERATURE NUMBER: APR 1964

RUSSIAN 04 000 000 0000 0104

AUTHOR: Tergov, V.G.; Nikolayev, A.V.; Mikhaylov, V.A.; Korolenok, L.N.;
Stoyakova, L.G.; Kolyarevskiy, G.S.

TITLE: Study of the extraction of uranyl nitrate by some derivatives of pyridine-N-oxide

FROM: AN SSSR, 1964, Vol. 1, No. 1, p. 104-108, 10 refs., 10x16 mm, no. 3, 1964, 96-104

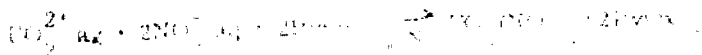
KEYWORDS: uranyl nitrate extraction; extraction; pyridine-N-oxide derivative; paroxyacetic acid; distribution isotherms; tributyl phosphate

The authors study the extraction of uranyl nitrate by some derivatives of pyridine-N-oxide (pyridine-N-oxide, 2-pyridylpyridine, 2,6-pyridinediol, 2,6-pyridinediol-1-oxide, paroxyacetic acid), and discusses the mechanism of extraction of uranyl nitrate by some of them. With regular pyridine-N-oxides containing one N → O group, uranyl nitrate forms compounds of the composition $UO_2(NO_3)_2 \cdot 2PyOx$ with molecules containing two N → O groups. It forms the compounds $UO_2(NO_3)_2 \cdot 2PyOx$. Isotherms of the distribution of uranyl nitrate between the organic and aqueous phases are plotted. The extraction of uranyl nitrate by the studied pyridine-N-oxide derivatives is studied in the region of high extraction efficiency.

2 07-05

ACCESSION NR: AP5009428

of the Isotherms and when tributyl phosphate is used is determined by the process



to take the extractive effect of the solvent into account. Besides, the
 constant of the extraction process is determined. It is shown that the
 more effective extraction is observed when tributyl phosphate is used.

Submitted to the Journal of Applied Chemistry, Academy of Sciences
 of the USSR, Institute of Inorganic Chemistry, Soviet Academy of Sciences,
 Moscow, U.S.S.R.

SUBMITTED: 19Jul64

OTHER: 005

NO REF SOV: 005

OTHER: 005

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 page 2/2

NIKOLAYEV, A.V.; APANAS'YEV, Yu.A.; LURASOV, V.B.; RYABININ, A.I.

Determination of the size of solvate molecules formed by tributyl phosphate. Zhur. strukt. khim. 5 no.3.490-492 My-Je '64.

(MIRA 1E:7)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR,
Novosibirsk.

NIKOLAYEV, A.V.; BOGATYEV, V.L.; VULIKH, A.I.

Ion-exchange system R^+, NH_4^+ || $R^-, Cl^- - H_2O$. Zhur. neorg. khim.
9 no.10:2469-2474 0 1964.

(MIRA 17:12)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR.

NIKOLAYEV, A.V.; CHIN' TSZAO-IN'

Functional advantages of jejuno-gastroplasty before modified
Bilroth II gastric resection. Khirurgiia 40 no.8:50-55 Ag '64.
(MIRA 18:3)

1. Kafedra fakul'tetskoy khirurgii (zav. - prof. N.N. Yelanskiy)
I Moskovskogo ordena Lenina meditsinskogo instituta imeni Sechenova.

ACCESSION NR: AP4019976

S/0020/64/154/006/1395/1397

AUTHORS: Nikolayev, A.V. (Corresponding member); Kolesnikov, A.A.

TITLE: Extraction system of $\text{La}(\text{NO}_3)_3\text{-HNO}_3\text{-H}_2\text{O-(C}_4\text{H}_9\text{O)}_3\text{PO}$ at 25C

SOURCE: AN SSSR. Doklady*, v. 154, no. 6, 1964, 1395-1397

TOPIC TAGS: extraction system, $\text{La}(\text{NO}_3)_3\text{-HNO}_3\text{-H}_2\text{O-(C}_4\text{H}_9\text{O)}_3\text{PO}$, lanthanum, $\text{La}(\text{NO}_3)_3$, HNO_3 , H_2O , lanthanum extraction

ABSTRACT: Experiments were carried out in isothermic conditions at $25 \pm 0.1^\circ\text{C}$. Lanthanum was determined complexometrically (J. Korbe, R. Pmbil Chem-Ana (45 4, 102 (1956))), the water content in the organic phase was determined by Fisher's method (Dzh. Mitchel, D. Smit, Akvometriya, L.-M., 1962, str. 68.) and nitric acid was determined by alkali titration with methyl red indicator. The distribution ratio of the component of the system was determined like the relation of its analytic concentrations in weight percentages in the organic phase in water. (Fig1) The distribution ratio of lanthanum depends on the relation of components of equilibrium water phases, and changes from 0.01 to 1.0 and more. The area of low recovery is located at

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ACCESSION NR: AP4019978

the origin, i.e. this is the area where a considerable degree of extraction is needed for complete recovery of lanthanum. The study of the extraction system $\text{La}(\text{NO}_3)_3\text{-HNO}_3\text{-H}_2\text{O}$ -(C, H, O)₂PO permitted the determination of a distribution ratio of 23 components $\text{La}(\text{NO}_3)_3$, HNO_3 , and H_2O in all areas of concentration. Orig. art. has: 1 table and 1² figure

ASSOCIATION: Institut neorganicheskoy khimii Sibirskovo otdeleniya Akademii nauk SSSR (Institute of Inorganic Chemistry, Siberian Branch, Academy of Sciences SSSR)

SUBMITTED: 28Oct63

DATE ACQ: 23Mar64

ENCL: 02

SUB CODE: CH

NR REF SOV: 006

OTHER: 003

Card

2/4

ACCESSION NR: AP4019978

ENCLOSURE: 02

Extraction system $\text{La}(\text{NO}_3)_3$ - HNO_3 - H_2O - $(\text{C}_2\text{H}_5\text{O})_2\text{PO}$: a - are extraction
rays, b - are isolines of coefficients of distribution $\text{La}(\text{NO}_3)_3$,
c - are the same for HNO_3 , d - are the same for H_2O

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ACCESSION NR: AP4022719

molar fraction of uranyl nitrate in the solution. The calculated solvation heat amounts to 6300 ± 380 cal/mole, which is indicative of the chemical nature of the interaction between the uranyl nitrate and TBP, and which is not observed in the H₂O-TBP system. A number of authors calculated the magnitude from the temperature change of the equilibrium constant of that reaction and it was found to be 3400-4660 cal/mole, with an ionic force of the aqueous phase from 1.2 to 0.2, 6300 cal/mole and 3610 cal/mole. The conclusion is that calorimetry is the only reliable method of determining the thermal effect of the mentioned extraction. Orig. art. has: 2 formulas and 3 tables.

ASSOCIATION: Institut neorganicheskoy khimii Sibirskogo otdeleniya Akademii nauk SSSR (Institute of Inorganic Chemistry of the Siberian Division, Academy of Sciences, USSR).

SUBMITTED: 10Nov63

DATE ACQ: 06Apr64

ENCL: 00

SUB CODE: 00

NR REF SOV: 006

OTHER: 002

Card 2/2

NIKOLAYEV, A.V.; BOGATYREV, V.L.; VEDIKH, A.I.

Ion exchange system: H^+ , Ca^{2+} , R^+ , Cl^- H_2O investigated by the ray method. Dokl. AN SSSR 155 no. 3:607-610 Mar '64.

(MIRA 17:5)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR. 2. Chlen-korrespondent AN SSSR (for Nikolayev).

NIKOLAYEV, A.V.; GRIGOR'YEV, V.V.

Coprecipitation in the system $Zn^{2+} - Co^{2+} - [Hg(SCN)_2]^{2-}$
studied by means of radiometric titration. Dokl. AN SSSR
155 no. 4:853-856 Ap '64. (MIRA 17:5)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN
SSSR. 2. Chlen-korrespondent AN SSSR (for Nikolayev).

NIKOLAYEV, A.V.; GRIGOR'YEV, V.A.

Coprecipitation of thallium (I) with the tetrathiocyanomercurates
of zinc, cobalt, and cadmium. Dokl. AN SSSR 155 no.6:1368-1370
Ap '64. (MIRA 17:4)

1. Chlen-korrespondent AN SSSR (for Nikolayev).

ACCESSION NR: AP4038525

S/0020/64/156/003/0616/0618

AUTHOR: Nikalayev, A. V. (Corresponding member); Torgov, V. G.;
Mikhaylov, V. A.; Kotlyarevskiy, I. L.

TITLE: Uranyl nitrate extraction with pyridine-1-oxide derivatives

SOURCE: AN SSSR. Doklady^a, v. 156, no. 3, 1964, 616-618

TOPIC TAGS: uranyl nitrate extraction, solvent extraction, alpha-alkylpyridine-1-oxide, extracting agent, extraction mechanism, extracting capability

ABSTRACT: The mechanism of solvent extraction of uranyl nitrate with α -alkylpyridine-1-oxides has been studied to discover an extracting agent for uranyl nitrate superior to those presently known, such as tributylphosphate (TBP), in respect to the solubility of their solvates in various organic solvents. The distribution isotherms of uranyl nitrate between the aqueous and organic phases and direct synthesis indicated that the formation of the disolvate

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ACCESSION NR: AP4038525

is the factor limiting uranyl nitrate concentration in the organic phase. An analogy was noted in the mechanism of extraction between α -alkylpyridine-1-oxides and neutral phosphoorganic compounds (TBP). On the basis of experimental equilibrium constants of the extraction process, the extracting capability of α -alkylpyridine-1-oxides was found to be 100 to 200 times higher than that of TBP. Orig. art. has: 2 figures and 1 table.

ASSOCIATION: Institut neorganicheskoy khimii Sibirskogo otdeleniya Akademii nauk SSSR (Institute of Inorganic Chemistry, Siberian Department, Academy of Sciences, SSSR)

SUBMITTED: 10Feb64

DATE ACQ: 09Jun64

ENCL: 00

SUB CODE: GC

NO REF SOV: 002

OTHER: 010

Card 2/2

ACCESSION NR: AF4041156

8/0000/04/156/004/0000/0090

AUTHOR: Nikhlayev, A. V.; Ivanov, I. N./ Yakhovlev, I. I.

TITLE: Phase equilibria in the UO_2SO_4 - H_2O - H_2SO_4 - $HEHFA$ and H_2O - UO_2SO_4 - H_2SO_4 - $HEHFA$ systems

SOURCE: AN SSSR: Doklady, v. 156, no. 4, 1964, 898-899

TOPIC TAGS: uranyl sulfate, extraction, dibutylphosphinic acid butyl etherate, phase diagram, solubility, uranyl sulfate containing system

ABSTRACT: Phase diagrams were constructed for the uranyl sulfate - water - butyl ester of dibutylphosphinic acid ($HEHFA - C_8H_{17}OPO(C_4H_9)_2$) and sulfuric acid - water - $HEHFA$ systems which constitute the quaternary extraction system for uranium VI salts (figs. 1 and 2). The extraction can be effected only in the narrow area A. The dihydrate $UO_2SO_4 \cdot 2H_2O$ is very stable in water; only in excess water will it break up into 2 liquid phases - an aqueous phase containing 1.02% uranyl sulfate and an organic phase with 19.2% UO_2SO_4 , 16.6% H_2O and 73.2% $HEHFA$. $HEHFA$ is completely miscible with H_2SO_4 , starting with approximately 80% acid. The binodal of the ternary system (fig. 2) is characteristic of organic systems having no chemical

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ACCESSION NR: APO1156

reaction. Orig. art. has: 3 tables and 2 figures.

ASSOCIATION: Institut neorganicheskoy khimii, Sibirskaya otdelevaya Akademiya nauk
USSR (Institute of Inorganic Chemistry, Siberian Department Academy of Sciences)

DATE: 02/04/68
AUTHOR: [illegible]
TITLE: [illegible]
SUBJECT: [illegible]

Card 2/4

ACCESSION NR: AF401156

ENCLOSURE: 01

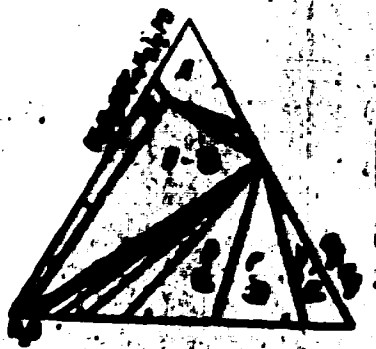


Fig. 1. Solubility diagram of the $HgBr_2 - HgO - C_2H_5OH(2H_2O)$ system at 25°C.
 A - area of separation of the aqueous and organic solutions of mercury sulfide;
 B - univariant area: solid dissolves, organic phase aqueous solution;
 C - area of equilibrium of dissolves with aqueous phase;
 D - area of equilibrium of solid dissolves, trihydrate and saturated aqueous
 solution; E - area of coexistence of solid dissolves & saturated organic phase

Card 3/4

NIKOLAYEV, A.V.; GRIGOR'YEV, V.A.

Compounds with a complex anion $[Hg(SCN)_6]^{2-}$ and their precipitates. Dokl.
AN SSSR 158 no.2:415-418 S '64. (MIRA 17:10)

7. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR. 2.
Chlen-korrespondent AN SSSR (for Nikolayev).

NIKOLAYEV, A.V.; DYADIN, Yu.A.; YAKOVLEV, I.I.

Solubility of water and uranyl nitrate in tributyl phosphate within the
0 - 100°C range. Dokl. AN SSSR 158 no.5:1130-1132 0 '64. (MIRA 17:10)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR. 2.
Chlen-korrespondent AN SSSR (for Nikolayev).

NIKOLAYEV, A.V.; KOLEJNIKOV, A.A.; SMIRNOVA, T.P.

Extraction system $\text{La}(\text{NO}_3)_3 - \text{NH}_4\text{NO}_3 - \text{H}_2\text{O} - (\text{C}_6\text{H}_5\text{O})_3\text{PO}$, PO.
Dokl. AN SSSR 199 no.2: 379-382 N 364. (MIRA 17:12)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR.
2. Chlen-korrespondent AN SSSR (for Nikolayev).

NIKOLAYEV, A.V.; AFANAS'YEV, Yu.A.; RYABININ, A.I.; KOROLEVA, T.I.

Thermochemistry of cerium (IV) nitrate extraction with tributyl phosphate. Dokl. AN SSSR 159 no.4:851-852 D '64 (MIRA 18:1)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR. 2. Chlen-korrespondent AN SSSR (for Nikolayev).

NIKOLAYEV, A.M.; DYADIN, Yu.A.; YAKOVLEV, I.I.; DUTAKOV, V.P.; MIRONOVA, Z.Y.

Polytherms of mutual solubility in the systems water-organic-phosphorus extraction agents. Report 1. Izv. SO AN SSSR no. 2. Ser. khim. nauk no. 1:27-31 '65. (MIRA 12:8)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR, Novosibirsk.

NIKOLAYEV, A.V.; MIKHAYLOVA, M.P.

Ternary systems hydrochloric acid - water - organic solvent.

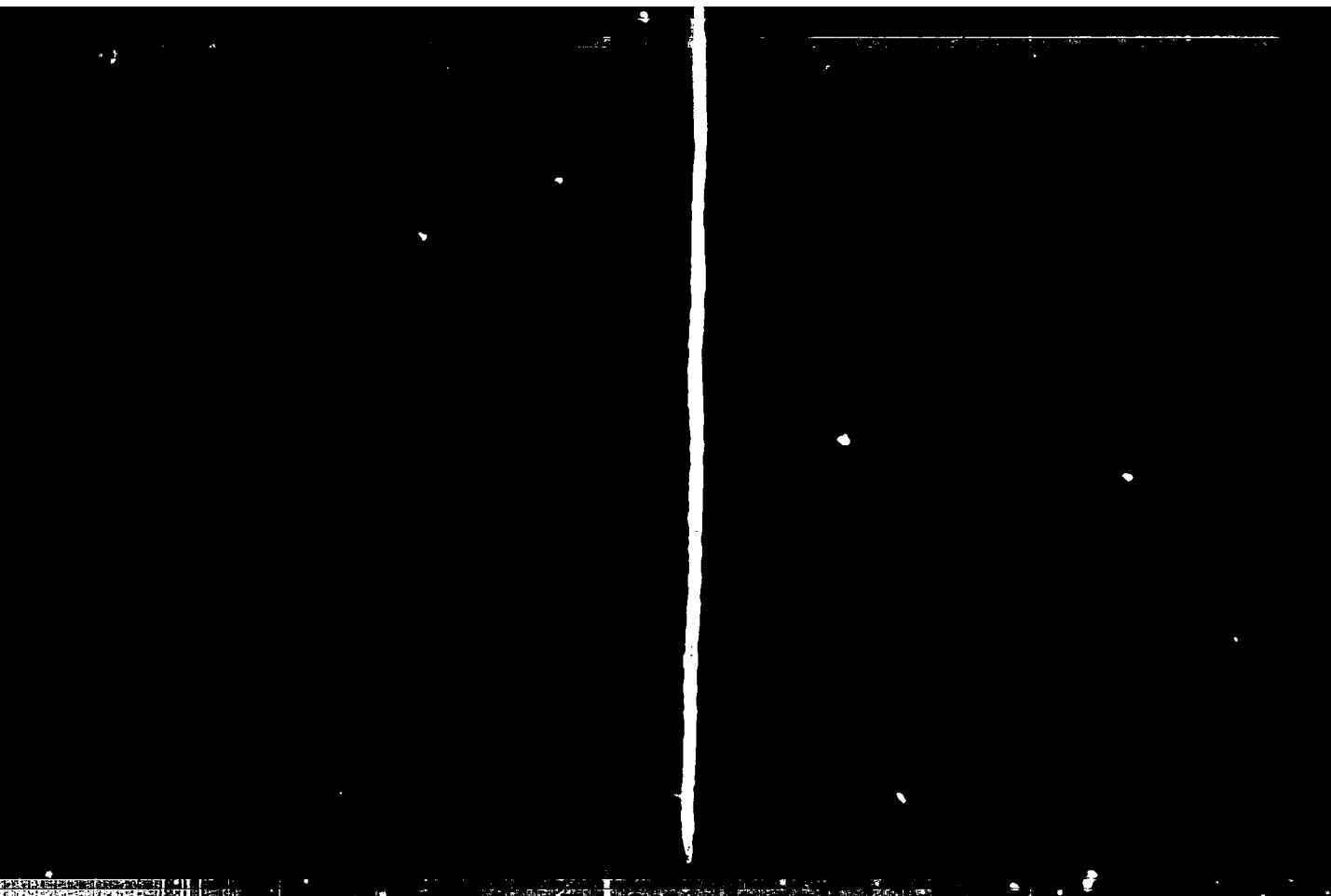
Izv. SO AN SSSR no.3 Ser. khim. nauk no.1:32-39 '65.

(MIRA 18:8)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya
AN SSSR, Novosibirsk.

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L 53905-65

ACCESSION NR: AP5017059

were determined. The polymers were found to be highly selective and quite stable to acids. The partition coefficient of such resins as the butylphosphonate, triallyl phosphite, and isooctylphosphonate remains virtually unchanged after treatment with 5 N HNO₃. A complete desorption of uranyl nitrate was achieved with a water-alcohol solution of ammonium carbonate. Cf. art. nos. 4 figured and 5 tables

ASSOCIATION: Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR, Novosibirsk (Institute of Inorganic Chemistry, Siberian Branch, AN SSSR)

RECEIVED: 15 Nov 63

ENCL: 00

REF CODE: OC, IC

NO REF NOV. 004

OTHER: 004

2/2 40F

NIKOLAYEV, A.V.; AFANAS'YEV, Yu.A.; KUZNETSOV, P.A.

Calculation of the enthalpy change during extraction according to the standard enthalpies of formation. Izv. IO AN SSSR no. 1 Ser. khim. nauk no.1:115-117 '65. (MIRA 1968)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR, Novosibirsk.

ABSTRACT: A method is presented for the determination of maximal heat flow in the center of a heat spot for a plasma stream. The calculation is based on equations obtained by Feyn and Kiddell for heat flow at a critical point, for the case of an equilibrium boundary layer. The possibility for determining maximal heat loss is a function of a parameter β which is defined as $\beta = \frac{1}{2} \frac{d^2 T}{dx^2} \bigg|_{x=0}$. The results show that the maximal heat loss is a function of β and that several parameters are involved in the calculation. The results are plotted as a function of β and the results are shown in Figure 1.

MAKSHOV, A.B.; NIKOLAYEV, A.V.

Method for estimating the decrement of seismic wave absorption.
Izv. AN SSSR. Fiz. zem. no.6:65-71 '69.

(MIRA 18:7)

1. Institut fiziki Zemli AN SSSR.

NIKOLAYEV, A.V.; GRIGOR'YEV, V.A.

Determination of the surface area of tetrathiocyanomercurates
by the isotope exchange method. Radiokhimiia 7 no.2:252-253
'65. (MIRA 18:6)

NIKOLAYEV, A.V.; DYADIN, Yu.A.; YAKOVLEV, I.I.

Mutual solubility in the system water - nitric acid - 10^{-2} M at 25°. Dokl. AN SSSR 160 no.2:363-365 Ja '65.

(MIRA 18:7)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR.
2. Chlen-korrespondent AN SSSR (for Nikolayev).

NIKOLAYEV, A.V.; STADIN, I.A.; KALININ, V.I.

Solubility polymers in the ternary system $BN_3 - C_2H_6 - C_2H_5OH$ (No. 2).
Dokl. AN SSSR 160 no. 4: 841-842, 1965.

(MIRA 1965)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR.
2. Chlen-korrespondent AN SSSR (for Nikolayev).

VULFIN, A.I.; NIKOLAYEV, A.V.; SEMENOV, M.K.; BEGATYEV, V.I.

Absorption of ammonia and chlorine by ion-exchange resins under dynamic conditions. Dokl. AN SSSR 160 no.5:1072-1074 P 165.

(MIRA 18:2)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR.
2. Chlen-korrespondent AN SSSR (fr. Nikolayev).