

SAVIN, A.B. (Moskva)

Processes optimal in respect to response time in multidimensional systems. Izv. AN SSSR. Tekh. kib. no.2:140-155. Nov-85. (MIRA 18:7)

24 4100

S/G24/62/GCO/001/005/015
E140/E455

AUTHOR: Savvin, A.E. (Moscow)

TITLE: Phase trajectories of systems optimal in speed with respect to a given region in the phase plane

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye tekhnicheskikh nauk. Energetika i avtomatika. no.1, 1962, 126-132

TEXT: The author considers an extension of the well-known problem of most rapid incidence on a point in the phase plane to incidence on a convex region. The systems considered are those with limited second derivative $|d^2x/dt^2| \leq a$. This permits the study to be limited to the phase plane $x, y (y \equiv dx/dt)$. From any point in the phase plane external to a given convex region there is a unique minimum time trajectory, consisting (as for the case of incidence on a point) of one or two parabolic segments or straight line segments. With suitable construction of the control, the minimum time trajectory will be generated by simple switching, the sign of the acceleration of the system being uniquely defined at each point in the phase plane. The author gives grapho-
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S/024/62/000/001/005/013
E140/E435

Phase trajectories of systems ...

analytic methods for finding the optimal trajectories and the isochrons. The equations for the latter vary in different regions of the phase plane. They are either closed continuous curves or terminate on an arc of the convex region or the optimal trajectories arriving at points on that arc. Since the optimal trajectories consist of segments of identical parabolae, the graphical construction proposed is quite simple. In conclusion the author considers regions with piecewise-linear boundaries and gives the example of a square region in which the centre does not coincide with the origin of coordinates (the latter is, however, within the square). There are 5 figures.

SUBMITTED: June 15, 1961

1A

Card 2/2

SAVVIN, A. B.

Dissertation defended at the Institute of Mechanics for the academic degree of Candidate of Physicomathematical Sciences:

"Synthesis of Second Order Automatic Stabilization Systems with Limited Transient Processes. "

Vestnik Akad Nauk, No. 4, 1963, pp. 119-145

SAVVIN, A.B. (Moskva)

Fastest possible extraction of a mapping point beyond the
bounds of the given region of the phase plane. Izv. AN SSSR.
Tekh. kib. no.4:147-156 JI-Ag '63. (MIRA 16:11)

ACCESSION NR: AP4011315

S/0103/64/025/001/0012/0015

AUTHOR: Savvin, A. B. (Moscow)

TITLE: Joint operation of two time-optimum automatic systems

SOURCE: Avtomatika i telemekhanika, v. 25, no. 1, 1964, 12-15

TOPIC TAGS: optimized automatic control, time optimum automatic system, bang bang automatic system, automatic control theory, optimum switched system, on off control system

ABSTRACT: A system of two dynamically independent automatic devices is considered, each described by degenerate first-order equations $\dot{x} = u, |u| < 1,$
 $\dot{y} = v, |v| < 1,$ where x, y are system variables, u, v controls. Such a control law $u(x, y), v(x, y)$ must be synthesized under which the system starts at an initial point (x, y) and arrives at a specified point (x_k, y_k) in a minimum time. A functional of the form $J = \max(T_1, T_2)$, where T_1 and T_2 are times of travel to (x_k, y_k) over

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the first and the second coordinates ($T_1 > 0, T_2 > 0$), is minimized. The minimax problem is solved for a specified point and a specified (convex) area in the phase plane and also for moving the system out of the specified area in the phase plane. It is found that the optimum control at a point within the area can be determined by comparing the times of motion up to the area boundary along four trajectories. Both controls must be maximal in each of the four sub-areas formed by separatrices. Orig. art. has: 3 figures and 14 formulas.

ASSOCIATION: none

SUBMITTED: 21Nov62

DATE ACQ: 14Feb64

ENCL: 00

SUB CODE: CG, IE

NO REF SOV: 003

OTHER: 001

Card 2/2

L 63257-65 EWT(d)/EPF(n)-2/EWP(v)/EWP(k)/EWP(h)/EWP(l) Po-4/Pq-4/Pf-4/Pg-4/Pae-2/
Pu-4/Pk-4/P1-4 IJP(c) WW/EC
ACCESSION NR: AP5012885 UR/0280/65/000/002/0146/0152

AUTHOR: Savvin, A. B. (Moscow)

TITLE: Time-optimal processes in multivariable systems

SOURCE: AN SSSR. Izvestiya. Tekhnicheskaya kibernetika, no. 2, 1965, 146-152

TOPIC TAGS: multivariable control system, automatic control, automatic control design, automatic control system, automatic control theory

ABSTRACT: ⁹ A system is theoretically considered which consists of n dynamically independent devices describable by first-order differential equations which operate for a common target. The time-optimal processes in such a system are investigated (a minimax problem), when a state-space point, or the inside (or outside) of a certain convex region, represents the target. A substantial peculiarity of the problem lies in the fact that several transient processes and corresponding control laws are possible which satisfy the optimum conditions. A circuit

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ACCESSION NR: AP5012885

diagram is given for realization of the optimal control law; the diagram for an n-variable system comprises 2^{2n-2} switch-over-contact polarized relays, and performs all comparison operations simultaneously. Orig. art. has: 6 figures and 34 formulas.

ASSOCIATION: none

SUBMITTED: 18Sep63

ENCL: 00

SUB CODE: DP, IE

NO REF SOV: 002

OTHER: 001

llc

Card 2/2

ACC NR: AT6036516

SOURCE CODE: UR/0000/66/000/000/0094/0095

AUTHOR: Vasil'yev, V. K.; Gorbov, F. D.; Novikov, M. A.; Savvin, A. B.; Tambiyev, Ye. Z.

ORG: none

TITLE: Investigation of the possibility of creating a conflict situation during interdependent cooperative pilot teamwork by means of mathematical modeling [Paper presented at the Conference on Problems of Space Medicine held in Moscow from 24 to 27 May 1966.]

SOURCE: Konferentsiya po problemam kosmicheskoy meditsiny, 1966. Problemy kosmicheskoy meditsiny. (Problems of space medicine); materialy konferentsii, Moscow, 1966, 94-95

TOPIC TAGS: mathematical model, group dynamics, space psychology, cosmonaut training, homeostasis

ABSTRACT: In recent years the "man-machine" problem has commanded increasing attention. Two trends have emerged from investigations devoted to this problem: the first involves a study of a possible optimum relationship between the operator and the machine; and the second considers the solution to mission-oriented problems by the operator. The majority of experiments have been devoted to the characteristics of one operator inter-

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ACC NR: AT6036516

acting with a mechanical system. However, the operator teamwork is of special interest.

The "homeostat" device makes it possible to conduct experimental tests on an operator participating in a team and receive quantitative data which can be used to construct a mathematical model of their interdependent activity.

Present information indicates that during the solution of "difficult" problems on the homeostat, there is a division of responsibility among the operators necessary for fulfilling the mission. Therefore, the possibility exists of constructing a heuristic model from experimental data by considering the differentiated nature of different operator tasks in one group or another.

Two approaches to studying operator tactics on the homeostat can be demonstrated; a) operator performance in a nonconflicting situation where the problem can be solved; b) operator performance in a conflicting situation where the problem cannot be solved. The latter approach is of special interest in selecting special, mission-oriented groups (space-flight teams, expeditionary groups etc.).

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A mathematical model was constructed reflecting the operation of the homeostat in standard regime (static model). Based on this model, it is possible to select exchange-coefficient values corresponding to a predetermined conflicting or nonconflicting situation. Some data have been obtained on the dynamic characteristics of operators during teamwork.

N. A. No. 22; ATD Report 66-116

SUB CODE: 05, 06 / SUBM DATE: 00May66

Card 3/3

ACC NR: AT6036517

SOURCE CODE: UR/0000/66/000/000/0095/0096

AUTHOR: Vasil'yov, V. K.; Katkovskiy, B. S.; Savvin, A. B.

ORG: none

TITLE: Mathematical modeling of the organism's O sub 2 requirement while performing physical work [Paper presented at the Conference on Problems of Space Medicine held in Moscow from 24 to 27 May 1966.]

SOURCE: Konferentsiya po problemam kosmicheskoy meditsiny, 1966. Problemy kosmicheskoy meditsiny. (Problems of space medicine); materialy konferentsii, Moscow, 1966, 95-96

TOPIC TAGS: mathematical model, oxygen consumption, biologic metabolism, biologic respiration

ABSTRACT: A mathematical model of a biological object can be constructed in a number of ways, one of which entails composing equations of relationships for individual elements in a system on the basis of physical, physical chemical, biochemical, and other laws. Here, the laws of biology and medicine provide a background. Another method involves analysis of input variables (affectors) and output variables (reactions) of a system. On the basis of such an analysis, a formal mathematical model can be arrived at which establishes a correlation between the input and output of a biological object. This method,

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widely known as the "black box method," is less capable of explaining processes taking place within an investigated object than the first method. However, the second method is of definite value for rating and prognosing the state of a biological system.

A mathematical model of human oxygen consumption was considered as constructed according to the black box method. An analysis of the oxygen regimen of the organism during standard, moderate physical exercise was conducted. The nature of the transition process of oxygen consumption was studied in response to closed physical work on an automatic "Belau" gas analyzer.

The process of oxygen consumption during physical exercise was represented by a second order differential equation. The process of recovery after completion of exercise was represented by another differential equation, since oxygen consumption curves during and after exercise differed in nature. An attempt was made to link coefficients of the recovery equation with the character of oxygen consumption processes during exercise.

The proposed mathematical model yields a solution which agrees well with the results of an experimental investigation. This permits it to be

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used for the quantitative appraisal of the oxygen regimen of an organism.
Upon further perfection, this model can be used to rate the general physical
condition of the human organism under actual spaceflight conditions and as
a basis for life support requirements. / N. A. No. 22; ATD Report 66-116/

SUB CODE: 06 / SUBM DATE: 00May66

Card 3/3

ACC NR: AP6030728 SOURCE CODE: UR/0055/66/000/004/0096/0104

AUTHOR: Savvin, A. B.

43
B

ORG: Department of Applied Mechanics, Moscow University (Kafedra prikladnoy mekhaniki Moskovskogo universiteta)

TITLE: A method for synthesizing the control law to bound transient processes in second-order systems

SOURCE: Moscow. Universitet. Vestnik. Seriya fiziki i khimii, no. 4, 1966, 96-104

TOPIC TAGS: automatic control, control synthesis, second order control system, transient process control

ABSTRACT: The control of the system described by the nonlinear ~~second order~~ differential equation

$$\ddot{x} = F(x, \dot{x}, \delta). \tag{1}$$

is considered. A control law (x, \dot{x}) is sought such that the state variable $x(t)$ satisfies the inequality

$$|x(t)| < b \text{ when } t_0 \leq t < \infty \tag{2}$$

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ACC NR: AP6030728

for arbitrary initial conditions corresponding to the strip D

$$|x| < b, -\infty < \dot{x} < \infty \quad (3)$$

of the phase plane. On the basis of theorems proved by the author (Prikladnaya matematika i mekhanika, v. 25, no. 3, 1961, 583—586) establishing sufficient conditions for the boundedness of solutions of the second-order differential equations, a method for synthesizing the control is presented. The method consists in determining the so-called "desirable" equation

$$\ddot{x} = f(x, \dot{x}), \quad (4)$$

whose solutions exist, are unique, and are bounded if the initial values $x_0 \in D$. The control δ is selected such that

$$F(x, \dot{x}, \delta(x, \dot{x})) \equiv f(x, \dot{x}). \quad (5)$$

The problem of constructing the desirable equations is analyzed and various forms of such equations containing certain arbitrary functions are considered. It is considered that the essential advantage of the method is the possibility of introducing into the desired equation (that is, into the control function) the arbitrary functions in an explicit form which satisfy various additional conditions imposed

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ACC NR: AP6030728

upon the control system. An example illustrates the application of the method
to the solution of the synthesis problem. Orig. art. has: 4 figures and 29 formulas.
[LK]

SUB CODE: 01, 12/ SUBM DATE: 24Feb65/ ORIG REF: 006/ ATD PRESS: 5079

Card 3/3 *aim*

SAVIN, A. P.

Cand Tech Sci

Dissertation: "On the Problem of Calculating the Joints Which Frictionally Transmit Stresses Acting in the Plane of Joint."

19/6/50

Moscow Order of the Labor Red Banner Higher Technical School imeni N.E. Bauman

SO Vecheryaya Moskva
Sum 71

AUTHOR SAVVIN, A.P. PA - 2192
TITLE On the Plane System of Frictional Forces (O ploskoy sisteme sil treniya).
PERIODICAL Izvestiia Akad. Nauk SSSR, Otdel. Tekhn., 1957, Nr 1, pp 144-149 (U.S.S.R.)
Received 3/1957 Reviewed 4/1957
ABSTRACT The Coulomb rule $T = fQ$ does not offer the possibility of computing normal pressure Q which would correspond to the equilibrium state for the case in which excentricity with respect to the center of the parallel forces of friction, on which occasion exterior forces are used, occurs, and in which a pair acts on the plane of contact, the plane of which is parallel to that of the plane of contact. The plane system of the frictional forces is described by three equilibrium equations in the plane of collision and by the equation $qf = \psi(x,y)$. Here f denotes the friction coefficient, q - specific pressure, ψ the generalized coefficient of the plane system of the frictional forces. In the case of $qf = \text{const.}$ the position of the revolution center does not depend on the amount of the exterior stress, but is determined by the geometric properties of the contact figure and by the position of the resultant. The relation Qf/P is equal for geometrically similar systems of friction forces, the relation Qf/M is proportional to similar dimensions, and the centers of revolution are similarly located. It is not possible to solve the equilibrium equations with respect to Qf/P in the case of a given position

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PA - 2192

On the Plane System of Frictional Forces.

of the exterior force. This is due to the fact that it is impossible to eliminate the coordinates of the revolution center from the equilibrium equation. However, if the position of the revolution center is given, tables can be made from which Q_f/P can be determined for concrete contacts in the case of a given position of the exterior force. (4 illustrations)

ASSOCIATION Textile-Institute of Kostroma
PRESENTED BY
SUBMITTED 3. 11. 1955
AVAILABLE Library of Congress.

Card 2/2

SAVVIN, A.P.; KUPCHIKOVA, V.M.

Strength of bagging under shock loads. Izv. vys. ucheb. zav.; tekhn.
tekst. . prom. no.5:37-41 '58. (MIRA 11:12)

1. Kostromskoy tekstil'nyy institut.
(Bagging--Testing)

SAVVIN, A.P., dotsent, kand.tekhn.nauk

Calculating rectangular friction joints. Izv.vys.ucheb.zav.;
mashinostr. no.6:95-109 '59. (MIRA 13:5)

1. Kostromskoy tekstil'nyy institut.
(Couplings)

S/122/60/000/007/002/011
A161/A029

AUTHOR: Savvin, A.P., Candidate of Technical Sciences, Docent

TITLE: The Selfbraking Reserve as a Means for Evaluating the Dependability of Selfbraking Mechanisms

PERIODICAL: Vestnik mashinostroyeniya, 1960, No. 7, pp. 10 - 14

TEXT: The author suggests a new factor for calculating the selfbraking capacity of various mechanisms, "selfbraking reserve coefficient", analogous with the strength reserve coefficient for machine parts used to calculate the resistance of machine parts to rupture. The conception of the forward and back motion is considered not as a change of the motion direction but a switchover in which the driven machine element becomes the driving one when the useful resistance applied to the driven element does not disappear fully at the moment of stopping, and the remaining resistance in the driven element becomes a motive force. Formulae are derived for one selfbraking mechanism and for several mechanisms connected into a system (Fig. 1). The final general formula for the "selfbraking reserve coefficient", n_1 , is

$$n_1 = 1 - \frac{\eta'_0}{\eta_n} \quad (\text{Formula 7})$$



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A161/A029

The Selfbraking Reserve as a Means for Evaluating the Dependability of Selfbraking Mechanisms

where η_n is the mechanism efficiency in forward motion (Formula 1) and η'_o - conditional efficiency in backward motion (Formula 4). Five practical calculation examples are given: 1) for a worm gear drive on roller or ball bearings; 2) an inclined plane; 3) a screwline surface (Fig. 3); 4) a screw jack (Fig. 4) and 5) a wedge key (Fig. 5). There are 5 figures.

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SAVVIN, A.P., kand.tekhn.nauk, dotsent

Calculating friction butt joints. Vest.mashinostr. 42
no.7:45-48 JI '62. (MIRA 15:8)

(Couplings)

SAVVIN, A.P.

The problem of making calculations for joints held with high-strength bolts in elements subject to flexure. Izv.vys.uch.zav.; stroi. i arkhitekt. 5 no.4:165-170 '62. (MIRA 15:9)

1. Kostromskoy tekhnologicheskoy institut.
(Building--Details)

SAVVIN, A.P.

Some geometrical sources of the defects of testing machines with
pendulum dynamometers and uniform scale. Izv.vys.ucheb.zav.;
tekh.tekst.prom. no.1:148-152 '63. (MIRA 16:4)

1. Kostromskoy tekhnologicheskoy institut.
(Testing machines)

SAVIN, A.P., kand.tekhn.nauk, dotsent

Calculation of rectangular friction belt joints. Izv.vys.ucheb.
zav.; mashinostr. no.7:76-86 '63. (MIRA 16:11)

1. Kostromskoy tekhnologicheskoy institut.

SAVVIN, A.P. (Kostroma)

Plane system of friction forces. Izv. AN SSSR. Mekh. no.3:
160-164 My-Je '65. (MIRA 18:7)

SAVVIN, B.D.; BUBYAKIN, N.S., inzhener, retsenzent; DUGINA, N.A., tekhnicheskiy redaktor

[Experience in drilling large parts in machine construction] Opyt rastrochki krupnykh detalei v stankostroenii. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. lit-ry, 1955. 31 p. (MIRA 8:7)
(Drilling and boring)

SAVVIN, B.YA
ALLAKHVERDIYAN, D.A., red.; VINOKUR, R.D., kand.ekon.nauk, dots; red.;
PETROV, A.I., red.; SAVVIN, B.Ya., red.; SHER, I.D., doktor
ekon.nauk, red.:

[Capital investment planning and ruble control in connection with fulfillment of the plan for putting new plants and equipment into operation; papers of a conference] Planirovanie kapital'nykh vlozhenii i kontrol' rublem za vypolnieniem plana vvoda v deistvie osnovnykh fondov; materialy nauchnogo soveshchaniia. Moskva, 1957. 186 p. (MIRA 11:5)

1. Moscow. Finansovyy institut. 2. Moskovskiy finansovyy institut (for Sher, Vinokur). 3. Chlen pravleniya prombanka SSSR (for Petrov, Savvin)
(Finance)

SAVIN, D. (Voronezh)

You can learn from them. Zhil.-kom. khoz. 12 no.5:14 My '62.
(MIRA 15:10)

1. Starshiy inzhener Voronezhskogo oblastnogo otdela kommunal'-
nogo khozyaystva.

(Apartment houses—Maintenance and repair)

SAVVIN, D. D.

Savvin, D. D. - "On the problem of the change in small deformations", Trudy Novocherkas. politekhn. in-ta im. Ordzhonikidze, Vol. XXI, 1949, p. 147-50.

SO: U-4631, 16 Sept. 53, (Letopis 'Zhurnal 'nykh Statey, No. 24, 1949).

SAVVIN, D. D.

Savvin, D. D. - "On the problem of the change in deformations in bending", Trudy
Novocherkas. politekhn. in-ta im. Orzhonikidze, Vol. XXI, 1949, p. 151-53.

SO: U-4631, 16 Sept. 53, (Letopis 'Zhurnal 'nykh Statey, No. 24, 1949).

124-57-2-2337D

Translation from: Referativnyy zhurnal, Mekhanika, 1957, Nr 2, p 111 (USSR)

AUTHOR: Savvin, D. D.

TITLE: On the Flexure of Rotating Circular Bars Beyond the Elastic Limit
(K voprosu ob izgibe kruglykh vrashchayushchikhsya sterzhney za predelom uprugosti)

ABSTRACT: Bibliographic entry on the author's dissertation for the degree of Candidate of Technical Sciences, presented to the Novocherkass. politekhn. in-t (Novocherkassk Polytechnic Institute, Novocherkassk), 1956.

ASSOCIATION: Novocherkass. politekhn. in-t (Novocherkassk Polytechnic Institute), Novocherkassk

1. Beams--Deflection 2. Beams--Elasticity

Card 1/1

SAVIN, D.D.

New attachment for serew-thread cutting. Mashinoströitel' no.11:28
N '60. (MIA 13:10)

(Screw cutting)

FREYMAN, L.S., prof.; SAVVIN, E.A., assistant

Theory of plane-parallel motion in the course of theoretical
mechanics. Izv. vys. ucheb. zav.; mashinostr. no.6:5-17 '61.
(MIRA 14:7)

1. Voronezhskiy lesotekhnicheskikh institut.
(Motion)

Country :USSR
Category :Farm Animals, The Honeybee. Q-5
Abs. Jour :RZBiol., No. 4, 1959, No. 16761
Author :Savvik, G. F.
Institut. :-
Title :Keeping Bees under Sheathing and in Pavil ions.
Orig. Pub. :Pchelovodstvo, 1958, No 6, 27-32
Abstract :In Czechoslovakia the keeping of bees under sheathing and in pavil ions has been recognized as the best method. The sheathing is arranged for 3-4 hives, and the pavil ions for 12-40 and even for 140 colonies.

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SOV/106-58-5 11/15

AUTHOR: Sarvir, G.G.
TITLE:

Basic Principles of Construction of the Switches in an Electronic Automatic Telephone Exchange (Osnovnye printsipy postroyeniya kommutatorov elektronnykh ATS)

PERIODICAL:
ABSTRACT:

'Elektrosvyaz', 1958, nr 5, pp 68 - 73 (USSR).
The requirements placed on the individual connective elements are: low attenuation in the conducting state, low noise level, stable operation, an off/on resistance ratio of better than 10 000. The simplest possible scheme is that of Figure 1, in which it is required to connect any of n input wires to any of m output wires. In a practical case, the overall number of elements needed, nm , would be uneconomical. Figure 2 shows a frequency-division multiplex system in which the cord circuit at the left enables a connection to be made between 2 of the circuits at the right by altering frequencies. By using pulses, the same operation can be carried out in the time domain and Figure 3 shows a typical arrangement of pulse trains. Figure 4 shows a pulse-amplitude modulation method of switching subscribers' lines. In spite of its lack of stability, such a system is successful since its use is confined within the exchange to the area within the dashed lines in the

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Basic Principles of Construction of the Switches in an Electronic Automatic Telephone Exchange

diagram. It is pointed out that a large telephone exchange would need a bandwidth in the common circuits of tens of megacycles. Two commercial systems described in the literature are mentioned, Phillips and Ericsson. The latter's use of resonant circuits is illustrated in Figure 5. There are 5 figures and 9 references, 3 of which are Soviet, 1 German and 5 English.

SUBMITTED: June 20, 1957

Card 2/2

SAVVIN, G.G., Cand Tech Sci — (diss) "On the effect of ^{the system} ~~some~~
of ~~the~~ group formation ^{up} ~~on~~ on the complexity of controlling devices
of ~~cross-bar automatic telephone stations.~~ ^(cross-bar automatic telephone stations.)
of ~~cross-bar automatic telephone stations.~~ Mos, 1959. 12 pp (Min of Communications
USSR. Mos Electrical Engineering Inst of Communications).
150 copies (KL, 38-59, 117)

SAVIN, G G

6(0)

PHASE I BOOK EXPLOITATION SOV/2793

Akademiya nauk SSSR. Laboratoriya sistem peredachi informatsii

Problemy peredachi informatsii. vyp. 3: Koordinatnyye sistemy ATS (Problems of Information Transfer. Nr/ 3: Crossbar Systems) Moscow, Izd-vo AN SSSR, 1959. 147 p. 2,000 copies printed.

Ed. of Publishing House: K. I. Grigorash; Tech. Ed.: T. V. Polyakova;
Editorial Board: A. A. Kharkevich (Resp. Ed.), V. N. Kuznetsov, I. A. Ovseyevich, V. N. Roginskiy (Resp. Ed. of this Number), and V. G. Solomonov (Deputy Resp. Ed.).

PURPOSE: This collection of articles may be useful to engineers engaged in the design of crossbar automatic telephone systems.

COVERAGE: The authors discuss the principle of operation of crossbar automatic telephone systems and their components. They discuss methods of switching and using crossbar connectors in selector units and present block diagrams of

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Problems of Information Transfer (Cont.)

SOV/2793

individual units and of the entire automatic telephone system. They also explain the principle of constructing master-switch circuits and present methods of calculating losses in systems. Articles 1 and 3 were presented at the conference of the Wire Communication Section of NTOF; I. E. Imani A. S. Popov on July 15, 1956. Articles 2, 4 and 5 were presented at the Joint Session of the Laboratory and Chair of Telephony of MEIS on September 21, 1956, December 11, 1957, and November 23, 1956, respectively. No personalities are mentioned. References appear at the end of each article.

TABLE OF CONTENTS:

Foreword 3

Kharkevich, A. D. Development of Crossbar Automatic Telephone Systems 5

The author presents a general discussion of a number of crossbar automatic telephone systems developed in various West European countries and describes the advantages of such systems. There are 14 references: 6 Soviet (including 1 translation), 7 English and 1 German.

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Problems of Information Transfer (Cont.)

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Kharkevich, A. D. Switching Possibilities of Crossbar Connectors and Their Use in Selector Units of Automatic Telephone Systems 15
The author discusses the switching characteristics of a crossbar connector and describes methods of using it in telephone circuits. He also presents examples explaining the construction of selector units with crossbar connectors. There are 10 references: 9 Soviet and 1 English.

Kharkevich, A. D. Block Diagrams of Individual Units and of the Entire Crossbar Automatic Telephone System 54
The author discusses the operation of various elements and units of a crossbar automatic telephone system and presents methods of constructing their block diagrams. He also describes the operation of ARF-10, ARF-50 and No.5 crossbar types of systems and presents their block diagrams. There are 6 references, all Soviet.

Lazarev, V.G., G. G. Savvin and L. I. Smirnova. Basic Principles of Constructing Master-switch Circuits of Crossbar Automatic Telephone systems. 78
The authors discuss the principles of constructing master-switch circuits for group selector and subscriber selector units of crossbar auto-

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Problems of Information Transfer (Cont.)

SOV/2793

matic telephone systems. A discussion of a master-switch circuit for a subscriber selector unit is presented only for the case of transposed connections of subscriber lines. There are 18 references: 11 Soviet and 7 English.

Kharkevich, A. D. - Calculation of the Number of Connecting Devices in a Crossbar Automatic Telephone System.

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The author discusses methods of calculating losses in a multistage system by analyzing a two-stage circuit. He also derives formulas for calculating losses and presents numerical examples. There are 12 references: 7 Soviet and 5 English.

AVAILABLE: Library of Congress

Card 4/4

JP/fal
12/15/59

LAZAREV, V.G.; SAVVIN, G.G.; SMIRNOVA, L.I.

Fundamental principles in the design of controlling units
for crossbar automatic telephone exchanges. Probl.pered.inform.
no.3:78-114 '59. (MIRA 13:1)
(Telephone, Automatic)

SAVVIN, G.G.; KHARKEVICH, A.D.

Selection of group formation networks with consideration of the
intricacy of control systems. Probl. pered. inform. no.4:5-18
'59. (MIRA 13:7)

(Telephone, Automatic)

SAVIN, G.G.;

Effect of transposed switching-in on the carrying capacity of
selection stages of automatic telephones of the crossbar system.
Probl. pered. inform. no.4:35-55 '59. (MIRA 13:7)
(Telephone, Automatic) (Switching theory)

BAGRINTSEVA, N.S., inzh.; SAVVIN, G.G., kand.tekhn.nauk; CHEN' TSZYUN'-LYAN
[Ch'ên Chün-liang], aspirant

Principle of designing an electronic controlling device in the
register finder stages of crossbar automatic telephone exchanges.
Vest. sviazi 21 no.5:9-11 My '61. (MIRA 14:6)
(Telephone, Automatic)

ACCESSION NR: AT4008643

S/2945/63/000/015/0036/0041

AUTHOR: Savvin, G. G.

TITLE: Time characteristics of a programmed automatic control system

SOURCE: AN SSSR. Institut problem peredachi informatsii. Problemy* peredachi informatsii, no. 15, 1963, Sistemy* raspredeleniya informatsii. Opozvaniye obrazov, 36-41

TOPIC TAGS: telephony, call handling, signal handling, information transmission, programmed information transmission, programmed control block, call control, connection control, control block time parameter, asynchronous operation, connection time, control, cadence time

ABSTRACT: The influence of various methods of programmed switching in an information-transmission network (such as a telephone network) on the variation of the programmed-control-block operation timing, on the cycle duration, and on other time characteristics of the pro-

Card 1/3

ACCESSION NR: AT4008643

grammed automatic control system are considered. It is shown that, from the point of view of utilizing program control blocks, the most effective method of constructing a control system is to use a multi-program control and an asynchronous operating principle. To increase the utilization of the program-control block and to decrease the switching time it is necessary to reduce the timing of the control block. The most effective way of doing this is to increase the relative operating speed of the functional block. A decrease in the number of operations in each operating step and a decrease in the control time are less effective both economically and from the point of view of reducing the connection time. In view of the increased investments associated with the use of the asynchronous control principle, each specific case should be evaluated on its own merits.

ASSOCIATION: Institut problem peredachi informatsii AN SSSR
(Institute of Information Transmission Problems AN SSSR)

Card 2/3

ACCESSION NR: AT4008643

SUBMITTED: 00

DATE ACQ: 23Jan64

ENCL: 00

SUB CODE: CO, CG

NR REF SOV: 003

OTHER: 000

Card 3/3

SAVVIN, G.C.

The characteristics of a program control device. (robi. pered.
inform. no. 15:86-11 '83 (MIRA 17:8)

LAZAROV, V.G.; LAPOVICH, G.F.; SAVVIE, G.G.; BAGMOVICH, G.G.

Transcription of standard automatic telephony switching circuits.
Issued under inform. No. 12:86-86 103.

(FOIA 17:10)

ACC NR: AT6020524

SOURCE CODE: UR/0000/05/000/000/0005/0012

36

AUTHOR: Naumchuk, O. F.; Savvin, G. G.

ORG: none

TITLE: Information distribution and capacity estimate of transmission networks [Paper presented at a Seminar of the Institute on February 3, 1964]

SOURCE: AN SSSR. Institut problem peredachi informatsii. Seti peredachi informatsii i ikh avtomatizatsiya (Circuits for information transfer and their automation). Moscow, Izd-vo Nauka, 1965, 3-12

TOPIC TAGS: communication network, communication system, switching theory

ABSTRACT: A method is proposed for estimating the transmission capacity of multipoint networks by including in the analysis the switching capabilities of its relay points. The analyzed networks consist of a finite number of terminal points and interconnecting channels with similar characteristics. The channels may interconnect any two terminal points through any combination of legs between the relay points. Data compression is not excluded from the analysis. The minimum and the maximum estimate of the transmission capacity between the terminal points of arbitrarily interconnected network legs is found. The estimate of network capacity simplifies the problem of network control and information routing in case of failure of any trunk line. Orig. art. has: 19 formulas and 1 figure.

^{5/7} SUB CODE: 09/ SUBM DATE: 04Dec65/ ORIG REF: 002/ OTH REF: 004

Card 1/1

BIBIKOV, Yuriy Stepanovich, inzh.; LEMTYUGOV, Vladimir Ivanovich,
inzh.; RUSAK, Aleksandr Matveyevich, inzh. [deceased];
SAVVIN, Igor' Dmitriyevich, inzh.; TAGUNOV, Nikolay
Mikhaylovich, inzh.; FILATOV, Vyacheslav Ivanovich, inzh.;
KUZ'MIN, V.D., kand. tekhn. nauk, red.

[The TGMI diesel locomotive] Teplovoz TGMI. Moskva, Trans-
port, 1965. 207 p. (MIRA 18:12)

1. Muromskiy zavod imeni F.E.Dzerzhinskogo (for all except
Kuz'min).

Savvin
CZECHOSLOVAKIA/Farm Animals. Honey Bee

6-6

Abstr Jour : Ref Zhur - Biol., No 8, 1958, No 35764

Author : Savvin Jiri

Inst : Not Given

Title : Feed Supplementation of Bee Colonies in the Spring (Podkormka pcheloosemey vesnoy)

Orig Pub : Vozdarstvi, 1957, 10, No 3, 38-39

Abstract : Beginning from March 18, 1955, six groups of experimental colonies were receiving the following feed supplementations: defrosted in a solution of honey (group I); yeast "Tobi" in a honey paste (group II); the same yeast in a honey solution (group III); bread leavening yeast in a honey solution (group IV); honey with water in a ratio of 1:1 (group V). Group VI was the control one. In the beginning of the experiment, there were 14 cold days, preventing the collection of pollen by the bees. On May 20, the alternation of the intensiveness of the breeding was as follows: II, I, V, III, IV, VI, and in the beginning of June it was: II, V, II, I, IV, VI.

Card : 1/1

Q-5

CZECHOSLOVAKIA/Farm Animals - Honey Bee.

Abs Jour : Ref Zhur - Biol., No 7, 1958, 31022

Author : Savvin Jiri

Inst : -

Title : Strong Colonies Are the Basis for Successful Beekeeping.
(Sil'nyye pcheloscmi'i - osnova uspehnogo pchelovodstva).

Orig Pub : Vcelarstvi, 1957, 10, No 4, 54-55.

Abstract : To feed the honey bees during a period lasting from March 12 to April 5, pollen in a solution of honey, a preparation of the soybean flower, "Soyapyl", in honey solution and in honey candy, and yeast of the brand "Spilka" also in honey solution, and candy, were used: one group was given an aqueous solution of honey; a 7th group was a control one. In each group, there were 4-8 colonies. "Soyapyl" and yeast were found to be good substitutes, especially when used in honey solution.

Card 1/2

CZECHOSLOVAKIA/Farm Animals - Honey Bee.

1958 31022

COUNTRY : CZECHOSLOVAKIA
CATEGORY : Farm Animals.
The Honeybee.
ABS. JOUR. : RZhBiol., No. 3, 1959, No. 12113
AUTHOR : Savvin, Jiri
TITLE : Successful Experiment of Bee Wintering in Boxes.
ORIG. PUB. : Vcelarstvi, 1957, 10, No 10, 151-154
ABSTRACT : In Czechoslovakia bees winter in beehives at liberty, in boxes and in stationary pavilions. By thermographically studying various methods of wintering it was determined that best results are obtained when bees winter in boxes which are made warmer with shavings or moss. The bees are placed into the box in October or November when the weather is warm and the walls of the beehive are thoroughly warmed.

Card: 1/1

SAVVIN, L., inzh. (Moldaviya); YEKHLAKOV, A., inzh. (Sverdlovsk);
TRUSOV, I., inzh. (Frunze); IVANOV, N., PLAKSEYEV, G. (Kherson);
KNOROZ, M. (L'vov); GROFENKO, P., rabochiy (Novosibirsk);
TARASOV, O. (Novorossiysk); D'YAKOV, P., inzh. (Kamensk-
Shakhtinskiy); BUTUSOV, V., dotsent (Moskva); SUNDAKOV, M.,
inzh., student; PORTNOV, Ya., kand. tekhn. nauk (Makhachkala);
PETROV, Yu., inzhener-stroitel' (Ivanovo)

Readers argue, agree, advise. Tekh. mol. 31 no. 6:6-9 '63.
(MIRA 16:7)

1. Starshiy inzhener Usol'skogo mashinostroitel'nogo zavoda
(for Ivanov). 2. Moskovskoye vyssheye tekhnicheskogo
uchilishche imeni Baumana (for Butusov). 3. Zaobnoye otdeleniye
fakul'teta zhurnalistiki Leningradskogo gosudarstvennogo
universiteta (for Sundakov).
(Technological innovations)

SAVVING L. G.

ISSN 0762

NUMERICAL SOLUTIONS

Konferentsiya po magnetnoy gidrodinamike. Mga, 1968.
Voprosy magnetnoy gidrodinamiki i kinematiki plazmy; trudy Konferentsii.
(Problems of Magneto-hydrodynamics and Plasma Dynamics; Transactions of a
Conference) Mga, 1968. 343 p.
Errata slip inserted. 1,000 copies printed.

Sponsoring Agency: Akademiya Nauk Latvinskoy SSR, Institut Fiziki.
Editorial Board: D.A. Frank-Kamenetskiy, Doctor of Physics and Mathematics,
Professor; A.I. Vol'dals, Doctor of Technical Sciences, Professor; T.M. Kirilo,
Candidate of Physics and Mathematics; V.A. Velits, Candidate of Physics and
Mathematics; V.G. Vitol, Candidate of Physics and Mathematics; Yu.M. Kravtsov;
and V.A. Kravchenko.

Ed.: A. Poyal'tseva; Tech. Ed.: A. Ryvinskiy

PREFACE: This book is intended for physicists working in the field of magneto-
hydrodynamics and plasma dynamics.
CONTENTS: This volume contains the transactions of a conference held in Mga,
June 1968, on problems in applied theoretical magneto-hydrodynamics. The
subjects of the conference were: the investigation of the basic trends in theo-
retical and applied magneto-hydrodynamics, establishing contact between the
people doing research in different branches of magneto-hydrodynamics, and
promoting the participation of theoretical physicists in problems in applied
magneto-hydrodynamics. More than 150 persons from different parts of the Soviet
Union took part in the conference, and 55 papers were read. Films, a sketchbook to
be held in Mga in June 1969. In this present collection of the transactions of
the conference, most of the papers and comments on them are presented by the
authors themselves in an abridged form. The book is divided into two parts:
the first part deals with problems in analytical magneto-hydrodynamics and plasma
dynamics, and consists of 35 articles by physicists (D.A. Frank-Kamenetskiy), magne-
to-hydrodynamics and the investigation of cosmic-ray variations (L.I. Dorman),
stability of hydromagnetic waves in a magnetic field (G.V. Orlovskiy and A.I. Dubrovny),
the second part, consisting of 35 articles, deals with problems of experimental magnetohydro-
dynamics, including the application of physical simulation for development
of electromagnetic processes in liquid metals (I.M. Kirilo) and physics of the
of electromagnetic pumps (P.G. Kirillov), at the Institute of Physics of the
Academy of Sciences, Latvian SSR. Several articles are devoted to induction
pumps, electromagnetic crucibles, electromagnetic stirring including schematic
diagrams of their power-supply systems. References are given at the end of
most of the articles.

Kravin, Yu.K. Comments on the Paper	251
Servin, L.G. Optimum Structural Utilization of Induction Pumps	253
Kirillov, P.G., Ye. Ye. Klyucharskiy, A.K. Mikhaylov, and G.A. Orlov. Development of Electromagnetic Pumps at the Institute of Physics, Academy of Sciences, Latvian SSR	261
Furbin, E.M. Comments on the Paper	269
Vitol, V.G. Use of Induction Pumps in the Foundry and Metallurgical Industry	273
Vitol, V.G., A.I. Certain Problems in Designing Linear Induction Pumps	275
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Carl 11/12	

SAVVIN, L.G., kand.tekhn.nauk, dotsent; OKHREMENKO, N.M., kand.tekhn.nauk,
dotsent (Leningrad)

Optimum geometric relationships in molten metal induction pumps.
Elektrichestvo no.12:82-84 D '62. (MIRA 15:12)

1. Rzhskiy institut inzhenerov Grazhdanskogo vozudshnogo flota.
(Liquid metals--Transportation) (Pumping machinery, Electric)

L 29691-66 EWP(k)/EWT(d)/EWT(m)/EWP(h)/I/EWP(1)/EWP(V)/EWP(C)/EWP(L)
ACC NR: AP6008810 SOURCE CODE: UR/0130/65/000/011/0050/0052

AUTHORS: Bonyakovskiy, M. A.; Savvin, M. V.; Zaytseva, Z. I. 44
42

ORG: Cherepovetsk Metallurgical Factory (Cherepovetskiy metallurgicheskiy zavod) B

TITLE: Modification of butt welding machine 1700 14

SOURCE: Metallurg, no. 11, 1965, 50-52

TOPIC TAGS: pickling steel alloy, sheet metal, welding inspection,
butt welding, welding equipment, seam welding/1700 butt welding machine,
08-10kp steel alloy, st 1-3kp steel alloy

ABSTRACT: To decrease the number of broken (in 1964: 61.7% for 2.75 mm sheet; 31.7 for 2.75; 29.5 for 3.0; 22.5 for 3.5, and 12.1 for 4.5 mm) and defective (30.4; 24.9; 19.9; 20.4, and 11.1% respectively) welds in the pickling of 08-10kp and St 1-3kp steel alloy sheets, the welding parameters were investigated and machine 1700 was modified. After testing the butt welds produced under different welding regimes and establishing the correct operating ranges, a more stringent tolerance on allowed electrode wear (1000--1200 seams) was established, and several changes on the machine were performed. These included raising of the inlet scrapers, decreasing the seam height, optimizing the seam trimmer, adding guiding rolls, etc. As a result of these changes, the incidence of defective welds has been reduced by a factor of ≈ 2.5 to 7.4--8.6%. The metallographical investigations were performed

Card 1/2

L 29691-66

ACC NR: AP6008810

by A. P. Palkina directed by V. S. D'yakonova. Orig. art. has: 1 figure and 1 table.

SUB CODE: 13/

SUBM DATE: none

Card 2/2 CC

LEBEDIINSKIY, Andrey Vladimirovich (Dr.) and SAVIN, N. G.

"On Relations of Sympathetic Enervation to the Reaction of Contracting Formations
on Efferent Influences of Various Types." Zef. Zhur., Vol 33, No 6, 1947, p749.
Chair of Physiology, Military Med Acad, S. M. Kirov.
Imeni

S8: U-4396

5
SAPRHOKIN, M.I., KARMANOVA, I.G., KLYONOV, E.N., REYDLER, R.M.
SAVVIN, N.G., FLEGONTOVA, N.P.

"On the role of sympathetic nervous system and cerebellum in
regulation of muscles activity."

Report submitted, but not presented at the 22nd International
Congress of Physiological Sciences.
Leiden, the Netherlands 10-17 Sep 1962

KUDRYAVTSEV, I.V.; MEYEROVICH, I.B.; SAVVINA, N.M.; TAFT, V.I.

Fatigue strength of shafts following nitriding and straightening.
Metalloved. i term. obr. met. no.10:32-34 O '63. (MIRA 16:10)

1. Tsentral'nyy nauchno-issledovatel'skiy institut tekhnologii i
mashinostroyeniya i zavod "Russkiy dizel'."

SAVVIN, N.V.
BOLDIN, Lev Andreyevich, kandidat tekhnicheskikh nauk; PRONIKOV, A.S.,
doktor tekhnicheskikh nauk, retsenznet; KUZNETSOV, M.M.,
kandidat tekhnicheskikh nauk, dotsent, retsenznet; SAVVIN, N.V.,
kandidat tekhnicheskikh nauk, dotsent, redaktor; RZHAVINSKIY, V.V.,
redaktor izdatel'stva; MODEL', B.I., tekhnicheskiy redaktor

[Machine tools; problems in operation] Metallorezhushchie stanki:
voprosy ekspluatatsii. Moskva, Gos.nauchno-tekhn.izd-vo mashino-
stroit.lit-ry, 1957. 259 p. (MIRA 10:7)
(Machine tools)

SAVITS, N. V.

"Investigation of Soldering Structural Steels in Gaseous Media with Copper Solders." Cand Tech Sci, Inst of Metallurgy
Imeni A. A. Naykov, Acad Sci USSR, Moscow, 1955. (RI, No 12, Mar 55)

SO: Sum. No. 670, 29 Sep 55-Survey of Scientific and Technical
Dissertations Defended at USSR Higher Educational Institutions (15)

KUZNETSOV, V.I.; SAVVIN, S.B.

Rapid photometric determination of thorium using the reagent thoron II.
Radiokhimiia 1 no.5:583-588 '59. (MIRA 13:2)
(Thorium--Analysis) (Benzeneearsonic acid)

05712
SOV/32-25-10-1/63

5 (2)
AUTHORS: Luk'yanov, V. F., Savvin, S. B.,
Nikol'skaya, I. V.

TITLE: Photometric Determination of Thorium in Zircons by Means of
the New "Arsenazo III" Reagent

PERIODICAL: Zavodskaya laboratoriya, 1959, Vol 25, Nr 10, pp 1155-1157 (USSR)

ABSTRACT: The separation of thorium (I) from zirconium (II) by the usual
methods is wearisome and incomplete. A rapid method of
determining (I) in zircons was developed, in which a previous
separation of other elements (including (II)) is not necessary.
The method is based on the colorimetric measurement of (I) by
means of the new "arsenazo III" reagent (1,8-dioxy-naphthalene-
3,6-disulphonic acid-2,7-bis <azo-1> benzene-2-arsonic acid)
in the presence of oxalic acid. The reagent was prepared by
S. B. Savvin (Ref 2). Already in the presence of 1-35 γ
of (I)/50 ml, the reagent produces a green coloring which,
in the case of excess reagent, turns into blue-violet. The
oxalic acid used in the determination eliminates the
influence of (II) (the content of which in zircon may amount
to up to 80%) and of titanium, since it forms complex
compounds with these elements. The oxalic acid acts much less

Card 1/2

Photometric Determination of Thorium in Zircons by
Means of the New "Arsenazo III" Reagent

05712

SOV/32-25-10-1/63

upon (I) in the highly hydrochloric-acid medium. Data on the reproducibility of the results obtained by the method described (Table 1), and of the results obtained by determinations of (I) in zircon (Table 2), are given. The course of analysis indicated shows that calibration curves are used for the determination of (I) with "arsenazo III", that the colorimetric determination was made by the device of type FEK-M-1 (with a red light filter), that the analysis takes 3 hours, and that the method is suitable for a content of (I) exceeding 0.005%. There are 3 figures, 2 tables, and 2 Soviet references.

Card 2/2

5.3610

75686
SOV/80-32-10-35/51

AUTHORS: Kuznetsov, V. I., Savvin, S. B.

TITLE: Synthesis of Dinitrobenzidine and Analytical Reagents "Arsenazo II," "Toron II," and "Phenazo"

PERIODICAL: Zhurnal prikladnoy khimii, 1959, Vol 32, Nr 10, pp 2329-2332 (USSR)

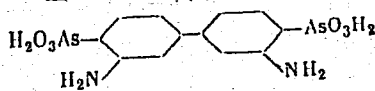
ABSTRACT: Biphenyl-4,4'-diarsonic acid-3,3'-bis [\langle -azo-2 \rangle -1,8-dihydroxynaphthalene-3,6-disulfonic acid] (Arsenazo II), and biphenyl-4,4'-diarsonic acid-3,3'-bis [\langle -azo-1 \rangle -2-hydroxynaphthalene-3,6-disulfonic acid] (Toron II) are very valuable analytical test reagents for uranium, thorium, rare-earth metals, and for some other elements (ZhAKh, 14, 8, 1958). 3,3'-Dinitrobiphenyl-4,4'-bis [\langle -azo-4 \rangle phenyl] (Phenazo) is a test reagent for magnesium (ZL, 24, 1053, 1958). The syntheses of "Arsenazo II" and "Toron II" were published for the first time. The improved preparation of the starting material 3,3'-dinitrobenzidine was previously published (J. Chem. Soc., 245, 1928; 4181, 1953). 3,3'-Diaminobiphenyl-

Card 1/4

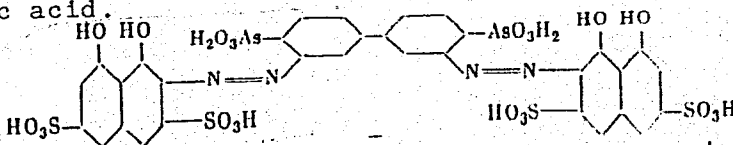
Synthesis of Dinitrobenzidine and Analytical Reagents "Arsenazo II," "Toron II," and "Phenazo"

75686
SOV/80-32-10-35/51

4,4'-diarsonic acid was prepared by bis-diazotization of 3,3'-dinitrobenzidine with nitrosyl-sulfuric acid.



The reaction with arsenous acid was carried out in the presence of NaHCO_3 and at 0° . The obtained 3,3'-dinitrobenzidine-4,4'-diarsonic acid was reduced with ferrous salts in an alkaline medium. "Arsenazo II" was obtained by coupling of bis-diazotized 3,3'-diaminobenzidine-4,4'-diarsonic acid (I) with chromotropic acid.

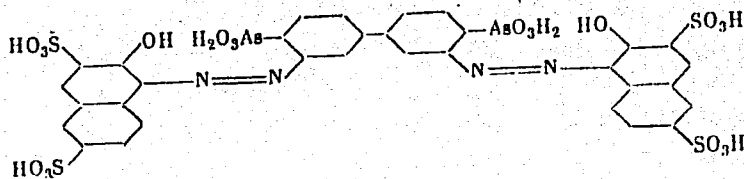


Card 2/4

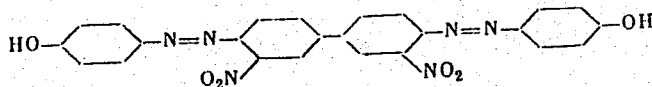
Synthesis of Dinitrobenzidine and Analytical Reagents "Arsenazo II," "Toron II," and "Phenazo"

75686
SOV/80-32-10-35/51

"Toron II" was obtained by coupling of I with R-salt.



"Phenazo" was obtained by coupling of bis-diazotized 3,3'-dinitrobenzidine with phenol.



There are 8 references, 2 Soviet, 1 U.S., 1 German, 4 British. The 5 U.S. and British references are: Cheng, K. L., Anal. Chem., 28, 1738 (1956); Hirst, H. R.,

Card 3/4

Synthesis of Dinitrobenzidine and Analytical
Reagents "Arsenazo II," "Toron II," and
"Phenazo"

75086
SOV/80-32-10-35/51

Cohen, J. B., J. Chem. Soc., 831 (1895); Fevre, R. J.,
Turner, E. E., 245 (1928); Barker, C. C., Casson, F. D.,
4181 (1953); Hodgson, H. H., Walker, J., 1620, (1933).

SUBMITTED: May 21, 1958

Card 4/4

5 (2)

AUTHOR:

Savvin, S. B.

SOV/20-127-6-24/51

TITLE:

Photometric Determination of Thorium and Uranium With the Arsenazo III Reagent

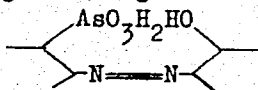
PERIODICAL:

Doklady Akademii nauk SSSR, 1959, Vol 127, Nr 6, pp 1231-1234 (USSR)

ABSTRACT:

At the beginning, organic reagents containing functional-

analytical groups



are listed: they have

valuable analytic properties. V. I. Kuznetsov suggested several of them (1-8): they are used for the photometric determination of Th, U, Pu, and other elements. The author synthesized 1,8-dioxy-naphthalene-3,6-disulfonic acid-2,7-bis-[azo-1]-2-phenyl-arsonic acid], which is here called arsenazo III and contains the mentioned group (see Scheme). This reagent yields, at corresponding pH-values, distinct contrast reactions with Th, U^{IV}, U^{VI}, ΣTR, Be, Pb, and some other elements. The color changes from pink (the reagent) to emerald green and blue. The main characteristic feature of arsenazo III, which makes it different from the reagents described before, is its capability

Card 1/3

Photometric Determination of Thorium and Uranium With the Arsenazo III Reagent SOV/20-127-6-24/51

of forming particularly stable internal complex compounds with the cations of the elements. The stability of these compounds surpasses that of arsenazo I and II (by V. I. Kuznetsov) by several orders of magnitude. This facilitates the determination of elements in highly acid solutions without a preceding time-consuming separation of sulphates, phosphates, fluorides, oxalates, and other disturbing substances. The relative stability of the complexes can be characterized quantitatively (Ref 2). The "method of stability indices" (Table 1) is used for this purpose. Besides, the properties of arsenazo III, the determination of thorium and uranium, and finally the synthesis of arsenazo III are described. Figure 1 shows the light-absorption curves by the solutions of arsenazo III and by complexes, figure 2 the pH-effect on the coloring of the complexes, figure 3 the effect of the phosphates on the determination of thorium, and figure 4 the same for the determination of uranium. There are 4 figures, 1 table, and 10 references, 5 of which are Soviet.

Card 2/3

Photometric Determination of Thorium and Uranium With SOV/20-127-6-24/51
the Arsenazo III Reagent

ASSOCIATION: Institut geokhimii i analiticheskoy khimii im. V. I. Vernadskogo
Akademii nauk SSSR (Institute of Geochemistry and Analytical
Chemistry imeni V. I. Vernadskiy of the Academy of Sciences,
USSR)

PRESENTED: April 22, 1959, by A. P. Vinogradov, Academician

SUBMITTED: April 15, 1959

Card 3/3

SAVVIN, S.B.; BAGREYEV, V.V.

Photometric determination of thorium in rocks by means of
arsenazo. Part 3. Zav.lab. no.4:412-415 '60.
(MIRA 13:6)

1. Institut geokhimii i analiticheskoy khimii Akademii nauk
SSSR.
(Thorium--Analysis) (Rocks--Analysis) (Arsenazo)

S/186/60/002/006/009/026
A051/A129

AUTHORS: Kuznetsov, V.I.; Savvin, S. B.

TITLE: The extraction-photometric method for the determination of uranium with arsenazo III

PERIODICAL: Radiokhimiya, v. 2, no. 6, 1960, 682 - 686

TEXT: The authors have shown that under certain conditions the UO_2^{2+} complexes with reagents of the arsenazo group can be extracted and photometry is possible directly in the organic phase without reextraction. The determination of microquantities of uranium can thus, be carried out simultaneously with its separation from most of the other elements. The suggested method is based on the extraction of the diphenylguanidine salt of the UO_2^{2+} -arsenazo III complex with butyl alcohol from a solution saturated with complex III and by its subsequent photometry in the extract at $\lambda = 660 m\mu$. The method is said to enable one to determine 1 - 50 of uranium in combination with the simultaneous separation from other elements. Phosphates, fluorides, sulfates, Fe, Al and other elements do not interfere. In order to extract most of the ele-

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The extraction-photometric method for

S/186/60/002/006/009/026
A051/A129

ments in addition to the diphenylguanidine salts, it is necessary to introduce certain anions into the solution, such as mono- or tri-chloroacetates, the role of the latter being the compensation of the excess positive charge of the element forming part of the complex, if its valency is 2. Elements forming two-charge cations at pH = 3 in the presence of complexon III with arsenazo III do not interact. The working method is described as follows: A few milligrams of the investigated substance assumingly containing 1 to 50 μ g of uranium are placed into a test tube and decomposed according to a method corresponding to the mineral composition of the sample and ensuring complete dissolution of uranium. For a thoroughly ground sample this is accomplished by boiling with HCl + H₂O₂ or with HCl + HNO₃. Without filtering off the non-dissolved part and placing the test tube in a boiling bath, the solution is evaporated until dry, passing air through, and the residue is processed with 2.0 ml of 0.05n HCl. 2.5 ml of a 5 % solution of disodium salt of complexon III is introduced. 1.00 ml of a 0.5 % aqueous solution of arsenazo III is added, 0.5 ml of a 20 % solution of diphenylguanidine chloride and 5 ml of butyl alcohol are also added. This is extracted, well shaken, and part of the upper colored layer is removed with a pipette and transferred to a 10 mm cuvette. The optical density is measured

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against water on a spectrophotometer at 660 m μ or on a photocolormeter with a red light filter. The uranium content is determined from a calibration curve, which is plotted in the same way. Several practical suggestions for improving the method are listed. There are 2 figures, 1 table and 14 references: 9 Soviet-bloc and 5 non-Soviet-bloc. The references to the four most recent English-language publications read as follows: J. Clinch, M. Guy, *Analyst*, 82, 80, 1957, J. H. John, F. Will, R. A. Black, *Analyt. Chem.*, 25, 8, 1200, 1953; T. S. West, *Chem. Age*, 80, 943, 1958; P. C. Cates, R. Laran, R.E. Williams, Th. F. Moore, *J. Am. Chem. Soc.*, 75, 9, 2212, 1953.

SUBMITTED: February 6, 1960.

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KUZNETSOV, V.I.; SAVVIN, S.B.

Photometric determination of thorium in monazites with arsenazo
II. Zhur.anal.khim. 15 no.2:175-179 Mr-Apr '60. (MIRA 13:7)

1. Institut geokhimii i analiticheskoy khimii im. V.I.Vernadskogo
AN SSSR, Moskva.

(Thorium--Analysis)

LUK'YANOV, V.F.; SAVVIN, S.B.; NIKOL'SKAYA, I.V.

Photometric determination of microquantities of uranium with
arsenazo III. Zhur.anal.khim. 15 no.3:311-314 M-Je '60.
(MIRA 13:7)

(Uranium—Analysis) (Arsenazo)

KUZNETOV, V.I. [Kuznetsov, V.I.]; SAVVIN, S.B.; MIHAILOV, V.A. [Mikhaylov, V.A.]

Realizations in the field of the analytic chemistry of uranium, thorium, and plutonium. Analele chimie 15 no.4:74-126 O-D '60. (EEAI 10:3)

(Uranium) (Thorium) (Plutonium)

SAVVIN, S.B.; VOLYNETS, M.P.; BALASHOV, Yu.A. BAGREYEV, V.V.

Photometric determination of microquantities of thorium in rocks
with arsenazo II. Zhur.anal.khim. 15 no.4:446-451 J1-Ag '60.
(MIRA 13:9)

1. V.I.Vernadsky Institute of Geochemistry and analytical
Chemistry, Academy of Sciences, U.S.S.R., Moscow.
(Thorium--Analysis) (Arsenazo)

KUZNETSOV, V.I.; SAVVIN, S.B.; MIKHAYLOV, V.A.

Progress in the analytical chemistry of uranium, thorium, and
plutonium. Usp. khim. 29 no.4:525-567 Ap '60. (MIRA 14:4)

1. Institut geokhimi i analiticheskoy khimii imeni V.I.Vernadskogo
AN SSSR.

(Uranium--Analysis) (Thorium--Analysis)
(Plutonium--Analysis)

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5.5300 (1282, 1273, 1227)

AUTHORS: Kuznetsov, V.I., Savvin, S.B.

TITLE: The sensitive photometric determination of thorium using the arsenazo-III reagent

PERIODICAL: Radiokhimiya, v 3, no 1, 1961, 79-86

TEXT: The authors recommend a sensitive photometric method for determining thorium using the arsenazo-III reagent, whereby 0.05 μ g Th can be detected. They show that 10-100-fold quantities of sulfates, phosphates and other complex-forming substances in addition to zirconium and uranium do not interfere with the determination of thorium. An extraction-photometric method is developed for determining thorium and another method is suggested for concentrating thorium by coprecipitation in the form of a Th-arsenazo-III complex on a colorless precipitate formed by diphenylguanidine salt - anthracene- α -sulfoacids. The high stability of arsenazo-III complexes is explained by the non-coplanar nature of the molecule. Arsenazo-III is said to include

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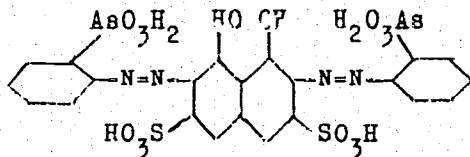
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the same groups as arsenazo-I and II (Ref 12, 13, 14). The high sensitivity of the reaction is combined with a satisfactory selectivity.

Structure of
arsenazo-III



Arsenazo-III is synthesized by azo-combination of diazo-0-aminophenyl-arsonic acid with chromotropic acid adding CaO (Ref 11). It differs from other reagents by its high sensitivity of reaction and by a lesser effect upon the conditions of the environment: acidity, sulfate concentration, phosphates and other thorium-binding substances. These characteristics of the reagents are said to be connected with the extremely high stability of the complex compounds formed by arsenazo-III and Th, Zr, U^(IV), U^(VI), rare-earth elements, etc. Arsenazo-III forms an intense emerald-green-coloring with thorium (Fig 1). Cations such as Zr, Hf, U^(IV), Sc and Fe^(III) partially, Bi, U^(VI) and high concentrations of rare-earth elements affect the complex

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formation of the reagent with thorium, but these effects can be eliminated through various chemical reactions. The same principle applies to the anode effect. The high sensitivity of the color reaction is said to be explained by the following factors: 1) the presence of a sharp peak on the curve of light-absorption of the arsenazo-III-thorium complex; 2) a significant shift of this peak on the curve of light-absorption of the complex as compared to the reagent, which easily eliminates the light-absorption of the reagent proper; 3) a high stability of the complex, which enables thorium to become completely bound to arsenazo-III. The concentration of thorium from diluted solutions carried out by coprecipitation of the diphenylguanidine salt of the thorium-arsenazo-III complex accompanied by the simultaneous precipitation of a base, such as the salt of diphenylguanidine with a suitable anion-sulfate, perchlorate, trichlorate, arylsulfonate, etc., is comparable to the method of extraction. The distinctive feature of the given method is the use of a colorless base (coprecipitant) instead of an intensively-colored methyl violet salt, which is an obstacle to the subsequent direct photometry of the solution obtained. The authors point out that arsenazo-III present in the solution does not pass completely into the precipitate (only 20%) in the

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The sensitive photometric determination ...

case of complete thorium recovery. The thorium content in a given solution is determined according to the formula:

$$Th (B\gamma) = \frac{2(E_1 - E_2)}{E_2 - E_1}$$

Table 2 lists examples of results obtained under the given experimental conditions. Introducing even a simple phenylazo-group into the arsenazo-I molecule, the stability of the complex will increase as compared to that of arsenazo-I without this introduction, if the phenylazo-group does not contain any salt-forming substitutes. Arsenazo-III is suitable for a very selective and sensitive determination of uranium in the tetra-valent state, when its behavior is similar to that of thorium. There are 3 tables, 4 graphs, 1 diagram and 20 references: 12 Soviet-bloc, 8 non-Soviet-bloc.

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SAVVIN, S.B.; MUK, A.A.

The color reaction of the Sc, Y, and rare earths with the reagent arsenazo III. Bul Inst Nucl 12:97-107 0 '61.

1. V.I.Vernadsky Institute of Geochemistry and Analytical Chemistry, Academy of Sciences, U.S.S.R., Moscow (for Savvin). 2. Institute of Nuclear Sciences "Boris Kidrich," Department of Physical Chemistry, Vinca (for Muk).

KUZNETSOV, V.I.; SAVVIN, S.B.

Extraction of stained complex compounds formed by reagents of the
arsenazo-thoron group. Dokl. AN SSSR 140 no.1:125-128 S.O '61.
(MIRA 14:9)

1. Institut geokhimii i analiticheskoy khimii im. V.I. Vernadskogo.
Predstavleno akademikom A.P.Vinogradovym.
(Complex compounds) (Arsenazo)

UDAL'ISOVA, N.I.; SAVVIN, S.B.; NEMODRUK, A.A.; NOVIKOV, Yu.P.;
DOBROLYUBSKAYA, T.S.; SINYAKOVA, S.I.; BILIMOVICH, G.N.;
SEN DYUKOVA, A.S.; BELYAYEV, Yu.I.; YAKOVLEV, Yu.V.;
NEMODRUK, A.A.; CIMUTOVA, M.K.; GUSEV, N.I.; PALEY, P.N.;
VINOGRA DOV, A.P., akademik, glav. red.; ALIMARIN, I.P.,
red.; BABKO, A.K., red.; BUSEV, A.I., red.; VAYNSHTEYN, E.Ye.,
red.; YERMAKOV, A.N., red.; KUZNETSOV, V.I., red.; RYABCHIKOV,
D.I., red. toma; TANANAYEV, I.V., red.; CHERNIKOV, Yu.A., red.;
SENYAVIN, M.M., red. toma; VOLYNETS, M.P., red.; NOVICHKOVA, N.D.,
tekh. red.; GUSKOVA, O.M., tekh. red.

[Analytical chemistry of uranium] Analiticheskaya khimiya urana.
Moskva, Izd-vo Akad.nauk SSSR, 1962. 430 p. (MIRA 15:7)

1. Akademiya nauk SSSR. Institut geokhimii i analiticheskoy
khimii.

(Uranium—Analysis)

SAVIN, S.B.

Arsenazo III. Met. poluch. khim. reak. i prepar.
no.6:25-28 '62. (MIRA 17:5)

1. Institut geokhimii i analiticheskoy khimii imeni
V.I. Vernadskogo AN SSSR.

SAVVIN, S.B.; DEDKOV, Yu.M.; MAKAROVA, V.P.

New metal indicators for barium ions. Determination of sulfates.
Zhur.anal.khim. 17 no.1:43-47 Ja-F '62. (MIRA 15:2)

I. V.I.Vernadsky Institute of Geochemistry and Analytical Chemistry,
Academy of Sciences, U.S.S.R., Moscow.
(Indicators and test papers) (Barium sulfate)

SAVVIN, S.B.

Complex formation of arsenazo III with elements. Zhur. anal.
khim. 17 no.7:785-795 0 '62. (MIRA 15:12)

1. Vernadskiy Institute of Geochemistry and Analytical
Chemistry Academy of Sciences U.S.S.R., Moscow.
(Arsenazo) (Complex compounds)

S/075/63/018/001/006/010
E071/E452

AUTHORS: Savvin, S.B., Basargin, N.N., Makarova, V.F.

TITLE: An analytical application of dibromoarsenazo II.
The determination of thorium in the presence of rare
earth elements

PERIODICAL: Zhurnal analiticheskoy khimii, v.18, no.1, 1963, 61-65

TEXT: The results of an investigation of the applicability of dibromoarsenazo II for the photometric determination of thorium indicated that it can be used for this purpose in the presence of rare earth elements which in 1N hydrochloric acid do not interfere with the determination up to a ratio of 1:5000. The sensitivity of the determination is 0.05 µg/ml of thorium. Sulphates and phosphates in quantities of up to 100 mg in 25 ml of the solution do not interfere with the determination. The reagent may also be useful for the determination of some other elements, as it produces sufficiently contrasting reactions with boron, UO_2^{2+} , vanadium^{IV} and rare earth elements (the colour formed and maximum permissible acidity for the individual elements is given). The method of the synthesis of the reagent is outlined. There are 4 figures and 2 tables.

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