L 20999-65
ACCESSION NR: AP5001153

The Prandtl-Nikuradze scale of turbulence l is used, and the Reynolds stress equations are written in nondimensional form with the following solution

$$\overline{vw} = 0, \quad \overline{v^2} = \overline{w^2}, \quad \overline{uw} = \frac{2\,\mathrm{Re}_{\omega l}}{k\,\mathrm{Re}_E + c_1}\overline{uv},$$

$$\frac{\overline{uv}}{E} = -\frac{\frac{2}{3}(k-c)\,\mathrm{Re}_E\,\mathrm{Re}_l}{(k\,\mathrm{Re}_E + c_1)^2 + 4\,\mathrm{Re}_{\omega l}^2},$$

where

$$\mathrm{Re}_l = \frac{l^2 \frac{dU}{dy}}{\nu}, \quad \mathrm{Re}_E = \frac{\sqrt{E}\,l}{\nu}, \quad \mathrm{Re}_{\omega l} = \frac{\omega l^2}{\nu}.$$

These results show that for a given Re_{ℓ}, the rotating flow reduces fluctuations and friction in the flow. The critical Reynolds numbers Re_0 and Re_{ω} are studied for the flow in a tube with and without spiral motion. For $\omega = 0$, the critical Reynolds number is given by $\mathrm{Re}_0 > 500$. For $\omega \neq 0$, two expressions are obtained for critical conditions by using the condition $\partial \mathrm{Re}_{\ell} / \partial \mathrm{Re}_E = 0$. The turbulent

Card 2/3

L 20999-65

ACCESSION NR: AP5001153

2

core of the flow and the viscous regions are treated independently. These then lead to the two expressions

$$\mathrm{Re}_0 = 65\sqrt{\mathrm{Re}_*} + 0{,}22\mathrm{Re}_* \qquad (k/c = 7),$$

$$\mathrm{Re}_0 = 96\sqrt{\mathrm{Re}_*} + 0{,}7\mathrm{Re}_* \qquad (k/c = 1{,}6).$$

where k/c is determined by comparing the computation results with experimental values. "The author is grateful to Academician G. I. Petrov and corresponding-member of the AN SSSR, V. M. Ivevlev, for their interest in the work and useful evaluation." Orig. art. has: 24 equations and 6 figures.

ASSOCIATION: none

SUBMITTED: 06Apr64 ENCL: 00

SUB CODE: ME NO REF SOV: 004 OTHER: 003

Card 3/3

L 00308-66 EWT(1)/EWP(m)/EPA(s)-2/EWT(m)/EPF(n)-2/EWA(d)/EWP(t)/FCS(k)/
EWP(b)/EWA(1) JD/WW/JG

ACCESSION NR: AP5016646 UR/0382/65/000/002/0003/0010
538.4 : 532.542.4

44
B

AUTHOR: Levin, V. B.

TITLE: Stabilizing influence of a longitudinal magnetic field on the inhomogeneous turbulent flow of electrically conducting liquid

SOURCE: Magnitnaya gidrodinamika, no. 2, 1965, 3-10

TOPIC TAGS: MHD flow, Reynolds number, turbulent flow

ABSTRACT: Calculations of turbulent shear flow characteristics is extended to the flow of conducting fluids in a longitudinal magnetic field by using a generalization of the dissipation term obtained by Iyevlev (4 ye rizhskoye soveshcheniye po magnitnoy gidrodinamike. Cb. Tezisov, Riga, 1964). Critical Reynolds number increase in pipe flow is studied in detail and it is shown that in a transition region a single new parameter can be employed in place of Reynolds and Hartmann numbers. A simple analytical relationship is obtained for Hartmann number dependence on the critical Reynolds number, which is useful in designing experiments and also determining stream flow properties from studies of pipe flows. Orig. art. has: 26 formulas, 5 figures.

Card 1/2

L 00308-66
ACCESSION NR: AP5016646

C

ASSOCIATION: none

SUBMITTED: 03Sep64 ENCL: 00 SUB CODE: ME, EM

NO REF SOV: 003 OTHER: 001

dg
Card 2/2

BELYSHEV, P.V.; USOV, G.V.; SOLOV'YEV, M.K. [deceased]; LEBEDEV, N.D.; LEVIN, V.F.; PEVZNER, M.L.; USOV, A.M.; ZOLKIN, I.D.; KONONOV, N.A.; IVANOV, P.P., red.; PANKRATOV, A.I., tekhn. red.

[Economics of a textile enterprise; for the aid of studying applied economics] Ekonomika tekstil'nogo predpriiatiia; v pomoshch' izuchaiushchim konkretnuiu ekonomiku. Ivanovo, Ivanovskoe knizhnoe izd-vo, 1960. 359 p. (MIRA 14:7)

(Textile industry)

LEVIN, V.F.

Creation of the material and technical foundations of communism. Izv. vys.ucheb.zav.; tekh.tekst.prom. no.6:3-10 '61. (MIRA 15:1)

1. Ivanovskiy tekstil'nyy institut imeni M.V.Frunze.
(Russia--Economic conditions)

GABRIYELOVA, M.G.; LEVIN, V.F.

Active white filler from superphosphate production wastes. Khim. prom. no.6:433 Je '61. (MIRA 14:6)
(Phosphates) (Fillers)

GABRIYELOVA, M.G.; LEVIN, V.F.; SUBBOTINA, O.P.

Ways of utilizing silica gel of superphosphate plants. Khim. prom. no.6:417-419 Je '63. (MIRA 16:8)

(Silica) (Phosphates)

LEVIN, V.I., inzhener-ekonomist

Technical and economic analysis of the organization of the construction of the Irtyshskoye-Karasuk railroad line. Trudy MIIT no.162:58-82 '63. (MIRA 17:4)

DAMASKIN, B.I., doktor tekhn. nauk, prof.; LEVIN, V.I., kand. tekhn. nauk,
starshiy propodavatel'; KRASKOV, V.A., inzh.

Loading of the shafts of a Class 97 sewing machine. Nauch. trudy
MTILP no.28:219-224 '63. (MIRA 17:11)

1. Kafedra detaley mashin Moskovskogo tekhnologicheskogo instituta
legkoy promyshlennosti.

LEVIN, V.I.

Drills with plastic bevel shafts. Mashinostroitel' no.4:20-21 Ap '63. (MIRA 16:5)

(Twist drills)

LEVIN, V.I.

Zoning of groundwater indicators of the northern Caspian Sea region in the search of fresh and brackish waters. Trudy MOIP 8:18-23 '64. (MIRA 17:12)

LEVIN, V. [illegible], inzh.

Calculation of optimum load in construction organizations.
Transp.stroi. 13 no.10:45-47 O '63. (MIRA 17:8)

ACCESSION NR: AT4042445 S/0000/64/000/000/0126/0131

AUTHOR: Levin, V. I.

TITLE: Pneumatic device for on-call control and regulation

SOURCE: Vsesoyuznoye soveshchaniye po pnevmo-gidravlicheskoy avtomatike. 5th, Leningrad, 1962. Pnevmo- i gidroavtomatika (Pneumatic and hydraulic control); materialy* soveshchaniya. Moscow, Izd-vo Nauka, 1964, 126-131

TOPIC TAGS: automation, automatic control system, pneumatic control system, pneumatic regulator, on-call control system, combinative selection

ABSTRACT: The author describes a device developed at the NIITeplopribor in Moscow, largely on the basis of elements of the universal system developed at the Institut avtomatiki i telemekhaniki (Institute of Automation and Telemechanics), and intended for use in the petroleum, gas, chemical, metallurgical and food processing industries. The principle of operation of the device is that of combinative selections. This principle provides a high speed response since it requires only one communication channel to transmit any one signal, which is particularly important for devices with pneumatic communication channels. Binary and binary-decimal codes are used. The author describes the coding and decoding mechanisms, as well as a device for accelerating the transmission of discrete pneumatic signals and a com-

Card 1/2

ACCESSION NR: AT4042445

bined system for controlling up to 100 parameters on the basis of a single indicator. The device will permit the following: centralization of the control of many parameters; reduction in the number of pneumatic lines between the object and the location of the operator; reduction in the number of secondary meters; and reduction in the size of the panels and consoles and also of the operator location. Orig. art. has: 1 table and 4 figures.

ASSOCIATION: none

SUBMITTED: 29Jan64 ENCL: 00

SUB CODE: IE NO REF SOV: 000 OTHER: 000

Card 2/2

L 28750-65 EWT(d)/EWP(c)/EWA(d)/EWP(v)/T/EWP(k)/EWP(h)/EWP(l) Po-4/Pq-4/
Pf-4/Pg-4/Pk-4/Pl-4 IJP(c) BC

ACCESSION NR: AT5003302 S/2950/64/000/003/0039/0042

AUTHOR: Levin, V.I.

53
52
BH

TITLE: Automatic search systems

SOURCE: EIKA, entsiklopediya izmereniy, kontrolya i avtomatizatsii (Encyclopedia of measurement, control, and automation), no. 3. Moscow, Izd-vo Energiya, 1964, 39-42

TOPIC TAGS: automatic control system, automatic search system, automatic optimization, search theory

14

9

ABSTRACT: This is a tutorial article on adaptive and self-learning systems. After a brief definition of both of these classes of automatic search systems, the author discusses at length an important subclass called the systems of automatic optimization. A general optimization system consists of a controlled object (or process) with n inputs ($x_1, \ldots x_n$), a noise input z and j outputs ($y_1, \ldots, y_j$), a computer (or calculator) C and an automatic optimizer A, as shown in Figure 1 of the Enclosure. From the output variables y the computer C computes the quality factor Q, subject to the condition that some predetermined functions H_i ($x_1, \ldots, x_n$) ($i = 1 \ldots m$) should not exceed certain prescribed limits. The optimizer A then controls the input variables x in such a way as to keep the factor Q at its extremum (maximum or minimum). The search methods involved in

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L 28750-65

ACCESSION NR: AT5003302 0

evaluation of the location of the extremum, all based on trial perturbations of the input variables by the optimizer, are: blind search, which can be deterministic (fixed scan program), random or locally random, and search with analysis of intermediate results. The applications of blind search are limited. The three main methods of search with analysis of intermediate results are the Gauss-Zeidel method, the method of steepest descent (slope) and the gradient method. The search methods are illustrated by considering specific systems described in the literature. Two of the simplest types of optimizer were described by L.N. Fitsner (Elektrichestvo, 1960, No. 8, 61-67). These are types 1A01-2 and 1A01-1, the last of which involves an integrator in the Q path and can thus be used to control processes with high noise levels. The steepest descent system takes a trial step δx in each of the input variables and evaluates the corresponding value of δQ. From this data the gradient of Q is computed and then the optimizer A takes large "working" steps Δx in the direction opposite to the direction of the gradient vector until the sign of ΔQ changes, indicating that the minimum was passed. Then the process is reversed. The gradient method is essentially the same except that in this method the gradient of Q is evaluated after each working step so that the control becomes much more accurate. Practical difficulties with automatic optimizers are encountered when the characteristics of the controlled object are complex, the noise level is high, the object has large inertia and strong drift in its characteristics, the trial perturbations cause a significant deviation from optimum conditions and when the required trial

Card 2/4

L 28750-65

ACCESSION NR: AT5003302

perturbations must be large. Some of these difficulties may be circumvented by evaluating all required data on a high speed electronic model of the object. This is turn requires a detailed knowledge of the object and precludes the possibility of any unexpected random changes in its characteristics. When two models are used, one slow and one high speed, in such a way that the output of the slow model can be continuously compared with the output of the actual object and the required data computed by the fast model, the performance can be significantly improved. The multichannel optimizers are often used in automatic synthesis problems. Other types of automatic search machines may not involve an optimization process. Examples are the Pandemonium (Programmed on IBM-704), the homeostat of Ashby and the machine for proving theorems in Euclidian geometry, described by Gelerter and Rochester (IBM JRD, Oct. 1958). Orig. art. has: 10 figures and 12 formulas.

ASSOCIATION: Institut avtomatiki i telemekhaniki, Moscow (Automation and remote control institute)

SUBMITTED: 00 ENCL: 00 SUB CODE: IE

NO REF SOV: 003 OTHER: 000

Card 3/4

L 28750-65

ACCESSION NR: AT5003302 0 **ENCLOSURE: 01**

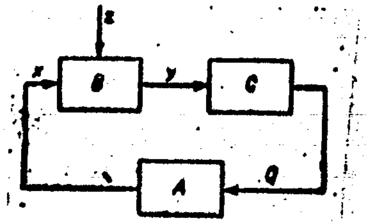

Рис. 1.

Fig. 1. General structure of an optimizing system.

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L 32140-65 EWT(1)/EEC(b)-2/EWA(h) Pm-4/Po-4/Pq-4/Pg-4/Peb/Pl-4

ACCESSION NR: AP5002685 S/0280/64/000/006/0085/0090 32

31

B

AUTHOR: Levin, V. I. (Kaunas)

TITLE: Probabilistic analysis of combination circuits and their reliability 25

SOURCE: AN SSSR. Izvestiya. Tekhnicheskaya kibernetika, no. 6, 1964, 85-90

TOPIC TAGS: logical element, logical circuit, logical circuit reliability

ABSTRACT: Any composition of binary logical elements is called a "combination circuit"; a "regular" circuit has no loops, and each node (except input) is connected either to an output channel or to an input channel. These two problems are analyzed and solved: (1) Given a regular combination circuit having n input and m output nodes and consisting of two-input conjunctions, disjunctions, and invertions with a specified error probability ε ; also given is the distribution of probabilities of input-parameter sets; find the distribution of probabilities of output-parameter sets; (2) For the same conditions, calculate the probability of

Card 1/2

L 32140-65
ACCESSION NR: AP5002685

correct operation of the combination circuit. The method permits the probabilistic analysis of the circuit in a step-by-step manner with subsequent consolidation of results. "In conclusion, the author wishes to thank B. R. Levin for discussing the results." Orig. art. has: 3 figures, 21 formulas, and 1 table.

ASSOCIATION: none

SUBMITTED: 06Apr64 ENCL: 00 SUB CODE: DP

NO REF SOV: 004 OTHER: 000

Card 2/2

L 23789-66 EWT(d)/EWT(l)/T/EWA(h) IJP(c) TG

ACC NR: AP6005760 SOURCE CODE: UR/0280/65/000/005/0064/0073

31 B

AUTHOR: Levin, V. I. (Kaunas)

ORG: none

16 16

TITLE: Probability analysis of finite automata and their reliability 25

SOURCE: AN SSSR. Izvestiya. Tekhnicheskaya kibernetika, no. 5, 1965, 64-73

TOPIC TAGS: finite automaton, reliability theory, probability, reliability engineering

ABSTRACT: This paper analyzes finite automata constructed on the basis of unreliable combination units and storage cells. The block diagram of the automaton and the random character of the input signal are taken into account, using the results of V. I. Levin (Veroyatnostnyy analiz kombinatsionnykh skhem i ikh nadezhnost'. Izv. AN SSSR, Tekhnicheskaya kibernetika, 1964, no. 6). The evaluation of the block diagram leads, in some cases, to a substantial reduction in the reliability requirements of the components. The ideal automaton is defined as $a(t+1) = \delta[a(t), x(t+1)], y(t+1) = \lambda[a(t), x(t+1)], t = 0, 1, 2, \ldots$; The reliability of a real automaton is also evaluated. Two examples are examined. In conclusion author expresses his gratitude to B. R. Levin for discussing the results. Orig. art. has: 5 figures, 1 table, and 35 formulas.

SUB CODE: 09, 12 / SUBM DATE: 09Jul64 / ORIG REF: 006 / OTH REF: 002

Card 1/1 W

ACC NR: AP6036714 SOURCE CODE: UR/0119/66/000/011/0007/0010

AUTHOR: Levin, V. I. (Candidate of technical sciences)

ORG: none

TITLE: New elements of pneumatic relay equipment

SOURCE: Priborostroyeniye, no. 11, 1966, 7-10

TOPIC TAGS: pneumatic device, pneumatic control system, logic element, relay

ABSTRACT: The modular principle in pressure-automation was introduced by T. K. Berends et al. (Priborostroyeniye, no. 11, 1963), and was further developed at the Scientific Research Institute Teplopribor, where the following new pneumatic elements have been experimentally produced and tested: 1) four elements for performing OR, AND, NOT, and YES logic functions; 2) control mechanisms (pneumatic push buttons YES and NO, pneumatic tumbler, terminal switch); 3) discrete pneumoelectric and electropneumatic converters. All four logic elements are assembled from a set of eleven standardized parts which include nine plastic parts and two rubber disc. The pneumoelectric converter is of the P1PR2 type; it converts discrete pneumatic signals "0" and "1" into discrete electric signals 0 and 0.25 amp/30v d-c, or 0 and 15 amp/115v a-c with up to 400 cps. The P1Ph1-type electropneumatic converter converts discrete electric signals "0" and "1" equal to 0 and 60 mamp/24v d-c into pneumatic signals 0 and 1.4 kg/cm^2 (±10%) pressure, respectively. Experiments proved

Card 1/2 UDC: 62.525.621.318.5

ACC NR: AP6036714

that the construction of elements for performing separate logic functions facilitated simplicity in design and assembly of pneumatic systems. The system has wide functional possibilities and is suitable for achieving control algorithms regardless of their complexity. The elements have small dimensions, high operating speed, low input and high output power, and standardized connectors. The use of free moving parts assure high reliability and durability of elements. Lot production of elements is scheduled for 1967 at the Ust'-Kamenogorsk Instrument Plant. Orig. art. has: 11 figures and 1 table.

SUB CODE: 13/ SUBM DATE: none/ ORIG REF: 001/ ATD PRESS: 5108

Card 2/2

ACC NR: AP7002592 (A,N) SOURCE CODE: UR/0413/66/000/023/0097/0097

INVENTOR: Levin, V.I.; Barkan, I.A.

ORG: none

TITLE: Pneumatic comparing element. Class 42, No. 189221. [announced by Scientific Research Institute of Heat and Power Engineering Equipment (Nauchno-issledovatel'skiy institut teploenergeticheskogo priborostroyeniya)]

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 23, 1966, 97

TOPIC TAGS: pneumatic device, pneumatic control

ABSTRACT:

An Author Certificate has been issued for the pneumatic comparing element shown in Fig. 1. To increase functional versatility and to simplify construction the displacement-to-pneumatic signal converter is made in the form of a chamber (which is connected to the output channel) with coaxial nozzles. Inside the chamber is placed a ball which interacts with the rod of the diaphragm assembly. The rod passes through one nozzle.

Card 1/2 UDC: 681.142.07-525

ACC NR: AP7002592

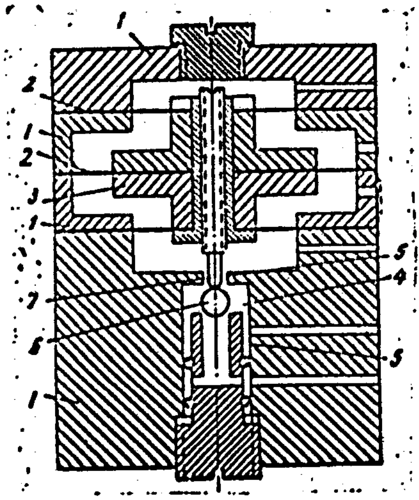


Fig. 1. Pneumatic comparing element

1 - Sections; 2 - diaphragm; 3 - rigid components of diaphragm assembly; 4 - chamber; 5 - nozzle; 6 - ball; 7 - rod.

SUB CODE: 13/ SUBM DATE: 24May65 / ATD PRESS: 5113

Card 2/2

DAMASKIN, B.I., doktor tekhn.nauk prof.; BARSH, kand.tekhn.nauk, dots.;
STEPHOV, L.N., assistent; LEVIN, V.I., assistent

Methof for experimentally determining the magnitude of active stresses in conveyer chains. Izv.vys.ucheb.zav.; tekh.leg. prom. no.5:146-151 '59. (MIRA 13:4)

1. Moskovskiy tekhnologicheskiy institut legkoy promyshlennosti. Rekomendovana kafedroy detaley mashin.
(Dynamometer) (Conveying machinery--Testing)

KOZLOV, I.V.; LEVIN, V.I.

Pneumatic control block of the standardized unit system with widened limit of the adjustment of throttling range. Priborstroenie no.2:1-5 F '61. (MIRA 14:2)
(Pneumatic control)

LEVIN, V.I., inzh.

System for testing loaded asynchronous electric motors with four poles and power exceeding 100 kw. Vest. elektroprom. 34 no.2:63-64 F '63. (MIRA 16:2)
(Electric motors, Induction—Testing)

LEVIN, V.I., inzh.

Air gaps of asynchronous electric motors with water-cooled stator hulls. Elektrotekhnika 34 no.9:72-73 S '63.
(MIRA 16:11)

LEVIN, V.I.

Appearance of remanent strain in brittle materials under the action of high-frequency elastic vibrations. Izv. vys. ucheb. zav.; fiz. no. 3:164-165 '64. (MIRA 17:9)

1. Vsesoyuznyy nauchno-issledovatel'skiy instrumental'nyy institut.

LEVIN, V.I., inzh.

Additional idling losses in the short-circuited rotor windings of asynchronous motors. Elektrotekhnika 36 no.5:47-51 My '65. (MIRA 18:5)

LEVIN, V.I., inzh.

Selection of an optimal air gap of an asynchronous motor. Elektrotekhnika 36 no.12:48-50 D '65.

(MIRA 19:1)

ACCESSION NR: AP4041857 S/0139/64/000/003/0164/0165

AUTHOR: Levin, V. I.

TITLE: Producing residual deformation in brittle materials by means of high-frequency elastic vibrations

SOURCE: IVUZ. Fizika, no. 3, 1964, 164-165

TOPIC TAGS: bending, residual bending deflection, bending hardened steel, bending sintered carbide, bending beryllium, vibration treatment, high frequency vibration

ABSTRACT: Residual deformation has been obtained in brittle materials by subjecting them to the action of high-frequency vibrations while under stress below their elasticity limit. In the experiments, the vibration frequency was varied from 7 to 100 kc. A residual bending deflection of up to 10 mm was obtained in hardened steel safety razor blades, 40 mm long and 0.08—0.1 mm thick, after several seconds of treatment at room temperature. Metallographic examination showed no changes in the structure of the steel. A permanent bending deflection up to 2 mm was obtained in a sintered VK-11 tungsten carbide

Card 1/2

ACCESSION NR: AP4041857

(89% WC, 11% Co) plate 40 mm long and 0.3—0.4 mm thick. A deflection of 5—6 mm was obtained in beryllium plate 20 mm long and 0.2—0.4 mm thick. The experiments showed that residual deformation can appear in stressed brittle materials subjected to the action of high-frequency vibrations. Orig. art. has: 3 figures.

ASSOCIATION: Vsesoyuzny*y nauchno-issledovatel'skiy instrumental'ny*y institut (All-Union Scientific Instrument Research Institute)

SUBMITTED: 16Dec63	ATD PRESS: 3055	ENCL: 00
SUB CODE: MM, ME	NO REF SOV: 001	OTHER: 000

Card 2/2

L 06269-67 EWT(d) IJP(c)

ACC NR: AP6028540 SOURCE CODE: UR/0280/66/000/003/0107/0110

21
B

AUTHOR: Levin, V. I. (Kaunas)

ORG: none

16

TITLE: Determination of the characteristics of probability automatons with feedback

SOURCE: AN SSSR. Izvestiya. Tekhnicheskaya kibernetika, no. 3, 1966, 107-110

TOPIC TAGS: probability automaton, reliability theory, probability, finite automaton, digital automaton

ABSTRACT: In this paper, which is a continuation of two previous articles by the author (Izv. AN SSSR. Tekhnicheskaya kibernetika, 1964, no. 6, and Izv. AN SSSR. Teknicheskaya kibernetika, 1965, no. 5), methods are outlined for finding the matrices Q, P (X_h), and R for any probability automaton with structural circuitry correctly built on binary elements and containing feedback. The matrices, which completely define the operation of these automatons (through analogous matrices of elementary automaton components), are described. Automatons with 2 or more states are considered. The procedure described in the paper for finding flow and output matrices remains valid even when the memory part of the automaton consists of several stages. The results achieved in the study are applicable to the analysis and synthesis of probability automatons with components which are subject to failure. In conclusion, the author wishes to express his gratitude to B. R. Levin for his commentary on the re-

Card 1/2

L 06269-67

ACC NR: AP6028540

sults of the paper. Orig. art. has: 8 formulas and 2 figures.

SUB CODE: 09,13,12/SUBM DATE: 21Nov64/ ORIG REF: 003

Card 2/2

ACC NR: AP6004515 (A) SOURCE CODE: UR/0345/65/000/005/0008/0011

AUTHOR: Damaskin, B. I.; Levin, V. I.

ORG: none

TITLE: Investigation of mechanisms for automatically cutting upper and lower threads in universal sewing machines

SOURCE: Shveynaya promyshlennost', no. 5, 1965, 8-11

TOPIC TAGS: textile industry machinery, automatic control

ABSTRACT: Thread cutting mechanisms in sewing machines are positioned coaxially with the shuttle, and by reciprocating motion, separate the threads from the shuttle and needle before cutting and fastening. A kinematic study was made of the thread separating and cutting process to determine the kinematic and geometric parameters for a thread cutting mechanism. Exemplary arrangements are shown in Figs. 1 and 3. Orig. art. has: 3 figures.

Card 1/3 UDC: 687.053.17.001.5

ACC NR: AP6004515

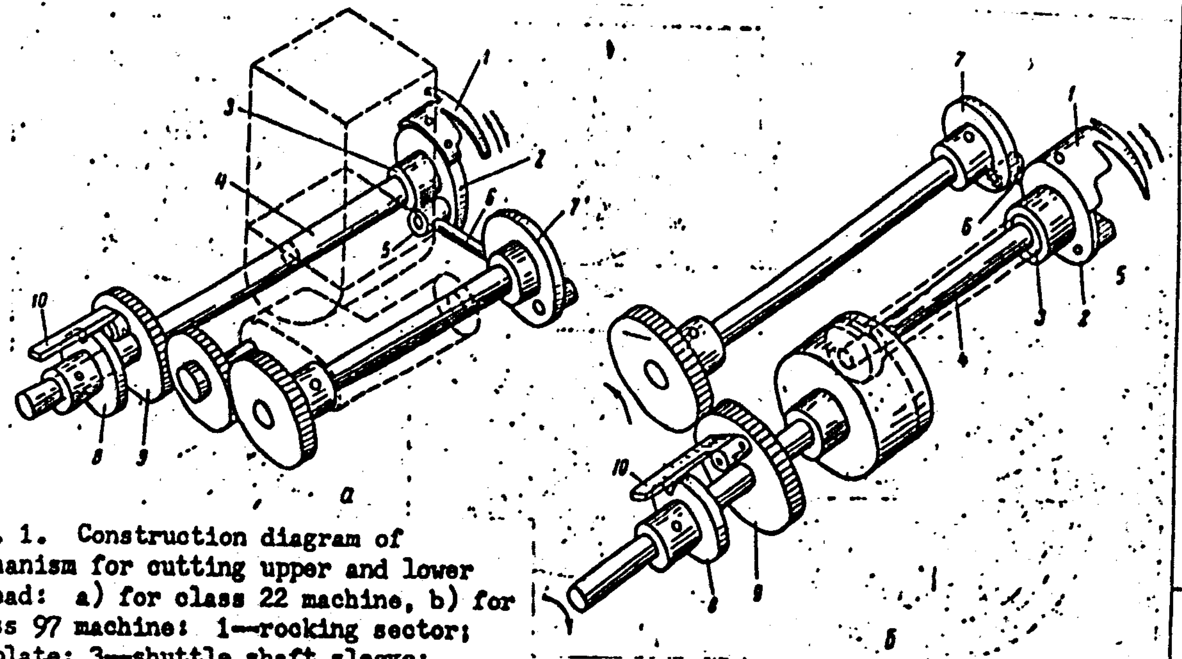


Fig. 1. Construction diagram of mechanism for cutting upper and lower thread: a) for class 22 machine, b) for class 97 machine: 1—rocking sector; 2—plate; 3—shuttle shaft sleeve; 4—shuttle shaft; 5—rocking plate pin; 6—guide; 7—crank; 8—disk for engaging cutting mechanism; 9—cutting mechanism engaging pin; 10—engaging catch.

Card 2/3

ACC NR: AP6004515

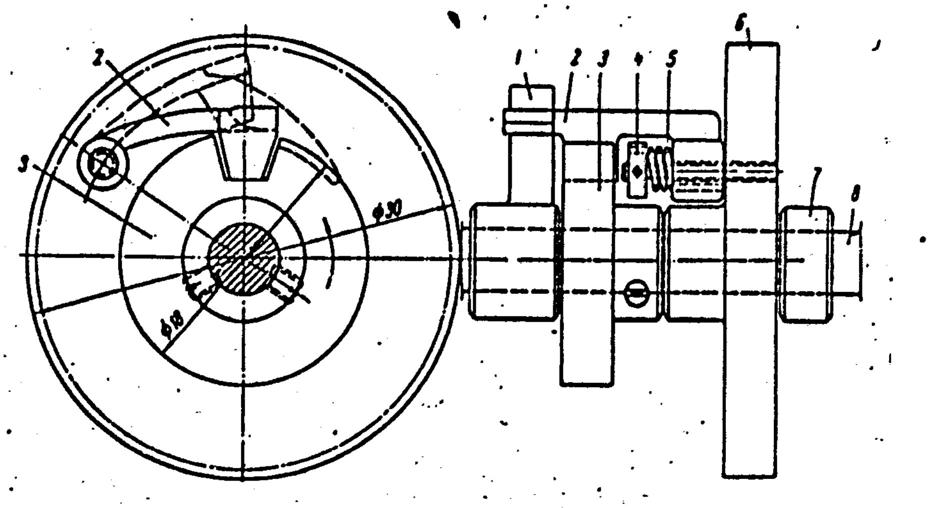


Fig. 3. Engaging mechanism for cutting thread.
1--cam; 2--engaging catch; 3--slotted disk; 4--catch shaft; 5--spring; 6--driving gear for turning crank; 7--adjusting ring; 8--shuttle shaft.

SUB CODE: 13/ SUBM DATE: none/ ORIG REF: 001

Card 3/3

LEVIN, V. I.

"Statistical Theories of Active Surfaces," Uspekhi Khimii, Vol 17, No 2, 1948, pp 174-203.

Translation W-22990, 18 Jun 52

LEVIN, V. I. PA 43/43T104

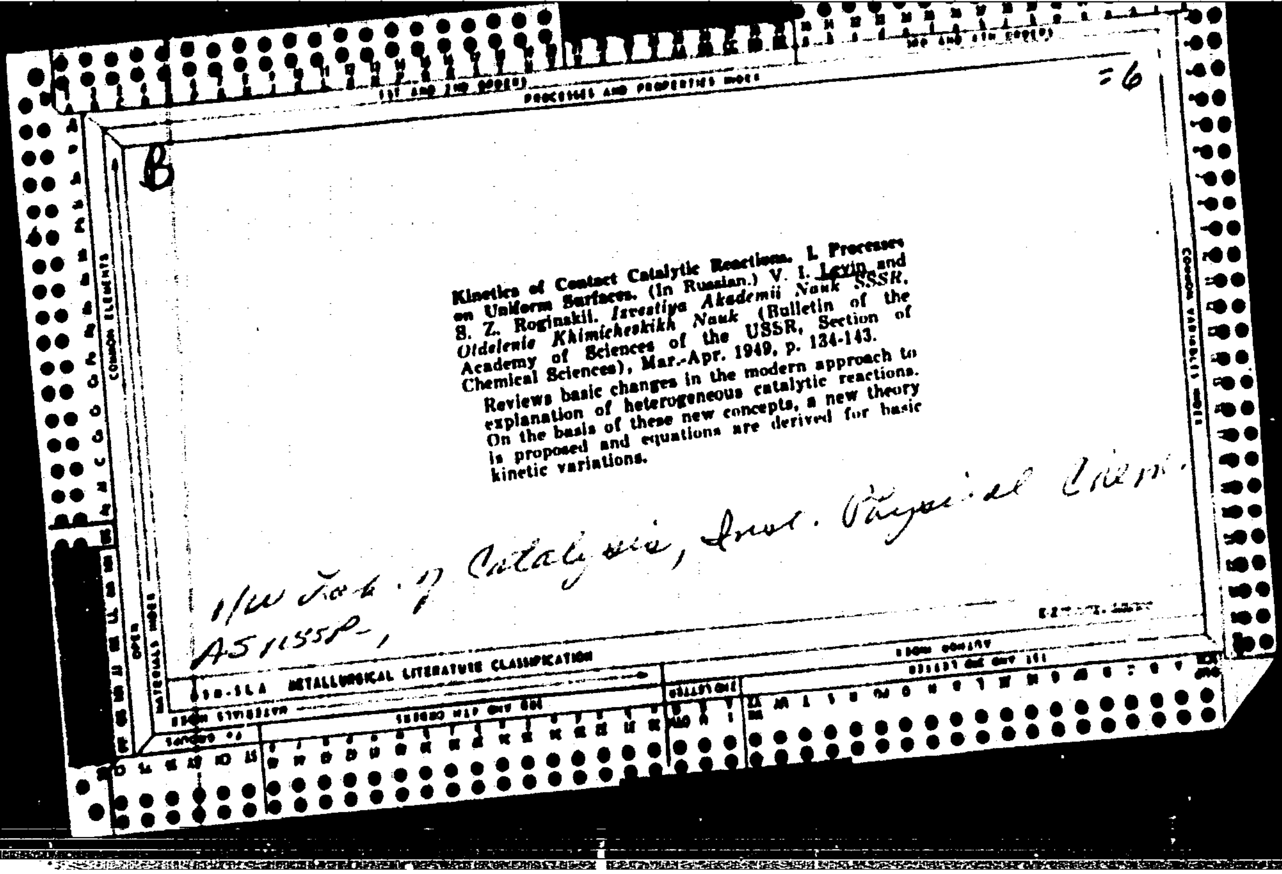
USSR/Physics 11 Jan 1948
Adsorption
Kinetics

"Method of Analyzing Processes on Heterogeneous Surfaces," V. I. Levin, Dept Catalysis and Topochem, Inst Phys Chem, Acad Sci USSR, 4 pp.

"Dok Akad Nauk SSSR, Nova Ser" Vol LIX, No 2

Presents method to find the function of distribution, according to energies of activation, of activated adsorption from kinetic isotherms of adsorption. Submitted by Academician A. N. Frumkin, 28 Oct 1947.

[redacted] 43T104



B

=6

Kinetics of Contact Catalytic Reactions. I. Processes on Uniform Surfaces. (In Russian.) V. I. Levin and S. Z. Roginskii. *Izvestiya Akademii Nauk SSSR, Otdelenie Khimicheskikh Nauk* (Bulletin of the Academy of Sciences of the USSR, Section of Chemical Sciences), Mar.-Apr. 1949, p. 134-143.

Reviews basic changes in the modern approach to explanation of heterogeneous catalytic reactions. On the basis of these new concepts, a new theory is proposed and equations are derived for basic kinetic variations.

Lab. of Catalysis, Inst. Physical Chem.
AS USSR,

3

The statistical method in the theory of adsorption and catalysis. V. I. Levin. *Problemy Kinetiki i Kataliza* 7, *Statist. Ya*[illegible]*. Sistem., Akad. Nauk S.S.S.R.* 206-37(1949).—The discrepancy between exptl. data and the existing theories of adsorption and catalysis is discussed in the light of surface heterogeneity. The adsorption equil. and the kinetics of adsorption on a heterogeneous surface are discussed. In view of the facts presented and the equations which are developed, various heterogeneous catalytic reactions are discussed. J. Rovtar Leach

LEVIN, V.I.

Determination of the character of a heterogeneous surface from kinetic measurements. V. I. Levin. *Problemy Kinetiki i Kataliza 7, Statist. Yavleniya Geterogen. Sistem. Akad. Nauk S.S.S.R.*, 297-336(1949); cf. *C.A.* 44, 0783*f*.—The character of heterogeneous surfaces was investigated by means of the processes which occur on these surfaces from the standpoint of the statistical theory. The kinetic measurements give values for functions which can in turn be used to det. the differential and integral distribution functions for the activation energy, *E*, of the process under consideration. Methods for detg. these functions are discussed, and examples of application to actual expts. are given.

J. Rovtar Leach

PROCESSES AND PROPERTIES INDEX

2C

B

Kinetics of Contact Reactions. II. Processes Taking Place on Nonuniform Surfaces. (In Russian.) V. I. Levin and S. Z. Roginskii. *Izvestiya Akademii Nauk SSSR* (Bulletin of the Academy of Sciences of the USSR), Section of Chemical Sciences, Mar.-Apr. 1950, p. 137-151.

Possible relations between different energy parameters of the surface were investigated. Formulates basic premises of the statistical theory of contact processes on nonuniform surfaces and indicates the main types of kinetic equations to be used depending on correlation between above parameters. 28 ref.

METALLURGICAL LITERATURE CLASSIFICATION

LEVIN, V. I.

USSR/Chemistry - Adsorption Apr 51

"Polymolecular Adsorption on Nonuniform Surfaces,"
V. I. Levin, Inst Phys Chem, Acad Sci USSR, Moscow

"Zhur Fiz Khim" Vol XXV, No 4, pp 453-458

From S. Brunauer's polymol adsorption eq, derived gen eq for isotherm of adsorption on nonuniform surface with arbitrary functions for distribution of sec of surface based on heat of adsorption. Eq applies for low-relative pressures ($x < 1$), becoming normal isotherm of monomol adsorption on nonuniform surface, and also in region of multilayer adsorption, where after filling of 1st layer isotherm eq corresponds to that for uniform surface.

LC 180T29

LEVIN, V.I.

USSR.

Affect of foreign admixtures on the character of the non-
uniformity of the surface of a solid body with respect to its
adsorptive properties. N. M. Man'ko and V. I. Levin.
Izvest. Akad. Nauk S.S.S.R., Otdel. Khim. [redacted]
409-18; *Bull Acad. Sci. U.S.S.R., Div. Chem. Sci.* 1953,
371-8 (Engl. translation).—The degree of nonuniformity
and its distribution are detd. in terms of the function $\rho(E) =$
He^{aE}, in which E is the energy of activation. $\rho(E)$ is a
distribution function. The method is applicable to all dis-
tribution types. In the case of activated charcoal the
degree of nonuniformity varies with the energy of acti-
vation of the activated adsorption as a function of the
nature and quantity of the admixts. Increasing amts. of
admixts. in all cases increase the extent of nonuniformity,
but do not affect the type of its distribution. Exptl. data
for the adsorption of H, O, and CO on sugar and various
ash and ash-free wood charcoals to which 1% of salts of
metals, such as Ag, Fe, Pt, K, Ca, and Ni, have been added
are given. The values of $a \times 10^4$ decrease from 3.00 for H
and 6.20 for O on a sugar charcoal to 0.60 and 0.64 on a Ca
charcoal. The values of $H \times 10^7$ increase from 0 to 3.0 and
8.9, resp. The values of the degree of nonuniformity $\epsilon =$
$2/a$ vary from $\epsilon \times 10^{-4} = 0.32$ to 3.13 for O and 0.67 to
8.40 cal./mole for H. F. H. Rathmann

Inst. Phys. Chem., AS USSR

LEVIN, V.I.

PHASE I BOOK EXPLOITATION

SOV/5064

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

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

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

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

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

TABLE OF CONTENTS:

(12)

LEVIN, V.I.

K.

USSR/Forestry - Forest Cultivation.

Abs Jour : Ref Zhur - Biol., No 4, 1958, 15386

Author : V.I. Levin

Inst : The Arkhangel Technological Forestry Institute.

Title : Correlations and Variations in the Basic Assized Elements of the Pine and Spruce Trees in the Forests of Arkhangelskaya Oblast'.
(Vzaimosvyaz' i var'irovaniye osnovnykh taksatsionnykh elementov derev'yev sosny i yeli v lesakh Arkhangel'skoy oblasti).

Orig Pub : Tr. Arkhang. lesotekhn. in-ta, 1957, 17, 138-149

Abstract : A detailed analysis is given of the basic assized indicators and their correlations in 1893 pine and 574 spruce model trees from the forests of Arkhangel'skaya Oblast'. The connection of form factors to the trees'

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COUNTRY	USSR
CATEGORY	Forestry. Forest Management.
ABS. JOUR.	Ref Zhur-Biologiya, No. 1, 1959, No. 1467
AUTHOR	Levin, V.I.
INST.	
TITLE	New Graphic Method of Determining the Stock of Timber Stands.
ORIG. PUB.	Izv. vyssh. uchebn. zavedeniy. Lesn. zh., 1958, No.1, 72-78
ABSTRACT	Nomograms for spruce and pine groves of the north, drawn up by the author, are proposed for the purpose of simplification, without reducing the accuracy of results (in enumerational valuation) in determining the reserve stock. This method eliminates the need for multiplication of the tabular volume by the number of trees, inasmuch as the ready stock is given in the nomogram by height and sum the areas of stands. Put at the basis of

CARD: 1/3

COUNTRY :
CATEGORY :

ABS. JOUR. : REF ZHUR - BIOLOGIYA, NO.1, 1959, No. 1467

AUTHOR :
INST. :

TITLE :

ORIG. PUB. :

ABSTRACT : the nomograms are the equations:

for pine $M = Q(0.414\cdot H + \frac{0.34}{0.642 + 0.908:H} + 0.814)$,

for spruce $M=Q(0.416\cdot H+0.429:H+\frac{0.32}{0.647+0.898\cdot H} + 0.767)$,

where M is the reserve stock in the area of recalculation in cu.m.; Q is the sum of the stand areas in the recalculation area in sq.m.; H is the average height of the timber stand in

CARD: 2/3

BURTSEVA, L.N.; LEVIN, V.I.; GOLUTVINA, M.M.; BUDNOV, V.S.

Separation of radioactive manganese without a carrier from deuteron irradiated chromium. Radiokhimiia 1 no.2:231-235 '59.
(MIRA 12:8)
(Manganese--Isotopes) (Chromium) (Deuterons)

GOLUTVINA, M.M.; SHITIKOVA, M.G.; LEVIN, V.I.; LENSKAYA, R.V.

Obtaining sodium chromate ($Na_2Cr^{51}O$) and chromium chloride ($Cr^{51}Cl_3$) and their utilization for labeling erythrocytes and plasma proteins. Med. rad. 4 no.3:61-65 Mr '59. (MIRA 12:7)

1. Iz TSentral'nogo ordena Lenina instituta gematologii i perelivaniya krovi Ministerstva zdravookhraneniya SSSR.

(CHROMIUM,
 prep. of sodium chromate & chromium chloride & labeling erythrocytes & plasma protein (Rus))
(BLOOD PROTEINS,
 labeling with chromium chloride & sodium chromate (Rus))
(ERYTHROCYTES,
 same)

LEVIN, V.I.; GALAKHOVA, K.Ye.

Centerless grinding of drills. Mashinostroitel' no.8:30 Ag '60.
(MIRA 13:9)

(Grinding and polishing)

22457

S/186/60/002/001/020/022
A057/A129

21.3200

AUTHORS: Levin, V.I.; Serebryakov, N.G.; Meshcherova, I.V.

TITLE: Preparation of silver-111 from neutron-irradiated palladium

PERIODICAL: Radiokhimiya, v. 2, no. 1, 1960, 120 - 126

TEXT: A method was developed for the separation of Ag^{111} from neutron-irradiated palladium by isotopic exchange with AgCl precipitate. The irradiated Pd can be used after separation from silver as Pd^{103} or irradiated for a second time to obtain Ag^{111}. With its shorter half-life and low yield in gamma-radiation ($\sim$9%) of relatively low energy (0.24 and 0.34 Mev) Ag^{111} is more convenient for medical purposes than P^{32} or Au^{198}. In the present study two methods, which have been described in literature, were employed: the method of precipitating an AgCl carrier from solutions of irradiated palladium [Ref. 2: F. Silicio et al., Anal. Chem., 28, 3, 365 (1956)], and the extraction of Ag^{111} from solutions of irradiated palladium by isotope exchange with already precipitated inactive AgCl [Ref. 3: W.W. Meinke and D.N. Sunderman, Science, 121, 777 (1955), Nucleonics, 13, 12, 58 (1955)]. Optimum conditions for the separation of Ag^{111} by co-precipitation with AgCl were determined, the degree of extraction and the radiochemical

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Preparation of silver-111 from neutron-irradiated.... S/186/60/002/001/020/022
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purity of the product were estimated. Optimum concentration of HCl is 1 N and at least 0.1 mg of carrier must be used. Heating the solution to 95 - 100°C effects formation of macrocrystalline precipitates. The AgCl precipitate containing Ag^{111} was re-precipitated 3 - 4 times. Extraction degrees were tabulated. The effect of HNO_3 concentration on the extraction degree of Ag^{111} was investigated in experiments with isotopic exchange and it was observed that concentrations of HNO_3 used in aqua regia do not interfere with the extraction, and results obtained by the isotopic exchange method are tabulated. The gamma-spectrum of the products obtained by the two methods was investigated with a scintillation counter containing a ФЭУ-29 (FEU-29) photomultiplier and a NaJ(Tl) crystal. The impurity present in the Ag^{111} sample obtained by co-precipitation can be seen from the maxima (450, 660 - 890 and 1,340 kev) in the gamma-spectrum (Fig. 3). The same impurity, i.e., a long lived isotope with a half-life of more than 200 days was determined in the Ag^{111} product prepared by isotopic exchange and was identified as Ag^{110}. In both products Ag^{110} is present in an amount of about 0.05%. It is supposed that Ag^{110} is formed from silver impurities present in the original palladium, or as product of secondary nuclear reactions. Since the isotopic exchange method is simpler, more efficient than co-precipitation, and since the same purity of the product is observed in both methods, the following preparation

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technique is suggested: About 5 g of palladium was bombarded for 23 - 25 days in a $\sim 10^{13}$ neutrons/cm^2 · sec beam. The sample is then dissolved by boiling in 30 - 50 ml of aqua regia at 95 - 100°C. The resulting solution is diluted with H_2O to a concentration of 3 N HCl, 30 mg silver in the form of macrocrystalline AgCl precipitate is added and mixed for 15 min at 95 - 100°C. Then the precipitate is filtered off, washed with 1% HNO_3 solution, and dissolved in 20 ml of concentrated ammonium hydroxide solution, re-precipitated twice, and the final ammoniacal solution is heated by adding hydrazine solution. The precipitated Ag metal is filtered off, washed, and dissolved in 5 - 10 ml HNO_3, the solution is evaporated until dry and the residual is dissolved in distilled water. From 5 g of palladium at least 300 mc of Ag^{111} were obtained. After separation from Ag, the residual palladium (with 150 - 200 mc activity) can be used as Pd^{103} for medical purposes or irradiated again to manufacture Ag^{111}. There are 3 figures, 2 tables and 6 references: 1 Soviet-bloc and 5 non-Soviet-bloc. X

SUBMITTED: May 23, 1959

LEVIN, V I

PHASE I BOOK EXPLOITATION SOV/4563

Metody polucheniya i izmereniya radioaktivnykh preparatov; sbornik statey (Methods for the Production and Measurement of Radioactive Preparations; Collection of Articles) Moscow, Atomizdat, 1960. 307 p. Errata slip inserted. 6,000 copies printed.

General Ed.: Valeriy Viktorovich Bochkarev; Ed.: M.A. Saguro; Tech. Ed.: N.A. Vlasova.

PURPOSE: This collection of articles is intended for scientific and technical personnel working in the production of radioactive isotopes.

COVERAGE: The collection contains original studies on methods of obtaining and measuring radioactive preparations. According to the foreword, the articles contain new data, and are of theoretical or practical interest to the extent that they discuss methods or give process information. In addition to several survey articles the collection contains discussions on the production of radioactive isotopes and inorganic radioactive preparations, including a number of carrier-free isotopes and several colloidal and other therapeutic preparations. Also discussed are methods for prepar-

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ing a number of tagged organic compounds, problems in the analysis of tagged organic compounds, the absolute and relative measurement of activity, and the radiometric analysis of preparations. New instruments and equipment are described and instructions concerning measurement methods and technique are included. V.I. Levin, Candidate of Chemical Sciences, V.P. Shishkov, Candidate of Technical Sciences, I.N. Bukharov, Candidate of Biological Sciences, and V.I. Shostak, Candidate of Chemical Sciences, are mentioned as having helped directly in the selection and preparation of the material for publication. References accompany each article.

TABLE OF CONTENTS:

PART I. PRODUCTION OF INORGANIC RADIOACTIVE PREPARATIONS

Methods for the Production (Cont.) SOV/4563

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S/186/60/002/002/010/022
E071/E433

AUTHORS: Panova, M.G., Levin, V.I. and Brezhneva, N.Ye.

TITLE: A study of the formation of complexes of yttrium
I. Yttrium oxinates

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PERIODICAL: Radiokhimiya, 1960, Vol.2, No.2, pp.197-207

TEXT: The object of the work was to investigate the formation of complexes of microquantities of yttrium. The method of investigation was based on changes in the coefficient of distribution of an easily extractable complex with known stability constants, on the introduction of additives, which form non-extractable complexes, into the system. As an auxiliary system, the authors chose complexes of yttrium with 8-oxyquinoline (oxin), which is of interest by itself as there are no data available on this system in the literature. The present paper describes the first part of the work - a study of oxinate complexes of yttrium. The measurement of the coefficients of distribution of yttrium oxinate was done in a perchlorate solution with the ionic force $\mu = 3.0$. The distribution of yttrium was done radiometrically using radioactive yttrium -90 or -91. Initially, the usual experimental procedure was adopted, i.e. shaking an aqueous solution

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of a required composition with a chloroform solution of oxin, but due to the hydrolysis of yttrium the reproducibility of results was poor and a long time was necessary to attain the equilibrium. The procedure was modified in that 10 ml of 3 M sodium perchlorate solution containing yttrium was shaken with 10 ml of an oxin solution in chloroform. After the separation of the organic phase, which contained practically all the yttrium, it was brought into contact with an aqueous solution containing no yttrium. Then the phases were separated by centrifuging and the activity of yttrium measured in both phases. The experimental temperature was 18 - 26°C. The concentration of oxin in chloroform was 0.5 M in all experiments. At yttrium concentrations $\leqslant 10^{-6}$ M the coefficient of distribution was practically constant, i.e. was independent of concentration, but for concentrations above 10^{-6} M the coefficient of distribution increased. Therefore, all the results used for the calculations of the stability constants of oxinate complexes were obtained at a concentration of yttrium below 10^{-6} M. At these concentrations, the extraction takes place in the form of a simple oxinate YA_3; at higher concentrations mainly in the form of dimer $(YA_3)_2$.

On the average 0.5 molecules of undissociated oxin enters the extractable complex. The constants of stability of oxinate complexes (log $\varkappa_1 = 8.15 \pm 0.14$, log $\varkappa_2 = 14.90 \pm 0.25$, log $\varkappa_3 = 20.25 \pm 0.35$) were calculated by three methods: "method of two parameters" (D.Dyrssen, L.Sillen, Acta chem. Scand., 7, 663 (1953)); a modification of this method using three parameters and by the analytical method of least squares. The differences in the values obtained by the three methods were close to the limits of accuracy of the experimental results. It is pointed out that although the values of the obtained constants relate to the ion force $\mu = 3$, nevertheless they were close to the values of constants for samarium oxinate obtained by Dyrssen (Ref.47: Sv.Kem.Tidskrift, 68, 212 (1956)). Part II of this paper (on sulphate, nitrate and chloride complexes) is published in the same issue, pp.208-214. There are 4 figures, 6 tables and 47 references: 11 Soviet-bloc and 36 non-Soviet-bloc. Four of the references to English language publications read as follows:

L.Pokras, Chem.Educ., 33, 152, 223, 282 (1956);
F.Spedding, J.Powell, W.Wheelwright, J.Am.Chem.Soc.,78,34 (1956);

A study of the formation.... S/186/60/002/002/010/022
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J.Sarls, J.Choppin, J.Inorg.Nucl.Chem., 4, 62, (1957);
B.Blaustein, J.Gryder, J.Am.Chem.Soc., 79, 540 (1957).

SUBMITTED: May 25, 1959

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S/186/60/002/002/011/022
E071/E433

AUTHORS: Panova, M.G., Brezhneva, N.Ye. and Levin, V.I.

TITLE: A study of the formation of complexes of yttrium
II. Sulphate, nitrate and chloride complexes

PERIODICAL: Radiokhimiya, 1960, Vol.2, No.2, pp.208-214

TEXT: This is continuation of the work previously published (Ref.1: same issue, pp.197-207). The investigation of the formation of yttrium complexes with sulphate, nitrate and chloride ions was based on measuring the distribution of this metal in the system: solution of 8-oxiquinoline in chloroform-aqueous solution, at various concentrations of the above ions and at a constant ion force $\mu = 3$. The presence of the above ions in the system causes a decrease in the coefficient of distribution of yttrium due to the formation of complexes not extractable by chloroform, which in turn can serve as a measure of the degree of formation of these complexes. The experimental procedure was the same as described in Part I (Ref.1). The calculation of the constants of formation of non-extractable yttrium complexes (sulphate etc) was based on the relationship derived between the coefficients of distribution of

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yttrium determined at the same pH but in the presence of sulphate (or another) ion and without it, i.e. by the method based on the same principle as that of D.Dyrssen and L.Sillen (Ref.2: Acta chem. Scand., 7, 663 (1953)). There are 3 figures, 3 tables and 10 references: 2 Soviet-bloc and 8 non-Soviet-bloc. Four of the references to English language publications read as follows:
J.W.Newton, J.M.Arcand. J.Am.Chem.Soc., 75, 10, 2449 (1953);
R.Connick, S.Mayer, J.Am.Chem.Soc., 73, 1176 (1951);
F.H.Spedding, S.Jaffe, J.Am.Chem.Soc., 76, 3, 882 (1954);
V.Bjerrum, G.Schwarzenbach and L.G.Sillen. Stability Constants of Metal-ion Complexes, with Solubility Products of Inorganic Substances, London (1958).

SUBMITTED: May 25, 1959

Card 2/2

S/081/62/000/006/015/117
B166/B101

AUTHORS: Golutvina, M. M., Levin, V. I., Tikhomirova, Ye. A.

TITLE: Production of arsenic-77 without a carrier from neutron-irradiated germanium

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 6, 1962, 40, abstract 6B256 (Tr. Tashkentsk. konferentsii po mirn. ispol'zovaniyu atomn. energii. V. 2. Tashkent, AN UzSSR, 1960, 402-407)

TEXT: A technique is described for separating As^{77} without a carrier from germanium irradiated by thermal neutrons. The irradiated specimen was dissolved at 90-100°C in HCl with an addition of H_2O_2; when this was done, the As was oxidized to As^{5+}. From an 8-9 M solution in HCl the Ge^{4+} was extracted with CCl_4, and the As^{5+} remained in aqueous solution. The As^{5+} was then reduced with NaI to As^{3+} and also extracted. The authors give a graph showing the distribution factor of As^{3+} and Ge^{4+} when extracting with CCl_4 as a function of HCl concentration. The radiochemical purity of the

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ANUCHIN, Nikolay Pavlovich, prof.; LEVIN, V.I., retsenzent; KONDRAT'YEV, P.S., red.; FUKS, Ye.A., red.izd-va; KUZNETSOVA, A.I., tekhn.red.

[Forest valuation] Lesnaia taksatsiia. Izd.2., ispr. i dop. Moskva, Goslesbumizdat, 1960. 529 p. (MIRA 14:4)

1. Zaveduyushchiy kafedroy taksatsii lesa Arkhangel'skogo lesotekhnicheskogo instituta (for Levin).
(Forests and forestry--Valuation)

S/186/60/002/005/008/017
A051/A130

AUTHORS: Panova, M. G., Levin, V. I.

TITLE: A study of the complex-formation of ittrium III. A study of the dissociation of 8-oxyquinoline by the extraction method

PERIODICAL: Radiokhimiya, v. 2, no. 5, 1960, 568 - 573

TEXT: The authors have determined the values of the dissociation constants of the complex-forming agent 8-oxyquinoline, at an ionic strength of 3, using the extraction method, needed in the investigation of the oxine and ittrium complex. In order to investigate the oxine dissociation the change in the distribution coefficient of the oxine was measured, between the chloroform and aqueous solution, depending on the pH of the latter. The obtained data were used to calculate the dissociation constants. The method used for measuring the distribution coefficients was as follows: the initial solution of oxine of a certain concentration was prepared by dissolving a substance recrystallized from alcohol, in chloroform. 3 M solution of sodium perchlorate of the same volume was added through a graduated funnel, to a chloroformed solution of the oxine, of a certain volume

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and concentration. The pH of the sodium perchlorate was regulated by additions of $HClO_4$ and NaOH. The contents of the funnel were mixed using a mechanical vibrator for a period of 10 min. After a 10-minute lamination, the phases were divided and the pH of the aqueous phase was measured. Then an analysis was carried out for the oxine content in the aqueous and organic phases and in the initial solution by photometry of the intensity of the coloring of the oxinate copper complex, for which purpose copper salts were added to the samples. Copper was used for the colorimetric determination of the oxine, thus, an excess of copper was used. Experiments were conducted at 21 - 26°C. The method used for analysing the oxine content in the organic phase and initial chloroform solution was as follows: 10 ml of 0.2 n solution of copper acetate (pH about 5.5) were added to 10 ml of the initial oxine solution. The phases were separated after a 10-minute period of mixing and standing. The organic phase was subjected to photometry. If the concentration of the oxine did not exceed 0.001 M, and if the color was too intense, the solution was diluted with chloroform. Figure 1 shows the relationship of the optical density of the chloroformed solution to the concentration of the oxine. The method for the analysis of the oxine content in the water phase is given as follows: The same volume of 0.4 n solution of copper acetate was added to a certain volume of the water phase, then pure chloroform was added in a volume, equal to the sum of the volumes of the water phase and the copper solution, with the intention of transferring the entire oxine from the water phase into the organic phase. After this, the color of the organic phase was subjected to photometry. The described analysis of the oxine is said to be applicable under the following two conditions: 1) the entire oxine is in the form of a copper complex and 2) the entire copper complex is in the organic phase. The table shows the results of the measurements of the distribution coefficients of oxine at various pH. With an increase in the pH of the perchlorate solution, the distribution coefficient first increases, in the interval pH = 6.1 - 7.3 hardly changes at all, and then, with a further increase of the pH once again decreases (Figure 2). The calculation of the dissociation constants were carried out in the following manner: the behaviour of oxine is treated as a weak base and very weak acid (Ref. 14: R. G. W. Hollingshead, Oxine and its derivatives. London, Butterworths, 1954). Thus, the following processes in an aqueous solution:

20653

S/186/60/002/005/012/017
A051/A130

21,3200

AUTHORS: Levin, V. I.; Golutvina, M. M.; Tikhomirova, Ye. A.

TITLE: Extraction of Co^{58} without a carrier from nickel irradiated with neutrons, by the extraction method

PERIODICAL: Radiokhimiya, v. 2, no. 5, 1960, 596 - 602

TEXT: The authors have attempted to find a more convenient method of Co^{58} extraction and were able to develop a separation method of indicator quantities of cobalt from the macro-quantities of nickel, using the extraction method with thributylphosphate from a hydrochloric solution. Co^{58} was extracted without a carrier from nickle oxide, irradiated with neutrons in the reactor. The radiochemical purity of the extracted Co^{58} was checked and the Co^{60} admixture was determined. The disadvantages of other existing methods of cobalt extraction and that of nickel using alcohols from solutions of perchlorates, chlorides and bromides, described by L. Garwin, A. N. Hixon (Ref. 7: Ind. Eng. Chem., 41, 10, 2298, 2303), T. E. Moore, R. J. Lenan, P. G. Yates (Ref. 8: I. Phys. Chem., 59, 1, 90, 1955) and T. E. Moore, R. W. Goodrich, E. A. Gootsman, B.S. Slerax, P. C.

X

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Yates (Ref. 9: J. Phys. Chem., 60, 5, 564, 1956) are said to be the formation of cobalt in the form of a complex, the destruction of which requires annealing, etc. The authors of this article investigated the extraction of cobalt and TBPh nickel from HCl and H_2NO_3 solutions. In the first case satisfactory results were obtained, used by the authors for developing the method of Co^{58} extraction without a carrier Experiments were conducted for determining the effect of the Co concentration on its extraction. The distribution coefficients D-C were measured of the cobalt at various concentrations of the latter (Figure 1). Further experiments for the extraction of the Co from the HCl solution showed that the distribution coefficients of the Co increase with a growth of the HCl concentration (Figure 2) passing through the maximum (K = 1.3) for solution 9 n HCl. Extraction of Co from solution with a constant concentration of chloride ions resulted in the highest values of the distribution coefficients for solutions close to neutral ones (Figure 2, 2). With an increase in the acidity of the solution the distribution coefficient first sharply drops, and then this drop slows up and the distribution coefficient becomes independent of the acidity in a certain region. Experiments conducted with solutions con-

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taining $NiCl_2$ and HCl, in concentrations where the chloride content remained constant and equal to 9 n resulted in a relationship shown in Figure 2,2,3. The general relationship nature of the extraction to the acidity is the same as for the solutions containing Li^+. In extracting the nickel, an investigation of the nickel distribution between the TBPh and the 9n HCl, at various concentrations of the nickel, showed that D-C- of this element under the given conditions hardly depends on its concentration within the range of 10^{-4} to 1.5 n, and averages 0.003. A change in the concentration of the HCl from 4 to 11 n, hardly affects the D-C- of the nickel at all (when its concentration is 5 mg/ml). In separating the cobalt from the nickel by extraction, the method of semi-counterflow extraction was used, where the required conditions of the separation can be determined mathematically. Experimental values were compared to calculated ones. The cobalt distribution determined experimentally, corresponded well with the calculated fractions, based on the estimated D-C. The static method of extraction is said to be inconvenient for practical application, thus experiments were conducted for nickel and cobalt separation in an extraction apparatus (Figure 3) consisting of a reactor and four compartments for dynamic extraction (Ref. 12: N. E. Brezhneva, V. I. Levin, G. V. Korpusov, N. M. Man'ko,

X

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A051/A130

Extraction of Co^{58} without a carrier ....

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E. K. Bogacheva. II Mezhdunar. konfer. OON po primeneniyu atomnoy energii v mirnykh tselyakh, doklad No 2295). A product containing 95% Co of the initial amount was obtained. The content of the solid non-volatile residue in the product did not exceed 0.1 mg/mc. Co^{58} was also extracted from irradiated Ni_2O_3 and its radiochemical purity was investigated. The Co^{60} determination was performed by means of a scintillation spectrometer taking into consideration the presence of gamma-lines having an energy of 1.6 Mev, when irradiating the Co^{58}, and representing 0.5 % of the intensity of the 0.81 Mev gamma-line (Ref. 13: B. S. Dzhelepov, L. K. Peker, Skhemy raspada radioaktivnykh yader. Izd. AN SSSR, M.-L., 1958). In discussing the experimental results the authors point out that the main aim was to find the optimum conditions of Co^{58} extraction and, thus, the investigations were not systematic. Certain conclusions are formed, however: The extracted TBPh chloride complexes of cobalt are said to be much more stable than the corresponding complexes of nickel. The iron complexes are even more stable, the D-C- of which, between the TBPh and the HCl reaches 10^5 (Ref. 14: H. Irving, D. N. Edgington, J. Inorg. Nucl. Chem. 10, 3/4, 306, 1959; Ref. 16: E. Bankmann, H. Specker, Z. Analyt. Chem., 162, 1. 18, 1958). The independence of the D-C- of the cobalt to the concentration of the latter, noted

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along a wide range of concentrations, points to the absence of polymer forms both in the organic as well as in the water phases. The nature of the extracted cobalt complex is said to be somewhat unclear to the authors, and although Irving and Edgington (Ref. 14) feel that $CoCl_2 \cdot 2TBF$ is extracted, the authors of this article claim that nature of relationship of the cobalt extraction to the acidity, at a constant concentration of the chloride ions (Ref. 14, Figure 8) points to the possible presence of a hydrogen ion in the composition of the extracted compound. If it is assumed that the extraction of the Co takes place in the form of two compounds, for example, $CoCl_2$ and H_2CoCl_2, then with a growth in the acidity (at a constant concentration of the chloride ions) first, it is thought, a decrease of the extraction can take place, due to a drop of the concentration of the free TBF, bound by the extracting HCl. Then with a further growth of the acidity, the formation of H_2CoCl_4 begins to take precedence, the extraction of which would cause an increase of the D-C-, which, it is thought, is noticed during the experiment, although not always in the same way. No explanation has been found as to why the extraction of the Co decreases when the Li^+ ions are replaced in the solution by Ni^{2+} ions, and further investigations of this system are recommended. The authors state that

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although the suggested method of Co^{58} extraction gives sufficient purity, other variations such as Co extraction at a lowered acidity, can be used at high chloride concentration conducting the process in a concentrated $NiCl_2$ solution and (or) adding to it calcium chloride or magnesium chloride. The advantage of this variation would be the possibility of decreasing the volumes of the extract and reextract due to an increase in the D-C- of the cobalt at low acidity. There are 5 figures, 1 table, 16 references: 3 Soviet-bloc and 13 non-Soviet-bloc. The four recent English language publications read as follows: R.S. Rochlin, Nucleonics, 17, 1, 54, 1959; H. Irving, D. N. Edgington, J. Inorg. Nucl. Chem., 10 3/4, 306, 1959; D. F. C. Morris, C. F. Bell, J. Inorg. Nucl. Chem., 10, 3/4, 336, 1959; C. E. Mellish, J. A. Payne, R. L. Otlet, UNESCO. Internat. Confer. radioisotopes in sci. res. Paper, 189, Paris, 1957.

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Card 6/10

LEVIN, V.I.; SEREBRYAKOV, N.G.; KOZLOV, M.D.

Physicochemical properties of a new radiotherapeutic preparation containing P32. Med. rad. 5 no.4:53-55 Ap '60. (MIRA 13:12)
(PHOSPHORUS ISOTOPES)

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A051/A129

5 2300(1273, 1238, 1274)

AUTHORS: P[illegible], M.V., Levin, V.I., Bryzgalova, R.V.

TITLE: A study of the complex-formation of yttrium. IV. Oxalate complexes

PERIODICAL: Radiokhimiya, v. 3, no. 1, 1961, 52-61

TEXT: The authors used the method of solubility measurements of difficultly soluble oxalates of rare-earth elements to investigate oxalate complexes. They made a study of the complex-formation of yttrium and cerium previously dealt with in Refs 2,3. The investigation was started by determining the instability constants of the cerium oxalate complexes (Ref 2), also used for determining the instability constants of the yttrium oxalate complexes. Ce^{144} and Y^{91} or Y^{90} isotopes were used to precipitate cerium or yttrium oxalate. The effect of the order of addition of the reagents on the crystallization process and equilibrium state was analyzed (Table 1), whereby it was noted that the order of addition of the reagents did not affect the velocity of

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attaining the equilibrium state. The calculations of the stability constants of the yttrium and cerium oxalate complexes were conducted along the following lines:

The product of solubility S of cerium (or yttrium) oxalate $Me_2(C_2O_4)_3$ is expressed by the equation:

$$S = a^2_{Me} \cdot a^3_{C_2O_4^{2-}} \qquad (1)$$

from which results

$$a_{Me} = \left(\frac{S}{a^3_{C_2O_4^{2-}}}\right)^{1/2} \qquad (2)$$

If three oxalate complexes $MeC_2O_4^+$, $Me(C_2O_4)_2^-$, $Me(C_2O_4)_3^{3-}$ are assumed to be formed, the conditions of the three equilibria are expressed thus:

$$a_{Me} \cdot a_{C_2O_4^{2-}} \cdot K_1 = a_{MeC_2O_4^+} \qquad (3)$$

$$a_{Me} \cdot a^2_{C_2O_4^{2-}} \cdot K_2 = a_{Me(C_2O_4)_2^-} \qquad (4)$$

(5)

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where $\varkappa_1$, $\varkappa_2$, $\varkappa_3$ are the sum constants of stability of complex ions, a_{Me}, $a_{C_2O_4^{2-}}$ activities corresponding to metal and oxalate ions, which, in turn, can be expressed by

$$a_{Me} = [Me] \cdot \gamma_3 \qquad (6)$$

$$a_{C_2O_4^{2-}} = [C_2O_4^{2-}] \cdot \gamma_2 \qquad (7)$$

where $[Me]$, $[C_2O_4^{2-}]$ are stoichiometric concentrations of the metal and oxalate ions, respectively, γ_2, γ_3 - the activity coefficients of the two-charge and three-charge ions, respectively. The total concentration of the metal ions in the solution is equal to:

$$[Me]_{total} = [Me^{3+}] + [Me(C_2O_4)^{+}] + [Me(C_2O_4)_2^{-}] + [Me(C_2O_4)_3^{3-}] \qquad (8)$$

using the relations (2-7) equation (8) is changed to:

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$$
\mathrm{Me}_{\mathrm{total}} = \frac{a_{\mathrm{Me}}}{\gamma_3} + \frac{a_{\mathrm{Me}} \cdot a_{C_2O_4^{2-}} \cdot \varkappa_1}{\gamma_1} + \frac{a_{\mathrm{Me}} \cdot a^2_{C_2O_4^{2-}} \cdot \varkappa_2}{\gamma_1} + \frac{a_{\mathrm{Me}} \cdot a^3_{C_2O_4^{2-}} \cdot \varkappa_3}{\gamma_3} =
$$

$$
= a_{\mathrm{Me}} \left[\frac{1}{\gamma_3} + \frac{\varkappa_1 \cdot a_{C_2O_4^{2-}}}{\gamma_1} + \frac{\varkappa_2 \cdot a^2_{C_2O_4^{2-}}}{\gamma_1} + \frac{\varkappa_3 \cdot a^3_{C_2O_4^{2-}}}{\gamma_3} \right] =
$$

$$
= \frac{S^{1/2}}{a^{3/2}_{C_2O_4^{2-}}} \cdot \left[\frac{1}{\gamma_3} + a_{C_2O_4^{2-}} \cdot \frac{\varkappa_1}{\gamma_1} + a^2_{C_2O_4^{2-}} \cdot \frac{\varkappa_2}{\gamma_1} + a^3_{C_2O_4^{2-}} \cdot \frac{\varkappa_3}{\gamma_3} \right] \tag{3}
$$

where γ_1 is the activity coefficient of the one charge ion. In equation (3) the unknown values are $\varkappa_1$, $\varkappa_2$, $\varkappa_3$ and S. In order to determine these, the two parameters α and β are introduced. Since the ionic strength was main-

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tained constant in the experiments, the values of the activity coefficients are also considered constant, then

$$\varkappa_1 = \frac{\gamma_1}{\gamma_3} 10^a \cdot \beta^2 \qquad (10)$$

$$\varkappa_2 = \frac{\gamma_1}{\gamma_3} 10^{2a} \beta^2 \qquad (11)$$

and

$$\varkappa_3 = 10^{3a} \qquad (12)$$

By introducing the expression $y = a_{C_2O_4^{2-}} \cdot 10^a$ (13)

for convenience, equation (9) is changed thus:

$$\boxed{Me}_{total} = \frac{S^{1/2}}{a^{3/2}_{C_2O_4^{2-}} \cdot \gamma_3} \{1 + y\beta^2 + y^2\beta^2 + y^3\} \qquad (14)$$

the expression:

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$$[Me]_{total} \cdot a^{3/2}_{C_2O_4^{2-}} = \frac{S^{1/2}}{\gamma_3} \left\{1 + y\beta^2 + y^2\beta^2 + y^3\right\} \qquad (15)$$

would then only depend on y. A graph is plotted of the relationship $\lg \left\{[Me]_{total} \cdot a^{3/2}_{C_2O_4^{2-}}\right\} = f\left\{\lg(a_{C_2O_4^{2-}})\right\}$, by calculating the activity of the free ions of oxalate, depending on the pH and its stoichiometric concentration C_s. Oxalic acid dissociates according to:

$$H_2C_2O_4 \rightleftarrows HC_2O_4^- + H^+$$

$$HC_2O_4^- \rightleftarrows C_2O_4^{2-} + H^+$$

The corresponding dissociation constants are equal to (Ref 4):

$$K_1 = \frac{\gamma_1 \cdot [HC_2O_4^-] \cdot a_{H^+}}{[H_2C_2O_4]} = 5.9 \cdot 10^{-2} \qquad (16)$$

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$$K_2 = \frac{\gamma_2 \cdot \left[C_2O_4^{2-}\right] \cdot a_{H^+}}{\left[HC_2O_4^-\right] \cdot \gamma_1} = 6.4 \cdot 10^{-5} \qquad (17)$$

thus,

$$a_{C_2O_4^{2-}} = \frac{C_x}{\frac{1}{\gamma_2} + \frac{a_{H^+}}{K_2 \cdot \gamma_1} + \frac{a_{H^+}^2}{K_1 \cdot K_2}} \qquad (18)$$

The required values of γ_1 and γ_2 needed for the calculations were taken from Refs 2, [illegible]. Knowing the concentration of the free ions of the oxalate in solution and the concentration of the metal over the residue the product $\left\{[Me] \cdot a_{C_2O_4^{2-}}^{1/2}\right\}$ is found. A graph of the relationship lg $\left\{[Me] \cdot a_{C_2O_4^{2-}}^{1/2}\right\}$ to lg $a_{C_2O_4^{2-}}$ (Figs 2-3) is plotted. From equations (10-12) it is seen that

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In order to determine the stability constants, the parameters α and β must be calculated. Thus, the following maximum conditions are considered for expression (15), writing it down first in the logarithmic form:

$$f(y) = \lg [Me]_{total} + 3/2 \lg a_{C_2O_4^{2-}} + \lg S^{1/2} - \lg \gamma_{\pm} + \lg [1 + y\beta' + y^2\beta^2 + y^3] \quad (19)$$

at $y \to 0$

$$f_1(y) = \lg [Me]_{total} + 3/2 \lg a_{C_2O_4^{2-}} + 1/2 \lg S - \lg \gamma_{\pm} = A \quad (20)$$

A is determined from the intersection of the lower branch of the curve of the ordinate (Fig 2, 3, Table 5). At $y \to \infty$

$$f_2(y) = \lg [Me]_{total} + 3/2 \lg a_{C_2O_4^{2-}} = A + 3 \lg y \quad (21)$$

from which follows that the maximum value of the tangent of the angle of the curve's slope $f(y)$ is equal to 3. The intersection of the limit line $f_2(y)$ and horizontal limit line $f_1(y) = \lg [Me]_{total} + 3/2 \lg a_{C_2O_4^{2-}} = A$, corresponds to the condition $\lg y = 0$ (or $y = 1$).

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Since $y = 10^a \cdot a_{C_2O_4^{2-}}$, then $y = 1$, $a = -\lg a_{C_2O_4^{2-}}$. The value of a is determined by drawing a perpendicular line on the abscissa axis from a point of intersection of the horizontal line $f_1(y) = \lg[Me]_{total} + 3/2 \lg a_{C_2O_4^{2-}}$, with the limit line $f_2(y) = A + 3 \lg y$. The second parameter, β, is found from the value of the main function $f(y)$ in the point $y=1$. According to (1[illegible]) at $y=1$

$$f(y)_{y=1} = A + \lg 2 + \lg(1 + \beta^2) \qquad (22)$$

The value of $f(1)$ is found from the point of intersection of the vertical line drawn through the point of intersection of the limit line $f_2(y)$ and the line $f_1(y) = A$ with the curve $f(y)$. Drawing a perpendicular line from this point on the ordinate axis, the value of $f(1)$ is found. Substituting it in equation (22), β is determined. Figs 2-3 show that the tangents to the curves $f(y)$ drawn at an angle, the tangent of which is equal to 3, pass through three points in the case of yttrium and through five points in the case of cerium. The authors assume that in the investigated range of concentration only two complexes are formed: $Me(C_2O_4)^+$ and $Me(C_2O_4)_2^-$. In this case the stability constants of the complexes are expressed by the equations:

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$$\frac{x_1 \cdot \tau_3}{\tau_1} = 10^a \cdot \beta \quad (23) \qquad \frac{x_2 \cdot \tau_3}{\tau_1} = 10^{2a} \quad (24)$$

and the main function $f(y)$ takes the form of:

$$f(y) = \lg \left\{ [\mathrm{Me}]_{\text{total}} \cdot a^{3/2}_{C_2O_4^{2-}} \right\} = A + \lg \left[1 + y + y^2 \right] \quad (25)$$

The equations of the corresponding limit lines at $y \rightarrow 0$ are then:

$$f_1(y) = \text{[illegible]} \quad (26) \qquad \text{At } y \rightarrow \infty : \ f_2(y) = A + 2 \lg y \quad (27).$$

The tangents to the curves $f(y)$ drawn at an angle the tangent of which is 2 in accordance with (27) pass through the entire middle part of the curves (Figs 2-3). The a parameter, similarly to the one previously described for the case of two complexes is found from the point of intersection $f_1(y)$ and $f_2(y)$ corresponding to the condition $y=1$. Parameter β is determined from the equation $f(y) = A + \lg (2 + \beta)$ (28) obtained from (25) at $y=1$. The average values of τ_1 and τ_3 are calculated from experimental data and the formula:

$$\tau = \int_{\mu_1}^{\mu^2} \tau(u) \cdot d\mu / (\mu_2 - u_1) \quad (29)$$

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The integration was performed graphically according to the method of rectangular triangles. In order to determine the three unknown factors in the given calculations two parameters were used, but three parameters can be introduced:

$\varkappa_1 = \frac{\gamma_1}{\gamma_3} 10^a \cdot \beta_1$ (30); $\varkappa_2 = \frac{\gamma_1}{\gamma_{3_2}} 10^{2a} \cdot \beta_2$ (31); $\varkappa_3 = 10^{3a}$ (32);

then $f(y) = A + \lg \left[1 + y\beta_1 + y^2\beta_2 + y^3\right]$ (33).

Parameter α is determined in this case as in the case of two parameters; $f(y)$ is found at $y=1$. $f(1) = A + \lg \left[2 + \beta_1 + \beta_2\right]$ (34), then another value of y is taken, $y=2$, and $f(y)$ at $y=2$ is:

$$f(y) = A + \lg \left[9 + 2\beta_1 + 4\beta_2\right] \qquad (35).$$

These equations are solved with two unknowns, and first β_1 and then β_2 are found. The results of the calculations of the constants are given in Table 6. The agreement of results found by different methods of calculations shows that two parameters are sufficient. $\varkappa_1$ and $\varkappa_2$ are calculated correctly in both cases (Figs 2,3). The authors compare their graphical method of

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calculations to the results obtained by other authors (Ref 2). This comparison shows that the values of the solubility product are much higher than those found by other authors (Table 8). The values of the stability constants, however, differ less from those of Crouthamal and Martin, as well as Feibash (Ref 5). This is explained by the fact that the equilibrium between the various forms of the dissolved complexes is reached much faster than the equilibrium with the solid phase and is not subject to the effect of the structure, contrary to the latter. There are 8 tables, 5 figures and 6 references: 2 Soviet-bloc, 4 non-Soviet-bloc. X

Card 12/18

[illegible], V.I.; [illegible], I.A.; [illegible], V.K.

Extraction separation of a carrier-free manganese isotope of
mass 54 from iron irradiated by neutrons. Radiokhimiia 3
no.4:417-421 '61. (MIRA 14:[illegible])
(Manganese—Isotopes)
(Iron—Isotopes)

S/186/61/003/005/013/022
E071/E185

AUTHORS: Levin, V.I., Golutvina, M.M., and Tikhomirova, Ye.A.

TITLE: The preparation of arsenic-74 from neutron-irradiated selenium

PERIODICAL: Radiokhimiya, v.3, no.5, 1961, 597-600

TEXT: In order to find a simple and cheap method of production of arsenic 74 (used in medicine and other fields) the authors investigated the possibility of using for this purpose the threshold reaction $Se^{74}(n,p)As^{74}$ carried out in a nuclear reactor. One selenium specimen was irradiated in a usual channel placed in the moderator for 65 days in a stream of 4×10^3 neutrons/cm^2.sec, and the second for 470 hours inside the fuel element in a stream of 7×10^{13} neutrons/cm^2.sec. In order to decrease the formation of Se^{75} the second specimen was surrounded by a cadmium filter. The irradiated selenium (in the form of fine powder) was dissolved in concentrated HNO_3, stable arsenic added and the salts transformed into a solution in hydrochloric acid from which selenium was precipitated with sulphurous acid.

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After the separation of selenium, $MgNH_4AsO_4$ was precipitated and redissolved in hydrochloric acid. Selenium - carrier was added and precipitated with sulphurous acid. The above operation was repeated 2 - 3 times. Finally arsenic was obtained as $Mg_2As_2O_7$ (yield about 60%), its activity was measured and its radiation investigated. An investigation of the γ spectrum indicated the presence of an admixture with an energy of about 0.14 MeV and half life time of 90-100 days. This was found to be due to an admixture of tellurium 123. The data obtained indicated that on irradiation of selenium in a stream of neutrons (7×10^{13} neutrons/cm^2.sec) arsenic 74 can be obtained with an activity of up to 200 microcurie per g of selenium. On irradiation of selenium for 470 hours in a neutron stream of about 7×10^{13} neutrons/cm^2.sec the actual yield was determined as about 0.12 mcurie per g of selenium. The radioactive purity of the product depends on the purity of selenium irradiated and the accuracy of purification from selenium-75. The other arsenic isotopes which can be simultaneously produced are As^{76}

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The preparation of arsenic-74 ... S/186/61/003/005/013/022
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(T = 26.75 hr) and As^{77} (T = 39 hours) which rapidly decompose. A substantial advantage of the method proposed is that As^{73} with the half period of 76 days, which is particularly undesirable in medical application, is not formed. The calculated value for the effective reaction cross-section of Se^{74}(n.p)As^{74} for fission neutrons ($\sigma \approx 2.9$ millibarn) agrees with the experimental one ($\sigma \approx 1.6$ millibarn).

There are 2 figures, 1 table and 10 references: 4 Soviet-bloc, 1 Russian translation from non-Soviet publication and 5 non-Soviet-bloc. The English language references read as follows:

Ref.1: G.L. Brownell, W.H. Sweet. Acta Radiol. v.46, 1-2, 425, 1956.
Ref.4: I.J. Gruverman, P. Kruger. Intern. J. Appl. Radiat. Isotopes, v.5, 1, 21, 1959.
Ref.7: R.S. Rochlin. Nucleonics, v.17, 1, 54, 1959.
Ref.9: D.J. Horen, W.E. Meyerhof, I.I. Kraushaar, D.O. Wells, E. Brun, J.E. Neighbor. Phys. Rev., v.113, 3, 875, 1959.

SUBMITTED: June 23, 1960

Card 3/3

DEGTYARENKO, N.S.; LEVIN, V.I.

Grinding drills having Morse No.1 cone tangs. Stan.i instr. 32 no.6:29-31 Je '61. (MIRA 14:6)

(Grinding and polishing)

LEGTYARENKO, N.S., kand.tekhn.nauk; LEVIN, V.I., inzh.

Investigating finishing operations in machining drills with diameters from 6.0 to 15.5 mm. Nov.tekh.izg.instr. no.2:38 '61. (MIRA 15:8)

(Grinding and polishing)

KORPUSOV, G.V.; LEVIN, V.I.; BREZHNEVA, N.Ye.; PROKHOROVA, N.P.; YESKEVICH,
I.V.; SEREDENKO, P.M.

Isolation of cerium by the extraction method. Zhur.neorg.khim.
7 no.9:2254-2261 S '62.
(MIRA 15:9)
(Cerium) (Extraction (Chemistry))

DAMASKIN, B.I.; LEVIN, V.I., (Moskva)

Loading dynamics of the shafts of sewing machines. Shvein.prom.
no.1:9-14 Ja-F '62. (MIRA 15:4)
(Sewing machines--Vibration)

LEVIN, V.I.

Quasi-equilibrium extraction processes. Ekstr.;teor., prim.,app. no.1:143-162 '62. (MIRA 15:11)

(Extraction (Chemistry))
(Phase rule and equilibrium)
(Mass transfer)

S/830/62/000/001/007/012
E111/E192

AUTHOR: Levin, V.I.

TITLE: Quasi-equilibrium extraction processes

SOURCE: Ekstraktsiya; teoriya, primeneniye, apparatura.
Ed. by A.P. Zefirov and M.M. Senyavin.
Moscow, Gosatomizdat, 1962. 143-162

TEXT: Detailed theoretical considerations of the above processes also applicable to non-equilibrium systems are given. On the basis of single-stage static extraction the author derives the following equations for the degrees of separation in extract $\varepsilon_1/\varepsilon_2$, and raffinate $(1 - \varepsilon_2)/(1 - \varepsilon_1)$; their volumes being v and v' respectively, D_1 and D_2 the distribution coefficients for the two substances, and n the number of extractions effected:

$$\frac{\varepsilon_1}{\varepsilon_2} = \frac{\left[1 - \left(1 + \frac{D_1 v'}{v}\right)^{-n}\right]}{\left[1 - \left(1 + \frac{D_2 v'}{v}\right)^{-n}\right]} \qquad (7)$$

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