"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ABDUSHELISHVILI, R. G.

Cand Med Sci - (diss) "Effect of several exogenic factors on hypo- and hyperplastic processes of blood circulation, and problems of inter-relations among these conditions." Tbilisi, 1961. 19 pp; (Tbilisi State Med Inst); 160 copies; price not given; (KL, 7-61 sup, 256)

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

DESYATCHIKOV, B.A., kand. ekon. nauk; GABZAILOV, G.F., kand. ekon. nauk; KADYROV, Z., nauchn. sotr.; ABDUSHUKUROV, T.; KALYAKIN, P.V., kand. ekon. nauk; FOKIN, A.I., kand. ekon. nauk; BAKIYEVA, R.A., nauchn. sotr.; IBRAGIMOV, M., nauchn. sotr.; KARDASI, A.A., kand. ekon.nauk; KADANER, E.A.; NIKONOV, F.D., nauchn. sotr.; ANTONETS, G.M.; ARTYKOV, A.A., kand. ekon. nauk; TRUSOV, A.N.; OVCHAROVA, M.A., nauchn. sotr.; TSOY,P., nauchn. sotr.; **KALYAKIN**, P.V., kand. ekon. nauk, otv. red.; DZHAMALOV, O.B., doktor ekon. nauk, red.; ARTYKOV, A., kand. ekon. nauk, red.; DESYATCHIKOV, B.A., kand. ekon. nauk, red.; SHARIFKHODZHAYEV, M., kand. ekon. nauk, red.; DESYATNIK, F.M., red.; GOR'KOVAYA, Z.P., tekhn. red.

[Economics of the machinery manufacture of Uzbekistan] Ekonomika mashinostroeniia Uzbekistana. Tashkent, Izd-vo AN Uzb.SSR, 1963. 289 p. (MIRA 16:12)

1. Akademiya nauk Uzbekskoy SSR, Tashkent. Institut ekonomiki. (Uzbekistan--Machinery industry)

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ABDUSHUKUROVA, R.U.

Feeding habits of the grass snake in the Tashkent Fish Hatchery during fall period. Zool. zhur. 44 no.3:462-463 '65.

(MIRA 18:8)

1. Institute of Zoology and Parasitology, Academy of Sciences of Uzbek S.S.R., Tashkent.

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ABDUSIN, P. P.

37234. ABDUSIN, P. P. i TSVETKOVA, M. A. Rol' struktury kollektorov v reshenii zadach ratsional'noy razrabotki neftyanykh zalezhey. Doklad' akad, Nauk SSSR, Novaya seriya, T. LXIX, No. 5, 194[illegible], s. 663-666. - Bibliogr: 6 Nazv.

SO: Letopis' Zhurnal'nykh Statey, Vol. 7, 1949

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

Abduslyamov, N.

MAKSIMYCHEVA, Z.T.; ABDUSLYAMOV, N.

Quantitative determination of potassium in the form of KBF_4. Zav.lab. 24 no.4:403-405 '58. (MIRA 11:4)
(Potassium--Analysis) (Potassium fluoborate)

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ABDUVAKHIDOV, Kh.

Water balance in virgin Sierozems. Nauch. trudy Tash GU no.204: 156-172 '62. (MIRA 17:9)

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ABDUVALIYEV, A.; KHAYRUTDINOVA, M.Kh.; ANDREYEV, A.G.; SULTANOV, A.S.

Thermosetting resin from furfuryl alcohol and furfurola. Uzb. khim. zhur. no.4:53-57 '58. (MIRA 11:12)

1. Institut khimii AN UzSSR.
(Resins, Synthetic) (Furfuryl alcohol) (Furaldehyde)

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

SULTANOV, A.S.; ABDUVALIYEV, A.A.

Producing furfuryl alcohol by continuous hydrogenation of furfurole. Dokl. AN Uz.SSR no.7:19-21 '58. (MIRA 11:10)

1. Institut khimii AN UzSSR. Predstavleno chlenom-korrespondentom AN UzSSR Kh.U. Usmanovym.
(Furfuryl alcohol) (Furaldehyde) (Hydrogenation)

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

SULTANOV, A.S.; ABDUVALIYEV, A.A.

Continuous reduction under pressure of furfurole to 2-methylfuran. Dokl.AN Uz.SSR no.12:35-37 '58. (MIRA 12:1)

1. Institut khimii AN UzSSR. Predstavleno chlenom-korrespondentom AN UzSSR Kh.U.Usmanovym.
(Furaldehyde) (Furan)

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ABDUVALIYEV, A.A.; KHAYRUTDINOVA, M.Kh.; ANDREYEV, A.G.; SULTANOV, A.S.

Method for the production of glue for repairs of wires with polyvinyl chloride insulation. Uzb. khim. zhur. no.3:72- '59. (MIRA 12:9)

(Electric wire, Insulated--Maintenance and repair)

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

KORSHAK, V.V.; SULTANOV, A.S.; ABDUVALIYEV, A.A.

Polymerization of furan and sylvan with the aid of ionic catalysts. Uzb.khim.zhur. no.4:39-47 '59. (MIRA 13:1)

1. Institut khimii polimerov AN UzSSR i Institut eksperimental'noy optiki i spektroskopii AN SSSR.
(Furan) (Catalysts) (Polymerization)

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

SULTANOV, A.S.; ABDUVALIYEV, A.

Polymerization of sylvan and furan. Dokl.AN Uz.SSR no.6:24-26 '59. (MIRA 12:9)

1. Institut khimii AN UzSSR. Predstavleno chlenom korrespondentom AN UzSSR Kh.U.Usmanovym.
(Polymers and polymerization)

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ABDUVALIYEV, A. A., Cand Chem Sci -- (diss) "Obtaining some film-forming polymers on a basis of furfural." Tashkent, 1960. 15 pp with graphs; (Academy of Sciences Uzbek SSR, Inst of the Chemistry of Polymers); 175 copies; price not given; (KL, 25-60, 127)

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

KHAYDAROV, Kh.F.; SULTANOV, A.S.; ABDUVALIYEV, A.A.

Polimerization of sylvan in the presence of complex ionic catalysts consisting of antimony, cadmium, and aluminum chlorides and organosilicon compounds. Khim. i fiz.-khim. prirod. i sint. polim. no.1:131-137 '62 (MIRA 18:1)

Polymerization of sylvan in solution. Ibid.:138-142

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ISRAILOV, D.; ABDUVALIYEV, A.A.; BRONOVITSKIY, V. Ye.; SULTANOV, A.S.

Processing of polytetrafluoroethylene into films by mixing with polysylvan. Khim. i fiz.-khim. prirod. i sint. polim. no.1: 215-219 '62 (MIRA 18:1)

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

S/081/62/000/015/036/038
B171/B101

AUTHORS: Khaydarov, Kh. F., Abduvaliyev, A. A., Sultanov, A. S.

TITLE: Investigation of the polymerization of sylvan in the presence of organic-titanium-silicon halide ionic catalysts

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 15, 1962, 632, abstract 15R35 (Sb. "Vopr. izpol'zovaniya mineral'n. i rastit syr'ya Sredn. Azii." Tashkent, AN UzSSR, 1961, 128-132)

TEXT: The reaction of the polymerization of sylvan under the action of complex catalysts: $Ti[CH_3Si]_2Cl_{10}$, $Ti[(CH_3)_2Si]_2Cl_8$, $Ti[(CH_3)_3Si]_2Cl_6$ and $Ti[C_6H_5Si]_2Cl_{10}$ has been investigated. The reaction was carried on for 5 hours at 50°C and the amount of the catalyst used represented 0.5-4% mole per mole sylvan. The yield of the polymer increases with the decease of the number of methyl groups in the catalyst. The molecular weight of polysylvan ranges from 1500 to 2000. Polysylvans thus prepared may be used in the paint and varnish industry. [Abstracter's note: Complete translation.]

Card 1/1

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ABDUVALIYEV, A.A.; BODNYA, M.D.; BARANOVSKAYA, G.M.; OBNOSOVA, A.D.; ISRAILOV, D.

Continuous method of sylvan polymerization in the solvent medium. Lakokras.mat.i ikh prim. no.6:27-29 '62. (MIRA 16:1)
(Sylvan)

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ABDUVALIYEV, A.A.; BODNYA, M.D.; BARANOVSKAYA, G.M.; OBNOSOVA, A.D.

Investigating the film forming properties of polysylvan modified with PF-6 alkyd resins. Lakokras.mat. i ikh prim. no.2:17-18 '63.
(MIRA 16:4)

(Furan) (Resins, Synthetic)

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

L 14947-63 EWP(j)/EWT(m)/BDS ASD Pc-4 RM
ACCESSION NR: AP3003791 S/0190/63/005/007/1012/1015

AUTHORS: Khaydarov, Kh. F.; Abduvaliyev, A. A.; Sultanov, A. S.

60
59

TITLE: Chemical structure of polysylvan

SOURCE: Vy*sokomolekulyarny*ye soyedineniya, v. 5, no. 7, 1963, 1012-1015

TOPIC TAGS: sylvan, polysylvan, furan, polymerization, ozonization

ABSTRACT: To find out the proper structure of polysylvan, two grams of the latter were dissolved in 40 ml of chloroform and subjected to ozonization at OC by passing into it oxygen containing 2.5-3.5% ozone at a rate of 50-60 ml/min. The ozonization was discontinued when the fluid turned blue, and the chloroform was distilled out. The ozonized product was decomposed by treatment at 80-90C with 30 ml of hydrogen peroxide, resulting in a turbulent evolution of carbon dioxide and leaving a brittle spongy mass. The latter was subjected to analysis for carboxyl, hydroxyl, and acetyl groups by standard chemical procedures as well as by infrared spectroscopy. While the test for acetyl groups proved negative, the acidity number was estimated as 23.1 and the percentage of hydroxyl groups as 17.1, from which it was determined that polymerization of sylvan takes place at the C=C bonds of the furan ring with the methylated carbon atom. The infrared spectra were taken by Yu. T. Tashpulatov and Yu. P. Putnev at the analytical laboratory of the Institute. Orig.

Card 1/2

Association: Inst. of Polymer Chemistry, Academy of Sciences, Uzbek SSR

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ABDUVALIYEV, A.A.; KHAYDAROV, Kh.F.; SAGDULLAYEVA, P.; OBNOSOVA, A.D.

Lacquers based on urea-formaldehyde resins modified with furfuryl alcohol. Lakokras.mat. i ikh prim. no.2:67-69 '64. (MIRA 17:4)

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ABDUVALIYEV, A.A.; KHAYDAROV, Kh.F.; SULTANOV, A.S.; SIGOV, V.V.;
DORONIN, N.L.; TARASOVA, A.G.

Production of polysylvan from the wood-chemical sylvan. Gidroliz. i lesokhim.prom. 17 no.2:22-23 '64. (MIRA 17:4)

1. Institut khimii polimerov AN UzbSSR (for Abduvaliyev, Khaydarov, Sultanov). 2. Ashinskiy lesokhimicheskiy kombinat (for Sigov, Doronin, Tarasova).

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ACCESSION NR: AT4040809 S/3099/62/000/001/0215/0219

AUTHOR: Israilov, D., Abduvaliyev, A. A., Bronovitskiy, V. Ye., Sultanov, A. S.

TITLE: Conversion of polytetrafluoroethylene into films by mixing with polysylvan

SOURCE: AN UzSSR. Institut khimii polimerov. Fizika i khimiya prirodny*kh i sinteticheskikh polimerov, no. 1, 1962, 215-219

TOPIC TAGS: teflon, polytetrafluoroethylene, polysylvan, polymer film, teflon film, polymer mechanical property, dimethyldichlorosilane, polymer electrical resistivity

ABSTRACT: Polysylvan, obtained by the polymerization of sylvan in the presence of $ZnCl_2$ and dimethyldichlorosilane in N_2 at 50C, was then used for the preparation of teflon films by two methods: (1) Mixing of powdered polytetrafluoroethylene with polysylvan in ratios of 1:1 to 1:5, and heating in reactors at 280-300C; however, homogeneous products could not be obtained at any intervals of temperature and polymer ratios. (2) Mixing various proportions of the polymers in rollers at a roller friction of 1:1.2 and temperatures of 30-80C. In both cases, films of various thickness with different physico-mechanical indices were

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ACCESSION NR: AT4040809

obtained. The best conditions were rolling at 50-60C for 40 minutes. Part of the films were baked in presses at 280-300C and the rest were extracted with acetone to remove the excess polysylvan and then baked at 300C. When 1:1 mixtures of polytetrafluorethylene and polysylvan were rolled at 50-60C for 10, 20, 40 and 60 minutes, the rupture strength of the films obtained was 85, 130, 162 and 105 kg/cm^2, respectively. To study the effect of the presence of silicon in the polymer on the blending of polytetrafluoroethylene, experiments were carried out with polysylvan containing silicon on one or both ends of the chain. The rupture strength of these films was 51 and 170 kg/cm^2, respectively. The authors also studied the electrical resistance of the films, with or without removal of excess polysylvan. The results showed a decrease in electrical resistivity with increasing temperature (20-150C), and an increase after extraction with acetone. When films containing excess polysylvan were baked on an hydraulic press with a pressure of 20 kg/cm^2 at 280-300C, dark colored films were obtained with holes from the leakage of the excess polysylvan. To eliminate this problem, the quantity of bound and free polysylvan in the film at a 1:1 ratio of polytetrafluoroethylene to polysylvan was studied. An average of 18% of the original polysylvan remained in the film after washing. Films from which the excess polysylvan had been removed were highly

Card 2/3

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"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ACCESSION NR: AT4040809

resistant to all solvents, including concentrated nitric acid. Orig. art. has: 2 tables.

ASSOCIATION: Institut khimii polimerov AN Uz SSR (Institute of Polymer Chemistry, AN UzSSR)

SUBMITTED: 00 ENCL: 00

SUB CODE: OC, MT NO REF SOV: 004 OTHER: 001

Card 3/3

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ACCESSION NR AP5001139

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

L 23035-65

ACCESSION NR AP5001139

Polymerization of sylvan in the presence of 2 mol.% sulfuric acid ether ... polysylvan, and in the presence of 5 mol.% ... The ... sylvan formed nondrying films ...

ASSOCIATION: Institut khimii polimerov AN UzSSR (Institute of Polymer ... UzSSR)

SUBMITTED: ... ENCL: ... SUB CODE: ...

NO REF SOV: 00 OTHER: ...

Card 2/2

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

AUTHOR: Abduvaliyev, A. (Aspirant)

TITLE: Characteristics of some indices of protein metabolism in brucellosis

SOURCE: Meditsinskiy zhurnal Uzbekistana, no. 11, 1964, 29-30

Card 1/1

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

L 56571-65
ACCESSION NR: AP5018601

... was high at first while the A/G ratio was low. The ...

... vaccinated. Some ...

... and the A ...

... vaccinated.

SUB CODE: LS

NR REF SOV: 000 OTHER: 000 JPRS

Card 2/2

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

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APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

Orig. art. has: 2 tables and 3 formulas.

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

MADZHIDOV, A.; ABDUVALIYEV, A.; SULTANOV, A.S.

Production of 2,5-dimethylolfuran. Uzb.khim.zhur. 9 no.1:72-75 '65. (MIRA 18:6)

1. Institut ispol'zovaniya topliva Gosudarstvennogo neftekhimicheskogo komiteta pri Gosplane SSSR.

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

KHAYDAROV, Kh.F.; ABDUVALIYEV, A.A.; SULTANOV, A.S.

Polymerization of silvan on complex ionic catalysts and the use of polysilvan as a film-forming agent. Uzb.khim.zhur. 8 no.4:65-70 '64. (MIRA 18:12)

1. Institut khimii polimerov AN UzSSR. Submitted May 4, 1962.

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ABDUVALIYEV, A.A.; ISMATOV, N.Kh.; BARANOVSKAYA, G.M.

Copolymerization of silvan and tung oil. Uzb. khim. zhur. 9 no.5:48-52 '65. (MIRA 18:12)

1. NIIKhTTS. Submitted Feb. 20, 1964.

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

L 23819-66 EWT(m)/EWP(j)/T IJP(c) WW/RM

ACC NR: AP6008691 (A) SOURCE CODE: UR/0291/65/000/005/0048/0052

AUTHOR: Abduvaliyev, A. A.; Ismatov, N. Kh.; Baranovskaya, G. M.

ORG: NIIKhTTs

TITLE: Copolymerization of sylvan and tung oil

SOURCE: Uzbekskiy khimicheskiy zhurnal, no. 5, 1965, 48-52

TOPIC TAGS: copolymerization, sylvan, tung oil, ionic catalyst

ABSTRACT: The copolymerization of sylvan and tung oil in the presence of ionic catalysts was carried out at 50°C in an inert gas atmosphere with constant stirring. The catalysts, $ZnCl_2$, $(CH_3)_xSiCl_y$, and sulfuric acid etherate, were found to be completely suitable for obtaining high yields of sylvan-tung oil copolymers. Lacquer films on glass and steel substrates were prepared from the solutions, and the physicomechanical properties of the copolymer films were measured. As the sylvan content of the copolymer increases, the drying rate of the film, its hardness, luster, and water resistance increase. The optimum ratio of sylvan to tung oil was found to range from 80:20 to 50:50. The films adhere well to metal and wood. Infrared spectra indicate that the copolymerization of sylvan and tung oil in the presence of ionic catalysts forms a substance with a higher molecular weight and a lower specific functionality than those of the initial oil. This causes a decrease in the gelation rate of the copolymer as its sylvan content increases. Orig. art. has: 2 figures, 2 tables.

SUB CODE: 07/ SUBM DATE: 20Mar64/ ORIG REF: 002/ OTH REF: 000

Cord 1/1

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

COUNTRY : USSR
CATEGORY : Soil Science. Soil Genesis and Geography. J

ABS. JOUR. : RZhBiol., No. 3 1959, No. 10662

AUTHOR : Abduyev, M. R.
INST. : Academy of Sciences, Azerbaydzhan SSR
TITLE : Dynamics of the Salification of Soils in Eastern Shirvan'.

ORIG. PUB. : Tr. 4-y nauchn. konferentsii aspirantov AN AzerbSSR. Baku, 1955, 89-97

ABSTRACT : The saline condition of the following soils of Eastern Shirvan' is described: the dark brown after-forest (chernozem-like) soil, dark chestnut, meadow-sierozem covered with steppe, meadow-bog and meadow solonchak soils.

CARD: 1/1

16

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ABDUYEV, M.R.

Moisture regime of soils in the eastern part of the Shirvan Steppe. Trudy Inst.pochv.i agrokhim.AN Azerb.SSR 7:215-223 '55. (MLRA 9:12)
(Shirvan Steppe--Soil moisture)

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ABDUYEV, M. R.

ABDUYEV, M. R.: "The water-salt dynamics of soils of the eastern portion of Shirvan Steppe." Published by the Acad Sci Azerbaydzhan SSR. Min Higher Education USSR. Armenian Agricultural Inst. Baku, 1956. (Dissertations for the Degree of Doctor in Agricultural Sciences).

SO: Knizhnays Letopis' No. 22, 1956

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ABDUYEV, M.R.

Geomorphology of the eastern part of Shirvan Steppe. Izv. AN Azerb.SSR no.4:59-68 Ap '56. (MLRA 9:10)

(Shirvan Steppe--Geology, Structural)

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"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

USSR/Cultivated Plants - Fruits. Berries. M-6

Abs Jour : Ref Zhur - Biol., No 7, 1958, 29988

Author : Abduyev, M.
Inst : -
Title : From an Attempt to Reclaim Salt Lands for Gardens and Vineyards.

Orig Pub : Sots. s. kh. Azerbaydzhana, 1956, No 10, 19-21

Abstract : Description is given of the salt land conditions of the soils occupied by gardens and vineyards in the sovkhoz near the city of Mingechaur in Azerbaydzhan. The agrotechny is indicated which is needed to increase the salt resistance of the plantings.

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"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ABDUYEV, M.R.

[redacted]

Soil moisture cycle and conditions for the deve pm t of agricultural crops in the eastern part of the Shirvan Steppe in zerbaijani with summary in Russian]. Izv.AN Azerb.SSR no.93-11 57. (MIRA 10:8)

(Shirvan Steppe--Crops and soils)

(Soil moisture)

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ABDUYEV, M.R.

Salinization conditions and types of saline soils in the eastern part of the Shirvan Steppe. Trudy Inst. pochv. i agrokhim. AN Azerb. SSR 8:47-82 '58. (MIRA 12:10)
(Kura Lowland--Alkali lands)

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ABDUYEV, M.R.

Specific nature of the deluvial type of soil salinity in the Kura-Aras Lowland. Izv.AN Azerb.SSR.Ser.biol. i sel'khoz. nauk no.1:81-94 '59. (MIRA 12:1)

(Kura Lowland--Alkali lands)

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ABDUYEV, M.R.

Chemical and geographical characteristics of soils with a talus-type salinity in the Siazan'-Sumgait Massif. Izv.AN Azerb.SSR.Ser.biol.i med.nauk 3:57-64 '61. (MIRA 14:7)

(Siazan' region—Saline and alkali soils)
(Sumgait region—Saline and alkali soils)

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ABDUYEV, M.R.

Solonetz soils formed from talus deposits and conditions governing their improvement in Azerbaijan. Izv. AN Azerb. SSR Ser. biol i med. nauk no.8:77-85 '61. (MIRA 16:8)
(AZERBAIJAN—SOLONETZ SOILS)
(RECLAMATION OF LAND)

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ABDUYEV, M.R.

Significance of diffusion in the migration of salts. Izv.AN Azerb.SSR.Ser.biol.i med.nauk no.6:49-57 '62. (MIRA 15:12)
(MINERALS IN SOIL) (DIFFUSION)

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ABDUYEV, M.R.

Soil conditions and the development of the root system of saltworts. Izv. AN Azerb. SSR. Ser. biol. i med. nauk no.2:69-78 '63. (MIRA 17:5)

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ABDUYEV, M.R.

Amounts of vegetative bulk under the conditions found in the western Caspian Lowland of Azerbaijan. Dokl. AN Azerb. SSR 19 no.5:31-34 '63. (MIRA 17:2)

1. Institut pochvovedeniya i agrokhimii AN AzSSR. Predstavleno akademikom AN AzSSR G.A. Aliyevym.

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ABDUYEV, M.R.

Root system of wormwood in the lowland of Azerbaijan. Izv. AN Azerb. SSR. Ser. biol. i med. nauk no.5:65-74 '63.

(MIRA 17:5)

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ABDUYEV, M.R.

Types of the salt profiles of soils with the diluvial form of salinity in the lowlands of Azerbaijan. Izv. AN Azerb. SSR. Ser. biol. nauk no.2:73-80 '64.

(MIRA 17:10)

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ABDUYEV, M.R.

Formation and evaluation of surface runoff in the piedmont plains of Azerbaijan. Izv. AN Azerb. SSR. Ser. biol. nauk no.4:65-73 '65. (MIRA 18:7)

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ABDUYEVSKAYA, K. A., Cand Chem Sci -- (diss) "Investigation of complex fluorides and oxalates of germanium." Moscow, 1960. 7 pp; (Academy of Sciences USSR, Inst of General and Inorganic Chemistry im N. S. Kurnakov); 150 copies; price not given; (KL, 17-60, 141)

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ABDUZHABAROV, MA.

Nuriddin's ice cave. Priroda 52 no.4:115-116 '63.

(MIRA 16:4)

1. Samarkandskiy gosudarstvennyy universitet im. Alishera Navoi.
(Zeravshan Range—Ice caves)

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ABDUZHABBAROVA, Kh.Yu.

Stratigraphy of Silurian sediments in the Shurab region. Vop. geol. Uzb. no.3:38-41 '62. (MIRA 16:6)

(Shur-Ob —Paleontology, Stratigraphic)

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

SIMAKOV, V. N.; ABDUZHALALOV, A.

Comparative study of the effectiveness of soil claying in the "dry" and "wet" sands of Leningrad Province. Vest. LGU. 16 no.21: 121-130 '61. (MIRA 14:11)
(Leningrad Province—Soil fertility)
(Clay)

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ABDUZHAMILOV, Sh.; AZIMOV, S.A.; CHERNOVA, L.P.; CHERNOV, G.M.; CHUDAKOV, V.M.

Azimuthal angular distribution of shower particles producted by cosmic ray particles in a photographic emulsion. Zhur. eksp. i teor. fiz. 45 no.3:407-414 S '63. (MIRA 16:10)

1. Institut yadernoy fiziki AN Uzbekskoy SSR.
(Photography, Particle track)
(Cosmic rays)

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ACCESSION NR: AP4042364 S/0056/64/047/001/0024/0029

AUTHORS: Abduzhamilov, Sh.; Azimov, S. A.; Chernova, L. P.; Chernov, G. M.; Chudakov, V. M.

TITLE: Angular distributions of secondary particles in pN collisions at 24 BeV energy

SOURCE: Zh. eksper. i teor. fiz., v. 47, no. 1, 1964, 24-29

TOPIC TAGS: pion scattering, angular distribution, nucleon scattering, dispersion analysis, nuclear emulsion

ABSTRACT: The research was undertaken because asymmetric emission of particles was observed in nucleon-nucleon collisions at energies of several hundred BeV (V. V. Guseva et al., Izv. AN SSSR, Ser. fiz., v. 26, 549, 1962. N. A. Dobrotin et al., Nuclear physics v. 35, 152, 1962). The statistical method of dispersion analysis (the F test) is used to check the hypothesis of independent secondary-particle

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"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ACCESSION NR: AP4042364

emission angles in inelastic pN interactions involving primary protons of equal energy E and equal numbers n of charged secondary particles. The experimental values of F for pN interactions at 24 BeV and for 4--9 charged secondary particles conflict with this hypothesis and indicate nonuniformity of the angular distributions in the laboratory system. This nonuniformity cannot be accounted for by momentum conservation in knock-on collisions and is associated with the particle production mechanism in peripheral interactions. The efficiency of the F-test for determining nonuniform angular distribution in the laboratory system was checked by investigating the random stars obtained from a somewhat different model of NN interactions at 300 BeV, by obtaining the spectrum of meson cloud velocities in the center of mass system and the secondary-particle energy spectrum in the rest system of the meson cloud. An accelerated on-track scanning of plates bombarded with 24-BeV protons in the CERN accelerator has shown that for the stars observed in the emulsion the most values of F exceed unity, meaning that the emission angles of the secondary particles are not independent at least for some

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values of n. The nonuniformity of the angular distributions is similar to the asymmetric c.m.s. particle emission observed in NN collisions at $\sim 10^{11}$ eV. The peripheral interactions at E-24 BeV remains dominant up to a multiplicity n = 9. "The authors are grateful to W. O. Lock for collaborating in the acquisition of the photographic plates exposed in the CERN accelerator." Orig. art. has: 2 figures and 19 formulas.

ASSOCIATION: Institut yadernoy fiziki Akademii nauk Uzbekskoy SSR (Institute of Nuclear Physics, Academy of Sciences, Uzbek SSR)

SUBMITTED: 23Jan64 ENCL: 00

SUB CODE: NP NR REF SOV: 003 OTHER: 001

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"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ABDUZHAMILOV, Sh.; AZIMOV, S.A.; CHERNOVA, L.P.; CHERNOV, G.M.;
CHUDAKOV, V.M.

Angular distributions of secondary particles in pN-collisions at an energy of 24 Bev. Zhur. eksp. i teor. fiz. 47 no.1:24-29 Jl '64. (MIRA 17:9)

1. Institut yadernoy fiziki AN Uzbekskoy SSR.

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"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ASSOCIATION: Institut yadernoy fiziki AN UzSSR (Institute of Nuclear Physics, AN UzSSR)

SUBMITTED: [illegible] ENCL: [illegible] SUB CODE: NP

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L 45314-66 EWT(m)/T

ACC NR: AP6023083 (AN) SOURCE CODE: UR/0367/66/003/004/0657/0662

AUTHOR: Abduzhamilov, Sh.; Azimov, S. A.; Chernova, L. P.; Chernov, G. M.; Chudakov, V. M.

ORG: Institute of Nuclear Physics, Academy of Sciences, Uzbek SSR (Institut yadernoy fiziki akademii nauk uzbekskoy SSR)

44
40
B

TITLE: Coherent interaction of high-energy protons with complex nuclei

SOURCE: Yadernaya fizika, v. 3, no. 4, 1966, 657-662

TOPIC TAGS: proton, high energy protin, photoemulsion, nucleon, particle interaction, proton interaction, inelastic interaction

ABSTRACT: The authors use a method proposed in a previous work [Sh. Abduzhamilov, S. A. Azimov, L. P. Chernova, G. M. Chernov, V. M. Chudakov ZhETF, 47, 24, 1964] to find and analyze in detail the differences between the angular distributions of secondary particles in showers formed by high-energy protons and satisfying the necessary selection criteria for pp and pn collisions in

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ACC NR: AP6023083

photoemulsions. These differences are easily explained by the inclusion of coherent interactions. The method of research is also explained in detail. Experimental data are presented and discussed. The results are discussed of processing the showers formed in photoemulsions by protons with 24 gev and satisfying the necessary criteria of selection of pn collisions. Measurements have been made previously by the authors, the number of particles being n $\gtrsim$ 4. The differences found indicate the possible existence of coherent interactions of protons with complex nuclei among the showers with three and four secondary charged particles at 10 and 24 gev. The authors also used measurements made at the Laboratory of High Energies of the Joint Nuclear Research Institute (OIYaI) during investigation of inelastic pn interactions of protons with an energy of 10 gev with free and quasi-free nucleons of the photoemulsion. The authors are grateful to V. I. Veksler for permission to use the experimental data obtained at the LVE OIYaI, and to M. I. Podgoretskiy for discussions of the work. Orig. art. has: 2 figures, 15 formulas, and 1 table. [GC]

SUB CODE: 20/ SUBM DATE: 12Mar65/ ORIG REF: 002/ OTH REF: 001/

Card 2/2 mjs

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ABDUAZIMOV, Kh.A.; SMIRNOVA, L.S.; YUNUSOV, S.Yu.

Interconversion of the alkaloids hippeastrine, ungerine and unsevine. Dokl. AN Uz. SSR 21 no.8:24-27 '64.
(MIRA 19:1)

1. Institut khimii rastitel'nykh veshchestv AN UzSSR.

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ABDULAYEV, D.M.

Some results of the study of the distribution of atherosclerosis among different population groups in the Azerbaijan S.S.R. Azerb. med. zhur. 42 no. 7:3-8 Jl '65 (MIRA 19:1)

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ATROSHCHENKO, V.I.; SHCHEDRINSKAYA, Z.M.; GAVRYA, N.A.; Prinimali uchastiye: AYRAPETYAN, M.T.; ABDULAYEVA, G.A.; TIMOKHINA, M.S.; RUD', A.A.

Catalysts for oxidation processes of natural gas to form formaldehyde and methanol. Zhur.prikl.khim. 38 no.3:643-649 Mr '65. (MIRA 18:11)

1. Submitted Febr. 27, 1963.

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ABDYKHALYKOVA, F.D.; KATSMAN, Ya.N.

Treatment of dermatomycosis in Semipalatinsk Province. Zdrav. Kazakh. 21 no.5:9-10 '61. (MIRA 15:2)
(SEMIPALATINSK PROVINCE--DERMATOMYCOSIS)

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ABDYLAYEV, A.A.

Thermal conditions of semiconductor diodes in a.c.circuits. Izv.vys. ucheb.zav.;prib. 7 no.5:144-150 '64. (MIRA 17:12)

1. Azerbaydzhanskoy nauchno-issledovatel'skiy institut elektrotekhnicheskoy promyshlennosti. Rekomendovano mezhvuzovskoy konferentsiyey po teplovym rezhimam radioelektronnykh ustroystv (detaley i apparatov).

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"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

TURUSBEKOV, M.; ABDYLDAYEV, A., red.; ANOKHINA, M.G., tekhn.red.

[Dictionary of physics terminology] Fizikalyk terminderdin sozdugu; doolboor. Slovar' fizicheskikh terminov; proekt. Frunze, Akad.nauk Kirgizskoi SSR. Terminologicheskaia komissiia, 1960. 190 p. (MIRA 13:7)
(Physics--Dictionaries)
(Russian language--Dictionaries--Kirghiz)

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

Abdyldayev, A.

S/003/60/000/009/001/001
B019/B054

AUTHOR: Frankl', F. I., Doctor of Physical and Mathematical Sciences, Professor

TITLE: Discussion of Problems of Hydroaerodynamics and Mathematical Physics

PERIODICAL: Vestnik vysshey shkoly, 1960, No. 9, pp. 47-49

TEXT: A Conference on Hydroaerodynamics and Mathematical Physics was held at Nal'chik in May 1960 on the initiative of the fiziko-matematicheskiy fakul'tet Kabardino-Balkarskogo universiteta (Department of Physics and Mathematics of the Kabardino-Balkarian University). Fourteen reports were delivered at the Conference by delegates of five higher institutes of learning and scientific institutes of the Northern Caucasus, as well as of three higher institutes of learning from other oblast' and Republics. The reports by Professor F. I. Frankl' and Senior Teacher I. N. Lenin (Kabardino-Balkarian University) on "The Flow Around Profiles With a Local Supersonic Zone Ending in a Compression

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Shock", by Professor S. V. Fal'kovich of Saratovskiy universitet (Saratov University) on "The Integrals of the Chaplygin Equation With Singular Points on the Parabolic Line", and Senior Teacher K. Karimanzhanov of Kirgizskiy universitet (Kirgiz University) on "The Application of the Straight-line Method to Certain Boundary-value Problems in the Theory of Transsonic Currents" dealt with the theory of transsonic currents. Problems of theoretical meteorology were dealt with in the report by L. N. Gutman, Doctor of Physical and Mathematical Sciences, of the Kabardino-Balkarskoye otdeleniye Instituta prikladnoy geofiziki AN SSSR (Kabardino-Balkarian Branch of the Institute of Applied Geophysics of the AS USSR) ("On the Theory of [illegible]"). Docent [illegible] of the Stavropol'skiy sel'skokhozyaystvennyy institut (Stavropol' Agricultural Institute) dealt with "Some Problems of Hydrodynamics Within the General Theory of Atmospheric Circulations". Mal'bakhov, Student of the Kabardino-Balkarian University, held a report on "The Vertical Structure of Monsoons". M. Zhekamukhov and N. Arkabayev, Post-graduate Students of the Kabardino-Balkarian University, offered "Examples of the Rotation of Cosmic Gas Masses" and "The Model of a Star

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as Steady Radial Flow of Gas Particles and Photon Gas". A. Abdyldayev, Post-graduate Student of the Kabardino-Balkarian University, in his report dealt with "Some Problems of the Plane-parallel Flow of Heavy Liquids in Channels". Senior Teacher V. I. Men'shikova of the Stavropol'skiy pedagogicheskiy institut (Stavropol' Pedagogical Institute) delivered a report on "Semi-inverse Methods in the Theory of Motion of Ground Water With a Free Surface". Problems of mathematical physics were dealt with in three reports by Senior Teacher I. M. Karasev of the Kabardino-Balkarian University, Docent P. G. Baranovskiy of the Severoosetinskiy pedagogicheskiy institut (North Ossetian Pedagogical Institute), and Docent Ye. I. Kesis of the Stavropol' Pedagogical Institute. Docent V. N. Faro of the Odesskiy politekhnicheskiy institut (Odessa Polytechnic Institute) dealt with the theory of oscillations. Special attention was paid to a report by Professor S. V. Fal'kovich who suggested a greatly improved method of calculating transsonic currents, to a report by Professor L. N. Gutman who suggested an interesting solution to one of the most important problems of local meteorological phenomena, and to a report by N. Arkabayev who gave an ingenious explanation of an important astrophysical

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phenomenon.

ASSOCIATION: Kabardino-Balkarskiy gosudarstvennyy universitet (Kabardino-Balkarian State University)

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IL 7600

S/140/60/000/005/001/021
C111/C222

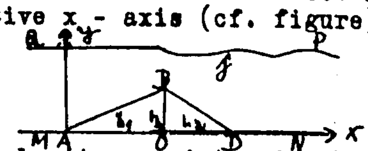
AUTHOR: Abdylayev, A.A.

TITLE: The Theory of Flow in a Channel With a Low Triangular Hindrance at the Ground

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Matematika, 1960, No. 5, pp. 3 - 11

TEXT: In the z = x + iy-plane let OX form the ground of the channel, let QP be the free surface, ABD be the hindrance. Let the fluid flow in the direction of the positive x - axis (cf. figure)

Fig. 1



For x = - ∞ let the velocity c and the depth h be known. For subcritical velocities, at the right side of the hindrance there appear waves the amplitude of which depends on the hindrance. By usual arrangements (conformal mapping) the author determines the field of velocities and the free surface with a consideration of the small terms of first order, and the

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The Theory of Flow in a Channel With a Low Triangular Hindrance at the Ground

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C111/C222

wave resistance with a consideration of the terms of second order. Under consideration of the fact that the height h_1 of the hindrance is very small, for the mapping into the plane of the complex potential $w = \varphi + i\psi$ the author uses (according to Wien (Ref. 1)) the formula

$$(2)\qquad \frac{dz}{dw} = \frac{1}{c}(w-a_1)^{\alpha_1-1}(w-a_2)^{\alpha_2-1}(w-a_3)^{\alpha_3-1}\left[1 + \epsilon\,\Omega(w)\right],$$

where a_1, a_2, a_3 are points of the φ-axis corresponding to A,B and D, $\alpha_1 + \alpha_2 + \alpha_3 = 3$, $\varepsilon = \frac{h1}{h}$ and $\Omega(w)$ is given by the boundary conditions

$$(3)\qquad \operatorname{Im}\Omega(w) = 0 \quad \text{for } \psi = 0,\ -\infty \leqslant \varphi \leqslant \infty .$$

$$(4)\qquad \Omega(w) = 0 \quad \text{for } \varphi = -\infty,\ 0 \leqslant \psi \leqslant q$$

and

$$(5)\qquad \operatorname{Re}\left\{\nu i\left[k\ln\frac{w-a_2}{w-a_1} + r\ln\frac{w-a_2}{w-a_3} + \Omega(w)\right] + \frac{k+r}{w-a_2} - \frac{k}{w-a_1} - \frac{r}{w-a_3} + \Omega'(w)\right\} = 0$$

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The Theory of Flow in a Channel With a Low Triangular Hindrance at the Ground

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for $\psi = q$, where $k = \frac{1-\alpha_1}{\varepsilon}$, $r = \frac{1-\alpha_3}{\varepsilon}$, $\nu = \frac{g}{c^3}$. ((5) follows from the Bernoulli equation for the free surface). If $F = \frac{c}{\sqrt{gh}} > 1$, then $\Omega(w)$ is sought by the arrangement

(12) $$\Omega(w) = \int_0^\infty \left[A(\lambda)\exp(i\lambda w) + \bar{A}(\lambda)\exp(-i\lambda w)\right]d\lambda + A_0 ,$$

where A_0 is a real constant, $A(\lambda)$ is unknown, $\bar{A}(\lambda)$ is conjugate complex to $A(\lambda)$. It results: $$\Omega(w) = \int_0^\infty \frac{(\nu+\lambda)\exp(-\lambda q)}{\lambda\,\theta(\lambda)}\left[(k+r)\cos\lambda(w-a_2) - k\cos\lambda(w-a_1) - r\cos\lambda(w-a_3)\right]d\lambda ,$$ where $\theta(\lambda) = \lambda\,\mathrm{ch}\,\lambda q - \nu\,\mathrm{sh}\,\lambda q$. If $F < 1$, then the expression for $\Omega(w)$ is supplemented by the summands $K + B\sin\lambda_0(w-a_2) + D\sin\lambda_0(w-a_1) + E\sin\lambda_0(w-a_3)$, where from (4)

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The Theory of Flow in a Channel With a Low Triangular Hindrance at the Ground

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it follows that $K = 0$, $B = -\frac{\pi(k+r)(\nu + \lambda_0)\exp(-\lambda_0 q)}{\lambda_0 \,\Theta'(\lambda_0)}$;

$D = \frac{\pi k(\nu + \lambda_0)\exp(-\lambda_0 q)}{\lambda_0 \,\Theta'(\lambda_0)}$, $E = \frac{\pi r(\nu + \lambda_0)\exp(-\lambda_0 q)}{\lambda_0 \,\Theta'(\lambda_0)}$. Now the free surface is determined with the aid of the Bernoulli equation by substituting $\frac{dz}{dw}$ into

(17) $$y = h + \frac{1}{\nu} \operatorname{Re}\left(\frac{dz}{dw} - \frac{1}{c}\right),$$

and restricting to terms with ϵ in the further calculation. For the wave resistance for $F < 1$ the author finds

(35) $$R = \frac{\rho c^2}{2} \cdot \frac{h_1^2}{h} f\left(\frac{h}{l_1}; \frac{h}{l_2}, F\right)$$

where f is given explicitly.

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The Theory of Flow in a Channel With a Low Triangular Hindrance at the Ground

S/140/60/000/005/001/021
C111/C222

The author mentions N. Kochin and K. Chadayeva. There is 1 figure and 3 references: 2 Soviet and 1 German.

ASSOCIATION: Kabardino-Balkarskiy gosudarstvennyy universitet (Kabardino-Balkarskaya State University)

SUBMITTED: October 16, 1958

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APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

USSR / General Problems of Pathology. Transplantation U
of Tissues and Tissue Therapy.

Abs Jour: Ref Zhur-Biol., No 11, 1958, 51576.

Author : Abdyldayev, K. A.
Inst : Kirgiz Health Dept.
Title : The Reaction of the Organism to Tissue Transplants by the Method of Filatov.

Orig Pub: Sov. zdravookhr. Kirgizii, 1956, No 6, 42-46.

Abstract: Rabbit skin, preserved for a period of 6 days in temperatures of 2-5°C, was inserted under the skin of the concha auriculae of rabbits. Degenerative changes were noted already during the first days, but no complete destruction was noted during the course of the experiment; the reticular layer (RL) of the dermis of the graft survived. All the epithelial structures, and also

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"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

COUNTRY : USSR
CATEGORY : General Biology. Individual Development. Transplantation and Union. B
ABS. JOUR. : RZhBiol., No. 2, 1959, No. 5117

AUTHOR : Abdyldayev, K. A.
INST. : Kirghiz State Medical Institute.
TITLE : The Problem of Histological Changes of Homologous Skin Implants.

ORIG. PUB. : Tr. Kirg. gos. med. in-ta, 1956, 8, 78-80

ABSTRACT : Pieces of rabbit skin, 4 x 4 mm in size, which were preserved according to the method of Filatov at a temperature of 2 - 4° for 5 - 6 days were implanted under the skin of 52 rabbits. Within the first few days after implantation degenerative changes were observed in the epidermis and dermis of the homotransplants. On the 4 - 8th day in some rabbits, however, the epithelium which is situated on the edge of the transplant preserves not only

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APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

Country : USSR
Category :

Abs. Jour :

Author :
Institut. :
Title :

Orig Pub. :

Abstract : be completely keratinized in nearly all of the cases, and the upper layers of the dermis underwent necrosis. Only the mechanical layer of the dermis presented a normal appearance, which according to the author's opinion may be explained by the fact that the cells of the host penetrated into it as well as by the formation of normal, dense connective tissue. The local reaction of the host to I during the first few days was expressed by an inflammatory infiltration of the dermis at the

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APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ABDYLDAYEV, K.A.; ARESTOVA, S.T.; MAKOVA, S.K.; ZHARKIMBAYEVA, A.Zh.

Morphogenesis of experimental hypertension under high-mountain conditions. Trudy KirgNOAGE no.2:60-62 '65.

(MIRA 18:11)

1. Iz laboratorii patomorfologii (rukovoditel' - kand.med.nauk K.A.Abdyldayev) i patofiziologii (rukovoditel' - starshiy nauchnyy sotrudnik M.A.Aliyev) Kirgizskogo instituta kray-voy meditsiny AMN SSSR. Nauchnyy konsul'tant - zasluzhennyy deyatel' nauki, prof. B.F.Malyshev.

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ABDYLDAYEV, K. A. Cand Med Sci -- (diss) "Histological changes of homoimplants in the skin of rabbits; and the reaction of the host's organism to ~~these changes.~~ them." Frunze, 1957. 16 pp 22 cm. (Kirgiz State Med Inst), 120 copies. (KL, 13-57, 100)

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

S/179/60/000/006/019/036
E022/E107

AUTHOR: Abdyldayev, M., (Osh)

TITLE: Investigation of a Thin Film of Liquid Flowing on a Three-Dimensional Surface

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Mekhanika i mashinostroyeniye, 1960, No. 6, pp. 120-124

TEXT: The investigation of the problem of thin liquid film on a flat plate has been described by F.I. Frankl' (Ref.1). The present article deals with a similar flow of a thin film over the surface of an ellipsoid. The author starts by introducing curvilinear coordinates x_1, x_2, which are taken along the lines of curvature of the surface; the third coordinate $x_3 = h$ is taken along the normal to the surface. The pressure on the free surface of the liquid is assumed to be atmospheric and consequently the velocity of the flow w_0 is constant and is set equal to unity. For the limiting case when the thickness of the film tends to zero, the velocity potential of the flow is

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E022/E107

Investigation of a Thin Film of Liquid Flowing on a Three-Dimensional Surface

introduced which is then employed to express the pressure on the surface of the ellipsoid in terms of k_1 and k_2, the two principal curvatures of the surface, and h^o the thickness of the film (this can be deduced from the continuity equation). The flow is restricted to the bottom half of the ellipsoid, the stream of liquid approaching the ellipsoid having a constant velocity which is perpendicular to the boundary of the bowl and parallel to the tangential surfaces. Next the elliptic coordinates λ, μ, ν are introduced, λ and μ being along the lines of curvature and for the case considered $\nu = 0$. The relations between these coordinates and x y z coordinates are then established and the equations for the Lamé's coefficients are developed. Since these coefficients grow indefinitely as $\lambda \rightarrow a^2$ and $\mu \rightarrow b^2$, new coordinates ξ and η called pseudo-cartesian are now introduced, which give finite values for H_λ and H_μ. By introducing differential equations of characteristics, as explained in Ref.4, it becomes apparent

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Investigation of a Thin Film of Liquid Flowing on a Three-Dimensional Surface

that the stream lines of the flow do not coincide with the lines of curvature, except along the central line $\lambda = a^2$. The flow along this central line is then considered at the end of the paper; the ellipsoid is assumed to have semi-axes $a^2:b^2:c^2 = 3:2:1$. The results of the analysis are tabulated. There are 1 figure, 1 table and 5 references: 4 Soviet and 1 translation from English into Russian.

SUBMITTED: May 5, 1960

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APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ABDYLDAYEV, M.

Symmetrical flow of a jet onto a solid of revolution. Uch. zap. Osh. gos. ped. inst. no.5:87-97 '63.

Thinly laminated two-dimensional jet flow of a liquid. Ibid.:99-107 (MIRA 18:2)

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"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ABDYLOV, A.

Activity of the Perseid meteor stream in 1964. Izv. AN Turk. SSR. Ser. fiz.-tekh. khim. i geol. nauk no.3:113 '65.
(MIRA 18:12)

1. Otdel geofiziki i seysmologii AN Turkmenskoy SSR. Submitted Dec. 10, 1964.

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ABDYUKHANOV, M.A.

"Multivibrator With Semiconductor Point-Contact Triode," by K. S. Rzhevkin and M. A. Abdyukhanov, Radiotekhnika i Elektronika, No 12, Dec 56, pp 1478-1484

The article describes the analysis of transient processes and the method of engineering calculation of a multivibrator with one point-contact semiconductor triode, operating in the regime of self-oscillation. Oscillations close to rectangular in shape are obtained, with pulse amplitude at the collector load almost equal to the feed voltage.

Calculation is based on the principle of solving the reverse problem, i.e., with the given pulse parameters the elements of the circuit are determined. An equivalent electric circuit is worked out, which greatly simplifies the process of calculation.

1. Fizicheskiy fakultet Moskovskogo gosudarstvennogo Universiteta imeni Lomonosova. (oscillators, Transistor)

SUM.1365

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"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ABDYUKHANOV, M.A.

109-9-9/15

AUTHORS: Kaptsov, L.N., Abdyukhanov, M.A. and Kashin, A.A.

TITLE: Application of the Quasi-Linear Method to the Analysis of a High Frequency Oscillator Employing a Transistor (Primeneniye kvazilineynogo metoda k analizu vysokochastotnogo generatora na poluprovodnikovom triode)

PERIODICAL: Radiotekhnika i Elektronika, 1957, Vol.II, Nr 9, pp. 1170 - 1173 (USSR)

ABSTRACT: A simple oscillator circuit containing a parallel RC network in the emitter and employing a single point-contact transistor (see Fig.1) is considered. The system is assumed to be operating at a comparatively high frequency so that the equivalent circuit of the transistor can be represented as an inductance L_T and a negative resistance R_T. It is assumed that under these conditions the waveform of the oscillations is sinusoidal. The circuit can easily be analysed by determining its $R_T = f_1(u_{30})|_{\omega = const}$, and its $L_T = f_2(u_{30})|_{\omega = const}$, where u_{30} is the amplitude of the first harmonic of the transistor input voltage. It is more convenient, however, to replace the function L_T by a function C_T such that $C_T = -1/\omega^2 L_T$. A set of functions

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Application of the Quasi-Linear Method to the Analysis of a High Frequency Oscillator Employing a Transistor.

$|R_T|$ and C_T for various frequencies was determined for the Soviet point contact transistor, type C1A, operating at the emitter current of 0.1 mA and collector voltage of -20 V (see Fig.3). From these curves it is possible to determine R and C and the amplitude of the oscillations for a given frequency. It is found that C_T decreases as a function of the amplitude (of oscillations) for increasing frequencies while R_T increases with increasing amplitudes. At comparatively low frequencies R_T is practically independent of $u_{э0}$. It was also observed that oscillations of the sinusoidal form can take place only above certain minimum frequencies, f_{min}. The values of f_{min} are of the order of 15% f_α, where f_α is the cut-off frequency of the transistor. There are 5 figures and 1 table. There is 1 Slavic reference.

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109-9-9/15

Application of the Quasi-Linear Method to the Analysis of a High Frequency Oscillator Employing a Transistor.

ASSOCIATION: Physics Faculty of the Moscow State University im. M.V. Lomonosov (Fizicheskiy Fakul'tet Moskovskogo Gosudarstvennogo Universiteta im. M.V.Lomonosova).

SUBMITTED: February 20, 1957.

AVAILABLE: Library of Congress.

Card 3/3

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3"

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

ABDYUKHANOV, N. A.

M. A. ABRYUKHANOV: "On the limits of applicability of small signal theory for semiconducting triodes." Scientific Session Devoted to "Radio Day", May 1958, Trudrezervizdat, Moscow, 9 Sep. 58

Analysis is presented of criteria of the applicability of small signal theory, obtained by Rittner; a new formulation of the problem is given and a solution of the problem is obtained in the stationary case and for slowly varying signals.

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ABDYUKHANOV, M. A.

10 июня

(с 18 до 22 часов)

В. Н. [illegible]

Тепловые режимы полупроводниковых приборов

В. М. [illegible]

Исследование и расчет температурной зависимости параметров полупроводниковых триодов дрейфового типа

Ю. Р. Носов,
В. Н. [illegible]

Осуществление температурной стабилизации режимов запирания на полупроводниковых триодах различных типов

<u>М. А. Абдюханов</u>

О зависимости параметров сплавных полупроводниковых триодов от тока эмиттера

В. Н. [illegible]

Шумы в полупроводниковых усилителях

11 июня

(с 10 до 18 часов)

Г. Ф. [illegible]

Статические характеристики и переходные процессы в полупроводниковых триодах при большом сигнале

Т. М. [illegible],
В. Н. [illegible]

Исследование особенностей работы спусковой схемы на плоскостных полупроводниковых триодах при [illegible] в зависимости от параметров триодов

А. Ю. [illegible]

Расчет усилительного каскада на транзисторах

В. А. [illegible]

О влиянии режима питания в полупроводниковых триодах на работу импульсных схем

11 июня

(с 18 до 22 часов)

Ю. М. [illegible],
Н. Я. [illegible],
С. М. [illegible]

Об объемном заряде и электрическом поле в базовой области сплавного триода

Н. С. [illegible]

Влияние неоднородности толщины базы на параметры сплавного триода

report submitted for the Centennial Meeting of the Scientific Technological Society of Radio Engineering and Electrical Communications im. A. S. Popov (VNORIE), Moscow, 8-12 June. 1959

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"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

AUTHOR: Abdyukhanov, M.A. SOV/109-4-7-3/25

TITLE: Limits of the Applicability of the Small-signal Transistor Theory

PERIODICAL: Radiotekhnika i elektronika, 1959, Vol 4, Nr 7, pp 1094 - 1102 (USSR)

ABSTRACT: The theory proposed by W. Shockley (Ref 1) is valid for small signals and is based on the assumption that the concentration of the minority carriers injected into the base of a transistor is much lower than the concentration of the majority carriers; this is written as $P/N_d \ll 1$, where P is the hole concentration and $N_d = n_o$ is the equilibrium concentration of the electrons in the base. The theory assumes the following boundary conditions for the holes in the base:

$$P = P_n e^{\frac{qV}{kT}} \quad (1),$$

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where P_n is the equilibrium concentration of the holes in the base and V is the external voltage applied to the transistor. The usual continuity equation for the minority carriers in the base is expressed by Eq (2), while the hole current is given by Eq (3), where τ_p is the lifetime of the excess carriers in the base. The steady-state solution of Eq (2) is in the form of Eq (4), where W is the width of the base and L_p is the diffusion length of the holes. The hole current is given by Eq (5), where P_3 is the hole concentration at the emitter junction. E. Rittner (Ref 2) derived the following continuity equation:

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$$\frac{\partial P}{\partial t} = - \frac{P - P_n}{\tau_p} -$$

$$- \frac{I\frac{\partial P}{\partial x} - bqD_pN_d\left(1 + \frac{b+1}{b}\frac{P}{N_d}\right)\left(1 + 2\frac{P}{N_d}\right)\frac{\partial^2 P}{\partial x^2} - (b-1)qD_p\left(\frac{\partial P}{\partial x}\right)^2}{qbN_d\left(1 + \frac{b+1}{b}\frac{P}{N_d}\right)^2} \qquad (6)$$

and the expression for the hole current:

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$$I_p = \frac{PI - bqD_p\left(2P + N_d\right)\frac{\partial P}{\partial x}}{(b + 1)P + bN_d} \qquad (7)$$

where $I = I_p + I_n$ is the total current in the base and $b = \mu_n/\mu_p$. These equations take into account the effect of the electric field in the base. When the ratio $P/N_d \ll 1$, Eq (6) can be simplified and written as Eq (8). On the basis of Eq (8), Rittner (Ref 2) concluded that the small signal solution (Eqs 4 and 5) is valid when the conditions given by Eqs (9) are fulfilled. Examination of Eqs (9) shows that the applicability of Eqs (4) and (5) is restricted to very small currents (of the order of a few μA). The author is of the opinion that though the principal Rittner equations are correct, the conclusions derived from them are erroneous. Eq (6) is therefore

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SOV/109-4-7-3/25

Limits of the Applicability of the Small-signal Transistor Theory

analysed in some detail. The problem consists of determining the conditions such that the solutions of Eqs (2) and (6) and their derivatives with respect to x would coincide, or diverge very little. Since direct solution of Eq (6) is very difficult, the problem is tackled indirectly. It is found that for $P/N_d \ll 1$ and $(W/L_p)^2 \ll 1$, the small-signal theory which is based on Eq (2) is quite adequate. In fact, it is found that it is accurate for the emitter currents of the order of a few mA. Furthermore, it is found that the small-signal theory is valid for low-frequency signals provided $P/N_d \ll 1$, where P contains a constant as well as an alternating component. The author expresses his gratitude to V.V. Migulin, K.S. Rzhevkin, K.Ya. Senatorov and Yu.M. Az'yan for discussing this work.

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"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

SOV/109-4-7-3/25

Limits of the Applicability of the Small-signal Transistor Theory

There are 7 references, of which 1 is English and 6 are Soviet.

ASSOCIATION: Fizicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta im. M.V. Lomonosova (Physics Faculty of Moscow University imeni M.V. Lomonosov)

SUBMITTED: February 18, 1958

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77959
SOV/109-5-3-13/26

AUTHORS: Abdyukhanov, M. A., Berestovskiy, G. N., Kuz'min, V. A.

TITLE: On the Calculation of Processes in Transistor Triodes by the Charge Method

PERIODICAL: Radiotekhnika i elektronika, 1960, Vol 5, Nr 3, pp 450-459 (USSR)

ABSTRACT: Introduction. The usual method of calculating the electrical characteristics of semiconductor triodes is the solution of the continuity problem for the minority carriers in the emitter, base, and collector zones at certain boundary conditions, which depend on applied external voltages and currents (see W. Shokley, M. Sparkes, G. Teal, U.S. ref). Although this is the most universal method, it often leads to complicated calculations. A later method (J. Sparkes, R. Beaufoy, U.S. ref) considers the semiconductor triode as a system controlled by the charge of surplus minority carriers of the base zone. The present paper investigates the

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relations between currents in the triode and the surplus charge carriers in the base, and analyzes the limits of the application of the charge method. Calculation examples help to evaluate its simplicity. 1. Basic relationships. The equation formulating the law of conservation of the full charge of holes in the base (p-n-p-triode) is:

$$\frac{dQ}{dt} = I_{pe} - I_{pk} - I_{VR} - I_{SR}. \quad (1)$$

where

$$Q = q\int_V (p - p_n)\,dV$$

is the hole charge in base of arbitrary volume V, exceeding the equilibrium charge; I_{pe} and I_{pk} are hole currents of emitter and collector, respectively; I_{VR}, I_{SR} are currents of volume and surface recombination. Further, the equilibrium hole charge will be

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ignored in comparison with the excess charge. Equation (1) can be derived also by integrating the continuity equation:

$$\frac{\partial p}{\partial t} = -\frac{p - p_n}{\tau_p} - \frac{\operatorname{div} I_p}{q} \qquad (2)$$

over the whole volume V of base. In order to apply (1) to practical calculations, additional conditions relating the triode (working as an amplifier) currents to the charge Q are needed. 1. Relation of collector current to charge is given by:

$$I_к = Q / \tau_к, \qquad (3)$$

where $\tau_к$ is coefficient depending on physical properties of the base zone of the triode. The distribution of holes in the base is linear and $\tau_к$ = const. For low injection rates:

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$$I_{\kappa} = \frac{\eta q D_p p_b(0) S}{W} = \eta Q \frac{2D_p}{W^2},$$

where $\eta = 1 - W^2/2L_p^2$ is transfer coefficient. Therefore,

$$\tau_{\kappa} = \tau_D / \eta. \qquad (3')$$

2. Concentration of holes in the base at the emitter junction is proportional to the charge Q :

$$p_b(0) = kQ. \qquad (4)$$

This equation enables the determination of the relation between the charge on one side and the current of surface recombination and electron current of the emitter on the other.

$$k = \frac{2}{qSW}.$$

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3. The surface recombination current I_{SR} is proportional to the hole concentration at the emitter junction:

$$I_{SR} = qsA_S p_b(0),$$

where s is surface recombination speed; A_S, effective surface area where recombination occurs. Based on (4):

$$I_{SR} = Q/\tau_S.$$

It is further assumed that s A_S = const, and also τ_S = const. 4. The volume recombination in the base zone plays a lesser role. The lifetime of holes in volume τ_V is const for low and high injection levels, but depends on the concentration for medium injection levels. For practical purposes the lifetime in volume τ_V = const for all levels. Combining the surface and volume recombination currents, and introducing the

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effective lifetime τ_p, the equation is written:

$$I_R = I_{VR} + I_{SR} = Q/\tau_p, \qquad (5)$$

where

$$\frac{1}{\tau_p} = \frac{1}{\tau_S} + \frac{1}{\tau_V},$$

5. The emitter electron current can be expressed through Q, using first the equation:

$$I_{ne} = \frac{qD_nS}{L_n} n_e(0) \text{ or } I_{ne} = \frac{qD_nS}{L_n} \frac{n_b(0)\, p_b(0)}{p_e(0)}. \qquad (6)$$

Since $p_e(0) = p_p$ is equilibrium concentration of holes in the emitter, $n_b(0) = n_n - p_n + p_b(0)$ as corresponding to the neutrality condition in each point of the base and $p_b(0) = kQ$, Eq. (6) takes shape:

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"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120013-3

$$I_{ne} = a_1 Q + a_2 Q^2, \qquad (7)$$

where a_1 and a_2 are constant coefficients. Substituting the above expressions for (1), and taking into consideration that $I_{pe} = I_e - I_{ne}$; $I_{pk} = I_k$, $I_b = I_e - I_k$, the equations, which together with conditions (1) and (5) constitute the whole set needed for calculations per charge method, are derived:

$$\frac{dQ}{dt} + \frac{Q}{\tau_p} + a_1 Q + a_2 Q^2 = I_b \qquad (8)$$

or

$$\tau_n \frac{dI_n}{dt} + \left(\frac{\tau_n}{\tau_p} + a_1 \tau_n\right) I_n + a_2 \tau_n^2 I_n^2 = I_b. \qquad (9)$$

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$$\tau_{\text{н}} \frac{dI_{\text{н}}}{dt} + \left(1 + \frac{\tau_{\text{н}}}{\tau_{p}} + a_1 \tau_{\text{н}}\right) I_{\text{н}} + a_2 \tau_{\text{н}}^2 I_{\text{н}}^2 = I_{\text{e}}. \tag{10}$$

These conditions are valid as long as charge Q varies with sufficient slowness in comparison to the diffusion time τ_D. If the charge varies with the time constant $\tau \simeq \tau_D$, the charge method can give considerable error. In some cases, however, the method can still be used as an approximation for some fast processes. As an example, the transient characteristic of a triode with a common base for small signals is investigated. The emitter current suddenly changes from 0 to I_{eo} at some t = 0. $I_k(t)$ is sought. For simplicity the emitter current I_{ne} is ignored. Eq. (10) takes shape:

$$\tau_{\text{н}} \frac{dI_{\text{н}}}{dt} + I_{\text{н}} = \tau_{\text{i}} I_{\text{eo}}.$$

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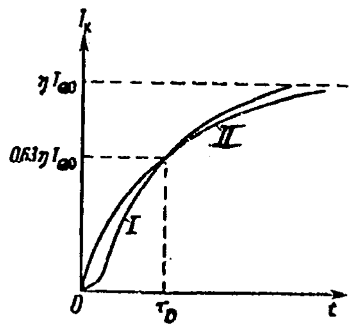
Its solution is:

$$I_K(t) = \eta I_{e0}[1 - \exp(-t/\tau_D)], \quad (11)$$

which is very often used for practical applications. Figure 2 shows the exact transient characteristic I and the approximated II as calculated per (11), where a pronounced difference may be seen at $t < 0.2\ \tau_D$.



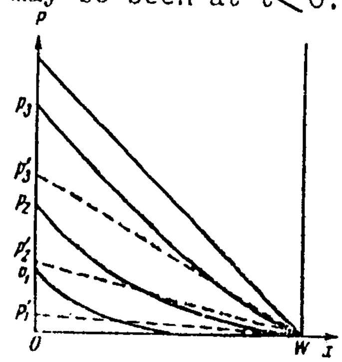


Fig. 2 Fig. 3
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Fig. 2. Transient characteristics of transistor triode in a circuit with a common base: (I) exact curve; (II) calculated per (11).

Fig. 3. Hole concentration in the emitter base at different times: (p_1, p_2, p_3) actual values: (p_1', p_2', p_3') calculated per (4).

This investigated example proves that for many practical cases relation (3) is valid and sufficiently accurate; the same is true when the base charge varies with the time constant $\tau \simeq \tau_D$. Figure 3 shows the distribution of holes in the base at different moments; since the calculated values (per 4) are lower than the actual, the I_{SR} and I_{ne} are also smaller than the actual magnitudes. But the influence of the recombination current and electron current

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of the emitter are important only for circuits where the charge at the base varies with the time constant, considerably exceeding τ_p; hence Eqs. (5) and (7) can be considered valid. Equation (1) expressing the law of charge conservation is valid for any geometry of the base. But since Eqs. (1)-(5) were proved only by solution of the continuity equation for a one-dimensional case, the field of application of the method is proved only for a one-dimensional model of transistor-triodes. 2. On the Influence of the emitter electron current on the transient characteristic of the transit triode, connected with a common emitter. The influence of the injection coefficient on the transient characteristic of the triode was investigated by E. I. Adirovich and K. V. Temko (USSR). In this work within the frame of theory of a small signal and assuming γ = const during the transient process, the diffusion equation for holes of the base was solved, but giving a cumbersome result, approximated by the following equation:

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$$h_a(t) = \frac{\gamma a' \cos\gamma}{\sqrt{1-\gamma^2}} \cdot \frac{1-\exp\left\{-\left[\frac{1}{\tau_p}+\frac{(a t_\varepsilon \cos\gamma)^2}{\varepsilon\tau_p}\right]t\right\}}{\frac{\tau_\beta}{\tau_p}+\frac{(a t_\varepsilon \cos\gamma)^2}{\varepsilon}}. \quad (12)$$

The transient characteristic for the transistor-triode is now calculated for moment $t = 0$ at which the base current jumps from 0 to I_{bo}. For a small signal in (7), the second term can be ignored, and Eq. (9) can be written as:

$$\frac{dI_n}{dt} + \frac{I_n}{\tau^*} = \frac{I_{bo}}{\tau_n}, \quad (13)$$

where

$$\frac{1}{\tau^*} = \frac{1}{\tau_p} + \frac{1}{\tau_r}, \quad t_\varepsilon = \frac{1}{a_t}. \quad (14)$$

From the steady distribution of holes in the base,

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τ_e can be determined:

$$\tau_e = \frac{\gamma\tau_D}{1-\gamma}. \qquad (15)$$

The solution of (13) is:

$$I_K(t) = \frac{\eta\tau^*}{\tau_D} I_{bo}[1 - \exp(-t/\tau^*)]. \qquad (16)$$

Taking (15) into consideration and using the equation $\tau_D = \tau_p(1-\eta)$, we get:

$$I_K(t) = \frac{\alpha}{1-\alpha} I_{bo}\left\{1 - \exp\left[-\left(\frac{1}{\tau_p} + \frac{1-\gamma}{\gamma\tau_D}\right)t\right]\right\} \qquad (17)$$

or

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$$I_{\kappa}(t) = \frac{\alpha}{1-\alpha} I_{b0}\left\{1 - \exp\left[-\frac{(1-\alpha)t}{\gamma\tau_D}\right]\right\} \quad (18)$$

(the authors refer here to J. Sparkes, R. Neaufoy, U.S. ref). From these expressions it follows that the collector current varies with the time constant $\tau^* < \tau_p$, where the inequality increases with decrease of γ and τ_D. The influence of the electron current on the transient characteristic can be ignored when $\tau_e / \tau_p \geqslant 10$ or:

$$\frac{\gamma(1-\eta)}{1-\gamma} \geqslant 10. \quad (19)$$

Usually η = 0.98 and (19) is satisfied when $\gamma \geqslant 0.998$. For values γ close to one the index of the exponential of formula (12) is:

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$$\frac{1}{\tau_p} + \frac{(\mathrm{arc}\cos\gamma)^2}{2\tau_D} \simeq \frac{1}{\tau_p} + \frac{1-\gamma}{\tau_D},$$

which is close to the one given in Eq. (17). 3. Calculation of the current amplification coefficient and output conductance of the transistor triode with consideration of the modulation of the base zone thickness. A harmonically varying current with an amplitude small as compared with the amplitude of the emitter bias current, is applied at the input of the transistor triode with a grounded base. Limiting calculations to low injection levels, the modulation of the base thickness is considered. All variables depending on time are assumed to vary harmonically, and to be small in magnitude as compared with variables corresponding to a steady state. The equation of conservation of charge:

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$$\frac{dQ}{dt} = -\frac{Q}{\tau_p} + I_{\text{э}} - I_{\text{к}} \qquad (20)$$

will be solved. For emitter current:

$$I_{\text{э}} = I_{\text{э}0} + i_{\text{э}0} \exp j\omega t,$$

for collector current:

$$I_{\text{к}} = I_{\text{к}0} + i_{\text{к}0} \exp j\omega t$$

for collector voltage:

$$V_{\text{к}} = E_{\text{к}} + v_{\text{к}0} \exp j\omega t,$$

where i_{ko} and v_{ko} are complex amplitudes. After respective substitutions the complex amplitude is calculated from (20) as:

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$$i_{\kappa 0} = \alpha i_{\vartheta 0} + G_{\kappa} v_{\kappa 0}. \tag{23}$$

where

$$\alpha = \frac{\gamma_0}{1 + \frac{\tau_\kappa}{\tau_p} + j\omega\tau_\kappa} = \frac{\alpha_0}{1 + j\omega\tau_D} \tag{24}$$

is the amplification coefficient per current for shortcircuited output given as approximation valid up to the critical frequency and

$$G_\kappa = \frac{\gamma_0}{1 + j\omega\tau_D}\left[-\frac{1}{\tau_p}\frac{\partial\tau_\kappa}{\partial W} I_{\kappa 0} + \frac{\partial\gamma}{\partial W} I_{\vartheta 0} - j\omega\frac{\partial\tau_\kappa}{\partial W} I_{\kappa 0}\right]\frac{\partial W}{\partial V_\kappa} \tag{25}$$

the output conductance, dependent on the modulation of the thickness of the base zone. Separating the active and reactive part of G_k for the one-dimensional

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model of the triode:

$$g_{\kappa} = \frac{g_0 + \omega^2 \tau_D C_0}{1 + \omega^2 \tau_D^2}, \quad C_{g\kappa} \simeq \frac{C_0}{1 + \omega^2 \tau_D^2}, \qquad (26)$$

where g_0 and C_0 are values of the active part of the output conductance and diffusion capacity at low frequencies, determined by:

$$g_0 = \frac{\partial (\tau_0 \gamma_0)}{\partial W} \frac{\partial W}{\partial V_{\kappa}} I_{\epsilon 0}, \qquad (27)$$

$$C_0 = -\gamma_0 \frac{W_0}{D_p} \frac{\partial W}{\partial V_{\kappa}} I_{\epsilon 0}, \qquad (28)$$

which coincide with the exact expressions derived from solution of the diffusion equation by J. M. Early (U.S. ref). The expressions for output conductivity are valid up to the critical frequency. If the variable

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voltage on the collector is caused by a load at the output $v_{ko} = -i_{ko} R_l$, it follows from (23) that:

$$i_{ko} = \frac{a}{1 + R_l G_k}. \qquad (29)$$

which shows that with increase of the load resistance the amplification coefficient per current drops. Figure 4 shows comprehensively the change of collector voltage with thickness of base.

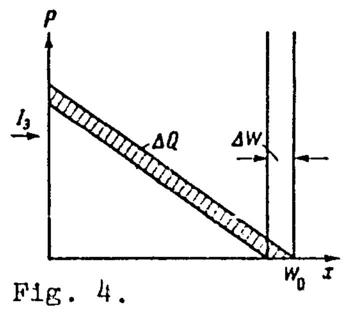

Fig. 4.

Fig. 4. Dependence of the charge Q on the thickness of the base zone W at constant emitter current.

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Conclusions. The charge method being convenient for engineering calculations of problems of transistor triode electronics is as valid for slow processes as the known methods based on solution of continuity equations. For many instances it is valid also for processes with time constants close to the critical frequency. It is possible that this method, after some modifications, could be applied to calculations of problems not only of fused, but also of drift transistor triodes. There are 4 figures; and 21 references, 8 Soviet, 11 U.S., 2 Japanese. The most recent or referred to U.S. references are: W. Shockley, M. Sparkes, G. Teal, P-N Transistor, Phys. Rev., 83, 7, 151 (1951); J. Sparkes, R. Beufoy, The Junction Transistor as a Charge Controlled Device, Proc. I.R.E., 45, 12, 1740 (1957); F. G. Hyde, Some Measurements of Commercial Transistors and Their Relation to Theory, Proc. I.R.E., p. B. 105, 19, 45 (1958); L. D. Armstrong, C. L. Carlson, M. Bentivedna, P-N-P Transistor Using High-Emitter-Efficiency Alloy

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SUBMITTED: May 12, 1959

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AUTHOR: Abdyukhanov, M. A.

TITLE: Change in Critical Frequency and Output Conductance of Fused Semiconductor Triodes With the Emitter Current

PERIODICAL: Radiotekhnika i elektronika, 1960, Vol 5, Nr 3, pp 478-489 (USSR)

ABSTRACT: One of the important characteristics of semiconductor triodes is the current amplification α in a circuit with common base and shortcircuited. Amplitude, phase, frequency characteristics of α determine to a great extent the frequency characteristics of transistor triodes. It was found that the usual range of emitter current consists of three zones. The zone of low positive shift of the emitter has a low α_o value due to a recombination in the p-n junction. In the second zone of medium injection levels, the role of recombination is smaller and α_o is higher. Finally, in the

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third zone a higher emitter current lowers the injection coefficient and consequently α_o. A study of frequency properties of α shows the same picture. At low injection levels frequency properties of α are determined by the diffusion of holes in the base area. The critical frequency depends on the width W of base area and on the diffusion coefficient D_p.

$$f_\alpha = \frac{2.43 D_p}{2\pi W^2}. \qquad (1)$$

Tests undertaken by the author did show that at low levels of injection the critical frequency is not constant but increases with an increasing emitter current. This rise is fast at low level of current; slows down at medium injection levels; reaches a maximum value and tapers off at a further rise of current. Previous attempts to explain this decrease failed, and the present article tries to find the reasons for it. Besides this it is necessary to clarify the relation of output conductance of the transistor

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triode with grounded base to the emitter current, which for high injection levels has characteristics different from low injection levels. This paper is further concerned with the calculation of output conductance for large signals by the charge method, and experimental investigation of its dependence on the emitter current. (1) Dependence of Critical Frequency on Emitter Current at Low Injection Levels: Under these conditions, the static capacitance C_e of the p-n junction influences the critical frequency, considerably lowering α at high frequencies. Capacitance C_e is connected in parallel with the input diffusion conductance of the triode, the expression for the latter being:

$$G_{in} = \frac{q}{kT} \frac{S_e q D_p p_n e^{\frac{qV_e}{kT}}}{L_p} \sqrt{1 + j\omega\tau_p} \coth\left[\sqrt{1 + j\omega\tau_p}\frac{W}{L_p}\right], \qquad (2)$$

where $L_p = \sqrt{D_p \tau_p}$ is the so-called diffusion

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length for base holes; p_n is the balanced concentration of holes in the base. The input alternating current i_e consists of the bias current $i_b = j\omega C_e v_e$, hole diffusion current $i_{pe} = G_{in} v_e$, and emitter electron current $i_{ne} = (1 - \gamma_o)/\gamma_o i_{pe}$; $i_e = i_b + 1/\gamma_o i_{pe}$.

The output current is $i_k = \eta i_{pe}$, where η is coefficient of hole transfer from emitter to collector. Therefore, the current amplification coefficient is

$$\alpha' = \alpha(j\omega) \frac{G_{in}}{G_{in} + j\omega C_e \gamma_0}, \qquad (3)$$

where $\alpha(j\omega)$ is the "inner" current amplification coefficient. Using the simple approximation for $\coth\left[\sqrt{1 + j\omega\tau_p}\,\frac{W}{L_p}\right]$ and the expression which is valid up

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to the critical frequency:

$$\alpha(j\omega) = \frac{\alpha_0}{1 + j\frac{\omega}{\omega_\alpha}}, \qquad (4)$$

where ω_α can be found from (1), the expression sought is:

$$\alpha' = \frac{\alpha_0}{1 + j\frac{\omega}{\omega'_\alpha}}, \qquad (5)$$

where

$$\omega'_\alpha = \omega_\alpha \frac{1}{1 + \omega_\alpha C_e r_e \gamma_0}, \qquad (6)$$

but $r_e = kT/qI_e$. From here on, apostrophes indicate measured variables. More exact approximations do not

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have practical values.

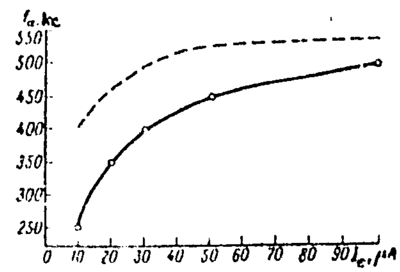

Fig. 1. Critical frequency versus emitter current at low currents for triode type П1 B (P1V).

The solid curve of Fig. 1 shows experimental results, the dotted, those theoretically computed from (6).
(2) Electronic Peculiarities of Semiconductor Triodes at Medium and High Injection Levels, and Factors Lowering the Critical Frequency: Two features lead to

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a drop of critical frequency when the injection level reaches $p_e/n_o \simeq$ 5 to 7: (a) There is, in the base area, a large charge of surplus holes and the modulation of base volume results in a high conductance parallel to the junction and proportional to emitter current. This leads to a decrease of critical frequency. (b) A considerable radial field is formed across the basic path of hole movement, which causes a drop of potential between the base and the emitter junction; therefore, the height of potential barrier at the junction declines at the edges of the emitter; and the concentration of injected holes at these edges increases as compared with the concentration at the center. Each of these peculiarities is discussed further below. (3) Influence of Base Resistance on Critical Frequency at High Emitter Currents: The triode shown on Fig. 2 is assumed to be ideal, and to it resistance r_b is connected as an outside element. For medium and high injection levels

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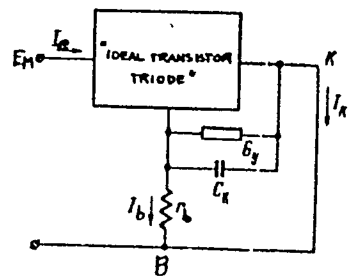
Fig. 2. Equivalent circuit of semiconductor triode with r_b, C_k, and G_y.



the continuity equation of hole concentration is non-linear and solution of the problem with the same precision as for low injection levels is not possible; therefore, the charge method will be used to determine the current amplification. Instead of a continuity equation an equation of charge conservation of surplus holes in the base area is solved:

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$$\frac{dQ}{dt} = -\frac{Q}{\tau_p} + I_{pe} - I_{\kappa} \qquad (7)$$

with the relation of charge Q to collector current per:

$$I_{\kappa} = \frac{Q}{\tau_{\kappa}}, \qquad (8)$$

where $Q = q\int_V (p - p_n)\,dv$; V is the base volume; $\tau_K = \tau_D / \eta_o$; τ_D is diffusion time of holes from emitter to collector. The solution of (7) using (8) results in:

$$i_{\kappa 0} = \gamma_0 \eta i_{e0} + G_{\kappa} v_{\kappa 0}, \qquad (9)$$

WHERE

$$G_{\kappa} = \frac{\eta}{\eta_0}(G_0 + j\omega C_0) + G_y + j\omega C_{\kappa}, \qquad (10)$$

$$G_0 = \frac{1}{\tau_p}\frac{\partial Q_0}{\partial V_{\kappa}} + I_{e0}\frac{\partial \gamma}{\partial V_{\kappa}}. \qquad (11)$$

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$$C_0 = \frac{\partial Q_0}{\partial V_K}; \tag{12}$$

G_0 and C_0 are low-frequency values of active part of output diffusion conductance and diffusion capacitance:

$$\eta = \frac{\eta_0}{1 + j\omega\tau_D} \tag{13}$$

is the transfer coefficient; G_y is conductance of collector leakage; C_k is static capacitance of collector; i_{eo}, i_{ko}, and v_{ko} are complex amplitudes of variable components of emitter and collector currents and collector voltage. In the absence of load $v_{ko} = (i_{eo} - i_{ko})r_b$ and substituting this expression into (9), the coefficient of current transmission is obtained:

$$\alpha' = \frac{\alpha + G_K r_b}{1 + G_K r_b} \tag{14}$$

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which is identical at low injection levels with the equation of hole density diffusion. A calculation of G_0 and C_0, per (11) and (12), using (8), leads to the active part G and diffusion capacitance C:

$$G = \frac{G_0 + \frac{\omega^2}{\omega_\alpha} C_0}{1 + \frac{\omega^2}{\omega_\alpha^2}} \qquad (15)$$

$$C = \frac{C_0}{1 + \frac{\omega^2}{\omega_\alpha^2}}. \qquad (16)$$

This coincides with high-frequency approximations of output conductance derived by Yu. A. Kamenetskiy from exact expressions of output conductance:

$$G_{K\varphi} = \frac{\alpha_0}{L_p} \frac{\partial W}{\partial V_K} I_{e0} \sqrt{1 + j\omega\tau_p}\,\mathrm{th}\left[\sqrt{1 + j\omega\tau_p}\,\frac{W}{L_p}\right]. \qquad (17)$$

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For medium and high injection levels, G and C can be calculated per (15) and (16) with the respective ω_α, G_o, and C_o determined by experiments. Figure 3 (a,b) shows experimental data on relation of G_o and C_o to emitter current of П1, П6, and П15 triodes. Assuming in (14) $|\alpha'| = \alpha_o / \sqrt{2}$ the following expression for critical frequency is obtained:

$$f_x = f_\alpha \frac{1}{\sqrt{1 + 2\delta_0 + \frac{4\delta_1}{\alpha_0}}}, \qquad (18)$$

where $\delta_0 = 2\pi f_\alpha C_0 r_b$, $\delta_1 = 2\pi f_\alpha C_0 r_b$. As C_o increases in proportion to emitter current, while r_b is independent of same (Fig. 4), critical frequency decreases when I_e rises per (18). In order to verify expression (18) the

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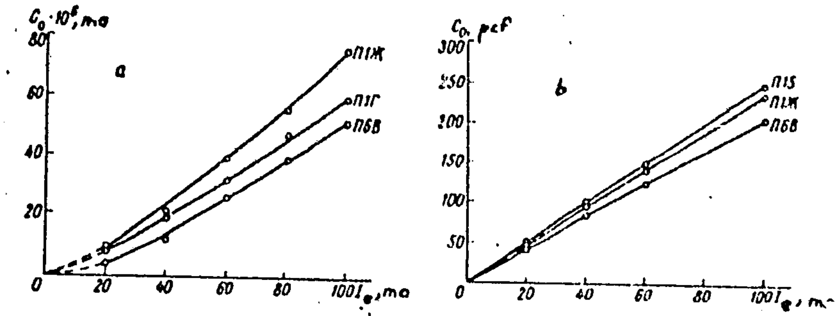

Fig. 3. Active portion of output conductance (a) and diffusion capacitance of collector (b) versus emitter current.

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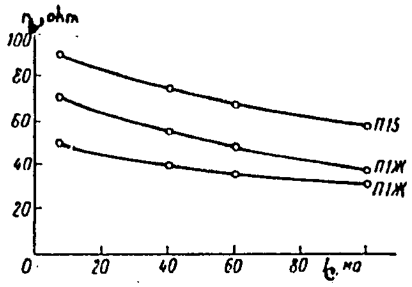

Fig. 4. Base resistance versus emitter current.

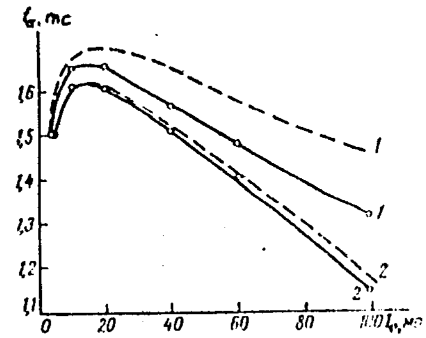

Fig. 5. Critical frequency versus high emitter current.

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dependence of critical frequency on emitter current was measured (Fig. 5, solid curve 2). An additional resistance R_b = 50 cm was imposed, in this case in the base line. Dashed line 2 shows the same dependence when a resistance $(R_b + r_b)$ was imposed and for f_α values determined from dashed curve 1. Solid line 1 shows the same dependence for П1Ж triode, while dashed line 1 shows the effect of excluded indluence r_b per (18). (4) Influence of the Radial Field on Critical Frequency: Actual triode emitters and collectors have spherical rather than planar surfaces (see Fig. 6). A mathematical solution for these surfaces presents insurmountable difficulties, and a simple method for determining the average base width W consists in the calculation of time constant $\tau = r_e C_{de}$ which determines the frequency properties of α up to critical frequency. Here r_e is input resistance of triode (disregarding r_b),

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$C_{de} = \partial Q / \partial V_e$ is input diffusion capacitance. Assuming the surfaces spherical and hole distribution to be linear, for $R_1^2 \gg r_1^2$ where $r_1 = d_1/2$,

$$\tau = \frac{W_0^2}{2D_p}\left(1 + \frac{gr_1^2}{2W_0}\right)^2, \qquad (20)$$

where W_0 (shown on Fig. 6) is the shortest distance between junctions. From (20) it follows that:

$$\overline{W} = W_0\left(1 + \frac{gr_1^2}{2W_0}\right). \qquad (21)$$

The presence of unequal distribution of injected holes along the emitter junction causes increase of $\overline{W}$ for large emitter currents. In order to determine the distribution of concentration of injected carriers in the base along radius r and to calculate $\overline{W}$,

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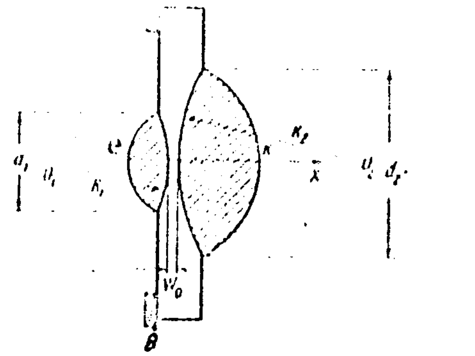
Fig. 6. Schematic representation of a fused triode in cross section



the voltage drop at the base V(r) must be calculated first. This is done under following assumptions: (1) The volume recombination of excess in the base is ignored; (2) The emitter surface is considered equipotential since the emitter material

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conductance is high compared with the base conductance; (3) The distribution of holes and electrons in the base along direction x is linear; (4) The distribution of the electron current in the base zone can be determined from $\partial j_{nx} / \partial x = A\sigma(x)$ where $\sigma(x) = \sigma_0\left[1 + \frac{p_e}{n_0}\left(1 - \frac{x}{W(r)}\right)\right]$ constant conductivity A at point. Under these assumptions the equation for V(r):

$$V(r) = \int_r^{r_1} \rho(\xi)\, j_{nr}(0, \xi)\, d\xi,$$

where $\rho(r)$ is specific conductivity at base along emitter surface, is transformed into:

$$V(r) = \frac{B\rho_{b0}}{W_0}\int_r^{r_1} \frac{dz}{z\left[1 + \frac{p_e(z)}{n_0}\right]} \int_0^z \frac{p(\xi)}{n_0}\left[1 + \frac{p(\xi)}{n_0}\right]^2 \frac{\xi\, d\xi}{\left[1 + \frac{p(\xi)}{2n_0}\right]\left(1 + \frac{g\xi^2}{W_0^2}\right)}. \quad (24)$$

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This equation can only be approximately solved:

$$V(r) = \frac{kT}{q} a \ln \left[\frac{1 + \frac{g r_1^2}{2W_0}}{1 + \frac{g r^2}{2W_0}} \right], \qquad (25)$$

where

$$a = \frac{q}{kT} B \mu_0 \frac{p_{e1}}{n_0} \frac{1}{g}. \qquad (26)$$

The distribution of injected hole concentration can be determined using equation

$$p_e(r) = p_e(r_1) \left[\frac{1 + \frac{g r^2}{2W_0}}{1 + \frac{g r_1^2}{2W_0}} \right]^a. \qquad (27)$$

The time constant can be evaluated for a = 1,2,3,4,.... The author concludes that while a linear distribution of holes along x-axis was assumed by the theory, the

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influence of a radial field bends their path from emitter to collector leading to their increased charges in the base and $\overline{W}$. The nonuniform distribution of holes on the emitter surface leads to a relative increase of the surface recombination current, which must be considered for determination of the current amplification at large emitter currents. Conclusions: The experimental data and theoretical calculations presented prove that the increase of the critical frequency with emitter current for low currents is basically determined by the weakening of the shunting influence of the static capacitance of the p-n junction. For medium and large injection levels, the experiments show not doubling (as should be expected from theoretical considerations), but only 40-50% increase as compared with the critical frequency for injection level $p_e/n = 0.1$. The presence of a radial electrical field in the base, and base resistance, cause a drop of the critical

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frequency at large emitter currents. Experiments and theoretical calculations of output conductance at large emitter currents did show it has mostly a diffusion character and increases in proportion to the emitter current. K. Rzhevkin assisted in this work. There are 6 figures; and 16 references, 4 Soviet, 8 U.S, 2 U.K., 2 Japanese. The most recent U.S. references are: Chih-Tang Sah, R. N. Noyce, W. Shockley, Current Generation and Recombination in P-N Junctions and P-N Junction Characteristics, Proc. IRE, 1957, 45, 9, 1228; W. Gaertner, R. Hanel, R. Stampel, F. Caruso, The Current Amplification of a Junction Transistor as a Function of Emitter Current and Junction Temperature, Proc. IRE, 1958, 46, 11, 875; M. I. Meyer, On the Variation of Transistor Small-Signal Parameters With Emitter Current and Collector Voltage, J. Electronics and Control, 1958, 4, 4, 305; M. I. Meyer, Supplementary Note to the Paper: On the Variation of Transistor Small-Signal Parameters With Emitter Current and Collector Voltage, 1958, 5, 4, 329; N. H. Fletcher,

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