"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

Misc 11

CA

Direction of some physiological processes in insects during the period preliminary to hibernation. R. S. Ushatinskaya. *Izvest. Akad. Nauk S.S.S.R., Ser. Biol.* 1952, No. 1, 101-14.—Examn. of *Pieris brassicae*, *Lasperesia pomonella*, *Pyrrhocoris apterus*, *Gastroidea viridula*, and *Selatosomus* species showed the following: Species that hibernate in the adult or larval state feed heavily just before hibernation and deposit much fat and smaller amts. of carbohydrate and protein reserves. At the end of the feeding period the H_2O level declines as a result of evacuation of the intestinal tract. As the exterior temp. declines (to 8.0°), the oxidative reactions decline, fat and H_2O reserves begin to be utilized, and glycogen supply increases. At the 1st frost period sugar level rises rapidly by 250-300%. The frost-resistance of the insects is improved by reduction of the body H_2O content, by transition to a quiescent period, by increase of glycogen level (which permits retention of H_2O in a form that is safe from freezing), and by increase of the level of reducing substances which increase osmotic pressure.

G. M. Kosolapoff

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

USHATINSKAYA, R.S.; PAVLOVSKIY, Ye.N., akademik.

Biological significance of food reserves in the intestines of the shield bug (Eurygaster integriceps Put.) in the dormant period. Dokl.AN SSSR 93 no.4: 737-740 D '53. (MLRA 6:11)

1. Akademiya nauk SSSR (for Pavlovskiy). 2. Institut morfologii zhivotnykh im. A.N.Severtsova Akademii nauk SSSR (for Ushatinskaya). (Eurygasters)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

USHATINSKAYA, R. S.

N/5
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Biologicheskiye osnovy ispol'zovaniya nizkikh temperatur v bor'be s vreditelyami zernovykh zapasov (Nasekomyye i kleshchi). (Biological principles of utilizing low temperatures in the struggle against pests of grain reserves 'insects and mites') Moskva, Akademkniga, 1954.
86 p. graphs, tables.
At head of title: Akademiya Nauk SSSR. Institut Morfologii Zhivotnykh.
"Literatura": p. 84 (87).

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

USHATINSKAYA, Raisa Sergeyevna

USHATINSKAYA, Raisa Sergeyevna, doktor biol.nauk; FEDOTOV, D.M., prof., zasluzhennyy deyatel' nauki, otvetstvennyy redaktor; SABLINA, T.B., redaktor izdatel'stva

[Principles of cold resistance in insects] Osnovy kholodostoikosti nasekomykh.. Moskva, Izd-vo Akad.nauk SSSR, 1957. 314 p. (MIRA 11:2)
(Insects--Physiology)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

P

USSR / General and Specialized Zoology - Insects.

Abs Jour : Ref Zhur - Biologiya, No 5, 1959, No. 20809

Author : Ushatinskaya, R. S.
Inst : AS USSR
Title : Some Physiological and Biochemical Peculiarities of the Diapause of the Colorado Beetle (Leptinotarsa Decemlineata Say)

Orig Pub : V sb.: Koloradskiy zhuk i mery bor'by s nim. 2.M., AN SSSR, 1958, 150-185

Abstract : Studies were basically conducted with beetles which enter the winter diapause. The amount of water in the body of the beetle declines from the moment it leaves the ground, according to a predetermined rate, until it re-enters the ground for the

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"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

USSR / General and Specialized Zoology - Insects. P

Abs Jour : Ref Zhur - Biologiya, No 5, 1959, No. 20809

winter, and then increases slightly. The beetles come out of the cocoon with very little fat (7.5%), and by the time of retreating for the winter, the females have 38% fat, the males 39.6% of the weight of dry substances. After 8 months these indices are correspondingly 32.5% and 33.4%, and by the end of the breeding period, 13.2% and 16.6%. The iodine number of fat does not change substantially. In the period before the diapause, the glycogen content increases until it reaches the maximum at the beginning of the diapause (44.9-44.5% of the dry weight of the body), at the end of the frost period it falls (to 32.8-36.2%), and then increases with the warmth of springtime, and decreases

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"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

P

USSR / General and Specialized Zoology - Insects.

Abs Jour : Ref Zhur - Biologiya, No 5, 1959, No. 20309

during egg laying to 35.9-34.7%. The amount of residual N is largest in young beetles, decreases in the pre-diapause period, and increases during the first half of the winter. The intensity of breathing decreases with the first days of the diapause, and on the 25th day it is 1/3 of what it was prior to the diapause; the coefficient of breathing drops at the same time (to 0.41-0.54), but increases in November (0.78-0.87), which corresponds to the stopping of the diapause and the start of hibernation. The start of the diapause is accompanied by the greatest catalase activity, and a lessening of the action of the peroxidase, polyphenoloxidase, glutathione, ascorbic

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"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

USSR / General and Specialized Zoology - Insects.

Abs Jour : Ref Zhur - Biologiya, No 5, 1959, No. 20809 P

acid and the tissue dehydrase. The period of hibernation is characterized by a slight increase in metabolism limited by low temperatures (numbness from the cold). It may be assumed that the principal biological purpose of diapause in this species is to maintain low metabolism which prevents the spending of reserves before the advent of positive temperatures, and that the immobility of the beetles which are spending a second winter is more like hibernation than diapause.
-- A. M. Emme

Card 4/4

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"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

USHATINSKAYA, R.S.

Seasonal periodicity of metabolism in insect ontogeny and its origin. Trudy Inst.morf.zhiv. no.27:163-174 '59. (MIRA 13:2)

1. Laboratoriya morfologii bespozvonochnykh zhivotnykh Instituta morfologii zhivotnykh im. A.N.Severtsova AN SSSR.
(Insects--Physiology) (Metabolism)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

USHATINSKAYA, R.S.

Summer diapause and second hibernation of the Colorado beetle (Leptinotarsa decemlineata Say) in Transcarpathia. Dokl. AN SSSR140 no.5:1189-1191 O '61. (MIRA 15:2)

1. Institut morfologii zhivotnykh im. A.N.Severtsova AN SSSR. Predstavleno akademikom Yu.A.Orlovym.
(Transcarpathia--Potato beetle)
(Diapause)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

USHATINSKAYA, R.S.

Physiological characteristics of larval development in the Chinese tussah moth (Antheraea pernyi G.-M.) under conditions of a long and short light day. Zool.zhur. 40 no.7:1030-1038 Jl '61. (MIRA 14:7)

1. Institute of Animal Morphology, U.S.S.R. Academy of Sciences, Moscow.
(Silkworms) (Photoperiodism) (Diapause)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

USHATINSKAYA, R.S.

Some physiological characteristics of the photoperiodic reaction in insects. Vop. ekol. 7:189-191 '62. (MIRA 16:5)

1. Institut morfologii zhivotnykh AN SSSR, Moskva.
(Photoperiodism) (Insects--Development)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

USHATINSKAYA, R.S., doktor biolog.nauk

I' pause in the Colorado beetle and the formation of its perennail ic uses. Zashch.rast.ot vred.i bol. 7 no.6:53-54 Je '62. (MIRA 15:12)

1. Institut morfologii zhivotnykh imeni A.N. Severtsova.
(Transcarpathia—Potato beetle)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

USHATINSKAYA, R.S.; KOZARZHEVSKAYA, E.F.

Diapause and hibernation of the first generation of the Colorado beetle (Leptinotarsa decemlineata Say.)In various soil types. Zool. zhur. 41 no.8:1166-1174 Ag '62. (MIRA 15:9)

1. Institute of Animal Morphology, U.S.S.R. Academy of Sciences, Moscow.

(Transcarpathia--Potato beetle) (Diapause)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

USHATINSKAYA, R.S.; PETROVA, D.V.

Physiological characteristics of Colorado beetle (Leptinotarsa decemlineata Say). Izv. AN SSSR Ser. biol. 28 no.5:735-745 S-O'63 (MIRA 16:11)

1. Institute of Animal Morphology, Academy of Sciences of the U.S.S.R., Moscow.

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

GLADKOVSKIY, A.K.; USHATINSKIY, I.N.

Composition, origin, and alteration of bauxites in Tikhvin District. Trudy Gor.-geol.inst. UFAN SSSR no.56:109-135 '61. (MIRA 15:7)

(Tikhvin District—Bauxite)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

GLADKOVSKIY, A.K.; USHATINSKIY, I.N.

Mineral composition of the main bauxite deposits of the world; origin and alteration of alumina minerals and bauxites. Trudy Inst.geol. UFAN SSSR no.64:5-40 '64. (MIRA 17:12)

Remarks on the book "Bauxites, their mineralogy and genesis." Ibid.:243-252

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

GLAZKOVSKIY, A.K.; USHATINSKIY, I.N.; GUTKIN, Yu.S.; [illegible] Yu.K.

Geosynclinal Devorian bauxite facies in the Urals and their metallogeny. Trudy Inst.geol. UFAN SSSR no.64:65-96 '64.

(MIRA 17:12)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

PROCESSES AND PROPERTIES INDEX

CA

The optimum heat arrangement and a general method of the layout of evaporators. N. A. Ushatinskii. *Khim. Mashinostroenie* 1938, No. 4, 3-10; No. 5, 3-12; *Khim. Mashinostroenie Zhur.* 2, No. 5, 127-8(1939).—A general method for the layout of evaporators is given in a full and in a simplified form. The arrangement is detd. by the physical and chem. properties of the evapd. soln. The conditions for detg. the no. of stills and of the pressure of the steam are described. A no. of examples are given. The information is of value for the layout of multistill evaporators.
W. R. Henn

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

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"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

ca

1

Evaporation and drying. B. V. Florinskii and N. A. Ushakovskii. *Khim. Mashinostroenie* 1949, No. 4-5, 6-9. —A review of developments in the Soviet Union during the last 10 yrs. B. Z. Kamich

COMMON ELEMENTS

COMMON VARIABLES INDEX

MATERIALS INDEX

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

AUTHOR INDEX

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

USHATINSKIY, N. A

Prevention of [illegible] in formation during the evaporation of [illegible]

[illegible]

of such [illegible] crystal centers. The addn. of crystals is necessary when solns. of salts of low soly. [illegible] while with substances of higher soly. none is required. The steam formation zone is [illegible] the heating tubes the velocity is sufficient to keep the solids in suspension and the soln. feed and the product recovery are continuous. Results [illegible] and the [illegible]

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"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

Ushatinskiy, N.S.

USSR/Processes and Equipment for Chemical Industries - Processes and Apparatus for Chemical Technology K-1

Abs Jour : Referat Zhur - Khimiya, No 9, 1957, 33256

Author : Ushatinskiy, N.S., Golub, S.I., Bukshteyn, V.M.
Inst :
Title : Prevention of Scale-Formation During Evaporation of Sodium Sulfate Solutions.

Orig Pub : Khim. prom-st', 1956, No 6, 324-329

Abstract : A method of general applicability in conjunction with crystallizing solutions is proposed for the control of scale formation is evaporation apparatus (EA) which consists in an accumulation of crystals of the scale-forming substance in the circulating solution, with or without a preliminary addition of crystals to establish a greater field of crystallization centers (besides the heating surface). It was found that on evaporation of saturated solutions, containing a definite amount of suspended Na-sulfate, and on

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"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

USSR/Processes and Equipment for Chemical Industries - Processes and Apparatus for Chemical Technology K-1

Abs Jour : Ref Zhur - Khimiya, No 9, 1957, 33256

continuous removal of the finished product, the stoppage of heating tubes with crystals is completely eliminated in the case of a forced circulation apparatus having no salt separator. Tests carried out in an industrial unit have shown that lowering of heat transfer coefficient in the heating chamber, due to scale formation, at a relatively low rate of circulation (1-8-1.9 m/second) was noted after 20 hours of operation, and was decreased not more than by 20-30% after 40 hours. On the basis of the experiments there has been worked out a scheme of a two-hull uniflow EA with automatically adjusting solution level within the separators. The recommended EA has a forced circulation (2-2.5 m/second, in the heating tubes) and an outlying heating chamber.

Card 2/2

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"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

USHATKIN, I.

Efficient utilization of waste from the knit-goods industry.
Prom.koop. no.12:25-26 D '55. (MLRA 9:5)
(Knit Goods) (Cotton waste)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

USHATKIN, I.K.

Lengthening the service life of the loop pickers of looms. Tekst. prom. 23 no.11:69 N '63. (MIRA 17:1)

1. Pomoshchnik master Orekhovskogo khlopchatobumazhnogo kombinata.

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

USHATKIN, I.P., inzh.

Over-all mechanization and automation fo production in the leather industry. Mekh.i avtom.proiz. 14 no.6:57-58 Je '60. (MIRA 13:7)
(Leather industry--Technological innovations)
(Automation)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

LEVITINA, E.M., inzh., USHATKIN, I.P., inzh.

New equipment and advanced technological processes in the
[illegible] industry. Mekh. i avt.pr.inv. 18 no.8:54-[illegible] Ag '[illegible].
(MIRA 17:10)

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"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

[illegible] V.S., [illegible] N.A.

[illegible] 3/[illegible] N '64. [illegible]

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"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

L 33997-66 EWT(d)/EWP(1) IJF(c) BB/GG

ACC NR: AR6017167 SOURCE CODE: UR/0058/65/000/012/A005/A005

AUTHOR: Ushatskaya, G. A.

TITLE: First problems in the programming of the physics course for general engineering departments

SOURCE: Ref. zh. Fizika, Abs. 12A38

REF SOURCE: Sb. Programmir. obuch. v tekhn. vuze. Kiyev, Kiyevsk un-t, 1965, 81-83

TOPIC TAGS: programmed teaching, physics, education

ABSTRACT: Defining the programming a physics course as an aggregate of measures that ensure the best mastery by students of the textbook material on physics within a short time, the author has broken up this subject into a series of individual problems and has proceded to resolve some of them: 1. Rearrangement of the sequence of traditional distribution of the material studied in different sections of the course, unification, and simultaneous study of those physical phenomena which obey identical laws and are described by identical equations. 2. Compilation of a working plan containing the distribution of the material in accord with the types of lessons (lectures, laboratory, practical assignments, etc.). 3. Development of the content and procedure for all types of lessons, and also the equipment necessary for these types of lessons. [Translation of abstract]

SUB CODE: 05, 09

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APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

ACCESSION NR: AR4036350 S/0299/64/000/007/M018/M018

SOURCE: Referativny*y zhurnal. Biologiya, Abs. 7M126

AUTHOR: Gurova, Ye. V.; Shin, N. F.; Mamish, A. M.; Kazakevich, N. P.; Ushatskaya, Z. V.; Barbarash, N. A.

TITLE: A study of the basic processes of the vital activity of transplanted extremities in dogs

CITED SOURCE: Sb. 5-ya Nauchn. konferentsiya. Kemerovsk. med. in-t, Kemerovo, 1963, 11-15

TOPIC TAGS: organ transplant, autotransplantation, homotransplantation, tissue preservation, extremity transplant

TRANSLATION: The basic processes of vital activity were studied in the extremities of dogs at various time intervals after auto-(47) and homotransplantation (30). The extremity was amputated at the middle third of the femur and then joined to the following bone segments with the aid of a metal pin. After autotransplantation, the percent Hb and the number of erythrocytes decreased, whereas the erythrocyte sedimentation rate and the number of leukocytes increased.

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ACCESSION NR: AR4036350

Sensory-motor functions in the transplanted extremity were restored in the course of several years. The extremity of the dog started to function 2-3 months after the operation; after 6 months, the support on the rear area of the foot was replaced by support on the sole of the foot. After homotransplantation, the increasing activity of the tissues of the transplanted extremity did not prevent its death; in response to the introduction of the products of the vital activity of the homotransplant into the host's body, there was an increased production of antibodies. N. S.

DATE ACQ: 17Apr64 SUB CODE: LS ENCL: 00

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"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

[illegible]-65 [illegible]/009/M017/M017

7

AUTHOR: Ushatskaya, Z. V.

TITLE: A comparison of indices for excitability and stain sorption of replanted extremity [illegible] later accretion periods

CITED SOURCE: Sb. 3 Vses. konferentsiya po peresadke tkaney i organov, 1963. Yerevan, [illegible]

TOPIC TAGS: dog, replanta[illegible], excitability, [illegible] sorption, accretion, [illegible]

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"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

USHATSKIY, V. N.

Absorption spectra of aqueous solutions of quadrivalent uranium salts in the visible region. V. N. Ushatskii and Yu. M. Tolmachev. *Trudy Radiievogo Inst. im. V. G. Khlopina, Khim. i Geokhim.* 7, 92-7(1956); cf. preceding abstr.—The absorption spectra of aq. solns. (0.0001-0.73 mole/l.) of UCl_4, UBr_4, $U(SO_4)_2$, and $(NH_4)_4U(C_2O_4)_4$ consist of up to 10 bands for every salt. The max. of the bands were measured; a half-width of 120-200 A. was found for two symmetrical peaks. A hypothesis as to the nature of the carriers of absorption has been arrived at by comparing the absorption spectra of solid quadrivalent U salts and their aq. solns.; the absorption peaks shift somewhat with the concn. of the soln. The carrier of absorption appears to be the U^{++} ion in the case of aq. solns. of the U^{++}-A type, while the $[U(C_2O_4)_3(H_2O)_2]^{--}$ ion is apparently the carrier of absorption in the case of $(NH_4)_4[U(C_2O_4)_4]$ solns. A. K.

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"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

USHATSKIY, V. N.

7

4

The photochemical oxidation reaction of quadrivalent uranium. V. N. Ushatskii and Yu. M. Tolmachev. *Trudy Radiatsiye Inst. im. V. G. Khlopina, Khim. i Geokhim.* 7, 98-102(1956).—Investigation of photochem. oxidation of U(IV) salt soln. indicates, that in simple salts, of type $U^{4+}A$ (A-anion) rapidity of oxidation with O to UO_2^{++} was greater when solns. were illuminated. The salts of U^{4+} are also oxidized well in darkness. Pure photochem. reaction of oxidation of U^{4+} ion to UO_2^{++} ion was investigated. What occurs is oxidation of complex salt $(NH_4)_4[U(C_2O_4)_4]$ where ion U^{4+} is part of ion $[U(C_2O_4)_4]^{4-}$. This salt was obtained by dissolving $U(C_2O_4)_2$ in soln. of $(NH_4)_2C_2O_4$. With oxidation of U^{4+} ion some quantity of C_2O_4 ions are oxidized also. Faster O oxidation of simple salts soln. of type U^{4+}-A (without acid) probably depends on activation energy of reaction $U^{4+} + O_2 \rightarrow UO_2^{++}$. Stimulated by light hydrated ion of U^{4+} in contact with O mol. forms UO_2^{++}, according to scheme: $U^{4+} + h_\nu \rightarrow (U^{4+})^*$, $(U^{4+})^* + O_2 \rightarrow UO_2^{++}$.

C. Melnyk

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

AUTHORS: Protopopov, A. N., Tolmachev, G. M., Ushatskiy, V. N., Venediktova, R. V., Krisyuk, I. I., Rodionova, L. P., Yakovleva, G. V.

SOV/89-5-2-5/36

TITLE: Distribution of the Mass of Fission Fragments Resulting From the Fission of U^{235}, U^{238} and Pu^{239} Induced by 14,6 MeV Neutrons (Raspredeleniye oskolkov po massam pri delenii U^{235}, U^{238}, Pu^{239} neytronami s energiiyey 14,6 Mev)

PERIODICAL: Atomnaya energiya, 1958, Vol. 5, Nr 2, pp. 130-134 (USSR)

ABSTRACT: The reaction $H^3(d,n)He^4$ served as a neutron source, the deuterons being accelerated up to 170 kV. Irradiation of the nuclei to be fissioned took place by means of a medium neutron flux of $5 \cdot 10^8$ n/cm^2.sec. Irradiation lasted from some minutes up to 8 hours. Separation of the fission products was carried out by the method of isotopic dilution. The separated elements were brought into anhydrous or non-hygroscopic compounds the absolute β-activity of which was measured with respect to the saturation activity of Mo^{99}. The following relative yields were measured:

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Distribution of the Mass of Fission Fragments Resulting From the Fission of U^{235}, U^{238} and Pu^{239} Induced by 14,6 MeV Neutrons

SOV/89-5-2-5/36

	U^{235}	U^{238}	Pu^{239}
Sr^{89}	0,86±0,04	0,55±0,03	0,44±0,02
Sr^{91}	0,96±0,07	0,65±0,05	0,49±0,03
Zr^{95}	0,97±0,04	0,93±0,04	-
Zr^{97}	1,16±0,05	1,02±0,05	0,96±0,04
Mo^{90}	1	1	1
Mo^{101}	-	0,99±0,04	-
Mo^{102}	-	0,71±0,08	-
Ru^{105}	0,28±0,02	0,39±0,03	-
Ag^{111}	0,22±0,01	0,18±0,01	0,34±0,02
Ag^{113}	0,22±0,02	0,16±0,01	-

Card 2/3

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"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

Distribution of the Mass of Fission Fragments Resulting From the Fission of U^{235}, U^{238} and Pu^{239} Induced by 14,6 MeV Neutrons

SOV/89-5-2-5/36

	U^{235}	U^{238}	Pu^{239}
Cd^{115}	0,21±0,01	0,16±0,01	0,28±0,02
I^{131}	0,83±0,05	0,91±0,05	-
Ba^{140}	0,86±0,04	0,80±0,04	0,64±0,03

The half-life of Mo^{99} was measured separately: $T_{1/2}$= 67,2±0,2 h. There are 3 figures, 1 table, and 16 references, 3 of which are Soviet.

SUBMITTED: September 12, 1958

Card 3/3

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

Ushatskiy, V. N.

21(8) SOV/89-6-5-18/33

AUTHORS: Bak, M. A., Bugorkov, S. S., Il'inskaya, T. A., Petrov, Yu. G., Petrzhak, K. A., Selatsev, V. M., Serokina, A. V., Ushatskiy, V. N.

TITLE: The Yield of Ru^{103} and Ru^{106} in the Fission of U^{235} and Pu^{239} by Fast Neutrons (Vykhody Ru^{103} i Ru^{106} pri deleniii U^{235} i Pu^{239} bystrymi neytronami)

PERIODICAL: Atomnaya energiya, 1959, Vol 6, Nr 5, pp 577-578 (USSR)

ABSTRACT: The yields of Ru^{103} and Ru^{106} were determined by means of a relative measurement with respect to the Mo^{99}-yield. Uranium oxide (U^{235}-enrichment >90 %) and plutonium oxide were pressed in aluminum caskets. The latter were surrounded by a 1 mm thick Cd-sheet, and the whole was packed in a firmly closed aluminum cylinder. The cavities are filled with boron carbide (all-round thickness at least 2 cm). Two samples were made from uranium and 4 from plutonium, and were irradiated for 52.2 hours in a water-filled beam tube of the heavy-water reactor of the AN SSSR (AS USSR). The neutron spectrum is characterized by the ratio

Card 1/3

The Yield of Ru^{103} and Ru^{106} in the Fission of U^{235} and Pu^{239} by Fast Neutrons SOV/89-6-5-18/33

E_n > 1.5 Mev : E_n > 2.5 Mev = 4.0 ± 1.5. From the irradiated samples Ru and Mo was chemically separated, after which thin β-preparations (thickness < 20 mg/cm^2) were produced on an organic foil; their activity was measured by means of a 4π-counter. An aluminum filter of 3 mg/cm^2 thickness is attached, so that only the β-rays of Ru^{103} and Ru^{106} reach the counter. Determination of the absolute activity of Ru^{103} and Ru^{106} was carried out by means of further filtering and recording the absorption curves of these radiating bodies with the same numbers. The momentum values measured make it possible, from 2 equations with 2 unknown ratios to calculate the latter. Herefrom it is possible to calculate the absolute fractions. From the latter and from the measured absolute Mo^{99}-β-activity (which will be dealt with by a publication in the near future) it was possible to calculate the following yields:

Card 2/3

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"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

The Yield of Ru^{103} and Ru^{106} in the Fission of U^{235} and Pu^{239} by Fast Neutrons SOV/89-6-5-18/33

	Ru^{103}	Ru^{106}
$Pu^{239}(n,f)$	5.7 ± 1.0 %	4.6 ± 0.8 %
$U^{235}(n,f)$	3.2 ± 0.6 %	0.71 ± 0.12 %

There are 1 figure, 1 table, and 1 Soviet reference.

SUBMITTED: December 22, 1958

Card 3/3

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

PETRZHAK, K.A.; TOLMACHEV, G.M.; USHATSKIY, V.N.; BAK, M.A.; BLINOVA, N.I.; BUGORKOV, S.S.; MOSKAL'KOVA, E.A.; OSIPOVA, V.V.; PETROV, Yu.G.; SOROKINA, A.V.; CHERNYSHEVA, L.P.; SHIRYAYEVA, L.V.

[Yields of certain fragments in U^{235}, U^{238}, and Pu^{239} fission by neutrons] Vykhody nekotorykh oskolkov pri delenii U^{235}, U^{238} i Pu^{239} neitronami deleniia. Moskva, Glav. upr. po ispol'zovaniiu atomnoi energii, 1960. 14 p. (MIRA 17:2)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

BONYUSHKIN, Ye.K.; ZAMYATNIN, Yu.S.; KIRIN, I.S.; MARTYNOV, N.P.; SKVORTSOV, Ye.A.; USHATSKIY, V.N.;

[Yields of fragments of U^{235} and U^{238} fission by fast neutrons] Vykhody oskolkov deleniia U^{235} i U^{238} bystrymi neitronami. Moskva, Glav. upr. po ispol'zovaniiu atomnoi energii, 1960. 19 p. (MIRA 17:3)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

32986

S/641/61/000/000/013/033
B104/B102

24.6600

AUTHORS: Petrzhak, K. A., Tolmachev, G. M., Ushatskiy, V. N., [illegible] M. A., Blinova, N. I., Bugorkov, S. S., Moskal'kova, E. [illegible], Osipova, V. B., Petrov, Yu. G., Sorokina, A. V., Chernysheva, L. P., Shiryayeva, L. B.

TITLE: Yields of some fragments in the fission of U^{235}, U^{238}, and Pu^{239} by fission neutrons

SOURCE: Krupchitskiy, P. A., ed. Neytronnaya fizika; sbornik statey. Moscow, 1961, 217-223

TEXT: The authors determined the yield of Sr^{89}, Zr^{95}, Mo^{99}, Ag^{111}, Cd^{115}, and Ba^{140} in the fission of U^{235}, U^{238}, and Pu^{239} by fission neutrons. A U^{235}-enriched uranium plate arranged in the thermal column of a heavy-water reactor of the AS USSR served as neutron source. 300-mg tablets and 1 μg targets were produced from each substance to be fissioned. The fission events were recorded in a fission chamber during the entire irradiation period (Fig. 1). The fission fragment yields were determined from their

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Yields of some fragments in ...

β-activity. The absolute β-activity was measured by two standard instruments with end-window counters. These standard instruments were calibrated with preparations of the fission fragments to be studied which had been applied to a collodium film. The absolute β-activity of the standard preparations was determined either with a 4π-counter or with an end-window counter having a window thickness of 0.005 ± 0.001 mg/cm². Six to eight measurements were made in three to four tablets (Fig. 3). The determination error of the fragment yield was between 6 and 11%. The fragment yield is found to depend on the isotope mass number. There are 3 figures, 3 tables, and 7 references: 3 Soviet and 4 non-Soviet. The four references to English-language publications read as follows: Engelkemeir, D., Novey T., Schover D. Radiochemical Studies. The Fission Products. Book 3, div. IV, vol. 9, 1334 (1951); Radiochemical Studies. The Fission Products. Book 3, div. IV, vol. 9, Appendix B, 2003 (1951); Keller R., Steinberg E., Glendenin L., Phys. Rev., 94, 4, 969 (1954); Turkevich A., Niday J., Phys. Rev., 84, 1, 52, (1951).

Card 2/12

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

USHATSKIY, V.N.

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24.6600

AUTHORS: Bonyushkin, Ye. K., Zamyatin, Yu. S., Firin, I. S., Martynov, M. P., Skvortsov, Ye. A., Ushatskiy, V. N.

TITLE: Fragment yields of fast neutron fission of U^{235} and U^{238}

SOURCE: Krupchitskiy, P. A., ed. Neytronnaya fizika; sbornik statey. Moscow, 1961, 224-234

TEXT: Results of fragment yield measurements carried out in 1953-1955 are dealt with. U^{235} and U^{238} were fissioned by 14.5-Mev neutrons and fission neutrons. The relative fragment yield with respect to the Mo^{99} yield and the absolute yield in Mo^{99} were determined. Pressed 10-50 g U_3O_8 tablets were put into a hermetically sealed container. A U^{235} multiplication system without a moderator, and a converter which transformed thermal neutrons into fission neutrons were used as fission neutron sources. The specimen was bombarded by an integral neutron flux of $2 \cdot 10^{13}$. A tritium-saturated zirconium target which was bombarded with

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Fragment yields of fast ..

150-kev protons served as 14.5-Mev neutron source. The integral neutron flux onto the specimen was $2 \cdot 10^{14}$. The irradiation time was 6 to 10 hrs. The fission fragments were separated from the irradiated samples by isotope dilution. The fragment yields were determined from their β-activity by end-window counters with a ~5-20 μ thick mica window having a diameter of 20 mm. The results are summarized in Table 2. The relative probability of a symmetrical fission largely depends on the excitation energy of the compound. For U^{235} the ratio r between the fragment yield of a symmetrical fission and the maximum yield increases from 0.00[illegible] in thermal-neutron fission to 0.0052 in fission induced by fission neutrons and to 0.2 in the fission with 14.5-Mev neutrons. An increase in excitation energy of the compound nucleus to 14.5 Mev increases the relative probability of a symmetrical fission by a factor of 1.5. The variation of r for U^{239}, U^{236}, U^{234}, and Pu^{239} is studied as a function of Z^2/A. The distribution of the fragment yields of these isotopes as a function of A of the fragments is asymmetric. The authors thank A. A. Malirkin, M. I. Pevzner, L. B. Poretskiy and Ye. I. Sirotinin for irradiating the uranium samples with neutrons, V. V. Spektor and L. S. Andreyeva for help in the measurements, V. N. Zapyatrina, A. A. [illegible]thenko, Ye. P.

Card 2/4 3

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

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Fragment yields of fast ...

Krasheninnikova, V. R. Negina, N. V. Shuvanova, S. Ye. Sanina and M. A. Kozyreva for the radiochemical separation. A. N. Protopopov (Atomnaya energiya, 5, vyp. 2, 1958) is mentioned. There are 6 figures, 2 tables, and 19 references: 5 Soviet and 14 non-Soviet. The four most recent references to English-language publications read as follows: Fong P., Phys. Rev., 102, 434 (1956); Katcoff S., Nucleonics, 16, 4 (1958); Bunney L. R., Scadden E. M., Abriam J., Ballou N. O., report no. 643, held at the Second International Conference on the Peaceful Uses of Atomic Energy, Geneva, 1958; Hemmendinger A., report no. 663, held at the Second International Conference on the Peaceful Uses of Atomic Energy, Geneva, 1958.

Table 2. Total fragment yield, %.
Legend: (1) isotope, (2) fission spectrum, (3) 14.5 Mev.

Card 3/4

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

APOLLONOVA, A.N.; KRISYUK, I.T.; USHATSKIY, V.N.

Partial fission yields of isobars with A=138. Radiokhimiia 4 no.6:711-714 '62. (MIRA 16:1)
(Uranium—Isotopes) (Fission products)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

VEKSLER, Ya.I., kand. med. nauk; USHAYEVA, I.I.; RADYUK, L.I.; SHEYNGERTS, A.R., kand. med. nauk

Characteristics of the course of alloxan diabetes in animals injured by penetrating radiation. Probl. endok. i gorm. 9 no.3:40-43 My-Je '63. (MIRA 17:1)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

[illegible], [illegible], Prof. [illegible], [illegible],
USHCHAIOVSKIY, P.I.

Fetus - Diseases

Mechanism of development of intracraneal hemorrhages in the fetus. Akush. i gin. no. 4, 1952.

Monthly List of Russian Accessions. Library of Congress. November 1952 UNCLASSIFIED

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

KEYLIN, S. L., Prof.; STEGAYLO, E. A., Docent; USHCHALOVSKIY, P. I.

Fetus - Diseases

Mechanism of development of intracraneal hemorrhages in the fetus. Akush. i gin., No. 4, 1952.

Monthly List of Russian Accessions. Library of Congress. October, 1952. UNCLASSIFIED

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

KEYLIN, S. L.; STEGAYLO, E. A.; USHCHAPOVSKIY, P. I.

Mbr., Department of Pathological Anatomy, Kirghizistan Medical Institute

"Mechanism of the development of intracraneal hemorrhages in the fetus," Akush. i gin. no. 4:52-57 Jl-Ag 1952

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

USHCHAPOVSKIY, P

TISHCHENKO, I., polkovnik; KAZARYAN, A., general-mayor; YEVSIKOV, V., podpolkovnik; USHCHAPOVSKIY, P., mayor.

Command training for officers. Voen. vest. 37 no.4:56-60 Ap '58. (MIRA 11:4)

(Russia--Army--Officers)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

USHCHAPOVSKIY, P.

Device for line electricians. Radio no.3:48-49 Mr '63.
(MIRA 16:2)

(Electric meters) (Electric measurements)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

USHCHAPOVSKIY, P., prepodavatel'

Model of a superheterodyne receiver. Prof.-tekh. [illegible] (MIRA 18:4)
30 Ja '65.

1. Professional'no-tekhnicheskoye uchilishche No.8, Korosten', Zhitomirskoy oblasti.

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

USHCHAPOVSKIY, P.

Automatic device for triggering signals. Radio no.3:44-45 Mr '65. (MIRA 18:6)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

USHCHAPOVSKIY, P.

"Korosten'" testing machine. Radio no.11:52-54 N '65. (MIRA 18:12)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

USHCHATINSKAYA, R. S.

672 Biologicheskiye osnovy ispol'zovaniya nizkikh temperature v bor'be s ureditelyami zernovykh zapasou. (Nasekomyye i kleshchi) M., Izd-vo Alad, nauk SSSR. 1954 88 s. s graf. 22 sm. (Akad. nauk SSSR.Init morfologii zhivornykh im. A.N.Severtsova). 5.000 ekz. 3r. 50k. - bibliogr.s. 84-87. - (54-54314)p 632.2/7: 631.531.16 +(016.3)

SO: Knizhnaya Letopis, Vol 1, 1955

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

L 63979-65 EWT(m)/EWP(b)/T/EWA(d)/EWP(w)/EWP(t) IJP(c) EM/JD UR/0149/65/000/001/0132/0135

ACCESSION NR: AP5013073

AUTHOR: Chernyavskaya, S. G.; Velichkin, A. S.; Kachaylova, O. A.; Kedrin, I. D.; Nichushkin, V. V.; Ushchenko, V. G.

TITLE: Use of audio frequency vibrations for aging aluminum alloys

SOURCE: IVUZ. Tsvetnaya metallurgiya, no. 1, 1965, 132-135

TOPIC TAGS: mechanical testing, fatigue testing, aluminum alloy

ABSTRACT: The effect of audio frequency vibrations on aging of aluminum alloys was studied. The results indicate that this method may be used to determine the mechanical properties of alloys in close agreement with data obtained in industry. A considerably shorter time is required than when using presently accepted methods. The tests were made on 4 aluminum alloys (see table 1 of the Enclosure). The samples were heat-treated in salt baths, quenched in water and immediately placed in electrical vibrators with a frequency of 60-2000 cps, or mechanical vibrators of 7-47 cps for 4 hours. The vibration amplitude for most tests was 1 mm, in some cases 2-3 mm. Specimen No. 1 was 55 mm long, 12 mm diameter; the other 3 were 110 mm long, 18 mm diameter. All specimens were tested for hardness before and after

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ACCESSION NR: AP5013073

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the vibration cycle. The schematic diagram of the electrical vibrator and a picture of the mechanical vibrator are shown. The test results are represented in 3 graphs: yield stress vs. vibration frequency; ultimate strength vs. frequency; yield stress vs. vibration amplitude. For comparison on each graph are given also values of the corresponding mechanical properties of each alloy as required by specifications and as determined from tests when the specimens were subjected to artificial aging. The audio frequency method gave nearly equivalent fatigue test results in $1/2$ to $1/4$ the time required when artificial aging is used and $1/30$ of that for natural aging. Numerical values of the yield stresses as determined by the authors are compared in a table with values required by specifications. Orig. art. has: 5 figures, 2 tables.

ASSOCIATION: Fiziko-tekhnicheskiy fakul'tet, Dnepropetrovskiy gosudarstvennyy universitet (Dnepropetrovsk State University) 44,55

SUBMITTED: 02Jul63 ENCL: 01 SUB CODE: MM

NO REF SOV: 006 OTHER: 000

Card 2/3

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

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ACCESSION NR: AP5013073 ENCLOSURE: 01

TABLE 1

Alloy grade	Basic components, %				Impurities, %					
	Cu	Mn	Mg	Si	Fe	Si	Zn	Ni	other	Total impurities
AL4	-	0.25-0.5	0.17-0.3	8.0-10.5	0.6	-	0.3	-	0.3 Cu	1.2
AK6	1.8-2.6	0.4-1.0	0.4-0.8	0.7-1.2	0.7	-	0.3	0.1	0.01 Sn	1.1
AK8	3.9-4.8	0.4-1.0	0.4-0.8	0.6-1.2	0.7	-	0.3	0.1	0.7(Fe+Ni)	1.2
D16	3.8-4.9	0.3-0.9	1.2-1.8	-	0.5	0.5	0.3	0.1	0.5(Fe+Ni)	1.5

Card3/3

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

CHERNYAVSKAYA, S.G.; VELICHKIN, A.S.; KACHAYLOVA, O.A.; KEDRIN, I.D.; NICHUSHKIN, V.V.; USHCHENKO, V.V.

Using sound frequency waves for the realization of aging processes in aluminum alloys. Izv. vys. ucheb. zav.; tsvet. met. 8 no.1:132-135 '65. (MIRA 18:6)

1. Dnepropetrovskiy gosudarstvennyy universitet, fiziko-tekhnicheskiy fakul'tet.

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

USHCHAPENKO, Z. I.

431

Proizuodstuo dereuyannykh igrushek. Iz opyta orteli ((Muzprom)) (g. Leningrad). M, KOIZ, 1954. 64 s. sill. 22 sm. 5.000 ek. 2 r. 85k. -(54-55542) p 674.56

SO: Knizhanaya, Letopis, Vol. 1, 1955

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

USHENIN, G.S.

Practice of making canned food of many grades should be discontinied as soon as possible. Kons.i ov.prom. 16 no.5:36 My '61. (MIRA 14:5)

1. Gor'kovskoye oblastnoye upravleniye mestnoy promyshlennosti. (Food, Canned)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

POPOV, Viktor Stepanovich; MANSUROV, Nikolay Nikolayevich; NIKOLAYEV, Sergey Aleksandrovich; USHENIN, V.A., redaktor; KONYASHINA, A.D., tekhnicheskiy redaktor

[Electric engineering] Elektrotekhnika. Izd. 5-oe, ispr. Moskva, Gos. izd-vo, 1956. 350 p. (MLRA 9:11)
(Electric engineering)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

[illegible], [illegible]., [illegible]

Inhibiting [illegible]
Uch. zap. [illegible] (MIRA 18:8)

1. Laboratoriya [illegible] [illegible]skogo
veterinarnogo instituta.

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

USHENINA, N.M.; STEPANOV, N.D.

Observation on soil moisture. Meteor. i gidrol. no.8:43 Ag '64 (MIRA 17:8)

1. Ural'skoye upravleniye gidrometeorologicheskoy sluzhby.

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TSEKHANSKIY, R.S.; ZOBOVA, N.N.; USHENINA, V.F.

Mechanism of the effect of alkaline sulfur solutions on nitro derivatives of toluene and diphenylmethane. Izv.vys.ucheb.zav.; khim.i khim.tekh. 4 no 6:985-987 '61. (MIRA 15:3)

1. Chuvashskiy pedagogicheskiy institut imeni Yakovleva, kafedra khimii.
(Alkali metal sulfides) (Toluene) (Methane)

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Derivatives of 2-phenylbenzothiazole analogs of cyanine dyes. A. I. Kiprianov, I. K. Ushenko, and A. L. Gershun.

J. Gen. Chem. (U.S.S.R.) 14, 865-80(1944)(English summary).—2-Mercaptobenzothiazole (250 g.) stirred with 540 cc. concd. NaOH (d. 1.42) in an autoclave at 200-5° for 4 hrs., cooled, filtered, and neutralized, yielded 50% *o-aminothiophenol* (I), b_3 125-7°. I (5 g.) and 3 g. homoterephthalic acid heated in a sealed tube to 200° for 15 hrs. yielded 17% *p,o-di-2-benzothiazolyltoluene*, m. 139-41° (from EtOH); *bis(Et p-toluenesulfonate)*, obtained by heating with *p*-$MeC_6H_4SO_3Et$, forms in water with NaOH a blue-black ppt., which in EtOH with satd. KI soln. gives bluish black crystals of *2-[o-(3-ethyl-2,3-dihydro-2-benzothiazolylidene)-p-tolyl]benzothiazole ethiodide* (II), m. 194° (from EtOH), absorption max. at 530 mμ. Similarly, homophthalic acid and I gave *o,o-di-2-benzothiazolyltoluene*, m. 184° (from EtOH); attempts to form quaternary salts with MeI and *p*-$MeC_6H_4SO_3Me$ were unsuccessful. Homoisophthalic acid and I gave *m,o-di-2-benzothiazolyltoluene*, m. 123-3° (from EtOH); *Et p-toluenesulfonate quaternary salt*, formed on heating to 125-35° for 12 hrs., gave in water with NaOH a brown ppt., which in abs. EtOH with satd. KI soln. yielded the bright red *m-isomer* of II, m. 146-7°. $(p\text{-}H_2NC_6H_4)_2CH_2$ and I gave at 270-80° 52% *bis(p-2-benzothiazolylphenyl)methane*, m. 210-11° (from pyridine-EtOH); the *Me p-toluenesulfonate quaternary salt*, formed at 140-5°, failed to give a ppt. or pigmentation on treatment with alkali in water; treatment in water with KI gave a yellowish *methiodide*, m. 166-8°, which was low in iodine. Terephthalic acid and I gave, after 25 hrs. at 250°, *p-di-2-benzothiazolylbenzene*, m. 245-50° (from pyridine); *Me p-toluenesulfonate quaternary salt* in water with KI soln. gave the *dimethiodide*, m. 250° (from EtOH), as an orange solid. The corresponding *m-isomer*, m. 155-6°, was prepd. from isophthalic acid; *dimethiodide*, m. 203-4° (from water), yellow needles. *o-Isomer*, prepd. as above from $C_6H_4(CO)_2O$, m. 102-5°; *bis(Me p-toluenesulfonate)*; *dimethiodide*, m. 185-7°. Dehydrothiotoluidine (III) (5 g.) diazotized in HCl and treated with 3.2 g. KI in 10 cc. water yielded 54% *6-methyl-2-(p-iodophenyl)benzothiazole*, m. 151-2° (from EtOH); *methiodide*, m. 201°; *ethiodide*, m. 181-2°. The above methiodide condensed with 2-methylbenzothiazole-EtI (IV) in abs. EtOH with addn. of EtOH-KOH, gave a small amt. of a colored product with an absorption max. at 564 mμ, and an absorption curve similar to that of 3,3'-diethyl-9-phenylthiocarbocyanine. A similarly small yield of a colored product was obtained on condensation with quinaldine-EtI. III (5 g.) was diazotized and treated with 8 g. NaOAc, then with 4 g. K xanthate in EtOH and 8 g. KOH, and boiled for 3 hrs.; after this, the solvent was removed and the residue treated with Me_2SO_4 to yield 3 g. *6-methyl-2-(p-methylmercaptophenyl)benzothiazole*, m. 192° (from EtOH); *methiodide*, m. 192°; the latter with IV gave a colored product, m. 225°, with an absorption max. of 564°. Diazotized III with KCN-CuCN gave a crude CN deriv., converted by EtI into the *ethiodide*, m. 173-4° (from EtOH), yellow plates, which condensed with IV analogously to the above compds. *2-p-Tolylbenzothiazole*, prepd. by condensation of I with *p*-toluic acid at 180° for 3.5 hrs., m. 80°; this was converted into the *Et p-toluenesulfonate quaternary salt* which on boiling in pyridine with *p*-$Me_2NC_6H_4CHO$, followed by addn. of satd. KI soln., gave *2-[p-(p-dimethylaminostyryl)phenyl]benzothiazole-EtI*, m. 216° (from EtOH), having an absorption max. at 530 mμ. 2-Methylbenzothiazole-MeBr

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5 g.) and 2.8 g. *p*-tolualdehyde heated in pyridine for hrs. gave *2-(p-methylstyryl)benzothiazole-EtBr*, m. 248° (from EtOH), lemon-yellow needles. This salt does not condense with $Me_2NC_6H_4CHO$ nor with $HC(OEt)_3$. The products formed from homoterephthalic and homoisophthalic acids may be considered to be analogs of cyanine dyes in which the polymethylene chromophore was partially substituted by the benzene ring. The intensity and the depth of color in these compds. is considerably less than in the corresponding thiocyanines, probably due to the disturbance of the equivalence of the polar structures existing in resonant condition. G. M. Kosolapoff

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PROCESSES AND PROPERTIES INDEX

Color and structure of cyanine dyes. I. Thiocarbocyanines with electropositive substituents. A. I. Kiprianov, I. K. Ushenko, and E. D. Sych (Acad. Sci. U.S.S.R.—Moscow). *J. Gen. Chem.* (U.S.S.R.) 15, 200-6(1945)(English summary); cf. *C.A.* 38, 1427[9].—Electropositive substituents introduced symmetrically into the 6,6'-positions of thiocarbocyanine form by their bathochromic activity a series which corresponds to the mobility of their electron pairs. Acylation of the phenol or the amino group displaces the absorption max. to a shorter-wave region. Action of alc. alkali on benzoylamino and *p*-toluenesulfamido deriva. of thiocarbocyanine deepens the color; the second example gives 6 times greater effect than the first. The bathochromic action of pos. substituents can be explained by the formation of resonant structures with a neg. charge on the C atoms of the polymethine chain. *p*-Acetanisidine (190 g.) was treated with 111 g. P_2S_5 in 500 cc. PhMe to yield 42% *thioacetanisidine*, m. 116-10°; 67 g. of this, in 1200 cc. *N* NaOH, was added dropwise with stirring to a cooled soln. of 321 g. $K_3Fe(CN)_6$ in 800 cc. water at 8-10°; after stirring for 1 hr. the mixt. was filtered and the ppt. washed with water; after soln. in benzene, the product was dried by azeotropic distn. of the solvent, and distd. in vacuo to yield 38% *2-methyl-6-methoxybenzothiazole*, b_{10} 154-65°. Heating 10 g. of the base with 11 g. Et *p*-toluenesulfonate for 6 hrs. at 130-40° gave 19.7 g. of the *quaternary compd.* as a red-brown, water-sol. solid mass. Heating with concd. HCl (18 hrs. at 150-60°) or concd. HBr (6 hrs. at 120-30°) gave *2-methyl-6-hydroxybenzothiazole hydrochloride*, m. 233-5° (decompn.) (isolated as dihydrate). *HBr salt*, m. 274-8°. 2-Methyl-6-nitrobenzothiazole (27 g.) in 150 cc. concd. HCl was heated on a steam bath, reduced with 34 g. Sn, and treated with an excess of 15% NaOH; extn. of the dried ppt. with hot MePh gave 70% of *2-methyl-6-aminobenzothiazole*, m. 123-(m. 125-6° from EtOH). Diazotization of 32.4 g. of this, treatment of the diazo soln. at 0° with 37.5 g. K xanthate with stirring, heating to 60-5° for 1 hr., taking up the sepd. oil in PhMe, evapn. of the solvent *in vacuo*, boiling the residue with 35 g. KOH in 150 cc. EtOH for 2.5 hrs., removal of EtOH, cooling, neutralization by HCl, and extn. with Et_2O gave 30% of *2-methyl-6-mercaptobenzothiazole*, b_{10} 169-9°, m. 48°. The success of prepn. depends on uninterrupted operations; the product oxidizes readily in the air. The following quaternary salts were prepd.: *Et p-toluenesulfonate* (by heating with the ester for 2.5 hrs. at 120-30°) (no consts. given); *ethiodide* (by addn. of KI to aq. soln. of above salt) (no cons. given); *methiodide* (by addn. of KI to aq. soln. of the dimethyl sulfate quaternary salt), m. 212° (from EtOH). *2-Methyl-6-iodobenzothiazole*, m. 141-2°, was prepd. by diazotizing 2.5 g. of the amino deriv., treating with 4 g. KI, letting stand overnight, heating on a steam bath, making the mixt. alk., distg. the product under 3 mm., and recrystg. from C_6H_6; heating with Et *p*-toluenesulfonate at 120-30° for 4 hrs., at 150° for 1 hr. gave the *quaternary salt*; the aq. soln. of this treated with KI gave the *ethiodide*, m. 227°. The following dyes were prepared: *Bis(3-ethyl-6-methoxy-2-benzothiazole)trimethinecyanine iodide*, $C_{21}H_{21}IN_2O_2S_2 \cdot 2H_2O$, m. 276°. (I), 3 g. 3-ethyl-2-methyl-6-methoxybenzothiazole *p*-toluenesulfonate and 3 g. orthoformic ester in 10 cc. pyridine were

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heated to boiling for 25 min., evapd. to 1/3 vol. and 68°, was prepd. by treating 20 g. 2-methylbenzothiazole
treated with dil. EtOH, convert to the iodide by means of with 60 g. chlorosulfonic acid with cooling and stirring,
KI, and recrystallize from EtOH. I (2.7 g.) was heated heating for 4 hrs., to 140-45°, pouring onto ice water and
in a sealed tube with 5 g. concd. HBr at 120-30° for 5 benzene, sepg. the benzene soln., and freeing of solvent.
hrs., dild. with water, excess HBr neutralized by NH_4OH, yield 54%; treatment with NH_3 gave the corresponding
and the cryst. dye transformed into the iodide by heating *amide*, m. 184-5°; boiling with water gave the cor-
with aq. KI; after 4 crystns. from EtOH there was ob- responding *sulfonic acid*, m. 295°. The sulfonic acid was
tained 21% of *bis(3-ethyl-6-hydroxy-2-benzothiazole)tri-* converted into the *quaternary salt* by heating with Et *p*-
methinecyanine iodide, $C_{21}H_{19}IN_2O_2S_2.4H_2O$ (II), m. 294° toluenesulfonate for 12 hrs. at 145-50°. The following
Bis(3-ethyl-6-acetoxy-2-benzothiazole)trimethinecyanine *esters* were prepd. by heating the sulfonyl chloride with
iodide, m. 256°, was prepd. by heating II with Ac_2O. corresponding alc.: *Me*, m. 43° (from PhMe), *Et*, m.
action of alkali in EtOH even in the cold leads to hydrolysis 50° (from EtOH), *Ph*, m. 124-5° (from EtOH); treat-
of the Ac groups and the soln. changes from violet to blue. ment of the chloride with Et_2NH gave the corresponding
Bis-(3-ethyl-6-mercapto-2-benzothiazole)trimethinecyanine *diethylamide*, water-sol. brown mass which was not puri-
p-toluenesulfonate, by heating 1 g. 3-ethyl-2-methyl-6- fied further; treatment of the chloride with $PhNH_2$ gave
mercaptobenzothiazole *p*-toluenesulfonate and 1 g. ortho- the *anilide*, m. 158° (from EtOH); 1-naphthylamine gave
formic ester in 10 cc. pyridine for 25 min., cooling, washing the *naphthylamide*, m. 184-8° (from EtOH). 2-Methyl-
the ppt. with Et_2O, water, and EtOH gave 76% of a prod- 6-aminobenzothiazole was diazotized, and the soln. was
uct whose analysis corresponded to $C_{31}H_{28}N_2O_3S_3$, but added to soln. of 16.6 g. $CuSO_4$ and 13.2 g. KCN in 100
which was apparently an oxidation product and did not cc. water, heated on a steam bath for 1 hr., neutralized,
have free SH groups; treatment with alkali in EtOH and the ppt. washed with water, and dried to give 2-
failed to change the position of absorption max. (580 *methyl-6-cyanobenzothiazole*, m. 135° (from PhMe). The
nm); however, on addn. to alk. alc. soln. of small amts. cyano deriv. (1.5 g.) was heated in a sealed tube with 3.5
of hyposulfite the violet color changes to green-blue, max. g. concd. HCl for 6 hrs. at 135-40°, the mixt. dissolved in
605 mμ; when the soln. stands in air, the max. slowly dil. NaOH, filtered, and pptd. by HCl to yield 79% 2-
returns to 580 mμ. II. **Thiocarbocyanines with electro-negative substituents.** A. I. Kiprianov and I. K. Ushenko *methyl-6-carboxybenzothiazole*, m. 239-40° (from EtOH);
(Acad. Sci. U.S.S.R., Moscow). *Ibid.* 207-14 (English *Et ester*, m. 72°, prepd. by satn. of EtOH soln. of the acid
summary).—Thirteen new sym. thiocarbocyanines with dry HCl, was treated in EtOH soln. to satn. with
electroneg. substituents in 6,6'-positions were prepd.m. 181-2° (from EtOH). The following dyes were
All are colored more deeply than the unsubstituted thio- prepd.: *Bis(3-ethyl-6-sulfo-2-benzothiazole)-trimethine-*
carbocyanine; the NO_2 group has the greatest effect; *cyanine:* from the quaternary salt of 2-methyl-6-sulfo-
CO_2H and its derivs., less; and SO_3H and its deriv., *benzothiazole* and orthoformic ester in pyridine, forms a
least. The action of the neg. substituents is attributed nonecryst. mass, sol. in water, and appears to be a pyridin-
to formation of resonant structures with pos. charge onium salt; addn. of KI to the alc. soln. ppts. the amor-
the C atoms of the polymethine chain. This is confirmed phous *K salt*, sol. in water, insol. in EtOH, free of iodine,
by the rate of decolorization by alkali; the neg.-substituted m. 152° (decompn.). *Bis(3-ethyl-6-methylsulfo-2-benzothi-*
dyes are decolorized more rapidly, those with pos. sub- *azole)trimethinecyanine* *p-toluenesulfonate*, from the
stituents more slowly than the unsubstituted thiocarbo- quaternary salt of the Me ester of 2-methyl-6-sulfobenzo-
cyanine. *2-Methyl-6-benzothiazolesulfonyl chloride*, m. thiazole and orthoformic ester in pyridine, m. 215° (de-

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compn.). *Bis(3-ethyl-6-ethylsulfo-2-benzothiazole)trimethinecyanine p-toluenesulfonate*, prepd. analogously, bronze plates, m. 227° (decompn.). *Bis(3-ethyl-6-aminosulfo-2-benzothiazole)trimethinecyanine chloride*, from the quaternary salt and orthoformic ester in pyridine, treated with hot satd. KCl soln.; bronze crystals, m. 217° (decompn.) from EtOH. *Bis(3-ethyl-6-diethylaminosulfo-2-benzothiazole)trimethinecyanine perchlorate*, pptd. from pyridine soln. by $NaClO_4$, bronze powder, m. 156° (decompn.) from EtOH. *Bis(3-ethyl-6-phenylaminosulfo-2-benzothiazole)trimethinecyanine chloride*, pptd. from pyridine soln. by NaCl, forms green needles, m. 246° (decompn.) from EtOH; *p-toluenesulfonate*, dark green powder (from 60% EtOH). *Bis(3-ethyl-6-naphthylaminosulfo-2-benzothiazole)trimethinecyanine p-toluenesulfonate*, dark-brown powder from EtOH. *Bis(3-ethyl-6-cyano-2-benzothiazole)trimethinecyanine iodide*, by treatment of the pyridine soln. with KI, coppery crystals, m. 273° (decompn.) from EtOH. *Bis(3-ethyl-6-aminoformyl-2-benzothiazole)trimethinecyanine iodide*, by treatment of pyridine soln. with KI; dark metallic crystals (from EtOH). *Bis(3-ethyl-6-carboxybenzothiazole)trimethinecyanine iodide*, by pptn. with KI; green metallic needles, m. 258° (decompn.) from EtOH. *Bis(3-ethyl-6-carbethoxy-2-benzothiazole)trimethinecyanine iodide*, coppery crystals, m. 228° (decompn.) from MeOH. *Bis(3-ethyl-6-nitro-2-benzothiazole)trimethinecyanine iodide*, fine dark cherry colored needles, m. 243° (decompn.). Abs. max. (in mμ) for the 6,6'-substituents were: H 558, NH_2 560, $NHEt_2$ 561, SO_3 561, SO_3OMe 561, SO_3OEt 562, SO_2NH_2 563, SO_2NEt_2 564, SO_3OPh 567, SO_2NHPh 570, SO_2NPh_2 570, $SO_2NH(1\text{-}C_{10}H_7)$ 570, CN 571, $CONH_2$ 571, CO_2H 572, COO^- 572, CO_2Et 572, NO_2 585. G. M. K.

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1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

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Color and structure of cyanine dyes. III. Substituted thiocarbocyanines of unsymmetrical structure. A. I. Kiprianov and I. K. Ushenko. *J. Gen. Chem.* (U.S.S.R.) 15, 684-9(1945)(English summary); cf. *C.A.* 40, 2309[1].—Destruction of symmetry of cyanine dyes leads to displacement of the absorption band as it was first shown by K. and Pilyugin (*Uch. Zap. Kharkov Gosuclarsi. Univ.* 10, 91(1937)). In the present paper the results of symmetry displacement by introduction of unequal substituents into 6,6-positions are given. In the presence of but one substituent, the absorption shift does not occur, while substitution of two unlike substituents produces a shift which is the greater, the more different are the substituents. The unsym. thiocarbocyanines were prepd. conventionally by heating one of the quaternary salts in Ac_2O with diphenylformamidine, and the resulting intermediate was then condensed with the other quaternary compd. in boiling pyridine; the dyes were purified by crystn. from EtOH. For the following compds., the found and calcd. values of the absorption max. are given: (*3-Ethyl-6-hydroxy-2-benzothiazole*)(*3-ethyl-2-benzothiazole*)*trimethinecyanine iodide*, green, m. 245° (decompn.), 566 mμ, 567 mμ; (*3-ethyl-6-methoxy-2-benzothiazole*)(*3-ethyl-2-benzothiazole*)*trimethinecyanine iodide*, black, m. 215° (decompn.), 565 mμ, 565.5 mμ; (*3-ethyl-6-nitro-2-benzothiazole*)(*3-ethyl-2-benzothiazole*)*trimethinecyanine iodide*, m. 263° (decompn.), 572 mμ, 571.5 mμ; (*3-ethyl-6-dimethylamino-2-benzothiazole*)(*3-ethyl-2-benzothiazole*)*trimethinecyanine iodide*, violet, m. 254° (decompn.), 585 mμ, 585 mμ; (*3-ethyl-6-nitro-2-benzothiazole*)(*3-ethyl-6-hydroxy-2-benzothiazole*)*trimethynecyanine iodide*, dark powder, m. 270° (decompn.), 578 mμ, 580.5 mμ; (*3-ethyl-6-nitro-2-benzothiazole*)(*3-ethyl-6-methoxy-2-benzothiazole*)*trimethinecyanine iodide*, dark-violet, m. 279° (decompn.), 574 mμ, 573.5 mμ, (*3-ethyl-6-nitro-2-benzothiazole*)(*3-ethyl-6-p-tolylsulfonamido-2-benzothiazole*)*trimethinecyanine iodide*, green, 582 mμ, 581.5 mμ; (*3-ethyl-6-nitro-2-benzothiazole*)(*3-ethyl-6-amino-2-benzothiazole*)*trimethinecyanine iodide* (by hydrolysis of above by heating with H_2SO_4-AcOH on a steam bath for 2 hrs.), dark crystals, m. 258° (decompn.), 580 mμ, 581 mμ, (*3-ethyl-6-nitro-2-benzothiazole*)(*3-ethyl-6-dimethylamino-2-benzothiazole*)*trimethinecyanine iodide*, bronze luster, m. 265° (decompn.), 588 mμ, 598.5 mμ. G. M. Kosolapoff

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USHENKO, I. K.

Kiprianow, A. I., and Ushenko, I. K. - "Oxidation of the Quarternary Salts of Dibenzthiasolyl and Dibenzoxasolylpropane into Carbocyanines" (p. 1542)

SO: Journal of General Chemistry, (Zhurnal Obshchei Khimii), 1947, Vol. 17, No. 8

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N-Phenylthiocyanines. A. I. Kiprianov and I. N. Ushenko. *J. Gen. Chem.* (U.S.S.R.) 17, 2201-7(1947) (in Russian).—A very much simplified procedure for *N*-phenylbenzothiazoles consists of treatment of a benzene soln. of *o*-PhNHC$_6$H$_4$SH with an acyl chloride; the corresponding 2-alkyl-3-phenylbenzothiazolium chloride ppts immediately and is readily converted to the corresponding iodide. In the case of the 2-Me deriv., obtainable by AcCl, the yield is 28%, 10 times that obtained by Brooker in a more complex synthesis (Brit. 551,330 (*C.A.* 38, 2281[6]), 551,824 (*C.A.* 38, 2067), 552,300 (*C.A.* 38, 3916[6])). In addn., attempts to repeat the prepn. of 2-methyl-3-phenylbenzothiazolium iodide under conditions given in the patents (see above), using iodine in AcOH or in MeCSNPh$_2$, failed to give the desired product. 3-Phenylbenzothiazolone (34 g), 48 g. KOH, and 250 ml. EtOH, heated on a steam bath 3.5 hrs., then freed of EtOH and the residue neutralized with HCl and extd. with Et$_2$O, gave 77% *o*-(*phenylamino*)*thiophenol*, b. 174-5° (easily oxidizes to the disulfide, m. 102°). This (67%) was also made by heating 33 g. 3-phenyl-2-iminobenzothiazole with 50 g. KOH in 125 ml. EtOH on a steam bath 4.5 hrs. The product, with acyl chlorides (equimol. amts.) in benzene gave either the cryst. quaternary *3-phenyl-2-alkylbenzothiazolium chloride* or a rapidly freezing oil; evapn. of the mixt. and treatment of the residue in H$_2$O with KI gave the corresponding iodides as microcryst. solids. The following were prepd. (the *2-alkyl* is indicated): *2-methyl iodide*, from AcCl, m. 234°, 43% yield; *2-ethyl iodide*, from EtCOCl, m. 225°, 80%; *2-ethyl chloride*, m. 200°, 31%; *2-propyl iodide*, from PrCOCl, 45% (no m.p. given); *2-benzyl iodide*, from PhCH$_2$COCl, m. 162°, 28%. BzCH$_2$COBr gave the *2-(bromomethyl) bromide*, mixed with oily 4-phenyl-3-ketobenzothiazine; the mixt. is readily sepd. by the solv. in water of the former compd. (no phys. consts. of the products are given); the yield of the former is 18%. Condensation of the above iodides with Et orthoformate, orthoacetate, or orthopropionate by boiling for 0.25-1.5 hrs. in pyridine, followed by pptn. with Et$_2$O or water, gave the following *thiocarbocyanine halides*. *Iodides*: *3,3'-diphenyl*, m. 276° (from EtOH), 80%, green, abs. max. 565 mu; *3,3'-diphenyl-9-methyl*, m. 242° (from EtOH), cherry-red, max. abs. 551 mu, 50%; *3,3'-diphenyl-9-ethyl*, m. 221° (from EtOH), cherry red, max. abs. 551 mu, 60%; *3,3'-diphenyl-5,10-dimethyl*, m. 210° (from EtOH), max. abs. 663 mu, 72%; *3,3'-diphenyl-5,10-diethyl*, m.p. not given, abs. max. 662 mu, 0%; *3,3'-5,10-tetraphenyl*, m. 212° (from EtOH) (Ac$_2$O used for condensation as pyridine does not work), abs. max. 662 mu, 25%. *Bromides*: *3,3'-diphenyl-5,10-dibromo*, m. 251° (from EtOH-Me$_2$CO), green, abs. max. 567 mu, 17%; *3,3'-diphenyl-5,10-dibromo-9-methyl*, m. 220° (from EtOH), green, max. abs. 552 mu, 22%. Condensation of the 2-alkyl-3-phenylbenzothiazole halides with *p*-Me$_2$NC$_6$H$_4$CHO in Ac$_2$O readily gave the following *benzothiazolium iodides*: *3-phenyl-2-(p-dimethylaminostyryl)*, m. 218° (from EtOH), blue-violet, abs. max. 547 mu; *3-phenyl-2-(p-dimethylamino-β-methylstyryl)*, m. 108° (from EtOH), red, max. abs. 508 mu, 51%; *3-phenyl-2-(p-dimethylamino-β-ethylstyryl)*, m. 175° (from EtOH), abs. max. 511 mu, 60%; *3-phenyl-2-(p-dimethylamino-β-phenylstyryl)*, m. 185° (from EtOH), abs. max. 536 mu, 35%; *3-phenyl-2-[(p-dimethylamino)bromostyryl]*, m.p. not given, violet crystals, too sol. for recrystn., 72% yield, abs. max. 549 mu. A strong bathochromic effect is evident in 3-Ph deriv. and a very strong effect in 8,10-alkylated derivs. of the thiocarbocyanines listed above. G. M. K.

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USHENKO, I.K.

Ushenko, I.K. " Apolymethylenethiocavtocyanines", Ukr. khim. zhurnal, 1948, Issue 1, p. 50-72, - Bibliog: p. 71-72.

SO: U-3042, 11 March 1953, (letopis 'nykh Statey, No, 10, 1949).

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USHENKO, I. K.

Feb 1948

USSR/Chemistry -Cyanine Dyes
Chemistry- Cyanines

" N-Arythiazolcyanines," A. I. Kiprianov, F. I. Asnina, I. K. Ushenko, Inst Org. Chem, Acad Sci USSR , 5½ pp

"Zhur Obshch Khim" Vol XVIII (LXXX), No 2

Todd's Bergel's, and Karimullah's methods were used in condensation of chloracetone with thioacetone produced aniline, alpha-naphthylamine, p-anisidine, and p-aminodimethylaniline. As a result authors obtained perchlorates of 3-phenyl-,3-alpha-naphthyl, and 3-p-dimethylaminophenyl-2,4- dimethylazole. By synthesis these produced symmetrical ar asymmetrical cyanide dyes. Established strong effect of radical in heteroatomic nitrogen on absorption of asymmetrical carbocyanide, which contains thiozole and benzthiozole nucleus. Submitted 23 Sep 1946.

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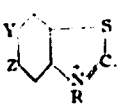
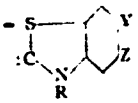
Color and planarity of molecules of organic dyes. A. I. Kiprianov and I. K. Ushenko. *Izvest. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk* 1950, 492-500; cf. *C.A.* 44, 5733g, 7837b.—In org. dyes with NMe_2 as the auxochromic group, substituents in an ortho position to the NMe_2 group which, through steric hindrance, enforce a rotation of that group relative to the plane of the ring, and thus disturb the planarity of the mol., give rise to a decrease of the absorption of light and to a shift of the absorption max. to shorter waves. Examples are *p*-(p-$Me_2NC_6H_4N{:}N$)$C_6H_3NO_2$, and *p*-[(p-$Me_2NC_6H_4$)$Cl{:}C_6H_4{:}NMe_2$, both without and with Me in ortho-position to the NMe_2 groups. Similar changes, attributable to a perturbation of the planarity of the mol. as a result of substitution of 2H in the NH_2 group by 2Me, and the corresponding increase of the size of the group, were found in the recently synthesized cyanine dye, ACH:CH-CH:B

where A =  and B = 

(R = Me, Y = Me, Z = NH_2), which gives a blue soln. in alc. (absorption max. 504 mμ) but which, after substitution of the 2H in the $2NH_2$ groups by 2Me, has a max. at 575 mμ and appears red-purple in alc. soln. Here, contrary to the usual effect of a methylation of the NH_2, the absorption shifts to shorter instead of to longer waves, and that as a result of the perturbation of planarity due to steric hindrance, coplanarity of the NMe_2 group with the ring having become impossible. Substitution of H atoms for the Me groups in the rings has no effect on the absorption, whereas in the compd. with NMe_2 instead of NH_2, that same substitution shifts the absorption max. by 33 mμ to longer waves. Changes in the position of the absorption max. are also produced when the coplanarity of the chromophore system, i.e. of the conjugated aromatic-heterocyclic rings, is disturbed by the substitution, as in the substituted monomethinecyanines of the type AC(R'):B(Y and Z are always H). Following are, for the different substituents R and R', the positions of the absorption max. (mμ) and the values 10^{-4} E of the absorption coeff.: H, H, 425, 8.0; Me, H, 425, 8.1; Et, H, 425, 7.5; Pr, H, 425, 7.3, Ph, H, 429, 7.5; H, Me, 426, —; H, Et, 425, —; H, Pr, 427, —; Me, Me, 465, 4.7; Et, Me, 480, 4.3; Me, Et, 465, 4.7, —; Me, Pr, 466, 4.5. Steric hindrance to coplanarity is present only in the last 4 derivs., and only these show a shift of absorption to longer waves and a lowering of E. The noncoplanarity of these 4 derivs. manifests itself also in the low yields, not over 15%, of their synthesis. The compd. 2,4,6-$(NO_2)_3C_6H_2CH{:}B$(R = Me, Y = H, Z = H) in benzene soln. is red and has a max. of absorption

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at 552 mμ, $E = 3 \times 10^5$; substituting of the H in the CH group by Me gives a blue soln., max. at 608 mμ, $E = 1.85 \times 10^5$. Analogous effects of disturbance of coplanarity are observed also in dyes with longer chains, as the trimethine dyes of the type AC(R'):CHC(R'):B(Y and Z are always H). The positions of the absorption max. and values of 10^{-4} E for different R and R' are: Me, H, 556, 14.0; Me, Me, 570, 7.0; Me, Ph, 580, 4.1; Ph, H, 565, 15.5; Ph, Me, 602, 8.8; Ph, Et, 600, 6.6; Ph, Ph, 601, 4.0; shifts of the max. to longer waves and lowering of E are found with the substituents Me, Me; Me, Et; Ph, Me; Ph, Et; and Ph, Ph, i.e. in all cases where there is noncoplanarity on steric-hindrance grounds. Lowering of E and shift of the absorption max. are accompanied by increased diffuseness of the max. as compared with the sharp max. of the planar compds. In the series of cyanine dyes with a closed polymethylene bridge of the type $AC:CH.C:B$ $(CH_2)_n$ (Y and Z are always H) the color varies in a peculiar way with n; the max. and 10^{-4} E are, for $n = 1$, 558, 14.8; $n = 2$, 601, 15.0; $n = 3$, 565, 13.0; $n = 4$, 575, 6.1. In the styryl-type polymethine dyes p-$Me_2NC_6H_4CH:CHA$ (R = Me, Y = H, Z = H), only substitution of the β-H atom by an alkyl gives rise to steric disturbance of the planarity, and to displacement of the max. to shorter waves, with a lowering of the intensity of absorption. The unsubstituted compd. in alc. soln. is red, max. 530 mμ, its β-Me deriv. is orange, max. 487 mμ, and its β-iso-Pr deriv. yellow, max. 437 mμ. In all cases of disturbance of planarity, except in one, the intensity of the absorption is lowered. The position of the max. is always shifted to shorter waves when the noncoplanarity is brought about by forcing the auxochrome group out of the common plane; where the coplanarity of the rings themselves is disturbed, the max. can suffer a shift either to shorter or to longer waves. Noncoplanarity is further assocd. with such properties as absence or near-absence of phosphorescence, lower melting temp., greater soly. in alc., lower resistance to decoloration by acids, particularly alkali, and lower resistance to decoloration by light.

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1. USHENKO, I. K.; SERDYUK, N. F.

2. USSR (600)

4. Thiocarbocyannines

7. Structure of some meso-substituted thiocarbocyanines, Ukr. khim. zhur., 16, No. 4, 1950.

9. Monthly List of Russian Accessions, Library of Congress, April, 1953, Uncl.

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Condensation of quaternary salts of heterocyclic bases with aromatic ketones. [illegible] *Ukrain. Khim. Zhur.* [illegible] A mixt. of 0.6 g. 2-methyl-6-nitrobenzothiazole [illegible] $Me_2NC_6H_4Ac$, and 3 ml. Ac_2O was heated 1.5 hr., and treated with $NaClO_4$ to give [illegible] *p-dimethylstyryl)-6-nitrobenzothiazole-EtClO₄*, m. 214° (decompn.), abs. max. 560 mμ. The following new dyes were similarly prepd (yield, m.p., and abs. max. are given): *2-(p-dimethylamino-α-phenylstyryl)-6-nitrobenzothiazole-EtI*, 42%, 232°, and 570 mμ; *2-(p-dimethylamino-β-methylstyryl)-6-nitrobenzothiazole-EtClO₄*, 67%, 190°, 515 mμ; *2-(p-dimethylaminostyryl)-5-methoxybenzothiazole-EtClO₄*, 60%, 290°, 535 mμ; *2-(p-dimethylamino-α-methylstyryl)-5-methoxybenzothiazole-EtClO₄*, 25%, 216°, 541 mμ; *2-(p-amino-α-methylstyryl)benzothiazole-EtClO₄*, —, 293°, 590 mμ. All the compds. decompd. on melting.

G. Meguerian

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USHENKO, I. K.

Formation of some *meso*-substituted thiocyanines. I. K. Ushenko and M. F. Serdyuk (State Univ., Kiev). *Ukrainskii Khim. Zhur.* 16, No. 4, 446-9(1950).—The reaction of 2-methylbenzothiazole-EtI (I) and $C(OMe)_4$ unexpectedly gave the same thiocarbocyanine (II) that was obtained by treating I with $MeC(OMe)_3$ in pyridine, and therefore was the *meso*-Me substituted deriv. of II (cf. Hamer, *C.A.* 23, 1903). Also the following derivs. of I gave the same derivs. of II by either method (m.p. and λ_{max} in $m\mu$ for II given): *5-methoxy-2-methylbenzothiazole-EtBr*, 273°, 557; *2,6-dimethylbenzothiazole-EtI*, 274°, 549; *2-methyl-6-benzylbenzothiazole-EtI*, 270°, 570; *2-methylbenzothiazole-PhCl*, 295°, 551.

G. Meguerian

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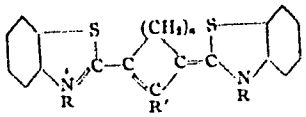
USHENKO, I. K.

Chemical Abst.
Vol. 48
Apr. 10, 1954
Dyes and Textile Chemistry

α - β - Polymethylenethiacarbocyanines. II. I. K. Ushenko (Inst. Org. Chem., Acad. Sci. Ukr. S.S.R., Kiev). *Ukrain. Khim. Zhur.* 16, No. 4, 451-3(1950); cf. *C.A.* 48, No. 5.—Five new dyes of the general formula A, where R = Et or Ph, R' = Me or Et, and n = 1 or 2, are described. *3,3'-Diphenyl-9-methyl-8,10-methylenethiacarbocyanine iodide* (I) was prepd. in 30% yield by boiling for 30 min. the



(A)

bis(chlorobenzene) deriv. of 1,3-dibenzothiazolylpropane (0.5 g.) in 0.5 g. triethyl orthoacetate (II) and 3 ml. acetic anhydride (III), pptg. I with an alk. soln. of KI, and extg. with Et_2O. I m. 170° with decompn. (from EtOH), max. abs. 596 mμ. Similarly, substituting triethyl orthopropionate (IV) for II, *3,3'-diphenyl-9-ethyl-8,10-methylenethiacarbocyanine iodide* was prepd. in 26% yield, m. 163-4° (decompn.), max. abs. 600 mμ. Heating to boiling for 15 min. (longer heating resulted in complete decolorization) the bis(ethyl *p*-toluenesulfonate) of 1,4-dibenzothiazolylbutane (V) with II and III gave *3,3'-diethyl-9-methyl-8,10-dimethylenethiacarbocyanine iodide*, m. 191° (decompn.) max. abs. 618 mμ. *3,3,9-Triethyl-8,10-dimethylenethiacarbocyanine iodide*, max. abs. 614 mμ, prepd. from V and IV, could not be isolated because it is decolorized in EtOH and acetone solns. Equally unstable is *3,3'-diphenyl-9-methyl-8,10-dimethylenethiacarbocyanine iodide*, prepd. from the bis(chlorobenzene) deriv. of 1,4-dibenzothiazolylbutane and II in 9% yield. It m. with decompn. 181° (from EtOH), max. abs. 625 mμ.

Gerard Aufleger

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Color of organic dyes and planarity of their molecules. I. A. I. Kipriianov and I. K. Ushenko (Acad. Sci. Ukrain. S.S.R., Kiev). *Zhur. Obshchei Khim.* (J. Gen. Chem.) 20, 134-44(1950).—Cyanine dyes contg. proximal groups of large size display a shift of absorption max. toward the red end of the spectrum and a corresponding decrease of the intensity of absorption in comparison with unsubstituted derivs. The explanation probably lies in destruction of planarity of mols. with bulky groups, leading to closing-up the energy differences between ground and excited states (cf. Brooker, *et al.*, *C.A.* 42, 1129a). Refluxing 2-methylbenzothiazole-MeI with 2-methylmercaptobenzothiazole-Me_2SO_4 and NaOAc in EtOH gave yellow *bis(3-methyl-2-benzothiazole)monomethinecyanine iodide*, decompg. 281° (from EtOH), λ_{max} 422 mμ, E_{max} 8.1 (× 10^{-4}). 2-Ethylbenzothiazole-MeI gave 35% *bis(3-methyl-2-benzothiazole)-8-methylmonomethinecyanine iodide*, orange, decompg. 237°, λ_{max} 465, E_{max} 6.0. Heating $CH_3(CO_2H)_2$ and 2-methylmercaptobenzothiazole-*p*-Me-$C_6H_4SO_2Ph$ in pyridine gave *bis(3-phenyl-2-benzothiazole)-monomethinecyanine iodide*, decompg. 315°, λ_{max} 429, E_{max} 7.5. Refluxing 1.2 g. 2-(methylmercaptobenzothiazole *p*-Me$C_6H_4SO_2Ph$) 1 g. 2-ethylbenzothiazole-PhCl, and 1 g. NaOAc in EtOH gave 10% *bis(3-phenyl-2-benzothiazole)-8-methylmonomethinecyanine iodide*, decompg. 266°, bronze plates, λ_{max} 490, E_{max} 3.5. Similar use of 2-propylbenzothiazole-PhI gave 13% *bis(3-phenyl-2-benzothiazole)-8-ethylmonomethinecyanine iodide*, m. 214° (from EtOH), λ_{max} 501, E_{max} 2.1. Refluxing 0.78 g. 2-methylbenzothiazole-PhI and 1 g. 2-(2-acetanilidovinyl)benzothiazole-EtI 15 min. in pyridine gave 50% *(3-ethyl-2-benzothiazole)(3-phenyl-2-benzothiazole)trimethinecyanine iodide*, decompg. 243° (from EtOH), green, λ_{max} 500, E_{max} 11.8. Similarly, 2-ethylbenzothiazole-EtI and 2-(2-acetanilidovinyl)benzothiazole-PhI gave 60% *(3-ethyl-2-benzothiazole)(3-phenyl-2-benzothiazole)-8-methyltrimethinecyanine iodide*, m. 158° (from EtOH), λ_{max} 562, E_{max} 11.0, while 2-ethylbenzothiazole-PhCl gave *(3-ethyl-2-benzothiazole)(3-phenyl-2-benzothiazole)-methyltrimethinecyanine iodide*, blue-green, m. 252°, λ_{max} 570, E_{max} 14.8, the corresponding PhI compd. gave *bis(3-phenyl-2-benzothiazole)-8-methyltrimethinecyanine iodide*, decompg. 275° (from EtOH), λ_{max} 572, E_{max} 15.0.

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while the mother liquor gave a *cyanine* without Me on the methine chain, $C_{29}H_{21}N_2S_2I$, m. 277°, λ_{max} 565. Refluxing 1 g. 2-(1-naphthylmethyl)benzothiazole-PhI, 1 g. $HC(OEt)_3$, and 4 ml. Ac_2O gave 32% *bis(3-phenyl-2-benzothiazole)-8,10-di-1-naphthyltrimethinecyanine perchlorate*, bronze crystals, decompg. 196-7° (from EtOH), λ_{max} 592, E_{max} 9.5. 2-(2-Tetrahydronaphthylmethyl)-benzothiazole-PhI and $HC(OEt)_3$ gave crude *bis(3-phenyl-2-benzothiazole)-8,10-(tetrahydro-2-naphthyl)-trimethinecyanine perchlorate*, λ_{max} 590. Heating 2-ethylbenzothiazole-MeI and $HC(OEt)_3$ in pyridine gave *bis(3-methyl-2-benzothiazole)-8,10-dimethyltrimethinecyanine iodide*, bronze needles, decompg. 223°, λ_{max} 570, E_{max} 7.0, while heating 2-benzylbenzothiazole-MeI with $HC(OEt)_3$ in Ac_2O gave 22% *bis(3-methyl-2-benzothiazole)-8,10-diphenyltrimethinecyanine perchlorate*, violet, decompg. 152°, λ_{max} 580, E_{max} 4.1; 2-(1-naphthylmethyl)benzothiazole-MeI gave 29% *bis(3-methyl-2-benzothiazole)-8,10-di-1-naphthyltrimethinecyanine perchlorate*, violet, decompg. 176° (from EtOH), λ_{max} 568, E_{max} 3.7, and the tetrahydro-2-naphthyl analog yielded *bis(3-methyl-2-benzothiazole)-8,10-bis(tetrahydro-2-naphthyl)trimethinecyanine perchlorate*, 25%, blue, decompg. 152° (from dil. EtOH), λ_{max} 578, E_{max} 2.1. Chloromethylation of *tetrahydronaphthalene* gave 52% *(2-chloromethyl) deriv*, b_{11} 139-42°; this (71 g.) boiled 3 hrs. with 29 g. KCN in 400 ml. EtOH and 70 H_2O gave the *nitrile* (72%), b_{15} 178-82°, which boiled 10 hrs. with 20% NaOH gave 70% *tetrahydro-2-naphthalene-acetic acid*, m. 85° (from H_2O); *amide*, m. 142° (from H_2O), was a by-product. The free acid and $SOCl_2$ gave 78% of the *acyl chloride*, b_5 143-4°, which with *o*-Me-NHC_6H_4SH in C_6H_6 gave a yellow mass yielding on soln. in H_2O and addn. of KI 72% *2-(tetrahydro-2-naphthylmethyl)-benzothiazole-MeI*, m. 230° (from H_2O). The results of Ushenko (*Ukrain. Khem. Zhur.* 14, 50 (1948)) are interpreted similarly to the above.

G. M. Kosolapoff

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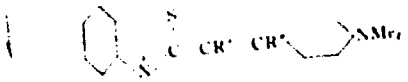
Color of organic dyes and the planarity of their molecules. II. A. I. Kiprianov and I. K. Ushenko (Acad. Sci. Ukr. S.S.S.R.) *Zhur. Obshchei Khim.* (J. Gen. Chem.) **20**, 514-17(1950); cf. C.A. **44**, 5733g.—The absorption spectra of the several styryl derivs. studied show a displacement of the max. to the shorter waves with concurrent decrease of intensity when alkyl or aryl groups are substituted in the α- or β-positions of the fundamental unit (I). The results are explained by destruction of co-



R (I)

planar structure of the benzene and the thiazole rings. The following max. (in mμ) and ε were observed (R, R', R'' given): *Ph, H, H* (I), 546, 6.2 × 10⁻⁴; *Ph, Me, H* (II), 508, 2.4 × 10⁻⁴; *Ph, Et, H* (III), 510, 2.6 × 10⁻⁴; *Ph, H* (IV), 540, 3.3 × 10⁻⁴; *Et, H, H* (V), 540, 11 × 10⁻⁴; *Et, Me, H* (VI), 481, 6.2 × 10⁻⁴; *Et, Et, H* (VII), 482, ; *Et, Ph, H* (VIII), 508, 2.5 × 10⁻⁴; *Ph, H, Me* (IX), 552, 2.2 × 10⁻⁴; *Ph, H, Ph* (X), 560, 1.5 × 10⁻⁴; *Et, H, Me* (XI), 518, 2.1 × 10⁻⁴, resp. New syntheses were as follows. **VI** was prepd. in 54%, yield by refluxing 1 hr. 0.5 g. 2-ethylbenzothiazole-EtI, 0.3 g. *p*-$Me_2NC_6H_4CHO$, and 2 ml. Ac_2O, followed by addn. of $NaClO_4$ in EtOH, yielding the *ethoperchlorate*, in 234° (decompn.), from EtOH). **VII**, prepd. similarly, could not be obtained completely pure. **VIII** was prepd. similarly from 2-benzylbenzothiazole-EtI and isolated as the *ethoperchlorate*, decomp. 172°, cherry-red, in 18%, yield. **IX** prepd. similarly from 2-methylbenzothiazole-PhBr and *p*-$Me_2NC_6H_4Ac$ in 29%, yield, isolated as the *phenyl perchlorate*, decomp. 215° (from EtOH). **X** (in 16%, yield), similarly prepd. from *p*-$Me_2NC_6H_4Bz$, decomp. 205° (from EtOH). **XI**, isolated as the *ethoperchlorate*, decomp. 203°, red, obtained in 34%, yield from 2-methylbenzothiazole, *p*-$MeC_6H_4SO_2Et$, and $Me_2NC_6H_4Ac$ in Ac_2O. G. M. K.

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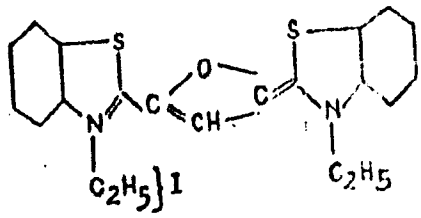
USHENKO, I. K.
P4 1953
Sensitizing & Sensitometry

520
α:γ-Epoxythiacarbocyanines, I. I. K. USHENKO. J. Soc. Chem. U.S.S.R. 1952, 22, 711-715.—The condensation product of diglycollyl dichloride with N-ethyl-o-aminothiophenol was converted into the iodide salt, which was then treated with orthoformic ester to yield the new dye—



The corresponding diphenyl compound was prepared in a similar manner. The absorption maxima of these dyes differ very little from those of the corresponding known dyes containing $-CH_2-$ in place of -O-, but their stability to light and to alkalis is much less. Attempts using an analogous method of preparation to produce dyes containing -S- or -S.S- in place of -O- were unsuccessful: sulphur was eliminated, and the products were known trimethin dyes.

J. Soc. Dyers and Col.

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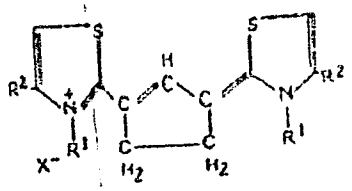
"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

Ushenko, I. K.

αγ-Polymethylenethiazolecarbocyanines-I. I. K. Ushenko. *J. Gen. Chem. U.S.S.R.*, 1952, 22, 870-874.—Four new cyanine dyes of formula



(R^2 = CH_3, R^1 = C_2H_5 and R^2 = C_6H_5, R^1 = C_2H_5, n-C_3H_7, n-C_4H_9 and X = anion) were prepared. They are unstable, and attempts to separate them from solution were unsuccessful. Their absorption maxima in ethanol solution lie at about 600 μ, namely, about 40 μ greater than the value for the corresponding thiazolecarbocyanine without the ethylene bridge.

J. Soc. Dyers and Colourists

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

N-Aryl-o-aminothiophenols. I. K. Ushenko. *Sbornik Statei Obshchei Khim., Akad. Nauk S.S.S.R.* 1, 516-22 (1953); cf. *C.A.* 42, 5016h.—A suspension of 30 g. *p,p'*-ditolylamine in 120 ml. PhCl was satd. with HCl, heated with 18 g. NH_4CNS 5 hrs. at 125–30°, and cooled to give 44% *as-p,p'-ditolylthiourea* (I), m. 199–200° (from EtOH). I (23.3 g.) suspended in 110 ml. $CHCl_3$ treated with 16.2 g. Br in $CHCl_3$ and allowed to stand 2 hrs. gave after evapn. and soln. in hot H_2O, *2-amino-3-p-tolyl-6-methylbenzothiazolium bromide* (II), m. 225° (from EtOH); the soln. of II treated with excess NH_4OH gave 78% *2-amino-3-p-tolyl-6-methylbenzothiazoline* (III), m. 73° (from EtOH). III (25 g.) in 180 ml. AcOH treated at 0° with 10.2 g. $NaNO_2$ in 20 ml. H_2O gave 84% pink *2-nitrosoimino-3-p-tolyl-6-methylbenzothiazoline* (IV), explosively decomp. 129°. IV (23 g.) added slowly to 100 ml. hot xylene gave after filtration and evapn. 78% *3-p-tolyl-6-methyl-2-benzothiazolinone* (V), m. 106° (from EtOH). V (18.2 g.), 21 g. KOH, and 100 ml. EtOH refluxed 3 hrs., evapd., dild. with H_2O and neutralized with HCl to Congo red with cooling gave 78% *2-p-tolylamino-5-methylphenylmercaptan*, m. 52° (from petr. ether). IV (3.5 g.) refluxed with 3.1 g. P_2S_5 in xylene 5 hrs. gave 65% *3-p-tolyl-6-methyl-2-benzothiazolinethione* (VI), m. 175° (from EtOH); VI (2.2 g.) heated with 2.3 g. *p*-$MeC_6H_4SO_3Me$ 5 hrs. at 110° gave 80% *3-p-tolyl-2-methylthio-6-methylbenzothiazolium p-toluenesulfonate*, m. 175° (from H_2O). The same procedures were employed in the prepn., resp., of: 41% *as-o,o'-ditolylthiourea*, m. 197° (from EtOH); *2-amino-3-o-tolyl-4-methylbenzothiazolium bromide*, m. 201° (from EtOH); 56% *2-imino-3-o-tolyl-4-methylbenzothiazoline*, m. 122° (from EtOH); 80% [illegible]; 74% *3-o-tolyl-6-methyl-2-benzothiazoline*, decomp. 116°; 74% *3-o-tolyl-6-methyl-2-benzothiazolinone*, b. 211°, m. 116–17° (from EtOH); 64% *2-o-tolylamino-5-methylphenylmercaptan*, b. [illegible]; 54% *3-o-tolyl-4-methyl-2-benzothiazolinethione*, m. 113° (from MeOH); 74% *3-o-tolyl-2-methylmercapto-4-m[illegible] toluenesulfonate* (m. not given). R[illegible] 3-phenyl-6,7-benzobenzothiazolin-2-one, $C_{19}H_{13}NS$[illegible] ml. EtOH with 18 g. KOH and 60 ml. EtOH 3 hrs. gave 83% *2-phenylamino-1-thionaphthol*, m. 81–2°. 3-Phenyl-6,7-benzobenzothiazolone and P_2S_5 in xylene gave 74% *3-phenyl-6,7-benzobenzothiazoline-2-thione*, m. 129° (from MeOH), which gave 83% *3-phenyl-2-methylthio-6,7-benzobenzothiazolium p-toluenesulfonate*, m. 192°. Heating 3-*p*-tolyl-6,7-benzobenzothiazolin-2-one with KOH in EtOH as above gave 85% *2-p-tolylamino-1-thionaphthol*, m. 85° (from petr. ether). Heating 3-*p*-tolyl-6,7-benzobenzothiazolin-2-one with P_2S_5 in xylene gave 47% *3-p-tolyl-6,7-benzobenzothiazoline-2thione*, m. 188° (from MeOH), which gave 65% *3-p-tolyl-2-methylthio-6,7-benzobenzothiazolium p-toluenesulfonate*, m. 169°. Heating 142 g. *N-(o-tolyl)-2-naphthylamine*-HCl with 49 g. NH_4CNS in xylene 5 hrs. at 125–30° gave 37% *N-(2-naphthyl)-N-(o-tolylthio)urea*, m. 202° (from EtOH), which as above gave *2-amino-3-(o-tolyl)-6,7-benzobenzothiazolium bromide*, m. 295°, which with NH_4OH gave 30% *2-imino-3-(o-tolyl)-6,7-benzobenzothiazoline*, m. 121° (from EtOH), which gave 97% *2-nitrosoimino deriv.*, decomp. 128°, which gave 84% *3-(o-[illegible])-6,7-benzobenzothiazolin-2-one*, m. 118° (from EtOH), which with KOH in EtOH [illegible] above gave 80% *2-(o-tolylamino)-1-thionaphthol*, m. [illegible] (from petr. ether), which with P_2S_5 gave 68% *3-(o-tolyl)-6,7-*[illegible]

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K USHENKO

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benzobenzothiazoline-2-thione, m. 142° (from Me_2CO), which gave 46% *3-(o-tolyl)-2-methylthio-6,7-benzobenzothiazolium p-toluenesulfonate*, m. 119°. Similarly NH_4CNS and cyclohexylaniline-HCl gave 35% *N-phenyl-N-cyclohexylthiourea*, m. 175° (from EtOH); the above procedures yielded: *2-amino-3-cyclohexylbenzothiazolium bromide*, m. 282°; 80% *2-imino-3-cyclohexylbenzothiazoline*, m. 104° (from EtOH); 91% *2-nitrosoimino analog*, decomp. 133°; 85% *3-cyclohexylbenzothiazolin-2-one*, m. 72° (from petr. ether); 71.4% *N-cyclohexyl-o-aminothiophenol*, b. 152-3° (*HCl salt*, m. 193°); 56% *3-cyclohexylbenzothiazoline-2-thione*, m. 99° (from MeOH); 64% *3-cyclohexyl-2-methylthiobenzothiazolium p-toluenesulfonate*, m. 169°. Refluxing 2 g. 3-ethyl-6,7-benzobenzothiazolin-2-one with 1.6 g. KOH in EtOH 3 hrs. gave after filtration, concn., and treatment with 4 g. AcCl in C_6H_6, a solid quaternary salt which was treated in aq. soln. with KI yielding 32% *2-methyl-1-naphthothiazole ethiodide*, m. 232°; the originally formed solid was the *K salt of 2-(ethylamino)-1-thionaphthol*. Heating 3-ethyl-6,7-benzobenzothiazolin-2-one with P_2S_5 gave 70% *3-ethyl-6,7-benzobenzothiazoline-2-thione*, m. 161° (from MeOH), which gave 82% *Et p-toluenesulfonate of 2-methylthio-6,7-benzobenzothiazole*, m. 164°.

G. M. Kosolapoff

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"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

USHENKO, I. K., and DMITRENKO, I. P.

α γ-Dimethylene Thiocarbocyanines Having Methoxy-Groups in the Benzene Ring. page 650. Sbornik/po obshchey khimii (Collection of Papers on General Chemistry), Vol 1, Moscow-Leningrad, 1953, pages 762-766.

Inst of Organic Chemistry, Acad Sci Uk SSR

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"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

Ushenko, I. K.

USSR

Benzothiazolylthiacyanines. I. K. Ushenko. *Soobshcheniya Nauch. Rabotakh Vsesoyuz. Khim. Obshchestva im. Mendeleeva* 1953, No. 2, 1-4; *Referat. Zhur., Khim.* 1954, No. 35000.—Thiacyanines dyes contg. benzothiazolyl-methyl radicals near the N or benzothiazolyl radicals in the 6,6'-position were synthesized. 2-Hydroxymethylbenzothiazole *p*-toluenesulfonate (I) (1 mole) obtained from 2-hydroxymethylbenzothiazole and *p*-toluenesulfonyl chloride in 2*N* NaOH at 40-50° [yield 73%, m. 100-7° (from benzene)], is heated 4 hrs. at 100° with 2-2.5 moles of 2-methylbenzothiazole. The product is a quaternary salt (II). The latter is made to react with $HC(OEt)_3$ (III) in pyridine which yielded thiacarbocyanine, $\lambda_{max.}$ 565 mμ. The same dye was synthesized from a quaternary salt (IIIa) obtained by heating I at 100° with 2-bromomethylbenzothiazole, m. 183°; yield 63%. II is transformed into IIIa by the action of KBr. By the action of I on 2-methyl-5-methoxybenzothiazole, 2-methyl-6-methoxybenzothiazole, 2-methyl-α-naphthothiazole, 2-methyl-6-nitrobenzothiazole, 2-methyl-6-dimethylaminobenzothiazole, quinaldine, α-picoline, 2-ethylbenzothiazole, 2-ethyl-6-nitrobenzothiazole, 2-propylbenzothiazole, 2-isobutylbenzothiazole, and 2-benzylbenzothiazole were obtained the corresponding quaternary salts. By condensation of these salts with III, *p*-dimethylaminobenzaldehyde, quaternary salt of the acetanilidovinyl

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deriv. of benzothiazole and the quaternary salt of 2 methyl-
mercaptobenzothiazole were obtained products of which
some of the quaternary salts were converted into [illegible]
benzothiazolylmethyl groups attached to N. [illegible]
carbocyanines of this kind compared with the [illegible]
carbocyanines having methyl radicals near the [illegible]
[illegible] by 6-7 mμ toward longer wavelengths [illegible]
[illegible] 6,6'-di(2-benzothiazolyl)thiacarbocyanine [illegible]
[illegible] by condensation of the quaternary [illegible]
[illegible] from o-aminothiophenol and the hydrochloride of [illegible]
methylbenzothiazole-6-carboxylic acid [illegible]
[illegible] of this dye, 590 mμ, is displaced by 31 mμ in the direc-
tion of the red end of the spectrum compared to [illegible]
diethylthiacarbocyanine.

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"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

USHENKO, I. K.

USSR/Chemistry - Dyes

Card : 1/1 Pub. 116 - 8/20

Authors : Ushenko, I. K.

Title : Study of the chemistry of cyanine dyes.3, 3'-Di-p-tolyl-6, 6'-dimethyl-thiacyanines

Periodical : Ukr. khim. zhur. 20, Ed. 4, 384 - 391, 1954

Abstract : New cyanine dyes, having p-tolyl radicals in the N-atoms and methyl groups in 6,6'-positions, and their chemical properties, are described. The introduction of alkyl groups into 8,10-positions of 3,3'-dimethylthiacarbocyanines and its effect on the displacement of the absorption maximum, is explained. It was established that the substitution of H-atoms in 8, 10-positions by methyl and methoxy groups sharply displaces the absorption maximum toward the long-wave zone of the spectrum. Ten references: 4-Ukrainian; 3-USSR, 1-Belgian and 2-German (1923-1953). Tables; drawings.

Institution : Acad. of Sc. Ukr-SSR, Institute of Organic Chemistry

Submitted : December 3, 1953

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

USHENKO, I.K.; STETSENKO, A.V.; RUBTSOVA, Ye.N.

Investigations in the chemistry of cyanine dyes. Part 8. 3,3'-diaryl-6,7,6',7',-dibenzothiacyanines. Ukr.khim.zhur. 20 no.5: 530-534 '54. (MIRA 8:1)

1. Institut organicheskoy khimii Akademii nauk USSR.
(Thiacyanines)

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"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

USHENKO, I.K.; MARENETS, M.S.

Investigations in the chemistry of cyanine dyes. Part 9. 3,3'-di-α-naphthylthiacyanines and 3,3'--diphenyl-4,5,4',5',dibenzothiacyanines. Ukr.khim.zhur. 20 no.5:535-542 '54. (MLRA 8:1)

1. Institut organicheskoy khimii Akademii nauk USSR.
(Thiacyanines)

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"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

USHENKO, I.K.

Preparation of 5- and 6-phenylbenzothiazole with the aid of diazo compounds. Dokl.AN SSSR 94 no.5:901-904 F '54. (MLRA 7:2)

1. Institut organicheskoy khimii Akademii nauk Ukrainskoy SSR. Predstavleno akademikom V.M.Rodionovym.
(Benzothiazole) (Diazo compounds)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

USHENKO, I.K.

Research in the field of cyanine-dye chemstry. Part 13. 3,3-
-dicyclohexylthiacyanines. Ukr.khim.zhur. 21 no.6:738-743 '55.
(MLRA 9:5)

1. Institut organicheskoy khimii AN USSR.
(Thiacyanines)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"

"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6

Ushenko, I. K.

USSR/ Chemistry - Organic chemistry

Card 1/1 Pub. 116 - 12/29

Authors : Ushenko, I. K., and Portnyagina, V. A.

Title : The chemistry of cyanine dyes. Part 11. 3,4-Trimethylenethiacyanines

Periodical : Ukr. khim. zhur. 21/6, 744-749, Dec 1955

Abstract : The derivation of 8-mercaptotetrahydro-1,2,3,4-quinoline through splitting of 3,4-trimethylenebenzthiazolone-2 with alcoholic alkaline is announced. Several new thiacarbocyanine and four styryl dyes were obtained through condensation of quaternary salts with ortho esters of carboxylic acid and p-dimethylaminobenzaldehyde in acetic anhydride or pyridine. It was found that quaternary salts with the trimethylene ring in 3,4 positions are more difficult in condensation with ortho esters than the homologous methylates or ethylates. Absorption maxima were established for all dyes synthesized. Five references: 2 USSR, 1 Eng., 1 USA and 1 Germ. (1931-1955).

Institution : Acad. of Sc., Ukr. SSR, Inst. of Organ. Chem.

Submitted : April 26, 1955

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001858120019-6"