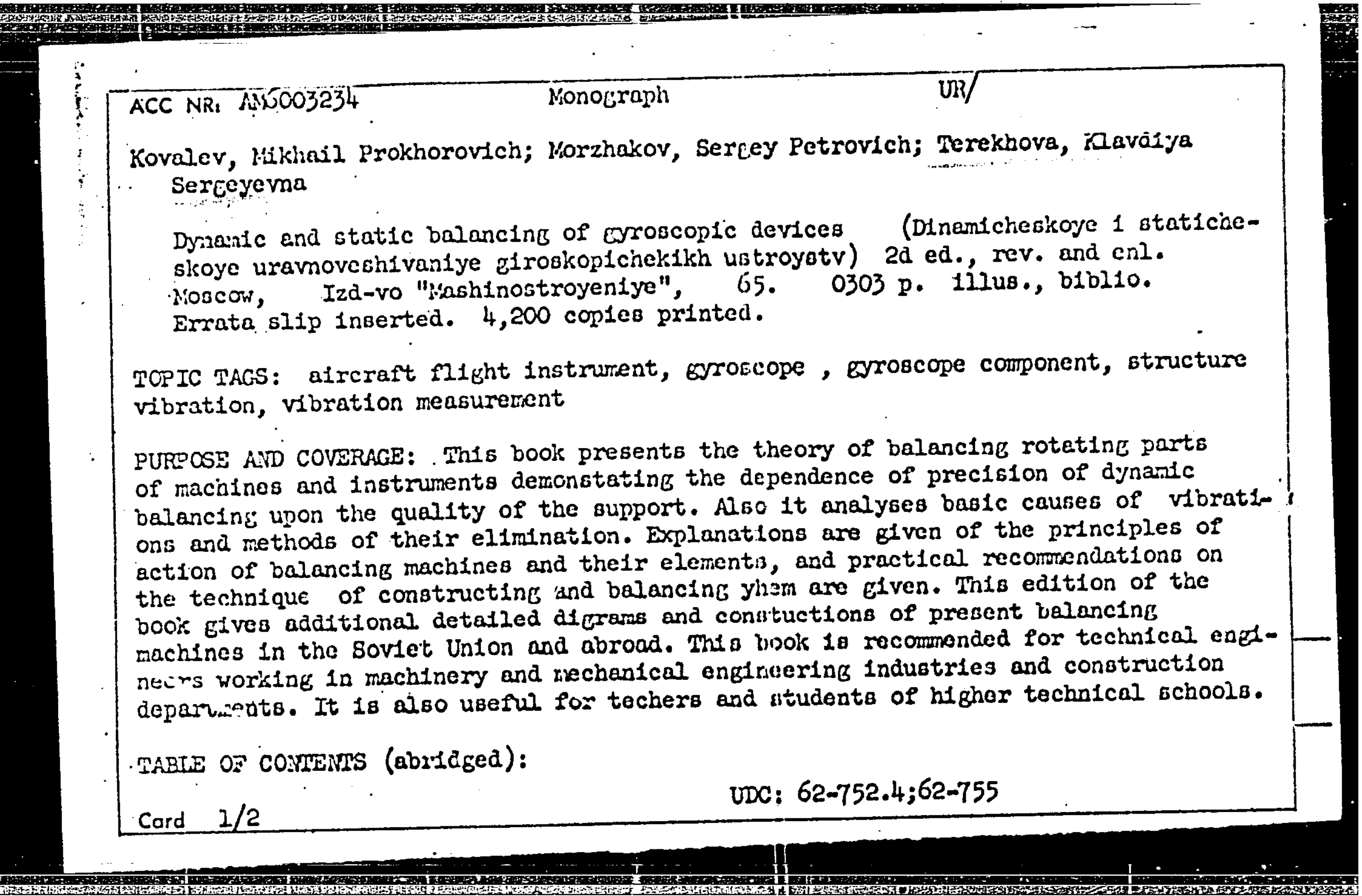

ACC NR: AM5003234 Monograph UR/

Kovalev, Mikhail Prokhorovich; Morzhakov, Sergey Petrovich; Terekhova, Klavdiya Sergeyevna

Dynamic and static balancing of gyroscopic devices (Dinamicheskoye i staticheskoye uravnoveshivaniye giroskopichekikh ustroystv) 2d ed., rev. and enl. Moscow, Izd-vo "Mashinostroyeniye", 65. 0303 p. illus., biblio. Errata slip inserted. 4,200 copies printed.

TOPIC TAGS: aircraft flight instrument, gyroscope , gyroscope component, structure vibration, vibration measurement

PURPOSE AND COVERAGE: This book presents the theory of balancing rotating parts of machines and instruments demonstating the dependence of precision of dynamic balancing upon the quality of the support. Also it analyses basic causes of vibrations and methods of their elimination. Explanations are given of the principles of action of balancing machines and their elements, and practical recommendations on the technique of constructing and balancing yhem are given. This edition of the book gives additional detailed digrams and constuctions of present balancing machines in the Soviet Union and abroad. This book is recommended for technical engineers working in machinery and mechanical engineering industries and construction departments. It is also useful for techers and students of higher technical schools.

TABLE OF CONTENTS (abridged):

UDC: 62-752.4;62-755

Card 1/2

ACC NR: AM6003234

SUB CODE: 17, 20 / SUBM DATE: 19Aug65 / ORIG REF: 030

Card 2/2

TEREKHOVA, K. T.

TEREKHOVA, K. T. -- "The Use of the Grass Cover of Natural Meadows for Growing Seeds of Valuable Fodder Grasses." Moscow, 1956. (Dissertation for the Degree of Candidate in Agriculture Sciences).

So.: Knizhnaya Litopis', No. 7, 1956.

TEREKHOVA, Lyubov' Andreyevna; DORONINA, R., red.; SHLYK, M., tekhn. red.

[Analysis of the regular flow of production of an enterprise] Analiz ritmichnosti raboty predpriiatiia. Moskva, Mosk. rabochii, 1964. 60 p. (MIRA 17:3)

TEREKHOVA, L.G.

EXCERPTA MEDICA Sec.2 Vol.9/8 Physiology, etc. Aug56

3522. TEREKHOVA L.G. Dept. of Zool., State Inst. of Pedagog., Pskoff. *Lo~~cal anaphylaxi~~s of the respiratory centre in warm-blooded animals and its abolition by labilizing substances (Russian text) ARKH. PATOL. (Moscow) 1955, 3 (15-21) Tables 4

Experiments were made on 1-year-old rabbits in which the medulla oblongata was exposed under local anaesthesia after the usual sensitization with horse serum. Horse serum was then dropped on the medulla oblongata in order to provoke local anaphylaxis. This was followed by dyspnoea which ended in respiratory arrest. The severe disturbances were controlled by labilizing agents (a continuous current anode, adrenaline or 'sympathomimetin'). Aeroionization during sensitization decreased local anaphylactic phenomena. For some time after respiratory arrest there was still a possibility of resuscitation.

Brandt - Berlin

TEREKHOVA, L.G.

Effect of ionizing radiation on the functional state of the respiratory center in rabbits. Med.rad. 3 no.5:11-14 S-O '58 (MIRA 11:12)

1. Iz instituta eksperimental'noy meditsiny (dir - prof. D.A. Biryukov) AMN SSSR i kafedry normal'noy fiziologii (zav. - prof. D.A. Biryukov) I Leningradskogo meditsinskogo instituta.
(ALLERGY, exper.
eff. of total body x-irradiation on resp. (Rus))
(RESPIRATION, eff. of radiation
x-ray total body, in exper. allergy (Rus))
(ROENTGEN RAYS, eff.
on resp. center in exper. allergy (Rus))

TEREKHOVA, ~~L.G.;~~ POLISHCHUK, V.I.

RG1-01 rheograph is a new apparatus for the study of the cardiovascular system. Med. prom. 14 no.8:43-46 Ag '60. (MIRA 13:8)

1. Samostoyatel'noye konstruktorskoye tekhnologicheskoye byuro biologicheskogo i fiziologicheskogo priborostroyeniya.
(MEDICAL INSTRUMENTS AND APPARATUS)

TEREKHOVA, L.G.; SAMORUKOV, I.A.

Sphygomograph SG2-01 is a new apparatus for the compound investigation of the cardiovascular system. Med. prom. 14 no. 10:42-45 O '60. (MIRA 13:10)

1. Samostoyatel'noye konstruktorskoye tekhnologicheskoye byuro "Biofizpribor".

(SPHYGMOGRAPH)

~~TEREKHOVA, L.G.~~, kand.biolog.nauk (Leningrad, P-136, Lakhtinskaya ul., d.25-b, kv.10); EMAN, A.A., inzhener

Surgical polygraph PGKH-01, a new device for the control of physiological processes during surgical operations. Vest.khir. 87 no.11:16-24 N '61. (MIRA 15:11)

1. Iz samostoyatel'nogo konstruktorskogo tekhnologicheskogo byuro biologicheskogo i fiziologicheskogo priborostroyeniya (Leningrad).
(SURGICAL INSTRUMENTS AND APPARATUS)

VAKS, A.I., TEREKHOVA, L.I.

Machining spindles for machine tools. Stan.i instr. 31 no.4:11-18 Ap '60. (MIRA 13:6)
(Spindles (Machine tools))

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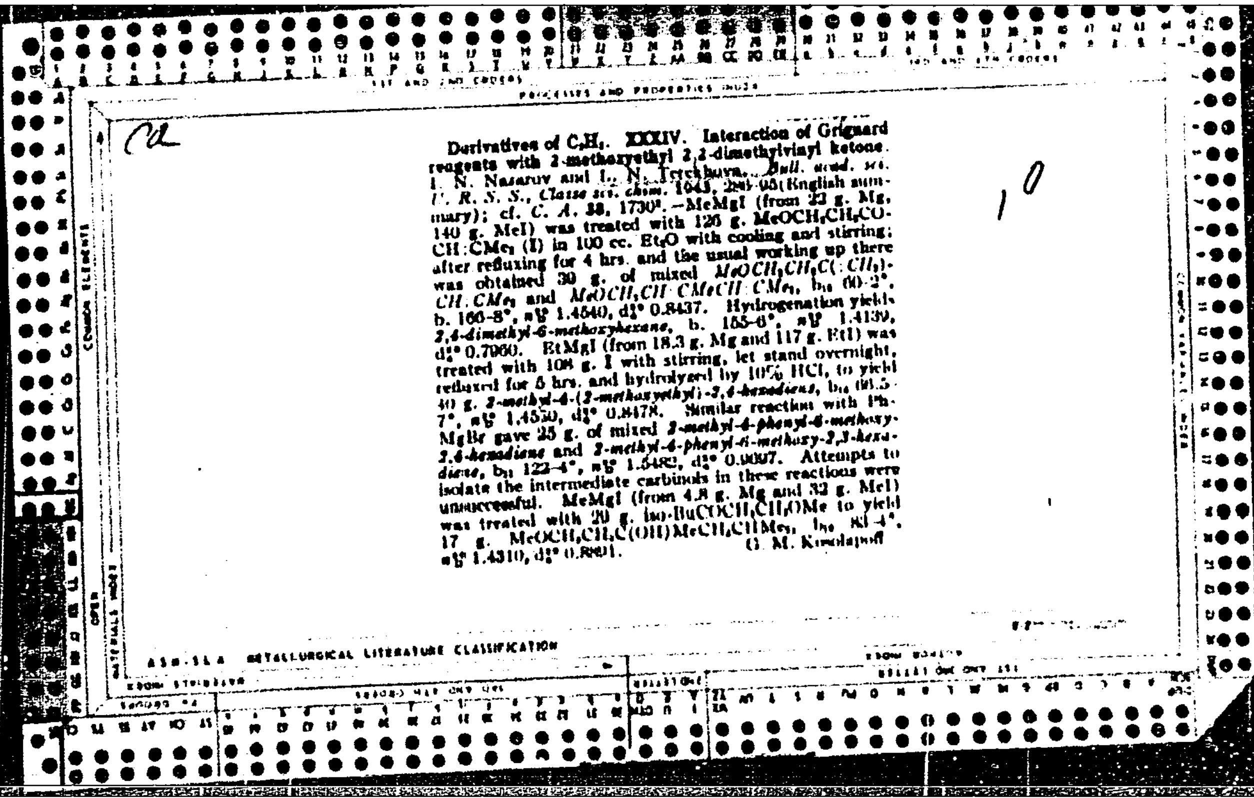
[illegible] , I. N.

Mbr., Inst. Organic Chemistry, Dept. Chem. Sci., Acad. Sci., [illegible].
"The Derivatives Acetylene: XXXI, Synthesis of Tetrahydro-Pyrones By Isomerization of
Vinylethinyl-Carbinols and Hydration of Divinylketones," Iz. Ak. Nauk SSSR, Otdel. Khim.
Nauk, No. 1, 1943;
XXXIV. "Interaction of the Grignard Reagents with B-Methoxyethyl-B, B-
Dimethylvinylketone," Ibid., No. 4, 1943;

XLV. The Addition of Ethyl Malonate, Ethyl Acetate, and Acetylacetone to
B, B-Dimethyldivinyl Ketone," ibid., No. 2, [illegible];
LXXXIX. Transformation of 2-Butyne-1, 4-Diol," ibid., 3, [illegible];
XCIV. Synthesis of Polycyclic Compounds related to Steroids:
Part III. Complete Synthesis of Compounds with Androstane Skeleton and their
Structural Isomers with Methylcyclopentane Ring B, Ibid., 4, [illegible].



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Derivatives of C_5H_8. XXXIV. Interaction of Grignard reagents with 2-methoxyethyl 2,2-dimethylvinyl ketone. I. N. Nazarov and L. N. Terekhova. *Bull. acad. sci. U. R. S. S., Classe sci. chim.* 1943, 289-95 (English summary); cf. *C. A.* 38, 1730⁴.—MeMgI (from 23 g. Mg, 140 g. MeI) was treated with 120 g. $MeOCH_2CH_2CO$-$CH:CMe_2$ (I) in 100 cc. Et_2O with cooling and stirring; after refluxing for 4 hrs. and the usual working up there was obtained 30 g. of mixed $MeOCH_2CH_2C(:CH_2)$-$CH:CMe_2$ and $MeOCH_2CH:CMeCH:CMe_2$, b_{16} 60-2°, b. 160-8°, n_D^{20} 1.4640, d_4^{20} 0.8437. Hydrogenation yields 2,4-dimethyl-6-methoxyhexane, b. 155-6°, n_D^{20} 1.4130, d_4^{20} 0.7960. EtMgI (from 18.3 g. Mg and 117 g. EtI) was treated with 108 g. I with stirring, let stand overnight, refluxed for 5 hrs. and hydrolyzed by 10% HCl, to yield 40 g. *2-methyl-4-(2-methoxyethyl)-2,4-hexadiene*, b_{16} 69.5-7°, n_D^{20} 1.4550, d_4^{20} 0.8478. Similar reaction with PhMgBr gave 25 g. of mixed *2-methyl-4-phenyl-6-methoxy-2,4-hexadiene* and *2-methyl-4-phenyl-6-methoxy-2,3-hexadiene*, b_{11} 122-4°, n_D^{20} 1.5482, d_4^{20} 0.9097. Attempts to isolate the intermediate carbinols in these reactions were unsuccessful. MeMgI (from 4.8 g. Mg and 32 g. MeI) was treated with 20 g. iso-$BuCOCH_2CH_2OMe$ to yield 17 g. $MeOCH_2CH_2C(OH)MeCH_2CHMe_2$, b_{16} 81-4°, n_D^{20} 1.4310, d_4^{20} 0.8901. G. M. Kosolapoff

TEREKHOVA, L. N.

USSR/Chemistry - Acetylene May/June 49

"Acetylene Derivatives: No 89, Transformations of 2-Butyne-1, 4-Diol," I. N. Nazarov, L. N. Terekhova, I. V. Torgov, Inst of Org Chem, Acad Sci USSR, 6pp

"Iz Ak Nauk SSSR, Otdel Khim Nauk" No 3

Describes transformation of 2-butyne-1, 4-diol in a solution of methanol by mercury into 1-methoxy-butane-4-ol-3-on, and latters's behavior in the splitting off of methanol, and in hydrolysis. Isolates 1-butene-4-ol-3-on and studies its properties. Submitted 20 Mar 48.

PA 56/49T9

TEREKHOVA, L. N.

USSR/Chemistry - Acetylene
Chemistry - Androstane

Jul/Aug 49

"Acetylene Derivatives, No 94, Synthesis of Polycyclic Compounds Related to Steriods: III, Complete Synthesis of Compounds With Androstane Skeletons and Their Structural Isomers With Methylcyclopentane Rings B," I. N. Nazarov, L. D Bergel'son, L. I. Shmonina, L. N. Terekhova, Inst of Org Chem, Acad Sci USSR, 4pp

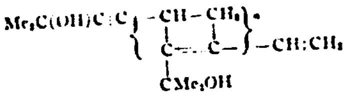
"Iz Ak Nauk SSSR, Otdel Khim Nauk" No 4

Reviews results of 5 years of experiments in subject field in tabular and formulary detail. Submitted 20 Mar 48.

PA 63/49T4

CA

Acetylene derivatives. XCVII. Mechanism of the polymerization of dimethyl(vinylethynyl)carbinol. I. N. Nazarov and L. N. Terekhova (Acad. Sci. U.S.S.R., Moscow). *Izvest. Akad. Nauk S.S.S.R., Otdel Khim. Nauk* 1950, 60-70; cf. *C.A.* 44, 3461d.—$Me_2C(OH)$-$C{:}CCH{:}CH_2$ polymerizes like $CH_2{:}CHC{:}CH$ itself with formation of cyclobutene rings, with 1 vinyl group reacting with the ethynyl group of another mole. The rings thus formed give rise to the primary polymer chains. The intermediate polymers have moderate mol. wts. (1000), as shown by chem. study, and have the structure I. The final polymer is insol. and is a complex tridi-



$$\mathrm{Me_2C(OH)C{:}C}\left\{\begin{matrix}-\mathrm{CH}-\mathrm{CH_2}\\ |\qquad\ |\\ \mathrm{C}=\mathrm{C}-\\ |\qquad\quad\\ \mathrm{CMe_2OH}\qquad\end{matrix}\right\}-\mathrm{CH{:}CH_2}$$

(I)

mensional structure. The monomeric carbinol (from Me_2CO and $CH_2{:}CHC{:}CH$ and KOH), b_9 50°, n_D^{20} 1.4770, forms a sirup at room temp. in 10-20 days and a glass in 40-60 days. Heat or light, or especially peroxides, accelerate the reaction rapidly. Use of 0.01-0.1% HNO_3 gives a stiff jelly within 3-10 hrs. but the glassy polymer does not form. Bz_2O_2 is the most practical catalyst (0.1%). The usual antioxidants act as stabilizers. Stirring 600 g. monomer with 0.05% Bz_2O_2 8-10 hrs. at 60° gave a sirup which after 3 pptns. from Me_2CO-Et_2O yielded the primary polymer as a flaky solid, which was very elastic, and which on further storage changed into the insol. glass; antioxidants prevent this 2nd stage of polymerization. Hydrogenation of the primary polymer over Raney Ni gives a solid, the process requiring 8 times less H than is taken up by the monomer, i.e. the polymerization state is 8. Hydrogenation of 27.4 g. of the primary polymer sirup (above) gave 22.5 g. Me_2BuCOH and 4.5 g. polymer, very similar to the above described but having a polymerization state of 10. The OH groups are intact (RMgX method). Hydrogenation of the primary solid polymer over Raney Ni at 100 atm. H at 150-60° gave the completely satd. polymer, hard amorphous solid, m. 120-70°, sol. in EtOH, Me_2CO, pyridine, slightly in Bu_2O; some OH group loss is shown by a 0.6% deficiency by RMgX analysis; Rast mol. wt. (1012 theoretical for 8-fold polymer) 925 50. Continued hydrogenation at 230-30° led to progressive displacement of the residual OH groups; after 7 hrs. the product contained 79.3% C and 13% H. Passage of 2 l. O contg. 5% O_3 into the primary polymer (8 g.) in Me_2CO and stirring with H_2O_2 at 50° gave 3 g. high-mol. acids (mol. wt. 840-5) and small amts. of HCO_2H; ozonization with 8 l. O gave 4 g. high-mol dicarboxylic acids, yielding a Ag salt corresponding to $(C_7H_{10}O)_4(CO_2Ag)_2$, and 0.18 g. HCO_2H, as well as 0.2 g. $Me_2C(OH)CO_2H$, m. 78°; ozonization with 12 l. O gave 0.3 g. HCO_2H, 0.2 g. $Me_2C(OH)CO_2H$, and 4 g. high-mol. dicarboxylic acids yielding a Ag salt of the compn. $(C_7H_{10}O)_4(CO_2Ag)_2$; finally ozonization with 24 l. O gave dicarboxylic acids which yielded a Ag salt, $(C_7H_{10}O)_2(CO_2Ag)_2$. Oxidation of the primary polymer with alk. $KMnO_4$ at 60° gave AcOH, $(CO_2H)_2$, and $Me_2C(OH)CO_2H$, m. 78-9°. When ozonization was carried to the termination (32 l. O) the dicarboxylic acids isolated yielded a Ag salt corresponding to $C_7H_{10}O(CO_2Ag)_2$

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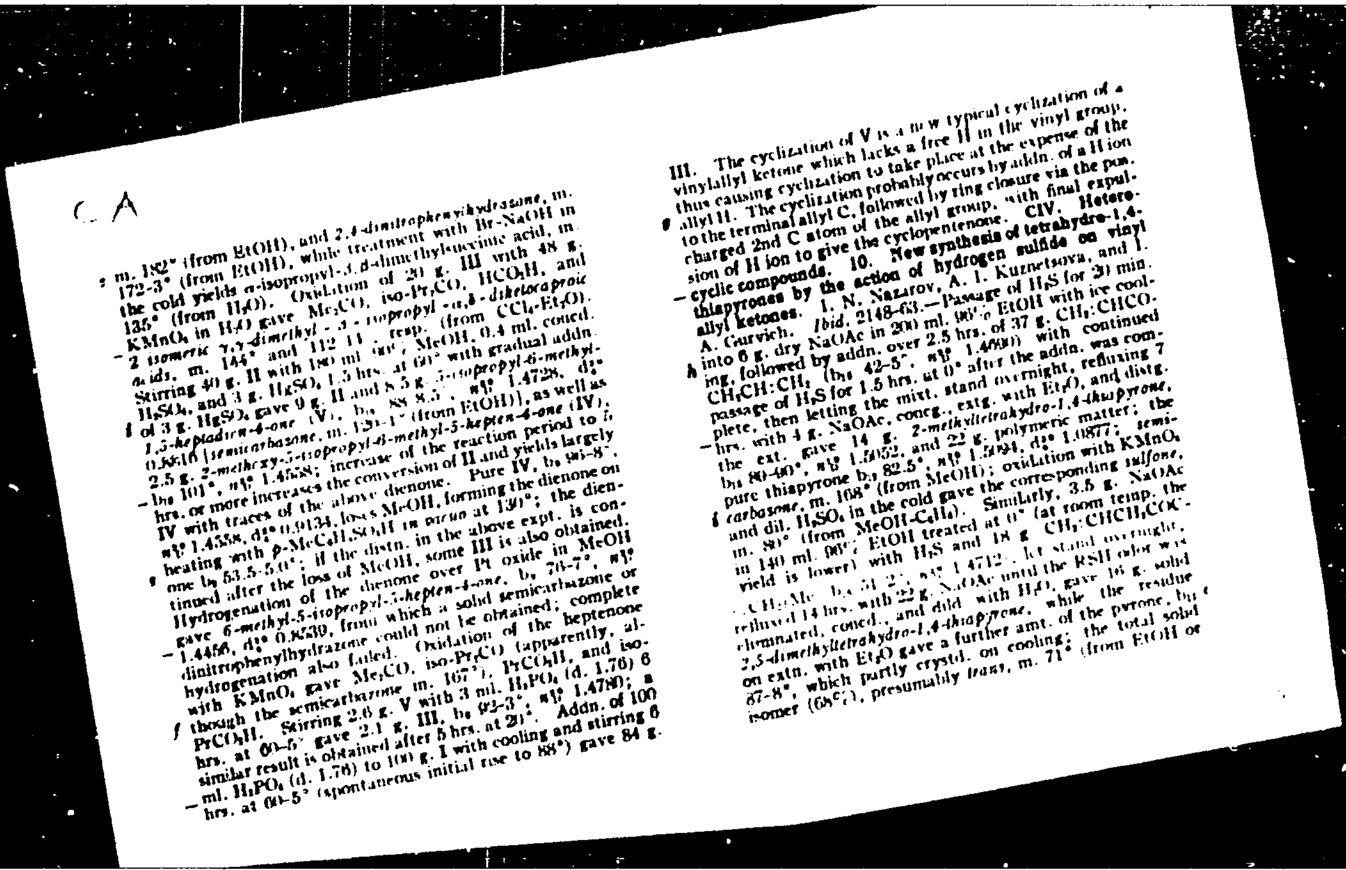
also gave 2 g. of the other tetracyclic ketone (VI or V), b. 179-81°, n_D^{20} 1.5520, which, hydrogenated over Pt, at first in EtOH, then in AcOH, gave the satd. analog, b. 160-74°, n_D^{20} 1.5200; no satisfactory cryst. derivs. of these ketones could be obtained. Heating 5 g. 1-vinyl-1-cyclohexene with 2.5 g. II 20 hrs. at 130° gave 4 g. keto enol (VII), m. 111-12° (from MeOH), which yellows on standing and cannot be hydrogenated over Pd, while over Pt only 2 H can be added, yielding a compd. (VIII), m. 113-18° (crude), m. 120-4° (from MeOH). Condensation of 2 g. II with 3 g. 1-vinyl-Δ¹-octahydronaphthalene in 20 ml. dioxane gave in 5 hrs. at 128-30° 4.7 g. resinous products, which gave 1 g. of a compd. (IX), m. 199-201° (from EtOH), hydrogenated to the monoolefin (X), m. 140-2° (from EtOH). **CVIII. Synthesis of polycyclic compounds related to sterols. 5. Total synthesis of a stereoisomer of 15-methylandrostenedione.** I. N. Nazarov and L. D. Bergel'son. *Ibid.* 618-60. *2-Methoxy-1,3-butadiene* (I), b. 74.8-5.1°, n_D^{20} 1.4438, was prepd. by addn. of MeOH to $CH_2:CHC:CH$, followed by cleavage of MeOH by $KHSO_4$ from the tri-MeO deriv. *1-Methyl-1-cyclohexen-6-one* (II), b. 65-7°, n_D^{20} 1.4812, was obtained from 2-methylcyclohexanone by a method to be later described. Heating I with a large excess of II (the use of lower ratios gives much dimerization and polymerization of I) in CO_2 with 0.5% pyrogallol to 190-210° for 3-40 hrs. yields up to 25% *cis-6-methoxy-8a-methyl-Δ⁶-octahydro-1-naphthalenone* (III) (C.A. numbering), b. 95-7°, n_D^{20} 1.5100 (other values: b. 115-17°, b. 98-102°, n_D^{20} 1.5078-1.5116); on repeated distn. the product b. 102°, n_D^{20} 1.5092; *semicarbazone*, m. 204° (from EtOH). Hydrogenation over Pd gave the *decahydro analog*, b. 125-8°, n_D^{20} 1.5000; *semicarbazone*, m. 200.5° (from EtOH). Shaking III with 3% HCl gave the hydrolysis product, *8a-methyl-1,6-diketodecahydronaphthalene*, m. 57° (from C_6H_6), whose *disemicarbazone* m. 221-2° (decompn.). III (19 g.) in Et_2O treated with C_2H_2 at -70° for 0.75 hr., then in a continued C_2H_2 stream with 20 g. K in 100 ml. *tert*-AmOH and 50 ml. Et_2O, with stirring and C_2H_2 passage continued for 6 hrs. at -70°, and the mixt. allowed to stand overnight and stirred 2 hrs. at room temp., gave, after the usual treatment with H_2O and neutralization of the org. layer with CO_2, 17.4 g. *1-ethynyl-6-methoxy-8a-methyloctahydro-1-naphthol*, b. 114-16° (in a N atm.), n_D^{20} 1.5218, hydrogenated over Pt to the *1-ethyl analog*, b. 104-8°, n_D^{20} 1.5110, which, shaken 1 hr. with 3% HCl, gave *1-ethyl-6-keto-8a-methyldecahydro-1-naphthol*, m. 102° (from petr. ether); *semicarbazone*, m. 226-8° (decompn.; from EtOH). The ethynyl compd. shaken 1 hr. with 5% HCl gave *1-ethynyl-6-keto-8a-methyldecahydro-1-naphthol*, m. 158° (from petr. ether-EtOH); *semicarbazone*, decomp. 232° (from EtOH). The mother liquor, after removal of the above keto compd., yielded an impure *isomer* of the same, b. 134-7°. Exhaustive hydrogenation of the isomer m. 158° gave *1-ethyl-6-keto-8a-methyldecahydro-1-naphthol*, m. 101-2°, identical with that made by hydrolysis of the methoxyoctanol deriv. Partial hydrogenation of the 1-ethynyl analog gave *1-vinyl-6-methoxy-8a-methyloctahydro-1-naphthol*, b. 113-16°, n_D^{20} 1.5108 (IV). Shaking IV with 3% HCl gave *1-vinyl-6-keto-8a-methyldecahydro-1-naphthol*, b. 131-5°, n_D^{20} 1.5141, whose *2,4-dinitrophenylhydrazone* m. 131° (from EtOAc-EtOH). Partial hydrogenation of 1-ethynyl-6-keto-8a-methyldecahydro-1-naphthol over Pd in EtOH gave the *1-vinyl analog* (V), b. 129-35°, n_D^{20} 1.5050, which retains some EtOH (*2,4-dinitrophenylhydrazone*, m. 130-2°, identical with the sample prepd. by the method immediately above). V (1.7 g.) heated with 0.9 g. powd. $KHSO_4$ to 100° at 60



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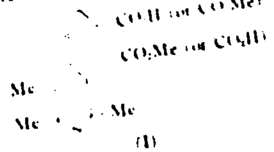
m. 182° (from EtOH), and *2,4-dinitrophenylhydrazone*, m. 172-3° (from EtOH), while treatment with Br-NaOH in the cold yields α-isopropyl-β,β-dimethylsuccinic acid, m. 135° (from H_2O). Oxidation of 20 g. III with 48 g. $KMnO_4$ in H_2O gave Me_2CO, iso-Pr_2CO, HCO_2H, and *2 isomeric γ,γ-dimethyl-β-isopropyl-α,δ-diketocaproic acids*, m. 144° and 112-14°, resp. (from CCl_4-Et_2O). Stirring 40 g. II with 180 ml. 90% MeOH, 0.4 ml. concd. H_2SO_4, and 3 g. $HgSO_4$ 1.5 hrs. at 60° with gradual addn. of 3 g. $HgSO_4$ gave 9 g. II and 8.5 g. *5-isopropyl-6-methyl-1,5-heptadien-4-one* (V), b_{10} 88-8.5°, n_D^{20} 1.4728, d_4^{20} 0.8616 [*semicarbazone*, m. 130-1° (from EtOH)], as well as 2.5 g. *2-methoxy-5-isopropyl-6-methyl-5-hepten-4-one* (IV), b_{10} 101°, n_D^{20} 1.4558; increase of the reaction period to 6 hrs. or more increases the conversion of II and yields largely IV with traces of the above dienone. Pure IV, b_9 96-8°, n_D^{20} 1.4558, d_4^{20} 0.9134, loses MeOH, forming the dienone on heating with p-$MeC_6H_4SO_3H$ *in vacuo* at 130°; the dienone b_9 83.5-5.0°; if the distn. in the above expt. is continued after the loss of MeOH, some III is also obtained. Hydrogenation of the dienone over Pt oxide in MeOH gave *6-methyl-5-isopropyl-5-hepten-4-one*, b_9 76-7°, n_D^{20} 1.4456, d_4^{20} 0.8530, from which a solid semicarbazone or dinitrophenylhydrazone could not be obtained; complete hydrogenation also failed. Oxidation of the heptenone with $KMnO_4$ gave Me_2CO, iso-Pr_2CO (apparently, although the semicarbazone m. 167°), $PrCO_2H$, and iso-$PrCO_2H$. Stirring 2.6 g. V with 3 ml. H_3PO_4 (d. 1.70) 6 hrs. at 60-5° gave 2.1 g. III, b_8 92-3°; n_D^{20} 1.4780; a similar result is obtained after 5 hrs. at 20°. Addn. of 100 ml. H_3PO_4 (d. 1.78) to 100 g. I with cooling and stirring 6 hrs. at 60-5° (spontaneous initial rise to 88°) gave 84 g. III. The cyclization of V is a new typical cyclization of a vinylallyl ketone which lacks a free H in the vinyl group, thus causing cyclization to take place at the expense of the allyl H. The cyclization probably occurs by addn. of a H ion to the terminal allyl C, followed by ring closure via the pos. charged 2nd C atom of the allyl group, with final expulsion of H ion to give the cyclopentenone. CIV.

Heterocyclic compounds. 10. New synthesis of tetrahydro-1,4-thiapyrones by the action of hydrogen sulfide on vinyl allyl ketones. I. N. Nazarov, A. I. Kuznetsova, and I. A. Gurvich. *Ibid.* 2148-63.—Passage of H_2S for 20 min. into 6 g. dry NaOAc in 200 ml. 90% EtOH with ice cooling, followed by addn. over 2.5 hrs. of 37 g. CH_2:CHCOCH$_2$CH:CH$_2$ (b_{14} 42-5°, n_D^{20} 1.4600) with continued passage of H_2S for 1.5 hrs. at 0° after the addn. was complete, then letting the mixt. stand overnight, refluxing 7 hrs. with 4 g. NaOAc, concg., extg. with Et_2O, and distg. the ext. gave 14 g. *2-methyltetrahydro-1,4-thiapyrone*, b_{11} 80-90°, n_D^{20} 1.5052, and 22 g. polymeric matter; the pure thiapyrone b_{13} 82.5°, n_D^{20} 1.5094, d_4^{20} 1.0877; *semicarbazone*, m. 168° (from MeOH); oxidation with $KMnO_4$ and dil. H_2SO_4 in the cold gave the corresponding *sulfone*, m. 80° (from MeOH-C_6H_6). Similarly, 3.5 g. NaOAc in 140 ml. 90% EtOH treated at 0° (at room temp. the yield is lower) with H_2S and 18 g. CH_2:CHCH$_2$COCH:CHMe, b_{14} 51-2°, n_D^{20} 1.4712, let stand overnight, refluxed 14 hrs. with 22 g. NaOAc until the RSH odor was eliminated, concd., and dild. with H_2O, gave 16 g. solid *2,5-dimethyltetrahydro-1,4-thiapyrone*, while the residue on extn. with Et_2O gave a further amt. of the pyrone, b_{11} 87-8°, which partly crystd. on cooling; the total solid isomer (68%), presumably *trans*, m. 71° (from EtOH or petr. ether), with a sharp odor; *semicarbazone*, m. 173-4° (from EtOH); *2,4-dinitrophenylhydrazone*, m. 188° (from EtOH). Combining the residual liquids from the trans isomer sepn. gave on repeated distn. (from 147 g. crude) 10.5 g. liquid mixt. of the cis and *trans isomers*, b_3 94°, n_D^{20} 1.5808, d_4^{20} 1.0851, which formed a *semicarbazone*, m. 171-2°, giving no depression with the deriv. of pure trans isomer; fractional crystn. of the *2,4-dinitrophenylhydrazones* of the mixt., however, gave the deriv. of the trans isomer (see above) and that of the *cis isomer*, orange, m. 142-3° (from EtOH); the distn. residues also yielded 16 g. *1,3-dimethyl-5-cyclopenten-3-one*, b. 162.5°, n_D^{20} 1.4651, formed by cyclization of the initial ketone. Boiling the liquid form of the thiapyrone with MeONa in MeOH 5 hrs. gave almost 90% of the trans isomer; the latter with $KMnO_4$ in dil. Me_2CO in the presence of dil. H_2SO_4 gave the corresponding *sulfone*, m. 138° (from EtOH), isolated from the aq. soln. Oxidation of the liquid mixt. of the thiapyrones gave from the aq. layer some sulfone identical with the above, while the Et_2O ext. gave the *sulfone* of the *cis form*, m. 103-4° (from EtOH). Boiling the cis sulfone in MeOH with a little MeONa 2 hrs. gave the *trans sulfone*. Passage of H_2S 20 min. into 0.4 g. NaOAc in 150 ml. ice-cooled Me_2CO and 1.5 ml. H_2O, followed by addn. of 14.5 a g. $CH_2:CHCH_2COC(:CH_2)Me$ over 1 hr. with continued passage of H_2S 3 hrs. at 0°, addn. of 0.5 g. pyrogallol, letting stand overnight, and concg. the soln. *in vacuo*, gave upon extn. with Et_2O 7 g. *2-methylhexane-1,5-dithiol-3-one*, b_{10} 98.5°, n_D^{20} 1.5120, d_4^{20} 1.0755, having a foul odor, giving a pos. SH test with HNO_2, and yielding glassy products with HgCN and C_6H_5CNO; boiling this dithiol with alc. NaOAc 4.5 hrs. gave much H_2S and the *trans isomer* of the thiapyrone described above, thus indicating that the dithiol is the intermediate product in its synthesis. e Similarly 27 g. low-boiling isomer of $MeCH:CMeCOCH_2CH:CH_2$ (b_{12} 64.5°, n_D^{20} 1.4720) with NaOAc in 90% EtOH and H_2S gave 64% *2,3,6-trimethyltetrahydro-1,4-thiapyrone*, b_4 84.6°, n_D^{20} 1.4960; the same reaction with 340 g. of the high-boiling isomer of the dienone (b_{15} 65-8°) gave 238 g. identical thiapyrone, b_4 79-80°, n_D^{20} 1.4960, as well as 80 g. of a mixt. of the 2 isomeric forms, f b_4 77-9°; the main product, on repeated distn., b_4 79°, n_D^{20} 1.4963, d_4^{20} 1.0288; *semicarbazone*, m. 173° (from EtOH); fractional crystn. of the semicarbazones formed from the isomer mixt. (above) gave a *semicarbazone* identical with the above and one m. 135° (from EtOH); the free thiapyrone of the latter was not isolated. Oxidation of the thiapyrone by $KMnO_4$ in dil. Me_2CO in the presence of H_2SO_4 gave the *sulfone*, m. 128°, $b_{0.1}$ 118-22°. Similarly NaOAc and H_2S in dil. Me_2CO with 44 g. $EtCH:CMeCOCH_2CH:CH_2$ g gave 67% *2,3-dimethyl-6-ethyltetrahydro-1,4-thiapyrone*, b_5 81°, n_D^{20} 1.4918, d_4^{20} 1.0150 [*semicarbazone*, m. 150.5° (from EtOH)]; oxidation (above) gave the *sulfone*, b_1 130°, n_D^{20} 1.4900, which could not be crystd.; *semicarbazone*, m. 180° (from EtOH). Similarly, 20.5 g. $EtCH:CPrCOCH_2CH:CH_2$ gave 8.7 g. *2-methyl-3-propyl-6-ethyltetrahydro-1,4-thiapyrone*, b_3 114°, n_D^{20} 1.4902, d_4^{20} 0.9904. Similar reaction of 97 g. allyl 1-cyclohexenyl ketone gave 34 g. solid *2-methylhexahydro-4-thiachromanone* (*trans isomer*), m. 77.5° (from MeOH) i [*semicarbazone*, m. 203-3.5° (from MeOH); *2,4-dinitrophenylhydrazone*, m. 221° (from C_6H_6-petr. ether)], and 30 g. liquid *mixt.* of *cis-trans isomers*, which yielded an

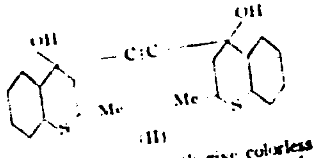
CA

unstated amt. of impure *cis isomer*, b_5 111°, n_D^{20} 1.5270, d_4^{20} 1.0578, forming a *mixt.* of *2,4-dinitrophenylhydrazones* sepd. by crystn. from EtOH into the deriv. m. 223° (above), and that m. 184°, apparently of the *cis isomer*; a colorless substance, m. 215°, was also isolated but not identified. Repetition of the synthesis with 120 g. ketone, 20 g. NaOAc, and 500 ml. 90% EtOH, H_2S passage as above, with refluxing for 32 hrs. after the addn., gave 40 g. mixed solid thiochromanones and 60 g. liquid fractions; fractional distn. and freezing of the liquid portions gave 1.8 g pure *cis isomer* m. 65° (from MeOH). Boiling the pure cis isomer or its mixts. with the trans form in MeOH contg. a little MeONa gave the pure trans form. $KMnO_4$ oxidation of the trans compd. gave the corresponding *sulfone*, m. 157-8° (from EtOH), while the cis isomer gave the *cis sulfone*, m. 144° (from EtOH); the latter may be sepd. from mixts. with the trans isomer by pptn. with petr. ether from C_6H_6. Boiling the sulfones with a 0.15% soln. of MeONa in MeOH failed to effect isomerization; longer boiling or the use of higher MeONa concns. led to decompn. It is interesting to note that while the *cis-2-methylhexahydro-4-thiachromanone* yields a *2,4-dinitrophenylhydrazone*, m. 181°, distinct from that of the trans isomer, the semicarbazones formed from the cis isomeric thiachromanones are identical and m. 202.5-3°.

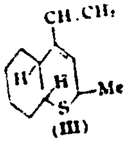
CV. **Heterocyclic compounds. II. Synthesis of 4-ethynyltetrahydrothiapyran-4-ols by condensation of acetylene with tetrahydro-1,4-thiapyrones.** *Ibid.* 2164-74.—Dry Et_2O (90 ml.) and 5.1 g. powd. KOH satd. with C_2H_2 at −8° were treated in a continuous C_2H_2 stream with 14 g. 2,5-dimethyltetrahydro-1,4-thiapyrone (m. 71°) in 70 ml. Et_2O over 1 hr.; after 3 hrs. of further treatment with C_2H_2, the mixt. was sepd. and the org. layer washed with H_2O and dil. HCl until neutral, while the aq. layer was dild. and extd. with Et_2O; the combined org. layers gave 3 g. original thiapyrone and 5.8 g. *2,5-dimethyl-4-ethynyltetrahydrothiapyran-4-ol*, b 88°, n_D^{20} 1.5250, d_4^{20} 1.0680; this was hydrogenated over Pd-$CaCO_3$ in EtOH to the *4-Et analog*, b 110-11°, n_D^{20} 1.5140, d_4^{20} 1.0341, also obtained in 88% yield (b 99-100°) from the thiapyrone and EtMgBr. Similarly, 32 g. 2,3,6-trimethyltetrahydro-1,4-thiapyrone gave 18.1 g. *2,3,6-trimethyl-4-ethynyltetrahydrothiapyran-4-ol*, b 102-2.5°, n_D^{20} 1.5185, d_4^{20} 1.0171, which gives the typical Ag acetylide ppt. with NH_3-Ag_2O, while partial hydrogenation in EtOH over Pd gave the *4-vinyl analog*, b 100.5-1.0°, n_D^{20} 1.5148, d_4^{20} 1.0220, and continued hydrogenation gave in 24 hrs. the *4-Et analog*, b 100°, n_D^{20} 1.5065, d_4^{20} 1.0147; this, obtained from the thiapyrone and EtMgBr, b 100.6-7°, n_D^{20} 1.5063, d_4^{20} 1.0163. Distn. of 17.2 g. of the 4-vinyl compd. with 5 g. $KHSO_4$ at 150-60° at 17 mm. gave 3 g. unreacted alc. and 8.8 g. *2,3,6-trimethyl-4-vinyl-5,6-dihydro-1,2H-thiapyran*, b 85°, n_D^{20} 1.5278, d_4^{20} 0.9902; similar dehydration of 11.2 g of the alc. with 0.35 g. *p*-$MeC_6H_4SO_3H$ at 160-70° gave 6.5 g. of the above diene; the latter heated with maleic anhydride to 100° 1 hr. in C_6H_6 in a sealed tube yielded the adduct, which with MeOH gave the compd. I, m. 157° (from C_6H_6-petr. ether); hydrogenation of the diene over Pd gave *2,3,6-trimethyl-4-ethyltetrahydrothiapyran*, b. 75.6° (?), n_D^{20} 1.4970, d_4^{20} 0.9355, which was not completely pure. Similarly C_2H_2 with 16.8 g. KOH in 400 ml. Et_2O and 53 g. *trans*-2-methylhexahydro-4-thiachromanone in 200 ml. Et_2O gave 40.7 g. mixed *isomers of 2-methyl-4-ethynylhexahydro-4-thiachromanol*, b_5 115-7°, n_D^{20} 1.5400; treatment with EtOH gave the *high-melting* isomer (13 g.), m. 112° (from EtOH), while petr. ether added to the residue yielded 10.5 g. low-melting isomer, m.



(I)



(II)



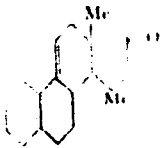
(III)

94° (from ligroin); both give colorless ppts. of Ag acetylides with NH3-Ag solns. and on heating to 120-30° with alkali yield C_2H_2. The residual material after isolation of the isomeric thiachromanols gave with EtOH an unstated amt. of an *acetylenic glycol*, $C_{22}H_{26}O_2S_2$, m. 221° (from EtOH), which does not give a test with NH3-Ag; it probably has the structure II. Hydrogenation of the high-melting ethynylthiachromanol over Pd gave the *high-melting isomer* of the *4-vinyl analog*, m. 94° (from EtOH), while the *low-melting isomer*, m. 78° (from ligroin), b₁ 155-6°, was similarly obtained from the low-melting ethynylthiachromanol. Complete hydrogenation similarly gave the *high-melting isomer* of the *4-Et deriv.*, b₁₄ 148°, m. 55° (from petr. ether), and the *low-melting isomer*, which does not freeze at −10°, b₁ 154°, n_D^{20} 1.5291. Oxidation of the former with $KMnO_4$ with cooling gave the *sulfone*, $C_{12}H_{22}O_2S$, m. 140° (from C_6H_6-ligroin), while the low-melting isomer gave a *sulfone* m. 178° (from C_6H_6).—Treatment of 10 g. *trans*-2-methylhexahydro-4-thiachromanone (10 g.) with EtMgBr (from 7.8 g. EtBr) gave 9 g. of the 4-ethyl-4-thiachromanol, m. 55°, identical with the above-described. Dehydration of the high-melting 4-vinyl alc. with p-$MeC_6H_4SO_3H$ at 140° in vacuo gave the *diene* (III), b₁₁ 140-1°, n_D^{20} 1.5607, d_4^{20} 1.0112; similarly the low-melting isomer gave the *diene*, b₁₁ 138-41°, n_D^{20} 1.5405; either diene warmed with maleic anhydride gave the *adduct*, m. 154° (from C_6H_6-petr. ether), which boiled with H_2O gave the corresponding *dibasic acid*, $C_{16}H_{22}O_4S$, isolated as the *dihydrate*, m. 206°. **CVI. Condensation of vinylacetylene with tetrahydro-1,4-thiapyrones. Synthesis of 4-(vinylethynyl)tetrahydrothiapyran-4-ol.** *Ibid.* 20, 376-84 (1950).—Addn. of 20 g. $CH_2{:}CHC{:}CH$ and 36 g. 2,2-*dimethyltetrahydro-1,4-thiapyrone* (I) in 60 ml. Et_2O to 15 g. powd. KOH in 20 ml. Et_2O at 0°, followed by an addnl. stirring 8 hrs. at 0° and 4 hrs. at room temp., gave 22 g. *2,2-dimethyl-4-(vinylethynyl)tetrahydrothiapyran-4-ol* (II), b₂ 131-2°, n_D^{20} 1.5158, d_4^{20} 1.0521, also obtained, b₁ 122-3°, n_D^{20} 1.5158, in 82% yield from the vinylacetylene Grignard reagent and the thiapyrone. The pyranol heated in vacuo with $KHSO_4$ (with pyrogallol) gave 2,2-*dimethyl-4-vinylethynyl-3,4-dihydro-1,2H-thiapyran*, b₁ 110.5-11.5°, n_D^{20} 1.5656, d_4^{20} 0.9917, which on hydrogenation over Pd-$CaCO_3$ gave the *4-butyl-2,2-dimethyltetrahydrothiapyran*, b₁₁ 110-10.5°, n_D^{20} 1.4885, d_4^{20} 0.9167. BuMgCl (from 11.5 g. BuCl) treated with I gave 60% 2,2-

mm. 0.5 hr. gave *1-vinyl-6-keto-8a-methyl-Δ¹-octahydronaphthalene*, $b_{1.5}$ 100-2°, n_D^{20} 1.5802 (*semicarbazone*, decomp. 226-7°), which (1.5 g.) heated 2 hrs. at 120° with 0.8 g. maleic anhydride gave 1.4 g. *7-keto-4b-methyldodecahydro-1,2-phenanthrenedicarboxylic acid* (C.A. numbering), m. 202° (from petr. ether), after treatment with dil. HCl, Na_2CO_3, and acidification; the *semicarbazone* of the acid decomp. 238.9° (from EtOH). Substitution of *1,3-dimethyl-1-cyclopenten-5-one* (b_{20} 83-4°, n_D^{20} 1.4660) for maleic anhydride in the above reaction gave in 6 hrs. at 200-5° (large excess of cyclopentenone used) 1.5 g. (from 2.2 g. dienone) of *15-methyl-Δ⁸⁽¹⁴⁾-androstene-3,17-dione*, plates, m. 161° (from petr. ether-C_6H_6); *monosemicarbazone*, m. 219-21°; the compd. did not take up H over Pt even at 100°. IV (2.2 g.) in dry Me_2CO treated with 0.8 g. P_2O_5 and stirred 12 min. in the cold and 20 min. at 50° gave 1.4 g. *1-methoxy-1-vinyl-6-keto-8a-methyldecahydronaphthalene*, b_1 101-3°, n_D^{20} 1.5042, also formed with p-$MeC_6H_4SO_3H$ at 110-15° or $KHSO_4$ at 120° (best yield); *2,4-dinitrophenylhydrazone*, m. 137-8° (from EtOH-C_6H_6); hydrogenation over Pt gave the *1-Et analog*, $b_{0.5}$ 97-100°, n_D^{20} 1.4913. Since IV could not be dehydrated normally, Chugaev's method (K and CS_2 in xylene) was tried with MeI; the unidentified *product*, b_1 124-8°, n_D^{20} 1.5290, again was not the "normal" product and failed to react with maleic anhydride even at 150°.

CIX. Synthesis of polycyclic compounds related to sterols. 6. Total synthesis of an isomer of 15-methylandrostene-3,17-dione with a methylcyclopentane ring B. I. N. Nazarov, I. N. Terekhova, and L. P. Bergel'son. *Ibid.* 661-70. 1,3-Dimethyl-1-cyclopenten-5-one (60 g.), 37 g. $CH_2:C(OMe)CH:CH_2$, and [illegible] pyrogallol

after 2 hrs. at 200° gave 5.6 g. unreacted ketone and 13 g. *3,7a-dimethyl-5-methoxy-Δ⁴-tetrahydro-1-indanone* (C.A. numbering) (I), b_1 110-12°, n_D^{20} 1.4950, d_4^{20} 1.059 (which gave no cryst. derivs.). Hydrogenation at 100° in dioxane over Pd gave *5-methoxy-3,7a-dimethyl-1-hydrindanone* (C.A. numbering), $b_{0.6}$ 110-12°, n_D^{20} 1.4783, d_4^{20} 1.012, *2,4-dinitrophenylhydrazone*, m. 98-8.5° (from C_6H_6-petr. ether). I shaken 3 hrs. with 3% HCl gave *3,7a-dimethylhydrindan-1,5-dione*, $b_{0.6}$ 101-2°, n_D^{20} 1.4928 (*disemicarbazone*, decomp. 241.5°). I (7.0 g.) treated in Et_2O at -70° with C_2H_2, followed by 11 g. K and 90 g. iso-AmOH, still in a C_2H_2 stream, gave, after an addnl. 7 hrs.' stirring at -70°, standing overnight, and continued stirring 10 hrs. at 10°, 4.3 g. *1-ethynyl-5-methoxy-3,7a-dimethyl-Δ⁴-tetrahydro-1-indanol*, b_1 120-2°, n_D^{20} 1.5175, which on repeated distn. isomerized into *3,7a-dimethyl-1-ethynyl-1-methoxy-5-ketohydrindan*, b_1 101-7°, n_D^{20} 1.4945, d_4^{20} 1.043 (*2,4-dinitrophenylhydrazone*, m. 111°). Stirring the MeO compd. (preferably in the crude reaction mixt. of the initial prepn.) with 10% HCl 5 hrs. at room temp. readily gave *1-ethynyl-5-keto-3,7a-dimethylhydrindan-1-ol*, m. 135° (II) (*semicarbazone*, m. 188-8.5°), along with some MeO deriv. (above) which can be isolated from the mother liquor. Hydrogenation of II over Pd in dioxane gave the *1-vinyl analog*, m. 70-1° (from EtOH) (*semicarbazone*, m. 180-7° (from EtOH)), which heated with $KHSO_4$ at 80 mm. to 120-30°, dehydrated readily to the corresponding Δ¹-hexahydroindene (IIa), $b_{0.5}$ 105-6°, n_D^{20} 1.5070, d_4^{20} 0.9824 (*semicarbazone*, m. 192-3°). This (0.8 g.) and 0.4 g. maleic anhydride, after 2 hrs. at 120°, gave *6,9-dimethyl-7-ketodecahydro-1,2-fluorenedicarboxylic anhydride* (C.A.



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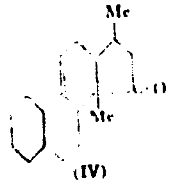

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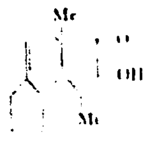

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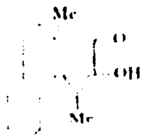
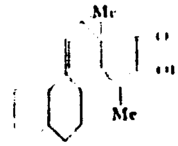


(VIII)

hydro-2-naphthol, prepd. analogously in 70% yield, b_{10} 115-18°, n_D^{20} 1.5xxx, on hydrogenation over Pt gave the *2-vinyl analog*, b_{10} 119-20°, n_D^{20} 1.5050, d_4^{20} 0.9005, which on dehydration, as above, at 150-60° gave 80% *2-vinylocta-hydronaphthalenes*, b_{10} 132-4°, n_D^{20} 1.5180, d_4^{20} 0.9274.



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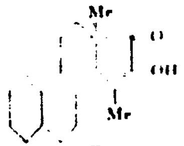

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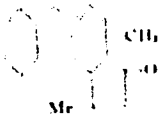

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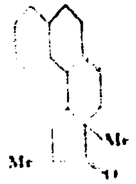


(VI)

which on condensation with *maleic anhydride* gave an *adduct*, decomp. 116-17°, probably a mixt. of *Δ¹-dodecahydro-1,2-anthracenedicarboxylic anhydride* and *Δ¹-dodecahydro-5,6-phenanthrenedicarboxylic anhydride*. heating the mixed dienes (14 g.) with 25 g. I and 0.4 g. pyrogallol 6 hrs. to 198-200° in a metal ampul gave 27 g. unreacted matter and 4 g. condensate, tetracyclic ketone (V or VI), b_1 155-6°, n_D^{20} 1.5290, d_4^{20} 1.0888; hydrogenation over Pt in EtOH gave the *satd. analog*, $C_{19}H_{30}O$, b_1 156-8°, n_D^{20} 1.5220; repeated fractionation of the condensation mixt.

pure III, b$_4$ 144-6°, n_D^{20} 1.6891; *semicarbazone*, m. 226-7°
(from MeOH). Condensation of 13 g. cyclohexyl hexa-
hydrobenzyl ketone and 11 g. CH$_2$:CHC:CH with 13 g.
KOH in cold Et$_2$O gave after 24 hrs. 9 g. *cyclohexyl(hexa-*
hydrobenzyl)(vinylethynyl)carbinol, b$_4$ 157-9°, n_D^{20} 1.5167,
d_4^{20} 0.9701 (also obtained in 58-g. yield by the Grignard
reaction from 48 g. CH$_2$:CHC:CH, 10.9 g. Mg, 55 g. EtBr,
and 57 g. of the above ketone). The carbinol on hydro-
genation over Adams catalyst gave *butylcyclohexyl(hexa-*
hydrobenzyl)carbinol, b$_4$ 129-33°, n_D^{20} 1.4920, d_4^{20} 0.9471,
while stirring with sirupy H$_3$PO$_4$ 5 hrs. at 60-5° gave 35%
5,6-dicyclohexyl-1,5-hexadien-3-yne (IV), b$_4$ 135-7°, b$_{3.5}$
124-6°, n_D^{20} 1.5310, d_4^{20} 0.9331; the same is obtained by
using 60% H$_2$SO$_4$, but KHSO$_4$ is ineffective. The hy-
drocarbon upon hydrogenation over Adams catalyst in
AcOH gave *1,2-dicyclohexylhexane*, b$_3$ 111-13°, n_D^{20} 1.4850,
d_4^{20} 0.8017, while stirring 15 hrs. at 60-5° with aq. MeOH
and a trace of H$_2$SO$_4$ mixt. with HgSO$_4$ (as described above)
gave 50% *5,6-dicyclohexyl-1,5-hexadien-4-one*, b$_4$ 143-5°,
n_D^{20} 1.5042, d_4^{20} 0.9613, very easily oxidized by air and form-
ing the *2,4-dinitrophenylhydrazone*, m. 60-5°, hydrogena-
tion of this ketone over Adams catalyst in AcOH gave
5,6-dicyclohexyl-4-hexanone, b$_4$ 122-4°, n_D^{20} 1.4912, d_4^{20}
0.9550, while stirring 5 hrs. with H$_3$PO$_4$ (d. 1.81) at 70-5°
gave *1,2-dicyclohexyl-3-methyl-1-cyclopenten-5-one*, b$_4$
142-3°, n_D^{20} 1.5225, d_4^{20} 0.9973, which gives 2 *isomeric 2,4-*
dinitrophenylhydrazones, m. 136-7° and 190° (from
MeOH), and which cannot be hydrogenated in AcOH over
Pt; this ketone cannot be prepd. by cyclization of IV
with H$_3$PO$_4$. Ozonization of this ketone gave *cyclohex-*
anecarboxylic acid, b$_{19}$ 130-9°, m. 21-2°, and a solid, m
162°, b$_{0.4}$ 170-84°, possibly the keto acid *C$_6$H$_{11}$COCH-*
MeCH$_2$CO$_2$H CIII. **Mechanism of hydration and cy-**
clization of dienynes 21. Hydration of 5-isopropyl-6-
methyl-1,5-heptadien-3-yne to 5-isopropyl-6-methyl-1,5-
heptadien-4-one and its cyclization to 1-isopropyl-2,2,3-
trimethyl-3-cyclopenten-5-one. New case of cyclization
of substituted vinyl allyl ketones without a free hydrogen
atom in the vinyl radical. I. N. Nazarov and L. N.
Pinkina. *Ibid.* 1870-81.—Powd. KOH (132 g.), 270 ml.
dry Et$_2$O, and 50 g. CH$_2$:CHC:CH treated at −5° with
180 g. iso-Pr$_2$CO and 115 g. CH$_2$:CHC:CH in 480 ml
Et$_2$O over 2 hrs., followed by stirring in the cold 5 hrs.
and standing overnight with addnl. stirring 5 hrs., gave
170 g. *diisopropyl(vinylethynyl)carbinol* (I), b$_6$ 78°, n_D^{20}
1.4778, d_4^{20} 0.8859, which polymerizes on standing. I
(10 g.) hydrogenated over Pt oxide in AcOH gave *butyldi-*
isopropylcarbinol, b$_{10}$ 85°, n_D^{20} 1.4455, d_4^{20} 0.8490. Stirring
50 g. I with 50 g. 60% H$_2$SO$_4$ 40 min. at 60° gave 35.5 g.
2 *6-methyl-5-isopropyl-1,5-heptadien-3-yne* (II), b$_{10}$ 64-5°,
n_D^{20} 1.5010, d_4^{20} 0.8210 (polymerizes on standing), and 2.5
g. *2,2,3-trimethyl-1-isopropyl-3-cyclopenten-5-one* (III),
b$_{10}$ 95-7°, n_D^{20} 1.4765; *semicarbazone*, m. 199°. Hydro-
– genation of II over Pt oxide in AcOH gave *6-methyl-5-*
isopropylheptane, b. 172-3°, b$_6$ 51.5-52.0°, n_D^{20} 1.4212,
d_4^{20} 0.7565. II (7.4 g.) stirred 7 hrs. at 60-5° with 7.5
ml. H$_3$PO$_4$ (d. 1.76) gave 6.6 g. III, b$_6$ 100°, n_D^{20} 1.4778,
d_4^{20} 0.9265 (*semicarbazone*, m. 201.5° (from EtOH),
6 *2,4-dinitrophenylhydrazone*, m. 128° (from EtOH). Hy-
drogenation of III over Pt oxide in AcOH gave *2,2,3-*
trimethyl-1-isopropylcyclopentanone, b. 200-12°, b$_{10}$
78-80°, n_D^{20} 1.4548, d_4^{20} 0.8826; *semicarbazone*, m. 190.5°.
– Ozonization of III gave iso-Pr$_2$CO, α-isopropyl-β,β-di-
methyllevulinic acid, b$_{0.5}$ 121°, n_D^{20} 1.4642, HCO$_2$H, and
AcOH; the above levulinic acid, m. 48° (after prolonged
freezing and washing with EtOH), yields a *semicarbazone*,

(A

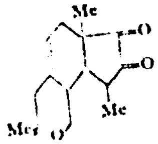
dimethyl-4-butyltetrahydrothiapyran-4-ol, b₃ 128°, n_D^{20}
1.4985, d_4^{20} 0.9880. Hydrogenation of II over Pd in EtOH
gave only *impure 4-Bu deriv.* of the *tetrahydro analog*.
as II absorption stopped before completion of the reaction.
Reaction of RMgBr (from 30 g. $CH_2:CHC:CH$) with 5.8
g. 2,5-dimethyltetrahydro-1,4-thiapyrone in Et_2O with 8
hrs.' refluxing, gave *2,5-dimethyl-4-(vinylethynyl)tetrahy-*
drothiapyran-4-ol, b₃ 120°, m. 62.5-64.0° (from petr.
ether), along with the *geometrical isomers* (total wt. 6.8 g.
crude mixt. m. 32-7°). The product (m. 62-4°) (15 g.)
heated to 165-70° with p-$MeC_6H_4SO_3H$ *in vacuo* gave 5.3 g.
2,5-dimethyl-4-(vinylethynyl)dihydrothiapyran, b₃ 110-
11°, n_D^{20} 1.5712, d_4^{20} 0.9903, which is unstable. The above
ketone and BuMgCl gave 40% *2,5-dimethyl-4-butyltetra-*
hydrothiapyran-4-ol, b₂ 140°, n_D^{20} 1.5015, d_4^{20} 0.9902.
RMgBr (from 20 $CH_2:CHC:CH$) with 23 g. 2,3,6-tri-
methyltetrahydro-1,4-thiapyrone gave 24 g. *2,3,6-tri-*
methyl-4-(vinylethynyl)tetrahydrothiapyran-4-ol, b₃ 135-6°,
n_D^{20} 1.5400, d_4^{20} 1.0115, which heated with $KHSO_4$ *in vacuo*
to 200° gave 30% *2,3,6-trimethyl-4-(vinylethynyl)dihydro-*
thiapyran, b₃ 116-7°, n_D^{20} 1.5600, d_4^{20} 0.9910. Similar
reaction with RMgBr from 10 g. $CH_2:CHC:CH$ and 22 g.
2-methylhexahydrothiachromanone (m. 77-8°) gave 10.5
g. *2-methyl-4-(vinylethynyl)hexahydrothiachroman-4-ol*,
viscous material, b₁ 156°, n_D^{20} 1.5555, d_4^{20} 1.0800, which, de-
hydrated over p-$MeC_6H_4SO_3H$ at 140° *in vacuo*, gave 50%
of the *corresponding tetrahydrothiachroman*, yellow, b₂
156°, n_D^{20} 1.5790, d_4^{20} 1.0330. The above chromanone
and BuMgBr gave 25% *2-methyl-4-butylhexahydro-*
thiachroman-4-ol, m. 79-80°, b₁ 153-6°. **CVII. Synthesis**
of polycyclic compounds related to sterols. 4. Diene
condensation of 1,3-dimethyl-1-cyclopenten-5-one and

1,3-dimethyl-1-cyclopentene-4,5-dione with 1- and 2-
vinyloctahydronaphthalenes. I. N. Nazarov and T. D.
Nagibina. *Ibid.* 631-8.—*1,3-Dimethyl-1-cyclopentene-5-*
one (I), b. 164-6°, n_D^{20} 1.4685, was obtained by cycliza-
tion of $CH_2:CHCH_2COC(:CH_2)Me$ (cf. *C. A.* 39, 1059);
1,3-Dimethyl-1-cyclopentene-4,5-dione (II), m. 65-6°,
was obtained by SeO_2 oxidation of dimethylcyclopentenone
(cf. part CI, above). *trans*-Octahydro-1(2*H*)-naph-
thalenone (45 g.), m. 31-3°, n_D^{20} 1.4840, in 200 ml. Et_2O
added in 3 hrs. to 21 g. powd. KOH in 500 ml. Et_2O at
15° with satn. by C_2H_2, let stand overnight, and hy-
drolyzed with H_2O, gave 37 g. *1-ethynyldecahydro-1-*
naphthol, b₁ 105-7°, n_D^{20} 1.5030, d_4^{20} 1.0008; this hydro-
genated in EtOH over Raney Ni gave the *1-vinyl analog*,
b₃ 118-19°, n_D^{20} 1.5010, d_4^{20} 0.9915, which (28 g.), heated
with 14 g. powd. $KHSO_4$ in a N stream at 34 mm. to 150-
60° gave 15 g. *1-vinyl-Δ¹-octahydronaphthalene*, b₃₄ 104-5°,
n_D^{20} 1.5170, d_4^{20} 0.9000; its adduct with maleic anhydride
Δ¹-dodecahydro-1,2-phenanthrenedicarboxylic anhydride, m.
139°; heating 7 g. diene and 21 g. 17 hrs. to 180-90° gave
25 g. unreacted matter and 4 g. condensation products,
b₁ 170-8°, n_D^{20} 1.5120, from which, after repeated crystn.
from MeOH, was isolated 2 g. mixed ketones (III and IV),
m. 72-88°; on further crystn. was isolated a homogeneous
ketone, either III or IV, m. 132-3°, which failed to yield a
semicarbazone; redistn. of the mother liquor gave 1 g.
product, b₁ 179-82°, which yielded 0.5 g. of the other
ketone (IV or III), m. 70-2°, whose *2,4-dinitrophenyl-*
hydrazone, m. 208-10° (from EtOH). *2-Ethynyldeca-*

C-A

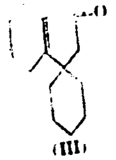
70

om IV. Analogous condensation of I with 1,3-dimethyl-3-cyclopenten-5-one gave a poor yield of condensation product, b_4 132-4°, badly contaminated with I dimer. Heating 1,3-dimethyl-1-cyclopenten-5-one (30 g.) with 37 g. SeO_2 in 46 g. AcOH to 100-10° (with cooling to moderate the action), then refluxing 0.5 hr., gave 13.7 g. *1,3-dimethyl-1-cyclopentene-4,5-dione*, b_4 85-105° (crude), m. 63-4° (pure product, m. 67°); *quinoxaline deriv.*, m. 253-4° (decompn.). The diketone (6.5 g.) heated with 7.6 g. I in dry dioxane 10 hrs. to 120-5° gave 4.1 g. of a *compd.* (V), m. 169-70° (from C_6H_6), sol. in 3-5% KOH,



(V)

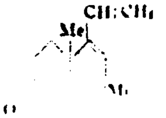
pptd. unchanged on acidification; hydrogenation over Adams Pt catalyst in AcOH gave the satd. analog (VI), m. 129.5-30° (from EtOH). CII. **Mechanism of hydration and cyclization of dienynes. 20. Hydration and cyclization of di(1-cyclohexen-1-yl)acetylene and 1,2-dicyclohexyl-1,5-hexadien-3-yne.** I. N. Nazarov and S. S. Bakhmutskaya. *Ibid.* 1777-86.—Passage of 20 l. C_2H_2 into 1 l. Et_2O contg. 70 g. powd. KOH simultaneously with addn. of 105 g. cyclohexanone with ice cooling and letting stand overnight gave, upon the usual treatment, 65 g. di(cyclohexyl-1-ol)acetylene, which on heating with $KHSO_4$ to 145-55° in a N stream gave 77% *di(1-cyclohexen-1-yl)acetylene* (I), b_4 125-8°, n_D^{20} 1.5573; this (110 g. I, 600 g. 90% aq. MeOH, 1 ml. concd. H_2SO_4, and 8 g. $HgSO_4$, stirred 4.5 hrs. at 60-5° with gradual addn. of 21 g. $HgSO_4$, gave 98 g. *1,2-di(1-cyclohexen-1-yl)ethanone* (II), b_4 128-30°, n_D^{20} 1.5347, d_4^{20} 1.0071; *semicarbazone*, m. 172-3° (from MeOH). Hydrogenation of II over Adams Pt catalyst in EtOH gave *cyclohexyl hexahydrobenzyl ketone*, b_4 110-12°, n_D^{20} 1.4840, d_4^{20} 0.9580; *semicarbazone*, m. 186-7° (from MeOH); *oxime*, m. 114° (from MeOH); II (5 g.) and 5 ml. H_3PO_4 (d. 1.77) stirred 6 hrs. at 60 gave 3.8 g. of the *spiro compd.* (III), b_4 120-1°, n_D^{20} 1.5203; its *semicarbazone*, m. 218°, was identical with that of the



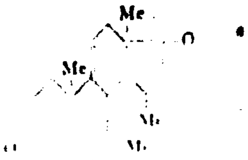
(III)

ketone reported by Marvel, *et al.* (C.A. 33, 7771). Heating I (28 g.) with 280 g. HCO_2H 10 hrs. at 55-60° gave 21.5 g. mixed ketones (described by Marvel *et al.*, *loc. cit.*) b_4 116-19°, the semicarbazone of which also m. 218-19°, and was identical with the above product; the spiro deriv. apparently predominates in the ketone mixt. obtained by either method. The "Marvel" ketone mixt. (22 g.) heated 3 hrs. with 20 ml. cryst. H_3PO_4 to 150° gives 12 g.

numbering), m. 182-3° (from C_6H_6-petr. ether), which boiled 2 hrs. with 3% HCl gave the *free acid*, m. 206-8° (decompn.; from dil. EtOH), while boiling with EtOH gave the *mono-Et ester*, m. 140-1° (from EtOH). Maleic anhydride replaced by an excess of 1,3-dimethyl-1-cyclopenten-5-one, 6 hrs. at 150-60° in a metal ampul yields 0.6 g. (60%) *diketone* (III), $b_{0.5}$ 155-60°, n_D^{20} 1.5300 (*monosemicarbazone*, decomp. 212-13°). 1,3-Dimethyl-1-cyclopenten-5-one (10 g.) in 10 ml. AcOH heated with 10 g. Se to 120° reacted vigorously, yielding 45% *1,3-dimethyl-1-cyclopentene-4,5-dione*, b_{12} 108-11°, m. 68-9.5° (from C_6H_6-petr. ether) [*mono(2,4-dinitrophenylhydrazone)*, m. 184.5-5.5° (from EtOH; decompn.)]. Heating this dione (0.7 g.) with 4 g. $CH_2:C(OMe)CH:CH_2$ in dioxane (with pyrogallol) 3 hrs. at 120° gave 0.6 g. *3,7a-dimethyl-1,2,5-hydrindanetrione*, yellow mass, $b_{0.1}$ 125-8°, which slowly solidified over P_2O_5 and m. 128-9°



IIa)



(III)

(from hexane); its *mono-2,4-dinitrophenylhydrazone*, m. 179.5° (from EtOH). Parts CLCV translated into English appear in *J. Gen. Chem. U.S.S.R.* 19, No. 9, a211-22, a223-33, No. 10, a411-14, No. 12, a621-36, a637-47 (1949), resp. G. M. Kosolapoff

TEREKHOVA, L. N.

I. N. Nazarov, L. N. Terekhova, and L. D. Bergel'son - "Acetylene derivatives. 109. Synthesis of polycyclic compounds related to the sterols. VI. Complete synthesis of the isomer of 15-methylandrosten-3. 17 dione with methylcyclopentane ring B." (p. 661)

SO: Journal of General Chemistry, (Zhurnal Obshchei Khimii), 1950, Vol. 20, No. /.

TEREKHOVA, L. N.

7

⑧ Chem

Acetylene derivatives. CXXVI. Synthesis of polycyclic compounds related to steroids. 14. Synthesis of tetracyclic ketones with a methylcyclopentane B ring. I. N. Nazarov, V. F. Kucherov, and L. N. Terekhova. *Bull. Acad. Sci. U.S.S.R., Div. Chem. Sci.* 1952, 427-35 (Engl. translation).—See *C.A.* 47, 5306c. CXXVII. Synthesis of polycyclic compounds related to steroids. 15. Structure of products of condensation of 2-methoxy-1,3-butadiene with 2-methyl-2-cyclohexen-1-one and methyl methacrylate. I. N. Nazarov and S. I. Zavyalov. *Ibid.* 043-7.—See *C.A.* 47, 10515d. CXXVIII. Heterocyclic compounds. 23. Action of primary aromatic amines and 2-aminopyridine on vinyl allyl ketones. Synthesis of aryl substituted 4-piperidones and 1-(2-pyridyl)-4-piperidones. I. N. Nazarov, S. G. Matsoyan, and V. A. Rudenko. *Ibid.* 923-32.—See *C.A.* 48, 1357d. CXXIX. Heterocyclic compounds. 24. Transformations of 1-phenyl-2,5-dimethyl-4-piperidone. *Ibid.* 933-7.—See *C.A.* 48, 1358e. H. L. H.

Chemical Abst.
Vol. 48 No. 9
May 10, 1954
Organic Chemistry

L 08705-67 EWT(1) JK

ACC NR: AP6034132 SOURCE CODE: UR/0297/66/0110/010/0901/0906

19
B

AUTHOR: Terekhova, L. P.

ORG: Division of Microbiology /Director-Prof. G. F. Gauze/; Institute for Research on New Antibiotics, Ministry of Health, SSSR, Moscow (Otdel mikrobiologii Instituta po izyskaniyu novykh antibiotikov Ministerstva zdravookhraneniya SSSR)

TITLE: Antibiotic substances formed by actinomycetes which induce formation of mature phage particles in lysogenic cultures of *Micrococcus lysodeikticus*

SOURCE: Antibiotiki, v. 11, no. 10, 1966, 901-906

TOPIC TAGS: antibiotic, fungus antibiotic, lysogenic culture, bacteriophage, bacteriophage particle, ~~screening procedure~~

ABSTRACT: Of 625 actinomycetes cultures, 34 (5.4%) induced phage-particle formation in lysogenic cultures of *Micrococcus lysodeikticus*. It is suggested that this method be used for preliminary screening of actinomycetes strains to detect those which produce inducing substances. Screening tests also revealed that culture fluids of most of the strains possessing inducing properties inhibited growth of tumor cells *in vitro*.

UDC: 615.779.931-017.717-012:576.852.18

Card 1/2

L 08705-67

ACC NR: AP6034132

Ninety-eight percent of the cultures were bacterial antagonists but no correlation of inductive and antibacterial properties was noted. Orig. art. has: 3 tables. [W.A. 50]

SUB CODE: 06/ SUBM DATE: 24Nov65/ ORIG REF: 004/ OTH REF: 006

Card 2/2 nst

L 01299-67 EWT(m)/EWP(t)/ETI IJP(c) JD

ACC NR: AP6003326 SOURCE CODE: UR/0365/66/002/001/0090/0094

AUTHOR: Marchenko, N. A.; Terekhova, L. S. 46

ORG: Kharkov Polytechnical Institute (Khar'kovskiy politekhnicheskiy institut) 8

TITLE: Electrolytic deposition of indium from tartrate electrolyte 18 27

SOURCE: Zashchita metallov, v. 2, no. 1, 1966, 90-94

TOPIC TAGS: indium, electrolytic deposition, electrolyte, titrimetry, electric conduction

ABSTRACT: The studies of the curves of potentiometric titration, the effect of concentration changes on the deposition of indium from electrolyte of the In-$NaHC_4H_4O_6$ system, and the changes of electric conductivity as a function of concentration of NH_4OH and the addition of NaCl, resulted in a determination of the following optimal composition of the electrolyte: 20 g/l of metallic indium (in the form of $In_2(SO_4)_3$), 200 - 250 g/l of sodium bitartrate, 40 g/l of $(NH_4)_2SO_4$, 60- 80 g/l of NaCl, and 250 ml/l NH_4OH (25%) at a current density of 0.5 - 2.5 amp/dm^2, a room temperature of 20C, and a pH of 9 - 10.5. The specific electric conductivity of this electrolyte was 0.1087 ohm^{-1}cm^{-1}, and the rate of deposition of indium was 13 - 20 μ/hr. The throwing power of the electrolyte was determined from the weight of the metal deposited on two cathodes situated 93 and 46.6 mm, respectively, from the anode. It was compared with the throwing power of a sulfate electrolyte containing 20 g/l of indium (in the

UDC: 621.357.7 : 669.87

Card 1/2

L 01299-67

ACC NR: AP6003326 0

form of $In_2(SO_4)_3$) and 12 g/l of Na_2SO_4. The throwing power of the tartrate and sulfate electrolyte was 40-50% and 10-11% respectively. The cathode and anode current efficiency as a function of current density were determined with a coulometer. It showed that the cathode current efficiency was 85-95%. It decreased with increased current density. This indicated a good throwing power of the electrolyte. The anode current efficiency, recalculated for In^{3+} was >100% in all cases. Fine-crystalline, dense, light-colored coatings were deposited at current densities of 0.5-2.5 amp/dm^2. The deposits had a good adhesion to metallic substrates of copper, brass, steels, and stainless steel with a coating thickness of 10μ. The rapid plotting of polarization curves revealed the presence in solution of several types of ions capable of discharging at corresponding electrode potentials. Polarization curves were plotted by the same method in sulfate electrolyte containing the same amount of indium (20 g/l of metallic indium). The curves indicated the predominance of diffusion kinetics already at small current densities. At φ =1.1 v, the liberation of hydrogen was the main process. The experimental value of the equilibrium potential and its value, calculated by assuming the presence of simple hydrated ions were very similar: -0.341 and -0.351 v, respectively. The equilibrium potential of indium (experimental) in the tartrate electrolyte studied was -0.51 v. Orig. art. has: 6 fig.

SUB CODE: 11/07/SUBM DATE: 06May65/ ORIG REF: 004

Card 2/2 ZC

MARCHENKO, N.A.; TEREKHOVA, L.S.

Electrolytic deposition of indium from a tartrate electrolyte.
Zashch. met. 2 no.1:90-94 Ja-F '66. (MIRA 19:1)

1. Khar'kovskiy politekhnicheskiy institut. Submitted May 6, 1965.

TEREKHOVA, M. F.

TEREKHOVA, M. F.: "School Traditions and Their Significance in the Communist Training of Children." Kiev State U imeni T. G. Shevchenko. Kiev, 1956. (Dissertation for the Degree of Candidate in Pedagogical Science)

So: Knizhnaya Letopis', No. 19, 1956.

TEREKHOVA, M. G.

USSR/Chemistry - Adsorbents
Chemistry - Carbons, Active

Jan 1948

"Adsorption Properties and the Structure of Adsorbents: II, Adsorption in Active Carbon Solutions of Widely Varying Concentrations," O. M. Dzhigit, A. V. Kiselev, M. G. Terekhova, K. D. Shcherbakova; Moscow State U; Lab of Adsorption, Acad Sci USSR; Inst of Phys Chem, Moscow, 11 pp

"Zhur Fiz Khim" Vol XXII, No 1

Study general types of adsorption isotherms of surface active substances found in solutions of weak adsorbent soluble materials. Adsorption of mixtures of water and acid or alcohols passes through maximum and decreases. Subdivision and cyclization of the adsorbent molecules decreases the degree to which they can fill the micropores of the carbon being studied. Submitt ed 14 May 1947.

PA 65T8

[illegible]

Dissertation: "Obtaining Ethyl Alcohol on the Base of Electrocracking of [illegible]." Cand Chem Sci, Moscow Order of Lenin State U imeni M. V. Lomonosov, 28 May 54, Vechernyaya Moskva, Moscow, 19 May 54.

SO: SUM 284, 26 Nov 1954

[illegible]

84243

S/076/60/034/009/001/022
B015/B056

11.1120

AUTHORS: Kobozev, N. I., Yeremin, Ye. N., Terekhova, M. G., and Mal'tsev, A. N.

TITLE: Physical Chemistry of Concentrated Ozone. IX. Study of Ozone Adsorption on Silica Gel at Various Temperatures

PERIODICAL: Zhurnal fizicheskoy khimii, 1960, Vol. 34, No. 9, pp. 1893 -1899

TEXT: The adsorption of ozone on silica gel at low temperatures (from -80° to -150°C) was investigated by saturating the silica gel in the gas flow at constant temperature until adsorption equilibrium was established, and the adsorbed gas quantity was then determined by gas analysis. The ozone-oxygen mixture was produced in a silent electrical discharge; the duration of adsorption amounted to 1 - 6 h as a function of the experimental temperature, and the rate of flow of the gas was 43-45 l/h. The experiments were carried out in a circulating apparatus (Fig. 1). The silica gel was in an adsorber cooled with liquid nitrogen (Figs. 2, 4). The latter was cooled in a cryostat (Fig. 3), whereas for

Card 1/2

84243

Physical Chemistry of Concentrated Ozone.
IX. Study of Ozone Adsorption on Silica Gel
at Various Temperatures

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B015/B056

the purpose of desorption, the cryostat was heated. The results of measurement show (Table 1) that ozone adsorption on silica gel rises to 7 to 8 times its amount with a temperature drop from -120°C to -150°C. Ozone desorption may thus be attained by a slight increase of temperature, or an effective separation of concentrated ozone with the aid of an adsorption-desorption cycle. For the temperatures of -120°, -130°, -140°, and -150°C the adsorption isothermal lines were obtained (Fig. 5), and it was found that they differ in appearance as well as according to the character of the dependence of adsorption on an increase of the ozone content in the equilibrium mixture. There are 5 figures, 2 tables, and 4 non-Soviet references: 3 German and 1 Swiss.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University imeni M. V. Lomonosov)

SUBMITTED: July 15, 1958

Card 2/2

TEREKHOVA, M. Ya. Engr.

The experimental work of gear-cutting machine operator, L. Ya. Khzheushnevich

Vest Mash p. 45, Oct 51

TEREKHOVA, M. YA.

Gear-cutting machines

Work of gear-cutter L. YA Khzheushnevich. Vest. Mash. 31 No. 10, 1951.

9. Monthly List of Russian Accessions, Library of Congress, September, 1952 ~~1953~~, Unclassified.

TEREKHOVA, N. A.

USSR/Medicine - Brucellosis Nov/Dec 51

"Dynamics of Vascular Reflexes in Brucellosis Patients," N. A Terekhova, Chair of Pathol Physiol, Kuybyshev State Med Inst

"Arkh Patol" Vol XIII, No 6, pp 16-21

The following abnormal vascular reflexes were encountered in sufferers from brucellosis: pathol instability of vascular tonus which decreases after administration of luminal; frequent pressor reaction to heat; frequent vasodilative response to irritation by cold, long-lasting aftereffects of reactions upon unconditional irritants; in some cases slowness of reactions, disappearing only upon

202T76

USSR/Medicine - Brucellosis Nov/Dec 51
(Contd)

administration of caffeine. A reversion of a series of induced unconditional vascular reflexes due to sudden increase of pathol instability occurred at the peak of reaction to injection of brucellosis vaccine; easy setting-in of neurotic conditions as a reaction to "outside events" /Porlov/ ("Sshibka"); long-lasting aftereffect from conditional reflex spasms of the blood vessels.

202T76

FIELDS, P., ed.; HEMINGWAY, V., ed.; TARASEVICH, L.M.[translator];
TEREKHOVA, N.A. [translator]; RYZHKOV, V.L., redaktor; ENDEN, M.G.,
~~redaktor; GERA~~SIMOVA, Ye.S., tekhnicheskiy redaktor

[The nature of virus multiplication. Translated from the English]
Priroda razmnozheniia virusov. Sost. gruppoi avtorov. Perevod s
angliiskogo L.M.Tarasevich i N.A.Terekhovoi. Pod red. i s predisl.
V.L.Ryzhkova. Moskva, Izd-vo inostrannoi lit-ry, 1956. 390 p.
(MLRA 9:7)

1. Chlen-korrespondent AN SSSR (for Ryzhkov)
(VIRUSES)

TEREKHOVA, N. A.

"Concerning the Cultivation of Tobacco Mosaic Disease in Tumors Caused by Bac. "Tumefaciens," a paper presented at the Conf. of Young Specialists, Inst. Microbiology, AS USSR, Mikrobiol., 25, No.1, p. 134, 1956

Translation U-8982, 9 Oct 56

TEREKhOVA N. A.

Proliferation of tobacco mosaic-disease virus in bacterial cultures of tomato plants [illegible]

[illegible]

TEREKHOVA, N.A. (Moskva)

[redacted]

New discoveries about plant tumors. Usp.sovr.biol. 41 no.2:246-250
Mr-Ap '56. (MIRA 9:8)
(GALLS (BOTANY))

USSR/General Problems of Pathology - Pathophysiology of the Infectious Process U.

Abs Jour : Ref Zhur - Biol., No 2, 1959, 8671

Author : Terekhova, N.A.

Inst : Kuybyshev Society of Pathologists

Title : The Priblem of Sensitivity of the Cerebral Cortex to Dysentery Antigen

Orig Pub : Sb. nauchn. rabot Kuybyshevsk. o-va patologoanatomov s sektsiey patofisiol. Kuybyshev, 1957, 77-80

Abstract : Experiments performed on 4 dogs according to the method of conditioned salivary reflexes. In all the animals the type of higher nervous activity was determined. Hundredths and thousandths of a mg/kg of dysentery antigen injected I.V. produced a reduetion of the positive conditioned reflexes in dogs of the strong type, phasic states

Card 1/2

0

COUNTRY : USSR
CATEGORY : Plant Diseases. Diseases of Cultivated Plants.

ABS. JOUR. : REF ZHUR - BIOLOGIYA, NO. 4, 1959, No. 15922

AUTHOR : ~~Turekhova, N.A.~~
INST. : Inst. of Microbiology AS USSR
TITLE : Influence of Regeneration Processes on Development of Tumorescence Caused by Bacterium tumefaciens in Tomatoes.

ORIG. PUB. : Fiziol. rasteniy, 1957, 4, No.1, 72-76

ABSTRACT : At the Institute of Microbiology of the Academy of Sciences of the USSR in experiments with tomato slips there was found to be a relation between tumor growths and the foci of meristematic growth, a normal inheritance of the plant. Root development in the severed cuttings infected with bacteria inhibited the formation of tumors. [illegible] there was not noted any delay at first in tumor formation with removal of the root in

CARD: 1/2 7

[illegible] : [illegible]
CATEGORY : Plant Physiology. Pathophysiology.
ABS. JOUR. : RZhBiol., No. 5, 1959, No. 19999
AUTHOR : Ryzhkov, V.L.; Terekhova, M.A.
INST. : AS USSR
TITLE : Mucopolysaccharide in Leaves of Abutilon st.

ORIG. PUB. : Dokl. AN USSR, 1957, 117, No.2, 341-344

ABSTRACT : A study of mucopolysaccharides (M) in the leaves of healthy and chlorotic Abutilon striatum plants was made at the Institute of Microbiology of the Academy of Sciences USSR. Healthy Abutilon pictum plants were also studied. By qualitative tests it was determined that the acid M contains amino-sugar and uronic acids. M is found in special parenchyma cells of the leaf veins and in its epidermis. The veins of A. striatum are richer in mucilage than the pith;

CARD: 1/2

TEREKHOVA, N.A.

Effect of metabolites and antimetabolites on plant tumors.
Izv.AN SSSR.Ser.biol. no.3:431-437 My-Je '59. (MIRA 12:9)

1. Institute of Microbiology, Academy of Sciences of the U.S.S.R., Moscow.
(GALLS (BOTANY)) (PLANTS, EFFECT OF CHEMICALS ON)

TEREKHOVA, N.A.

Conditions for the recovery of Abutilon in enfectious chlorosis.
Report No.1: Effect of light. Vop.virus. 4 no.6:724-727 N-D '59.
(MIRA 13:3)

1. Institut mikrobiologii AN SSSR, Moskva.
(VIRUS DISEASES)
(PLANTS dis.)

TEREKHOVA, N.A.

Conditions for the recovery of Abutilon from infectious chlorosis. Report No.2: Recovery under the effect of defoliation. Vop.virus. 6 no.5:614-618 S-O '60. (MIRA 14:7)

1. Institut mikrobiologii AN SSSR, Moskva.
(ABUTILON--DISEASES AND PESTS)
(CHLOROSIS (PLANTS))

TEREKHOVA, N.A.

Relation between normal and tumorous growth in Lycopersicum esculentum. Zhur.ob.biol. 21 no.1:54-58 Ja-F '60. (MIRA 13:5)

1. Institute of Microbiology, Academy of Sciences of the U.S.S.R.
(TOMATOES) (TUMORS, PLANT)

RYZHKOV, V.L.; TEREKHOVA, N.A.; LOYDINA, G.I.

Causes of the resistance of the Ambalema tobacco variety to the mosaic virus. Dokl. AN SSSR 134 no.6:1453-1456 O '60.
(MIRA 13:10)

1. Chlen-korrespondent AN SSSR (for Ryzhkov).
(TOBACCO--DISEASE AND PEST RESISTANCE) (MOSAIC DISEASE)

TEREKHOVA, N.A.

Regeneration of normal shoots from bacterial tumors. Zhur.ob. biol. 23 no.4:289-295 Jl-Ag '62. (MIRA 15:9)

1. Institute of Microbiology, U.S.S.R. Academy of Sciences.
(AGROBACTERIUM TUMEFACIENS) (REGENERATION (BOTANY))

RYZHKOV, V.L.; TEREKHOVA, N.A.

Reproduction of tobacco mosaic virus in tumors of Nicotiana tabacum and Nicotiana glutinosa following intraspecific grafting. Vop. virus. 10 no. 6:678-680 N-D '65 (MIRA 19:1)

1. Institut mikrobiologii AN SSSR, Moskva. Submitted August 7,1965.

L 3660-66 EWP(e)/EPA(s)-2/EWT(m)/EWP(i)/EPA(w)-2/EWP(b) WW/WH

UR/0363/65/001/006/0984/0990 37

ACCESSION NR: AP5018936 666.1:542.65 24

B

AUTHOR: Troitskiy, O.A. 44,55; Terekhova, N.B. 44,55

TITLE: Mechanical strength of a pyroceramic 15 44,55 in relation to the conditions of its preparation, state of the surface, and moisture content

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 1, no. 6, 1965, 984-990

TOPIC TAGS: pyroceramic, lithium aluminosilicate glass, pyroceramic preparation, glass mechanical property

ABSTRACT: The article deals with the relationship between the conditions of formation of pyroceramics of the lithium aluminosilicate system during the generation of crystallization centers, their structure, and their properties in samples with various surface states. The samples were subjected to preliminary heat treatments lasting various periods of time at 650C to allow the centers to form, and to the main heat treatment at 780C to cause the crystals to grow. The mechanical strength and microhardness were then measured. Electron microscopy was used to determine the degree of crystallization, and infrared spectra were taken at 2-5μ to determine the moisture content qualitatively. Some of the

Card 1/2

L 3660-66

ACCESSION NR: AP5018936

3

samples were etched with 20% hydrofluoric acid (a 100-200μ layer was thus removed). It was found that such chemical etching strengthens pyroceramics of the lithium aluminosilicate system catalyzed with titanium dioxide by a factor greater than 2. The microhardness of the pyroceramics was higher than that of the original glass, but the data showed a considerable scatter. The density of the pyroceramic increased with the duration of the pretreatment. The moisture content of the pyroceramics was found to be greater than that of the original glass; the cause of this effect was not determined. Orig. art. has: 4 figures.

44,55

ASSOCIATION: Institut fiziki tverdogo tela AN SSSR (Institute of Solid State Physics, AN SSSR)

SUBMITTED: 11Feb65 ENCL: 00 SUB CODE: MT

NC REF SOV: 002 OTHER: 003

Card 2/2

ACC NR: AP7006213 SOURCE CODE: UR/0363/67/003/001/0200/0202

AUTHOR: Troitskiy, O. A.; Terekhova, N. B.

ORG: Institute of Solid State Physics, Academy of Sciences, SSSR (Institut fiziki tverdogo tela Akademii nauk SSSR)

TITLE: Effect of α irradiation on the microplasticity of quartz glass

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 3, no. 1, 1967, 200-202

TOPIC TAGS: alpha radiation, glass, irradiation effect, plasticity

ABSTRACT: The effect of α irradiation with Pu^{239} (particle energy 5.14 MeV) on the microplasticity of quartz glasses was studied by means of microhardness measurements in which the length of the diagonal in indentations made with a diamond pyramid was determined. Both the indenter and the α particles penetrated the glasses to approximately the same depth (10-12 μ). Gauss distribution curves of the microhardness values for deformation of the glass with and without irradiation showed that the field of external α radiation causes a decrease in microhardness or increase in the microplasticity of quartz glass. The number of atoms displaced under the influence of the α bombardment was calculated to be approximately 2.76×10^9 atoms/cm^3 sec. From the thermodynamic standpoint, the irradiation affects the strength of the glass by changing the free surface energy of the glass. Orig. art. has: 1 figure and 1 table.

SUB CODE: 20/ SUBM DATE: 02Aug65/ ORIG REF: 006/ OTH REF: 004

Card 1/1 UDC: 666.192+539.104.539.12.04

TERKHOVA, V. F.

USSR/Metals - Manganese Temperature, Influence Sep 49

"The Influence of Temperature Upon the Mechanical Properties of Manganese," Ye. M. Savitskiy, V. F. Terekhova, Inst of Gen and Inorg Chem imeni N. S. Kurnakov, Acad Sci USSR, 3 pp

"Dok Ak Nauk SSSR" Vol LXVIII, No 1

Determined effect of temperatures from -195 to 1,240° upon mechanical properties of electrolytic manganese specimens. Hardness was determined directly while specimens were being heated ~~in~~ an electric furnace. Used dry ice and liquid nitrogen to cool specimens. Found that, in manganese, modification with simplest and loosest structure, characterized by least number of atoms in elementary lattice, i.e., gamma-modification, becomes stable in heating. Submitted by Acad G. G. Urazov 30 Jun 49.

PA 2/50T95

TEREKHOVA, V. F.

USSR/Chemistry - Metallurgy 11 Dec 52

"Measurement of Internal Pressures in Polymorphous Metals That Arise Upon Heating," Ye. M. Savitskiy and V. F. Terekhova, Inst of Gen and Inorg Chem imeni N. S. Kurnakov, Acad of Sci USSR

DAN SSSR, Vol 87, No 5, pp 787-789

Cylindrical samples 15 mm in diameter and 30 mm high are placed under pressure in a 7-ton press and the internal pressure measured when the sample is heated electrically. The method is sensitive and could be used as a new method for detg the temps for

254T3

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polymorphic and other phase transformations in metals. Presented by Acad G. G. Urazov 15 Oct 52.

254T3

PA 254T3

[illegible]

Effect of temperature on mechanical properties of germanium. E. M. Savitskii and V. F. Terekhova (N. S. Kurnakov Inst. Gen. Inorg. Chem., Moscow). Khim. [illegible] 1955, No. 2, 176-60. Hardness, compressive strength, and relative shrinkage under pressure were detd. for Ge in the temp. interval from 20° to 950°. Above 600° the ordinarily brittle metal becomes capable of plastic deformation. A 2-3 fold increase of hardness takes place in Ge near its m.p. The phenomenon can be explained by the appearance of ability toward plastic deformation. G. M. Kosolapoff

MG

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SOV/124-58-1-1399

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 1, p 173 (USSR)

AUTHORS: Savitskiy, Ye. M., Terekhova, V. F.

TITLE: Influence of the Temperature on the Mechanical Properties of Cobalt (Vliyaniye temperatury na mekhanicheskiye svoystva kobal'ta)

PERIODICAL: Tr. In-ta metallurgii AN SSSR, 1957, Nr 1, pp 153-157

ABSTRACT: The authors correlate data relative to the various mechanical properties of cobalt and note that the properties vary within the 350-450°C temperature interval. They attribute these changes to a polymorphic transformation of the cobalt.

Reviewer's name not given

Card 1/1

Terekhova, V. F.

137-1957-12-25260

Translation from: Referativnyy zhurnal, Metallurgiya, 1957, Nr 12, p 330 (USSR)

AUTHORS: Savitskiy, Ye.M., Terekhova, V. F.

TITLE: The Influence of Temperature on the Mechanical Properties of Alkaline-Earth Metals (Vliyaniye temperatury na mekhanicheskiye svoystva shchelochno-zemel'nykh metallov)

PERIODICAL: Tr. In-ta metallurgii. AN SSSR, 1957, Nr 1, pp 162-169

ABSTRACT: Tensile strength, hardness, and plasticity of Mg, Ca, Sr, and Ba were investigated. Experiments were carried out in an atmosphere of Ar, at temperatures between 20° and 800°. According to the decreasing degree of strength and hardness, at 20°, the metals are arranged as follows: Mg, Ca, Sr, Ba. At 550° the differences in strength and hardness are leveled out. The fact that mechanical properties change as a function of temperature, confirms the existence of two polymorphous transformations of Ca and Sr. It is noted that a sharp reduction in plasticity takes place when Ca and Sr change to the hexagonal β modification. High-temperature, cubic γ modifications of these metals are extremely plastic. An increase in σ_b was observed in Ca, Sr, and Ba, at 100-150°.

P. N.

Card 1/1

1. Alkaline earth metals - Mechanical properties - Temperature factors

SOV/137-58-7-15957

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 7, p 289 (USSR)

AUTHORS: Savitskiy, Ye.M., Terekhova, V.F.

TITLE: Investigation of the Mechanical Properties and Construction of the Diagram of the Recrystallization of Chromium (Issledovaniye mekhanicheskikh svoystv i postroyeniye diagrammy rekristallizatsii khroma)

PERIODICAL: V sb. Issled. po zharoprochn. splavam. Vol 2. Moscow, AN SSSR, 1957, pp 148-157

ABSTRACT: The effect of temperature on the hardness, plasticity, and strength during stretching and compression and also the a_k of Cr of various grades of purity, namely: hydride (98.5%), aluminothermic (98.9%) and electrolytic (99.5%) was investigated. Aluminothermic Cr has the greatest hardness at room temperature. Its σ_b is 4.7 kg/mm², while that of the electrolytic Cr is 17 kg/mm². The critical point of the brittleness of Cr depends upon its purity. Upon compression the aluminothermic Cr is transformed from the brittle state into the malleable at 300°C; the electrolytic Cr is similarly transformed at 200-250°. Upon a rise of temperature Cr

Card 1/2

SOV/137-58-7-15957

Investigation of the Mechanical Properties and Construction (cont.)

softens considerably. During the transition into the plastic state a certain increase in hardness is observed in Cr of all types at 350-450°. At 1000° electrolytic Cr subjected to monoaxial compression can withstand a single-stroke 90% upsetting without failure. In the 500 to 700° range impact specimens without a notch do not break but bend plactically. In this temperature range Cr can be worked by pressure. A specific characteristic of Cr is its increase in strength with a rise in temperature. This is especially true for impure Cr. The σ_b of aluminothermic Cr increases from 4.7 at 20° to 10 at 1100°, that of electrolytic Cr from 17 at 20° to 28 kg/mm^2 at 500°. X-ray investigations showed that the increase in the strength of Cr in the 300-500° range is not relat ed to the appearance of a new crystalline modification of Cr. A diagram of the recrystallization of Cr, constructed with the help of microstructural and X-ray methods and by measurement of microhardness, is adduced. Full recrystallization of Cr occurs at 1020°. The hardness and the ductility of Cr after recrystallization do not decrease; the temperature of the transition of Cr from the brittle into the ductile state upon compression is decreased by 30-50 o/o.

1. Chromium--Physical properties 2. Chromium--Crystallization 3. Chromium--Temperature factors

N. K.

Card 2/2

TEREKHOVA, V. F.

5(2) PHASE I BOOK EXPLOITATION SOV/1727

Akademiya nauk SSSR. Institut geokhimii i analiticheskoy khimii

Redkozemel'nyye elementy; polucheniye, analiz, primeneniye (Rare Earth Elements; Extraction, Analysis and Application) Moscow, Izd-vo AN SSSR, 1958. 331 p. 2,200 copies printed.

Resp. Ed.: D. I. Ryabchikov, Professor; Editorial Board: I. P. Alimarin, Corresponding Member, USSR Academy of Sciences, I. E. Zaozerskiy, Doctor of Chemical Sciences, E. V. Koglyarov, Candidate of Technical Sciences, V. I. Kuznetsov, Doctor of Chemical Sciences, M. M. Senyavin, Candidate of Chemical Sciences, and Yu. S. Sklyarenko, Candidate of Chemical Sciences; Eds. of Publishing House: D. N. Trifonov and T. G. Levi; Tech. Ed.: S. G. Markovich.

PURPOSE: This book is intended for scientists, chemists, teachers and students of higher educational institutions, chemical and industrial engineers, and other persons concerned with the extraction, preparation, use, or study of rare earth elements.

COVERAGE: This collection contains reports presented at the June 1956 Conference on Rare Earth Elements at the Institute of Geochemistry and Analytical Chemistry imeni V. I. Vernadskiy of the Academy of Sciences USSR. The articles treat chemical methods of separating rare earth mixtures, methods of processing rare earth ores, ion exchange chromatography, chemical analysis, and some industrial applications of rare earths. Aside from contributing authors, the editors mention the following Soviet scientists, who are studying rare earth elements, rare earth deposits, extraction methods, and the preparation of oxides and salts: Martynov, Mel'nikov, Khrushchev, Melikov, Pisarzhevskiy, Chernyak, Tanatar, Belousov, Zhukov and especially, N. A. Orlov, who first obtained the majority of rare earth elements in the pure state, separated many complex molecular compounds of these elements, and determined their specific properties. References are given at the end of each article.

TABLE OF CONTENTS:

Rare Earth Elements; Extraction (Cont.) SOV/1727

Card 10/11

(1F)

Terekhova V. F.

AUTHORS: Savitskiy, Ye. M., Doctor of Chemical Sciences 30-2-42/49
Terekhova, V. F., Candidate of Technical Sciences

TITLE: Investigation of the Alloys of Rare Metals (Issledovaniye splavov redkikh metallov)
All-Union Conference (Vsesoyuznoye soveshchaniye)!

PERIODICAL Vestnik Akademii Nauk SSSR, 1958, Nr 2, pp 111-112 (USSR)

ABSTRACT: On November 18 - 20, 1957, an All Union Conference was called by the Institute for Metallurgy imeni A. A. Baykov of the AN USSR and the Board for Rare Metals at the Scientific Technical Committee of the Cabinet Council of the USSR. The conference was attended by representatives of scientific research institutes, universities and industry. Reports on raw material sources of rare metals and their production in pure state, problems of scientific investigations of alloys of rare metals, investigation results of alloys of various systems, their physical chemical properties and industrial application were delivered and discussed. Serious shortcomings hindering the development of research were pointed out. Above all, the intensification of the production of pure rare metals was demanded. The determination of the

Card 1/2

Investigation of the Alloys of Rare Metals. 30-2-42/49
All Union Conference

constants of physical chemical properties of pure rare metals and their alloys has to be regarded as the least investigated which hinders its rational introduction into political economy. Also systematical work in this field is carried out insufficiently. There is also a lack of information in this field; no special periodical exists. The importance of the ascertainment of new metals with addition of rare metals for the new technica was stressed. Research work must be considerably extended and carried out more quickly. For this work also the institutions of the AN USSR and their subsidiaries, the academies of the Republics of the Union, branch institutes, universities, and laboratories must join. The Institute for Metallurgy was charged with the coordination of the work. The resolution was also made to carry out the work methodically so as to shorten the necessary time and to reduce the expenses of research work. Equally the demand for an own periodical was expressed.

AVAILABLE: Library of Congress

Card 2/2

1. Rare metals-Sources 2. Rare metals-Alloys 3. Scientific research-Rare metals 4. Metallurgy-USSR 5. Rare metals-Production

SAVITSKIY, Ye.M.; TEREKHOVA, V.F.

Mechanical properties and recrystallization diagram of zirconium iodide. Trudy Inst.met. no.3:181-190 '58. (MIRA 12:3)
(Zirconium iodide--Testing)

78-3 3-37/47

AUTHORS: Savitskiy, Ye. M., Terekhova, V. F.

TITLE: The Phase Diagrams of the Alloys of Lanthanum With Cerium and Lanthanum With Calcium (Diagrammy sostoyaniya splavov lantana s tseriyem i lantana s kal'tsiyem)

PERIODICAL: Zhurnal Neorganicheskoy Khimii, 1958, Vol. 3, Nr [illegible], pp. 756-762 (USSR)

ABSTRACT: The phase diagrams of the alloys of lanthanum with cerium, and lanthanum with calcium were investigated by thermal analysis, and by the determination of microstructure, hardness and electric resistance, and the diagrams were constructed. In the system lanthanum-cerium purest metallic cerium with 97 - 99 % purity and lanthanum with 98,5 % purity were used. Lanthanum and cerium dissolve in a liquid and solid state and form a diagram with unlimited solubility. In the system lanthanum-calcium the initial metals were molten in a vacuum under an argon atmosphere. The produced alloys were investigated by the determination of microstructure and the analyses showed that in a solid state a layer formation is to be

Card 1/2

78-3 3-37/47

The Phase Diagrams of the Alloys of Lanthanum With Cerium and Lanthanum With Calcium

noticed. The thorough investigation by the microstructure determination showed that in a solid state more than two layers occur. The occurrence of two layers in the alloys can already be observed at a calcium content of more than 12 - 15 %. With an increase in the calcium content to 30-60 % the thickness of the outer layer highly increases. By the chemical analyses, the determination of the specific weight and the hardness of the layers it was found that the upper layer consists of calcium and the lower one of lanthanum. The alloys with about 1 % calcium consist of a phase of solid solution. The alloys with 60 - 80 % calcium have three layers of which the middle one is of polyhedral structure and is rich in calcium. The solubility of lanthanum in calcium and of calcium in lanthanum at an eutectic temperature of 705°C is not higher than 3 - 5 %. There are 15 figures, 4 tables, and 8 references, 3 of which are Soviet.

ASSOCIATION: Institut metallurgii im. A. A. Baykova Akademii nauk SSSR (Metallurgical Institute imeni A. A. Baykov, AS USSR)

SUBMITTED: June 10, 1957

Card 2/2

SOV/78-3-9-22/38

AUTHORS: Savitskiy, Ye. M., Terekhova, V. F., Novikova, I. A.

TITLE: The Phase Diagram of the Alloys of the System Magnesium-Neodymium (Diagramma sostoyaniya splavov sistemy magniy-neodim)

PERIODICAL: Zhurnal neorganicheskoy khimii, 1958, Vol 3, Nr 9, pp 2138-2142 (USSR)

ABSTRACT: The thermal analysis, the microstructure, and the determination of the microhardness were used for the construction of the phase diagram of the system magnesium-neodymium. The hardening method was used for the determination of the solubility of neodymium in magnesium in solid state. Chemical compounds of neodymium and magnesium exist in the solid solutions of neodymium in magnesium within the range of 40 - 60 percents by weight neodymium. Considerable structural changes of the alloys occur with an increase of the neodymium content up to 1%. If neodymium is added to magnesium, the hardness is increased and the mechanical properties of the alloys are improved. The strength and plasticity of the alloys in the system neodymium-magnesium in the region of the solid solution on the basis of magnesium are increased with rising neodymium content. At 150

Card 1/2

SOV/78-3-9-22/38

The Phase Diagram of the Alloys of the System Magnesium-Neodymium

and 250°C the alloys of magnesium with neodymium are considerably more solid than pure magnesium. The microstructure of the alloys changes to a great extent in alloys with 10% neodymium, they reach the maximum dispersion at 25% neodymium. There are 4 figures, 2 tables, and 7 references, 4 of which are Soviet.

ASSOCIATION: Institut metallurgii im. A. A. Baykova Akademii nauk SSSR (Institute of Metallurgy imeni A. A. Baykov, AS USSR)

SUBMITTED: January 21, 1958

Card 2/2

S/137/60/000/009/018/029
A006/A001

[illegible]

Translation from: Referativnyy zhurnal, Metallurgiya, 1960, No. 9, pp. 257-258,
21596

AUTHORS: Savitskiy, Ye.M., Terekhova, V.F., Tsikalov, V.A.

TITLE: Investigation of the Physico-Chemical Interactions of Rare-Earth Metals With Iron and Steel

PERIODICAL: V sb.: Redkozelmel'n. elementy v stalyakh i splavakh, Moscow, Metallurgizdat, 1959, pp. 31-49

TEXT: The authors studied the interaction of rare-earth metals, such as La and Ce, with S, O, Si and C of steel and the effect of Ce and La on the mechanical properties of Fe. The Fe-La system, with up to 2 weight percent La, was studied by microscopical, electronoscopical and mechanical methods. It is established that small additions of rare-earth metals (0.2-0.5%) refine considerably the structure of Fe and steel. Rare-earth metals are strong deoxidizers which cause the fine-dispersed distribution of oxide impurities. The addition of 0.2-0.5% rare-earth metals to steel containing $S > 0.1\%$ cause considerable desulfuri-

Card 1/2

S/137/60/000/009/018/029
A006/A001

Investigation of the Physico-Chemical Interactions of Rare-Earth Metals With Iron and Steel

zation. At a S content of $<$ 0.02-0.03%, desulfurization is not observed. The presence of $\leq$ 0.2% Si in the steel does not reduce the refining effect of Ce. The rare-earth metals introduced into the steel in an amount of 0.9-1.5%, interact with C, forming carbides, and reduce considerably the perlite content in the steel. The addition of 0.1-0.2% rare-earth metals causes higher strength, ductility and a_k of steel. An increase of the rare-earth metal content from 0 to $>$ 3% reduces the mechanical properties of Fe and steel due to the formation of brittle intermetallic compounds of Fe with the rare-earth metals. At a La content of $>$ 0.4-0.5 weight %, a second phase is observed in the Fe-La system. Solubility of La in γ-Fe is greater than in α-Fe. A considerable improvement of physico-mechanical properties of Fe-Al alloys was observed when rare-earth metals were introduced in an amount of up to 5 weight %.

A.R.

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

Card 2/2

SOV/136-59-1-12/24

AUTHORS: Savitskiy, Ye.M., and Terekhova, V.F.

TITLE: Yttrium and its Alloys (Ittriy i yego splavy)

PERIODICAL: Tsvetnyye Metally, 1959, Nr 1, pp 48-53 (USSR)

ABSTRACT: The authors have carried out an investigation of the microstructure and properties of yttrium and its alloys and the reaction and influence of the element on alloy properties. Yttrium for the investigation was supplied by D.D. Sokolov, L.A.Izhvanov and N.P.Vershinin. The purity of the metal was 96.5%, its microstructure characterised by inclusions of a second phase both at grain boundaries and within grains (Fig 1). The Brinel hardness was 80-85 kg/mm^2 and the ultimate strengths in tension and compression were 16 and 82 kg/mm^2. It was found that yttrium is completely dissolved by cerium; with aluminium, iron and copper eutectic mixtures are found; in alloys with chromium, titanium and zirconium, yttrium does not dissolve in large quantities, with peritectoid reactions over small concentration ranges and immiscibility in the solid state at higher yttrium contents; yttrium is practically immiscible with vanadium, niobium, tantalum and molybdenum. The

Card 1/3

Yttrium and its Alloys SOV/136-59-1-12/24

introduction of 0.1 - 0.2% yttrium refines the grains of almost all the cast metals studied, but with aluminium and magnesium the opposite effect is produced. Yttrium has a deoxidizing and inoculating effect on all the alloys and with magnesium and aluminium the element has a hardening effect. The authors recommend that the study of the alloying action of yttrium should be made the subject of special investigations.

Figs 3,4,6 and 7 show microstructures of alloys of yttrium with aluminium, chromium, copper and zirconium, respectively, Fig 2 shows the macro- (left) and micro-structures (centre and right) for a 10-% Y magnesium alloy and Fig. 5 the microstructures of 10-% Y alloys with molybdenum (left), tantalum (centre) and vanadium

Card 2/3

Yttrium and its Alloys SOV/136-59-1-12/24

(right).
There are 7 figures and 8 references, 6 of which are Soviet and 2 English.

ASSOCIATION: Institut Metallurgii AN SSSR (Institute of Metallurgy, AS USSR)

Card 3/3

SOV/129-59-3-9/16

AUTHORS: Savitskiy, Ye.M., Terekhova, V.F. and Burov, I.V.

TITLE: Influence of Rare Metals on the Mechanical Properties of Iron-aluminium Alloys (Vliyaniye redkikh metallov na mekhanicheskiye svoystva zhelezoalyuminiyevykh splavov)

PERIODICAL: Metallovedeniye i Termicheskaya Obrabotka Metallov, 1959, Nr 3, pp 38 - 43 + 2 plates (USSR)

ABSTRACT: Up to relatively recently, it was not possible to produce Fe-Al alloys with aluminium content of about 16 wt.% with an elongation at room temperature exceeding 3%. The cause of such brittleness was obviously the large quantity of non-metallic Al_2O_3 inclusions, the presence of a considerable quantity of admixtures in the original iron and also the formation of chemical compounds and of superstructures. The increased brittleness is also brought about by the tendency of these alloys to form a large number of micro-cracks due to low-temperature conductivity and also due to the tendency to grain growth. The authors investigated the effects of applying rare metals for improving the

Card1/5

SOV/129-59-3-9/16

Influence of Rare Metals on the Mechanical Properties of Iron-aluminium Alloys

mechanical properties of alloys of this type. The alloys were produced using as starting materials electrolytic iron of 99.58% purity and aluminium of 99.99% purity. The influence was investigated of alloying additions of the following elements: Zr, Ti, Ta, Nb, V, B, Mo, Ce. The additions were selected for the purpose of determining their influence as deoxidation agents, inoculation substances and carbide-forming substances. The chemical composition of the investigated 38 alloys is entered in Table 1, p 40. The effect of the individual elements on the mechanical properties was investigated and also on the magnetic and the technological properties. In Figure 6, the dependence of the hardness on additions of rare metals is graphed for iron-aluminium alloys containing 15-16% Al. In Figure 7, the influence of cerium on the macro- and microhardness of iron-aluminium alloys is graphed. In Figure 8, the influence of additions of rare metals on the strength of iron-aluminium alloys is graphed. Figures 2-5 show microphotos

Card2/5

SOV/129-59-3-9/16

Influence of Rare Metals on the Mechanical Properties of Iron-aluminium alloys

(magnification 100 times) of Fe-Al alloys containing various additions and also non-metallic inclusions. In Figure 9, the influence of zirconium and tantalum on the ductility of Fe-Al alloys during hot rolling is graphed. Numerical data on the influence of zirconium and tantalum on the impact strength of alloys are entered in Table 2; numerical data on the influence of Ta, Zr and Ce on the tensile strength of Fe-Al alloys are entered in Table 3. The authors arrived at the following conclusions. 1)The main harmful admixture which causes brittleness of Fe-Al alloys is oxygen, which forms occlusions of aluminium oxides along the boundaries and in the body of the grains. A good method of producing alloys with a minimum content of oxygen is induction smelting, in a pure helium atmosphere, in crucibles made of aluminium oxide and introducing aluminium on the surface of the metal. It is necessary to deoxidise primarily the iron in vacuum with carbon or hydrogen.. 2) An appreciable refining of the grain of Fe-Al alloys

Card3/5

SOV/129-59-3-9/16

Influence of Rare Metals on the Mechanical Properties of Iron-aluminium Alloys

occurs as a result of additions of Ti and combined additions of cerium with zirconium, cerium with molybdenum and cerium with vanadium.
3) Boron and vanadium in quantities up to 0.05 - 0.2% increases appreciably the hardness of the alloys. The strength of the alloys increases from 22 - 37 kg/mm^2 as a result of addition of 0.05% boron; tantalum (0.2%) and zirconium (0.5%) increases the strength by 20 - 25 kg/mm^2 and also the impact strength and the ductility during hot rolling.
4) Magnetic Fe-Al alloys can be easily deformed in the hot state and rolled into sheet. Non-magnetic alloys (based on FeAl compounds) can be rolled only if the optimum rolling regimes are equally complied with (a well-treated surface, small values of reduction, low speeds of deformation and strict adherence to the specified temperature conditions).
5) Combined alloying with cerium (0.25%), vanadium (0.25%)

Card4/5

SOV/129-59-3-9/16

Influence of Rare Metals on the Mechanical Properties of Iron-aluminium Alloys

and molybdenum (1.8%) brings about a shift in the line of the magnetic transformation of the iron-aluminium alloys (from 16 to 14% Al content).

6) None of the investigated alloys oxidises in air at 1 200 °C and all have a corrosion resistance commensurate with that of refractory steels. The specific gravity of such Fe-Al alloys (containing 16% Al) is 20% lower than the specific gravity of steel.

7) Iron-aluminium alloys alloyed with small quantities of cerium, zirconium, tantalum, etc. can be applied as relatively cheap high-strength materials at room and at elevated temperatures and also as materials with a high resistance to corrosion. There are 9 figures, 3 tables and 15 references, 5 of which are Soviet, 1 Japanese, 1 German and 8 English.

ASSOCIATION: Institut metallurgii AN SSSR (Institute of Metallurgy of the Ac.Sc.USSR)

Card 5/5

SOV/78-4-2-28/40

18(6)

AUTHORS: Savitskiy, Ye. M., Terekhova, V. F., Kholopov, A. V.

TITLE: The Phase Diagram of the Alloys of the System Chromium-Cerium (Diagramma sostoyaniya splavov sistemy khrom-tseriy)

PERIODICAL: Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 2, pp 435-438 (USSR)

ABSTRACT:

The phase diagram of the alloys chromium-cerium (up to 30 weight % cerium) was investigated by micro-structure analyses, thermal analyses, and X-ray analyses. Electrolytic chromium (99.5%) and metallic cerium (99%) were used as initial materials. In the system chromium-cerium separation into two layers takes place in a wide range (10 to 90% cerium) upon liquid state at 1780°. The analyses of the micro-structure of the alloys show that in the field of the solid solution the solidity of the alloy rises upon increase of cerium content. Cerium additions amounting from 1-1.5% to chromium increase the solidity of chromium and refine its structure. Alloys of the system chromium-cerium with cerium contents $> 3\%$ are unstable in air and decompose while cerium oxides are formed. The liquidus and solidus curves of these alloys

Card 1/2

SOV/78-4-2-28/40

The Phase Diagram of the Alloys of the System Chromium-Cerium

were determined. D. Ya. Svet and V. V. Grishin participated in these determinations. The solubility of cerium in solid chromium was determined and it was found that the solubility is 2-3% at 1500°, 3-5% at 1600°, and 5-10% at 1700°. The solubility curve of cerium in solid chromium, depending on the temperature, was drawn on the basis of the micro-structure analysis. The phase diagram of the alloys chromium-cerium (up to 30% cerium) was drawn according to data on microstructure and thermal analyses. There are 8 figures, 2 tables, and 7 references, 4 of which are Soviet.

ASSOCIATION: Institut metallurgii im. A. A. Baykova Akademii nauk SSSR (Institute of Metallurgy imeni A. A. Baykov of the Academy of Sciences, USSR)

SUBMITTED: November 29, 1957

Card 2/2

18(6) SOV/78-4-6-43/44

AUTHORS: Savitskiy, Ye. M., Terekhova, V. F., Tsikalov, V. A.

TITLE: The Phase Diagram of the Alloys Aluminum-Yttrium (Diagramma sostoyaniya splavov alyuminiya s ittriyem)

PERIODICAL: Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 6, pp 1461 - 1462 (USSR)

ABSTRACT: The system aluminum-yttrium was investigated for the first time. Alloys up to 60 percentages by weight yttrium were produced and investigated by metallographic, thermal, and X-ray structural analyses and the microhardness was determined. Aluminum of the type AV-000 and metallic yttrium of a purity of 99.6% were used as initial materials. The phase diagram of the alloys aluminum-yttrium (60 percentages by weight yttrium) is a complicated system with occurrence of chemical compounds (Fig 1). Chemical compounds occur as crystals in alloys with 13.5 and 42 percentages by weight yttrium. The microstructure of the alloys aluminum-yttrium with 0.34, 8.78. 42.1 and 57.3 percentages by weight yttrium is given in figure 2. Alloys with 57.3 percentages by weight yttrium

Card 1/2

The Phase Diagram of the Alloys Aluminum-Yttrium SOV/78-4-6-43/44

have a composition which corresponds to the formula Al_5Y_2. The microhardness of this alloy amounts to 600 kg/mm^2. By the X-ray structural analysis it was found that this compound has a complicated crystal structure. Further investigations are necessary for the completion of the phase diagram aluminum-yttrium. There are 2 figures.

SUBMITTED: January 30, 1959

Card 2/2

SOV/78-4-6-44/44

18(6)

AUTHORS: Savitskiy, Ye. M., Terekhova, V. F., Burov, I. V.

TITLE: Investigations of the Alloys of Niobium With Lanthanum and Cerium (Issledovaniye splavov niobiya s lantanom i tseriyem)

PERIODICAL: Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 6, pp 1462 - 1463 (USSR)

ABSTRACT: Thermal-, microstructure-, and X-ray analyses were carried out in the alloys of niobium with lanthanum and the hardness and the electric resistance were determined. On the strength of the investigations phase diagrams of the systems niobium-cerium and niobium-lanthanum (up to 50 percentages by weight cerium and lanthanum) were constructed and given in figures 1 and 2. Niobium of a purity of 99%, metallic lanthanum of 99%, and cerium of a purity of 98.9% were used as initial materials. It was found that niobium with lanthanum and cerium has in the liquid and solid phase wider immiscible regions. The formation of layers in the system niobium-cerium begins already in the case of 1 - 2% cerium and in the alloys niobium-lanthanum in the case of 0.1 - 0.2% lanthanum. The solubility of cerium

Card 1/2

Investigations of the Alloys of Niobium With Lanthanum and Cerium SOV/78-4-6-44/44

and lanthanum in niobium in solid state is not higher than 0.05%. It was found that the plasticity of niobium is increased by the addition of 0.3 - 0.5% cerium. There are 2 figures.

SUBMITTED: January 30, 1959

Card 2/2

SAVITSKIY, Ye.M.; TEREKHOVA, V.F.

Yttrium and its alloys. Tsvet. met. 32 no.1:48-53 Ja '59.
(MIRA 12:1)

1. Institut metallurgii AN SSSR.
(Yttrium--Metallography) (Yttrium alloys)

Terekhova, V.F.

PHASE I BOOK EXPLOITATION SOV/4164

Vsesoyuznoye soveshchaniye po splavam redkikh metallov. 1st, Moscow, 1957

Redkiye metally i splavy; trudy... (Rare Metals and Alloys; Transactions of the First All-Union Conference on Rare-Metal Alloys) Moscow, Metallurgizdat, 1960. 436 p. 3,150 copies printed.

Sponsoring Agencies: Akademiya nauk SSSR. Institut metallurgii; USSR Komissiya po redkim metallam pri nauchno-tekhnicheskom komitete.

Ed.: I.K. Shapovalov; Ed. of Publishing House: O.M. Kamayeva; Tech. Ed.: P.G. Islent'yeva.

PURPOSE: This collection of articles is intended for metallurgical engineers, physicists, and workers in the machine-building and radio-engineering industries. It may also be used by students of schools of higher education.

COVERAGE: The collection contains technical papers which were presented and discussed at the First All-Union Conference on Rare-Metal Alloys, held in the Institute of Metallurgy, Academy of Sciences USSR in November 1957. Results of investigations of rare-metal alloys, titanium, and copper-base alloys with additions of rare metals are presented and discussed along with investigations of rhenium, vanadium, niobium, and their alloys. The effect of rare-earth metals on properties of magnesium alloys and steels is analyzed. The uses of rhenium as a dehydrating catalyst, electroplating material, and material suitable for making plugs for automobile electrical systems are discussed. Also, the effect of the addition of certain elements on the properties of heat-resistant steel is examined and alloys with special physical properties (particularly semiconductive alloys) are discussed. No personalities are mentioned. Soviet and non-Soviet references accompany some of the articles.

PART II. TITANIUM AND COPPER-BASE ALLOYS WITH RARE-METAL ADDITIONS

Rare Metals (Cont.) SOV/4164

Andreyeva, V.V., A.I. Glukhova, Ye.I. Yemenskaya, L.I. Seleznev, and M.V. Mal'tsev. Corrosion Resistance of Zirconium and Its Alloys 156

PART IV. RARE-EARTH METALS AND THEIR EFFECT ON PROPERTIES OF MAGNESIUM ALLOYS

Ryabchikov, D.I., and Yu.S. Sklyarenko. Rare-Earth Elements and Possibilities of Producing Them 171

Ioffe, Ye.L., V.N. Bezrukova, and L.V. Kudryash. Production of Aluminum-Cerium, Aluminum-Lanthanum, Magnesium-Cerium, Magnesium-Lanthanum, and Magnesium-Neodymium Addition Alloys by Electrolysis 180

Terekhova, V.F., and Ye.M. Savitskiy. Investigation of Physicochemical Interaction of Rare-Earth Metals With Magnesium, Iron, Chromium, and Titanium 189

Mikheyeva, V.I., and M.Ye. Kost. Hydrides of Rare-Earth Metals and Possibilities of Their Practical Utilization 202

Card 5/8

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S/180/60/000/03/013/030
E193/E383

AUTHORS: Savitskiy, Ye.M., Stepanov, Ye.S. and Terekhova, V.F. (Moscow)
[redacted]

TITLE: Neodymium and Its Alloys with Aluminium

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Metallurgiya i toplivo, 1960, Nr 3, pp 73 - 78 (USSR)

ABSTRACT: The object of the present investigation was to determine the physical and mechanical properties of pure (99.5%) neodymium and neodymium-aluminium alloys. The following properties were determined for cast neodymium: Brinell hardness 46 kg/mm^2; ultimate compressive strength - 25 kg/mm^2; ductility (in compression) - 36%. It has been found that neodymium is characterised by good, both hot and cold, workability, it being possible to produce neodymium strip, 0.5 mm thick, by cold-rolling with intermediate annealings at 500 - 600 °C. Neodymium, cold-rolled to 70% reduction in thickness, had the UTS equal to 13 kg/mm^2 and ductility (in tension) equal 1-2%. The constitution diagram of the aluminium-neodymium system, constructed on the basis of metallographic and thermal analysis, is shown in Figure 3. It has been found that

Card1/3

80981

S/180/60/000/03/013/030
E193/E383

Neodymium and Its Alloys with Aluminium

solid solubility of neodymium in aluminium does not exceed 0.2%. A eutectic, containing approximately 13 wt.% neodymium, is formed at about 640 °C. In the investigated concentration range, the existence of two intermetallic compounds, $NdAl_4$ and $NdAl_2$, has been observed. The former is formed as a result of a peritectic reaction at 1 250 °C; the latter crystallizes out from the liquid phase at 1 450 °C. Owing to the formation of the intermetallic compounds, addition of neodymium to aluminium increases the strength of the latter metal. Hardness of an aluminium-base alloy containing 30 wt.% neodymium is 155 kg/mm^2, as compared with 25 kg/mm^2 for pure aluminium; addition of 5% neodymium increases the UTS of aluminium from 5 to 10 kg/mm^2 and lowers its ductility by 5-10%. Hardness of the intermetallic compounds $NdAl_4$ and $NdAl_2$ is 350 and 600 kg/mm^2, respectively. The electrical restivity of aluminium is not significantly affected by addition of neodymium; resistivity of the

Card2/3

80981

S/180/60/000/03/013/030
E193/E383

Neodymium and Its Alloys with Aluminium

5% Nd-Al alloy is practically equal to that of pure aluminium. The effect of temperature up to 300 °C on the mechanical properties of the Al-Nd alloys with up to 5% Nd has been also investigated. Figure 1 shows the microstructure of neodymium (a) cast, (b) after 70% cold deformation and (c) after cold deformation to 70% and annealing at 500 °C. Figure 2 shows the microstructure of the aluminium-neodymium alloys (cold-worked and annealed), containing 0, 0.74, 1.05, 9.24, 24.21, 47.47 and 66% neodymium. There are 3 figures, 2 tables and 9 references, 7 of which are Soviet and 2 English.

SUBMITTED: March 2, 1960

4

Card 3/3

SOV/78-5-1-43/45

5(2)

AUTHORS: Terekhova, V. F., Markova, I. A., Savitskiy, Ye. M.

TITLE: Alloys of Magnesium With Yttrium

PERIODICAL: Zhurnal neorganicheskoy khimii, 1960, Vol 5, Nr 1, pp 235-236 (USSR)

ABSTRACT: The authors investigated the influence exerted by yttrium upon the properties of magnesium and plotted the phase diagram for the system Mg - Y, on which there are no data available. They studied the macro- and microstructure of 19 alloys with an yttrium content of up to 55%, carried out the thermal analysis, and measured their hardness. Figure 1 shows the microstructure of magnesium alloys with different yttrium content. Figure 2 illustrates the phase diagram recorded by a Kurnakov pyrometer, and represents the dependence of microhardness on the content of the second component. In alloys with more than 40% of yttrium, a compound of Mg with Y (probably Mg_3Y) was formed, whose crystallographic data were determined by P. I. Kripyakevich and Ye. I. Gladyshevskiy. The phase diagram shows that it is similar to the earlier investigated diagrams of the

Card 1/2

Alloys of Magnesium With Yttrium SOV/78-5-1-43/45

systems Mg - La, Mg - Ce, Mg - Pr, and Mg - Nd, but the melting point of its eutectic is higher. Thus, this Mg - Y system obtains better physical and mechanical properties than the systems formed by Mg and other rare earth elements. There are 2 figures and 3 Soviet references.

SUBMITTED: July 23, 1959

Card 2/2