SVECHNIKOVA, E.L.; SHIGAYEVA, M.Kh.

Variability of some micro-organisms under the influence of the mud from Lake Balpash-Sor. Report No. 2. Variability of micro-organisms by introducing them in mud substratum in cellophane bags. Trudy Inst. mikrobiol. i virus. AN Kazakh. SSR 5:98-103 '61. (MIRA 15:4)
(Balpash-Sor, Lake--Baths, Moor and mud) (Micro-organisms)

SHIGAYEVA, M.[redacted].; SIVERTSEVA, V.D.

Natural variability of Actinomyces coelicolor, strain No. 17.
Trudy Inst.mikrobiol.i virus.AN Kazkah.SSR 6:78-82 '62. (MIRA 15:8)

(ACTINOMYCES)

SHIGAYEVA, M.kh.; SIVERTSEVA, V.D.

Variability of Actinomyces, producer of celicomycin, induced by ultraviolet rays. Trudy Inst. mikrobiol. i virus. AM Kazakh. SSR 7:90-94 '63 (MIRA 16:12)

SHIGAYEVA, M.Kh.

Characteristics of a pigmentless variant of Actinomyces coelicolor, producer of coelicomycin. Trudy Inst. mikrobiol. i virus. AM Kazakh. SSR 7:95-98 '63 (MIRA 16:12)

Effect of ultraviolet rays on the pigmentless variant, producer of coelicomycin. Ibid.:99-105

L 13625-65 Pb-4/Pa-4 BSD/AMD/AS(mp)-2

ACCESSION NR: AR4045853 S/0299/64/000/014/B031/B032

SOURCE: Ref. zh. Biologiya. Svodny*y tom, Abs. 14B230 B

AUTHOR: Shigayeva, M. Kh.; Sivertseva, V. D.

TITLE: Selection of active strains of coelicicomycin producers using ultraviolet rays

CITED SOURCE: Izv. AN KazSSR. Ser. biol. n., vy*p. 1, 1964, 53-57

TOPIC TAGS: coelicomycin, ultraviolet rays, mutation, irradiation, Actinomyces coelicolor strain 17/65, antibiotic

TRANSLATION: As a result of irradiating spores of Actinomyces coelicolor strain 17/65 three times and then selecting active variants, three mutant strains were produced which synthesize two times more antibiotic than the initial culture. Antibiotic activity of these mutants is higher in the medium in which the selection was made; activity is highest in Chapek's medium and amounts to 128, 192, and 256 units/mg. It has been established that succeeding irradiations (second and third) reduce the selection rate but

Card 1/2

L 13625-65
ACCESSION NR: AR4045853

increase the stability of the mutants.

SUB CODE: LS ENCL: 00

Card 2/2

SHIGAYEVA, M.Kh.; SIVERTSEVA, V.D.; DZYUBANOVA, R.M.

Effect of ethylenimine on Actinomyces coelicolor, producer of celicomycin. Trudy Inst. mikrobiol. i virus. AN Kazakh. SSR. 8: 86-92 '65. (MIRA 18:11)

SHIGAYEVA, M.Kh.; SIVERTSEVA, V.D.; ALEKSEYEVA, Z.I.

Characteristics of the active strain of Actinomyces coelicolor produced by the action of ultraviolet rays. Trudy Inst. mikrobiol. i virus. AN Kazakh. SSR. 8:93-100 '65.
(MIRA 18:11)

SHIGER, A.G.

Administrativno-territorial'noe delenie zarubezhnykh stran. Chast'1 (Administrative-territorial division of foreign countries. Part I). Moskva, Geografgiz, 1952. 272 p.

SO: Monthly List of Russian Accessions, Vol. 6, No. 1, April 1953

SHIGER, A.G.
VOL'F, M.B.

"Administrative and territorial division of foreign countries"; handbook, part 1. A.G.Shiger. Reviewed by M.B.Vol'f. Izv.Vses.geog. ob-va 86 no.3:312-313 My-Je '54. (MLRA 7:6)
(Shiger, A.G.) (Administrative and political divisions)

CHUZO, Nagaiszi, dr., prof.; YOSHIO, Okada, dr.; SHIGETOSHI, Ishiko, dr.; SHIGEO, Daido, dr.

Electron microscopic picture of the healthy and diseased lung. Tuberkulozis 17 no.2:40-46 F '64.

1. A kyotoi Egyetem Tbc kutatointezetenek Sebeszeti klinikaja (Japan) kozlemenye.

CHUZO, Nagaiszi, dr., prof.; YOSHIO, Okada, dr.; SHIGETOSHI, Ishiko, dr.; SHIGEO, Daido, dr.

Electron microscopic picture of the healthy and diseased lung. Tuberkulozis 17 no.2:40-46 F '64.

1. A kyotoi Egyetem Tbc kutatointezetenek Sebeszeti klinikaja (Japan) kozlemenye.

S/137/60/000/009/028/029
A006/A001

Translation from: Referativnyy zhurnal, Metallurgiya, 1960, No. 9, p. 269,
# 21700

AUTHORS: Kopp, L.P., Shigidina, L.M., Sudakova, O.D.

TITLE: On the Problem of Causes of Reduced Ductility of X23H18 (Kh23N18) Steel at Elevated Temperatures and the Possibility of Improving Same by Rare-Earth Elements

PERIODICAL: V sb.: Redkozemel'n. elementy v stalyakh i splavakh, Moscow, Metallurgizdat, 1959, pp. 211-230

TEXT: A study was made of the dependence between the macrostructure of a Kh23N18 steel ingot and the ductility of the steel at 900-1,200°C, and of the effect of rare-earth elements on the macrostructure of the ingot, the purity in respect to S and $O_2$, and the ductility of the steel. Ductility was evaluated from the number of revolutions until the breakdown of a square section specimens of 10 x 10 mm, twisted at high temperatures. It was stated that the introduction

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S/137/60/000/009/028/029
A006/A001

On the Problem of Causes of Reduced Ductility of X 23H 18 (Kh23N18) Steel at Elevated Temperatures and the Possibility of Improving Same by Rare-Earth Elements

to the steel of $\geq$ 0.2% Ce caused a decrease of the S and $O_2$ content in the steel but did not change the N content. The positive effect of Ce on the ductility of Kh23N18 steel was established only at 1,200° and Ce content $\leq$ 0.1%. The effect of Ce is connected not as much with a reduced S content, as with deoxidation of the steel and the formation of compounds of rare-earth elements with S and $O_2$ having high melting points. There are 10 references.

T.F.

Translator's note: This is the full translation of the original Russian abstract.

Card 2/2

SHIGILDEYEV, G. N.

BOLOTOV, P. A. Inzhener i OSTAPKOVICH, M. A. Inzh., VOROBYEV, A. A. Inzh., SHIGILDEYEV, G. N. Inzh.

Leningradskiy filial Vsesoyuznogo nauchno-issledovatel'skogo instituta stroitel'nogo i dorozhnogo mashinostroyeniya

RASTVORONASOS PROIZVODITEL'NOST'YU 1-2 m3/chas DLYA ZHESTKIKH RASTVOROV Page 143

SO: Collections of Annotations of Scientific Research Work on Construction, completed in 1950. Moscow 1951

CHIGINSKIY, G.S., tekhnik

Prevention of the wedging of the start valves of VVN air switches.
Energetik no.9:28-29 S '64. (MIRA 17:10)

SORVIN, Ye., inzh.; SHIGIN, A.

Device for measuring the filament voltage of high-voltage kenotrons. Radio no.2:39-40 F '63. (MIRA 16:2)
(Diodes) (Electron tubes—Testing)

SHIGIN, A., kand. tekhn. nauk; POSPELOV, D., starshiy prepodavatel'

Cybernetics in automotive transportation. Za rul. 21 no.3: 16-17 Mr '63. (MIRA 16:4)

1. Moskovskiy energeticheskiy institut.

(Transportation, Automotive) (Cybernetics)

SHIGIN, A. A.

Parasites - Herons

New filaria of heron. Trudy Gel'm, lab. No. 5, 1951.

9. Monthly List of Russian Accessions, Library of Congress, September 1952. UNCL.

SHIGIN, A. A.

"Helminths of Ichthyophagous Birds of the Rybinsk Reservoir." Cand Biol Sci, All-Union Inst of Helminthology, Moscow, 1954. (RZhBiol, No 8, Dec 54)

Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (12)
SO: Sum. No. 556, 24 Jun 55

SHIGIN,A.A.

Results of helminthological research on ichthyophagous birds of the Rybinsk Reservoir for the three years, 1949-1951. Trudy probl.i tem.sov. no.4:57-60 '54. (MLRA 8:7)

1. Gor'kovskiy Gosudarstvennyy pedagogicheskiy institut, Kafedra zoologii.
(Parasites--Water birds) (Parasites--Fishes) (Rybinsk Reservoir--Parasites)

SHIGIN, A.A.

Independence of the genus Episthmium (Lühe, 1909) in connection with the description of a new species Ep.colymbi nov.sp.from the great crested grebe. Trudy Biol.sta."Borok" no.2:327-334 '55. (Trematoda) (Parasites--Grebes) (MLRA 9:6)

SHIGIN, A. A.

USSR / Zooparasitology - Helminths. G-2

Abs Jour : Ref Zhur - Biol., No 18, 1958, No. 81706

Author : Shigin, A. A.
Inst : Not given
Title : Parasitic Helminths From Herons and Grebe of the Rybinsk Reservoir

Orig Pub : Tr. Darvinsk. gos. zapovedn., 1957, No 4, 245-289

Abstract : In the Darwin reservation in 1949-1952 and 1954, 168 grey and 2 grey-cheeked herons and 70 large grebe were dissected, in which 638 species of helminths were found (28 species of trematodes, 13 cestodes, 21 nematodes, and 1 skreben species); in grebe 27 species (11 trematodes, 7 cestodes and 9 species of nematodes). Eleven species of helminths complete their full cycle in the reservoir, using different fish species as their intermediary or final hosts. Among parasites most pathogenic to fish are

Card 1/2

IZYUMOVA, N.A.; SHIGIN, A.A.

Parasites of fishes of the Volga River in the regions of Gorkiy and Kuybyshev Reservoirs. Trudy Biol. sta. "Borok" no.3:364-383 '58.
(MIRA 11:9)

(Gorkiy Reservoir--Parasites--Fishes)
(Kuybyshev Reservoir--Parasites--Fishes)

SHIGIN, A. A.

"On the Specific Composition of the Diplostomum (Strigeata) Fenus of Trematodes Which Parasitize Gulls."

Tenth Conference on Parasitological Problems and Diseases with Natural Reservoirs, 22-29 October 1959, Vol. II, Publishing House of Academy of Sciences, USSR, Moscow-Leningrad, 1959.

Darwinian State Reservation

SHIGIN, A.A.

Helminth fauna of laridine birds in Rybinsk Reservoir. Trudy DGZ no.7:309-362 '61. (MIRA 16:2)
(Rybinsk Reservoir--Parasites--Terns)
(Rybinsk Reservoir--Parasites--Gulls)
(Rybinsk Reservoir--Worms, Intestinal and parasitic)

SHIGIN, A.A.

Life span of Diplostomum spathaceum in the organism of an additional host. Trudy Gel'm. lab. 14:262-272 '64. (MIRA 17:10)

SUDARIKOV, V. Ye.; SHIGIN, A.A.

Methods of studying metacercaria of trematodes of the order Strigeidida. Trudy Gel'm. lab. 15:158-166 '65.
(MIRA 19:1)

SHIGIN, A.A.

Taxonomic significance of the secondary excretory system in metacercaria of the genus Diplostomum. Trudy Gel'm. lab. 15: 200-202 '65 (MIRA 19:1)

Study of the life cycle of Diplostomum mergi (Trematoda, Diplostomatidae), a new pathogen of fish diplostomatosis. Ibid.:203-205

SHIGIN A.G.

112-3-6498

Translation from: Referativnyy Zhurnal, Elektrotekhnika, 1957, Nr 3, p. 200 (USSR)

AUTHOR: Shigin, A.G.

TITLE: Generation of Given Time Intervals by an Electronic Computer (Polucheniye zadannykh intervalov vremeni pri pomoshchi elektronnogo schetnogo ustroystva)

PERIODICAL: Tr. Mosk. energ. in-ta, 1956, Nr 18, pp. 319-330

ABSTRACT: The author describes an electronic instrument designed and constructed in the Electronic Computing Laboratory of the Moscow Institute of Power Engineering. The instrument generates pulses with determined and precise sequential time delays. There are two interval ranges: 1) 10,20,40,80, 160,320,640 and 1,280 $\mu$ sec; 2) 1,2,4,8,16,32,64 and 128 msec. The desired interval is selected by a switching arrangement on the control panel. The absolute error in the first range is less than 0,25$\mu$ sec, and not greater

Card 1/3

Generation of Given Time Intervals by an Electronic Computer (Cont.)

than 2 $\mu$ sec in the second range. The output signals, which indicate the limits of the intervals, have a peaked shape of positive and negative polarity (the first half of the signal is a positive pulse, and the second half is negative); the total durationg of the signal is not greater than 0.8 $\mu$ sec. The instrument can be adjusted for continuous generation of pulses or for the generation of only two pulses with a given sequence interval. Paired pulses are registered by neon tubes. The instrument is provided with two output channels, which can be connected in parallel. In another mode of operation, paired pulses can also be generated in different channels, i.e., the first pulse in the first channel and the second pulse in the second channel. The operating conditions are selected by means of flip-flop switches. The instrument operates in the following manner. A 100-kc quartz-stabilized sine-wave generator sends signals to a pulse shaper. If necessary, a four-stage frequency divider is connected between the

Generation of Given Time Intervals by an Electronic Computer (Cont.)

generator and pulse shaper to decrease the frequency by a factor of 100; in other words, the signal at the divider output has a frequency of 1 kc. A blocking oscillator employed as a pulse shaper shapes the sine-wave pulses into short peaked pulses of alternating polarity. Definite pulses are now selected (for example, every second or fourth pulse). The pulses are selected by a counting circuit consisting of trigger stages; the method used eliminates the possibility of different triggering times influencing the uniformity of the pulse sequence. The output device transforms the pulses into a bipolar form and permits controlling the amplitude of the output pulses in the limits of 0 to 5 v. The shape and amplitude of the output pulses are monitored by an oscilloscope unit consisting of an amplifier, a sweep generator and an oscillotron. The shortcomings of the instrument are pointed out, and methods for improvement are suggested. V.A.B

Card 3/3

SHIGIN, A.G.

High-precision time-interval transmitters. Biul.tekh.-ekon.inform. (MIRA 11:7)
no.5:30-31 '58.
(Pulse techniques (Electronics)) (Time signals)

ZIMIN, Viktor Aleksandrovich; BARABANOVA, G.K., inzh., retsenzent; ZHDANOV, G.M., doktor tekhn. nauk, retsenzent; ROGACHEVA, O.I., inzh., retsenzent; SEMENOVA, Ye.T., inzh., retsenzent; SHIGIN, A.G., kand. tekhn. nauk, retsenzent; MARTENS, S.L., inzh., red.; MODEL', B.I., tekhn. red.

[Electronic calculating machines; fundamentals of theory, design, and application] Elektronnye vychislitel'nye mashiny; osnovy teorii, rascheta i primeneniia. Moskva, Mashigz, 1962. 737 p. (MIRA 15:4)
(Electronic calculating machines)

S/196/62/000/017/005/005
E194/E155

AUTHOR: Shigin, A.G.

TITLE: A computer for determining the technical-economic characteristics of thermal electric power stations

PERIODICAL: Referativnyy zhurnal, Elektrotekhnika i energetika, no.17, 1962, 29, abstract 17 G 163. (Tr. Mosk. energ. in-ta, no.37, 1961, 169-181).

TEXT: A computer for this use should perform the following: collect and sort all the necessary information; convert the information into a binary code; correct the initial data, using certain mathematical devices; calculate in a certain sequence various technical-economic characteristics of the sets, and groups of the thermal electric power station as a whole; calculate the technical-economic characteristics to determine the optimum operating conditions of the power station. On the basis of the formulae that are obtained for determination of the technical-economic characteristics a programme is drawn up for calculating them. Analysis of the programme shows that the error of calculation of the technical-economic characteristics is 3.5-4% of the

Card 1/2

A computer for determining the ... S/196/62/000/017/005/005
E194/E155

maximum values of the magnitudes calculated, unless the instruments used to collect the necessary information are improved. With the existing instruments the error can, however, be reduced to 2.5-3% by taking mean values of initial data over a time interval and excluding significant random errors from the means by the usual methods. A digital computer was selected for the purpose. Analysis of the computer programme provided the initial data necessary both to select the type of computer from those available and also to develop a specialised computer (in this latter case the functions of the computer may be extended). It appears most promising to employ the principle of parallel operation in computers with ferrite-transistor elements. Fundamental properties are given of a computer based on electronic tubes. Such a computer, if the series principle is used, requires 580 electronic tubes. It has approximately the same operating speed as the high-speed universal computer type "Ural" ('Ural') which contains 800 electronic tubes. 4 references.

[Abstractor's note: Complete translation.]

Card 2/2

POSPELOV, Dmitriy Aleksandrovich; SHIGIN, A.G., dots., red.

[Arithmetical and logical principles of digital computers] Arifmeticheskie i logicheskie osnovy vychislitel'nykh mashin diskretnogo deistviia. Moskva, Mosk. energeticheskii in-t. Pt.2.[Logic algebra functions, synthesis and analysis of networks with time independent operation] Funktsii algebry logiki, sintez i analiz skhem, rabota kotorykh ne zavisit ot vremeni. Red. A.A. Shigin. 1961. 107 p. Pt.3. [Time dependent and recurrent Boolean functions, analysis and synthesis of networks with time dependent operation] Vremennye i rekurrentnye bulevy funktsii, analiz i sintez skhem, rabota kotorykh zavisit ot vremeni. Red. A.G.Shigin. 1961. 79 p. (MIRA 16:4)
(Electronic computers)

SHIGIN, A.G.

System of complex automation and calculating machines. Trudy MEI no.41:5-18 '62. (MIRA 16:7)

(Automation) (Electronic computers)

BERS, A.A.; SHIGIN, A.G.

Structure of the command cycle of a discrete-type computer and computer efficiency. Trudy MEI no.41:19-32 '62.
(MIRA 16:7)

(Electronic computers)

SHIGIN, A.G.; SHCHEGLOV, Yu.M.

Special features of the operation of a ferrite-transistor stage. Trudy MEI no.41:61-80 '62. (MIRA 16:7)

(Electronic computers—Circuits)

SURGUCHEVA, M.V.; SHIGIN, A.G.

Study of the input characteristics of a transistor during large signal input. Trudy MEI no.41:97-112 '62. (MIRA 16:7)

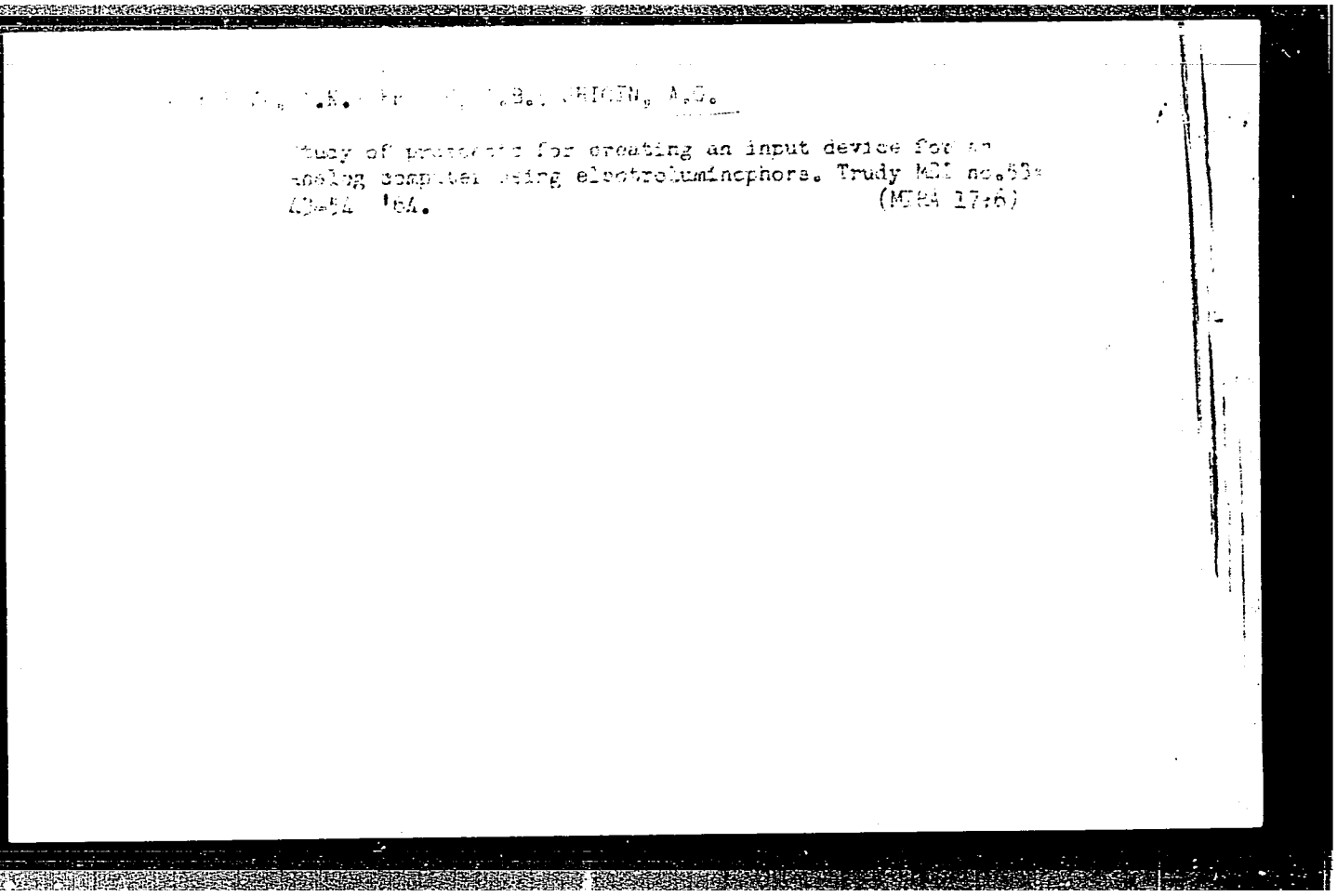
(Transistors)

POSPELOV, Dmitriy Aleksandrovich; SHIGIN, A.G., red.

[Solution of problems using numerical computers] Reshenie zadach na vychislitel'nykh [redacted] shinakh diskretnogo deistviia. Moskva, Mosk. energ. in-t. Pt.1. [Principles of programming] Osnovy programmirovaniia. 1961. 159 p. (MIRA 17:1)

AL'PEROVICH, L.Z. (Moskva); SHIGIN, A.G. (Moskva)

Module control of arithmetic operations. Izv. AN SSSR. Tekh. kib. no.3:69-71 Je '64. (MIRA 17:10)



[illegible] K. [illegible] B. [illegible] MIKIN, A.G.

Study of principles for creating an input device for an analog computer using electroluminophore. Trudy MAI no.59: 43-54 '54. (MLRA 7:6)

PYATKIN, V.P.; SHIGIN, A.G.

Information nets of concepts and of the structure of a teaching process. Trudy MEI no.53:89-95 '64.
(MIR 17:6)

ACCESSION NR: AP4041961 S/0280/64/000/003/0069/0071

AUTHOR: Al'perovich, L. Z., Shigin, A. G.

TITLE: Control by the modulus of arithmetic operations

SOURCE: AN SSSR. Izv. Tekhnicheskaya kibernetika, no. 3, 1964, 69-71

TOPIC TAGS: control system, error correction, automatic control, cybernetics, arithmetic operation, modulus, modular control

ABSTRACT: In the work of V. V. Peterson (0 kontrole summatora Kiberneticheskiy sbornik, 1962, No. 4), it is shown that any self-contained control of a summation device is control by a modulus. In the present paper, the organization of control with the use of several moduli is proposed and recommendations are given for the selection of a system of moduli. A method of error correction is also described, and the control of numbers with floating commas is considered. For convenience of control the selection of a modulus is based on the following fact: Let $A = \sum_{i=0}^{n} a_i x^i$ be any number written in a notation system

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ACCESSION NR: AP4041961

with basis $x > 1$. Here $0 \leq a_i < x$. In order that the equality be true with respect to the modulus

$$\sum_{i=0}^{n} a_i x^i \equiv \sum_{i=0}^{n} a_i \pmod{p}, \qquad (1)$$

it is necessary and sufficient that the modulus p be a divisor of the number $x - 1$. Five examples are considered. In conclusion, the author points out that examples of the use of one modulus for control of the work of a machine are well-known. The extension of the number of moduli seems a comparatively simple problem and does not cause difficulty in its realization, while providing a significant advantage to the system in comparison to the well-known methods of multiple duplication. Orig. art. has: 5 formulas and 3 figures.

ASSOCIATION: none

SUBMITTED: 15Oct63 ENCL: 00

SUB CODE: MA, DP NO REF SOV: 001 OTHER: 000

2/2
Card

MATVEYEV, V., inzh.; SHIGIN, I.

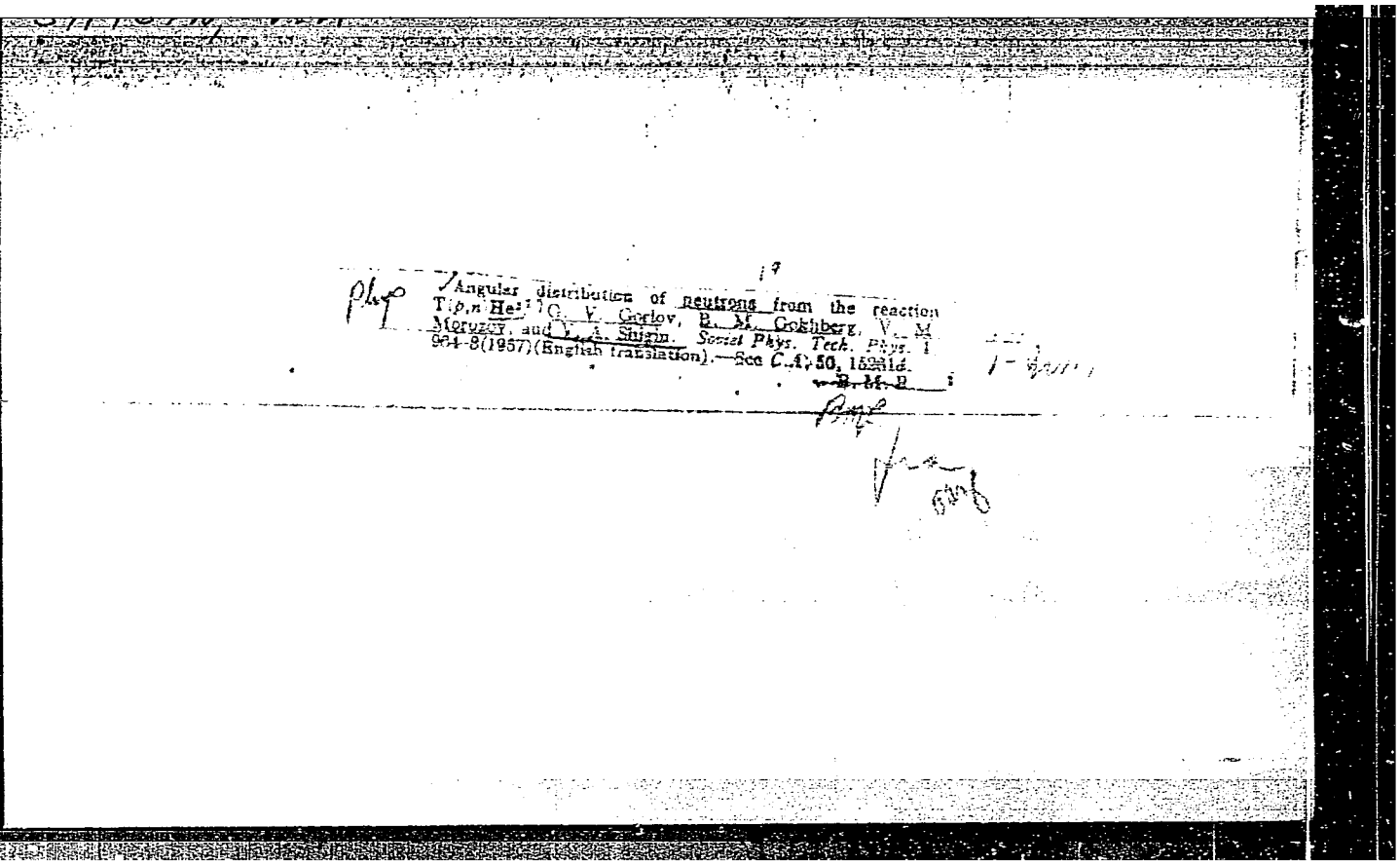
Large precast reinforced concrete industrial building.
Stroitel' no.2:3-5 F '60. (MIRA 13:5)

1. Proizvodstvenno-tekhnicheskoye otdeleniye tresta No.2, Voronezh (for Matveyev). 2. Glavnyy inzhener spetsuchastka UNR-570 tresta Stal'konstruktsiya (for Shigin).
(Voronezh--Industrial buildings)
(Precast concrete construction)

SHIGIN, V.A.

SUBJECT USSR / PHYSICS CARD 1 / 2 PA - 1346
AUTHOR GORLOV, G.V., GOCHBERG, B.M., MOROZOV, V.M., ŠIGIN, V.A.
TITLE The Angular Distribution of the Neutrons Produced on the Occasion of the Reaction $T(p,n)He^3$.
PERIODICAL Žurn.techn.fis, 26, fasc. 5, 985-989 (1956)
Issued: 6 / 1956 reviewed: 10 / 1956

This angular distribution was measured for proton energies of 1200, 1400 and 1600 keV. The protons were produced by means of an electrostatic generator and after passing through a 90 degrees magnetic analyzer they were directed upon a tritium target. The system for the voltage stabilization of the generator warrants a constancy of the proton energy which is accurate up to $2.10^{-2}$%. A solid tritium target was used, and a long counter served as a detector. The proportionality counter had a firm covering of boron and was filled with a mixture of argon and methyl alcohol. Next, the problem of the sensitivity of the long counter with respect to neutrons with different energies is discussed in detail. With the help of the obtained characteristic of sensitivity it was possible to measure the angular distribution of neutrons with more than 25 keV with great accuracy, i.e. for all angles at proton energies of 1400 and 1600 keV and for angles below 152° (in the center of mass system) at 1200 keV. In the case of large angles and 1200 keV accuracy is considerably lower.
Angular distribution was measured inside a cabin of 3 x 3 x 2,5 m, the walls of which were coated with a mixture of paraffin and borax. In the center of the cabin was the tritium target. The long counter was located at the distance of



Angular distribution of neutrons from the reaction T(p,n)He³. G. V. Gorlov, B. M. Golubberg, V. M. Morozov, and V. A. Shigin. *Soviet Phys. Tech. Phys.* 1 904-8(1957)(English translation).—See *C.A.* 50, 16284d.

21(7) SOV/89-6-4-8/27

AUTHORS: Gorlov, G. V., Gokhberg, B. M., Morozov, V. M., Otroshchenko, G. A., Shigin, V. A.

TITLE: The Fission Cross Sections for $U^{233}$ and $U^{235}$ Under the Action of Neutrons With Energies From 3 to 800 kev (Secheniya deleniya $U^{233}$ i $U^{235}$ pod deystviyem neytronov s energiyey ot 3 do 800 kev)

PERIODICAL: Atomnaya energiya, 1959, Vol 6, Nr 4, pp 453-457 (USSR)

ABSTRACT: The neutrons were obtained from the $T(p,n)He^3$-reaction, the proton energy amounting to 1200, 1400 and 1600 kev. The measuring chamber, the construction of the target, the neutron detector, and measurement of the angular distribution of the T(p,n)He-reaction are described by reference 2. Determination of the dependence of the fission cross section on neutron energy was carried out in two stages. First, only the relative course of fission cross section dependence was determined. Next, the absolute value of $\sigma_f$ for 270 kev neutrons was measured, and with this reference value the relative curves were re-calculated. Results are graphically represented and show the following limits:

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SOV/89-6-4-8/27

The Fission Cross Sections for $U^{233}$ and $U^{235}$ Under the Action of Neutrons With Energies From 3 to 800 kev

| $E_n$ | $\sigma_f(U^{235})$ | $\sigma_f(U^{233})$ |
|---|---|---|
| 3.4 kev | 4.8 b | 7.5 b |
| 780 kev | 1.05 b | 1.9 b |

Accuracy of neutron energies at $E_p$ = 1200 kev

| $E_n$ | for $U^{235}$ | for $U^{233}$ |
|---|---|---|
| 3.4 kev | ± 0.8 kev | ± 0.7 kev |
| 200 kev | ± 28 kev | ± 17 kev |
| 340 kev | ± 13 kev | ± 9.5 kev |

Accuracy of neutron flux measurement: ~2-3% (at neutron energies of 9 and 3.4 kev it however amounted to 6 and 14% respectively). Accuracy of the measurement of the relative course of the fission cross section curve: ~4% for $U^{235}$ and ~6% for $U^{233}$ (except in the case of neutron energies of 3.4 kev - 16%, 9 kev - 9%, 30 kev - 6%, for $U^{235}$ and $U^{233}$ correspondingly 19, 11, and 9%). Sum errors in absolute $\sigma_f$-determination: $U^{235}$ ~ 7%, $U^{233}$ ~ 8%.

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The Fission Cross Sections for $U^{233}$ and $U^{235}$ Under the Action of Neutrons With Energies From 3 to 800 kev SOV/89-6-4-8/27

The results obtained agree well with previously obtained data, but it must be born in mind that the present work was carried out already in 1953-1954. There are 3 figures and 5 references, 4 of which are Soviet.

SUBMITTED: September 25, 1958

Card 3/3

Cross Section of $Th^{229}$ Fission

electronic recorder. Nickel windows 0.5 mm thick were soldered to the front plates of the chamber. A thorium layer approximately 0.8 mg/cm$^2$ thick and having a diameter of 17 mm was attached to the high-voltage electrode of the chamber. The thorium had the following isotope composition: 60 mg of $Th^{229}$ and 1.5 mg of $Th^{232}$. The chamber was filled with 65% argon and 35% methane (2 atm pressure), and mounted on a turntable. The resolution with reference to the energy varied from 2 kev for measurements of 6 kev neutrons to 20 kev for measurements of $\geq$350 kev neutrons. The number of fissions on the scattered neutrons was determined from deviation of chamber counts from the $1/r^2$-function at different distances between chamber and target. Results of the experiment are illustrated in a figure. The course of the cross section curve differs greatly from the typical dependence of the fission cross section on the energy of the neutrons. This holds for nuclei split by thermal neutrons. The cross section decreases by 20% altogether in the interval 20-200 kev, thereafter diminishes greatly toward a minimum at 600 kev, and then increases again by 25%. Unfortunately, measurements at energies above 1200 kev were

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not possible owing to the large content of $Th^{232}$. There is 1 figure.

ASSOCIATION: Institut atomnoy energii Akademii nauk SSSR (Institute of Atomic Energy of the Academy of Sciences, USSR)

PRESENTED: June 2, 1959, by I. V. Kurchatov, Academician

SUBMITTED: April 9, 1959

66412
SOV/20-128-6-16/63

24.6600

AUTHORS: Gokhberg, B. M., Otroshchenko, G. A., Shigin, V. A.

TITLE: Effective Cross Sections and Anisotropy of $Np^{237}$ and $Th^{230}$ Fissions

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 128, Nr 6, pp 1157-1159 (USSR)

ABSTRACT: It was a matter of interest to measure the effective cross sections and anisotropy of nuclear fission in the immediate proximity of the threshold value. Such measurements had hitherto been made only for $U^{238}$ and $Th^{232}$. The authors investigated nuclei $Np^{237}$ and $Th^{230}$. Experimental conditions and technique of measuring the fission cross sections had already been investigated earlier (Ref 3). The layers of fissioning substances had a thickness of $\sim$0.5 mg/cm$^2$. Further experimental conditions are mentioned. 2 diagrams illustrate the dependence of the fission cross section and the ratio of differential fission cross sections $\sigma_f(0^o)/\sigma_f(90^o)$ on the energy of neutrons. Because of the small effective cross section of reaction, anisotropy of

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Effective Cross Sections and Anisotropy of $Np^{237}$ and $Th^{230}$ Fissions

$Np^{237}$ fission was only measured beginning with a neutron energy of 350 kev. Owing to the lack of sufficiently reliable data concerning the isotopic composition of the $Th^{230}$ sample, measurements could not be made on $Th^{230}$ above an energy of 1200 kev, where impurity $Th^{232}$ begins to make its action strongly felt. Owing to this reason it was also impossible to determine the absolute value of the fission cross section of $Th^{232}$ by this experiment. For $Np^{237}$, fission cross section remains almost constant in the range of energies of from 12 to 100 kev, i.e. within a tenfold change of energy (~ 20 mb), and a threshold value of reaction is evidently lacking. This fact is a little surprising, as seen from the viewpoint of the fission model used today. On the other hand, the plane course of the cross section and the slight anisotropy of fission are evidently in good agreement with the fact that the original $Np^{237}$ nucleus is odd - even and that it exhibits a high spin. The $Np^{238}$ nucleus is originating from the capture of the neutron is odd - odd, i.e.

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Effective Cross Sections and Anisotropy of $Np^{237}$ and $Th^{230}$ Fissions

it is highly excited, namely with a large moment. This leads to the mentioned character of dependence of fission characteristics on the neutron energy. Fission cross section of $Th^{230}$ versus energy of neutron function is likewise in good agreement with the conclusions derived from the "collective" model with respect to the even - even nucleus. Fission of $Th^{230}$ has its threshold value at 650 kev, with the cross section increasing strongly beyond that value. At the beginning of the general cross section rise a local maximum is clearly noticeable. This is the reason why the $Th^{231}$ nucleus may have a level at a great distance from the other higher levels. Anisotropy of fission in the range of this maximum, however, is the opposite to the one which is presupposed by the collective model for an even - even nucleus. Further investigations concerning the character of $Th^{230}$ anisotropy and especially, measurement of the total angular distribution of the fission fragments, are yet required to clarify this problem. There are 2 figures and 4 references, 1 of which is Soviet.



4

66412

SOV/20-128-6-16/63

Effective Cross Sections and Anisotropy of $Np^{237}$ and $Th^{230}$ Fissions

ASSOCIATION: Institut atomnoy energii Akademii nauk SSSR (Institute of Atomic Energy of the Academy of Sciences, USSR)

PRESENTED: June 2, 1959, by I. V. Kurchatov, Academician

SUBMITTED: April 9, 1959

4

Card 4/4

33082
S/638/61/001/000/004/056
B102/B138

21.2100

AUTHORS: Gokhberg, B. M., Otroshchenko, G. A., Shigin, V. A.

TITLE: Fission cross section of $Th^{229}$, $Th^{230}$, and $Np^{237}$ and fission anisotropy of $Th^{230}$ and $Np^{237}$

SOURCE: Tashkentskaya konferentsiya po mirnomy ispol'zovaniyu atomnoy energii. Tashkent, 1959. Trudy. v. 1. Tashkent, 1961, 57-61

TEXT: Fission cross sections and anisotropy were measured around the fission threshold. The bombarding neutrons were produced in T(p,n) reactions. In bombardment with neutrons of $E_n < 350$ kev, $E_p$ was 1200 kev, for $E_n > 350$ kev $E_p$ was varied and only the neutrons emitted in the direction of the proton beam were used. Fission was determined by a plane-parallel ionization chamber connected with a recorder. The background due to fissions induced by scattered neutrons was determined by check measurements and did not exceed 10%. Anisotropy was also observed with an ionization chamber. The energy resolution was 30 kev. Results: $Th^{229}$. The

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33082
S/638/61/001/000/004/056
B102/B138

Fission cross section of ...

specimen consisted of 60 μg $Th^{229}$ + 1.5 μg $Th^{232}$. $\sigma_f = F(E_n)$ decreases rapidly between 6 and 20 kev, it decreases 20% between 20 and 200 kev and reaches a minimum at 600 kev, after which it increases slightly again. $Th^{230}$. The exact isotopic composition of the specimen was not known. Only relative measurements were made up to $E_n$ = 1200 kev. The fission threshold is at $E_n \approx 670$ kev. The local maximum at $E_n \approx 770$ kev suggests the existence of a $Th^{231}$ level far removed from the higher levels. The results are in good agreement with those of the collective model of even-even nuclei. $N^{237}$. The specimens contained practically no admixtures. Between 12 and 150 kev, $\sigma_f$ is almost constant ($\sim$20 mb), then it rises almost linearly, and tending to saturation a bit beyond 1000 kev. The anisotropy, $\sigma_f(0^\circ)/\sigma_f(90^\circ)$ was also measured as a function of $E_n$. Between 700 and 1000 kev it decreases from 2 to 1.2 for $Th^{230}$, then rises again and at 1200 kev reaches 1.4. The existence of a maximum near the threshold is in accordance with the collective model. The anisotropy in the range of this maximum is, however, in contradiction to the model given in Ref. 2. In $Np^{237}$ the anisotropy was only measured from $E_n$ = 350 kev.

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Fission cross section of ...

It rises from 1.0 to 1.2 when $E_n$ is increased to 1500 kev. This slight dependence is due to $Np^{237}$ being an odd-even nucleus with 7/2 spin. There are 3 figures and 3 non-Soviet references. The three references to English-language publications read as follows: Ref. 1: Hjill D. L. and Wheeler J. A. Phys. Rev., 89, 1102, 1953; Ref. 2: Wilets L. and Chase D. M. Phys. Rev., 103, 1296, 1956; Ref. 3: Henkel R. L. and Bralley G. E. Phys. Rev., 103, 1292, 1956.

ASSOCIATION: Institut atomnoy energii AN SSSR (Institute of Atomic Energy AS USSR)

Card 3/3

32985
S/641/61/000/000/012/033
B104/B102

24.6600

AUTHORS: Otroshchenko, G. A., Shigin, V. A.

TITLE: Cross section and fission anisotropy of $Np^{237}$ and $Th^{230}$

SOURCE: Krupchitskiy, P. A., ed. Neytronnaya fizika; sbornik statey. Moscow, 1961, 211-216

TEXT: The angular distribution anisotropy of the $Np^{237}$ and $Th^{230}$ fission fragments was studied. The fission was induced by neutrons of up to 1.5 Mev produced in the reaction $T(p,n)He^3$. A 30-40 μa proton beam from an electrostatic generator was directed at a tritium target. This target consisted of titanium saturated with tritium to T/Ti atomic ratio of 1.8. The neutron flux was determined by a boron counter. At neutron energies above 350 kev the measurements were made in the neutron fluxes leaving the target in the direction of the proton beam. Owing to its thickness the protons lost about 60 kev in the target. The neutron energy was varied by varying the proton energy. In measurements with protons of energies lower than 350 kev the proton energy was kept constant at about 1200 kev and neutron fluxes were used that left the target at different angles

Card 1/1 2

Cross section and fission ...

relative to the proton beam. The fission events were recorded by means of a plane-parallel ionization chamber. A thin layer (0.5 mg/cm$^2$, 17 mm diameter) of the substance to be fissioned was applied to the high-voltage electrode of the chamber. The chamber was filled with 2 atm argon (with 35% methane). The energy resolution varied from 3 kev for 12 kev neutrons to 20 kev for 350-kev neutrons. The anisotropy of the fission fragments was determined by means of a double ionization chamber. The substance to be fissioned was placed at a distance of 67 mm from the target. The results are graphically represented. There are 3 figures and 3 non-Soviet references. The two references to English-language publications read as follows: Henkel R. L., Brolley J. E., Phys. Rev., 103, 1296 (1956); Wilets L., Chase D. M., Phys. Rev., 103, 1296 (1956).

Fig. 2. Cross section and fission anisotropy of $Np^{237}$ as a function of the neutron energy.
Legend: (1) $\sigma_f$ in barn, $E_n$ in kev.

Fig. 3. Cross section and fission anisotropy of $Th^{230}$ as a function of the neutron energy.
Legend: (1) $\sigma_f$ in relative units, $E_n$ in kev.

Card 2/2

SHIGIN, V.A.

Anisotropy of $I_{0°}/I_{90°}$ fragments resulting from the fission of U233 by 100-1000 Kev. neutrons. Dokl. AN SSSR 140 no.2:351-353 S '61. (MIRA 14:9)

1. Institut atomnoy energii im. I.V.Kurchatova AN SSSR. Predstavleno akademikom A.P.Aleksandrovym.
(Nuclear fission) (Uranium--Isotopes) (Neutrons)

OTROSHCHENKO, G.A.; SHIGIN, V.A.

[Effective fission cross sections and anisotropy of $Np^{237}$ and $Th^{230}$] Effektivnye secheniia i anizotropiia deleniia $Np^{237}$ i $Th^{230}$. Moskva, Glav.upr. po ispol'zovaniiu atomnoi energii, 1960. 12 p. (MIRA 17:1)

DUBROVINA, B. M.; SHIGIN, V. A.

"Fission cross section of PA 231 and PU 239XY neutrons in the energy interval 1,5 - 1500 KEV."

report submitted for IAEA Intl Nuclear Data Sci Working Group Mtg, Vienna, 9-13 Nov 64.

ACCESSION NR: AP4042787 S/0020/64/157/003/0561/0562

AUTHORS: Dubrovina, S. M.; Shigin, V. A.

TITLE: Cross section for fission of Pa-231 and Pu-239 by neutrons in the energy interval 1.5--1500 keV

SOURCE: AN SSSR. Doklady*, v. 157, no. 3, 1964, 561-562

TOPIC TAGS: protactinium, plutonium, fission cross section, fission neutron, odd even nucleus, neutron scattering, inelastic scattering

ABSTRACT: The authors wanted to ascertain whether the absence of irregularity in the variation of the fission cross section with the neutron energy near the fission threshold is a characteristic of all odd-even nuclei. To this end, they studied the variation of the fission cross section of the odd-even nucleus $Pa^{231}$. The cross sections for the fission of $Pa^{231}$ were measured in the neutron energy interval 140--1740 keV. In addition, they measured the fis-

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ACCESSION NR: AP4042787

sion cross section of $Pu^{239}$ in the neutron energy interval 1.5--1250 keV. The measurements were made with an electrostatic accelerator, using a procedure analogous to that described earlier (G. V. Gorlov et al., Atomnaya energiya v. 6, no. 4, 453, 1959; B. M. Gokhberg et al., DAN, v. 128, no. 5, 911, 1959). The results obtained for $Pu^{239}$ agreed within the limits of measurement error with results by others. The measurements indicate that the fission cross section of $Pa^{231}$ deviates greatly from those of $Np^{237}$ and $Am^{241}$. The dips following the maxima in the fission cross section of $Pa^{231}$ are apparently due to competition on the part of the newly uncovered channels of inelastic neutron scattering. It is, however, difficult to identify these channels, since the corresponding excitation levels of $Pa^{231}$ have not been sufficiently studied. The results of the work therefore show that the irregularity in the course of variation of the fission cross section are observed also in odd-even nuclei. Orig. art. has: 2 figures. Report presented by A. P. Aleksandrov.

Card 2/3

L 2737-66 EWT(m)/EPF(n)-2/EWP(t)/EWP(b)/EWA(h) IJP(c) JD/WW/JG
ACCESSION NR: AP5024335 UR/0367/65/002/002/0243/0247

AUTHOR: Borisova, N. I.; Novgorodtseva, V. I.; Pchelin, V. A.; Shigin, V. A.

TITLE: The symmetric fission threshold for $Np^{237}$

SOURCE: Yadernaya fizika, v. 2, no. 2, 1965, 243-247

TOPIC TAGS: neptunium, radioisotope, nuclear fission, fission cross section, fission threshold

ABSTRACT: The cross section for symmetric fission is measured as a function of excitation energy. Particular attention is given to the behavior of this cross section close to the threshold of asymmetric fission. $Np^{237}$ was used as the target. Fission was produced by neutrons. The low degree of anisotropy in the angular distribution of $Np^{237}$ fission fragments, and the weak relationship between this anisotropy and neutron energy indicate that contributions to the fission cross section from various states at the fission barrier do not change considerably when the neutron energy is varied. This made it possible to eliminate the influence of independent-particle effects on the fission fragment yield. An electrostatic accelerator was used. The T ($p$, $n$) $He^3$ and D ($d$, $n$) $He^3$ reactions served as sources of monochromatic neutrons. Symmetric and asymmetric fissions were identified by the

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L 2737-66
ACCESSION NR: AP5024335

3

radiochemical method. Yields were determined for $Mo^{99}$, $Ag^{111}$, $Cd^{115}$ and $Ba^{140}$. The methods for preparing the sample for irradiation and determining the yields of these isotopes are described. The exposure time was 25-50 hours at a neutron intensity of $2 \cdot 10^8$ neutrons/sec·cm$^2$. The results are graphed and tabulated. It is found that the thresholds of symmetric and asymmetric fission coincide. This indicates that the process of symmetric fission coincides at first with the process of asymmetric fission and that the differences in the yields of symmetric and asymmetric fission and in the behavior of their cross sections at high neutron energies are due to the effect of fragment shells which appear in the last stages of the fission process. "The authors consider it their pleasant duty to thank B. M. Gokhberg and B. V. Kurchatov for constant interest in the work and discussion of the results, and also L. V. Chistyakov for valuable consultation on methods." Orig. art. has: 1 figure, 1 table.

ASSOCIATION: none

SUBMITTED: 20Mar65 ENCL: 00 SUB CODE: NP

NO REF SOV: 005 OTHER: 012

Card 2/2

L 1873-66 EWT(m) DIAAP

ACCESSION NR: AT5022307 UR/3136/65/000/833/0001/0012

AUTHOR: Borisova, N. I.; Novgorodtseva, V. I.; Pchelin, V. A.; Shigin, V. A.

TITLE: Symmetric fission threshold of Np super 237

SOURCE: Moscow. Institut atomnoy energii. Doklady, IAE-833, 1965. Porog simmetrichnogo deleniya Np237, 1-12

TOPIC TAGS: nuclear fission, neptunium, fission cross section, fission product, neutron bombardment

ABSTRACT: The variation of the symmetric fission cross section of Np237 was studied as a function of the excitation energy. Particular attention was concentrated on the behavior of the cross section in the vicinity of the asymmetric fission threshold. The target used was Np237, and the fission was induced by monoenergetic neutrons produced by the reactions T(p,n)He3 and D(d,n)He3. The experiments were carried out on an electrostatic accelerator. The results indicate that the thresholds of symmetric and asymmetric fission coincide. A detailed comparison of the fission cross section curves shows that the barriers of symmetric and asymmetric fission are the same in height as well as shape. The results agree with the hypothesis that during the initial stage the process of

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SUBMITTED: 00

NO REF SOV: 008



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L 1843-66 EWT(m)/EWA(h)
ACCESSION NR: AT5022292 UR/3136/65/000/796/0001/0014

17
B+1

AUTHOR: Shigin, V. A.

TITLE: Nuclear fission via quasi-molecular states

19

SOURCE: Moscow. Institut atomnoy energii. Doklady, IAE-796, 1965. O delenii yader cherez kvazimolekulyarnyye sostoyaniya, 1-14

TOPIC TAGS: nuclear fission, nucleon interaction, nuclear structure

ABSTRACT: A mechanism of nuclear fission via quasi-molecular (QM) states is proposed. The stability of QM states in relation to the fusion and separation of touching nuclei is due to the presence of nucleonic structures in the nuclei and to the associated additional resistance of the nuclei to distortion. At the same time, these states are unstable toward nucleon exchange by the nuclei. Consideration of QM states leads to new interpretations of the fission process according to which fission consists of: (1) the growth of a light nucleus on the surface of the nucleus undergoing fission (this growth takes place at the expense of nucleons migrating to the surface from the core, in which the nucleons are bound together less tightly than in the light nucleus); (2) the subsequent separation of the quasi-molecules formed. The growth of the light nucleus begins

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L 1843-66
ACCESSION NR: AT5022292

with an alpha particle. The mechanism offers a new approach to problems of asymmetry of fragment masses and influence of fragment shells on the fission process; at the same time, the previous approach to the problems of kinetic energy of the fragments and evaporation of neutrons from the latter is retained. The QM mechanism is used to elucidate certain aspects of fission. Orig. art. has: 1 figure and 1 table.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: NP

NO REF SOV: 002 OTHER: 007

Card 2/2

SHIGIN, Ye.K., aspirant

Synthesis of automatic control systems with sign-shifting input of integrating and correcting elements. Nauch.dokl.vys.shkoly; mash.i prib. no.1:193-199 '58. (MIRA 12:1)

1. Predstavleno kafedroy "Teoreticheskaya mekhanika" Moskovskogo vysshego tekhnicheskogo uchilishcha imeni N.E. Baumana.
(Automatic control)

AUTHOR: Shigin, Ye. K. (Moscow) 103-19-4-3/12

TITLE: On the Improvement of Transient Processes by Means of Corrective Terms (Rectification Terms) with Variable Parameters (Ob uluchshenii perekhodnykh protsessov korrektiruyushchimi zven'yami s peremennymi parametrami)

PERIODICAL: Avtomatika i Telemekhanika, 1958, Vol. 19, Nr 4, pp. 306 - 311 (USSR)

ABSTRACT: Here some methods for the improvement of the transient processes in systems of automatic control of the fourth order with two integrating terms are given. It is shown that by introducing parameters, which change during the course of the transient process, in a system of automatic control with given structure and given characteristics of the invariable ground terms the goodness of the transient processes can considerably be improved. Furthermore is shown that in systems with an integrating term this is obtained not only by introduction of a variable time constant of the differenciating term but also by the most necessary introduction of the variable time constant of the integrating term.

103-19-4-3/12

On the Improvement of Transient Processes by Means of Corrective Terms (Rectification Terms) with Variable Parameters

There are 4 figures and 5 references, 4 of which are Soviet.

SUBMITTED: May 18, 1957

AVAILABLE: Library of Congress

1. Transient functions---Control

Card 2/2

28(0); 10(2); 25(2) PHASE I BOOK EXPLOITATION SOV/2036

Moscow. Vyssheye tekhnicheskoye uchilishche imeni N. E. Baumana

Mekhanika; sbornik statey (Mechanics; Collection of Articles) Moscow, Oborongiz, 1959. 119 p. (Series: Its: Trudy vyp. 92) 3,400 copies printed. Errata slip inserted.

Ed. (Title page): V. V. Dobronravov, Doctor of Physical and Mathematical Sciences, Professor; Ed. (Inside book): Ye. V. Latynin, Engineer; Ed. of Publishing House: L. I. Sheynfayn; Tech. Ed.: V. P. Rozhin; Managing Ed.: A. S. Zaymovskaya, Engineer.

PURPOSE: This book is intended for scientific and research personnel, engineers, and students of advanced courses at instrument-making and machine design vuzes.

COVERAGE: This volume deals with problems frequently encountered in modern instrument making and in designing specialized machines and includes general theory of automatic congrol, vibrations, theoretical and applied gyroscopy, stability of motion, etc. Abstracts of the individual articles are given in the Table of Contents.

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previously neglected, and a more exact map of the operation of the gyro pendulum emerges. The results obtained will unconditionally be useful in producing gyroscopes, the operating-accuracy requirements for which are increasing all the time. References: 1 Soviet.

SHIGIN, Ye.K.

Using units with logical and operational elements for operating a system of automatic control. Nauch.dokl.vys.shkoly; mash. i prib. no.1:119-126 '59. (MIRA 12:8)

1. Stat'ya predstavlena kafedroy "Teoreticheskaya mekhanika" Moskovskogo vysshego tekhnicheskogo uchilishcha im. Baumana.
(Automatic control)

SHIGIN, Ye.K.

Block of logical elements equipped with semiconductor devices. Nauch. dokl. vys. shkoly; mash. i prib. no.2:190-200 '59. (MIRA 12:12)

(Electronic control)

SHIGIN, Ye.K., aspirant

Nonlinear automatic control systems with elements having delta-type characteristics. [Trudy] MVTU no.92:28-48 '59.
(MIRA 12:10)

(Automatic control)

TIKHMENEV, S.S.; TRONINA, V.P.; CHIKIN, V.A.; KNYAZEV, G.N.; GULYAYEV, M.P.; ZAKHAROV, Yu.Ye.; CHIKINA, I.S.; LYAMIN, V.I.; BOCHAROV, V.K.; SHIGIN, Ye.K.; KROTOV, V.F.

Scientific, pedagogical and social activity of Professor V.V. Dobronravov. [Trudy] MVTU no.104:7-18 '61. (MIRA 15:2)
(Dobronravov, Vladimir Vasil'evich, 1901-)

20748
S/103/61/022/003/003/008
B116/B209

16.9500 (1031, 1121, 1132, 1013)
26.2195

AUTHOR: Shigin, Ye. K. (Voronezh)

TITLE: A servo system with logical control

PERIODICAL: Avtomatika i telemekhanika, v. 22, no. 3, 1961, 314-321

TEXT: In the present paper an electromechanical servo system with jump-like variation of the correction unit parameters is described. The changes are initiated by a logical semiconductor block. A typical assembly scheme of a servo system is shown in Fig. 1. The system is of second order of astatism with respect to the control and of first order of astatism with respect to the disturbances. The logical laws of the jump-like change of the parameters are given in a way that during jump-like regulation the system is not subjected to overshoot. In order to reduce the time of transition in such a system, the variation of the parameters of the differentiating unit 2 and of the integrating unit 3 have to be jump-like. If together with the introduction of an enhanced attenuation, integration with the inverse sign is performed, the transition will take place without a considerable overshoot. If the quantity changes its sign

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A servo system with logical control

at the output of the differentiating unit 4 and if the amplification factor $K_3$ of unit 4 changes jump-like, it is possible to reduce the transition time and the maximum control deviation during stabilization. The logical laws for jump-like switching of the parameters from 2, 3, and 4 (Fig. 1) are written down:

$$K_1 = \begin{cases} K_{10} & \text{for } x_1 x_2' \leq 0 \text{ and } x_2' x_4' \leq 0 \quad (9) \\ K_{\Delta 1} K_{10} & \text{for } x_1 x_2' < 0 \text{ and } x_2' x_4' > 0 \quad (10) \\ K_{\Delta 1} K_{10} & \text{for } x_1 x_2' > 0 \quad (11) \end{cases}$$

$$K_2 = \begin{cases} K_{20} & \text{for } x_1 x_2' \leq 0 \text{ and } x_2' x_4' \leq 0 \quad (12) \\ K_{\Delta 2} K_{20} & \text{for } x_1 x_2' > 0 \quad (13) \\ -K_{\Delta 2}' K_{20} & \text{for } x_1 x_2' < 0 \text{ and } x_2' x_4' > 0 \quad (14) \end{cases}$$

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A servo system with logical control

$$K_3 = \begin{cases} K_{30} & \text{for } x_1 x_2' > 0 \text{ and } x_2' x_4' > 0 \quad (15) \\ -K_{\Delta 3} K_{30} & \text{for } x_1 x_2' > 0 \text{ and } x_2' x_4' < 0 \quad (16) \\ K_{30} & \text{for } x_1 x_2' \leqslant 0 \quad (17) \end{cases}$$

where $x_1$ denotes the error, $x_2$, $x_3$, $x_4$ - the quantities at the output, $K_1$, $K_2$, $K_3$ - the amplification factors of the respective units and/or elements, $K_{10}$, $K_{20}$, $K_{30}$ - the basic values of the amplification factors of the respective units, $K_{\Delta 1}$, $K_{\Delta 2}$, $K'_{\Delta 2}$, $K_{\Delta 3}$ - the amplification factors of the respective parameters, $x_7$ - the controlled quantity, p - the symbol of differentiation, $T_1$, $T_3$ - time constants,

$$x_2' = \frac{K_1' T_1 p x_1}{T_1 p + 1}, \quad x_4' = \frac{K_3' T_3 p^2 x_7}{T_3' p + 1} \quad (K_1' = \text{const}, K_3' = \text{const}).$$

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S/103/61/022/003/003/008
B116/B209

A servo system with logical control

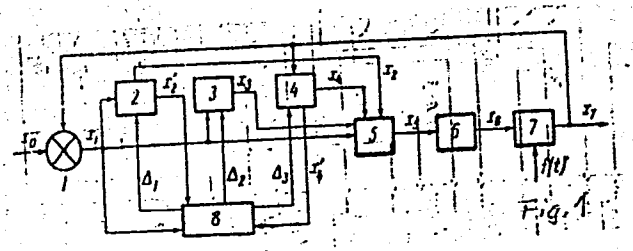
The logical operations according to the laws (9) - (17) were performed in an experimental servo system by means of a block of logical elements. The quantities $x_1$, $x_2'$, and $x_4'$ were fed into the input of the latter. The block compares the signs of these quantities and acts upon the elements 2, 3, and 4 (Fig. 1) by means of $\Delta_1$, $\Delta_2$, and $\Delta_3$ by changing the parameters of those quantities. A ДРК-627 (DRK-627) motor was used as a connecting element of the servo system, the signals were summed up by a magnetic amplifier 5, the electronic amplifier 6 was used for the matching of load. Fig. 2 shows the wiring of the semiconductor block of logical elements. In order to avoid coupling of the circuits of the system, the examined d.c. voltages were transformed into pulses in this block. Fig. 5 shows oscillograms of transients of the servo system in the curves of the key resistors (Кл-3 (Kl-3) and Кл-4 (Kl-4)) that were connected according to Fig. 2. From these oscillograms one may see that the introduction of the logical control according to (9) - (14) made it possible to obtain a system without any greater overshoot. The logical laws for the change of the system parameters permit to shorten the time and the overshoot of the transient by 4 to 6 times. The graphical-

S/103/61/022/003/003/008
B116/B209

A servo system with logical control

analytical method established by Bashkirov is mentioned in this paper, but is not explained. There are 6 figures and 7 Soviet-bloc references.

SUBMITTED: August 5, 1959




Legend to Fig. 1: Assembly scheme of the servo system. 1) sensitive element, 2) corrective differentiating element, 3) corrective integrating unit, 4) second-order differentiating element, 5) totalizing amplifier, 6) power amplifier, 7) controlled object; $x_0$ control action, $x_5$, $x_6$ quantities at the output, f(t) disturbance; 8) block of logical elements.

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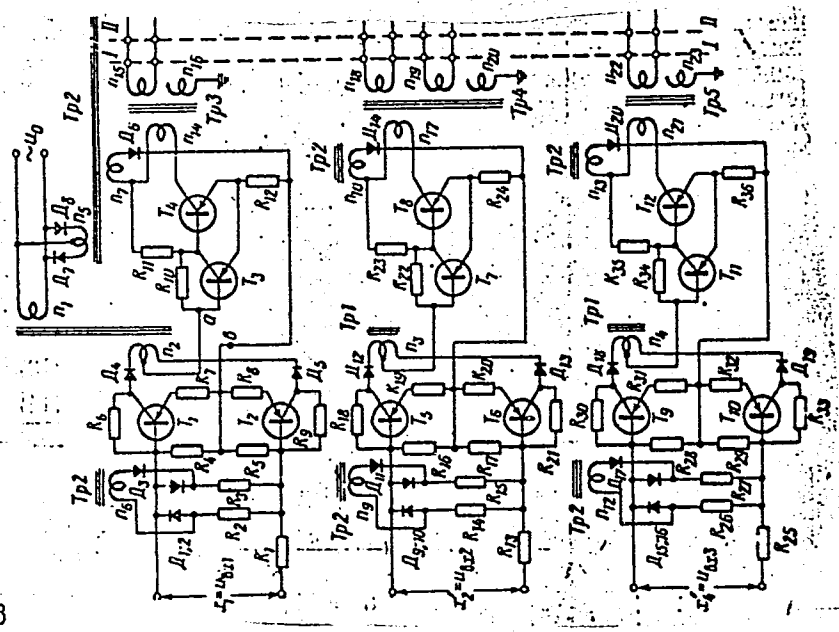
A servo system with logical control



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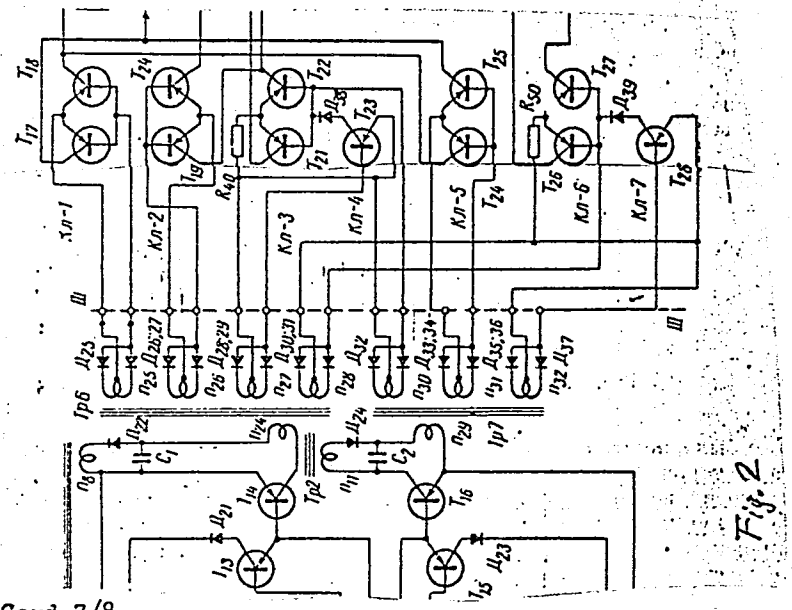
A servo system with logical control



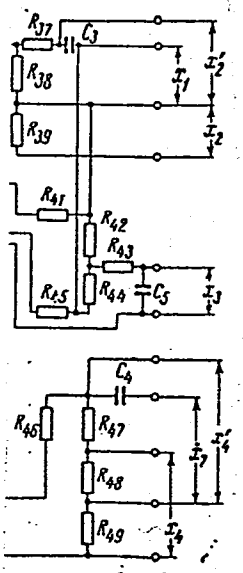


Fig. 2

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A servo system with logical control

Legend to Fig. 5: ом ohm, ком kiloohm, Кл key, сек second. Curve 1: transient in a system with non-variable parameters; curve 2: process in a system with jump-like varying parameters; curve 3: variation of the K1-3 resistor when the sign of the quantity at the output of the integrating unit is inversed.

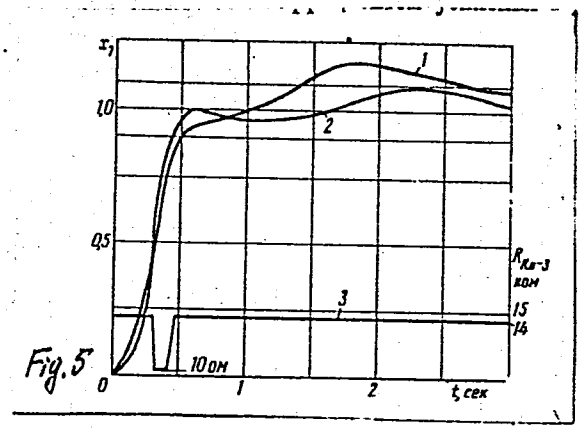


Fig. 5

Legend to Fig. 2: Circuit of the block of logical elements. Тр transformer, Д diodes, ВХ input, Кл key.

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SHIGIN, Ye.K.

BR

S/[illegible]/104/001/018
D237/D304

AUTHORS: Tikhmenev, S.S., Tronina, V.P., Chikin, V.A., Knyazev, G. N., Gulyayev, M.P., Zakharov, Yu.Ye., Chikina, I.S., Lyamin, V.I., Bocharov, V.K., Shigin, Ye.K., and Krotov, V.F.

TITLE: Scientific, pedagogical and general activities of Professor V.V. Dobronravov

SOURCE: Moscow, Vysshaye tekhnicheskoye uchilishche [Trudy], no. 104, 1961. Mekhanika, 7 - 18

TEXT: On the occasion of his 60th birthday and the 35th anniversary of the scientific and pedagogical activity of Professor, Doctor of Physical and Mathematical Sciences, Vladimir Vasilyevich Dobronravov who is at present Professor of Theoretical Mechanics at MVTU im. N.E. Baumana (MVTU im. N.E. Bauman), eleven of his students present this appreciation. V.V. Dobronravov was born on March 17th, 1901. In 1924 he obtained his degree in mathematics at the Saratovskiy Gosudarstvennyy universitet im. N.G. Chernyshevskiy (Saratov State University im. N.G. Chernyshevskiy). In 1927 he accepted the

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Scientific, pedagogical and ...

post of Assistant to the Professor of Physics at the Astrakhan State Medical Institute, where in subsequent years he published a paper in neuro-biophysics. During 1929-31, he was Professor of Mathematics at the Saratov Agricultural Institute and lectured at Saratov University. From 1931 he worked in a number of higher educational establishments in Moscow and was associated with Moscow University from 1931 to 1952. In 1946 he was awarded a doctorate at Moscow State University and in 1951 he was elected to the Department of Theoretical Mechanics at MVTU im. N.E. Bauman, where in subsequent years, under his guidance, courses in specialized branches such as stability of motion, gyroscopy, oscillation, variational method etc. were developed. During his career the main contributions made were in the field of mechanics of non-holonomic systems. After 1950 he published papers on kinetics of motion of rigid body (Trudy MIKhM, no. 2, (10), 1950), stability of linear systems of diff. equations with constant coefficients in (Avtomatika i Telemekhanika, v. 17, no. 3, 1956) etc. In the 1950's he also became interested in astronautics. He has been a member of the Moscow Mathematical Society since 1944, and is an active member of the Methodological Commis-

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sion on the Theoretical Mechanics of the Ministry of the Secondary and Higher Education of USSR. At present he is engaged in preparing a monograph on non-holonomic systems.

ASSOCIATION: Moskovskoye ordena Lenina i ordena trudovogo krasnogo znameni vysshoye tekhnicheskoye uchilishche im. Baumana (Moscow Order of Lenin and Order of the Red Banner of Labor Higher Technical School im. Bauman)

Card 3/3

L 28967-66 EWT(d)/EWP(v)/EWP(k)/EWP(h)/EWP(l) BC

ACC NR: AP6019174 SOURCE CODE: UR/0103/65/026/010/1664/1671

AUTHOR: Shigin, Ye. K. (Voronezh)

ORG: none

TITLE: Automatic control of an object with pure delay by a regulator with switching parameters. I.

SOURCE: Avtomatika i telemekhanika, v. 26, no. 10, 1965, 1664-1671

TOPIC TAGS: quality control, control system stability, automatic control system

ABSTRACT: An investigation of the possibility of improving the quality of control processes and expanding the area of stability of automatic control systems for a technological plant with large pure delay and small inertial delay, which can be ignored. The control is selected as a known error function, its derivatives and error integral, and also with consideration of the ratio of the signs of the error and its derivatives. The particular case in question is that of chemical industry technological processes, in which the large pure delay is provided by transport processes (belt delivery of dry material, etc.). Orig. art. has: 7 figures and 16 formulas. [JPRS]

SUB CODE: 13 / SUBM DATE: 15Feb65 / ORIG REF: 009

Card 1/1 BLG

UDC: 62-53

L 46656-66 EWT(d)/EWP(v)/EWP(k)/EWP(h)/EWP(l) BC

ACC NR: AP6021391 SOURCE CODE: UR/0103/66/000/006/0072/0081

AUTHOR: Shigin, Ye. K. (Voronezh)

59
B

ORG: none

14

TITLE: Automatic control of a plant with pure time delay by means of a variable-parameter regulator. Part II

SOURCE: Avtomatika i telemekhanika, no. 6, 1966, 72-81

TOPIC TAGS: computer element, logic element, automatic regulation, CONTROL SYSTEM STABILITY

ABSTRACT: An analysis is made in this paper of the stability and quality of a PI-automatic control system with constant and switchable parameters on the part of the regulator and with the control plant described by the author earlier (Avtomaticheskoye regulirovaniye ob"yekta s chistym zapazdyvaniyem regulyatorom s pereklyuchayemymi parametrami. I. Avtomatika i telemekhanika, t. XXVI, no. 10, 1965). Logical laws are found for the switching of the parameters which ensure that the error modulus integral and the error square integral will depend on the parameters of the regulator and the plant in a manner represented by a sloping function. An analysis is made of the degree of qualitative stability of a PI-system with switching parameters in the case of a spontaneous or operational variation both in the parameters of

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L 46656-66

ACC NR: AP6021391

the regulating element and in the plant itself. Orig. art. has: 6 figures and 13 formulas.

SUB CODE: 09, 13/ SUBM DATE: 15May65/ ORIG REF: 003/ OTH REF: 000

Card 2/2

ACCESSION NR: AP4015110 S/0136/64/000/002/0048/0051

AUTHORS: Shigina, L. N.; Andreyev, V. M.

TITLE: Hydrolysis of germanium tetrachloride

SOURCE: Tsvetny*ye metally*, no. 2, 1964, 48-51

TOPIC TAGS: germanium tetrachloride, hydrolysis, hydrolysis rate, hydrolysis condition , germanium dioxide crystallization

ABSTRACT: The effect of temperature, reagent ratio, method of hydrolysis, and agitation, on the degree of germanium tetrachloride hydrolysis including additional recovery of slurry after hydrolysis with and without agitation was investigated. It was observed that the degree of hydrolysis increases during the first 1-2 hours, and that the temperature determines the hydrolysis constant. Generally it was found that the process rate increases at lower temperatures of about 20C and that crystallization of germanium dioxide is more rapid at the low temperatures. The temperature range investigated was from -2 to +49C and it was concluded that the lower the temperature the

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ACCESSION NR: AP4015110

higher the maximum and the flatter the hydrolysis curve; also, the limits of permissible acidity are wider at low temperatures. Agitation, especially in the cooled systems, accelerates hydrolysis, equalizing the composition of the solution and facilitating heat removal. Using an $H_2O:GeCl_4$ ratio of 7:1, the initial hydrolysis at 0C is 97.41%, and by agitating for 1 hour hydrolysis is increased to 99%. Orig. art. has 5 figures and 1 equation.

ASSOCIATION: None

SUBMITTED: 00 / DATE ACQ: 12Mar64 ENCL: 00

SUB CODE: CH NR REF SOV: 000 OTHER: 00

Card 2/2