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MEDVEDEV, Nikolay Akimovich; SPRINTSIN, M.N., red.; KIMMEL', L.S., red. izd-va; BACHURINA, A.M., tekhn. red.

[Forests of the European North and their industrial use]Lesa Evropeiskogo Severa i ikh promyshlennaia ekspluatatsiia. Moskva, Goslesbumizdat, 1962. 124 p. (MIRA 16:2)
(Russia, Northern--Forests and forestry)
(Russia, Northern--Lumbering)

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6"

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SPRINTSYN, M.N.; AMALITSKIY, V.M.[deceased]; DENIS'YEV, V.I.; ZHUKOV, A.M.; LIKHOVIDOV, N.K.; SHCHEDRIN, B.Ye.; KAFTANOVSKIY, G.M.; SUKHANOVSKIY, A.I.; TSVETKOV, V.A.[deceased]; MITEL'MAN, Ye.L.; KALASHNIKOV, P.L.; ANDREYEV, I.I., retsenzent; SALTYKOV, M.I., otv. red.; SLUTSKER, M.Z., red. izd-va; GRECHISHCHEVA, V.I., tekhn. red.

[Handbook for the logging enterprise economist]Spravochnik ekonomista Lespromkhoza. Moskva, Goslesbumizdat, 1962. 291 p. (MIRA 16:1)

(Lumbering--Handbooks, manuals, etc.)

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

SPRINZL, M.

CZECHOSLOVAKIA

KRISTIAN, P.; SPRINZL, M.; ANTUS, K.

Institute of Organic Chemistry, Slovak Institute of Technology, Bratislava, (for all).

Prague, Collection of Czechoslovak Chemical Communications, No 11, November 1965, pp 3658-3663.

"Synthesis and infrared spectra of diisothiocyanates of the aryl and arylmethyl type."

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

SPRISHEVSKIY, A.I.

MINENKO, V.I.; TSARIKHIN, D.A.; NECHIPORENKO, N.N.; PUSTOVALOV, V.I.; SPRISHEVSKIY, A.I.

Method of insulating suspension devices for galvanizing parts. Avt.trakt.prom. no.10:29 O '54. (MLRA 7:10)

1. Khar'kovskiy velosipednyy zavod.
(Galvanizing)

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

SPRISHEVSKIY, A.I.

MINENKO, V.I., kandidat khimicheskikh nauk; TSARIKHIN, D.A., kandidat tekhnicheskikh nauk, dotsent; NECHIPORENKO, N.N., kandidat tekhnicheskikh nauk, dotsent; PUSTOVALOV, V.I., inzhener; SPRISHEVSKIY, A.I., kandidat tekhnicheskikh nauk.

Insulated hooks for electroplating machine-parts. Vest. mash. 36 no.8:62-63 '56. (MLRA 9:10)

1. Khar'kovskiy velosipednyy savod.
(Electroplating)

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25(2)
AUTHOR: Sprishevskiy, A. I. SOV/32-25-9-43/53

TITLE: Electronic Automatic Cutout for Machines for the Testing of Contact Resistance

PERIODICAL: Zavodskaya laboratoriya, 1959, Vol 25, Nr 9, pp 1136-1137 (USSR)

ABSTRACT: So far, in contact resistance tests, the fatigue crumbling of pittings was determined on the basis of the noise change of the testing machine or by a visual examination of the pitting, and then the electromotor was switched off. An automatic control of the cutout of the machine at the instant of the crumbling of the pitting was developed. For this purpose, an electronic automatic cutout was designed. The basic scheme of the latter was suggested by the Candidate of Technical Sciences I. M. Sakhon'ko, while the scheme of the necessary amplifier was worked out by Engineer V. I. Shchipunov and D. Ya. Pavlov. The mode of operation of the cutout is based on the conversion of the mechanical vibration arising from the destruction of the pitting into electric signals which act on an electronic scheme and thus stop the electromotor by means of a relay. A piezoelectric transmitter (Fig 1)

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SPRISHEVSKIY A. I.
P 4

PHASE I BOOK EXPLOITATION SOV/5105

Nauchno-tekhnicheskaya konferentsiya po voprosam povysheniya iznosostoykosti i sroka sluzhby mashin.

Povysheniye iznosostoykosti i sroka sluzhby mashin. t. 2 (Increasing the Wear Resistance and Extending the Service Life of Machines. v. 2) Kiyev, Izd-vo AN UkrSSR, 1960. 290 p. 3,000 copies printed.(Series: Its: Trudy, t. 2)

Sponsoring Agency: Vsesoyuznoye nauchno-tekhnicheskoye obshchestvo mashinostroitel'noy promyshlennosti. Tsentral'noye i Kiyevskoye oblastnoye pravleniya. Institut mekhaniki AN UkrSSR.

Editorial Board: Resp. Ed.: B. D. Grozin; Deputy Resp. Ed.: D. A. Draygor; M. P. Braun, I. D. Faynerman, I. V. Kragel'skiy; Scientific Secretary: M. L. Barabash; Ed. of v. 2: Ya. A. Samokhvalov; Tech. Ed.: N. P. Rakhlina.

PURPOSE: This collection of articles is intended for technical personnel of the machine industry and for workers of scientific

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research institutes and design and planning organizations.

COVERAGE: The collection contains papers presented at the Third Scientific Technical Conference held in Kiyev in September 1957 on problems of increasing the wear resistance and extending the service life of machines. The conference was sponsored by the Institut stroitel'noy mekhaniki AN UkrSSR (Institute of Structural Mechanics of the Academy of Sciences Ukrainian SSR), and by the Kiyevskaya oblastnaya organizatsiya nauchno-tekhnicheskogo obshchestva mashinostroitel'noy promyshlennosti (Kiyev Regional Organization of the Scientific Technical Society of the Machine-Building Industry). Papers presented at the conference were published in two volumes. The first volume contains papers presented at the plenary session and at the conference section on "Wear of Metals and Methods of Investigation". The second volume contains papers presented at the conference section on "Methods of Extending the Service Life of Machine Parts". These papers discuss mechanical, chemical, and electrolytic methods of increasing the durability (wear resistance and fatigue strength)

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of metallic and nonmetallic machine parts. Only methods which have found industrial application are reviewed. In addition to members of the editorial board the following persons participated in the preparation of the papers for publication: Professor M. P. Braun, Professor D. V. Vaynberg, Candidate of Technical Sciences I. P. Petrenko, Engineer M. D. Sinyavskaya, Candidate of Technical Sciences V. A. Shevchuk, Candidate of Technical Sciences V. N. Semirog-Orlik, Engineer V. F. Yankevich, Candidate of Technical Sciences M. L. Gorb, and others. References (mostly Soviet) accompany some of the papers.

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Balashov, B. F. Increasing the Fatigue Resistance of Parts by Cold Working 7

Al'shits, I. Ya. [Candidate of Technical Sciences], and L. N. Sushkina. New Bearing Materials and Coatings 18

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Astaf'yev, S. S. [Candidate of Technical Sciences]. Electrospark Hardening of Machine Parts 28

Sprishevskiy, A. I. [Candidate of Technical Sciences]. The Effect of Manufacturing Accuracy on the Increase of the Efficiency of Rolling Bearings 40

Kuz'min, M. I. Work-Hardening and Burnishing of Gear Teeth 47

Formin, G. T. Increasing Wear Resistance and Prolonging the Service Life of Parts With Large Cross-Section Area by Surface Hardening After Rapid Heating in Furnaces 57

Panchenko, N. P. [Candidate of Technical Sciences]. Residual Strain of Rings Made of ShKh15 Steel 70

Shevchenko, P. V. [Candidate of Technical Sciences]. Investigation of Damages to the Contact Surface of [Railroad-Car] Wheels and Measures Taken to Increase Their Strength and Extend Their Service Life 83

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

S/123/61/000/015/017/032
A004/A101

AUTHORS: Grozin, B. D., Panchenko, N. P., Semirog-Orlik, V. N., Sprishevskiy, A. I.

TITLE: The effect of mechanical operations on the state of the outer layers of antifriction bearings

PERIODICAL: Referativnyy zhurnal, Mashinostroyeniye, no. 15, 1961, 19, abstract 15B111 (V sb. "Povysheniye iznosostoykosti i sroka sluzhby mashin. v. 1". Kiyev, AN UkrSSR, 1960, 61-76)

TEXT: The authors present the results of comprehensive investigations of the effect of mechanical working on the physical state of the outer layers of the antifriction surfaces of antifriction bearing races. Four groups of specimens of bearing races were investigated, the manufacturing technology and processing conditions of which were different. The specimens were subjected to metallographic, electronic microscopic, X-ray structure and spectral analyses; their microhardness was also investigated. During some grinding conditions and other operations carried out after hardening, high temperatures and local pressures are arising, the interaction of which causes structural transformations in the surface

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The effect of mechanical operations ...

layer. The thermal effect during grinding is different in the field of surface projections and cavities. The projections may undergo a second hardening, while the cavities mainly experience a tempering. The non-homogeneity of the outer layer produces structural stress raisers owing to which micro-destructions are possible in the surface layer. The thermal effect arising during the process of after-hardening operations contributes to the concentration of chromium and carbon at the surface. The initial microgeometry and the shape of the surface being machined affect the temperature gradient of the outer layer. The defective layer originating during the preceding operations cannot always be eliminated by technological finishing operations. The investigation shows the way of developing dependable processing conditions. There are 21 figures.

M. Borts

[Abstracter's note: Complete translation]

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

KACHANOV, N.N.; SPRISHEVSKIY, A.I.; KHASIN, G.A.; BERNSHTEYN, M.L.

What should a modern metallographic microscope be like?
Zav.lab. 26 no.6:770-773 '60. (MIRA 13:7)

1. Nauchno-issledovatel'skiy i eksperimental'nyy institut podshipnikovoy promyshlennosti (for Kachanov and Sprishevskiy). 2. TSentral'naya zavodskaya laboratoriya Zlatoustovskogo metallurgicheskogo zavoda imeni I.V.Stalina (for Khasin). 3. Moskovskiy institut stali im. I.V.Stalina (for Bernshteyn).
(Microscope)

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

SPRISHEVSKIY, A.I., kand.tekhn.nauk; MAKAROV, L.M., inzh.

Over-all mechanization and automation in the bearing industry. Mekh. i avtom. proizv. 15 no. 5:1-7 My '61. (MIRA 14:5)
(Bearing industry--Technological innovations)
(Automation)

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

SPRISHEVSKIY, V.I.

Bronze Age site at Chust. Sov.etn. no.3:69-76 '54. (MLRA 7:11)
(Chust--Bronze Age) (Bronze Age--Chust)

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SPRISKOV, V.

RUBINSKIY, N.; SPRISKOV, V.

Superior operation of a trolley bus service center. Zhil.-kom. khoz.5 no.6:16-17 '55. (MLRA 9:1)

1.Director Vtorego trolleybusnogo depo Moskvy (for Rubinskiy)
2.Glavnyy inzhener trolleybusnogo depo Moskvy (for Spriskov).
(Moscow--Trolley buses--Maintenence and repair)

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

SPRITSMAN, E.M.

Development of the technology for a simplified preparation of brandy. Trudy MNIIP 4:13-27 '64. (MIRA 18:2)

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

KRONITIS, Yan Yanovich [Kronitis, J.]; ZANDER, R., spets. red.; SPRIVULIS,Z., red.; MIRONOV, A., tekhn. red.

[Manual for collective farm foresters] Spravochnik kolkhoznogo lesovoda. Perevod so 2-go izd. Riga, Latviiskoe gos. izd-vo, 1959. 446 p. (MIRA 14:10)

(Collective farms) (Foresters)

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

EGLITIS, Oskars; SPRIVULIS, Z., red.; UDRE, V., tekhn. red.

[Beekeeping equipment] Biskopibas inventars. Riga, Latvijas Valsts izdevnieciba, 1962. 179 p. (MIRA 16:5)
(Bee culture)

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

MELESHKIN,A. [Meleskins,A.], kand. sel'khoz. nauk; SPRIVULIS, Z. [translator]; NEILANDE,A., red.; AIZUPIETE, M., tekhn. red.

[Best varieties of vegetables, potatoes, and fodder root crops] Darzenu, kartupelu un lopbaribas saknaugu labakas skirnes. Otrais parstradatais un papildinatais izdemums. Riga, Latvijas Valsts izdevnieciba, 1960. 222 p. [In Latvian] (MIRA 14:12)
(Potatoes--Varieties) (Root crops--Varieties)
(Vegetables--Varieties)

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

RIHTERS, A; SPRIVULIS, Z., red.; DUNAISKIS, Z., tekhn. red.

[How we prepare for the 22d Congress of the CPSU; achievements on the "Burtnieki" State Farm] PSKP XXII kongresu sagaidot; padomju saimniecibas "Burtnieki" sasniegumi. Riga, Latvijas Valsts izdevnieciba, 1961. 57 p. (MIRA 15:3)
(Communist Party of the Soviet Union--Congresses)
(Latvia--State farms)

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

SKROMANIS, A.; SPRIVULIS, Z., red.; AKE, I., tekhn. red.

[DPR-2 milking unit]Slauksanas agregats DPR-2. Riga, Latvijas Valsts izdevnieciba, 1961. 88 p. (MIRA 15:12)
(Latvia—Milking machines)

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

SVIKIS, J.; TEIKSEVS, A.; SPRIVULIS, Z., red.

[Mechanization of the protection of plants] Augu aizsardzibas darbu mehanizacija. Riga, Latvijas Valsts izdba, 1963. 167 p. [In Latvian] (MIRA 17:7)

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

LABRENTS, V. [Labrencis, V.]; ODIN', Ya.[Odins, J.]; SPRIVULIS, Z., red.; ZHAGARS, A., tekhn. red.

[Tables for the calculation of earthwork with trapezoidal and trapezoidal-parabolic cross sections] Tablitsy dlia rascheta zemlianykh rabot pri trapetseidal'noi i trapetseidal'no-parabolicheskoi forme poperechnykh sechenii. Riga, Latviiskoe gos. izd-vo, 1963. 236 p. (MIRA 16:4)
(Earthwork--Tables, calculations, etc.)

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

KLAVINS, J.; SPRIVULIS, Z., red.

[Improve the herd; L... Collective Farm of the Valmiera Agricultural Collective and State Farm Administration as a purebred cattle station] Izkopsim ganampulku: Valm... ras kolhozu un padomju saimniecibu razosanas parvalde. Lenina kolhozsskirnes lopu audzetava. Riga, Latvijas Valsts izd-ba, 1964. 21 p. [In Latvian] (MIRA 17:7)

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BERZIN[illegible], E.; [illegible], V.; [illegible], M.; [illegible], A.; [illegible] SPRIVULIS, Z., red.

[Regulation and maintenance of agricultural machinery] Lauksaimniecības mašīnu regulēšana un kopšana. Rīga, Latvijas Valsts izd-ba, 1964. 429 p. [In Latvian] (MIRA 18:1)

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

ĀM[illegible], I.; [illegible], A.[translator]; [illegible], A., red.

[Growing of hybrid turnips] Hibridkalu audzesana. Riga, Latvijas Valsts izd-ba, 1965. 91 p. [In Latvian]
(MIRA 18:1)

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OZOLS, J.; SPRIVULIS, Z., red.

[Mechanization of legume culture] Paksaugu audzesanas mehanizacija. Riga, Latvijas Valsts izd-ba, 1963. 108 p. [In Latvian] (MIRA 18:3)

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

GAILIS, J.; SPRIVULIS, Z., red.

[Forest tree breeding and seed plantations] Meza koku selekcija un seklu plantacijas. Riga, Latvijas Valsts izdevnieciba, 1964. 193 p. [In Latvian]
(MIRA 18:7)

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

[redacted], V.

"Socialist Development of Food-using Industries", p. 29, (HPT, Vol. 1, No. 1, January 1954, Bratislava, Czech.)

SO: Monthly List of East European Accessions (EEAL), LC, Vol. 4, No. 3, March 1955, Uncl.

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

SPROCK, Vitazoslav, prof., inz.

Termination of the first five-semester course at the Higher School of Forestry and Woodworking. Drevo 18 no.5:197-198 My '63.

1. Vysoka skola lesnicka a drevarska, Zvolen.

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

LEWENFISZ-WOJNAROWSKA, T.;SPROCZYNSKI, K.

Antibiotics in the treatment of diarrheas. Pediat. polska 27 no.3:287-296 Mar 1952. (CLML 23:2)

1. Of the First Pediatric Clinic (Head--Prof. St. Popowski, M.D.) of Lodz Medical Academy.

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S/197/61/000/001/002/002
B124/B203

AUTHORS: May, L., Sprogis, Yu.

TITLE: New method of producing methyl triacetoxy silane

PERIODICAL: Izvestiya Akademii nauk Latviyskoy SSR, no. 1 (162), 1961, 71-76

TEXT: All procedures hitherto used to produce methyl triacetoxy silane can be divided into three steps: 1) acetylation of alkyl chloro silane by various acetylating agents, 2) distillation of the solvent under atmospheric pressure, and 3) vacuum distillation of alkyl acetoxy silane, possibly with the use of a dephlegmator. B. N. Dolgov, V. P. Davydova, and M. G. Voronkov consider the acetylation of alkyl chloro silanes by acetic anhydride at room temperature during 18-20 hr, subsequent slow distillation of the acetyl chloride, and fractionation of the residue under vacuum with the use of a dephlegmator, to be the most suitable method of producing alkyl acetoxy silanes; the methyl triacetoxy silane yield attains up to 70% of the theory. K. A. Andrianov, A. A. Zhdanov, and A. A. Bogdanova obtained methyl triacetoxy silane from methyl

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trichloro silane and acetic anhydride by continuous distillation of the acetyl chloride by a dephlegmator and a descending cooler with a yield of 78% of the theory. The authors' experiments showed that a yield of about 70-75% of the theory can be attained with the use of all variants mentioned for the acetylation of methyl chloro silane. Benzene, toluene, carbon tetrachloride, 1,2-dichloro ethane, and ether were studied as solvents; the acetylation of methyl trichloro silane was most efficient by means of glacial acetic acid in benzene, CCl_4, or 1,2-dichloro ethane (70-75% yield of the theory). The dependence of the boiling point of methyl triacetoxy silane on pressure in vacuum distillation was determined (Fig. 1). In the distillation (which must be repeated) under vacuum or atmospheric pressure, 1,3-dimethyl-1,1,3,3-tetraacetoxy siloxane is formed by means of intramolecular condensation, and sometimes polymerizes to a resinous substance. This also leads to reduced yields. Therefore, it is more convenient to recrystallize the product from the reaction mixture, the best solvents being the aliphatic hydrocarbons of petroleum (petroleum ether, benzine, kerosene) and, among them, benzine. Acetylation is best carried out at 66 - 67°C (boiling point of methyl trichloro silane), which guarantees

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an efficient condensation of vapors. With the use of benzine as a solvent in the acetylation of methyl trichloro silane, the reaction mixture forms two distinctly separated layers after filtration. Crystallization begins immediately, and is concluded after 1-6 hr (depending on the volume of the crystallized fraction and the type of precipitation). Fig. 2 shows a typical crystallizate from benzine (pure liquid methyl triacetoxy silane). The formation of layers in the filtrate also occurs in kerosene, but yield and purity of the product are lower. Under optimum conditions, the yield in the procedure described attains 80-86% of the theory; it depends on the time of heating, the amount of solvent, the conditions of filtration and rewashing, the time of cooling, etc. The degree of purity of the crystalline product is 95-98%. Among all known methods, the one described is the simplest, most economical, and most suitable for application in the industry. There are 3 figures and 23 references: 5 Soviet-bloc and 16 non-Soviet-bloc.

ASSOCIATION: Institut khimii AN Latv. SSR
(Institute of Chemistry of the AS Latviyskaya SSR)

SUBMITTED: July 21, 1960

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

MAY, L . [Maijs, L.]; SPROGIS, Yu. [Sprogis, J.]

New method for obtaining methyltriacetoxysilane. Vestis Latv ak no.1: 71-76

1. Institut khimii AN Latviyskoy SSR.

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

ŠPRONC, Adolf.

2

4--Effect of a constant addition of β-carotene in the green fodder on the usefulness and health of chickens. Ladislav Landau and Adolf Šprone. *Pol'nohospodárstvo* 3, 61–80 (1956).—Two groups of 280 white Leghorns each were used in the expts. The first group obtained fresh green fodder from the second day after birth until the 14th month. The second group obtained the usual standard mixt. of food and had the seasonal privilege of eating outside on the green pasture. All other enviromental factors were kept as equal as possible. The authors noted a distinct advantage of the first group of animals over the second group in respect to growth, weight, attainment of puberty, ability to lay eggs, capability of eggs to hatch, and health of the animals. Details are given and a very compete literature is cited.

Otto E. Lobstein

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

SPRONC, A

Country : CZECHOSLOVAKIA
Category : Farm Animals. Q-4
Domestic Birds.
Abs. Jour : Ref Zhur-Biol., No 15, 1958, 74134

Author : Landau, Ladislav; Marcinka, Kamil; Sprone,*
Institut. : -
Title : The Relationship between the Quantity of Provitamin and Vitamin A in the Egg Yolk and the Hatching of Chicks in Incubation.
Orig Pub. : Polnospodarstvo, 1957, 4, No 4, 641-664

Abstract : The first group (control) received the standard protein mixture, the 2nd received the same mixture + fodder cabbage as desired + 1000-2000 of γβ -carotene daily, the 3rd received the standard protein mixture + 3000 international units of axerophtol-acetate dissolved in vegetable oil. The results of the experiments are (in the order of groups): average egg-laying capacity 63.33; 60.87, and 62.23 eggs; the content of vitamin A in 100 g of egg yolk: 602.6; 1087.4 and 976.8 international

Card: 1/3

*Adolf

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

Country : CZECHOSLOVAKIA
Category : Farm Animals. Q-4
Domestic Birds.
Abs. Jour : Ref Zhur-Biol., No 16, 1958, 74134

Author :
Institut. :
Title :

Orig. Pub. :

Abstract : units, and β-carotene: 18.3; 67.1 and 19.2 γ; chicks hatched from the number of laid eggs: 64.3; 68.2 and 79.1 percent; chicks hatched from fertilized eggs: 72.4; 74.4 and 85.4 percent; dead embryos according to data of the 1st and 2nd transillumination: 14.4; 12.0 and 4.0 percent; the number of chicks perished during the first 5 days and chicks not able to survive: 7.54; 4.98 and 3.82 percent; the content of vitamin A in 1 g of the liver of peri-

Card: 2/3

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

SPRONOV, F.F.

Appearance of helminthophage in soil carnivorous Hyphomycetes in Turkmenia. Doklady Akad. nauk SSSR 81 no.5:973-976 11 Dec 51. (CIML 21:5)

1. Presented by Academician K.I. Skryabin 15 September 1951.
2. Institute of Malaria and Medical Parasitology Turkmen SSR.

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

SPROSTRANOV, B.

"Health Center." p. 3,
(ZDRAVEN FRONT, No. 49, Dec. 1954, Sofiya, Bulgaria)

SO: Monthly List of East European Accessions, (EEAL), LC, Vol. 4
No. 5, May 1955, Uncl.

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

SPROSTRANOV, B.I.

Case of Q fever. Suvrem. med., Sofia 8 no.4:93-94 1957.

1. Iz Okoliiskata bolnitsa - gr. Breznik. Terapevtichno otdelenie (Zavezhdashch: B. I. Spostranov).
(Q FEVER, case reports, (Bul))

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

SPROSTRANOV, B.I. (Bolgariya)

Electrocardiographic changes during the sensitization period and in anaphylactic shock. Klin.med. 35[i.e.34] no.1 Supplement:12-13 Ja '57. (MIRA 11:2)

1. Iz terapevticheskogo otdeleniya (zav. B.I.Sprostranov) Okoliyskoy bol'nitsy v g.Breznik.
(AUSCULTATION)

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

KWIATKOWSKA, Barbara; SPRUCH, Tadeusz; ZBROJA, Wanda

Diagnostic errors in cases of anomalous positions of the kidney. Pol. tyg. lek. 17 no.20:792-795 14 My '62.

1. Z I Kliniki Poloznictwa i Chorob Kobiecych AM w Lublinie; kierownik: prof. dr med. Stanislaw Liebhart i z I Kliniki Chirurgicznej AM w Lublinie; kierownik: prof. dr med. Tadeusz Jacyna Onyszkiewicz.

(KIDNEYS abnorm)

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

SPRUCH, Tadeusz; JABLONKA, Stanislaw

Asymotomatic retroperitoneal rupture of the duodenum with unusual complications. Pol. tyg. lek. 18 no.52:197.- 1977 23 D '63.

1. Z I Kliniki Chirurgicznej Akademii Medycznej w Lublinie (kierownik: prof. dr med. T. Jacyna-Onyszkiewicz).

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

CZOCHRA, Marian; SPRUCH, Tadeusz

Asymptomatic perforation of gastric ulcer. Pol. tyg. lek. 19 no.1:27-29 1 Ja'64

1. Z Kliniki Chirurgicznej AM w Lublinie; kierownik: prof. dr. med. T.Jacyna-Onyszkiewicz.

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

PANECKA, Anna; SPRUCH, Tadeusz

Result of the treatment of acute pancreatitis with trasylol.
Pol. tyg. lek. 19 no.45:1729-1732 N 9'64

1. Z I Kliniki Chirurgicznej Akademii Medycznej w Lublinie (Kierownik: prof. dr. T. Jacyna-Onyszkiewicz).

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

L 8478-66 EWT(d)/EWP(v)/EWP(k)/EWP(h)/EWP(l)

ACC NR: AP5028518 SOURCE CODE: UR/0286/65/000/020/0099/0099

AUTHORS: Gil'man, L. M.; Sprude, I. K.

ORG: none

TITLE: A direct action pressure regulator. Class 42, No. 175753 [announced by Central Engineering Bureau of Armature Construction (Tsentral'noye konstruktorskoye byuro armaturostroyeniya)]

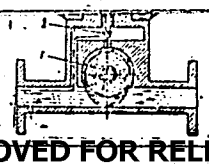
SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 20, 1965, 99

TOPIC TAGS: pressure regulator, mechanical engineering

ABSTRACT: This Author Certificate presents a direct action pressure regulator containing a directing membrane mechanism with a regulating device, the regulating organ in the form of a ball valve, and a regulated throttle with a valve. The throttle is mounted in line between the chamber above the ball and a pipe behind the regulating organ. To produce a low coefficient of hydraulic resistance, the chamber above the ball is connected to the chamber of the directing mechanism, while the membrane is rigidly connected to the valve of the throttle.

SUB CODE: 13, 14/ SUBM DATE: 25Mar64

Card 1/1 UDC: 621-531.8-553.6



Card 2/2 UDC: 62-553.4

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

ACC NR: AP6032525

in the chamber under the ball independent of the regime of medium being regulated, the chamber is equipped with auxiliary valve operated by a type of servodrive. Orig. art. has: 1 figure.

SUB CODE: 20/ SUBM DATE: 03Apr64/

Card 2/2

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

L 04215-66
ACC NR: AP6018001 (N) SOURCE CODE: UR/0413/66/000/010/0115/0115

33
B

INVENTOR: Gilman, L. M.; Sprude, I. K.

ORG: none

TITLE: Device for the prevention of pressure increase in tanks and pipelines. Class 47, No. 181931

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 10, 1966, 115

TOPIC TAGS: pressure control, ~~pressure~~ valve, pipeline, storage tank, hydraulic resistance

ABSTRACT: An Author Certificate has been issued for a device preventing pressure increase in tanks and pipelines. The device includes a main spring-valve and an auxiliary spring-valve. In order to increase operating reliability and reduce hydraulic resistance, both valves are spherical and mounted on the elastic walls of the chamber. The main-valve chamber cap has a port connecting it with the upper chamber of the valve housing (see Fig. 1). Orig. art. has: 1 figure. [KP]

UDC: 621.646.82

Card 1/2

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

L 44215-66
ACC NR: AP6018001

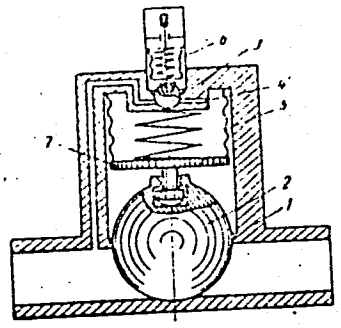

Fig. 1. Device for preventing pressure increase in tanks and pipelines. 1— Housing; 2— main valve; 3— auxiliary valve; 4— duct in the valve housing; 5— main-valve chamber; 6— auxiliary-valve chamber; 7— cap

SUB CODE: 13/ SUBM DATE: 26Oct64/

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APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

SPRUNG, Fedor (Zagreb)

Laboratory of Heat Measurements. Energija Hrv 12 no.7/8: 217-218 '63.

"Nikola Tesla, pioneer of the electricity era" by Milan Pertot. Reviewed by Fedor Sprung. 256.

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

[illegible], ...

Explanation of the proposed standard for pine logs. p. 61. ([illegible]
No. 4, apr. 1954, Beograd, Yugoslavia)

SO: Monthly list of East European Accessions, (EEAL), LC, Vol. 4, no. 1
Jan. 1955, Uncl.

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

[redacted], ...

Explanation of the proposed standard for fir and juniper logs. p. 105.
STANDARDIZACIJA, no. 6, June 1954, Beograd, Yugoslavia)

SO: Monthly list of East European Accessions, (EEAL), LC, Vol. 4, No. 1
Jan. 1955, Uncl.

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

SPRUNG, Mkso, dr., Ploce

Kinetoses and antihistaminics. Med. glasn. 8 no.9:309-310 Sept 54.
(MOTION SICKNESS, ther.
antihistaminics)
(ANTIHISTAMINICS, ther. use
motion sickness)

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

SPRUNG, Makso, Kapetan dr.

Severe anaphylactic complications following intravenous administration of penicillin. Voj. san. pregl., Beogr. 13 no.1-2:60-64 Jan-Feb 56.

(PENICILLIN, injurious effects, anaphylaxis (Ser))
(ALLERGY, etiology and pathogenesis, penicillin anaphylaxis (Ser))

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

SPRUSANSKY, Jozef, inz.

"Handbook of water resources management" by S.Hronec and [dr.] J.Ratica. Reviewed by Jozef Sprusansky. Vodni hosp 12 no.11: 453 N '62.

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

SPRUSIL, Alois

Mechanization and automation of the limestone and coke conveying and batching for the limestone kiln of the Opava beetsugar mill. Listy cukrovar 80 no.4:86-88 Ap '64.

1. Severomoravske cukrovary National Enterprise, Olomouc.

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

SPRUSIL, B.

On the evaluation of measurements of small changes in electric resistance. Chekhosl fiz zhurnal 15 no.4:287-298 '65.

1. Faculty of Mathematics and Physics of Charles University, Prague 2, Ke Karlovu 5. Submitted October 15, 1964.

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

SPRUSIL, Jiri, inz.; DEJMEK, Wilfried, inz.

Hydromechanical coal mining in the United States. Uhli 7 no.3: 104-106 '65.

1. Banske projekty, Ostrava.

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

SPRYGIN, A.I., inzh.

Ways to reduce the number of accidents in the magnesium industry. Bezop. truda v prom. 5 no.8:10-11 Ag '61. (MIRA 14:8)

1. Upravleniye Permskogo okruga Gosgortekhnadzora RSFSR.
(Magnesium industry--Hygienic aspects)

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

[redacted], G.I., kand.; [redacted], I.I.

Diametrical fan for partial ventilation. [illegible] gor. zhur. 7 no.10:134-136 '64. (MIRA 17:11)

1. Sverdlovskiy gornyy institut imeni V.V. Vakhrusheva. Rekomendovana kafedroy gornoy mekhaniki.

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

KHOROSHEV, O.V., kand. [illegible] nauk; SPRYGIN, I.L., inzh.; PRITYKIN, [illegible]; BOYEV, S.N.

Use of diametral fans for partial aeration. Gor. zhur. no.9: 72 S '65. (MIRA 18:9)

1. Tashkentskiy politekhnicheskiy institut (for Khoroshev, Sprygin).
2. Altyn-Topkanskiy svintsovo-tsinkovyy kombinat (for Pritykin).
3. Sverdlovskiy gornyy institut (for Boyev).

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

KOROLYUK, I.K.; STRAKHOV, N.M.; GEKKER, R.F., redaktor; SPRYGINA, L.I., redaktor; SHEVCHENKO, G.N., tekhnicheskiy redaktor.

[Limestone hillocks and conditions of their formation in Podolia] Podol'skie toltry i usloviia ikh obrazovaniia. Moskva, Izd-vo Akad.nauk SSSR, 1952 138 p. (Akademiia nauk SSSR. Institut geologicheskikh nauk. Trudy, no.110). (MLRA 9:7)

1.Chlen-korrespondent AN SSSR (for Strakhov).
(Podolia--Physical geography) (Podolia--Corals, Fossil)

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

FILATOVA, L.G.; SPRYGINA, L.

Effect of environmental temperature and hormones on the endurance of animals during a fast developing hypoxia. Opyt izuch. reg. fiziol. funk. 6:73-77 '63 (MIRA 17:3)

1. Laboratoriya ekologicheskoy fiziologii (zav. - prof. A.D. Slonim) Instituta fiziologii imeni I.P.Pavlova AN SSSR i kafedra zoologii i fiziologii (zav. - doktor biolog. nauk L.G. Filatova) Kirgizskogo gosudarstvennogo universiteta.

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

ARMAND, David L'vovich; DOBRYNIN, Boris Fedorovich [deceased]; YEFREMOV, Yuriy Konstantinovich; ZIMAN, Lev Yakovlevich; MURZAYEV, Eduard Makarovich; SPRYGINA, Lyudmila Ivanovna; MESTERGAZI, M.M. [deceased] redaktor; VASIL'YEVA, O.S., redaktor; SMIRNOVA, N.P., redaktor; MAKHOVA, N.N., tekhnicheskiy redaktor.

[Non-Soviet Asia; its physical geography] Zarubezhnaia Aziia; fiziicheskaia geografiia. Moskva, Gos.uchebno-pedagog.izd-vo Ministerstva prosveshcheniia RSFSR, 1956. 606 p.[Supplement] Prilozheniia 1956. 13 leaves (fold.maps). (MLRA 9:5)

(Asia--Physical geography)

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

RIKHTER, G.D., otv. red.; ORLOV, V.I., red.; SERYGINA, L.I., red. izd-va; LADYCHUK, L.P., red.izd-va; DOROKHINA, I.N., tekhn. red.

[Natural conditions and resources of the U.S.S.R.] Prirodnye usloviia i estestvennye resursy SSSR. Moskva, Izd-vo AN SSSR. Vol.6. [Western Siberia] Zapadnaia Sibir'. 1963. 487 p. 2 maps (MIRA 17:1)

1. Akademiya nauk SSSR. Institut geografii.

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

SPRYNAROVA, S.; GLIVICKY, V.

Problem of relationship between physical training, physical development, and the functional state in young workers. p. 531.

CESKOSLOVENSKA HYGIENA. Praha, Czechoslovakia. Vol. 4, no. 9, Oct. 1959.

Monthly list of East European Accessions (EEAI) LC, Vol. 9, no. 1, January 1960.

Uncl.

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

SPRYNAROVA, S.;JOACHIMSTHALER, F.

Electromyographic study of a complex movement habit. Cesk. fysiol. 9 no.1:57-58 Ja 60.

1. Vyzkumny ustav telovychovny. Praha.
(MOVEMENTS physiol.)
(ELECTROMYOGRAPHY)

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

ZBUZEK, V.;BARTOSOVA, D.;VACULA, J.;SPRYNAROVA, S.

Studies on the value of adaptation changes to specific sprint and stamina training. Cesk. fysiol. 9 no.1:69-70 Ja 60.

1. Vyzkumny ustav telovychovny a fakulta ITVS VSP, Praha.
(PHYSICAL EDUCATION AND TRAINING)
(ADAPTATION PHYSIOLOGICAL)

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

GLIVICKY, V.; SPRYNAROVA, S.; TINTERA, J.

Comparison of changes of pulmonary ventilation, oxygen requirements pulse frequency and blood pressure during average load in trained and untrained students. Cesk.fysiol. 9 no.3:230-231 My '60.

1. Vyzkumny ustav telovychovny, Katedra lekarskych ved ITVS, fakulta KU, Praha.
(SPORTS)
(RESPIRATION physiol)
(PULSE physiol)
(BLOOD PRESSURE physiol)

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

SPRYNAROVA, S.

Comparison of themaximum oxygen requirements in trained and untrained students aged from 16 to 17. Cesk.fysiol. 9 no.3:270-271 My '60.

1. Vyzkumny ustav telovychovny, Praha
(RESPIRATION physiol)
(PHYSICAL EDUCATION AND TRAINING)

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

SPRYNAROVA, S.; REISNAUER, R.

Participation of changes in pulmonary ventilation and utilization of oxygen from inspired air in the increase in oxygen consumption during physical exertion measured repeatedly in boys. Physiol. Bohemoslov. 14 no.1:96-106 '65

1. Physical Culture Research Institute and Endocrinological Research Institute, Prague.

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

STRYZHKOVA, M. A.

"The Importance of the Trophic Function of the Cerebrum in the Regulation of Hormone Reactions (The Role of the Cerebrum in the Interaction Process Between the Hypophysis and the Thyroid Glands)". Cand Biol Sci, Saratov U, Saratov, 1954. (RZhBiol, No 3, Feb 55)

SO: Sum. No. 631, 24 Aug 55 - Survey of Scientific and Technical Dissertation Defended at USSR Higher Educational Institutions. (14)

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652730001-6

VUNDER, P.A.; SPRYSHKOVA, N.A.

Effect of decerebration on intensification of reactions of the thyroid to methylthiouracil and thyrotropic hormone. Biul. eksp. biol. i med. 40 no.11:16-19 N. '55. (MLRA 9:1)

1. Iz kafedry fiziologii zhivotnykh (zav. - prof. P.A. Vunder) Saratovskogo gosudarstvennogo universiteta imeni N.G. Chernyshevskogo.

(BRAIN, physiology,
eff. of decerebration on thyroid reactions to methylthiouracil & thyrotropic hormone in chicks)
(THYROID GLAND, physiology,
eff. of decerebration on reactions to methylthiouracil & thyrotropic hormone in chicks)
(THIOURACIL, derivatives,
methylthiouracil, eff. on thyroid in decerebrated chicks.)
(PITUITARY GLAND, ANTERIOR, hormones,
thyrotropic hormone, eff. on thyroid in decerebrated chicks)

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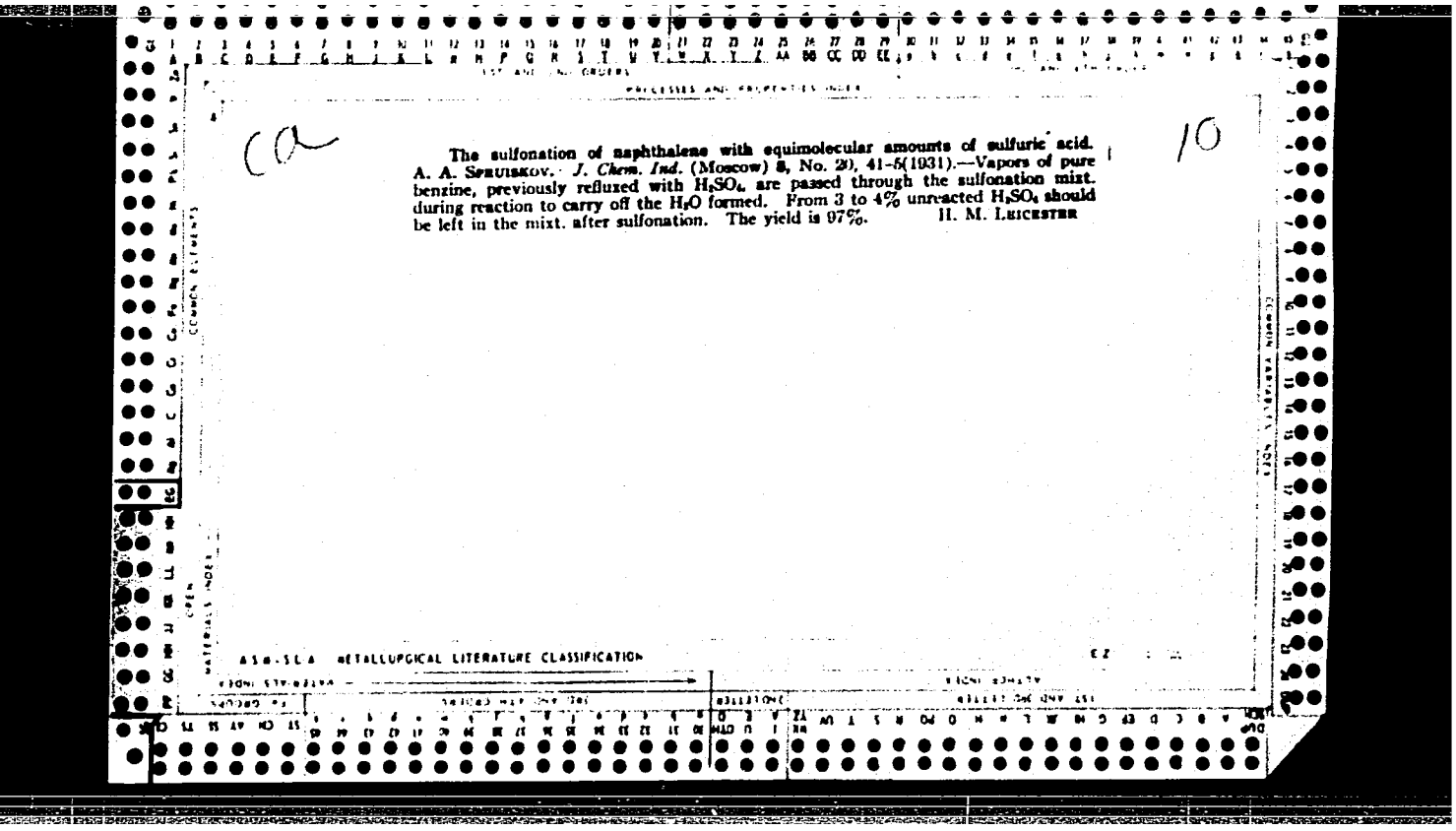

The sulfonation of naphthalene with equimolecular amounts of sulfuric acid. A. A. Spryskov. *J. Chem. Ind.* (Moscow) **8**, No. 20), 41-5(1931).—Vapors of pure benzine, previously refluxed with H_2SO_4, are passed through the sulfonation mixt. during reaction to carry off the H_2O formed. From 3 to 4% unreacted H_2SO_4 should be left in the mixt. after sulfonation. The yield is 97%. H. M. Leicester

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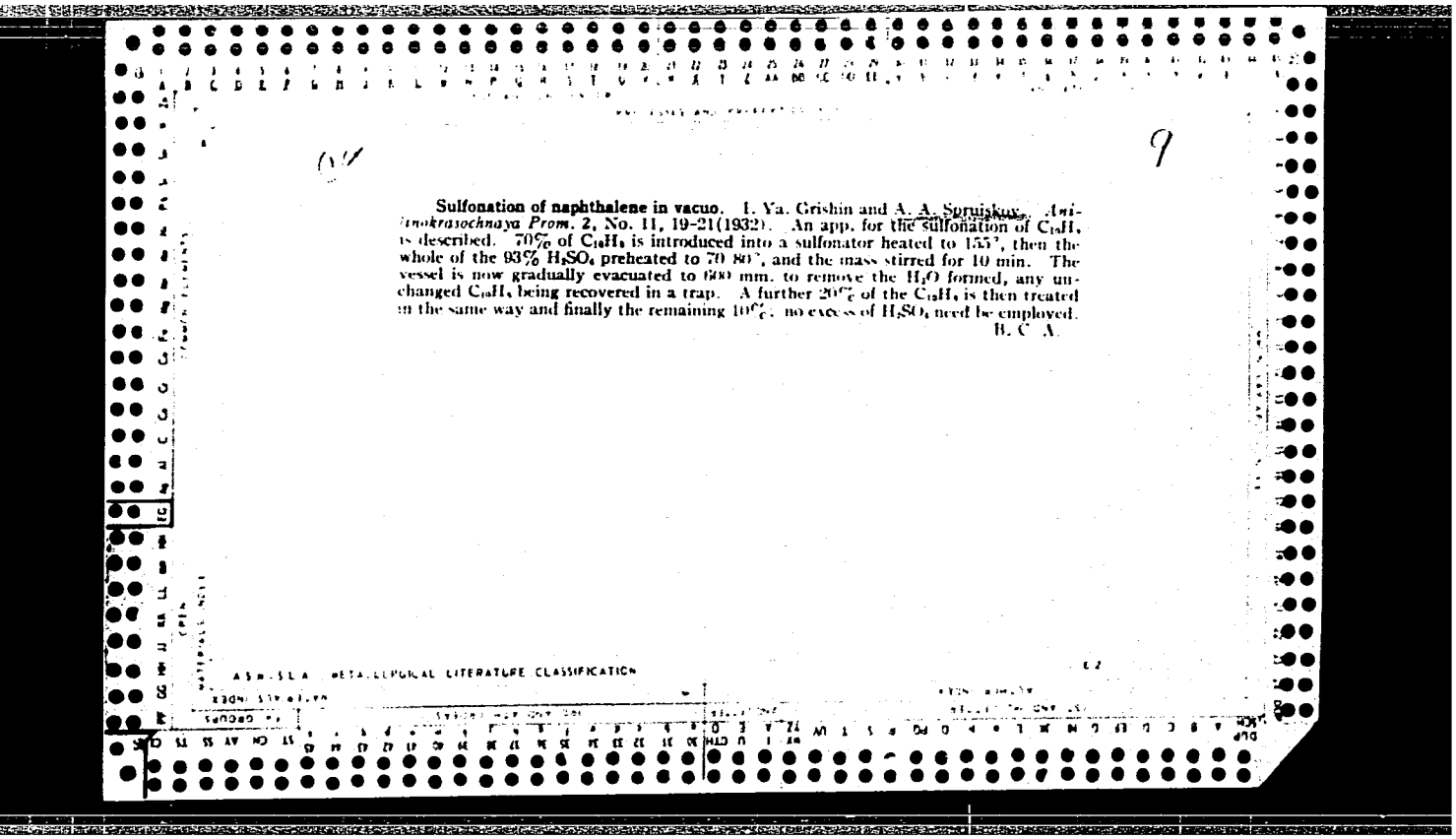

Sulfonation of naphthalene in vacuo. I. Ya. Grishin and A. A. Spruiskov. *Anilinokrasochnaya Prom.* 2, No. 11, 19–21(1932). An app. for the sulfonation of $C_{10}H_8$ is described. 70% of $C_{10}H_8$ is introduced into a sulfonator heated to 155°, then the whole of the 93% H_2SO_4 preheated to 70–80°, and the mass stirred for 10 min. The vessel is now gradually evacuated to 600 mm. to remove the H_2O formed, any unchanged $C_{10}H_8$ being recovered in a trap. A further 20% of the $C_{10}H_8$ is then treated in the same way and finally the remaining 10%, no excess of H_2SO_4 need be employed.
B. C. A.

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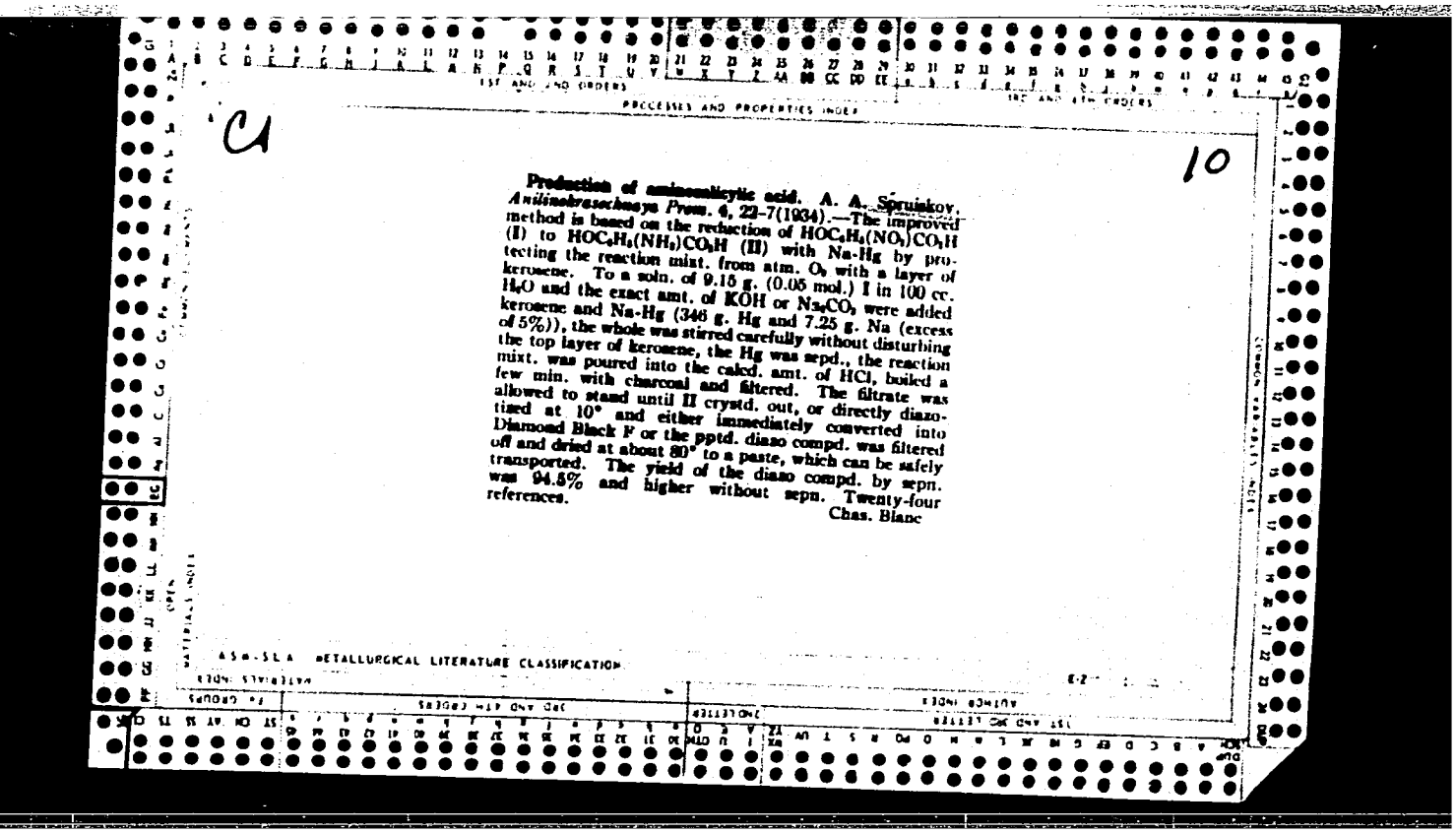

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Production of aminosalicylic acid. A. A. Spriskov. *Anilinokrasochnaya Prom.* 4, 22–7(1934).—The improved method is based on the reduction of $HOC_6H_3(NO_2)CO_2H$ (I) to $HOC_6H_3(NH_2)CO_2H$ (II) with Na-Hg by protecting the reaction mixt. from atm. O_2 with a layer of kerosene. To a soln. of 9.15 g. (0.05 mol.) I in 100 cc. H_2O and the exact amt. of KOH or Na_2CO_3 were added kerosene and Na-Hg (346 g. Hg and 7.25 g. Na (excess of 5%)), the whole was stirred carefully without disturbing the top layer of kerosene, the Hg was sepd., the reaction mixt. was poured into the calcd. amt. of HCl, boiled a few min. with charcoal and filtered. The filtrate was allowed to stand until II crystd. out, or directly diazotized at 10° and either immediately converted into Diamond Black F or the pptd. diazo compd. was filtered off and dried at about 80° to a paste, which can be safely transported. The yield of the diazo compd. by sepn. was 94.8% and higher without sepn. Twenty-four references.

Chas. Blanc

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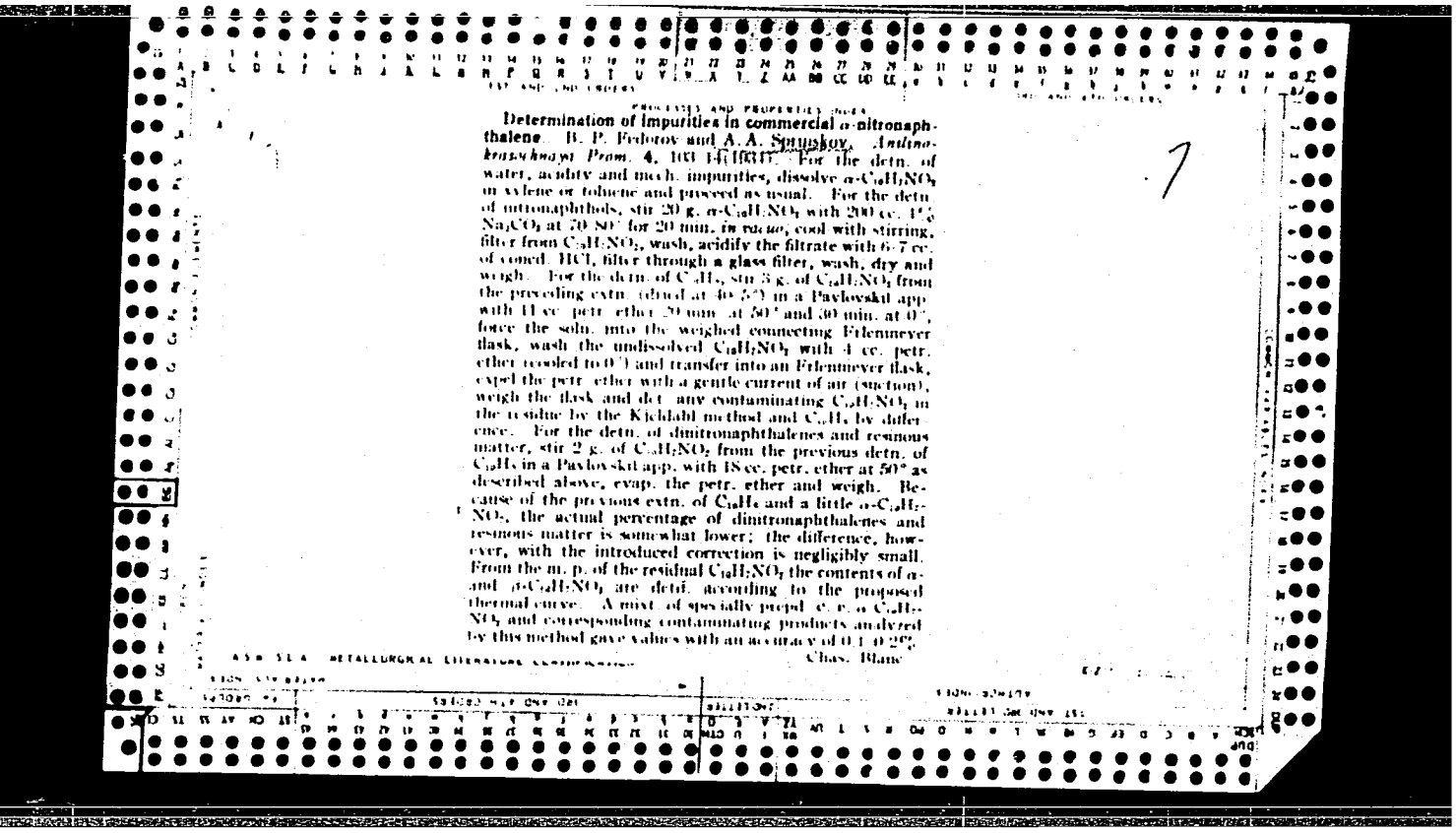
PROCESSES AND PROPERTIES INDEX



Determination of impurities in commercial α-nitronaphthalene. B. P. Fedorov and A. A. Spruskov. *Anilinokrasochnaya Prom.* 4, 103-14(1934). For the detn. of water, acidity and mech. impurities, dissolve α-$C_{10}H_7NO_2$ in xylene or toluene and proceed as usual. For the detn. of nitronaphthols, stir 20 g. α-$C_{10}H_7NO_2$ with 200 cc. 1% Na_2CO_3 at 70-80° for 20 min. *in vacuo*, cool with stirring, filter from $C_{10}H_7NO_2$, wash, acidify the filtrate with 6-7 cc. of concd. HCl, filter through a glass filter, wash, dry and weigh. For the detn. of $C_{10}H_8$, stir 3 g. of $C_{10}H_7NO_2$ from the preceding extn. (dried at 40-5°) in a Pavlovskii app. with 11 cc. petr. ether 20 min. at 50° and 30 min. at 0°, force the soln. into the weighed connecting Erlenmeyer flask, wash the undissolved $C_{10}H_7NO_2$ with 4 cc. petr. ether (cooled to 0°) and transfer into an Erlenmeyer flask, expel the petr. ether with a gentle current of air (suction), weigh the flask and det. any contaminating $C_{10}H_7NO_2$ in the residue by the Kjeldahl method and $C_{10}H_8$ by difference. For the detn. of dinitronaphthalenes and resinous matter, stir 2 g. of $C_{10}H_7NO_2$ from the previous detn. of $C_{10}H_8$ in a Pavlovskii app. with 18 cc. petr. ether at 50° as described above, evap. the petr. ether and weigh. Because of the previous extn. of $C_{10}H_8$ and a little α-$C_{10}H_7NO_2$, the actual percentage of dinitronaphthalenes and resinous matter is somewhat lower; the difference, however, with the introduced correction is negligibly small. From the m. p. of the residual $C_{10}H_7NO_2$ the contents of α- and β-$C_{10}H_7NO_2$ are detd. according to the proposed thermal curve. A mixt. of specially prepd. c. p. α-$C_{10}H_7NO_2$ and corresponding contaminating products analyzed by this method gave values with an accuracy of 0.1-0.2%.

Chas. Blanc

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PROCESSES AND PROPERTIES IN FA

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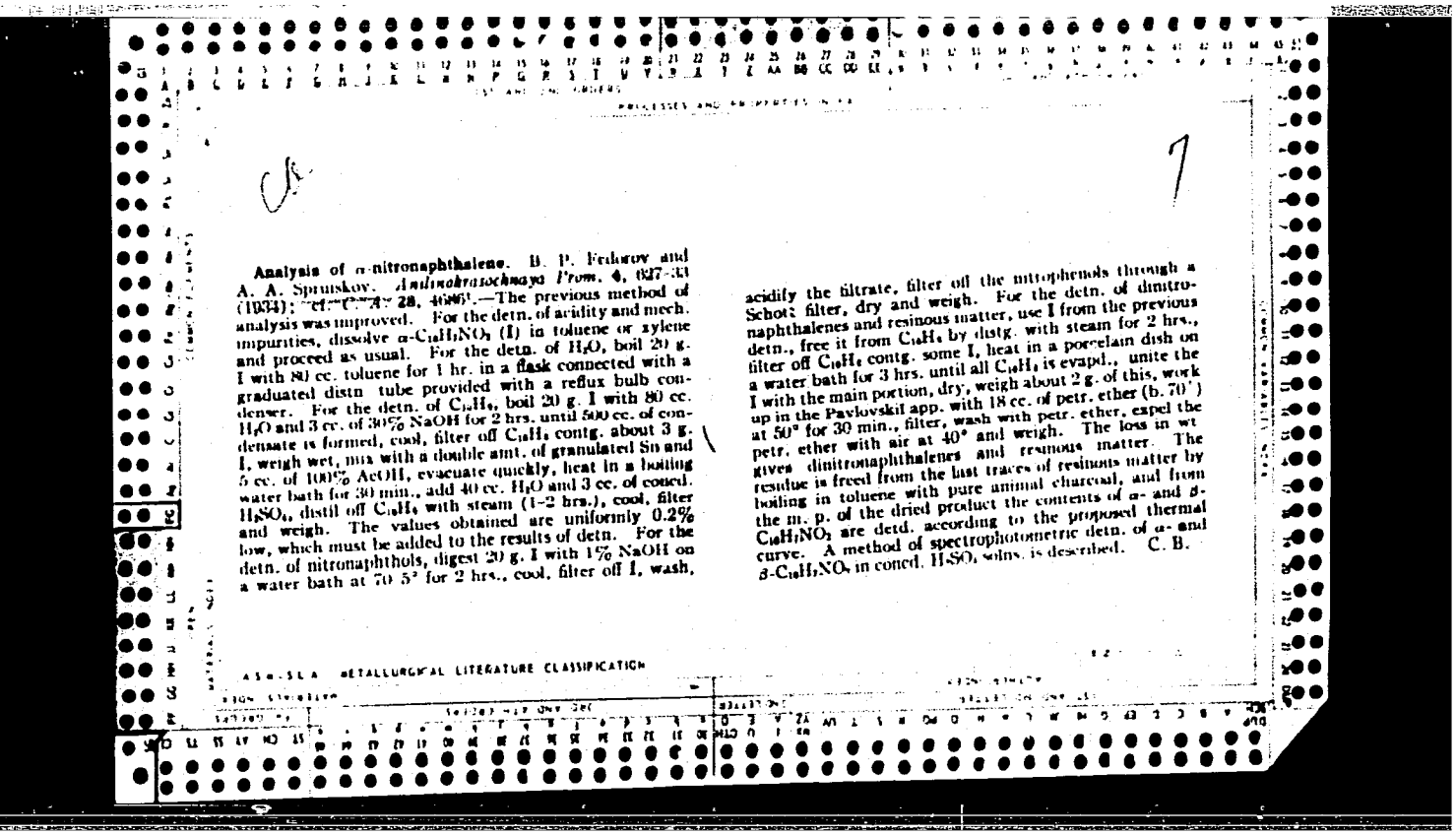

Analysis of α-nitronaphthalene. B. P. Fedorov and A. A. Spruiskov. *Anilinokrasochnaya Prom.* 4, 627-33 (1934); cf. C. A. 28, 4686[1].—The previous method of analysis was improved. For the detn. of acidity and mech. impurities, dissolve α-$C_{10}H_7NO_2$ (I) in toluene or xylene and proceed as usual. For the detn. of H_2O, boil 20 g. I with 80 cc. toluene for 1 hr. in a flask connected with a graduated distn tube provided with a reflux bulb condenser. For the detn. of $C_{10}H_8$, boil 20 g. I with 80 cc. H_2O and 3 cc. of 30% NaOH for 2 hrs. until 500 cc. of condensate is formed, cool, filter off $C_{10}H_8$ contg. about 3 g. I, weigh wet, mix with a double amt. of granulated Sn and 5 cc. of 100% AcOH, evacuate quickly, heat in a boiling water bath for 30 min., add 40 cc. H_2O and 3 cc. of concd. H_2SO_4, distil off $C_{10}H_8$ with steam (1-2 hrs.), cool, filter and weigh. The values obtained are uniformly 0.2% low, which must be added to the results of detn. For the detn. of nitronaphthols, digest 20 g. I with 1% NaOH on a water bath at 70-5° for 2 hrs., cool, filter off I, wash, acidify the filtrate, filter off the nitrophenols through a Schott filter, dry and weigh. For the detn. of dinitronaphthalenes and resinous matter, use I from the previous detn., free it from $C_{10}H_8$ by distg. with steam for 2 hrs., filter off $C_{10}H_8$ contg. some I, heat in a porcelain dish on a water bath for 3 hrs. until all $C_{10}H_8$ is evapd., unite the I with the main portion, dry, weigh about 2 g. of this, work up in the Pavlovskii app. with 18 cc. of petr. ether (b. 70°) at 50° for 30 min., filter, wash with petr. ether, expel the petr. ether with air at 40° and weigh. The loss in wt gives dinitronaphthalenes and resinous matter. The residue is freed from the last traces of resinous matter by boiling in toluene with pure animal charcoal, and from the m. p. of the dried product the contents of α- and β-$C_{10}H_7NO_2$ are detd. according to the proposed thermal curve. A method of spectrophotometric detn. of α- and β-$C_{10}H_7NO_2$ in concd. H_2SO_4 solns. is described. C. B.

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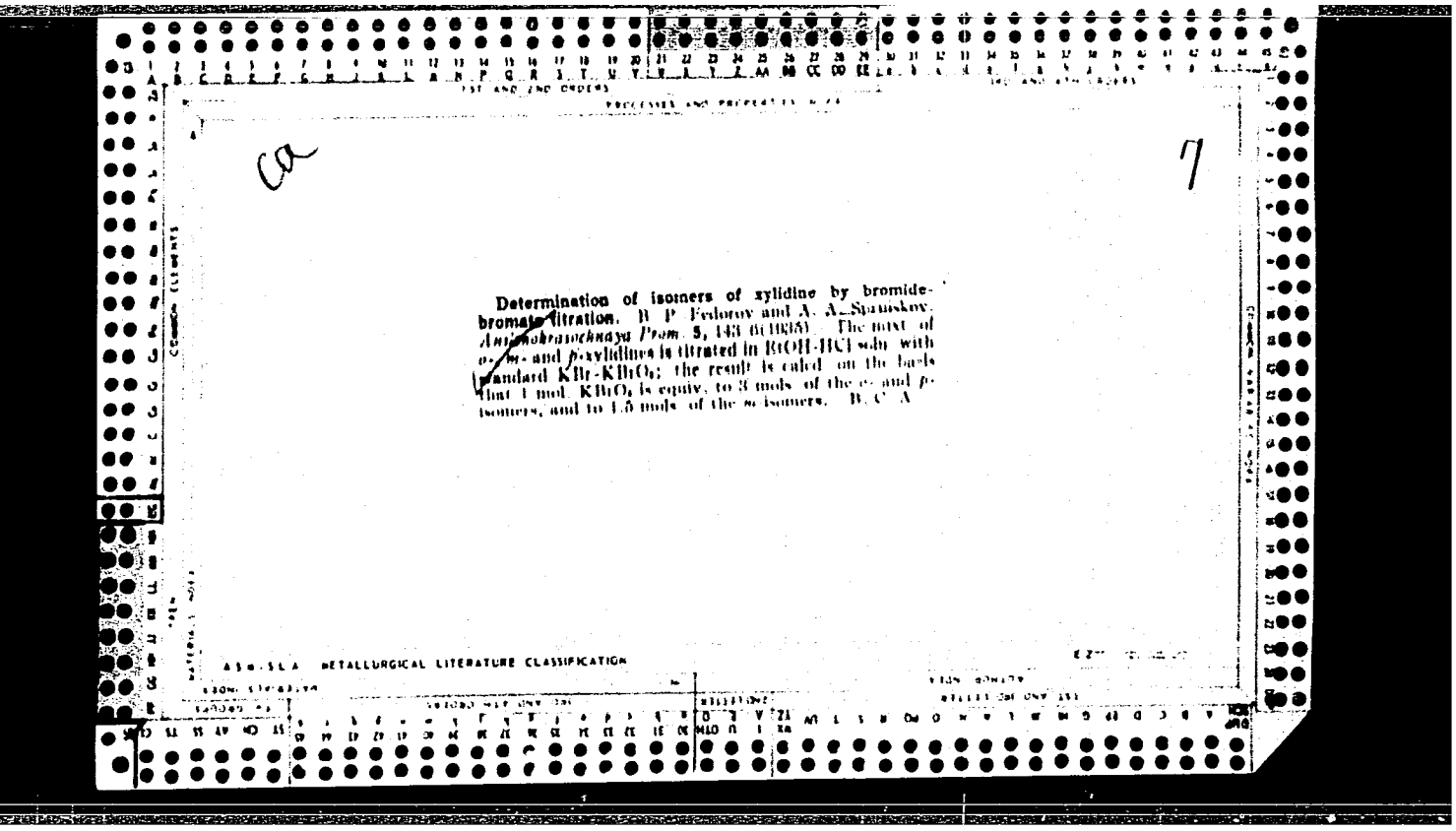

Determination of isomers of xylidine by bromide-bromate titration. B. P. Fedorov and A. A. Spruiskov. *Anilinokrasochnaya Prom.* 5, 143-6(1935). The mixt. of *o*-, *m*- and *p*-xylidines is titrated in EtOH-HCl soln. with standard KBr-$KBrO_3$; the result is calcd. on the basis that 1 mol. $KBrO_3$ is equiv. to 3 mols. of the *o*- and *p*-isomers, and to 1.5 mols. of the *m*-isomers. B. C. A.

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1ST AND 2ND ORDERS

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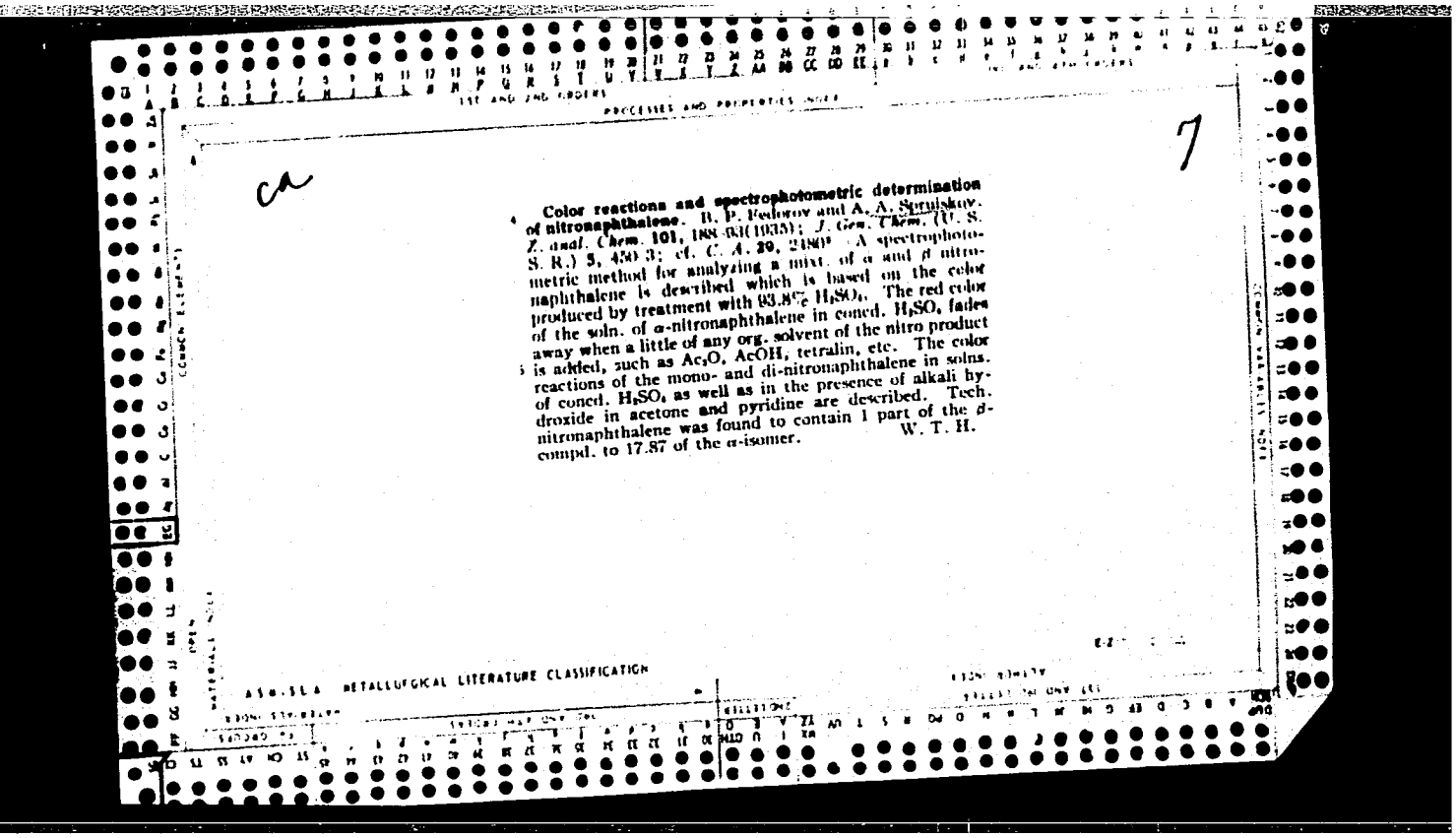

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Color reactions and spectrophotometric determination of nitronaphthalene. B. P. Fedorov and A. A. Spruiskov. *Z. anal. Chem.* **101**, 188-93(1935); *J. Gen. Chem.* (U. S. S. R.) **5**, 450-3; cf. *C. A.* **29**, 2480[3]. A spectrophotometric method for analyzing a mixt. of α and β nitronaphthalene is described which is based on the color produced by treatment with 93.8% H_2SO_4. The red color of the soln. of α-nitronaphthalene in concd. H_2SO_4 fades away when a little of any org. solvent of the nitro product is added, such as Ac_2O, AcOH, tetralin, etc. The color reactions of the mono- and di-nitronaphthalene in solns. of concd. H_2SO_4 as well as in the presence of alkali hydroxide in acetone and pyridine are described. Tech. nitronaphthalene was found to contain 1 part of the β-compd. to 17.87 of the α-isomer. W. T. H.

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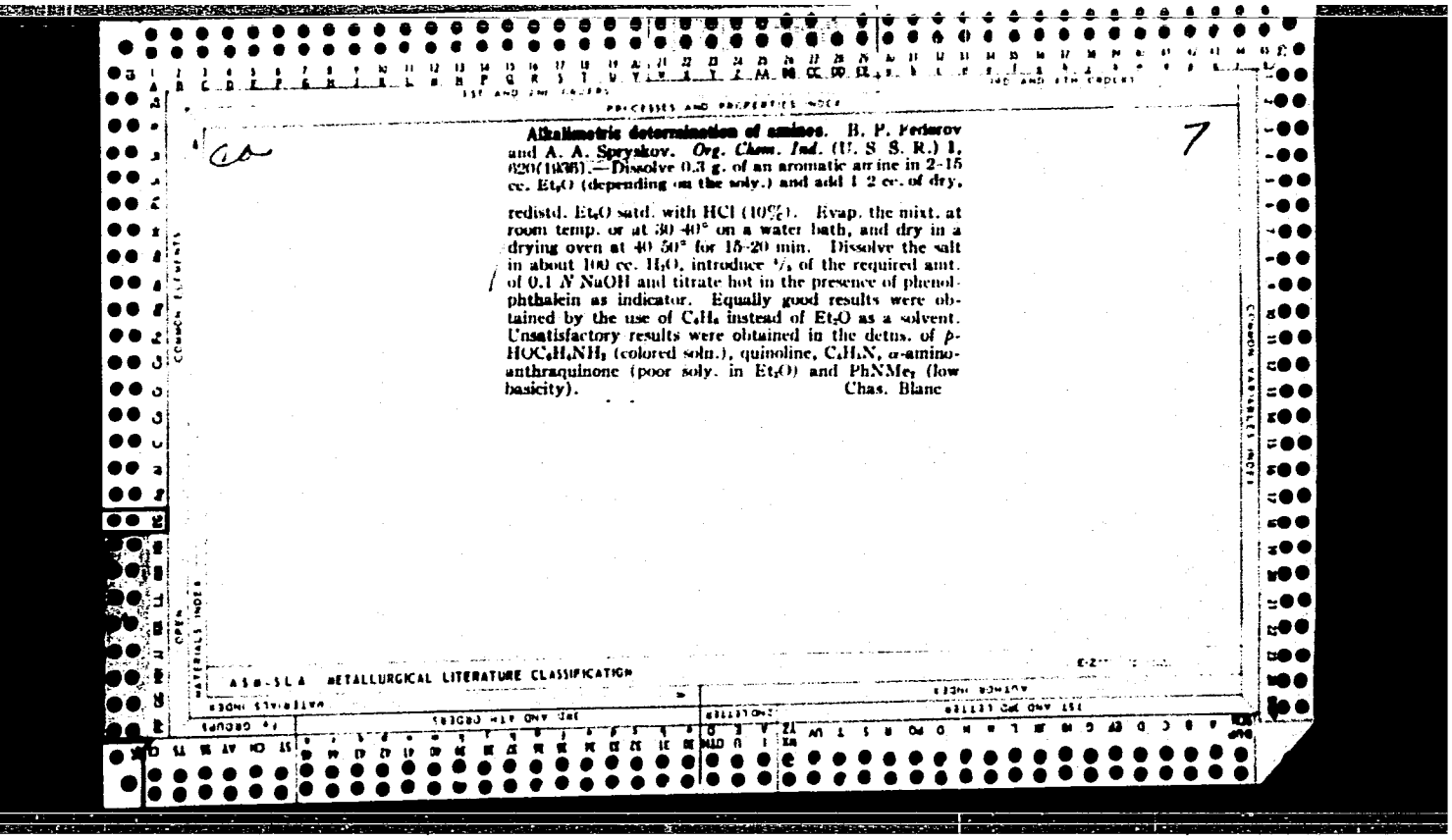

Alkalimetric determination of amines. B. P. Yeriavov and A. A. Spryskov. *Org. Chem. Ind.* (U. S. S. R.) 1, 920(1936).—Dissolve 0.3 g. of an aromatic amine in 2–15 cc. Et_2O (depending on the soly.) and add 1–2 cc. of dry, redistd. Et_2O satd. with HCl (10%). Evap. the mixt. at room temp. or at 30–40° on a water bath, and dry in a drying oven at 40–50° for 15–20 min. Dissolve the salt in about 100 cc. H_2O, introduce ½ of the required amt. of 0.1 *N* NaOH and titrate hot in the presence of phenolphthalein as indicator. Equally good results were obtained by the use of C_6H_6 instead of Et_2O as a solvent. Unsatisfactory results were obtained in the detns. of *p*-$HOC_6H_4NH_2$ (colored soln.), quinoline, C_9H_7N, α-aminoanthraquinone (poor soly. in Et_2O) and $PhNMe_2$ (low basicity).

Chas. Blanc

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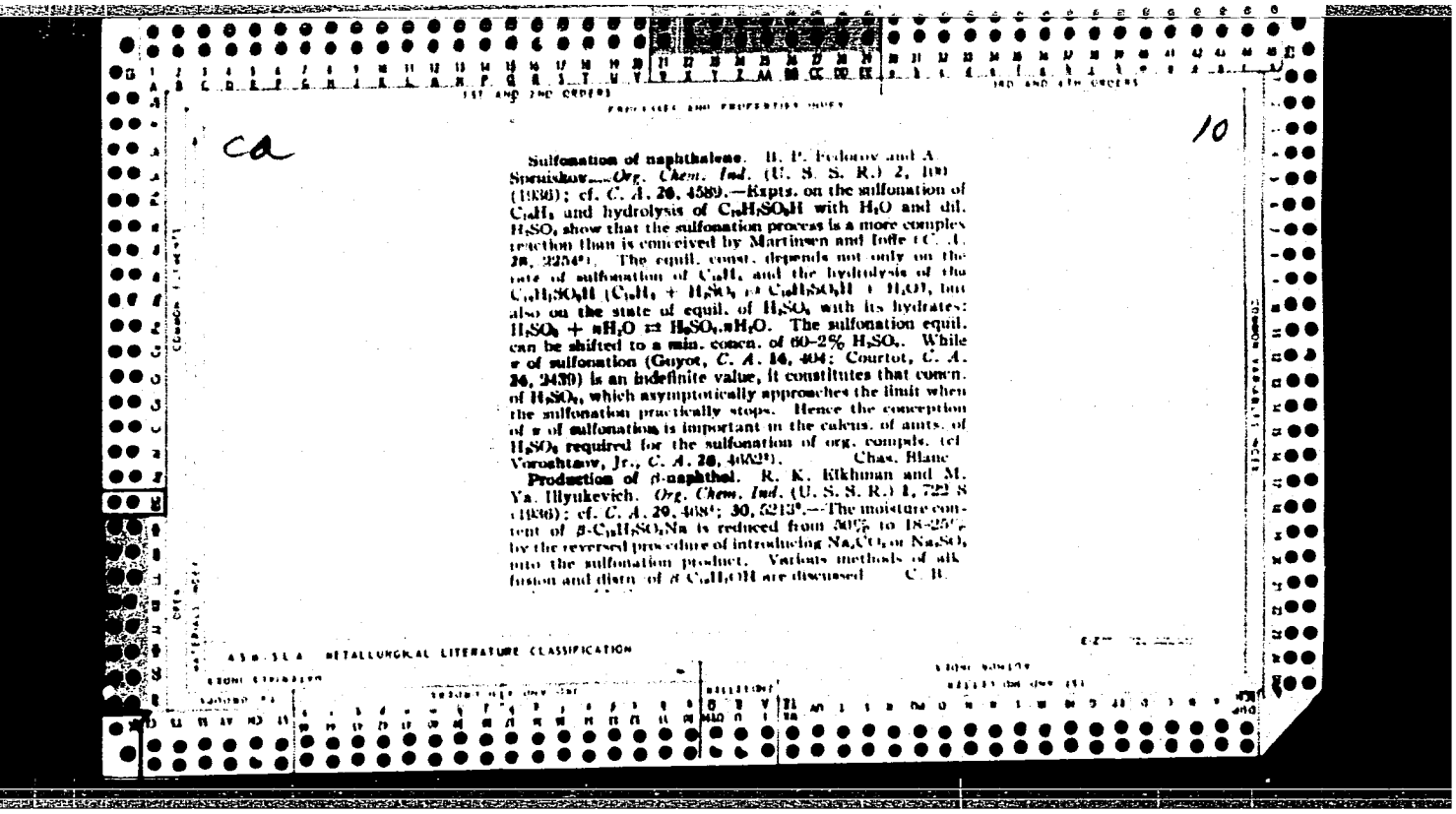

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Sulfonation of naphthalene. B. P. Fedorov and A. Spesitsev.—*Org. Chem. Ind.* (U. S. S. R.) 2, 101 (1936); cf. *C. A.* 29, 4589.—Expts. on the sulfonation of $C_{10}H_8$ and hydrolysis of $C_{10}H_7SO_3H$ with H_2O and dil. H_2SO_4 show that the sulfonation process is a more complex reaction than is conceived by Martinsen and Ioffe (*C. A.* 28, 2254[2]). The equil. const. depends not only on the rate of sulfonation of $C_{10}H_8$ and the hydrolysis of the $C_{10}H_7SO_3H$ ($C_{10}H_8 + H_2SO_4 \rightleftarrows C_{10}H_7SO_3H + H_2O$), but also on the state of equil. of H_2SO_4 with its hydrates: $H_2SO_4 + nH_2O \rightleftarrows H_2SO_4.nH_2O$. The sulfonation equil. can be shifted to a min. concn. of 60–2% H_2SO_4. While *n* of sulfonation (Guyot, *C. A.* 14, 404; Courtot, *C. A.* 24, 2439) is an indefinite value, it constitutes that concn. of H_2SO_4, which asymptotically approaches the limit when the sulfonation practically stops. Hence the conception of *n* of sulfonation is important in the calcns. of amts. of H_2SO_4 required for the sulfonation of org. compds. (cf. Voroshtsov, Jr., *C. A.* 28, 4082[2]). Chas. Blanc

Production of β-naphthol. R. K. Klkhman and M. Ya. Illyukevich. *Org. Chem. Ind.* (U. S. S. R.) 1, 722 S (1936); cf. *C. A.* 29, 4084; 30, 5213[8].—The moisture content of β-$C_{10}H_7SO_3Na$ is reduced from 50% to 18–25% by the reversed procedure of introducing Na_2CO_3 or Na_2SO_4 into the sulfonation product. Various methods of alk. fusion and distn. of β-$C_{10}H_7OH$ are discussed. C. B.

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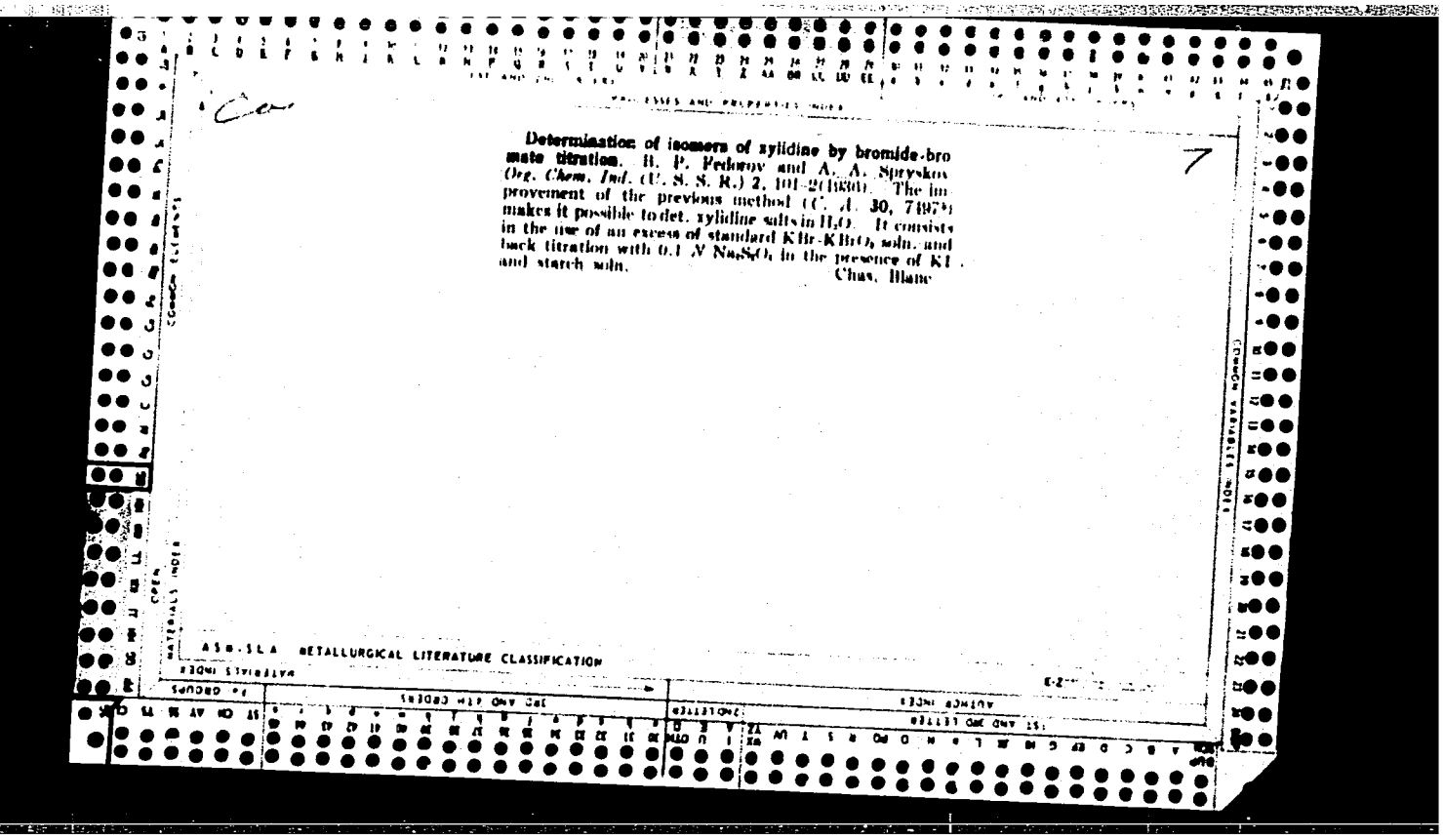

Determination of isomers of xylidine by bromide-bromate titration. B. P. Fedorov and A. A. Spryskov *Org. Chem. Ind.* (U. S. S. R.) 2, 101–2(1936). The improvement of the previous method (C. A. 30, 7497) makes it possible to det. xylidine salts in H_2O. It consists in the use of an excess of standard KBr-$KBrO_3$ soln. and back titration with 0.1 *N* $Na_2S_2O_3$ in the presence of KI and starch soln.

Chas. Blanc

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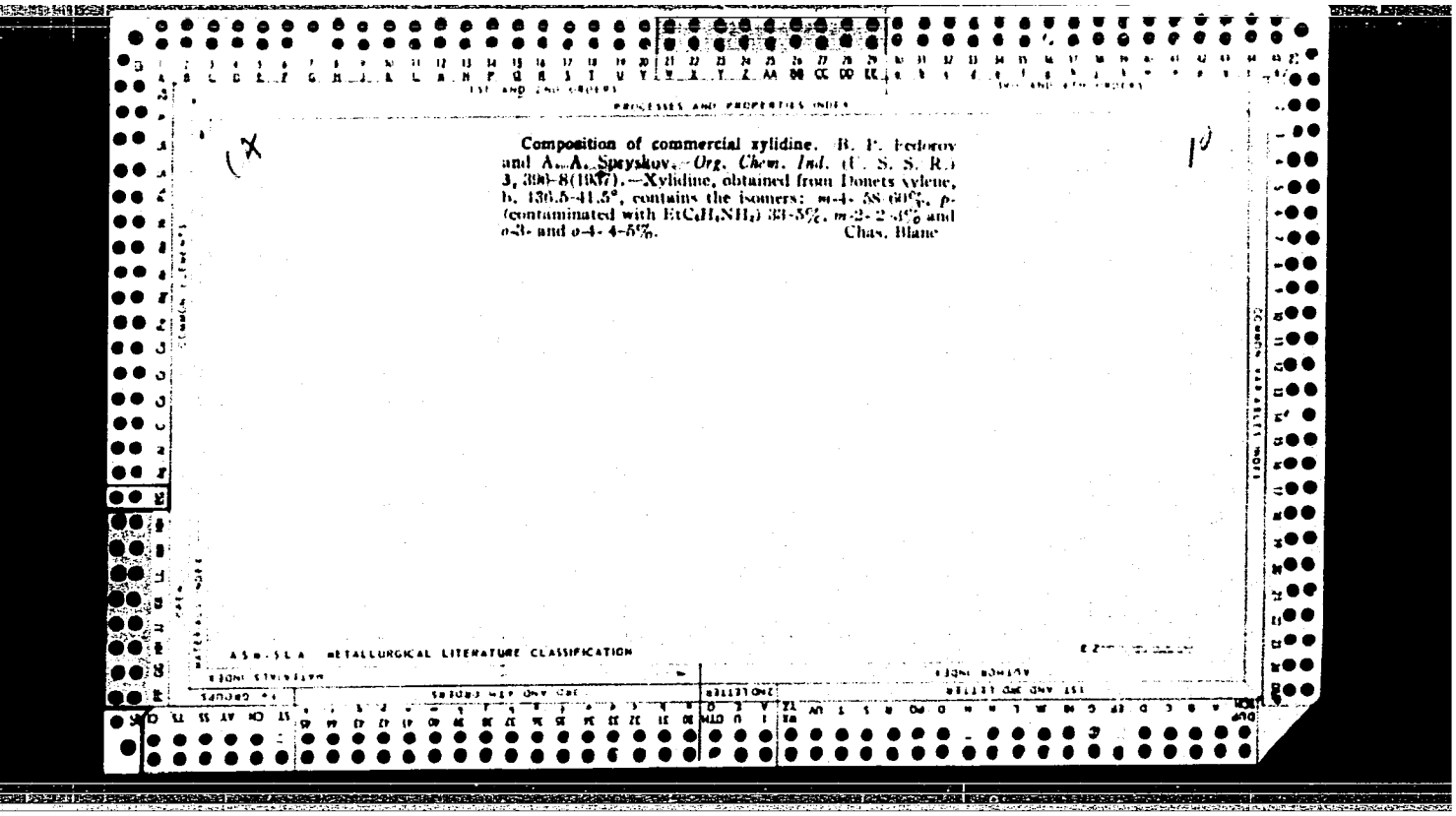

Composition of commercial xylidine. B. P. Fedorov and A. A. Spryskov.—*Org. Chem. Ind.* (U. S. S. R.) 3, 330–8(1937).—Xylidine, obtained from Donets xylene, b. 136.5–41.5°, contains the isomers: *m*-4- 58.60%, *p*- (contaminated with $EtC_6H_4NH_2$) 33.5%, *m*-2- 2.5% and *o*-3- and *o*-4- 4.5%. Chas. Blanc

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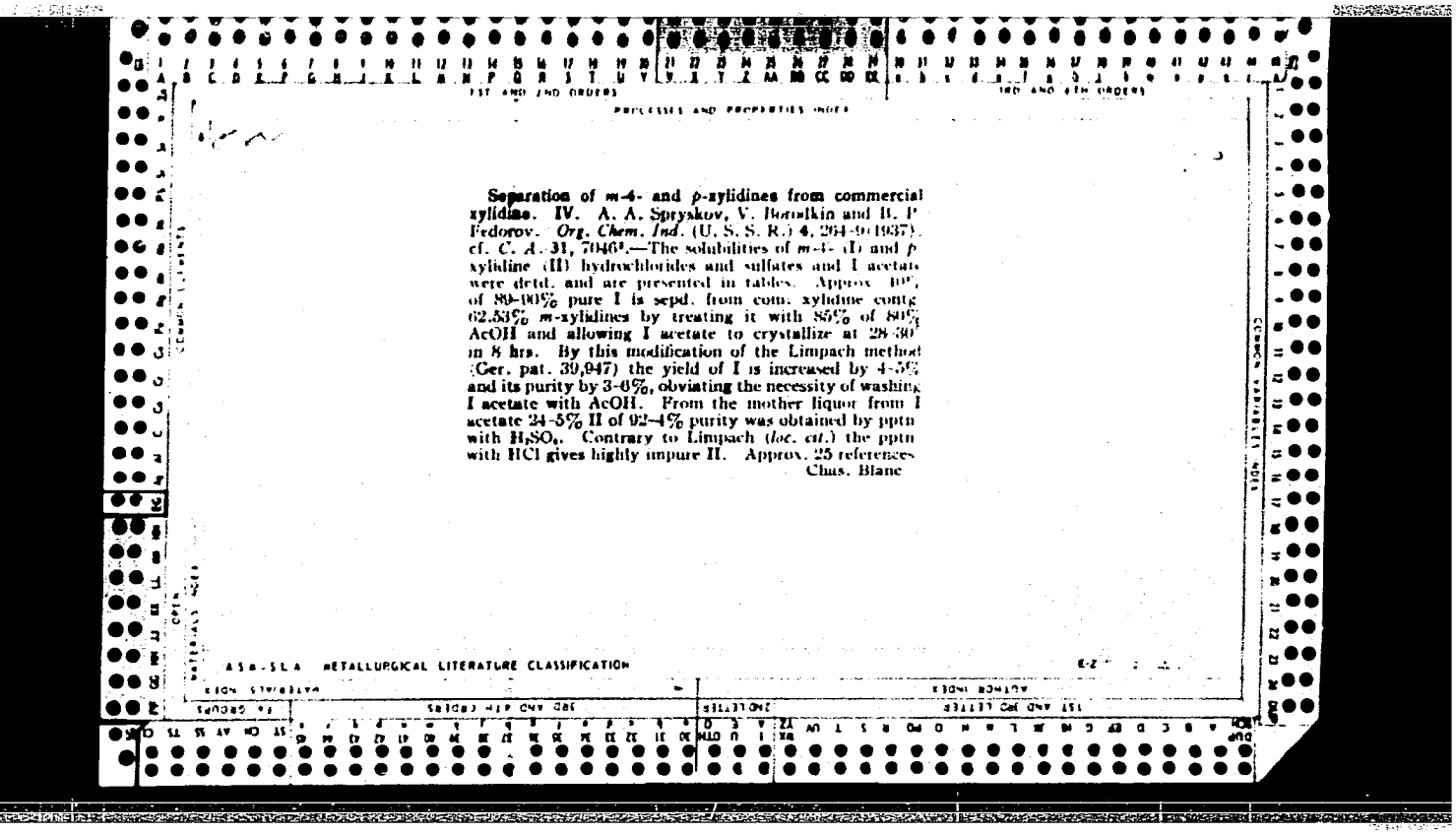

Separation of *m*-4- and *p*-xylidines from commercial xylidine. IV. A. A. Spryskov, V. Borulkin and B. P. Fedorov. *Org. Chem. Ind.* (U. S. S. R.) 4, 264-9 (1937); cf. *C. A.* 31, 7046⁹.—The solubilities of *m*-4- (I) and *p*-xylidine (II) hydrochlorides and sulfates and I acetate were detd. and are presented in tables. Approx. 10% of 80-90% pure I is sepd. from com. xylidine contg. 62.53% *m*-xylidines by treating it with 85% of 80% AcOH and allowing I acetate to crystallize at 28-30° in 8 hrs. By this modification of the Limpach method (Ger. pat. 39,947) the yield of I is increased by 4-5% and its purity by 3-6%, obviating the necessity of washing I acetate with AcOH. From the mother liquor from I acetate 24-5% II of 92-4% purity was obtained by pptn with H_2SO_4. Contrary to Limpach (*loc. cit.*) the pptn with HCl gives highly impure II. Approx. 25 references.

Chas. Blanc

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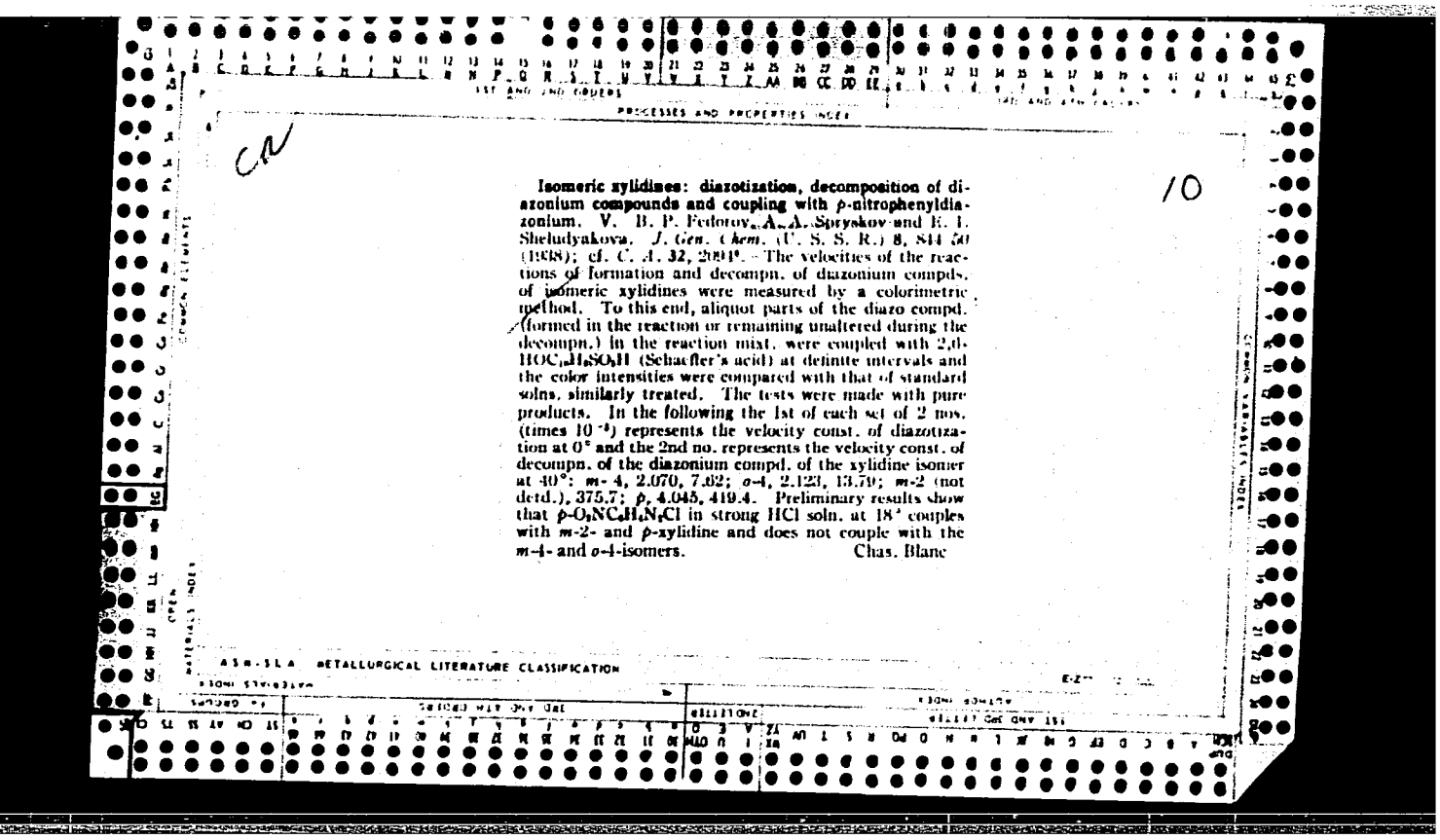

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Isomeric xylidines: diazotization, decomposition of diazonium compounds and coupling with *p*-nitrophenyldiazonium. V. B. P. Fedorov, A. A. Spryskov and E. I. Sheludyakova. *J. Gen. Chem.* (U. S. S. R.) 8, 844-50 (1938); cf. *C. A.* 32, 2094[6]. — The velocities of the reactions of formation and decompn. of diazonium compds. of isomeric xylidines were measured by a colorimetric method. To this end, aliquot parts of the diazo compd. (formed in the reaction or remaining unaltered during the decompn.) in the reaction mixt. were coupled with 2,6-$HOC_{10}H_6SO_3H$ (Schaeffer's acid) at definite intervals and the color intensities were compared with that of standard solns. similarly treated. The tests were made with pure products. In the following the 1st of each set of 2 nos. (times 10^{-5}) represents the velocity const. of diazotization at 0° and the 2nd no. represents the velocity const. of decompn. of the diazonium compd. of the xylidine isomer at 40°: *m*-4, 2.070, 7.62; *o*-4, 2.123, 13.79; *m*-2 (not detd.), 375.7; *p*, 4.045, 419.4. Preliminary results show that *p*-$O_2NC_6H_4N_2Cl$ in strong HCl soln. at 18° couples with *m*-2- and *p*-xylidine and does not couple with the *m*-4- and *o*-4-isomers. Chas. Blanc

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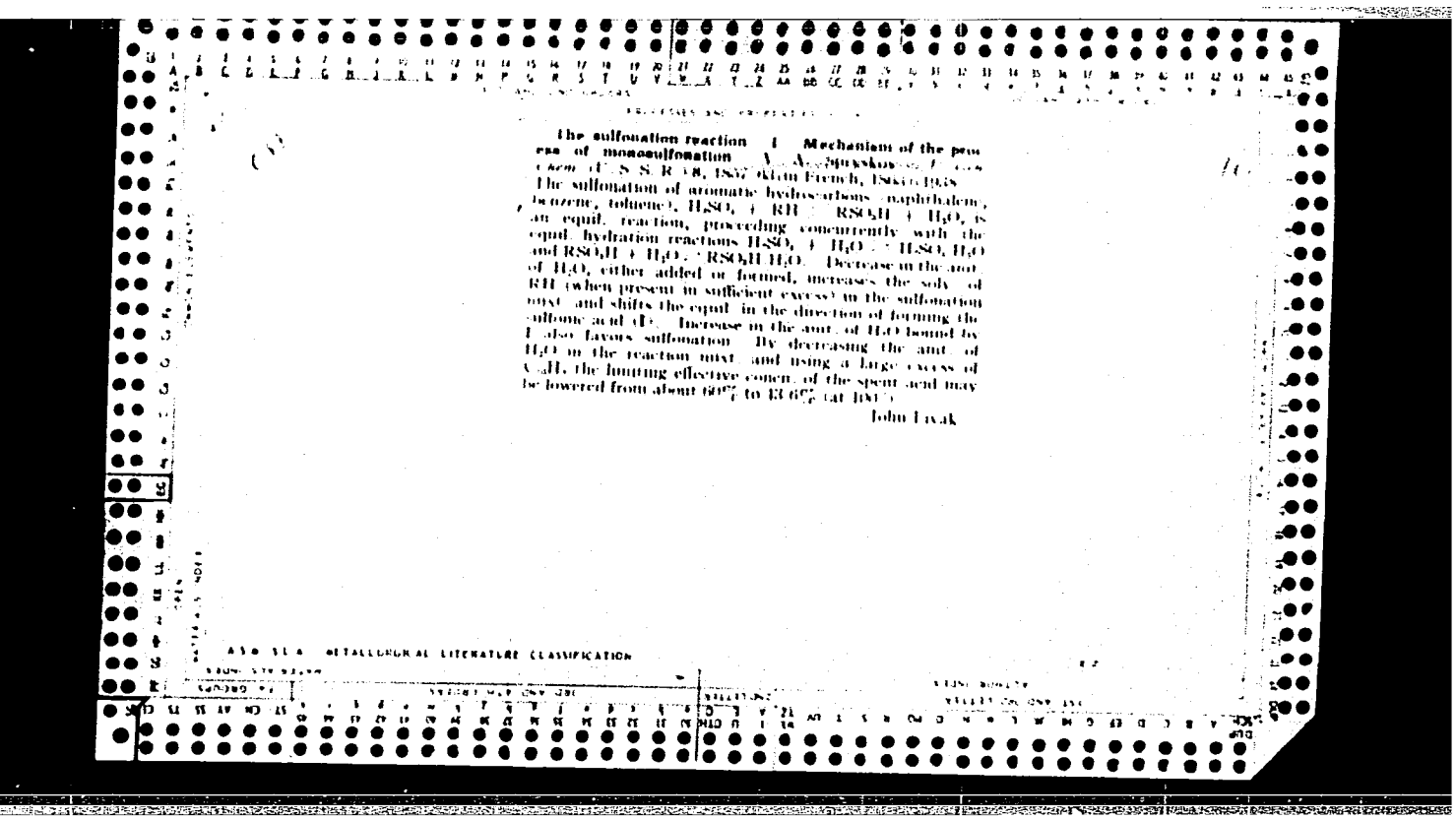

The sulfonation reaction. I. Mechanism of the process of monosulfonation. V. A. Spryskov. *J. Gen. Chem.* (U. S. S. R.) 8, 1857 (Klein French, 1858) (1938).

The sulfonation of aromatic hydrocarbons (naphthalene, benzene, toluene), $H_2SO_4 + RH \rightleftharpoons RSO_3H + H_2O$, is an equil. reaction, proceeding concurrently with the equil. hydration reactions $H_2SO_4 + H_2O \rightleftharpoons H_2SO_4 \cdot H_2O$ and $RSO_3H + H_2O \rightleftharpoons RSO_3H \cdot H_2O$. Decrease in the amt. of H_2O, either added or formed, increases the solv. of RH (when present in sufficient excess) in the sulfonation mixt. and shifts the equil. in the direction of forming the sulfonic acid (I). Increase in the amt. of H_2O bound by I also favors sulfonation. By decreasing the amt. of H_2O in the reaction mixt. and using a large excess of $C_{10}H_8$, the limiting effective concn. of the spent acid may be lowered from about 60% to 13.6% (at 100°).

John Lyak

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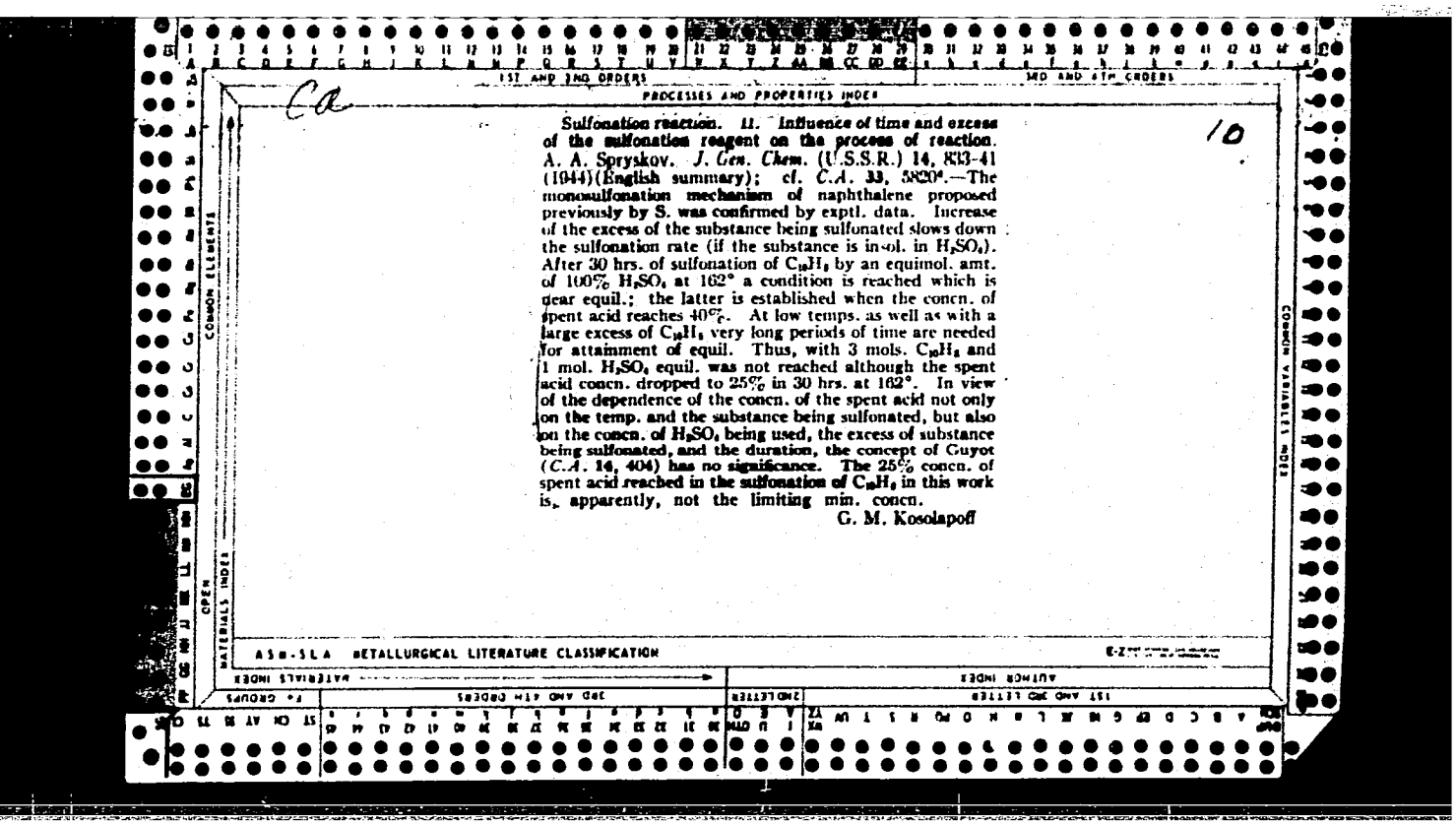

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Sulfonation reaction. II. Influence of time and excess of the sulfonation reagent on the process of reaction. A. A. Spryskov. *J. Gen. Chem.* (U.S.S.R.) **14**, 833-41 (1944)(English summary); cf. *C.A.* **33**, 5820⁶.—The monosulfonation mechanism of naphthalene proposed previously by S. was confirmed by exptl. data. Increase of the excess of the substance being sulfonated slows down the sulfonation rate (if the substance is insol. in H_2SO_4). After 30 hrs. of sulfonation of $C_{10}H_8$ by an equimol. amt. of 100% H_2SO_4 at 162° a condition is reached which is near equil.; the latter is established when the concn. of spent acid reaches 40%. At low temps. as well as with a large excess of $C_{10}H_8$ very long periods of time are needed for attainment of equil. Thus, with 3 mols. $C_{10}H_8$ and 1 mol. H_2SO_4 equil. was not reached although the spent acid concn. dropped to 25% in 30 hrs. at 162°. In view of the dependence of the concn. of the spent acid not only on the temp. and the substance being sulfonated, but also on the concn. of H_2SO_4 being used, the excess of substance being sulfonated, and the duration, the concept of Guyot (*C.A.* **14**, 404) has no significance. The 25% concn. of spent acid reached in the sulfonation of $C_{10}H_8$ in this work is, apparently, not the limiting min. concn.

G. M. Kosolapoff

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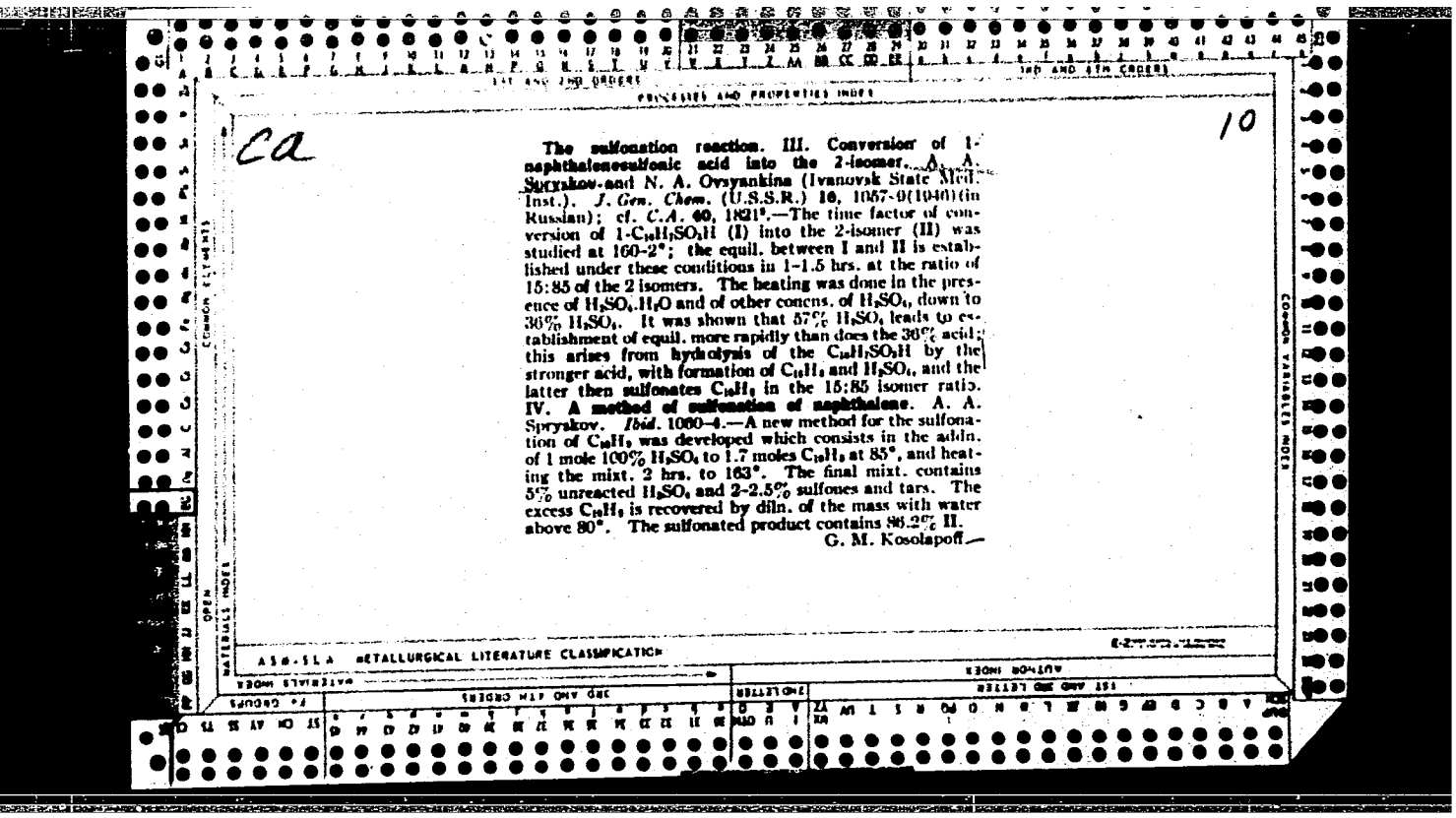

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The sulfonation reaction. III. Conversion of 1-naphthalenesulfonic acid into the 2-isomer. A. A. Spryskov and N. A. Ovsyankina (Ivanovsk State Med. Inst.). *J. Gen. Chem.* (U.S.S.R.) **10**, 1057-9(1940)(in Russian); cf. *C.A.* **60**, 1821⁹.—The time factor of conversion of 1-$C_{10}H_7SO_3H$ (I) into the 2-isomer (II) was studied at 160–2°; the equil. between I and II is established under these conditions in 1–1.5 hrs. at the ratio of 15:85 of the 2 isomers. The heating was done in the presence of $H_2SO_4.H_2O$ and of other concns. of H_2SO_4, down to 36% H_2SO_4. It was shown that 57% H_2SO_4 leads to establishment of equil. more rapidly than does the 36% acid; this arises from hydrolysis of the $C_{10}H_7SO_3H$ by the stronger acid, with formation of $C_{10}H_8$ and H_2SO_4, and the latter then sulfonates $C_{10}H_8$ in the 15:85 isomer ratio. **IV. A method of sulfonation of naphthalene.** A. A. Spryskov. *Ibid.* 1060–4.—A new method for the sulfonation of $C_{10}H_8$ was developed which consists in the addn. of 1 mole 100% H_2SO_4 to 1.7 moles $C_{10}H_8$ at 85°, and heating the mixt. 2 hrs. to 163°. The final mixt. contains 5% unreacted H_2SO_4 and 2–2.5% sulfones and tars. The excess $C_{10}H_8$ is recovered by dilu. of the mass with water above 80°. The sulfonated product contains 86.2% II.

G. M. Kosolapoff

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"A Study of the Sulphonation Reaction. IV. The Method for the Sulphonation of Naphthalene," by A. A. Spryskov. (p. 1063)

SO: Journal of General Chemistry (Zhurnal Obshchei Khimii) 1946, Volume 16, No. 7

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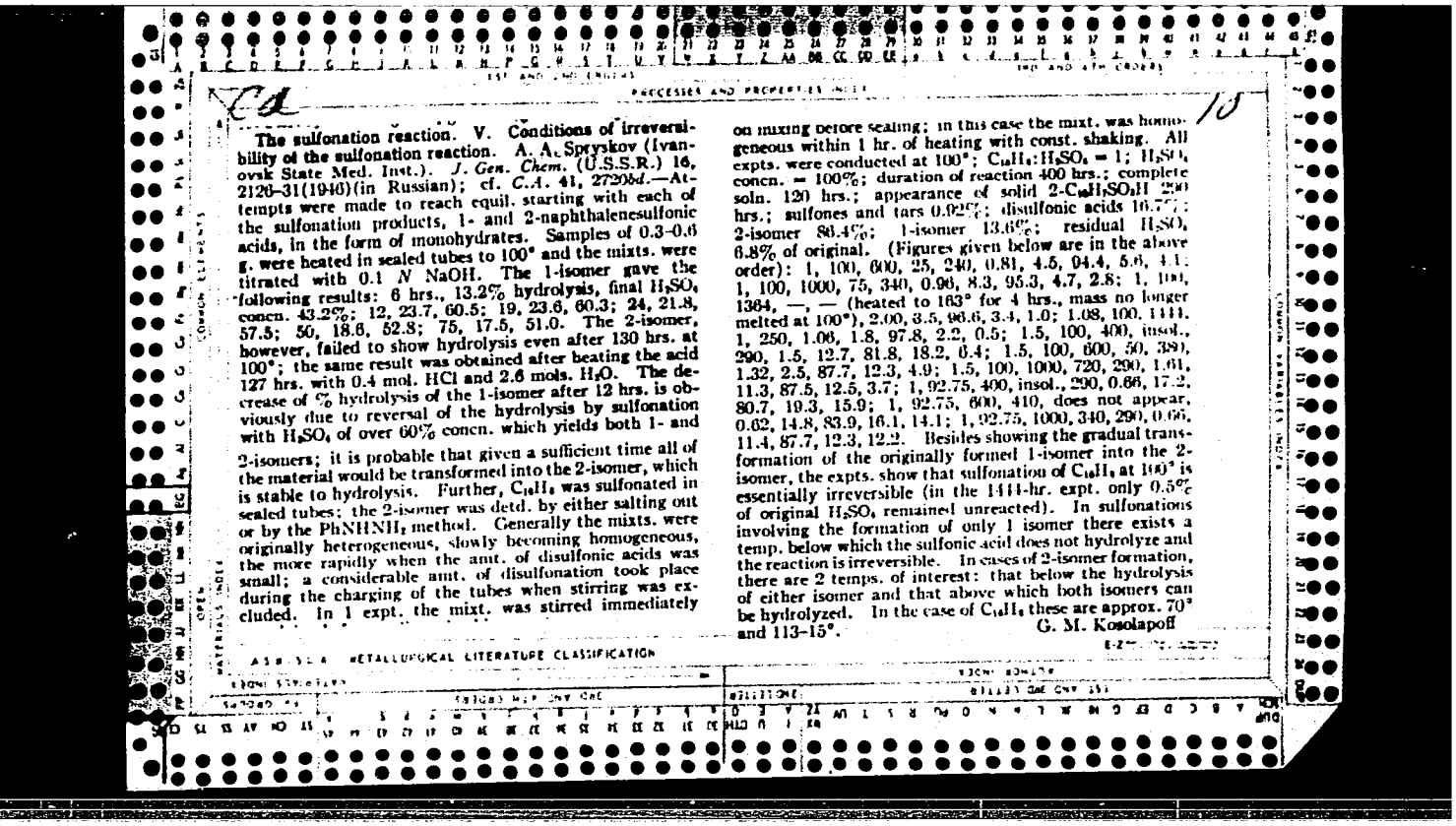

The sulfonation reaction. V. Conditions of irreversibility of the sulfonation reaction. A. A. Spryskov (Ivanovsk State Med. Inst.). *J. Gen. Chem.* (U.S.S.R.) 16, 2126–31(1946)(in Russian); cf. *C.A.* 41, 2720*bd*.—Attempts were made to reach equil. starting with each of the sulfonation products, 1- and 2-naphthalenesulfonic acids, in the form of monohydrates. Samples of 0.3–0.6 g. were heated in sealed tubes to 100° and the mixts. were titrated with 0.1 *N* NaOH. The 1-isomer gave the following results: 6 hrs., 13.2% hydrolysis, final H_2SO_4 concn. 43.2%; 12, 23.7, 60.5; 19, 23.6, 60.3; 24, 21.8, 57.5; 50, 18.6, 52.8; 75, 17.5, 51.0. The 2-isomer, however, failed to show hydrolysis even after 130 hrs. at 100°; the same result was obtained after heating the acid 127 hrs. with 0.4 mol. HCl and 2.6 mols. H_2O. The decrease of % hydrolysis of the 1-isomer after 12 hrs. is obviously due to reversal of the hydrolysis by sulfonation with H_2SO_4 of over 60% concn. which yields both 1- and 2-isomers; it is probable that given a sufficient time all of the material would be transformed into the 2-isomer, which is stable to hydrolysis. Further, $C_{10}H_8$ was sulfonated in sealed tubes; the 2-isomer was detd. by either salting out or by the $PhNHNH_2$ method. Generally the mixts. were originally heterogeneous, slowly becoming homogeneous, the more rapidly when the amt. of disulfonic acids was small; a considerable amt. of disulfonation took place during the charging of the tubes when stirring was excluded. In 1 expt. the mixt. was stirred immediately on mixing before sealing; in this case the mixt. was homogeneous within 1 hr. of heating with const. shaking. All expts. were conducted at 100°; $C_{10}H_8$:H_2SO_4 = 1; H_2SO_4 concn. = 100%; duration of reaction 400 hrs.; complete soln. 120 hrs.; appearance of solid 2-$C_{10}H_7SO_3H$ 200 hrs.; sulfones and tars 0.92%; disulfonic acids 16.7%; 2-isomer 86.4%; 1-isomer 13.6%; residual H_2SO_4 6.8% of original. (Figures given below are in the above order): 1, 100, 600, 25, 240, 0.81, 4.5, 94.4, 5.6, 4.1; 1, 100, 1000, 75, 340, 0.96, 8.3, 95.3, 4.7, 2.8; 1, 100, 1364, —, — (heated to 163° for 4 hrs., mass no longer melted at 100°), 2.00, 3.5, 96.6, 3.4, 1.0; 1.08, 100, 1414, 1, 250, 1.06, 1.8, 97.8, 2.2, 0.5; 1.5, 100, 400, insol., 290, 1.5, 12.7, 81.8, 18.2, 0.4; 1.5, 100, 600, 50, 389), 1.32, 2.5, 87.7, 12.3, 4.9; 1.5, 100, 1000, 720, 290, 1.61, 11.3, 87.5, 12.5, 3.7; 1, 92.75, 400, insol., 290, 0.66, 17.2, 80.7, 19.3, 15.9; 1, 92.75, 600, 410, does not appear, 0.62, 14.8, 83.9, 16.1, 14.1; 1, 92.75, 1000, 340, 290, 0.66, 11.4, 87.7, 12.3, 12.2. Besides showing the gradual transformation of the originally formed 1-isomer into the 2-isomer, the expts. show that sulfonation of $C_{10}H_8$ at 100° is essentially irreversible (in the 1414-hr. expt. only 0.5% of original H_2SO_4 remained unreacted). In sulfonations involving the formation of only 1 isomer there exists a temp. below which the sulfonic acid does not hydrolyze and the reaction is irreversible. In cases of 2-isomer formation, there are 2 temps. of interest: that below the hydrolysis of either isomer and that above which both isomers can be hydrolyzed. In the case of $C_{10}H_8$ these are approx. 70° and 113–15°.

G. M. Kosolapoff

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"Study of Sulphation Reaction. V. Conditions for the Irreversibility of the Sulphation Reaction." by A. A Baryskov (p. 2126)

SO: Journal of General Chemistry (Zhurnal Obshchei Khimii) 1946, Volume 16, No. 12

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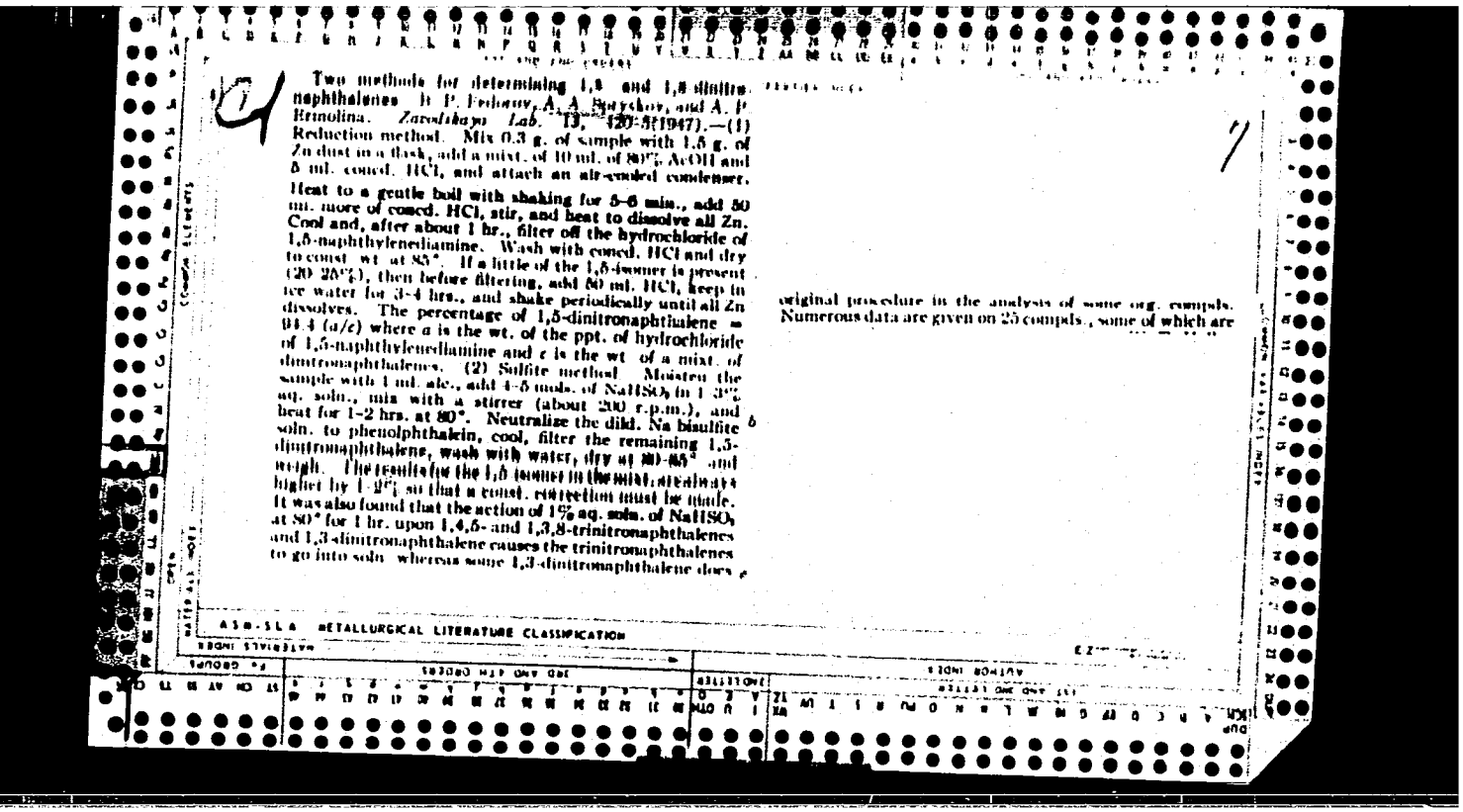

Two methods for determining 1,5 and 1,8 dinitronaphthalenes. B. P. Fedorov, A. A. Spryskov, and A. P. Ermolina. *Zavodskaya Lab.* 13, 420-5(1947).—(1) Reduction method. Mix 0.3 g. of sample with 1.5 g. of Zn dust in a flask, add a mixt. of 10 ml. of 80% AcOH and 5 ml. concd. HCl, and attach an air-cooled condenser. Heat to a gentle boil with shaking for 5-6 min., add 50 ml. more of concd. HCl, stir, and heat to dissolve all Zn. Cool and, after about 1 hr., filter off the hydrochloride of 1,5-naphthylenediamine. Wash with concd. HCl and dry to const. wt. at 85°. If a little of the 1,5-isomer is present (20-25%), then before filtering, add 50 ml. HCl, keep in ice water for 3-4 hrs., and shake periodically until all Zn dissolves. The percentage of 1,5-dinitronaphthalene = 94.4 (a/c) where a is the wt. of the ppt. of hydrochloride of 1,5-naphthylenediamine and c is the wt. of a mixt. of dinitronaphthalenes. (2) Sulfite method. Moisten the sample with 1 ml. alc., add 4-5 mols. of $NaHSO_3$ in 1-3% aq. soln., mix with a stirrer (about 200 r.p.m.), and heat for 1-2 hrs. at 80°. Neutralize the dild. Na bisulfite soln. to phenolphthalein, cool, filter the remaining 1,5-dinitronaphthalene, wash with water, dry at 80-85° and weigh. The results for the 1,5 isomer in the mixt. are always higher by 1-2% so that a const. correction must be made. It was also found that the action of 1% aq. soln. of $NaHSO_3$ at 80° for 1 hr. upon 1,4,5- and 1,3,8-trinitronaphthalenes and 1,3-dinitronaphthalene causes the trinitronaphthalenes to go into soln. whereas some 1,3-dinitronaphthalene does

original procedure in the analysis of some org. compds. Numerous data are given on 25 compds., some of which are

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1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

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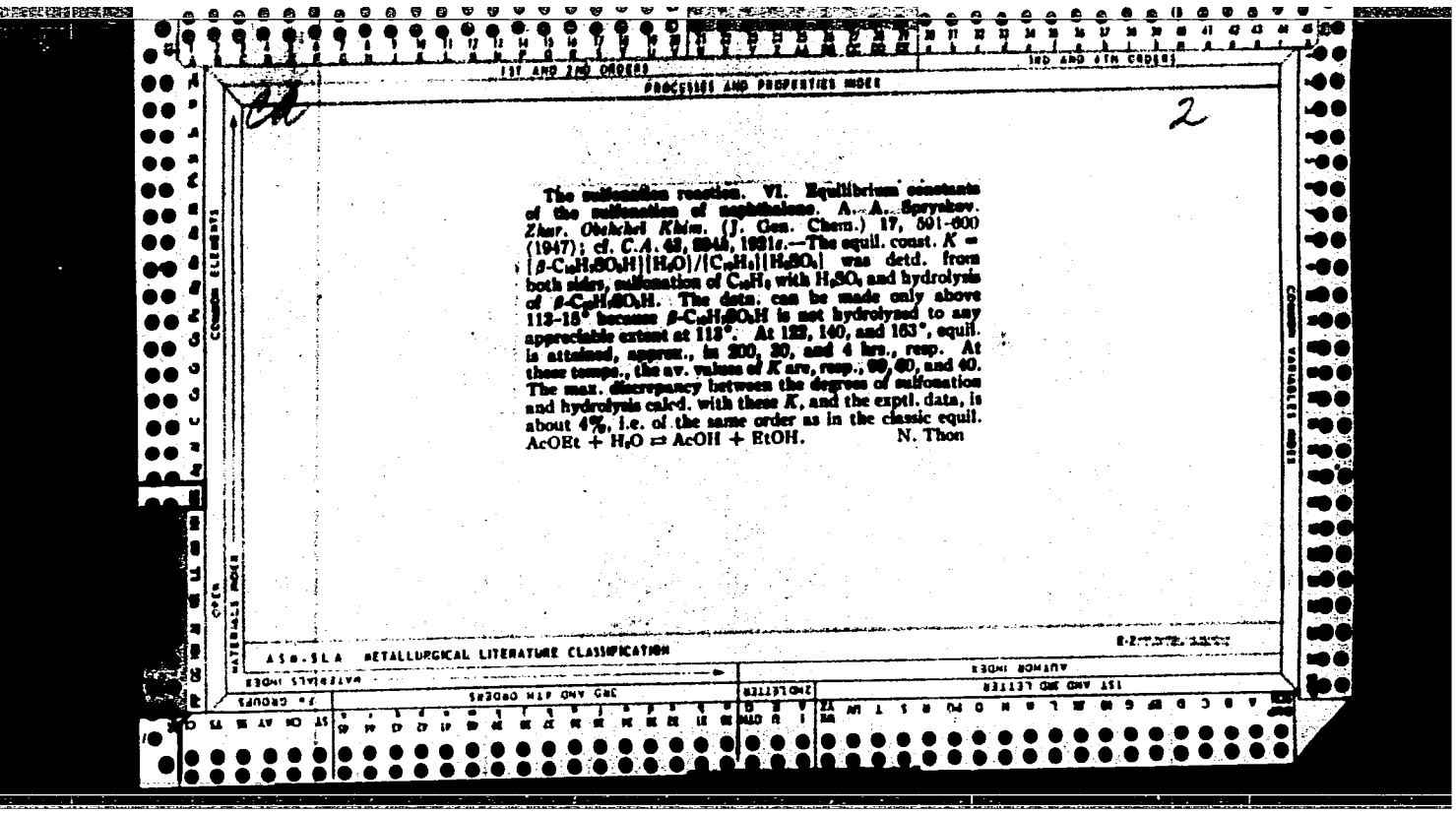

The sulfonation reaction. VI. Equilibrium constants of the sulfonation of naphthalene. A. A. Spryskov. *Zhur. Obshchei Khim.* (J. Gen. Chem.) 17, 591-600 (1947); cf. *C.A.* 43, 894h, 1921e.—The equil. const. $K = [\beta\text{-}C_{10}H_7SO_3H][H_2O]/[C_{10}H_8][H_2SO_4]$ was detd. from both sides, sulfonation of $C_{10}H_8$ with H_2SO_4 and hydrolysis of $\beta\text{-}C_{10}H_7SO_3H$. The detn. can be made only above 113-15° because $\beta\text{-}C_{10}H_7SO_3H$ is not hydrolyzed to any appreciable extent at 113°. At 122, 140, and 163°, equil. is attained, approx., in 200, 30, and 4 hrs., resp. At these temps., the av. values of K are, resp., 99, 60, and 40. The max. discrepancy between the degrees of sulfonation and hydrolysis calcd. with these K, and the exptl. data, is about 4%, i.e. of the same order as in the classic equil. $AcOEt + H_2O \rightleftarrows AcOH + EtOH$. N. Thon

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SPRYSKOV, A. A.

PA 15T91

USSR/Chemistry - Sulfonation
Chemistry - Naphthalene

Mar 1947

"Study of the Sulfonation Reaction: VI, The Equilibrium Constants of the Naphthalene Sulfonation Reaction," A. A. Spryskov, 10 pp

"Zhur Obshch Khim" Vol XVII, No 3

Values of the equilibrium constants, and data on the equilibrium condition.

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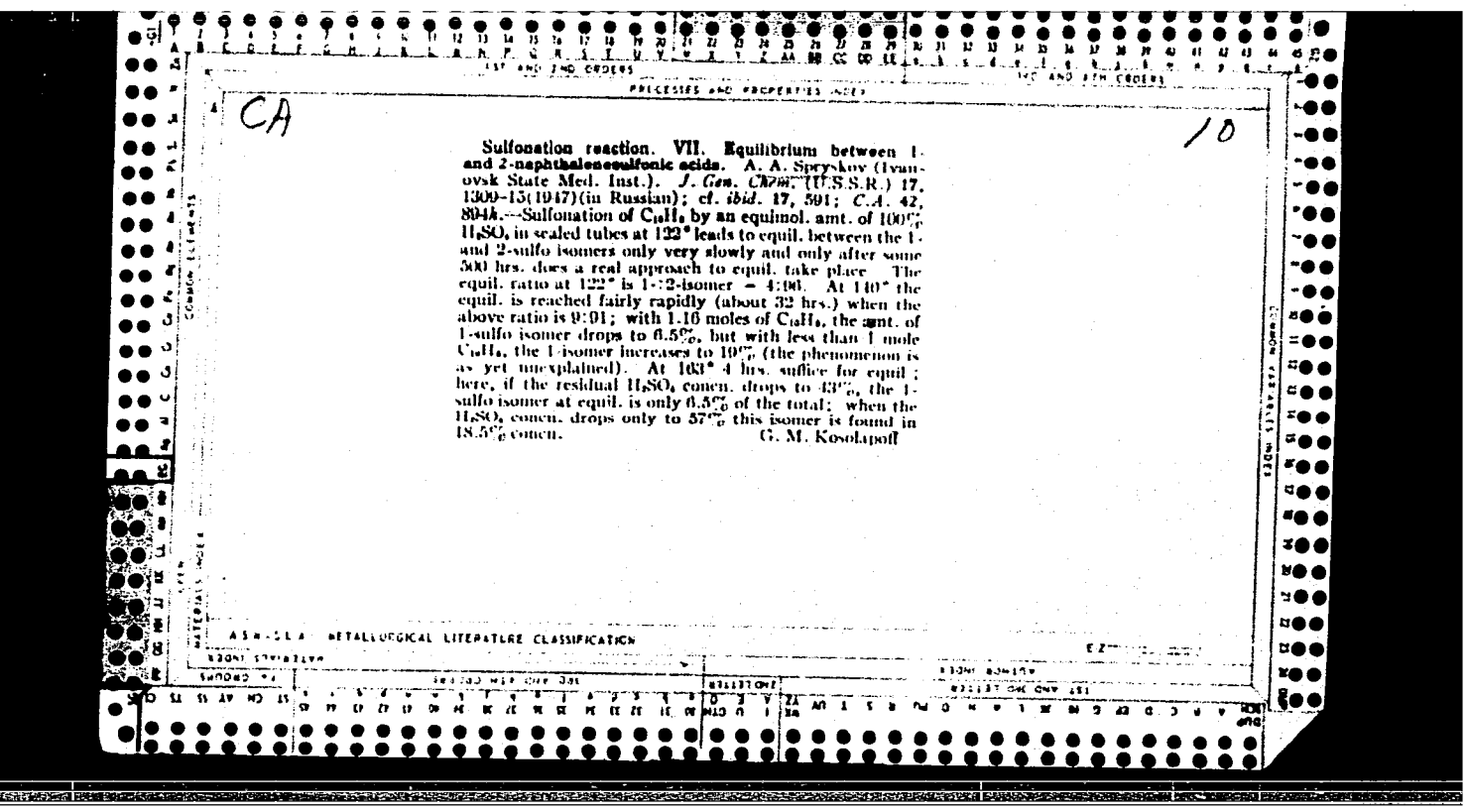

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Sulfonation reaction. VII. Equilibrium between 1- and 2-naphthalenesulfonic acids. A. A. Spryskov (Ivanovsk State Med. Inst.). *J. Gen. Chem.* (U.S.S.R.) 17, 1309–15(1947)(in Russian); cf. *ibid.* 17, 591; *C.A.* 42, 804*h*.—Sulfonation of $C_{10}H_8$ by an equimol. amt. of 100% H_2SO_4 in sealed tubes at 122° leads to equil. between the 1- and 2-sulfo isomers only very slowly and only after some 500 hrs. does a real approach to equil. take place. The equil. ratio at 122° is 1-:2-isomer = 4:96. At 140° the equil. is reached fairly rapidly (about 32 hrs.) when the above ratio is 9:91; with 1.16 moles of $C_{10}H_8$, the amt. of 1-sulfo isomer drops to 6.5%, but with less than 1 mole $C_{10}H_8$, the 1-isomer increases to 10% (the phenomenon is as yet unexplained). At 163° 4 hrs. suffice for equil.; here, if the residual H_2SO_4 concn. drops to 43%, the 1-sulfo isomer at equil. is only 6.5% of the total; when the H_2SO_4 concn. drops only to 57% this isomer is found in 18.5% concn.

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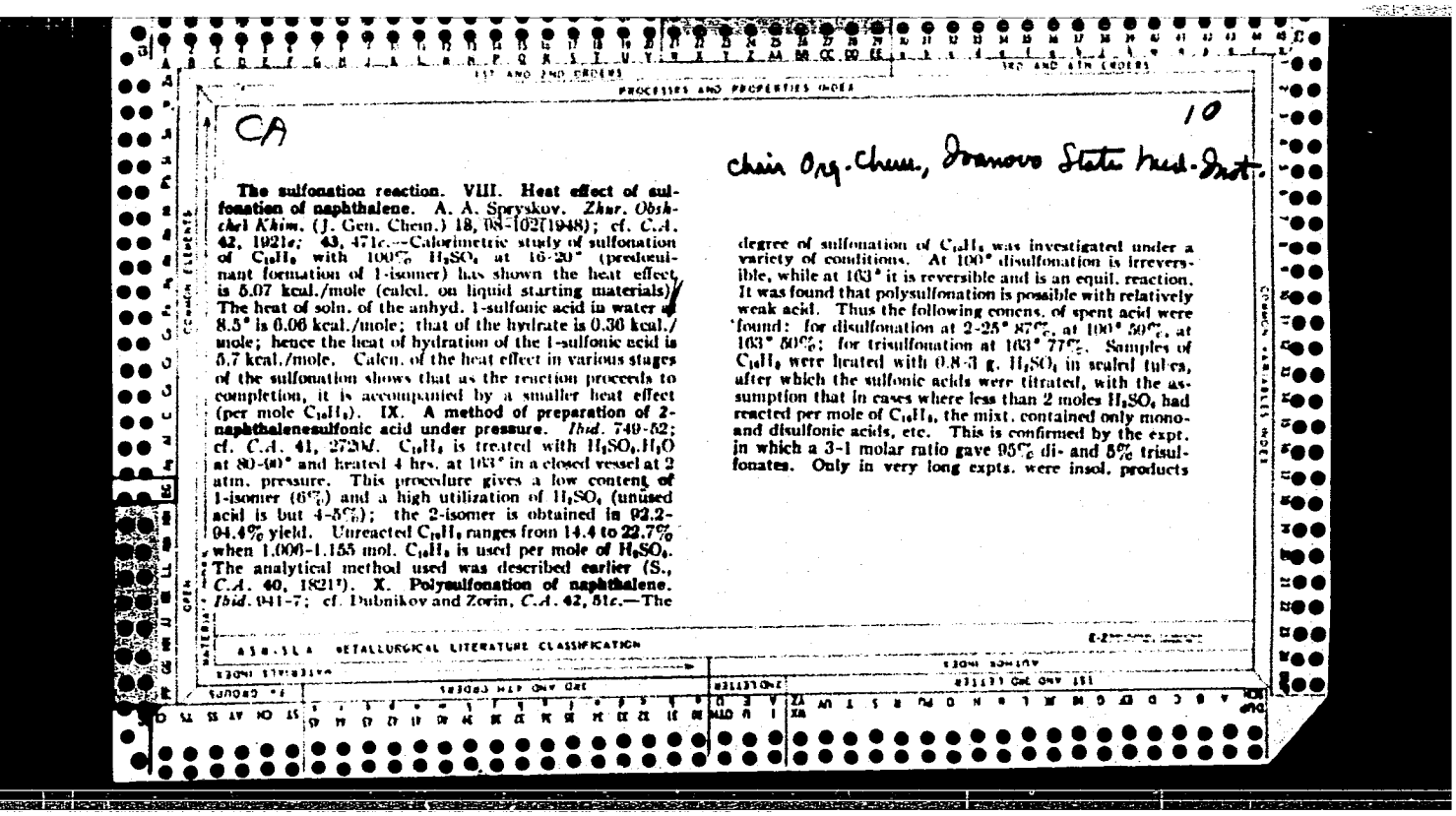

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Chair Org. Chem., Donnovo State Med. Inst.

The sulfonation reaction. VIII. Heat effect of sulfonation of naphthalene. A. A. Spryskov. *Zhur. Obshchei Khim.* (J. Gen. Chem.) 18, 98-102(1948); cf. *C.A.* **42**, 1921*e*; **43**, 471*c*.—Calorimetric study of sulfonation of $C_{10}H_8$ with 100% H_2SO_4 at 16-20° (predominant formation of 1-isomer) has shown the heat effect is 5.07 kcal./mole (calcd. on liquid starting materials). The heat of soln. of the anhyd. 1-sulfonic acid in water at 8.5° is 0.06 kcal./mole; that of the hydrate is 0.36 kcal./mole; hence the heat of hydration of the 1-sulfonic acid is 5.7 kcal./mole. Calcn. of the heat effect in various stages of the sulfonation shows that as the reaction proceeds to completion, it is accompanied by a smaller heat effect (per mole $C_{10}H_8$). IX. **A method of preparation of 2-naphthalenesulfonic acid under pressure.** *Ibid.* 749-52; cf. *C.A.* 41, 2720*d*. $C_{10}H_8$ is treated with $H_2SO_4.H_2O$ at 80-90° and heated 4 hrs. at 163° in a closed vessel at 2 atm. pressure. This procedure gives a low conteng of 1-isomer (6%) and a high utilization of H_2SO_4 (unused acid is but 4-5%); the 2-isomer is obtained in 92.2-94.4% yield. Unreacted $C_{10}H_8$ ranges from 14.4 to 22.7% when 1.000-1.155 mol. $C_{10}H_8$ is used per mole of H_2SO_4. The analytical method used was described earlier (S., *C.A.* **40**, 1821*i*). X. **Polysulfonation of naphthalene.** *Ibid.* 941-7; cf. Dubnikov and Zorin, *C.A.* **42**, 51*c*.—The degree of sulfonation of $C_{10}H_8$ was investigated under a variety of conditions. At 100° disulfonation is irreversible, while at 163° it is reversible and is an equil. reaction. It was found that polysulfonation is possible with relatively weak acid. Thus the following concns. of spent acid were found: for disulfonation at 2-25° 87%, at 100° 50%, at 163° 80%; for trisulfonation at 163° 77%. Samples of $C_{10}H_8$ were heated with 0.8-3 g. H_2SO_4 in sealed tubes, after which the sulfonic acids were titrated, with the assumption that in cases where less than 2 moles H_2SO_4 had reacted per mole of $C_{10}H_8$, the mixt. contained only mono- and disulfonic acids, etc. This is confirmed by the expt. in which a 3-1 molar ratio gave 95% di- and 5% trisulfonates. Only in very long expts. were insol. products

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detected. The following results were obtained with 100% H_2SO_4: at 20° 0.18 mole $C_{10}H_8$ per mole H_2SO_4 in 0.25 hr. gave 84% mono- and 16% disulfonic acids; 0.1 mole $C_{10}H_8$ per mole H_2SO_4 in 1.5 hrs. gave 86 and 14%, resp.; 0.37 mole in 11,240 hrs. at 5–25° gave 78 and 22%, resp.; while 0.12 mole under the same conditions gave 98% di- and 2% trisulfonic acids. At 100° the results were: 0.03 mole $C_{10}H_8$ per mole H_2SO_4 in 40 hrs. gave 90% di- and 10% trisulfonates, spent acid concn. 98.7%; 0.10 mole in 165 hrs. gave 90 and 10%, resp., 94.8% spent acid; 0.42 mole in 40 hrs. gave 54% mono- and 46% disulfonates, 76.9% spent acid; 0.5 mole in 24 hrs. gave 75% mono- and 25% diacid, spent acid 76.5%, while in 1570 hrs. this gave 43% mono- and 57% disulfonic acid, with 59% spent acid concn. At 130° the results were: 0.5 mole $C_{10}H_8$ in 1 hr. gave 80% mono- and 20% disulfonic acids, 78% spent acid; in 3 hrs. 78% and 22%, resp., and 77.7% spent acid; in 6 hrs. 71% mono- and 29% disulfonates, 75.3% spent acid; 0.2 mole $C_{10}H_8$ in 3 hrs. gave 98% di- and 2% trisulfonic acids, with spent acid of 89.1% concn., while 0.25 mole in 3 hrs. gave 5% mono- and 95% disulfonic acids, with 85.3% spent acid. At 163° 0.10 mole $C_{10}H_8$ per mole H_2SO_4 in expts. ranging up to 36 hrs. gave a max. of 65% tri- and 35% disulfonation (at 36 hrs.), with 93.6% spent acid; 0.20 mole $C_{10}H_8$ in expts. up to 210 hrs. gave a max. of 29% tri- and 71% disulfonation at 210 hrs., with 86.5% spent acid concn.; with 0.3 mole $C_{10}H_8$ (up to 210 hrs.), the 25-hr. run gave 64% mono- and 36% disulfonation (62.6% spent acid) when 78.3% H_2SO_4 was used, while the 100% acid gave in 47 hrs. 1% mono- and 99% disulfonates, with 78.6% spent acid concn., and at 210 hrs. 95% di- and 5% trisulfonates were obtained (spent acid, 77.4%); when 0.45 mole $C_{10}H_8$ was used the max. values were at 210 hrs. 23% mono- and 77% disulfonates, with 57.8% spent acid; further increase of the amt. of $C_{10}H_8$ lead to the progressively larger amts. of monosulfonates. Heating 0.2534 g. 2,6-disulfonyl chloride with 0.1320 g. H_2O 100 hrs. at 163° gave 12.2% hydrolysis of the sulfo group (estd. by SO_4 detn.), while in a similar expt. the 2,7-isomer gave 16.8% hydrolysis; this shows that disulfonation is no longer reversible at this temp. Sulfonation of 1- and 2-sulfonaphthalenes at 100° with 0.18–0.4 mole per mole H_2SO_4 for 15–1227 hrs. showed that 95% H_2SO_4 is capable of introducing a 3rd sulfo group into the mol.; thus, the spent acid concn. was 95%, when 0.18 mole 1-$C_{10}H_7SO_3H$ and 1 mole 100% H_2SO_4 were kept at 100° 167 hrs., resulting in formation of 78% di- and 22% trisulfonic acids; with the 2-isomer, using 0.21 mole with 88.6% H_2SO_4, 15 hrs. gave 3.6% mono- and 96.4% disulfonates, with spent acid concn. of 82.7%. G. M. Kosolapoff

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SPRYSKOV, A. A.

A. A. Spryskov, The study of the reaction of sulfonation. XI. The obtaining of monosulfo acid during sulfonation of benzene with fuming sulfuric acid. P. 1370.

A method has been worked out for the sulfonation of benzene consisting of different weight amounts of benzene and 23-27% of fuming sulfuric acid are mixed in the cold and then heated while stirring in a closed vessel at 162-163° for nine hours.

Chair of Organic Chemistry of the
Ivanov State Medical Institute
July 4, 1947.

SO: Journal of General Chemistry (USSR) 18, (80) No. 7 (1948).

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