

YAKOVLEV, G.N.
All-Union Arctic Scientific Research Institute, Moscow

"Solar Radiation as the Chief Component of the Heat Balance of the Arctic Ice,"
English) 13 pp.
paper (submitted) at Arctic Sea Ice Conference, Easton, Md., 24-27 Feb 58

*EVAL - A-3, 112, 158
Available in Lib.*

YAKOVLEV, G. N.

p. 2

PHASE I BOOK EXPLOITATION

BOV/4085

Leningrad. Arkticheskiy i Antarkticheskiy nauchno-issledovatel'skiy institut

Problemy Arktiki; sbornik statey, vyp. 5 (Problems of the Arctic; Collection of Articles, No. 5) Leningrad, Izd-vo "Morskoy transport," 1958. 139 p. 500 copies printed. XEROX COPY

Additional Sponsoring Agency: USSR. Ministerstvo morskogo flota. Glavnoye upravleniye severnogo morskogo puti.

Resp. Ed.: V.V. Frolov; Editorial Board: L.L. Balakshin, M.I. Belov, Ya. Ya. Gakkel', A.A. Girs, P. A. Gordiyenko, L.G. Kaplinskaya, A.F. Laktionov, A.P. Nikol'skiy, A.Ya. Sukhorukov, and A.F. Treshnikov (Deputy Resp. Ed.); Tech. Ed.: L.P. Drozhzhina.

PURPOSE: The publication is intended for geographers, oceanographers, and readers interested in the study of the Arctic and Antarctic regions.

COVERAGE: This collection of 19 articles published by the Arctic and Antarctic Institute deals with phenomena on the Arctic ice sheet, the effect of western

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Problems of the Arctic, Collection of Articles, No. 5 SOV/4085

atmospheric circulation on air conditions in the Arctic . methods of photometric processing of aerial photographs in determining the depth of reservoirs, magnetic observations and processes occurring on islands in Soviet Arctic waters. Brief information on the results of Soviet Arctic and Antarctic expeditions is included. References follow the articles.

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YAKOVLEV, G.N.

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PART I BOOK REVISIONS 027/ACC

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Antarctic Collection of Articles, 10, 11...
1979, 129 p. Extra ally insured, 500 copies printed.

Additional Sponsoring Agency: USSR, Ministry of...
average...
Bary, M.I. V.Y. Pashov, Editorial...
Yakovlev, G.N. I.I. Yakovlev, I.I. Yakovlev, I.I. Yakovlev

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Scientific Research Institute...
Arctic Seas, atmospheric circulation...
drifting ice, the intensity of...
in ice...
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sea...

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YAKOVLEV, G. N., Doc Geog Sci -- (diss) "Heat balance in the drifting glacier cover of Central Arctica." Moscow, 1960. 22 pp; (Moscow State Univ im M. V. Lomonosov (Geography Faculty), Ministry of Higher and Secondary Specialist Education RSFSR); 300 copies; price not given; list of author's works at end of text (12 entries); (KL, 51-60, 116)

YAKOVLEV, G.N.

Snow cover on drift ice in the central Arctic. Probl.Arkt.i
Antarkt. no.3:65-76 '60. (MIRA 13:9)
(Arctic Ocean--Snow)

YAKOVLEV, G.N.

Typification of temperature distribution in the ice sheet
thickness. Probl. Arkt. i Antarkt. no.10:77-80 '62.

(MIRA 1612)

(Arctic regions—Ice)

YAKOVLEV, G.N.

Ice studies in the central Arctic. Probl.Arkt.i Antarkt.
no.11:47-57 '62. (MIRA 16:2)

(Arctic regions—Ice)

YAKOVLEV, G.N.

Relief shapes of the surface of drifting ice. Probl. Arkt. 1
Antarkt. no.12:61-68 '63. (MIRA 16:7)
(Arctic regions--Ice)

YESIKOV, A.D.; BESCHASTNOVA, G.S.; YAKOVLEV, G.N.

Flame photometric determination of strontium in minerals and
rocks. *Izv. AN SSSR. Ser. geol.* 24 no. 12: 69-76 D '59.
(MIRA 13:8)

1. Institut geologii rudnykh mestorozhdeniy, petrografii,
mineralogii i geokhimi AN SSSR, Moskva.
(Strontium) (Photometry)

YESIKOV, A.D.; BESCHASTNOVA, G.S.; YAKOVLEV, G.N.

Flame photometric determination of rubidium and strontium.
Biul.Kom.po opr.abs.vzr.geol.form. no.5:76-81 '62. (MIRA 15:11)
(Rubidium) (Strontium) (Geological time) (Photometry)

YESIKOV, A.D.; BESCHASTNIKOVA, G.S.; YAKOVLEV, G.N.

Determination of the isotope composition of strontium in the MI-1305
mass spectrometer. *Biul.Kom.po opr.abs.vozr.geol.form.* no.5:82-88
'62. (MIRA 15:11)
(Mass spectrometry) (Geological time) (Strontium)

S/169/62/000/012/007/095
D228/D307

AUTHORS: Yesikov, A.D., Yesikova, G.S. and Yakovlev, G.N.

TITLE: Determining the absolute age of some lepidolites by the rubidium-strontium method

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 12, 1962, 10, abstract 12481 (Byul. Komis. po opredeleniyu absol-yutn. vozrasta geol. formatsiy, AN SSSR, no. 5, 1962, 89-93)

TEXT: The rubidium-strontium method of ascertaining the absolute age of minerals is based on the β -decay of the rubidium isotope with mass 87 and on the formation of the stable strontium isotope. Lepidolites which, as a rule, contain up to 2-3% rubidium are most suitable for age determination. Mass-spectrometric methods are being applied to determine extremely small amounts of strontium and rubidium. Work on determining the age of several lepidolites was carried out in the Laboratoriya absolyutnogo vozrasta IGYeM AN SSSR (Absolute Age Laboratory, IGYeM, AS USSR). Rubidium was deter-
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S/169/62/000/012/007/095
D228/D307

Determining the absolute age ...

mined by the flame photometry method; radioactive strontium was determined on a mass-spectrograph. One-band sources, mass-spectral scanning, and the method of increasing the mass-spectrometer sensitivity, which were all developed by the author, were employed in the latter determinations. The results obtained from determining the age of lepidolites by the rubidium-strontium method agree well with data for age determinations by the potassium-argon method.

[Abstracter's note: Complete translation]

Card 2/2

CHUDINOV, E.G.; YAKOVLEV, G.N.

Reaction of pentavalent neptunium with the arsenazo 3
reagent. Radiokhimiya 4 no.4:505-506 '62. (MIRA 15:11)
(Neptunium compounds)
(Arsenazo)

CHUDINOV, E.G.; YAKOVLEV, G.N.

Determination of trace amounts of neptunium with the arsenazo
3 reagent. Radiokhimiya 4 no.4:506-508 '62. (MIRA 15:11)
(Neptunium compounds)
(Arsenazo)

AP028326

SOURCE CODE: UR/0040/66/030/004/0768/0773

AUTHOR: Ivanilov, Yu. P. (Moscow); Yakovlev, G. N. (Moscow)

ORG: none

TITLE: On the bifurcation of fluid flow between two rotating cylinders

SOURCE: Prikladnaya matematika i mekhanika, v. 30, no. 4, 1966, 768-773

TOPIC TAGS: Couette flow, secondary flow, rotational flow, flow research

ABSTRACT: The origin of secondary stationary flows in a fluid contained between two cylinders rotating in the same direction is analyzed. A two-dimensional steady flow without pressure gradient in the direction of flow, caused by the tangential movement of the bounding surfaces (Couette flow), has a trivial solution. Upon introducing a linearized system of equations defining stationary axisymmetric flows, some additional boundaries and parameters are formulated. The physical essence of the bifurcation operator is explained and expressed mathematically. Orig. art. has: 24 formulas.

SUB CODE: 20/

SUBM DATE: 10Jan66/

ORIG REF: 008/

OTH REF: 004

Card 1/1

YAKOVLEV, G. N. and KOSYAKOV, V. N.

"Spectrophotometric Studies of the Behavior of Americium Ions in Solutions,"
a paper presented at the Atoms for Peace Conference, Geneva, Switzerland, 1955

YAKOVLEV, G. N., DERGUNOV, Ye. P., REFORMATSKIY, I. A. and DEDOV, V. B.

"A Hot Analytical Laboratory," a paper presented at the Atoms for Peace Conference,
Geneva, Switzerland, 1955

YAKOVLEV, G. N., KURCHATOV, B. V., GORBENSHCHIKOVA, V. I., and CHERNYAVSKAYA, N. B.

"The Sulphate Method of Separating Plutonium and Neptunium," a paper
presented at the Atoms for Peace Conference, Geneva, Switzerland, 1955

KURCHATOV, B.V., starshiy nauchnyy sotrudnik-khimik; GREBENSHCHIKOVA,
V.I., starshiy nauchnyy sotrudnik; CHERNYAVSKAYA, N.B.,
nauchnyy sotrudnik; YAKOVLEV, G.N., nauchnyy sotrudnik

[Sulfate method for isolating plutonium and neptunium] Sul'fatnyi
metod vydeleniia plutoniia i neptuniia. Moskva, 1955. 7 p.
(Plutonium) (Neptunium) (MIRA 14:6)

YAKOVLEV, G.M.; GORBENKO-GERMANOV, D.S.

[Deposition of americium with double carbonates of uranium or plutonium with potassium] Soosazhdenie ameritsiia s dvoynymi karbonatami urana ili plutoniia s kaliev; doklady, predstavlenye SSSR na Mezhdunarodnuu konferentsiiu po mirnomu ispol'zovaniu atomnoi energii. Moskva, 1955. 8 p. [Microfilm]
(Americium) (MIRA 9:3)

~~YAKOVLEV, G.N.~~; DERGUNOV, Ye.P.; REFORMATSKIY, I.A.; DEDOV, V.B.

[Analytical hot laboratory] Goriachaia analiticheskaia laborato-
riia. Moskva, 1955. 15 p. (MIRA 14:7)
(Testing laboratories) (Nuclear research)

YAKOVLEV, G.N., nauchnyy sotrudnik; KOSYAKOV, V.N., nauchnyy sotrudnik

[Spectrophotometric research on the behavior of americium ions in solution; reports presented by the U.S.S.R. to the International Conference on Peaceful Uses of Atomic Energy] Spektrofotometricheskie issledovaniia povedeniia ionov ameritsiia v rastvorakh; doklady, predstavlennye SSSR na Mezhdunarodnuuiu konferentsiiu po mirnomu ispol'zovaniiu atomnoi energii, 1955. 15 p. (MIRA 12:11)
(Americium)

V- JAKOVLEV, G.N.

SUBJECT USSR / PHYSICS CARD 1 / 2 PA - 1727
AUTHOR JAKOVLEV, G.N., ČULKOV, P.M., DEDOV, V.B., KOSJAKOV, V.N., SOBOLEV, JU.P.
TITLE The Production of Thin Layers of Plutonium, Americium, and Curium
by the Method of Electric Deposition.
PERIODICAL Atomnaja Energija, 1, fasc. 5, 131-132 (1956)
Issued: 1 / 1957

For the examination of the nuclear properties of transuranium metals the authors developed a method of quantitative electric deposition of Pu, Am, and Cm on metal surfaces. Deposition occurred from neutral and slightly acid alcohol-acetone solutions of chlorides in form of hydroxides.

Apparatus: Various types of electrolyzers were used for the investigation. The glass bowls were carefully pressed immediately on to the cathode. The platinum anode is arranged strictly parallel to the cathode. With a set of glass vessels it is possible to obtain layers with different areas and of different shapes. Illustrations of electrolyzers are attached.

Experimental Methods: As to density of the depositions and quality of the layers, electrolysis of the neutral solutions furnishes compounds of trivalent chlorides. A mixture of 50% ethyle alcohol, 45% acetone, and 5% water was used as a solvent. The most effective method for the production of trivalent plutonium is the chlorination of plutonium oxide by tetrachlorine carbon vapors in a noble gas atmosphere at from 625 to 650° C. Also the production of neutral solutions of Americium and Curium chloride presents no difficulties. The qualitative separation of elements and the production of qualitatively fully satis-

Atomnaja Energija, 1, fasc. 5, 131-132 (1956) CARD 2 / 2

PA - 1727

factory layers with a maximum density (in the case of plutonium) of $0,5 \text{ mg/cm}^2$ was successfully carried out.

The Electrolysis of Acid Solutions of Am, Cm, and Pu: On the occasion of electric deposition from slightly acid electrolytes the method of the production of initial materials is considerably simplified, but also hydrogen is deposited, and hereby the quality of the deposits deteriorates somewhat. The electric deposition of plutonium occurred from hydrochloride alcohol-acetone solutions with a pH-value of the electrolyte of from 1,5 to 2 and a current density of from 5 to 10 milliamperes/cm². On this occasion plutonium was practically deposited quantitatively, and the layers of satisfactory quality attained thicknesses of $0,3 \text{ mg/cm}^2$. The electric deposition of Americium and Curium occurred at a current density of 10 milliamperes/cm² and a pH-value of the electrolyte of from 2 to 2,5. Also a simultaneous deposition of this element is possible.

In conclusion the electrolytic deposition of plutonium from an alcohol-acetone solution of carbon tetrachlorine at pH = 1 and at a current density of 40 milliamperes/cm² is discussed. The above methods were repeatedly employed by the authors.

INSTITUTION:

YAKOVLEV, G. N.

PRIKHOT'KO, A. F.

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p3

PHASE I BOOK EXPLOITATION SOV/1365

L'vov. Universytet

Materialy I Vsesoyuznogo soveshchaniya po spektroskopii. t. 1: Molekulyarnaya spektroskopiya (Papers of the 10th All-Union Conference on Spectroscopy. Vol. 1: Molecular Spectroscopy) [L'vov] Izd-vo L'vovskogo univ-ta, 1957. 499 p. 4,000 copies printed. (Series: Itsi Fizichnyy zbirnyk, vyp. 3/8/)

Additional Sponsoring Agency: Akademiya nauk SSSR. Komissiya po spektroskopii. Ed.: Jazer, S.L.; Toch. Ed.: Saranyuk, T.V.; Editorial Board: Laristerg, G.S., Academician (Resp. Ed., Deceased), Neporent, B.S., Doctor of Physical and Mathematical Sciences, Pabelinskiy, I.L., Doctor of Physical and Mathematical Sciences, Fabrikant, V.A., Doctor of Physical and Mathematical Sciences, Komitovskiy, V.G., Candidate of Technical Sciences, Candidate of Physical and Mathematical Sciences, Rayskiy, S.M., Candidate of Physical and Mathematical Sciences, Klimovskiy, L.K., Candidate of Physical and Mathematical Sciences, Miliyanchuk, V.S., A. Ye., Candidate of Physical and Mathematical Sciences.

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YAKOVLEV, G. N.

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THE PREPARATION OF THIN FILMS OF PLUTONIUM, AMERICIUM, AND CURIUM BY AN ELECTROLYTIC METHOD. G. N. Yakovlev, P. M. Chulkov, V. B. Dadoy, V. K. Fozarev, and I. P. Sobolev. *J. Nuclear Energy*, No. 1, 156-611(1967).

Yakovlev

18
Methods for quantitative electrodeposition of Pu, Am, and Cm, on metallic surfaces were developed. The elements were deposited as hydroxides from neutral and weakly acidic alcoholic solutions of the chlorides. (M.H.R.)

am RG JJP

Yakovlev, G. H.

8. Nuclear Spin and Magnetic Moment of Eu^{152} Obtained From Paramagnetic Resonance Study

"Hyperfine Structure of Paramagnetic Resonance. Nuclear Spin and Magnetic Moment of the Isotope Eu^{152} With Half-Life 5.3 Years," by A. A. Manenkov, A. M. Prokhorov, P. S. Trukhlyayev, and G. H. Yakovlev, Doklady Akademii Nauk SSSR, Vol 112, No 4, Feb 57, pp 623-625

The nuclear spin and magnetic moment of Eu^{152} , possessing a 5.3-year half-life, were obtained from the hyperfine structure of the paramagnetic resonance. A 17% concentration of Eu^{152} was obtained from a mixture of Eu^{151} and Eu^{153} exposed to a neutron beam. A superheterodyne spectroscopy was used to measure the hyperfine structure of paramagnetic resonance in $\text{SrS.Eu}^{151, 152, 153}$.

Analysis of the structure yielded the values 2.03 nuclear magnetons and 3 for the magnetic moment and spin, respectively, of Eu^{152} . (U)

..., A. A., KOSYAKOV, V. N., RYKOV, A. G., SOBOLEV, YU. P. and YAKOVLEV, G. N.
(Inst of Atomic Energy AS ~~USSR~~ USSR)

"Investigation of Several Oxidation-Reduction Reactions of Americium"

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.

YAKOVLEV, G. N. and KOSYAKOV, V. N.

"Studies in the Americium Chemistry."

paper to be presented at 2nd UN Intl. Conf. on the peaceful uses of Atomic Energy, Geneva, 1 - 13 Sep 58.

21(10)

AUTHORS:

Yakovlev, G. N., Dedov, V. B.

SOV/89S-58-5-2/4

TITLE:

Development of Methods of Remote Control in Radiochemical Laboratories of the USSR (Razvitiye metodov distantsionnoy raboty v radiokhimicheskikh laboratoriyakh AN SSSR)

PERIODICAL:

Atomnaya energiya, 1958, Supplement 5, pp 26 - 37 (USSR)*

ABSTRACT:

All mechanisms used for remote control imitate somehow the activity of the human hand. These mechanisms are therefore the intermediate link between the operator and the working object and are denoted manipulators in their total arrangement and structure. They are generally divided into two main groups: the first group shows an especially complicated structure, and the operator and the executing organ are mostly linked mechanically by an intermediate transmission. In the designs of the second group the movements of the executing mechanism reflect more or less the movements of the operator. These mechanisms are comparatively simple in their construction and are used most frequently in radiochemical laboratories.

Arrangements by which only one or the other movement is Modern Equipment for Working with Radioactive Isotopes: Collection of Materials

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Moscow, Izd-vo ~~g~~ ^g ~~o~~ ^o ~~u~~ ^u ~~p~~ ^p ~~r~~ ^r ~~a~~ ^a ~~v~~ ^v ~~l~~ ^l ~~e~~ ^e ~~n~~ ⁿ ~~i~~ ⁱ ~~y~~ ^y ~~a~~ ^a ~~p~~ ^p ~~o~~ ^o ~~i~~ ⁱ ~~s~~ ^s ~~p~~ ^p ~~o~~ ^o ~~l~~ ^l ~~'~~ ['] ~~z~~ ^z ~~o~~ ^o ~~v~~ ^v ~~a~~ ^a ~~n~~ ⁿ ~~i~~ ⁱ ~~y~~ ^y ~~a~~ ^a ~~t~~ ^t ~~o~~ ^o ~~m~~ ^m ~~o~~ ^o ~~y~~ ^y ~~e~~ ^e ~~n~~ ⁿ ~~e~~ ^e ~~r~~ ^r ~~g~~ ^g ~~i~~ ⁱ ~~p~~ ^p ~~r~~ ^r ~~i~~ ⁱ ~~s~~ ^s ~~o~~ ^o ~~v~~ ^v ~~e~~ ^e ~~t~~ ^t ~~e~~ ^e ~~M~~ ^M ~~-~~ ~~v~~ ~~o~~ ~~S~~ ~~S~~ ~~S~~ ~~R~~ ~~1~~ ~~9~~ ~~5~~ ~~8~~, 110 pp. (Supplement No 5 to periodical Atomnaya energiya, '58, contains 3 articles.)

Development of Methods of Remote Control in Radiochemical SOV/89S-58-5-2/4
Laboratories of the USSR

carried out while the main work is performed by the moved object (e.g. mounted on a conveyor) represent a completion of the mechanisms mobile into all directions. These arrangements are preferably used in chemical processes. In solving the problem of the absence of danger in work with radioactive bodies the special importance of the ventilation system and the system applied for the removal of the waste products must be emphasized. These 2 factors in connection with the problem of protection radiation are the main tasks of safety engineers. The system of laboratory ventilation must meet 3 main demands: 1) The supply of fresh air into an air-conditioned room must take place in a way that at any time equal air conditions are prevailing. 2) The direction of the air motion must be the same in the whole laboratory building. 3) The air passing into the atmosphere must be purified and its degree of purity must be examined. 2 different systems of communication are used for the removal of the waste products, i.e. one in which highly active solutions or waste are removed, and a second one in which polluted water is removed. A well-considered planning of these systems with the

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Development of Methods of Remote Control in Radiochemical SOV/89S-58-5-2/4
Laboratories of the USSR

necessary washing plants proves the abilities of the designer.
3 methods are employed for the solution of the problem of
separating different elements from each other:

- 1) precipitation
- 2) extraction
- 3) chromatography

Within the framework of the AS USSR intense work is carried
out for the automation of these 3 processes. In the case of
precipitation the stabilization of the technological processes
is attained by a control system supervising the order of the
operations and the special activity of each operation. During
the chromatographic process the separation of the elements
can be controlled only by physical characteristics. This
represents special difficulties for practical performance. 4
pictures of individual parts of a chromatograph are shown.
The method of guided automatized work developed for radio-
chemistry will sooner or later play an important part in the
processing of inactive materials. There are 10 figures.

Card 3/3

AUTHORS:

Yakovlev, G. N., Gorbenko-Germanov, D. S., SOV/79-28-10-2/60
 Razbitnoy, V. M., Kazanskiy, K. S., Zenkova, R. A.

TITLE:

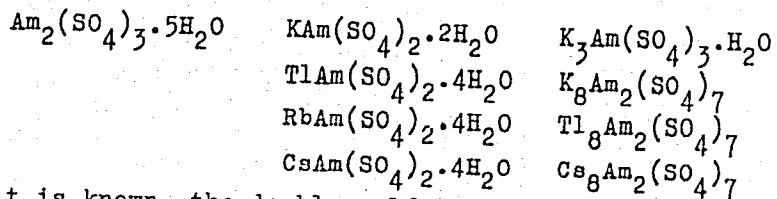
Investigation of the Double Sulfates of Americium According
 to the Absorption Spectra in the Crystals (Izucheniye dvoynnykh
 sul'fatov ameritsiya po spektram pogloshcheniya v kristallakh)

PERIODICAL:

Zhurnal obshchey khimii, 1958, Vol 28, Nr 10,
 pp 2624 - 2637 (USSR)

ABSTRACT:

In the present paper the normal sulfate and the double
 sulfate of americium with potassium, thallium, rubidium and
 cesium were investigated. The normal sulfate as well
 as the following double sulfates of americium were
 identified:



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As it is known, the double sulfates of the rare earths

Investigation of the Double Sulfates of Americium
According to the Absorption Spectra in the Crystals

SOV/79-28-10-2/60

and of the alkali metals are difficult to solve and, therefore, are of importance for the analytical chemistry of these elements. (According to the actinide theory, the transuranic elements are analogs of the rare earths, and in their case the analogy of the chemical properties of many compounds also plays a role, especially the similarity of the double sulfates with the alkali metals). The absorption spectra of the polycrystalline samples of these compounds were taken within the range of 4000-8500 Å at 300, 200 and 80° K (Figs 3-11). Phase diagrams were taken for the synthesis $R_2SO_4-Am_2(SO_4)_3-H_2O$ (R=K, Tl and Rb) (Figs 1, 2). The split of the electron band $Am^{+++}5030 \text{ Å}$ in the crystals of the compounds to be investigated was studied. The group of electronically oscillating "bands" within the range of 4500 Å were identified which are not observed in solutions and which are in a high degree sensitive to a change of the composition of the compound. The influence of the temperature and the amount of crystal water on the character of the split of the electron band $Am^{+++}5030 \text{ Å}$ and the combination

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Investigation of the Double Sulfates of Americium
According to the Absorption Spectra in the Crystals

SOV/79-28-10-2/60

of the above mentioned "bands" within the range of
4500 Å were investigated. There are 11 figures, 6 tables,
and 13 references, 3 of which are Soviet.

SUBMITTED: August 16, 1957

Card 3/3

PHASE I BOOK EXHIBITION 207/5084

International Conference on the Peaceful Uses of Atomic Energy. 24, Geneva, 1958.

Bolshoy Sovetskikh uchenykh. [t-t] Khimiyu radioelementov i radiatsionnykh yavleniy (Reports of Soviet Scientists. v. 4): Chemistry of Radioelements and Radiation Transformations) Moscow, Atomizdat, 1959. 343 p. 5,000 copies printed. (Series: Ita; Trudy)

Ed. (Title page): A. P. Vinogradov, Academician; Ed.: V. I. Lashinov) Tech. Ed.: Ye. I. Mzall.

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

COVER: 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 uranium, 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. I. Lashinov 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.

Alanchibava, I. P., Ye. L. Karyava, Ye. V. Likh, V. V. Pevko, and K. I. Chelobanov. Production and Properties of Several Heavy Fluorides of Trivalent Plutonium (Report No. 2208) 157

Karyava, O. M., and V. V. Karyava. Investigations on the Chemistry of Americium (Report No. 2177) 147

[D. S. Gorenko-Gorenkov is mentioned as having supplied the material for the second section of this study.]

Gravdatary, O. Ye., V. D. Mikhovskiy, S. M. Shirovskiy, A. Kuznetsov, and V. S. Smalid. Contribution to the Chemistry of Radioactive Bismuth (Report No. 2143) 166

Spitsyn, V. I., Ye. D. Belukova, A. P. Kuznetsov, V. V. Gromov, Z. K. Spiridonov, Ye. M. Vetrov, and G. I. Kuznetsov. Study of the Migration of Radioactive Elements in Soils (Report No. 2207) 174

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[The investigations were carried out at the Laboratory of Radiochemistry of the Institute of Atomic Energy in L. Ye. Karpova.]

Laboratory of Radiation Chemistry of the Physicochemical Institute Gorbunov, Ye. V. Barylo, and A. I. Chernova. The data on oxidation-reduction reactions taking place in aqueous solutions under the effect of gamma-radiation were obtained from investigations made at the Laboratory of Electrochemistry of Metals (Laboratory of Corrosion and Electrochemistry of Metals) under the direction of Ye. M. Kilibayeva, M. Ya. Buzs, and G. S. Tsvetkov. The following are mentioned as having made a study of complex reactions such as the formation of dyes from lauroic bases: V. B. Gorbunov, A. Zaslavskaya, L. I. Melnikova, T. V. Bromberg, and M. Ye. Kuznetsova.

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[The following are mentioned: N. S. Kolobova and V. V. Zharikov.]

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PRASOR BOOK EXPLOITATION SOV/2713

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

Doklady sovetskikh uchenykh; polucheniye i primeneniye izotopov (Reports of Soviet Scientists; Production and Application of Isotopes) Moscow, Atomizdat, 1959. 388 p. (Series: Its: Trudy, vol. 6) 8,000 copies printed.

Eds. (Title page): G.V. Kurdyumov, Academician, and I.I. Novikov, Corresponding Member, USSR Academy of Sciences; Ed. (Inside book): Z.D. Andreyenko; Tech. Ed.: Z.D. Andreyenko.

PURPOSE: This book is intended for scientists, engineers, physicians, and biologists engaged in the production and application of atomic energy to peaceful uses; for professors and graduate and nongraduate students of higher technical schools where nuclear science is taught; and for the general public interested in atomic science and technology.

COVERAGE: This is volume 6 of a 6-volume set of reports delivered by Soviet scientists at the Second International Conference on the Peaceful Uses of

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Reports of Soviet (Cont.)

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Atomic Energy held in Geneva from September 1 to 13, 1958. Volume 6 contains 32 reports on: 1) modern methods for the production of stable radioactive isotopes and their labeled compounds, 2) research results obtained with the aid of isotopes in the field of chemistry, metallurgy, machine building, and agriculture, and 3) dosimetry of ionizing radiation. Volume 6 was edited by: S.V. Levinskiy, Candidate of Medical Sciences; V.N. Prusakov, Candidate of Chemical Sciences; and V.V. Sedov, Candidate of Medical Sciences. See Sov/2081 for titles of volumes of the set. References appear at the end of the articles.

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(Report No. 2131)

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YAKOVLEV, G.N.

3 (2)
 AUTHORS: Zaytsev, A. A., Kosyakov, V. E., Rykov, A. G., Sobolev, Yu. P., Makriev, G. N. SOV/00-1-1/26

TITLE: The Radiolytic Reduction of As(V) and As(V) (Semi-oxidation) aktyvo vyzhivaniya As(V) i As(V))

PERIODICAL: Atomnaya energiya, 1959, Vol. 7, Nr. 1, pp 27 - 46 (USSR)

ABSTRACT: The constants of the radiolytic reduction rate of AsO₄³⁻ in hydrochloric, nitric- and sulphuric acid are experimentally determined. The radiation yields of the reduction products forming during the reduction of As(V) are calculated. The contribution of hydrogen peroxide to the production of hydrogen peroxide, it is possible to determine the contribution of hydrogen peroxide to the production of hydrogen peroxide in the reduction reaction. On the basis of kinetic data it is believed to be possible to give a mechanism for the radiolytic reduction of AsO₄³⁻ and AsO₃³⁻. From the equations obtained for the reduction rate of AsO₄³⁻ it is possible to calculate the contribution of hydrogen peroxide and of hydrogen radicals in the reduction investigated. The following is to be said with respect to the experimental part: Chemically pure As₂O₃ was used, which was purified several times through the usual procedure. The arsenic concentration in the solutions was radiometrically measured. The production of hydrogen peroxide (calculated from the data) and the accumulation of hydrogen peroxide in the solutions are described in detail. The results obtained are partly shown by diagrams, and the following curves describe the radiolytic reduction of arsenic in 2.0 M HNO₃ and in 0.1 M H₂SO₄ + 1.0 M H₂O₂, radiolytic reduction of As(V) and accumulation of H₂O₂ in 1.0 M H₂SO₄. The relation of the average valence state (V) of arsenic to the radiolytic reduction in 9.0 M HNO₃ at various arsenic concentrations. b) Variation of the average valence state (V) of arsenic in the radiolytic reaction in 0.5 M HNO₃ up to 14.3 M HNO₃. The rates and the yield of the radiolytic reduction of AsO₄³⁻, the observed and calculated reduction rate of AsO₄³⁻ in 0.1 M H₂SO₄, as well as the yields of H₂O₂ and of the hydrogen radicals in sulphuric- and hydrochloric acid are given in tables. There are 7 figures, 3 tables, and 13 references, 3 of which are Soviet.

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SUMMARY: November 17, 1959

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YAKOVLEV, G. N.

21 (1), 5 (2)
 AUTHORS: ZAYTSEV, A. I., KOVAKOV, V. K., BYKOV, SOV/89-7-1-13/26
 A. G., YAKOVLEV, G. N., YAKOVLEV, G. N.

TITLE: Disproportionation of Am (IV) (Disproportionirovaniye Am (IV))

PERIODICAL: Atomnaya energiya, 1959; Vol 7, Nr 1, pp 69-71 (USSR)

ABSTRACT: As a preliminary result, it is said that the reactions
 $2Am^{4+} + 2H_2O \rightarrow Am^{3+} + AmO_2^+ + 4H^+$ and
 $Am^{4+} + AmO_2^+ \rightarrow Am^{3+} + AmO_2^+$ have actually been experimentally
 proved. The production of the various chemical solutions and
 the times needed for setting-up the material are given. The
 concentration of Am (IV), Am (III), Am (IV), Am (IV) measured
 by means of the spectrometer. The material was measured
 measured was filled into a hermetically closable cylindrical
 cigarette of 2 cm length, and was measured in the spectrometer in
 this condition. Total americium concentration was determined
 from the α -activity of the Am²⁴¹. Apart from the initially
 mentioned results, it was further stated that the reactions:
 $3Am^{4+} + 2H_2O \rightarrow 2Am^{3+} + AmO_2^+ + 4H^+$

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Disproportionation of Am (IV) SOV/89-7-1-13/26

$2AmO_2^+ + 4H^+ \rightarrow AmO_2^+ + Am^{4+} + 2H_2O$ can be proved. The yields of
 individual reactions depending upon the molar concentration
 of the various solutions are mentioned. There are 1 table and
 8 references, 2 of which are Soviet.

SUBMITTED: November 17, 1958

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DEDOV, V.B.; RYZHOV, M.N.; TRUKHLYAYEV, P.S.; YAKOVLEV, G.N.

[Complex formation of americium and curium with
 α -hydroxybutyric acid] Issledovanie komplekso-
obrazovaniia ameritsiia kiuriiia s α -oksiizomaslianoi
kislotoi. Moskva, In-t atomnoi energii, 1960. 10 p.

(MIRA 17:1)

(Americium compounds) (Curium compounds)
(Propionic acid)

LEBEDEV, I.A.; PIROZHKOVA, S.V.; RAZBITNOY V.M.; YAKOVLEV, G.N.

[Complexing of Am^{+3} with oxalate ions] Izuchenie kompleksobrazovaniia Am^{+3} s oksalat-ionami. Moskva, In-t atomnoi energii AN SSSR, 1960. 14 p. (MIRA 17:1)

ZAYTSEV, A.A.; KOSYAKOV, V.N.; RYKOV, A.G.; SOBOLEV, Yu.P.;
YAKOVLEV, G.H.

[Disproportionation of americium (V)] Disproportsioniro-
vanie ameritsiia (V). Moskva, In-t atomnoi energii AN SSSR,
1960. 18 p. (MIRA 16:12)

(Americium)

LEBEDEV, I.A.; PIROZHKOVA, S.V.; YAKOVLEV, G.N.

[Determination of the composition and instability constants of the oxalate, nitrate, and sulfate complexes of Am (III) and Cm (III) by the ion exchange method] Opredelenie sostava i konstant nestoikosti oksalatnykh nitratnykh i sul'fatnykh kompleksov Am (III) i Cm(III) metodom ionnogo obmena. Moskva, In-t atomnoi energii, 1960. 20 p.
(MIRA 17:1)

ZAYTSEV, A.A.; KOSYAKOV, V.N.; RYKOV, A.G.; SOBOLEV, Yu.P.; YAKOVLEV, G.N.

Disproportionation of americium(V). Radiokhimiya 2 no.3:339-347 '60.

(MIRA 13:10)

(Americium)

ZAYTSEV, A.A.; KOSYAKOV, V.N.; RYKOV, A.G.; SOBOLEV, Yu.P.; YAKOVLEV, G.N.

Kinetics of reduction of americium(V) by hydrogen peroxide. Radio-
khimii 2 no.3:348-350 '60. (MIRA 13:10)
(Americium) (Hydrogen peroxide)

LEBEDEV, I.A.; PIROZHKOVA, S.V.; RAZBITNOY, V.M.; YAKOVLEV, G.N.

Complex formation between Am^{3+} and oxalate ions. Radiokhimiya 2
no.3:351-356 '60. (MLDA 13:10)
(Americium compounds) (Oxalates)

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S/186/60/002/005/006/017
A051/A130

21.3100

AUTHORS: Lebedev, I. A.; Pirozhkov, S. V.; Yakovlev, G. N;

TITLE: Determination of the composition and instability constants of oxalate, nitrate and sulfate $\text{Am}^{(III)}$ and $\text{Cm}^{(III)}$ complexes by the ion-exchange method.

PERIODICAL: Radiokhimiya, v.2, no. 5, 1960, 549 - 558

TEXT: (III) The article deals with a study of complex-formation of $\text{Am}^{(III)}$ and $\text{Cm}^{(III)}$ with oxalate-, nitrate- and sulfate- ions, using the ion-exchange method on the cationite. The complex-formation of $\text{Pu}^{(III)}$ in oxalate solutions was investigated in particular (Ref. 5: A.D. Gel'man, N.N. Matovina, A.I. Moskvina, Atomnaya energiya, 4, 1, 52, 1958). It is pointed out that the method in question has received wide application in recent times for determining the composition and instability constants of the complex ions of radioactive elements. Mention is made of Ref. 6 (V. V. Fomin, Usp. Khim. 24,8, 1010, 1955) as outlining the calculation method for the various cases. The experiments were conducted on indicator quantities of Am^{241} and Cm^{242} isotopes, the concentration of which was about 10^5 decays/

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min.ml in the initial solution. A KY-2 (KU-2) cationite was used as the sorbent (grain size 140 - 200 mesh). In order to determine the distribution coefficient of the metal, the weighed resin portion between the cationite and solution, was brought to equilibrium with a certain volume of the solution, containing known concentrations of Am and Cm and ammonium salt of the corresponding acid. Experiments were conducted at 20 - 25°C (room temperature). The effect was determined of the pH on φ (distribution coefficient) of Am³ in the absence of a complex-forming agent (φ_0), since the experiments were carried out at various pH of the solution. Table 1 gives the results of these determinations, indicating that with a change of the pH from 1.5 to 4.4, φ_0 does not actually change. Certain experiments showed that: 1) the change of the resin and solution ratio (b) does not affect φ , 2) the effect of the resin swelling on the solution volume does not exist, 3) an equilibrium in the system cationite-solution under the given conditions (ion strength $\mu = 0.2 - 1.5$, pH 1.5 - 4.0) is reached in 3 - 4 hours. Tables 2 - 8 and graphs 1 - 3 give the experimental data on the relationship of φ of Am^(III) and Cm^(III) to the concentration of the nitrate-, sulfate- and oxalate ions. φ was calculated from results of the analysis according to

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the following formula:

$$\varphi = \frac{c_0 - c_M}{bc_m} \quad (1).$$

The activity of the oxalate ions was calculated from the formula:

$$a_{C_2O_4^{2-}} = \frac{B}{\frac{1}{\gamma^2} + \frac{a_{H^+}}{\gamma_1 K'} + \frac{a_{H^+}^2}{K' K''}} \quad (2)$$

where B is the concentration of the ammonium oxalate, a_{H^+} activity of the hydrogen ions, K' and K'' - I and II constants of dissociation of oxalic acid, equalling $5.36 \cdot 10^{-2}$ (Ref. 7: B.S. Darken, J. Am. Chem. Soc., 63, 1007, 1941) and $5.42 \cdot 10^{-5}$ (Ref. 8: G. D. Pinching, R. G. Bates. J. Reseach Nat. Bur. Stand. 40, 405, 1948), respectively. The values of the activity coefficients of the uni- and two-charge ions (γ_1 and γ_2) for the oxalate solutions were taken by the authors from Ref. 9 (C.E. Crouthamel, D. S. Martin, Card 3/14

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J. Am. Chem. Soc., 73, 569, 1951). The functions ψ_1, ψ_2, ψ_3 were calculated from experimental data according to formula (3), showing the relationship of the distribution coefficient of the metal during sorption on the cationite, to the concentration of the complex-forming agent, are connected with the stability constants of the complex ions:

$$\varphi = \varphi_0 \frac{1 + \sum_{j=1}^{p-r} l_j [A]^j}{1 + \sum_{i=1}^n i [A]^i} \quad (3)$$

where i are the general stability constants of the complex ions, $[A]$ - the concentration (activity) of the addend; n - maximum number of addends, bound to an ion of metal; l_j - the constants for the given systems (at constant ionic strength and constant concentration of the exchanging cation), connected with the sorption of the complex cations; p - metal charge; r - charge of the addend. By introducing the functions:

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$$\psi = \frac{f_0}{\rho} - 1 \quad (4); \quad \psi_1 = \frac{\psi}{[A]} \quad (5) \quad \text{and} \quad \psi_2 = \frac{\frac{\psi_1}{[A]} - 1}{[A]} \quad (6)$$

the following expression is derived:

$$\psi = \frac{(\beta_1 - l_1) [A] + (\beta_2 - l_2) [A]^2 + \beta_3 [A]^3 + \dots}{1 + l_1 [A] + l_2 [A]^2} \quad (7)$$

since the complex formation of tri-valent cation is studied, $p - r \leq 2$, then no more than two l_j should be taken, thus:

$$\psi_1 = \frac{\beta_1 - l_1 + (\beta_2 - l_2) [A] + \beta_3 [A]^2 \dots}{1 + l_1 [A] + l_2 [A]^2} \quad (8)$$

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$$\psi_1^0 = \beta_1 - l_1, \quad (9)$$

$$\psi_2 = \frac{\frac{\beta_2 - l_2}{\psi_1^0} - l_1 + \left(\frac{\beta_3}{\psi_1^0} - l_2 \right) [A] + \dots}{1 + l_1 [A] - l_2 [A]^2} \quad (10)$$

$$\psi_2^0 = \frac{\beta_2 - l_2}{\psi_1^0} - l_1 \quad (11)$$

Taking into account the low values of l_1 and l_2 it is seen that in the case of complex-formation with one addend, the slope of the curve of this relationship is equal to 1, with two about 2, with three more than 2, etc. Further, the stability constants of these complex ions can be calculated

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from the successive calculation of the values of ψ_i^0 (by extrapolating) $k[A] = 0$, the relationship of ψ_i to $[A]$. The authors state that if the sorption of the complex is disregarded as compared to the sorption of the free ion of metal, then in formulae (3) - (11), the values of l_j can be left out, and then

$$\psi_1^0 = \beta_1 \quad (12), \quad \psi_2^0 = \frac{\beta_2}{1} \quad (13)$$

If the sorption of the complex cation is not disregarded, then the value of β , can be computed in the following manner: the function is calculated for several points:

$$\phi = \frac{\frac{\psi_0}{\psi} (\psi_1^0 [A] - 1) + 1}{[A]^2} \quad (14)$$

After having found the value of ϕ^0 by extrapolating the dependence ϕ from $[A]$ to $[A] = 0$ a graph indicating the dependence of

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$$\frac{\phi - \phi_0}{[A]} \quad \text{from} \quad \frac{\psi_1 - \psi_1^0}{[A]}$$

is plotted and its slope equaling β_1 is found. Figures 1,2,3 and 4 show the establishment of the composition of complex ions, indicating the dependence of logarithm ψ of americium and curium on different ion complexes. For the calculation of the instability constants of complex ions formulae (8) and (10) were used, rendering the following expressions:

$$\psi_1 \simeq \beta_1 - l_1 = \psi_1^0 \quad (15)$$

and

$$\psi_2 \frac{\beta_2 - l_2}{\psi_1^0} - l_1 = \psi_2^0 \quad (16)$$

thus, ψ_1 and ψ_2 were dealt with as the average values of ψ_1 and ψ_2 , in points where they were constant. The constancy of the values of ψ_1 and ψ_2

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are also considered an indication of the fact that the sorption of the complex ion can be disregarded as compared to the sorption of the free cation, i.e., the values of l_1 and l_2 can be disregarded in formula (7) and (8). Table 10 is a list of the determined values of general instability constants of the oxalate, nitrate and sulfate complexes of $\text{Am}^{(\text{III})}$ and $\text{Cm}^{(\text{III})}$ and the values of the step instability constants of the $\text{Am}^{(\text{III})}$ and $\text{Cm}^{(\text{III})}$ complexes

$$K_1 = \frac{1}{\beta_1} \quad \text{and} \quad K_2 = \frac{\beta_1}{\beta_2}$$

recalculated for zero ionic strength, using the activity coefficients for the oxalate ions, (Ref. 9) and the Davis equation. In discussing the experimental results the authors state that a fair amount of corresponding results was obtained experimentally of the instability constants of the $\text{Am}(\text{C}_2\text{O}_4)_2^-$ ion, using the insolubility method (Ref. 4: I. A. Lebedev, S. V. Pirozhkov, B. M. Razbitnoy, G. N. Yakovlev, Radiokhimiya, 2, 3, 351, 1960) and ion-exchange (in both cases $6.9 \cdot 10^{-5}$). The instability constant of the first complex (AmC_2O_4^+) determined by the above methods differed by a

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A051/A130

Determination of the composition and ...

factor of two ($5.0 \cdot 10^{-7}$ and $1.0 \cdot 10^{-6}$) explained by the error introduced in determining the product of solubility of the americium oxalate and K_0 , the values of which are part of this constant. A comparison of the literature values and those obtained by the authors for the instability constants of nitrate complexes of tri-valent lanthanides and actinides, point to a regular decrease of the complex stability with a drop in the radii of the central ions (Table 11). This comes from the addend (nitrate-ion) having large dimensions. The comparison of the instability constants of the same complex ions of Am^{3+} and Cm^{3+} shows an obvious tendency to a weakening of the complex stability in curie, as compared to americium. It is thought that the screening effect of the 5f-electrons is present here. There are 11 tables, 5 figures and 13 references: 6 Soviet-bloc and 7 non-Soviet-bloc. The four recent English language publications read as follows: M. Ward, G. A. Welch, J. Inorg. Nucl. Chem., 2, 395, 1956; G. D. Pinching, R. G. Bates, J. Reseach. Nat. Bur. Stand., 40, 405, 1948; C. E. Crouthamel, D. S. Martin, J. Am. Chem. Soc., 73, 569, 1951; F. H. Spedding, S. Jaffe, J. Am. Chem. Soc. 76, 882, 1954.

Card 10/14

20651
S/186/60/002/005/006/017
A051/A130

Determination of the composition and

Table 10: (1) Constants of oxalate, nitrate and sulfate complex ions of Am^{3+} and Cm^{3+} .
(2) Complex ion; (3) general constant of stability β ; (4) for Am ; (5) for Cm
(6) Step constant of instability K at $\mu = 0$; (7) for Am ; (8) for Cm .

Константы оксалатных, нитратных и сульфатных комплексных ионов Am^{3+} и Cm^{3+}

Комплексный ион (2)	μ	Общая константа устойчивости β (3)		Степенчатая константа неустойчивости K при $\mu = 0$	
		для Am (4)	для Cm (5)	для Am (6)	для Cm (7)
$MC_2O_4^+$	0.2	$9.8 \cdot 10^5$	$9.1 \cdot 10^5$	$1.0 \cdot 10^{-7}$	$1.1 \cdot 10^{-7}$
$M(C_2O_4)_2^-$	0.2	$1.4 \cdot 10^{10}$	$1.4 \cdot 10^{10}$	$6.9 \cdot 10^{-5}$	$6.8 \cdot 10^{-5}$
MNO_3^{2+}	1.0	4.0	3.7	—	—
MSO_4^+	0.75	$6.0 \cdot 10^1$	$5.8 \cdot 10^1$	$2.1 \cdot 10^{-4}$	$2.2 \cdot 10^{-4}$
MSO_4^+	1.5	$5.8 \cdot 10^1$	—	—	—
$M(SO_4)_2^-$	0.75	—	$8.4 \cdot 10^1$	—	$1.58 \cdot 10^{-1}$
$M(SO_4)_2^-$	1.5	$1.3 \cdot 10^2$	—	—	—

TABLE 10

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20651

S/186/60/002/005/006/017
A051/A130

X

Determination of the composition and ...

Table 11: (1) Instability constants of nitrate complexes of tri-valent lanthanides and actinides; (2) Complex ion; (3) pK, (4) radius of the central ion (in Å); (5) literature reference.

Константы нестойкости нитратных комплексов тривалентных лантанидов и актинидов

Комплексный ион (2)	pK, (3)	Радиус центрального иона (в Å) (4)	Литературная ссылка (5)
CoNO ₃ ²⁺	1.05	1.02	[10]
PuNO ₃ ²⁺	0.77	1.00	[11]
AmNO ₃ ²⁺	0.60	0.99	—
CmNO ₃ ²⁺	0.57	—	—

TABLE 11

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Determination of the composition and

Figure 1: Relationship of $\lg \Psi$ of americium and curie to the log of activity of the oxalate-ions.

S/186/60/002/005/006/017
A051/A130

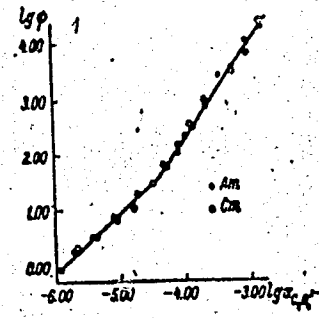
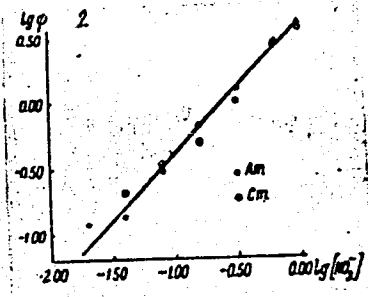


Figure 2: Relationship of $\lg \Psi$ of americium and curie to the log of the concentration of nitrate-ions.



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Determination of the composition and

20651
S/106/60/002/005/006/017
A051/A130

Figure 3: Relationship of $\lg \Psi$ of curie to the log of the concentration of the sulfate-ions.

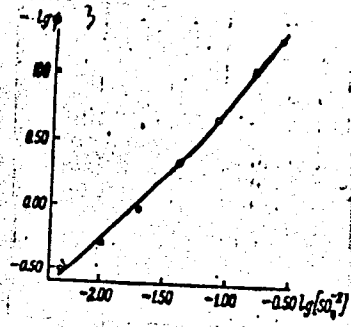
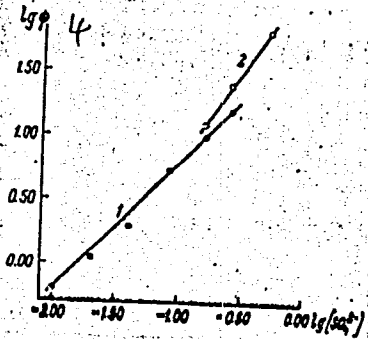


Figure 4: Relationship of $\lg \Psi$ of Americium to the log of the concentration of the sulfate-ions. 1 - at $\mu = 0.75$; 2 - at $\mu = 1.5$

Card 14/14

PENNEMEN, R. [Penneman, R.A.]; KINEN, T. [Keenan, T.K.]; KOSYAKOV, V.N.
[translator]; YAKOVLEV, G.N., red.; SAKHAROV, V.M., red.;
DOTSENKO, V., tekhn. red.; GROTEYEVA, Yu., tekhn. red.

[Radiochemistry of americium and curium] Radiokhimiia ameri-
tsiia i kiurii. Pod red. G.N.Iakovleva. Moskva, Izd-vo inostr.
lit-ry, 1961. 96 p. (MIRA 15:1)
(Americium) (Curium) (Radiochemistry)

LEBILAV, I.A.; YAKOVLEV, G.N.

Ion exchange method for the determination of the composition
and instability constant of Am^{III} and Cm^{III} lactate complexes.

Radiokhimiya 3 no.4:455-457 1961.

(RUSSIAN)

(Americium compounds)

(Curium compounds)

(Ion exchange)

(Lactates)

DEDOV, V.B.; LEBEDEV, I.A.; RYZHOV, M.N.; TRUKHLYAYEV, P.S.; YAKOVLEV, G.N.

Americium and curium complexing with α -hydroxyisobutyric acid.
Radiokhimiya 3 no.6:701-705 '61. (MIRA 14:12)
(Americium compounds)
(Curium)
(Isobutyric acid)

33189

S/186/61/003/006/010/010
EO40/E185

24.6210

AUTHORS: Lebedev, I.A., Pirozhkov, S.V., Semochkin, V.M., and Yakovlev, G.N.

TITLE: Separation of protactinium by the ion exchange method and properties of some protactinium compounds.

PERIODICAL: Radiokhimiya, v.3, no.6, 1961, 760-761

TEXT: Protactinium (Pa^{231}) was separated from neutron-irradiated specimens of thorium oxide enriched with ionium (Th^{230}). The specimen weighed 6.3 g and contained 2.01 g of ionium. Purification of the products of the reaction was carried out in an ion-exchange column made of Teflon and charged with Dowex-1X8 resin ground to 500 mesh. Uranium, protactinium and iron (retained on the resin) were washed out with 250 ml of 0.5N HCl + 0.1N HF. The α -radiation of the sample was determined in an ionizing spectrometer in conjunction with a 50-channel α -analyzer. 18% of the radiation was found to come from protactinium and 82% from uranium, which corresponds to 99.9% Pa^{231} and 0.1% U^{232} by weight. Measurement of the total radiation of the sample showed it to contain 11.8 mg of protactinium and 11 μg of U^{232} .

Card 1/2

X

33189

Separation of protactinium by the S/186/61/003/006/010/010
EO40/E185

The sample was further purified and the impurities (Na, Mg, Ca, Ba and Fe) were reduced to below 3%. Brief chemical properties and methods of preparation are given of protactinium oxide $\text{PaO}_{2.25}$, hydroxide, iodate and phynylarsonate. Acknowledgments are expressed to S.A. Baranov, Yu.F. Rodionov and N.M. Yashin for assistance. There are 11 references; 3 Russian translations from non-Soviet-bloc publications and 8 non-Soviet-bloc. The four most recent English language references read as follows:

- Ref. 2: J. Golden, A.G. Maddock, J. Inorg. Nucl. Chem., v.2, 1, 46 (1956).
Ref. 4: M.L. Salutsky, K. Shaver, A. Elmlinger, M.L. Curtis, J. Inorg. Nucl. Chem., v.3, 5, 289 (1956).
Ref. 9: K.A. Kraus, G.E. Moore, J. Am. Chem. Soc., v.77, 5, 1383 (1955).
Ref. 10: A.G. Maddock, W. Pugh, J. Inorg. Nucl. Chem., v.2, 2, 114 (1956).

SUBMITTED: July 19, 1960

Card 2/2

X

S/186/62/004/003/008/022
E071/E433

AUTHORS: Lebedev, I.A., Yakovlev, G.N.

TITLE: The determination of the composition and stability constants of thiocyanide complexes of Am(III), Cm(III) and Ce(III) by an ion exchange method

PERIODICAL: Radiokhimiya, v.4, no.3, 1962, 304-308

TEXT: Complex formation of trivalent actinides and lanthanides with thiocyanide ion is used for group separation of these elements, but the exact composition of these complexes and their stability constants are unknown. The authors studied complex formation of trivalent americium and curium with thiocyanide anions on changes in their concentration from 0.064 to 5.0M. For comparison the formation of complexes of Ce(III) under the same conditions was also studied. The experimental method consisted of the determination of the sorption of Am³⁺, Cm³⁺ and Ce³⁺ on cationite K \checkmark -2 (KU-2) in ammonium or sodium form on the concentration of thiocyanide ions at ionic force 0.5 and 5. Indicator quantities of Am²⁴¹, Cm²⁴² and Ce¹⁴⁴ were used. Experiments at ionic force $\mu = 0.5$ were made in ammonium
Card 1/2

The determination of ...

S/186/62/004/003/008/022
E071/E433

thiocyanide solutions with additions of ammonium perchlorate and at $\mu = 5.0$ in sodium thiocyanide with addition of sodium perchlorate. In all cases $\text{pH} = 4$ was maintained. It was found that at $\mu = 0.5$ complex ions of the form $\text{M}(\text{SCN})_2^{2+}$ are present. At $\mu = 5.0$ the type of complexes formed depended on the concentration of thiocyanide ions. At concentrations up to 1 M only $\text{M}(\text{SCN})_2^{2+}$ ions and at concentrations above 1 M mainly ions of the type $\text{M}(\text{SCN})_3$ were present. Moreover, at concentrations between 4 and 5 M the appearance of considerable quantities of complex ions $\text{Am}(\text{SCN})_4$ and $\text{Cm}(\text{SCN})_4$ was observed, while cerium did not form this type of ions. On the basis of experimental results stability constants for the respective compounds were calculated. It is concluded that the possibility of group separation of trivalent lanthanides and actinides on an anionite using a concentrated thiocyanide solution is based on a substantial difference in the stability constants of complex ions formed under these conditions, as well as on the formation by actinides negatively charged complex ions. There are 2 figures and 3 tables.

SUBMITTED: April 24, 1961
Card 2/2

S/186/62/004/003/009/022
E071/E433

AUTHORS: Lebedev, I.A., Pirozhkov, S.V., Razbitnoy, V.M.,
Yakovlev, G.N.

TITLE: An investigation of the decomposition of americium
oxalate under the influence of its own α -radiation

PERIODICAL: Radiokhimiya, v.4, no.3, 1962, 308-312

TEXT: Radiolysis of the oxalate group in solid compounds under the influence of α -radiation has been studied on oxalate of plutonium-239. However, the composition of the gas evolved during the decomposition was not studied. In the present work the authors investigated the decomposition of oxalate of americium-241 by studies of the change in weight of the residue with time, accumulation of carbonate and the amount and composition of gas evolved. It was found that oxalate of trivalent americium on standing is decomposed under the influence of its own α -radiation, passing into carbonate. The decomposition is completed after 15 to 20 days and after 50 to 60 days the composition of the residue corresponds to $\text{Am}_2(\text{CO}_3)_3 \cdot 5\text{H}_2\text{O}$. This decomposition is a first order reaction with a velocity.
Card 1/2

S/186/62/004/003/009/022

An investigation of the decomposition .. E071/E433

constant of $0.22 \pm 0.04 \text{ days}^{-1}$. The mixture of gases evolved on decomposition consists of CO_2 and CO with a prevalence of CO_2 . There are 4 figures and 2 tables.

SUBMITTED: May 29, 1961

Card 2/2

S/186/62/004/003/020/022
E075/E436

AUTHORS: Chudinov, E.G., Yakovlev, G.N.

TITLE: Photometric determination of neptunium with the aid of quercetin

PERIODICAL: Radiokhimiya, v.4, no.3, 1962, 373-375

TEXT: A new method was sought for the determination of Np²³⁷ in view of the difficulties encountered with the spectrophotometric and radiometric methods used for the determination of low concentrations of Np in complex mixtures. It was established that the fourvalent Np forms with quercetin (3,5,7,3',4'-pentaoxyflavin) in H₂O-ethanol medium a yellow-green complex with the absorption maximum at 425 mμ. If the solution of quercetin is added to an acid H₂O-ethanol solution of Np, the optical density of the complex gives a sharp maximum at pH = 1.6. The optical density did not depend greatly on pH in the range of 3.0 to 7.0, if the Np solution was added to quercetin solution. The molar absorption coefficients for the Np compound under the conditions given above were 14600 and 23000 respectively. As quercetin formed complexes with many elements, Np had to be separated from
Card 1/2

Photometric determination ...

S/186/62/004/003/020/022
E075/E436

any admixtures. Application of the method to synthetic mixtures of Np, U and Pu containing 2.5 to 150 γ of Np gave a relative error of 6%. The time of the determination was 5 hours. There are 4 figures and 1 table.

SUBMITTED: May 26, 1961

Card 2/2

ZAYTSEV, A.A.; LEBEDEV, I.A.; PIROZHKOV, S.V.; YAKOVLEV, G.N.

Extraction of rhenium and molybdenum with trioctylamine from
sulfuric acid solutions. Zhur.neorg.khim. 8 no.9:2184-2186
S '63. (MIRA 16:10)

ZAYTSEV, A.A.; LEBEDEV, I.A.; PIROZHKOVA, S.V.; YAKOVLEV, G.N.

Extraction of rhenium by pyridine bases. Zhur. neorg. khim.
8 no.10:2407-2411 0 '63. (MIRA 16:10)

1. Institut atomnoy energii im I.V. Kurchatova.
(Rhenium) (Pyridine bases)

L 36974-65 EWT(m)/EWP(t)/EWP(b) LJP(c) JD
ACCESSION NR: AP4043851 S/0186/64/006/004/0440/0444

AUTHOR: Zaytsev, A. A.; Lebedev, I. A.; Pirozhkov, S. V.; Yakovlev, G. N. 13 B

TITLE: Extraction of technecium from nitric acid solutions by phosphoric acid derivatives and trioctylamine 27

SOURCE: Radiokhimiya, v. 6, no. 4, 1964, 440-444

TOPIC TAGS: technecium extraction, organic phosphate, tributyl phosphate, trioctylamine, alkyl amine, phosphine oxide, trioctyl phosphine oxide, methylphosphonic acid

ABSTRACT: Studies on the extraction of the short-lived radioactive isotope Tc-99 by a variety of organic phosphates, phosphonic acid esters and amines showed that technecium cannot be extracted from 0.1-4 M HNO₃ solutions by acidic reagents. High distribution coefficients were obtained, however, with neutral phosphates such as tri-n-octylphosphine oxide, diisoamylmethylphosphonate and tributyl phosphate, and especially with trioctylamine. The degree of extraction was found to depend on both the HNO₃ concentration and the concentration of organic extractant; thus, the highest distribution coefficients were obtained with 0.1 M HNO₃ in the case of

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L 36974-65
ACCESSION NR: AP4043851

0

triethylphosphine oxide and trioctylamine but with 0.5-1 M HNO_3 in the case of tributylphosphate and diisoamylmethylphosphonate. Studies on the extraction of Tc by diisoamylmethylphosphonate from $\text{HNO}_3/\text{NaNO}_3$ solutions in which the pH was varied but the ionic strength was kept constant showed that the distribution coefficient is independent of the pH but is proportional to the 2.2-3.2 power of the diisoamylmethylphosphonate concentration. After extraction of Tc with these organic solvents, it can best be isolated by extraction with ammonia; in the case of tributyl phosphate, this reextraction is difficult, which impairs the usefulness of this extractant. Orig. art. has: 6 tables, 3 figures and 1 formula.

ASSOCIATION: None

SUBMITTED: 02Jan63

ENCL: 00

SUB CODE: IC

NO REF SOV: 004

OTHER: 002.

Card

2/2 *Ex*

L 36975-65 EWP(m)/EWP(t)/EWP(b) IJP(o) JD
ACCESSION NR: AP4043852 S/0186/64/006/004/0445/0448 13 B

AUTHOR: Zaytsev, A. A.; Lebedev, I. A.; Pirozhkov, S. V.; Yakovlev, G. N.

TITLE: Extraction of technecium (VII) from alkaline solutions by pyridine derivatives

SOURCE: Radiokhimiya, v. 6, no. 4, 1964, 445-448

TOPIC TAGS: technecium extraction, uranium fission product, pyridine derivative, neutron bombardment, distribution coefficient, alkali cation, sodium nitrate

ABSTRACT: In a continuation of work on the purification of radioactive technecium (Tc-99, prepared by bombardment of molybdenum with neutrons) by extraction procedures, the authors investigated the extraction of heptavalent Tc from alkaline solutions by 4 different pyridine derivatives: 2-methylpyridine, quinoline, 2,4-dimethylpyridine, and 2-methyl-5-ethyl-pyridine. Most attention was paid to the last 2, since these were found to be the most convenient to use, even though 2-methylpyridine yielded even higher distribution coefficients in most media. A study of the effect of the pH and the nature of the alkali cation on the distribution coefficient of Tc showed that optimal extraction by 2,4-dimethylpyridine and 2-methyl-5-ethylpyridine is obtained from 1-3 M NaOH, and that even better extraction is
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L 36975-65
ACCESSION NR: AP4043852

possible from LiOH solutions; i.e., the distribution coefficients decreased in the order: $Li > Na > K > NH_4 > Rb > Cs$. Other studies showed that the addition of Na_2CO_3 contributed to better extraction of Tc, while addition of $NaNO_3$ decreased the distribution coefficients considerably. Comparative studies on the extraction of some uranium fission products (Zr, Mo, Ru, Cs and Pm) by 2-methyl-5-ethylpyridine from ammonium carbonate solution showed very low distribution coefficients in all cases, indicating that a rather high degree of purification of Tc can be achieved in this way. The Tc can be isolated (reextracted) from the pyridine derivatives either by steam distillation of the solvent or by extraction with water or alkaline solution after dilution of the solvent with benzene, dichloroethane or chloroform. Orig. art. has: 1 figure, 5 tables and 1 formula.

ASSOCIATION: None

SUBMITTED: 02Jan63

ENCL: 00

SUB CODE: IC

NO REF SOV: 002

OTHER: 005

Card 2/2 *bs*

E-27605-65 EWT(n)/EPF(n)-2/EWP(t)/EWP(b) Pu-4 IJP(c) JB/MM/JG

ACCESSION NR: AP5001642

S/0186/64/006/006/0655/0665

AUTHOR: Gureyev, Ye. S.; Kosyakov, V. N.; Yakovlev, G. N.

25
23 B

TITLE: Extraction of actinide elements with dialkyl phosphoric acids

SOURCE: Radiokhimiya, v. 6, no. 6, 1964, 655-665

TOPIC TAGS: actinide element, uranium extraction, neptunium extraction, plutonium extraction, americium extraction, cerium extraction, dialkyl phosphoric acid

ABSTRACT: The object of the work was to study the extraction of ²³⁸uranium (VI), ²³⁷neptunium (V), ²³⁹plutonium (IV), ²⁴¹americium (III) and ¹³⁷cerium (III) with dialkyl phosphoric acids from nitric acid solutions and the influence on the extraction of such factors as the length and degree of branching of the carbon atom chain of the alkyl radical, concentration of the extracting agent in the organic phase, concentration and type of the acid in the aqueous phase, and type of the neutral diluent. The nature of the dependence of the distribution coefficients of Am (III), Pu (IV), and U (VI) on the concentration of the extracting agent in the organic phase and on the content of hydrogen ions in the aqueous phase was elucidated. It was shown that when the carbon chain of the radical in the dialkyl-phosphate increases in length, the extractability of these elements increases

Card 1/2

L 27605-65

ACCESSION NR: AP5001642

0

slightly, and that branching of the chain causes a decrease in the distribution coefficients. The nature of the diluent also has a pronounced effect on the extraction. Orig. art. has: 7 figures, 5 formulas and 11 tables.

ASSOCIATION: none

SUBMITTED: 24Jun64

ENCL: 00

SUB CODE: IC

NO REF SOV: 004

OTHER: 011

Card 2/2

L 54748-65

ACCESSION NR. AT5015400

extrapolating the values obtained to zero ionic strength, the thermodynamic instability constants of the ions AmAc^{2+} and $\text{Am}(\text{Ac})_2^+$ were found to be 1.2×10^{-3} and 6.4×10^{-3} , respectively. The neutral complex $\text{Am}(\text{Ac})_3$ may also be present in the solution, but its constant could not be determined because of insufficient evidence of its existence.

ASSOCIATION: None

SUBMITTED: 12Dec63

ENCL: 00

SUB CODE: IC

NO REF SOV 00

OTHER: 013

Card

2/2

YAKOVLEV, G.N.

Dirichlet problem for a region with a non-Lipshits boundary.
Dif. urav. 1 no.8:1085-1098 Ag '65. (MIRA 18:9)

1. Moskovskiy fiziko-tehnicheskoy institut.

4

L 00037-66 EWT(m) DIAAP
ACCESSION NR: AP5020306

UR/0186/65/007/004/0453/0461

AUTHOR: Dedov, V. B.; Volkov, V. V.; Gvozdev, B. A.; Yermakov, V. A.; Lebedev, I. A.
Razbitnoy, V. M.; Trukhlyayev, P. S.; Chuburkov, Ya. T.; Yakovlev, G. N.

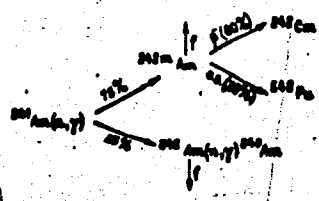
TITLE: Production of Pu-242 and Cm-242 from neutron-irradiated Am-241

79, 25
E

SOURCE: Radiokhimiya, v. 7, no. 4, 1965, 453-461

TOPIC TAGS: plutonium, curium, americium, extraction, neutron irradiation

ABSTRACT: Irradiation of Am-242 with thermal neutrons produces Pu²⁴², Cm²⁴² and Am²⁴³ which are of great interest in a number of physical and radiochemical investigations. The synthesis scheme is as follows:



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L 00037-66

ACCESSION NR: AP5020306

0

The thermal neutron cross section of Am²⁴¹ is 900 barn, thus even upon short irradiation with a high density thermal-neutron beam a significant amount of the above isotopes may be produced. It can be seen from the above process that the yield of fission products is small since they are produced mainly during fission of Am²⁴². This facilitates the chemical processing of irradiated substances. Production of Pu²⁴² by this process requires much less time than the method which uses Pu²³⁹ as starting material. The authors describe the chemical separation of Pu²⁴², Cm²⁴² and Am²⁴³ from irradiated Am²⁴¹. The scheme for the chemical processing was selected to be such that it would produce rapid separation of the products. The main separation steps involved chromatographic and chemical extraction methods. Chromatographic separation was made extremely difficult by high α -activity due to the presence of Cm²⁴². Chemical processing was carried out in a shielded area on a special stand with remote control of all operations. The article indicates some properties of curium oxalate, potassium curium sulfate, curium hydroxide and curium carbonate. Orig. art. has: 5 tables and 3 figures.

ASSOCIATION: none

SUBMITTED: 18Apr64

ENCL: 00

SUB CODE: OC, NP

NO REF SOV: 004

OTHER: 005.

Card 1/2 *MM*

BONDAR', Nikolay Gerasimovich, doktor tekhn. nauk, prof.; KAZEY,
Igor' Ivanovich, kand. tekhn. nauk; ~~LESOKHIN~~, Bernard
Falkovich, kand. tekhn. nauk; KOZ'MIN, Yuriy Georgiyevich,
kand. tekhn. nauk, dots.; Primalni uchastiye: TARASENKO,
V.P., kand. tekhn. nauk; YAKOVLEV, G.N., kand. tekhn. nauk
dots.; DOROSHENKO, Ye.V., kand. tekhn. nauk; NEVZOROV,
I.N., inzh.; KONASHENKO, S.I., kand. tekhn. nauk, dots.;
ORLENKO, V.P., inzh.; KHOKHLOV, A.A., kand. tekhn. nauk,
dots.; ZELEVICH, P.M., kand. tekhn. nauk, red.

[Dynamics of railroad bridges] Dinamika zheleznc-dorozhnykh
mostov. [By] N.G. Bondar' i dr. Moskva, Transport, 1965.
411 p. (MIRA 18:12)

L 38456-66 EWI(m)/EWP(w)/I/EWP(t)/EII/EWP(k) IJK(c) JB/nii/DJ

ACC NR: AP6025086

(A,N)

SOURCE CODE: UR/0122/66/000/007/0067/0069

AUTHOR: Babuk, V. V. (Engineer); Yakovlev, G. N. (Doctor of technical sciences; Professor); Bernshteyn, M. L. (Doctor of technical sciences; Professor)

ORG: none

TITLE: Effect of thermomechanical treatment of steel on wear resistance

SOURCE: Vestnik mashinostroyeniya, no. 7, 1966, 67-69

TOPIC TAGS: low alloy steel, chromium containing steel, manganese containing steel, boron containing steel, high strength steel, high temperature treatment, thermomechanical treatment, steel treatment, steel wear resistance/03Kh8 steel, 47Kh8 steel, 55KhGR steel

ABSTRACT: Three steels were subjected to high-temperature thermomechanical treatment (HTMT). 03Kh8 steel was rolled at 950—970C with a 75% reduction and immediately water or oil quenched; 47Kh8 steel was rolled at 1100C with a reduction of 50 or 75% and also water or oil quenched; 55KhGR steel was rolled at 920C with a reduction of 80%, straightened with a press, and then cooled in air. After tempering at 200C for 1 hr (55KhGR steel—for 40 min), the steels were tested for wear resistance in friction on cast iron under a specific pressure of 0.5—2.5 kg/mm² at a speed of 2.1 m/sec. 03Kh8 and 47Kh8 steels were tested with intensive lubrication, and 55KhGR steel in dry friction. The test results showed that HTMT lowered the wear resistance of

Card 1/2

UDC: 620.178.162:669.14.018.27:621.789

L 38456-66

ACC NR: AP6025086

03Kh8 steel under low specific pressures, but had practically no effect under higher specific pressures. For 47Kh8 steel under a specific pressure of 1.4 kg/mm² and higher, HTMT with a reduction of 50 and 75% increased wear resistance by 10—30 and 80—90%, respectively. The HTMT also increased the wear resistance of the 55KhGR steel by about 100—150%. The increase of the wear resistance is proportional to the reduction during the HTMT and its effect is more pronounced with increasing specific pressure. Orig. art. has: 4 figures and 2 tables. [MS]

SUB CODE: 11, 14/ SUBM DATE: none/ ATD PRESS: 5047

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L 34051-66 EWP(m)/EWP(j)/EWP(t)/ETI LJP(c) JI/WM/Jw/JG/EM

ACC NR: AP6025486

SOURCE CODE: UR/0186/66/008/001/0033/0042

82
81
B

AUTHOR: Rykov, A. G.; Vasil'yev, V. Ya.; Yakovlev, G. N.

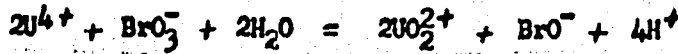
ORG: none

TITLE: Investigations of oxidation-reduction reactions of actinide elements. III. Kinetics of the reaction between uranium (IV) and bromate ions in perchlorate solutions

SOURCE: Radiokhimiya, v. 8, no. 1, 1966, 33-42

TOPIC TAGS: oxidation reduction reaction, chemical kinetics, uranium, bromate, anion, stoichiometry, reaction rate, hydrogen ion, ion concentration

ABSTRACT: The mechanism of the conversion of M^{4+} ions to Mo_2^{2+} or Mo_3^{2+} ions in the reaction with anion oxidants has not been well studied. The present study deals with the kinetics of oxidation-reduction reactions of ions of actinide elements with oxygen-containing anions. The experiments on the determination of the stoichiometry of the reaction were conducted at 25°C in 2 M $HClO_4$. The results showed that the stoichiometric coefficient of the reaction remains approximately constant within the limits of 2.1-2.3 with a change in the ratio of initial reagent concentrations $\frac{[U(IV)]_c}{[BrO_3^-]_0}$ from 2.5 to 5.5. Evidently, the principal reaction is



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accompanied by considerably slower oxidation of U(IV) by BrO^- ions. It has been shown that the reaction governing the rate of the overall process passes through two activated complexes formed under different equations. The reaction rate in the first route does not depend on concentration of hydrogen ions, and along the second — it is proportional to the square of the H^+ ion concentration. Thermodynamic values have been found characterizing the reactions of formation of each activated complex. The formal entropy values of these complexes have been calculated. Orig. art. has: 10 figures and 7 tables. [JPRS: 35,728]

SUB CODE: 07 / SUBM DATE: 23Nov64 / ORIG REF: 010 / OTH REF: 011

Card 2/2

ACC NR: AP7002003

SOURCE CODE: UR/0040/66/030/006/1140/1146

AUTHOR: Ivanilov, Yu. P. (Moscow); Yakovlev, G. N. (Moscow)

ORG: none

TITLE: Steady state convection in the presence of an external magnetic field

SOURCE: Prikladnaya matematika i mekhanika, v. 30, no. 6, 1966, 1140-1146

TOPIC TAGS: convective heat transfer, magnetohydrodynamics, incompressible flow, viscous flow

ABSTRACT: The presence of steady convective flows in a conducting liquid confined in a vessel heated from the bottom is shown analytically for the case when an external magnetic field is present. It is assumed that the density of the liquid is a linear function of the temperature and that the temperature gradient is constant. The steady flow of the liquid is defined by four sets of equations: dynamic equations, equations of heat conductivity, induction equations and equations of incompressibility. These equations contain the following parameters: Rayleigh number, Prandtl number, magnetic Reynolds number, magnetic pressure number, pressure, acceleration due to gravity, external magnetic field intensity and the projection of velocity along the direction of the gravitational force. The variables are dimensionless and are introduced as functions of the following: the kinematic viscosity, the characteristic linear dimen-

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ACC NR: AP7002003

sion, the velocity vector, the vector of magnetic field intensity induced by the motion of the liquid, Cartesian coordinates, coefficient of heat conductivity, specific heat, coefficient of magnetic viscosity, electrical conductivity and magnetic permeability. Boundary conditions are assigned by assuming that the vessel is completely filled and that its wall is a perfect conductor. A generalized solution of the problem is formulated together with the solution of the corresponding linearized steady state problem. Two lemmas and five theorems are proved in the course of the analysis to show the presence of steady convective flows. It is concluded that analogous results can be obtained if the liquid is placed in a dielectric material. Orig. art. has: 26 formulas.

SUB CODE: 20/ SUBM DATE: 10Jan66/ ORIG REF: 012/ OTH REF: 001

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