#356

MIKHAYLOV, B. B., ZHERDEVA, L. G., KARASEVA, A. A., VOZNESENSKAYA, E. V., ALTSHULER, A. E., KROL, B. B., OROCHKO, D. I., AKIMOV, V. S., AGAFONOV, A. V., DRUZHININA, A. V.

"Production of Lubricating Oils and Paraffin from Sulfurous Oils in the USSR."

Report submitted at the Fifth World Petroleum Congress, 30 May - 5 June 1959. New York City.

MIKHAYLOV, B.G.

Category : USSR/General Problems - Problems of Teaching

A-3

Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 5526

Author : Mikhaylov, B.G.

Title : Concerning the Problem of the Connection Between the Courses in Physics and Chemistry in the Secondary School.

Orig Pub : Uch. zap. Yolabukhsk. ped. in-ta, 1956, 1, 85-139

Abstract : No abstract

Card : 1/1

UL'YANOV, N.A., kand.tekhn.nauk; MIKHAYLOV, B.I.

Performance of the elastic driving wheel on hard-surface ground. Avt. prom. no.5:25-27 My '60. (MIRA 14:3)

1. Sibirskiy avtodorozhnyy institut.
(Automobiles—Wheels—Testing)

MIKHAYLOV, B.I., inzh.; UL'YANOV, N.A., kand.tekhn.nauk

Automatic adjustment of motor grader operations. Stroi.i dor.
mashinostr. 5 no.7:6-7 Jl '60. (MIRA 13:7)
(Automatic control)
(Graders (Earthmoving machinery))

26241
S/119/61/000/008/008/008
D215/D302

9.6110

HOR: Mikhaylov, B.I.

TITLE: Transistor anemometer

4

PERIODICAL: Priborostroyeniye, no. 8, 1961, 27 - 28

TEXT: This paper describes the construction, operation and application of a portable transistor anemometer designed for use in research and scientific work. The instrument is capable of measuring the velocities of gases ranging from 1 cm/sec to several tens of meters per second. In the working temperature range of 0° to 60°C the performance is stable, and the error does not exceed 2 %. The instrument is driven from a battery. The power consumption is 0.12 watts. The unit is connected to a measuring fork by means of a flexible tube. The fork consists of a tubular root with a transmitter at one end and a handle at the other. The transmitter is electrically connected to the electronic unit by means of 3 conductors, two of them being screened and the screen itself acting as the fourth conductor. The circuit diagram is shown in Fig. 2.
Card 1/3

26241

Transistor anemometer ... S/119/61/000/008/008/008
D215/D302

X

The transmitter consists of a bridge energized by a sinusoidal oscillator. T_1 and T_2 are electrically identical sundry elements located in pointed hollow heads. The working transmitter head T_1 has two openings 0.7 mm in diameter, located on the axis of symmetry. The diameter of the openings is increased if air velocities exceed 6 m/sec. The resistance of the thermistors depends on the velocity of medium and their temperature difference. T_2 is an ambient temperature compensating thermistor. The unbalance signal is amplified and the output current, proportional to the velocity of gas passes through an indicator (50 μA f.s.d.). T_3 is a correcting thermistor. k_6 is a balancing potentiometer. The amplifier is temperature stabilized by means of a.c. and d.c. negative feedbacks. The power supply is 6 volts. The compensating capacitor C_5 (560 pF) is used only if the bridge cannot be balanced. There are 2 figures.

Card 2/3

S/119/62/000/001/005/011
D201/D302

AUTHOR: Mikhaylov, B.I.

TITLE: A shunt temperature compensated thermistor thermometer

PERIODICAL: Priborostroyeniye, no. 1, 1962, 19 - 20

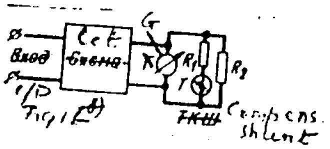
TEXT: The author gives a short analysis of the method of design and the characteristics of a shunt compensated thermistor thermometer for remote measurement of the temperature range - 22 to + 85°C ± 1 % (practically independent of temperature), simultaneously at 9 control points. The circuit (Fig. 1b) employs resistors ВС (VS) having a negative temperature coefficient of approximately 0.0007. The temperature compensating shunt is connected across the galvanometer. It consists of resistors R_1 and R_2 and a thermistor T. Part of the current flows in the shunt and if at a constant signal the current changes owing to a change in the ambient, the shunt will compensate this current variation, the current flowing through the galvanometer will remain constant and depend only on the value of the signal. The galvanometer, the shunt and the circuit of the sen-

Card 1/2

A shunt temperature compensated ... S/119/62/000/001/005/011
D201/D302

sing element form a bridge and this is adjusted so that the zero deflection corresponds to - 22°C and max. deflection to + 85°C, which means that the value of R_1 is equal to the resistance of the thermistor at - 22°C. The sensing element consists of a high value (4.56 kilo ohms) thermal resistance type KMT. Because of a large spread in thermal resistance and thermistor characteristics, every instrument has to be individually calibrated. There are 4 figures.

Fig. 1b.



Card 2/2

MIKHAYLOV, B.I.

Inertialess electric speedometer. Priborostroenie no.4:19-20 Ap '62.

(Speedometers)

(MIRA 15:4)

NIKITINA, A.N.; TER-SARKISYAN, G.S.; MIKHAYLOV, B.M.;
MINCHENKOVA, L.Ye.

Fluorescence of solutiors of certain substituted polyenes. Opt. i spektr. 14 no.5:655-663 My '63. (MIRA 16:6)

(Unsaturated compounds—Spectra)

MIKHAYLOV, B.M., konstruktor; KOLOMIYER, M.G., konstruktor.

New small-sized roller. Avt.dor. 19 no.1:24-25 Ja '56.(MLRA 9:5)
(Rollers (Earthwork))

MIKHAYLOV, B.M.

Role of vegetative cover in lateral weathering in the mountain regions of the Liberian Shield. Dokl. AN SSSR 157 no.4:856-858 Ag '64

(MIRA 17:8)

1. Predstavleno akademikom N.M. Strakhovym.

BOYTSOVA, Ye.P.; MAZINA, Ye.A.; MIKHAYLOV, B.M.; OVECHKIN, N.K.;
ROSSOVA, S.M., redaktor; GUROVA, O.A., tekhnicheskikiy redaktor.

[Geology of the southwestern region of the Turgay Gates]
Geologiia iugo-zapadnoi chasti Turgaiskogo progiva. Moskva, Gos.
nauchno-tekhn. izd-vo lit-ry lp geologii i okhrane nedr, 1955.
154 p. (Leningrad. Vsesoiuznyi geologicheskii institut. Trudy,
vol. 5).
(MLRA 9:5)
(Turgay Gates--Geology, Stratigraphic)

MIKHAYLOV, B.M.

[redacted]

Determining indices of refraction of clay fractions of rocks by means of the Fedorov stage. Inform.sbor.VSEGEI no.2:68-71 '55.
(MLRA 9:11)

(Refractive index)
(Clay--Optical properties)

MIKHAYLOV, B.M.

Results of staining mixtures of clayey minerals with methylene blue.
Inform.sbor.VSEGEI no.2:71-76 '55. (MLRA 9:11)
(Methylene blue) (Clay)

MIKHAYLOV, B.M.

Montmorillonite from vareigated lower Cretaceous deposits of Kiya Valley in Western Siberia. Uch.zap.Len.un no.188:108-116 '55. (MLRA 9:8)

(Kiya Valley--Montmorillonite)

[illegible]

MIKHAYLOV, B.M.

Meneralogical and petrographical characteristics of clay formations of the upper Cretaceous and Paleocene in a section of the Pokurskaya key well in Western Siberia. Mat. VSEGEI Litol. no.1:77-91 '56.

(MIRA 11:2)

(Khanty-Mansiysk National Territory--Clay)

MIKHAYLOV, B.M.

Effect of absorbed cations on the color of suspensions of clays of different mineralogical composition, stained with methylene blue. Mat. VSEGEI Litol. no.1:159-161 '56. (MIRA 11:2)
(Clay) (Cations)

APUKHTIN, N.I.; BOGRETSOVA, T.B.; BOCH, S.G. [deceased]; GENESHIN, G.S.; GOLUBEVA, L.V.; GROMOV, V.I.; KRASNOV, I.I.; MIKHAYLOV, B.M.; NIKIFOROVA, K.V.; NIKOLAYEV, N.I.; POKROVSKAYA, I.M.; POPOV, V.V.; PRINTS, R.N.; RAVSKIY, E.I.; SHANTSER, Ye.V.; EPSHTEYN, S.V.; YAKOVLEVA, S.V.; FEODOT'YEV, K.M., redaktor izdatel'stva; KASHINA, P.S., tekhnicheskiy redaktor

[Concise field manual for a comprehensive geological survey of the Quaternary] Kratkoe polevoe rukovodstvo po kompleksnoi geologicheskoi s"emke chetvertichnykh otlozhenii. Sost. N.I.Apukhtin i dr. Moskva, 1957. 201 p. (MLRA 10:9)

1. Akademiya nauk SSSR. Geologicheskiy institut. 2. Morkovskiy geologo-razvedochnyy institut (for Shantser). 3. Geologicheskiy institut Akademii nauk SSSR (for Nikiforova, Ravskiy, Golubeva) 3. Vsesoyuznyy Nauchno-issledovatel'skiy geologicheskiy institut Ministerstva geologii i okhrany nedr SSSR (for Ganeshin, Bogretsova, Mikhaylov). 4. Voyenno-inzhenernaya akademiya im. Kuybysheva (for Popov). 5. Trest "Mosgeolnerud" (for Prints). 6. Severo-Zapadnoye geologicheskoye upravleniye (for Apukhtin)
(Geology, Stratigraphic)

MIKHAYLOV, B M

VIKULOVA, M.F.; ZVYAGIN, B.B.; MIKHAYLOV, B.M.; BERLIN. T.S.; ORESHNIKOVA, Ye.I.; SHAKHOVA, R.A.; IVANOVA, I.I.; TATARINOV, P.M., prof., red.; GEYSLER, A.N., prof.red.; DOMINIKOVSKIY, V.N., kand.geologo-mineralogicheskikh nauk, red.; KNIPOVICH, Yu.N., kand. geologo-mineralogicheskikh nauk; SMUROV, A.A., kand. geologo-mineralogicheskikh nauk; FRANK-KAMENETSKIY, V.A., kand. geologo-mineralogicheskikh nauk; BABINTSEV, N.I., red.izd-va; KRYNOCHKINA, K.V., tekhn.red.

[A methods manual on the petrographic and mineralogical study of clays] Metodicheskoe rukovodstvo po petrografo-mineralogicheskomu izucheniiu glin; trudy Instituta. Sost. kollektivom avtorov pod rukovodstvom M.F. Vikulovoi. Moskva, Gos. nauchno-tekhn. izd-vo lit-ry po geol. i okhrane nedr, 1957. 447 p. (MIRA 11:2)

1. Leningrad. Vsesoyuznyy geologicheskiy institut. 2. Chlen-korrespondent AN SSSR (for Tatarinov)
(Clay)

MIKHAYLOV, B.M.

Indirect determination of the iron content in loose oolitic ores. Razved. i okh.nedr 24 no.10:23-25 O '58.
(MIRA 12:2)

1. Vsesoyuznyy geologicheskiy nauchno-issledovatel'skiy institut.
(Oolite) (Iron)

MIKHAYLOV, B.M.

Determining the danger of silicosis from fine dispersed rocks.
Inform.sbor. VSEGEI no.16:143-148 '59. (MIRA 15:3)
(LUNGS--DUST DISEASES)

MIKHAYLOV, B.M.

Methods and problems of lithofacies mapping in closed areas. Trudy VSEGEI 72:21-27 '62. (MIRA 15:9)
(Geology—Maps)

MIKHAYLOV, B.M.

Lithofacies maps in geological surveying of closed areas. Sov. geol. 6 no.7:136-140 Jl '63. (MIRA 16:8)

1. Vsesoyuznyy nauchno-issledovatel'skiy geologicheskiy institut.

0901 1722

L 6911-66 EWT(m)/EWP(k)/EWA(c)/T/EWP(b)/EWP(v)/EWP(t) IJP(c) JD/HM
ACCESSION NR: AP5000060 S/0286/64/000/021/0068/0068

AUTHOR: Glazunov, S. G.; Gruzdeva, L. A.; Moiseyev, V. N.; Poplavko-Mikhaylov, M. V.; Khorev, A. I.; Mikhaylov, B. N. 45 B

TITLE: Filler material for welding titanium alloys with a high content of β-phase. Class 49, No. 166221

SOURCE: Byul. izobr. i tovar. znakov, no. 21, 1964, 68

TOPIC TAGS: titanium, titanium alloy, beta titanium alloy, welding, filler wire, electrode wire

ABSTRACT: This Author Certificate introduces a titanium-base filler alloy for welding titanium alloys with a high content of β-phase. To make the filler suitable for any such titanium alloys and to improve the ductility of the weld metal, the filler alloy contains 1—3% Al and 8—10% Mo.

ASSOCIATION: none

SUBMITTED: 16Oct61 ENCL: 00 SUB CODE: MM, IE

NO REF SOV: 000 OTHER: 000 ATD PRESS: 3148

Card 1/1 nls

TER-SARKISYAN, G.S.; MIKHAYLOV, B.M.

Reaction of
1-(2,6,6-trimethylcyclohexen-1-yl)-3-(ethylmercapto)-1,3-butadiene
with acetals. Zhur. org. khim. 1 no.7:[illegible]-[illegible] '65.
(MIRA 18:11)

1. Institut organicheskoy khimii imeni N.D.Zelinskogo AN SSSR.

L 31004-66 EWT(m)/EWA(d)/EWP(t) IJP(c) JD/JG

~~ACC NR:~~ AP6007782 SOURCE CODE: UR/0136/66/000/002/0080/0082

AUTHOR: Moiseyev, V. N.; Glazunov, S. G.; Mikhaylov, B. M. 37

8

ORG: none

18 27

TITLE: High strength titanium alloys

SOURCE: Tsvetnyye metally, no. 2, 1966, 80-82

TOPIC TAGS: titanium alloy, aluminum containing alloy, molybdenum containing alloy, vanadium containing alloy, chromium containing alloy, iron containing alloy, alloy mechanical property, alloy heat treatment, high strength alloy

7

ABSTRACT: A series of high strength titanium alloys containing up to 30% molybdenum, up to 6% aluminum, and small amounts of iron, chromium, and vanadium have been developed. Alloy ingots weighting up to 6 kg were melted in a vacuum arc furnace and rolled into sheets 1.2 mm thick. Sheet specimens were annealed at 800C for 30 min, furnace cooled at a rate of 2—3 C/min, annealed at 750, 800, or 850C for 15 min, water quenched, and aged at 450—500C for 4—16 hr. It was found that alloys containing 8—10% molybdenum had the highest strength, 150 kg/mm^2; additions of up to 4% aluminum caused a further increase of tensile strength up to 160 kg/mm^2. Further increases in strength can be obtained by alloying with 1% iron, 1% chromium, and 2—5% vanadium, which strengthen both the α- and β-phases. Seven such alloys were melted, cast into ingots weighing up to 40 kg, which were forged into 80 x 80 mm billets at

2

Card 1/2 UDC: 669.295:620.18

L 31004-66

ACC NR: AP6007782

1050—850C, and then into bars 12 or 22 mm in diameter at 950—750C. These alloys were tested in the fully annealed or heat-treated (annealed, quenched, and aged) conditions. Annealing at 800—850C for 30 min followed by furnace cooling at a rate of 2—4 C/min ensured a relatively high tensile strength, 105—125 kg/mm^2, at an elongation of 14—21% and a reduction of area of 45—63%. Annealing at 800—860C followed by aging at 450—500C increased the strength to 160—170 kg/mm^2 and lowered the elongation to 4—9% and the reduction of area to 20—31%. Annealing at 720—800C and aging at 450—550C produced a strength of 148—155 kg/mm^2, an elongation of 6—12%, and a reduction of area of 32—50%. It is concluded that $\alpha+\beta$ alloys containing additional alloying elements can be strengthened to a high level by annealing and aging. However, prior to heat treatment they should be subjected to intensive plastic deformation at temperatures of the $\alpha+\beta$ region. Orig. art. has: 2 figures and 3 tables. [AZ]

SUB CODE: 11, 13/ SUBM DATE: none/ ATD PRESS: 4214

Card 2/2

L 29950-66 EWP(k)/EWT(m)/T/EWP(w)/EWP(t)/ETI IJP(c) JD/HW/WB

ACC NR: AP6017298 (A) SOURCE CODE: UR/0136/66/000/005/0080/0082

AUTHOR: Glazunov, S. G.; Moiseyev, V. N.; Mikhaylov, B. M.

40
B

ORG: none

TITLE: Heat-resistant titanium-clad titanium alloys

SOURCE: Tsvetnyye metally, no. 5, 1966, 80-82

TOPIC TAGS: titanium alloy, alloy cladding, titanium clad alloy, alloy property

ABSTRACT: Heat-resistant titanium alloys are susceptible to cracking during hot and warm rolling due to the insufficient plasticity of the metal at rolling temperatures. An attempt has been made to improve the plasticity by cladding with unalloyed titanium. Two alloys, OT4-2 (6.5% aluminum, 1.5% manganese) and an imported alloy (8% aluminum, 1% molybdenum, 1% vanadium) were clad by pack rolling. Cladding made it possible to lower the temperature of heat rolling to 1050C, which considerably reduced the effect of oxidation. Final rolling to a thickness of 2 mm was done at 750—550C. Cladding was found to lower somewhat the tensile and yield strengths but to increase the ductility. For example: clad OT4-2 alloy sheets had a yield strength of 88.8—91.2 kg/mm^2, a tensile strength of 95.0—97.3 kg/mm^2 and an elongation of 22.5—24.5% compared to 93.4—95.6 kg/mm^2, 103.7—105.5 kg/mm^2, and 12.8—14.6 for unclad sheets. As the test temperature was increased, the difference became less pronounced. The ductility of unclad specimens was greatly reduced when sheets were

Card 1/2 UDC: 669.295:621.771.8

L 29950-66

ACC NR: AP6017298

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exposed to temperatures of 400—500C for 100 hr, while the ductility of clad specimens remained almost unaffected. Cladding also greatly improved the formability and weldability of both alloys. No separation of cladding from the base material was observed during any of the tests. Orig. art. has: 3 tables and 2 figures. [FM]

SUB CODE: 11, 13/ SUBM DATE: none/ ATD PRESS: 5611

Card 2/2 CC

L 23000-66 EWT(m)/EWP(w)/T/EWP(t) IJP(c) JD/JG

ACC NR: AP6012144 SOURCE CODE: UR/0413/66/000/007/0060/0060

INVENTOR: Moiseyev, V. N.; Glazunov, S. G.; Mikhaylov, B. M.; Metelkin, V. Ye. 40 B

ORG: none

TITLE: A titanium-base alloy. Class 40, No. 180351

27

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 7, 1966, 60

27 27

TOPIC TAGS: titanium alloy, aluminum containing alloy, molybdenum containing alloy, vanadium containing alloy, chromium containing alloy, iron containing alloy

27 27 27

ABSTRACT: This Author Certificate introduces a titanium-base alloy containing aluminum, molybdenum, vanadium, and chromium. To improve the mechanical properties, the alloy has the following chemical composition: 2—6% aluminum, 6—9% molybdenum, 1—3% vanadium, 0.5—2% chromium, 0—5% iron, and the rest titanium. 18

[WW]

SUB CODE: 11/ SUBM DATE: 06Jan65/ ATD PRESS: 4238

2

Card 1/1

L 31873-65 EWT(d)/EWT(m)/EWP(w)/EWA(d)/EWP(v)/EWP(k)/EWA(h) Pf-4/Peb EM

ACCESSION NR: AR3005870 S/0124/64/000/011/V010/V010

SOURCE: Ref. zh. Mekhanika, Abs. 11V79

25
B

AUTHORS: Mikhaylov, B. K.

26

TITLE: Calculation of gently-sloping shell which is rectangular in plan, with account of the compliance of two opposite edges

CITED SOURCE: Sb. Teor. mekhan., sporotivl. materialov, stroit. mekhan. L., 1964, 40-42

TOPIC TAGS: shell stability, shell structure

TRANSLATION: The author considers a shell that is rectangular in plan, has a gentle slope, is hinge-supported on two opposite edges, and is supported on elastic beams at the two other edges. Boundary conditions, in which account is taken of the flexural rigidity of the end beams in two planes and of their torsional rigity, are set up for these edges. The solution reduces to a single eighth-order differential equation relative to the resolving function. It is

Card 1/2

L 31873-65

ACCESSION NR: AR5005870

proposed to solve this equation in terms of single trigonometric series, but th solution itself is not given. It is mentioned that the solution was obtained by the author with a computer for the case of symmetrical deformation. Without giving the results of the solution, the author confines himself to the remark that the elastic compliance of the edges must be taken into account. P. A. Lukash.

SUB CODE: AS ENCL: 00

Card 2/2

L 46000-66 EWT(1)/FCC GW

ACC NR: AR6016287 SOURCE CODE: UR/0269/66/000/001/0046/0046

AUTHORS: Sidorov, V. V.; Andrianov, N. S.; Mikhaylov, B. K.; Pokrovskiy, G. B.; 57
Smolyakov, B. P. B

TITLE: Combined meteor station KGU-M2

SOURCE: Ref. zh. Astronomiya, Abs. 1.51.374

REF SOURCE: Sb. Meteorn. rasprostr. radiovoln. No. 2. Kazan', Kazansk. un-t, 1964, 3-19

TOPIC TAGS: meteor observation, meteor tracking, radio echo, upper atmosphere

ABSTRACT: A general discussion of the combined meteor station KGU-M2 developed at the Radio Astronomical Problems Laboratory KGU (Problemnaya radioastronomicheskaya laboratoriya KGU) is presented. The station is intended for studying the properties of the upper atmosphere by radio reflections from meteor tracks, the physics of meteoric ionization, and some problems of meteor astronomy. The main consideration is given to a description and analysis of noise prevention and station operation synchronization devices. Recommendations for its further improvement are given. Resume /Translation of abstract/

SUB CODE: 03

Card 1/1 UDC: 523.164.8

L 46881-66 EWT(1)

ACC NR: AR6016288 SOURCE CODE: UR/0269/66/000/001/0046/0046

33

B

AUTHOR: Mikhaylov, B. K.

TITLE: Indicator for recording the form of reflected pulses

SOURCE: Ref. zh. Astronomiya, Abs. 1.51.377

REF SOURCE: Sb. Meteorn. rasprostr. radiovoln. No. 2. Kazan', Kazansk. un-t, 1964, 53-58

TOPIC TAGS: meteor observation, meteor tracking, radio echo

ABSTRACT: A three-dimensional indicator is described. It permits recording of reflected pulses in large scale with the simultaneous plotting of the amplitude-time characteristics of the meteor echo. The causes of possible errors with the determination of distortions occurring at reflection are considered. Abstract [Translation of abstract]

SUB CODE: 03

Card 1/1 pla UDC: 523.164.8

1ST AND 2ND ORDERS

3RD AND 4TH ORDERS

PROCESSES AND PROPERTIES INDEX

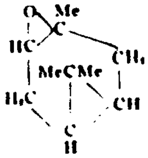
CA

10

Oxide of d-Δ⁴-carene. B. A. ARBUZOV AND B. M. MIKHAILOV. *J. Russ. Phys.-Chem. Soc.* 62, 607-15(1930).—*d-Δ⁴-Carene* (I) belongs to the group of bicyclic terpenes, widely distributed in nature, which was discovered by Simonsen (*C. A.* 14, 2617). Δ³-Carene and Δ⁴-carene, which was found by S. in the essential oil of *Andropogon Iwarancusa* (*C. A.* 17, 91), are the first natural terpenes having the carene nucleus

Me_2C CH CH CH_2 CMe CH CH_2 (I) and Me_2C CH CH CH CMe CH_2 CH_2

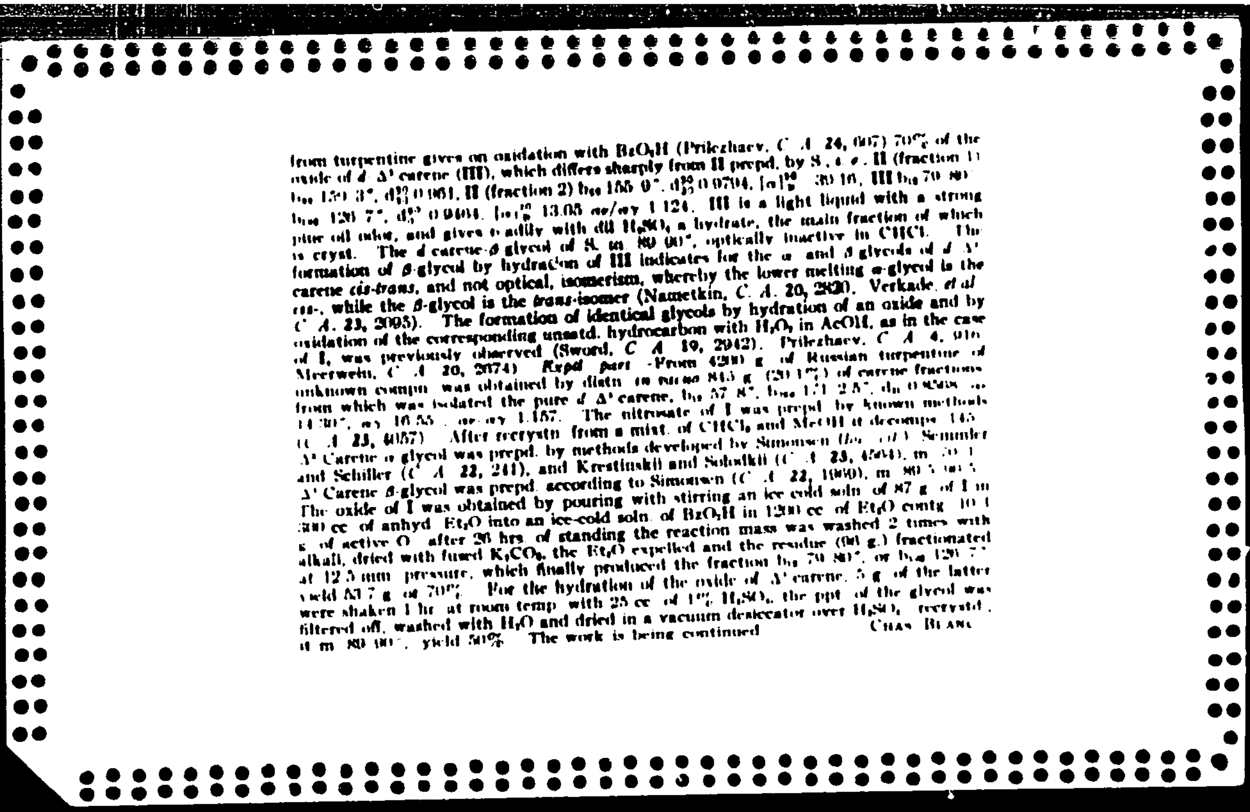
S. (l. c.) oxidized I with $KMnO_4$ in alk. soln. to a careneglycol, m. 69-70°, [α]D 10.05°, and with H_2O_2 in AcOH to a glycol m. 90-1°, optically inactive in alc. and $CHCl_3$ (Pillay and S., *C. A.* 22, 1000). This isomerism of glycols was presumed by him to be either a *cis-trans* or optical isomerism, wherefore the glycol m. 69-70° was named *d*-carene-α-glycol, and the glycol m. 90-1° *d*-carene-β-glycol. By the action of dil. H_2SO_4 the β-glycol loses 1 mol. of H_2O with formation of a mixt. of *p*-cymene and

1-epoxy-*d*-Δ⁴-carene  (II) which has an odor resembling linalool

and proved to be a very stable compd. giving no reaction with Br in $CHCl_3$, and forming no hydrate on shaking for several days with dil. H_2SO_4. The uncommon stability of II as contrasted with the high reactivity of the oxides of α-pinene and norpinene seems to be little understood, and is here proposed to be investigated. The Δ⁴-carene isolated

OVER

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



from turpentine gives on oxidation with BzO_2H (Prilezhaev, C. A. 24, 607) 70% of the
oxide of d-Δ³-carene (III), which differs sharply from II prepd. by S., l. c. II (fraction 1)
b_{10} 150 3°, d_{15}^{15} 0.961, II (fraction 2) b_{760} 155 0°, d_{15}^{20} 0.9704, $[\alpha]_D^{20}$ 30 16, III b_{10} 70 80
b_{760} 120 7°, d_4^{20} 0.9404, $[\alpha]_D^{20}$ 13.05 nα/nγ 1 124. III is a light liquid with a strong
pine oil odor, and gives readily with dil. H_2SO_4 a hydrate, the main fraction of which
is cryst. The d-carene-β-glycol of S. m. 80 90°, optically inactive in $CHCl_3$. The
formation of β-glycol by hydration of III indicates for the α- and β-glycols of d-Δ³-
carene *cis-trans*, and not optical, isomerism, whereby the lower melting α-glycol is the
cis-, while the β-glycol is the *trans*-isomer (Nametkin, C. A. 20, 2820. Verkade *et al*
C. A. 23, 2095). The formation of identical glycols by hydration of an oxide and by
oxidation of the corresponding unsatd. hydrocarbon with H_2O_2 in AcOH, as in the case
of I, was previously observed (Sword, C. A. 19, 2942). Prilezhaev, C. A. 4, 916
Meerwein, C. A. 20, 2674). *Exptl. part.*—From 4200 g. of Russian turpentine of
unknown compn. was obtained by distn. in vacuo 845 g. (20.1%) of carene fractions
from which was isolated the pure d-Δ³-carene, b_{10} 57 8°, b_{760} 171 2.5°, d_4 0.8568 ..
14 30°, n_D 16.55 . nα/nγ 1.157. The nitrosate of I was prepd. by known methods
(C. A. 23, 4057). After recrystn. from a mixt. of $CHCl_3$ and MeOH it decomps. 145
Δ³-Carene α-glycol was prepd. by methods developed by Simonsen (loc. cit.), Semmler
and Schiller (C. A. 22, 241), and Krestinskii and Solodkii (C. A. 23, 4501), m. 70 1
Δ³-Carene β-glycol was prepd. according to Simonsen (C. A. 22, 1000), m. 80.5 90.5
The oxide of I was obtained by pouring with stirring an ice cold soln. of 87 g. of I in
300 cc. of anhyd. Et_2O into an ice-cold soln. of BzO_2H in 1200 cc. of Et_2O contg. 10.4
g. of active O; after 28 hrs. of standing the reaction mass was washed 2 times with
alkali, dried with fused K_2CO_3, the Et_2O expelled and the residue (64 g.) fractionated
at 12.5 mm. pressure, which finally produced the fraction b_{12} 70 80°, or b_{760} 120 7°
yield 63.7 g. or 70%. For the hydration of the oxide of Δ³-carene, 5 g. of the latter
were shaken 1 hr. at room temp. with 25 cc. of 1% H_2SO_4, the ppt. of the glycol was
filtered off, washed with H_2O and dried in a vacuum desiccator over H_2SO_4, recrystd.,
it m. 80 90°, yield 50%. The work is being continued. Chas. Blanc

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

BC

MIKHAYLOV (B M)

B·I·2

Determination of the yield of oil from oil sands under laboratory conditions. B. Mikhailov (Groz. Neft., 1932, 2, No. 7—8, 61—65).—The yield depends on the original pressure in the sands and the original gas pressure, the physico-chemical condition of the crude oil and gas or dissolved gas, the physical nature of the subterranean reservoir, the rate of production, the area of the deposit, and the diam. of the wells.

Ch. Abs.

COMMON ELEMENTS

OPEN

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ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

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3RD AND 4TH ORDERS

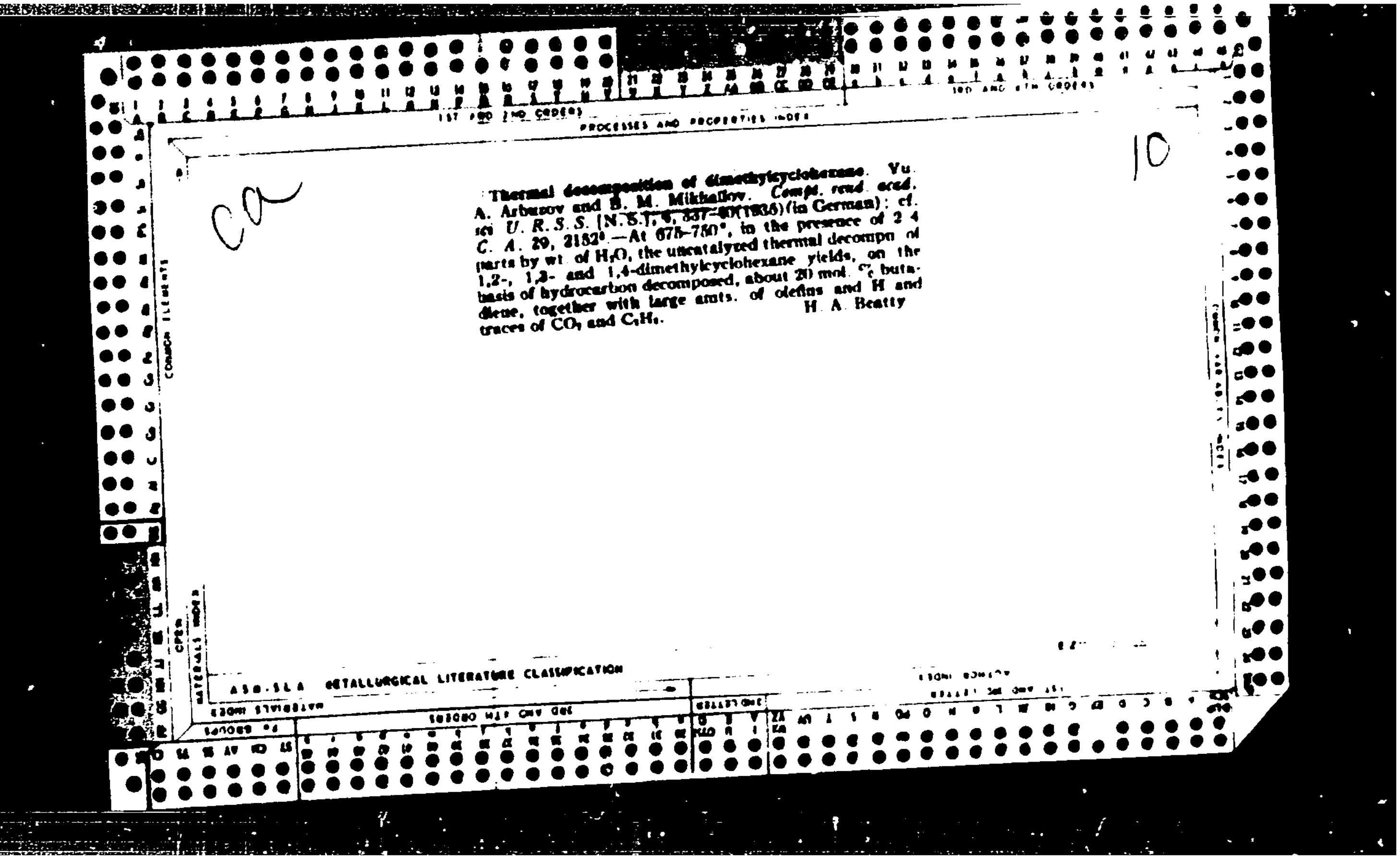
AP

1✓

Thermal decomposition of cyclohexane hydrocarbons.
N. D. Zelinskii, B. M. Mikhailov and Yu. A. Arbuzov.
J. Gen. Chem. (U. S. S. R.) 4, 856-65; *Compt. rend.*
acad. sci. U. R. S. S. 4, 208-12(in German 212)(1934).—
Tabulated results are given of the thermal decompn.
without the use of a catalyst of cyclic hydrocarbons satd.
with H_2O (1.5-4 vols.). Conclusions: (the yields given
in mol. percentage are based on the decompd. hydro-
carbons) cyclohexene at 650° gave 79.3 C_2H_4 and 65.2
butadiene (I); Δ¹-methylcyclohexene at 600° gave 75.1
C_2H_4 and 35.3 isoprene; Δ³-methylcyclohexene at 690°
gave 56.4 I and some propylene; cyclohexane at 750°
gave 92% C_2H_4, 30.9% I and H_2; methylcyclohexane
at 750° gave 34.8% I; ethylcyclohexane at 750° gave
41.2% I, and decalin at 750° gave 11.6% I. The results show
that Baku heavy benzine (b. 100-30°), contg. considerable
quantities of cyclohexane hydrocarbons, can be used for
the production of diolefin hydrocarbons by the thermal
decompn. under the conditions of a considerable reduction

cyclohexanone, $OC\overline{CH_2.CH_2.CHMe.CH_2.C}$:$CHC_6H_4OMe$
p (III), pale yellow, m. 91.5-3°. Hot alc. III (3 g.)
and $H_2NNHCONH_2.HCl$ (3.5 g.) + AcONa (3.5 g.)
in dil. EtOH ppt. 3.6 g. of the *semicarbazone*, $C_{16}H_{21}O_2N_3$,
of III, pale yellow, m. 205-6° (decompn.). III (2.8
g.), $NH_2OH.HCl$ (1.7 g.) and $Na_2CO_3.10H_2O$ (2.8 g.)
in dil. EtOH, refluxed 2 hrs. and dild., ppt. 2.1 g. of the
oxime, $C_{15}H_{19}O_2N$, of III, cream-yellow, m. 122-4°. III
(1 g.), I (0.6 g.) and 4% KOH (10 g.), refluxed and steam-
distd., give a high yield of *4-methyl-2,6-dianisal-1-cyclo-*
hexanone (IV), m. 144-5°. It is also formed in high yield
by refluxing for 1.5 hrs. II (5 g.), I (12.2 g.) and dil. alc.

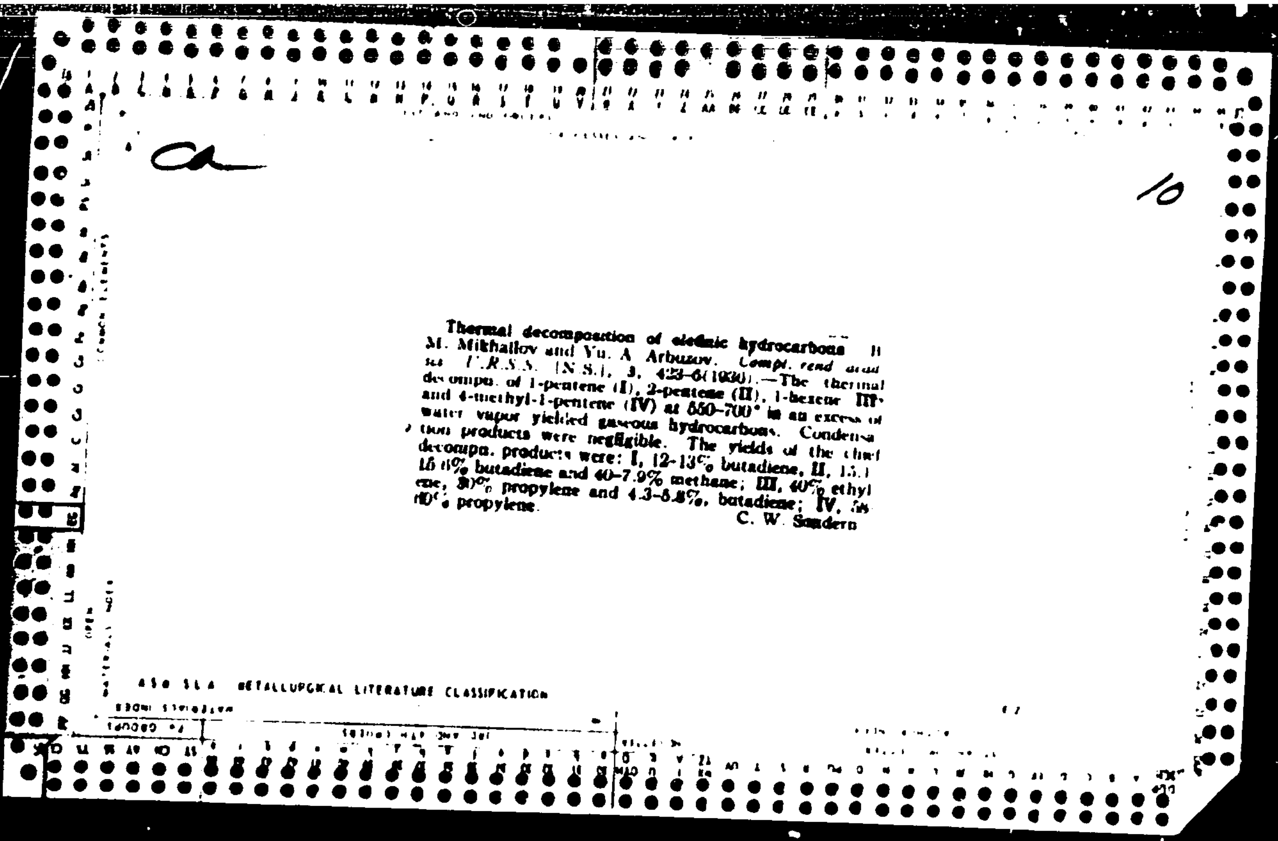
KOH (2 g.). It is photosensitive, and slowly turns
orange-red behind glass. IV and Br (4 atoms) in cold
$CHCl_3$ yield the *penta-Br deriv.*, $C_{23}H_{19}O_3Br_5$, pale rose,
decomps. around 170° to an intense violet-red liquid.
It is a mono-Br substitution and tetra-Br addn. compd.
It is very photosensitive, and turns maroon and violet-
red. A suspension of III (10 g.) and BzH (5 g.) in dil.
... for 5 hrs. and steam-distd., yields 15 g. of
...*l-hexanone*, canary-yellow,
C. C. Davis



CA

10

Thermal decomposition of dimethylcyclohexane. Yu. A. Arbuzov and B. M. Mikhailov. *Compt. rend. acad. sci. U. R. S. S.* [N. S.], 4, 337-40(1936)(in German); cf. *C. A.* 29, 2152^{4}.—At 675-750°, in the presence of 2-4 parts by wt. of H_2O, the uncatalyzed thermal decompn. of 1,2-, 1,3- and 1,4-dimethylcyclohexane yields, on the basis of hydrocarbon decomposed, about 20 mol. % butadiene, together with large amts. of olefins and H and traces of CO_2 and C_2H_6. H. A. Beatty

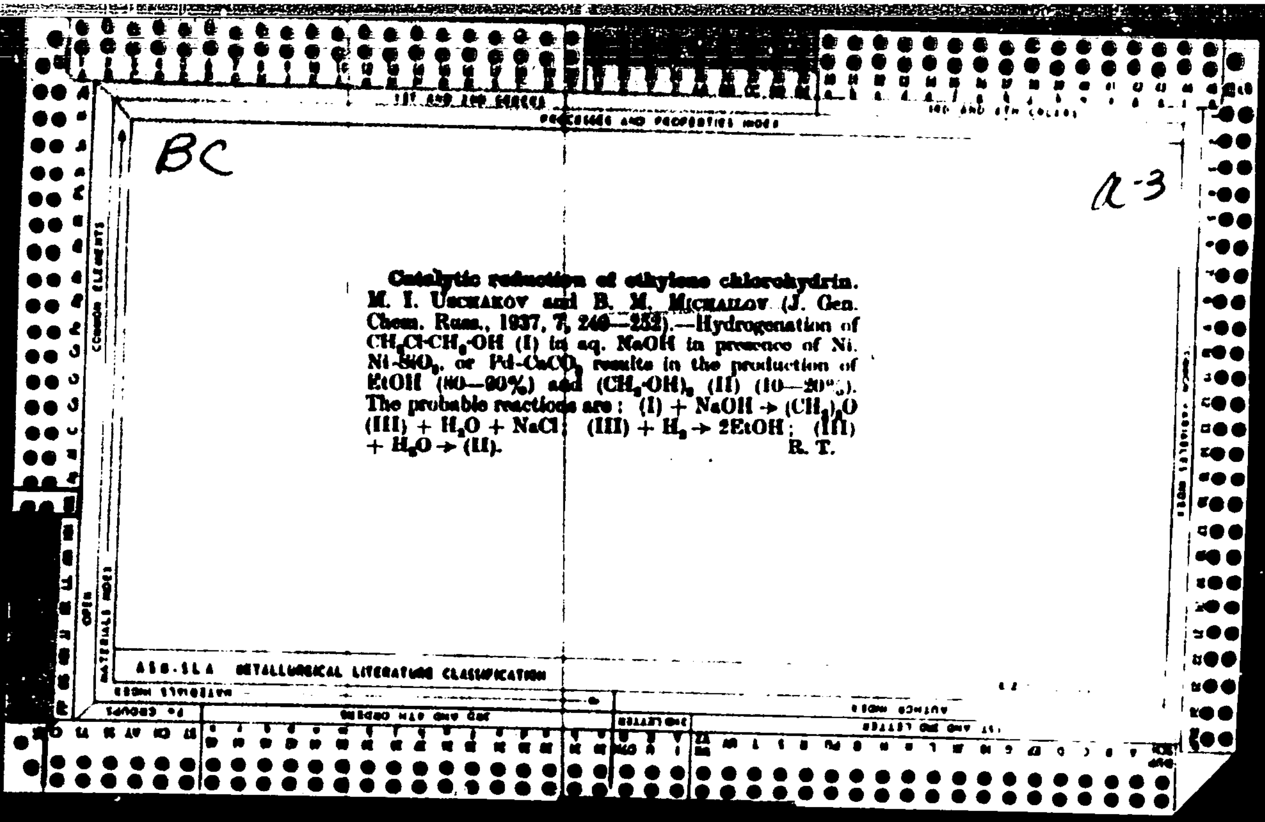


Ca

10

Thermal decomposition of olefinic hydrocarbons B.
M. Mikhailov and Yu. A Arbuzov. *Compt. rend. acad*
sci. U.R.S.S. (N.S.), 3, 423-6(1936).—The thermal
decompn. of 1-pentene (I), 2-pentene (II), 1-hexene (III)
and 4-methyl-1-pentene (IV) at 650-700° in an excess of
water vapor yielded gaseous hydrocarbons. Condensa-
tion products were negligible. The yields of the chief
decompn. products were: I, 12-13% butadiene, II, 15.1-
16.0% butadiene and 40-7.9% methane; III, 40% ethyl-
ene, 30% propylene and 4.3-5.8%, butadiene; IV, 58-
60% propylene.
C. W. Sanders

ASM SLA METALLURGICAL LITERATURE CLASSIFICATION



BC

a-3

Catalytic reduction of ethylene chlorohydrin. M. I. Uschakov and B. M. Michailov (J. Gen. Chem. Russ., 1937, 7, 249—252).—Hydrogenation of $CH_2Cl\cdot CH_2\cdot OH$ (I) in aq. NaOH in presence of Ni, Ni-SiO_2, or Pd-$CaCO_3$ results in the production of EtOH (80—90%) and $(CH_2\cdot OH)_2$ (II) (10—20%). The probable reactions are: (I) + NaOH → $(CH_2)_2O$ (III) + H_2O + NaCl; (III) + H_2 → 2EtOH; (III) + H_2O → (II). R. T.

PROCESSES AND PROPERTIES INDEX

BC

11 3

Condensation of dihydroresorcinol with benzylideneacetophenone. B. M. Michailov (J. Gen. Chem. Russ., 1937, 7, [illegible]).—*cyclo*Hexane-2 : 6-dione and CHPh:CHBz in piperidine (18 hr. at 100°) yield 1-(β-*benzoyl*-α-*phenylethyl*)*cyclohexane*-2 : 6-*dione*, m.p. 159—160° [*monoxime*, m.p. 200·5—202·5° (decomp.); *semicarbazone*, m.p. 220·5—221·5°], which with NH_2OH,HCl in EtOH (4 hr. at the b.p.) yields the *oxime*, m.p. 216·5—217°, of 5-*keto*-2 : 4-*diphenyl*-5 : 6 : 7 : 8-*tetrahydroquinoline*, which is obtained in two isomeric forms, m.p. 111—112° and 128·5—130·5°, by hydrolysis of the oxime with 25% H_2SO_4 (2 hr. at 100°). R. T.

ASD-SLA METALLURGICAL LITERATURE CLASSIFICATION

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Synthesis of 10-alkyl derivatives of 9-methyl-1,2-benzanthracene.—B. M. Mikhailov and N. G. Chernova. *Compt. rend. acad. sci. U. R. S. S.* 20, 579-81(1938)(in English).—Cyclization of 12 g. 2-(1-$C_{10}H_7CHMe)C_6H_4CO_2H$ by heating with 35 g. anhyd. $ZnCl_2$ at [illegible] for 1 hr. gave 70% 9-methyl-1,2-benzanthrone, m. 105-6.5° (m. 106.4-7.2°, recrystd. from Me_2CO). Treatment of the latter with appropriate RMgX compds. gave the following *1,2-benzanthracene derivs.*: *9,10-dimethyl*, yellow, m. 122-3° (cf. Bachmann and Chemerda, C. A. 32, 4978^9, and Newman, C. A. 32, 4978^1), m. 80% yield (*monopicrate*, black, m. 112.2-13.2°); *9-methyl-10-ethyl*, yellow, m. 70-71.5°, by decompn. of the *dipicrate*, carmine-red, m. 110-10.8°; *9-methyl-10-propyl*, light green, m. 99-101°, by decompn. of the *dipicrate*, red, m. 88-8[illegible]; *9-methyl-10-butyl*, light yellow, m. 71-2°, 40% yield, by decompn. of the *dipicrate*, red, m. 101-5.8°.

John L. Conti

A.S.M.-S.L.A. METALLURGICAL LITERATURE CLASSIFICATION

CA

10

PROCESSES AND PROPERTIES INDEX

Synthesis of polycyclic compounds. I. 1',2',3',4'-Tetrahydro-1,2-benzanthracen-9-one. N. G. Chernova and B. M. Mikhailov. *J. Gen. Chem.* (U. S. S. R.) 9, 2168-70(1939).—Cyclization of *o*-(6-tetralyl)methylbenzoic acid (I) was studied by heating 45 min. 10 g. I and 30 g. of powd. anhyd. $ZnCl_2$ in an oil bath at 180°, decompg. the [illegible] with dil. HCl and extg. with $CHCl_3$. After the [illegible] of unaltered I with Na_2CO_3 soln. and the $CHCl_3$ by [illegible], the residue was recrystd. from C_6H_6, giving [illegible]*tetramethylenanthranol*, m. 142.5° (142°, Braun, *et al.*, *C. A.* 22, 1586). Concn. of the mother liquor yielded 7% *1',2',3',4'-tetrahydro-1,2-benzanthracen-9-one* (II), m. 100-9.7°. Grignard reaction of 0.5 g. II in 25 ml. C_6H_6 and MeMgI (from 0.5 g. Mg, 3 g. MeI and 25 ml. ether) gave 48% *9-methyl-1',2',3',4'-tetrahydro-1,2-benzanthracene*, m. 123.0-4.2°; *picrate*, m. 125.5-6.2°. **II. The Reformatskii reaction with 9-methyl-1,2-benzanthracen-10-one.** B. M. Mikhailov and N. G. Chernova. *Ibid.* 2171-2.—A mixt. of 12 g. of 9-methyl-1,2-benzanthracen-10-one, 10.3 ml. $BrCH_2CO_2Et$ and 8.9 g. Cu-Zn in 40 ml. of dry C_6H_6 was heated until the violent reaction had begun and the source of heat was removed. The reaction mixt. was then refluxed on a water bath for 7 hrs. and decompd. with ice water and dil. HCl. Evapn. of the C_6H_6 and recrystn. of the residue from alc. yielded 44% of *Et 9-methyl-1,2-benzanthr-10-yl acetate*, m. 81.6-3°. The acetate, sapond. with 10% KOH in alc., gave the *free acid; amide*, m. 270-2° (decompn.). The acid on heating at 200° or at 180° with the addn. of $ZnCl_2$ split CO_2 and gave *9,10-dimethyl-1,2-benzanthracene*, m. 121-2.4°.

Chas. Blanc

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

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Bc

a3

Synthesis of polycyclic compounds. II. Reformatsky reaction with 9-methyl-1:2-benzanthrone-10. B. M. Mikhailov and N. G. Tschernova (J. Gen. Chem. Russ., [illegible], 2171—2173).—9-Methyl-1:2-benzanthrone-10 with $BrCH_2\cdot CO_2Et$ and Zn–Cu in C_6H_6 yield 9-methyl-1:2-benz-10-anthranylacetic acid, m.p. [illegible] (decomp.) [Et ester, m.p. [illegible]; amide, m.p. [illegible] (decomp.)], converted into 9:10-dimethyl-1:2-benzanthracene by heating at the m.p. or with $SnCl_2$. R. T.

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

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3RD AND 4TH ORDERS

CA

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Synthesis of polycyclic compounds. IV. 9-Ethyl-10-methyl-1,2-benzanthracene and 9-ethyl-1,2-benzanthracene. B. M. Mikhailov and A. N. Blokhina. *J. Gen. Chem.* (U. S. S. R.) 10, 1793–7(1940).—In a study of carcinogenic compds. *9-ethyl-* (I) and *9-ethyl-10-methyl-1,2-benzanthracene* (II) were prepd. as follows: 2-(1-Naphthoyl)benzoic acid (28 g.), in 300 ml. abs. Et_2O and 420 ml. benzene, treated with EtMgBr (from 63.2 g. EtBr), decompd. in the usual manner, boiled with dil. HCl and let stand overnight, yields a mixt. of *lactones* of *2-[1-hydroxy-1-(1-naphthyl)propyl]benzoic acid* (III) and of *2-(hydroxy-1-naphthylmethyl)benzoic acid* (IV). The Et_2O benzene soln. of the mixt., shaken out with Na_2CO_3 and pptd. by petr. ether, yields 22.5% III, m. 162–4°, and the mother liquor from III yields IV, m. 137–8° (from benzene, EtOH). III (10 g.) in 180 ml. AcOH, boiled with 50 g. Zn-Hg with gradual addn. of 180 ml. concd. HCl-60 ml. AcOH, dild. with H_2O, extd. with Et_2O, the latter extd. with Na_2CO_3 and the ext. acidified, yields 73.3% *2-[1-(1-naphthyl)propyl]benzoic acid* (V), m. 149.5–50° (from benzene). V (5.8 g.) and 28 ml. $SnCl_4$, heated 1 hr. on a steam bath, dissolved in Me_2CO, dild. with benzene, treated with dil. HCl, the benzene soln. extd. with 10% Na_2CO_3, then evapd., yield 80% *9-ethyl-1,2-benzanthr-10-one*, (VI), m. 92–92.8° (from Me_2CO). VI (0.5 g.), 2.5 g. Zn dust (activated by $CuSO_4$ soln.) and 6 ml. MePh, boiled for 21 hrs. with 40 ml. 10% NaOH, followed by distn. of the MePh *in vacuo*, yield 81.8% *9-ethyl-9,10-dihydro-1,2-benzanthran-10-ol* (VII), m. 94.5–5.5° (from benzene). VII (0.32 g.) in benzene, shaken with 10% HCl, followed by distn. of the benzene, yields 83% I, m. 107.4–8.4° (from EtOH); monopicrate, red, m. 111–13°; dipicrate, red, m. 124–5°. VI (1 g.) in 40 ml. benzene, added to MeMgI (from 6 g. MeI), let stand 24 hrs., decompd. by aq. NH_4Cl, followed by removal of the solvents, yields 81% II, m. 76–7° (from EtOH); dipicrate, red, m. [illegible]. VI (0.5 g.) in 20 ml. benzene, added to EtMgBr (from 2 g. EtBr) and refluxed 3 hrs., let stand overnight, then decompd. as usual, the solvents removed and the residue taken up in benzene and passed over Al_2O_3, yields *9,10-diethyl-1,2-benzanthracene*, m. 98.5–9.5° (from Me_2CO–EtOH). Cf. C. A. 34, 9080. G. M. Kosolapoff

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

MIKHAILOW, B. M.

"Syntheses of polycyclic compounds. V. 4', 5-ace-3, 4-benzopyrene." Mikhailow, B. M., and Chernowa, N. G. (p. 282)

SO: Journal of General Chemistry (Zhurnal Obshchei Khimii) 1942, Vol 12, No 5-6.

1ST AND 2ND SOURCES

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BC

[illegible] of [illegible] compounds. [illegible] [illegible] derivatives of 5 : 6-[illegible]-1 : 2-[illegible]. [illegible] [illegible] and A. N. [illegible] (J. Gen. Chem. Russ., 1942, 12, [illegible]).—The introduction of alkyl groups in the meso-position of 1 : 2-benzanthracene gives rise to carcinogenic hydrocarbons, but alkyl derivatives of 5 : 6-aceo-1 : 2-benzanthracene (cf. A., 1938, II, 374) are not carcinogenic.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

MIKHAILOW, B. M.

"Syntheses of polycyclis compounds. VII. On 9, 10-dephenyl - 1', 2', 3', 4' - tetrahydro-1,2-benzanthracene." Mikhailow, B. M., and Chernowa, V. C. (p. 295)

SO: Journal of General Chemistry (Zhurnal Obshchei Khimii) 1942, Vol 12, No 5-6.

MIKHAILOV, B. M.

"Synthesis of polycyclic compounds. 1,4,5-ace-3,4-benzopyrene." Mikhailow, B. M., and Chernowa, N. G. (p. 531)

SO: Journal of General Chemistry (Zhurnal Obshchei Khimii) 1942, Vol 12, No 9-10.

1ST AND 2ND ORDERS

3RD AND 4TH ORDERS

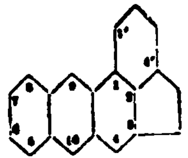
PROCESSES AND PROPERTIES INDEX

Ca

10

Syntheses of polycyclic compounds. VIII. 10-Alkyl derivatives of 3,4'-ace-1,2-benzanthracene. B. M. Mikhailov and A. N. Blokhina. *J. Gen. Chem.* (U. S. S. R.) 13, 610-15(1943)(English summary); cf. *C. A.* 37, 3083⁹.—2-(3-Acenaphthenylmethyl)benzoic acid (10 g.) in 100 cc. warm AcOH were treated with 10 cc. Ac_2O and 1.4 g. $ZnCl_2$, refluxed for 20 min. and cooled to yield 95% *3,4'-ace-1,2-benzanthryl 10-acetate*, m. 233-4° (from AcOH). The numbering used is shown in A. The above (5.5 g.) in 250 cc. dry benzene was added to BuMgBr (from 9 g. BuBr), refluxed for 2 hrs. and decompd. with ice and NH_4Cl soln. to yield 90% crude *3,4'-ace-1,2-benzanthracen-10-ol* (I), which yields *3,4'-ace-1,2-benzanthraquinone*, m. 221-2° (from AcOH), on oxidation with dichromate. The benzene soln. of I (3 g.), after refluxing for 1 hr., yielded on evapn. a mixt. of the starting material and its isomer, *acebenzanthrone;* the mixt. (II) m. 170-88°. II (1 g.) in benzene was reacted with MeMgI (from 9 g. MeI), refluxed for 4 hrs. and decomposed in the usual manner, to yield, after passage in benzene-petr. ether soln. over activated alumina, 30% *10-methyl-3,4'-ace-1,2-benzanthracene*, m. 181.7-82.5° (from benzene-EtOH); *picrate*, m. 191-2° (from benzene). II (0.6 g.) was reacted with EtMgBr (from 2.4 g. EtBr) to yield, after similar chromatographic treatment, [illegible]% *10-ethyl-3,4'-ace-1,2-benzanthracene*, m. 174.5-5° (from benzene-petr. ether); *picrate*, m. 150-6° (decompn.). II (0.1 g.) and PrMgBr (from 2 g. PrBr) similarly gave 25% of *10-propyl-3,4'-ace-1,2-benzanthracene*, m. 143-4° (from benzene-EtOH); *picrate*, m. 165.5-6.5° (from EtOH). II (0.5 g.) and BuMgBr (from 2.5 g. BuBr) yielded 20.7% *10-butyl-3,4'-ace-1,2-benzanthracene*, m. 128-9° (from benzene-EtOH); *picrate*, m. 141-2° (from EtOH).

G. M. Kosolapoff



(A)

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

3RD AND 4TH ORDERS

PROCESSES AND PROPERTIES INDEX

Be

a-3

COMMON ELEMENTS

Synthesis of polycyclic compounds. IX. Reaction between stable free radicals and multi-nuclear aromatic hydrocarbons. Addition of triphenylmethyl to 9 : 10-dimethylanthracene. B. M. Michailov (*Bull. Acad. Sci. U.R.S.S., Cl. Sc. Chim.*, 1948, 627—630).—CPh_3 adds to the 9 : 10-positions of 9 : 10-dimethylanthracene. The reaction is explained on the basis of the quantum-chemical theory of stability and reactivity of free radicals.

9 : 10-Dimethylanthracene in C_6H_6 is shaken with CPh_3Cl and Hg for 16 hr. at room temp., and then for 20 hr. at 100°, to give 9 : 10-*di(triphenylmethyl)*-9 : 10-*dihydroanthracene*, $C_{54}H_{44}$, m.p. 184—193°.

R. T.

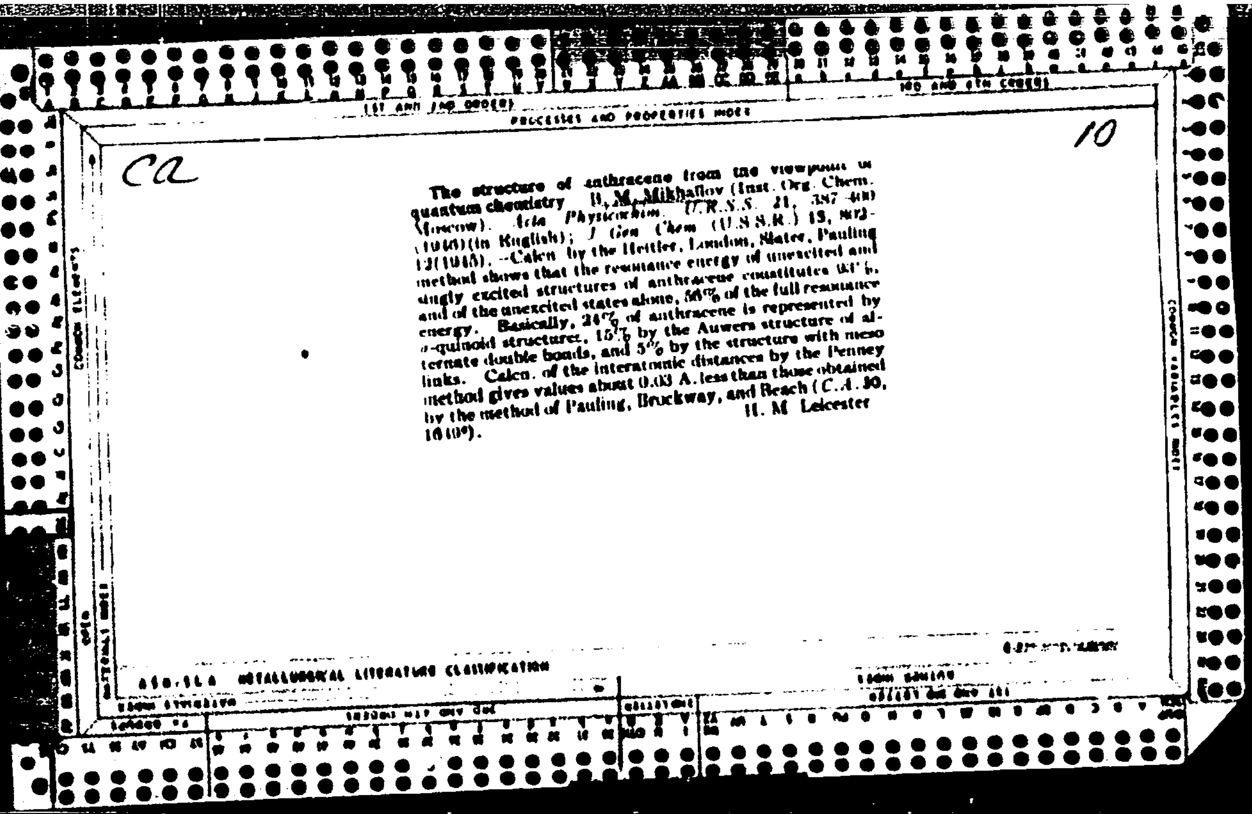
MATERIALS INDEX

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

MIKHAILOV, B. M.

Y

Synthesis of polycyclic compounds. X. Mechanism of Wurtz reaction in the bimetallic derivatives of anthracene and 1,2-benzanthracene. B. M. Mikhailov. *Izvest. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk* 1946, 619–32; cf. *C.A.* 40, 4712¹.—The formation of the metal derivs. was done as follows: the hydrocarbon in a 1:1 mixt. of pure C_6H_6 and Et_2O and a quantity of glass beads were charged into the flask in a N atm. and treated with sliced metal; the closed flask was shaken 50–100 hrs., then a Y-tube was attached, through 1 leg of which RX was added with cooling, while the 2nd leg was connected to a gasometer. After standing 0.5 hr. the unreacted metal was removed and the products worked up. Anthracene (20 g.), 6 g. Na, 150 ml. C_6H_6-Et_2O, and an equiv. amt. of MeI gave 7.4 g. anthracene, 1.3 l. gases (63% CH_4, 31% C_2H_6, and 6% C_2H_4), and 3.8 g. cryst. products, m. 98–102.5°, from which 0.18 g. *9,10-dimethyl-9,10-dihydroanthracene*, m. [illegible] (from EtOAc), was obtained; the mother liquor from this was evapd. and the residue dehydrogenated with S at 210–20°; treatment with picric acid gave some *9,10-dimethylanthracene picrate*, m. 172–4°, while chromatographing the mother liquor from this on Al_2O_3, followed by treatment with alc., gave *9-methylanthracene picrate*, m. 139–40°, which gave the free hydrocarbon, m. 79–80° (from dil. EtOH). Heating 9,10-dimethyl-9,10-dihydroanthracene with S 20 min. to 195–200° gives 80% 9,10-dimethylanthracene, m. 183.5–4.5° (from C_6H_6). The reaction performed as above but using 15 g. MeCl, gave 1% anthracene and 70% mixed 9,10-dimethyl-9,10-dihydroanthracene and 9-methyl-9,10-dihydroanthracene; the mixt. evolved 100 ml. gases (19% CH_4 and 81% C_2H_6). 1,2-Benzanthracene (10 g.), 2.3 g. Na, 150 ml. C_6H_6-Et_2O, and 5 g. MeCl gave 0.1 g. 1,2-benzanthracene, after the sepn. of which the remaining material was dehydrogenated by heating with S and treated with picric acid, giving a picrate, m. 171.5–3.5°, which gave 1.4 g. free *10-methyl-1,2-benzanthracene*, m. 140–1°; the mother liquors gave some *9,10-dimethyl-1,2-benzanthracene*, m. 122–3°. 30 ml. of gas was collected (31% CH_4, 69% C_2H_6). Anthracene (10 g.), 2 g. Li, and an equiv. of MeI gave 30 ml. mixed C_2H_6, CH_4, and C_2H_4, 3.1 g. anthracene, and 34% mixed crude dihydro derivs.; dehydrogenation of these by S resulted in isolation of 9,10-dimethyl- and 9-methylanthracenes. Anthracene (20 g.), 4 g. Li, and 13 g. MeCl gave after evapn. of the solvents 20.2 g. cryst. solid, m. 65–105°, which after dehydrogenation with S 1.5 hrs. at 210–20°, followed by heating with a little Cu 10 min. at 220–30°, gave 15.5 g. 9,10-dimethylanthracene, m. 182–4.5° (from C_6H_6), with an addnl. amt. from the mother liquor (total yield 92.8%); the pure substance, m. 183.5–4.5°, long yellow needles. In a duplicate expt. the reaction product was directly cryst. from EtOAc-C_6H_6 and gave (from 10 g. anthracene) 1.8 g. *9,10-dimethyl-9,10-dihydroanthracene*, m. 180–1°, while chromatography of the liquors on Al_2O_3 gave some *[illegible]* of the same hydrocarbon, m. 51–3°. Addn. of MeOH to the



Ca

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The structure of anthracene from the viewpoint of quantum chemistry. B. M. Mikhailov (Inst. Org. Chem. Moscow). Acta Physicochim. U.R.S.S. 21, 387-410 (1946)(in English); J. Gen. Chem. (U.S.S.R.) 15, 803-12(1945). —Calcn. by the Heitler, London, Slater, Pauling method shows that the resonance energy of unexcited and singly excited structures of anthracene constitutes 80% of the full resonance energy and of the unexcited states alone, 56%. Basically, 24% of anthracene is represented by the Auwers structure of o-quinoid structures, 15% by the structure with meso alternate double bonds, and 5% by the Penney links. Calcn. of the interatomic distances by the method gives values about 0.03 A. less than those obtained by the method of Pauling, Brockway, and Beach (C.A. 30, 1610^{9}). H. M. Leicester

MIKHAYLOV, B. M. Dr. Chem. Sci.

Dissertation: "Investigation in the Field of Anthracene and 1, 2-Benzanthracene." Inst of Organic Chemistry, Acad Sci USSR, 12 Jun 47.

SO: Vechernyaya Moskva, Jun, 1947 (Project #17836)

MIKHAILOV, B. M.

Syntheses of polycyclic compounds. XIII. Lithium-organic compounds of anthracene. B. M. Mikhailov. *Izvest. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk* (Bull. acad. sci. U.R.S.S., Classe sci. chim.) 1948, 420-6; cf. C.A. 42, 6350i.—Reaction of Li with 9,10-dibromoanthracene (I) leads to the exchange of 1 Br for Li when 1 atom of Li is used, while both Br atoms are exchanged when 2 atoms of Li are used. 9-Bromoanthracene (II) (0.5 g.) in 10 ml. dry Et_2O, treated in a N atm. with 0.1 g. Li in thin slices, shaken periodically 1 hr. at 40° in a sealed flask, cooled, poured on powd. Dry Ice, and the aq. layer acidified, gave only a trace of *9-anthracenecarboxylic acid* (III), while 40% anthracene was recovered from a benzene ext. BuLi (from 0.48 g. BuCl and 0.1 g. Li in 10 ml. Et_2O) treated in a N atm. with 0.9 g. II, shaken 5 min. at room temp., poured on solid CO_2, extd. with Et_2O, and the aq. layer acidified gave 77% III, m. 214-16° (from dil. EtOH); the Et_2O layer gave 3.2% anthracene. Repetition of the expt. but keeping the mixt. 15 min. at 40° gave 68% III and 13% anthracene. BuLi (from 0.95 g. BuCl and 0.15 g. Li in 20 ml. ice-cold Et_2O) shaken 5 min. at room temp. with 1.0 g. II, then treated with about 1 g. ethylene oxide (gas), followed by decompn. with H_2O, gave in the Et_2O layer 64.5% *9-(2-hydroxyethyl)anthracene*, yellow needles, m. 106.5-7.5° (from dil. EtOH). Shaking 2 g. I, 0.1 g. Li, and 30 ml. Et_2O 20 hrs. at 50-60° in a sealed flask, followed by treatment with solid CO_2, gave 0.14 g. *9-bromo-10-anthracenecarboxylic acid*, m. 265-7° (from EtOH), and 0.1 g. original I. Addn. of 2.5 g. I to BuLi (from 0.95 g. BuCl and 0.15 g. Li in 20 ml. Et_2O), followed by heating in a sealed flask 30 min. at 40° and treatment with CO_2, gave 80.3% of the above acid; when the heating was extended to 2 hrs. the yield dropped to 37.2%, while shaking 5 min. at room temp. gave 58% of the acid and 0.30 g. I. Addn. of 1.9 g. I to 0.0075 mole BuLi in Et_2O, followed by shaking 15 min. at room temp., gave, on carboxylation as above 0.34 g. *9,10-anthracenedicarboxylic acid*, decomp. 330-40° (from dil. EtOH). BuLi (from 1.9 g. BuCl and 0.3 g. Li in 20 ml. Et_2O), dild. with 20 ml. Et_2O, then treated over 2-3 min. with stirring and cooling with 4.5 g. powd. I, stirred 15 min., treated with cooling with Et_2O-MeOH, stirred with H_2O, and the org. layer concd., yielded 43.6% II, m. 97-9° (from EtOH). BuLi (from 0.95 g. BuCl and 0.15 g. Li in 25 ml. cold Et_2O) and 2.5 g. I, shaken in a N stream 15 min. at room temp., then treated with 0.5 g. gaseous ethylene oxide, decompd. with water, and extd. with Et_2O, gave 64% *9-bromo-10-(2-hydroxyethyl)anthracene*, decomp. 147.5-8° (from Et_2O), yellow needles.

G. M. Kosolapoff

MIKHAYLOV, B. M.

PA 8/49T16

USSR/Chemistry - Cyclic Compounds Jul/Aug 48
Chemistry - Synthesis

"Synthesis of Polycyclic Compounds," B. M. Mikhaylov, Inst Org Chem, Acad Sci USSR, 6½ pp

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

Studies action of lithium and n-butyl-lithide (I) on meso-brome derivatives of anthracene. Establishes that when lithium reacts with 9, 10-dibromanthracene (II), one halogen atom is replaced by metal. When one equivalent of I reacts with 9-brom and II, 9-anthryl lithide and 9-brom-10-anthryl lithide are formed. These can be used in synthesis. When two equivalents of I react with II,

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USSR/Chemistry - Cyclic Compounds (Contd) Jul/Aug 48

two halogen atoms are replaced by metal. Submitted 6 Nov 1946.

8/49T16

MIKHAILOV, B. M.
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Synthesis of polycyclic compounds. New preparation of homologs of 1,2 benzanthracene. B. M. Mikhailov and T. K. Kozmmskaya. Doklady . Akad. Nauk S.S.S.R. 59, 509-11 (1948); cf. C. A. 42, 6350i. Li (0.05 g.), 0.25 g. BuCI, and 7ml. abs. El_2O are shaken 2 hrs. in a Schlenk flask filled with N, the BuLi soln, under N treated with 0.5 g. 10-bromo-1,2-benzanthracene in dry pure C_6116, shaken 7-10 min., poured on Dry Ice, and treated with water, giving 60% 1,2 benzanthracene-10-carboxylic acid, M. 218-20°; the neutral products contain 23% 1,2 benzanthracene. If in the above expt. the mixt. is treated with an excess of Mel in Et_2O instead of CO_2 and heated 2 hrs. at 40° in a closed flask, treatment with water and evapn. give 30% 10-methyl-1,2-benzathracene, m.140-1° (from benzene-alc.) . Etl instead of Mel similarly gave 47.5% 10-ethyl-1,2-benzanthracene, m. 113.5-14° (fromEtOH).

G. M. Kosolapoff

MS

MIKHAYLOV, B. M.

PA 43/49T11

USSR/Chemistry - Cyclic Compounds Mar/Apr 49
Chemistry - Alkali Metals

"Syntheses of Polycyclic Compounds," B. M. Mikhaylov, A. N. Blokhina, Inst of Org Chem, Acad Sci USSR, 14 pp

"Iz Ak Nauk SSSR, Otdel Khim Nauk" No 2

Investigates reaction between sodium and lithium addition products with anthracene and 1, 2-benzanthracene and alkyl halides. Discovers effects of (1) nature of alkali metal, (2) nature of halide, and (3) magnitude of hydrocarbon radical in alkyl halide on course of process. Establishes that

[redacted] 43/49T11

USSR/Chemistry - Cyclic Compounds Mar/Apr 49
(Contd)

reaction between lithium compounds of multinuclear hydrocarbons and alkyl chlorides is a preparative method of obtaining mesohomologues of anthracene, 1, 2-benzanthracene and their 9, 10-dihydro derivatives. Submitted 7 Apr 48.

[redacted] 43/49T11

MIKHAYLOV, B. M. PA56/49T12

USSR/Chemistry - Anthracene **May/Jun 49**
Chemistry - Synthesis

"Synthesis of Polycyclic Compounds: XV, Metalizing 9, 10-Dihydroanthracene and 9, 10-Dihydro-1, 2-Benzanthracene," B. M. Mikhaylov, A. N. Blokhina, Inst of Org Chem, Acad Sci USSR, 7½ pp

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

Studies the reaction of metalizing these substances, with n-butyllithium and phenyllithium, showing products to be monometallic and dimetallic hydrocarbon derivatives. These reactions have application in the synthesis of single-displaced derivatives of 9, 10-dihydroanthracene. Submitted 7 Apr 49.

[redacted] 56/49T12

A

Metal compounds of phenazine and their transformations. B. M. Mikhailov and A. N. Blokhina (Acad. Sci. U.S.S.R., Moscow). *Izvest. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk* 1950, 304-14. Na almost does not add to *phenazine* (I) in Et_2O, while Li adds slowly and incompletely. Alkali metals add to I satisfactorily in $(MeOCH_2)_2$. I is best prepd. according to Campbell *et al.* (*C.A.* 32, 5894), but the o-$H_2NC_6H_4NHPh$ is not oxidized as such with Pb oxide; instead, vapors of the base are led in a N stream over the oxide heated to red heat. 40-65% of a product m. 171-2° is obtained. Shaking 1 g. I in 20 ml. $(MeOCH_2)_2$ with 0.47 g. Na in a N atm. in a sealed ampul 30 5 hrs. produces a red-cherry color, followed by pptn. of *9,10-di-Na 9,10-dihydrophenazine*, poorly sol. brick-red solid. Passage of MeCl into such a mixt. gave, after concn. and shaking out with H_2O-C_6H_6, 0.5 g. *9,10-dimethyl-9,10-dihydrophenazine*, m. 151-2° (from C_6H_6-MeOH), insol. in MeOH. Chromatography of the mother liquor on Al_2O_3 in petr. ether gave an addnl. 0.17 g. 9,10-di-Me deriv. (total yield 67%) (elution with petr. ether) and 0.2 g. I (elution with petr. ether and C_6H_6). When the reaction with Na was run 70 hrs. the yields were unchanged. MeI gave 60% di-Me deriv. and 17% I. Similarly EtCl or EtI heated 1 hr. to 40° and let stand 40 hrs., gave 41-4% *9,10-diethyl-9,10-dihydrophenazine*, m. 130-1°, and 17% I. To a red soln. of 9,10-di-Na 9,10-dihydroanthracene (from 1 g. anthracene and 0.3 g. Na in 10 ml. $(MeOCH_2)_2$) was added 0.7 g. 9,10-dihydrophenazine in the same solvent; immediate formation of the di-Na deriv. took place and the usual treatment with MeCl gave 17% I, 50% dimethyldihydrophenazine, and 0.4 g. 9,10-dihydroanthracene. The di-Na deriv. from 1 g. I with 1.4 g. $ClCH_2OEt$ gave 0.24 g. I and 19% *9,10-di-[illegible]ethoxy-9,10-dihydrophenazine*, m. 140-40.5° (from MeOH) (elution with C_6H_6). Passage of ethylene oxide into a suspension of the di-Na deriv. (from 1 g. I) and standing 3 hrs. gave, upon treatment with Et_2O-H_2O and chromatographing (elution with C_6H_6-Et_2O), after ligroin [illegible] 32%, *9,10-bis(2-hydroxyethyl)-9,10-dihydrophenazine*, m. 182-4° (from dil. Me_2CO). BuBr (2 g. [illegible] $(MeOCH_2)_2$ and the di-Na deriv. from 1 g. I gave a green brown color and evolved heat; treatment with MeOH, followed by C_6H_6-H_2O, gave 0.85 g. I. Addn. of 1 g. 9,10-dihydrophenazine in 17 ml. $(MeOCH_2)_2$ to a filtered soln. of PhLi (from 5.3 g. PhBr and 0.5 g. Li) in Et_2O with ice cooling gave a voluminous ppt. of *9,10-di-Li 9,10-dihydrophenazine*; addn. of 7 g. MeI gave a lively reaction and pptn. of LiI; treatment with H_2O and evapn. of the working layer gave 77% di-Me deriv. after the usual working up. Adding 1 g. I in $(MeOCH_2)_2$ to PhLi [illegible] in Et_2O, letting stand 20 hrs. (same ppt. formed) and adding 1.1 g. MeI gave after the usual treatment 0.05 g. I, and 21% *9-methyl-10-phenyl-9,10-dihydrophenazine*, m. 116.5-17.5° (from EtOH). If the PhLi-I mixt. is heated with shaking 10 hrs. at 50-60° before treatment with MeI, there are obtained 0.22 g. Ph_2, 0.13 g. 9,10-dimethyl-9,10-dihydrophenazine, 0.18 g. I, and 0.09 g. 9-methyl-10-phenyl-9,10-dihydrophenazine, identical with the above; thus at normal temp. PhLi adds to I, while at elevated temp. an exchange reaction occurs, yielding the 9,10-di-Li deriv. G. M. Kosolapoff

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Action of phosphorus pentachloride and pentabromide on anthracene and its derivatives. B. M. Mikhailov and M. Sh. Promyslov (Inst. Gen. and Exptl. Pathol., Acad. Med. Sci. U.S.S.R.). *Zhur. Obshchei Khim.* (J. Gen. Chem.) 20, 338-45(1950).—The reaction of anthracene with PCl_5 probably proceeds by addn. of atomic Cl and PCl_4 across the meso positions and the product then splits off PCl_3 and HCl. Refluxing 2 g. anthracene, 2.8 g. PCl_5, and 25 ml. dry C_6H_6 1 hr. gave 0.6 g. *9-chloroanthracene*, m. 104-6°, on cooling and 1 g. addnl. on evapn. for 80.1% yield, with 0.47 g. recovered anthracene; a doubled amt. of PCl_5 gave after 100 hrs. at room temp. 0.35 g. *9,10-dichloroanthracene*, m. 208-10°, and 1.4 g. 9-Cl deriv. Heating the 9-Cl deriv. with PCl_5 in C_6H_6 3 hrs. gave 51.7% of the 9,10-di-Cl deriv., while standing 6 days at room temp. gave 34.4%. Heating 9-bromoanthracene with PCl_5 in C_6H_6 3 hrs. gave 35.5% *9-chloro-10-bromoanthracene*, m. 208-10° (from C_6H_6), m. 210.5-11° (on repeated crystn.). Keeping 9-methylanthracene similarly with PCl_5 19 hrs. in C_6H_6 gave 29% *9-methyl-10-chloroanthracene*, m. 170-80° (from EtOH). Addn. of 5.07 g. PBr_5 to 2 g. anthracene in C_6H_6 gave a soln. gradually depositing the dibromide, which vanished in 20 min., and evapn. after washing gave 95.4% 9-bromoanthracene, m. 100-1° (from EtOH); interruption of the reaction after 10 min. gave *9,10-dibromo-9,10-dihydroanthracene*, m. 94-7°. Similar reaction of 9-chloroanthracene in 20 min. gave 80.2% 9-chloro-10-bromoanthracene, while 9-bromoanthracene in 24 hrs. gave 84.6% *9,10-dibromoanthracene*, m. 218-20°. 9-Methylanthracene in a similar reaction in 10 min. gave 42.5% *9-methyl-10-bromoanthracene*, m. 170-3°. Hence, the PBr_5 reactions go via the PBr_3-Br_2 route. G. M. Kosolapoff

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Preparation of acenaphthylene. B. M. Mikhailov and A. N. Blokhina. *Zhur. Obshchei Khim.* (J. Gen. Chem.) 20, 1810-12(1950). Contrary to Flumiani (C. A. 17, 662), passage of acenaphthene over PbO at 4[illegible] produces no significant conversion to *acenaphthylene*. The latter forms in 30% yield, however, at 640-60°; the product, m. 92-3°, picrate, m. 202-3°, is freed from starting material by crystn. of the mixed picrates from C_6H_6. G. M. K.

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Structure of organic compounds of alkali metals. The complex nature of the lithium organic compound of tetraphenylethylene. B. M. Mikhailov and N. G. Chernova. *Doklady Akad. Nauk S.S.S.R.* 70, 237-9(1950).—Since many metalloorg. compds. contg. 2 alkali-metal atoms exist in colorless or colored forms, depending upon the presence or absence of polar solvents like Et_2O in the medium, the possibility of Et_2O actually taking part in the formation of colored forms was investigated. Shaking 0.5 g. $Ph_2C:CPh_2$ and 0.05 g. sliced Li in 60-75 ml. dry Et_2O in a N-filled sealed tube over 90 hrs. and mech. removal of the red product, drying *in vacuo* to essentially constant wt., and treatment with Et_2O-MeOH gave *1,1,2,2-tetraphenylethane*, m. 205-8°; the wt. difference between the latter and the red complex, with allowance for the Li content (obtained by titration of the aq. layer) gave the compn. of the *complex* as a combination of *1 mol. hydrocarbon, 2 atoms Li,* and *1 mol. Et_2O*, possibly formed by a doubly neg. ion of $(Ph_2C:)_2$ and a doubly pos. ion of Li_2OEt_2. It is suggested that Et_2O may form an integral part of many other alkali-metal complexes and substances like Ph_3CNa, when prepd. in Et_2O solns. It is believed that all alkali-metal org. compds. are of 2 types: those with a C—M bond of essentially covalent type with partly ionic character, and those which are colored and have a true complex ionic structure; class 1 covers metalalkyls and metalaryls which are nonconductors in Et_2O soln. G. M. Kosolapoff

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Synthesis of phosphoörganic aromatic compounds with lithium reagents. B. M. Mikhailov and N. P. Kucherova. *Doklady Akad. Nauk S.S.S.R.* 74, 501-4(1950). Anthracene does not react with PCl_3 in the presence of $AlCl_3$, while PCl_5 leads only to Cl derivs. Aryl Li derivs. with P halides in Et_2O readily gave P derivs. Thus 3 PhLi and PCl_3 gave 61% *Ph_3P*; 1-$C_{10}H_7Li$ gave 27% *(1-$C_{10}H_7$)$_3$P*, m. 278-80°, while 9-phenanthryllithium gave 72% *tri-9-phenanthrylphosphine*, m. 374-6° (from MePh); 9-anthryllithium gave 20% *tri-9-anthrylphosphine* orange-red, m. 270-3°, while 9-bromo-10-anthryllithium gave yellow *tris(9-bromo-10-anthryl)phosphine*, m. 206-8° (from MePh). Similarly, the Li deriv. from 10-bromo-1,2-benzanthracene gave 54.6% *tris(1,2-benzanthr-10-yl)phosphine*, yellow, m. 192-4°. $POCl_3$ in Et_2O similarly gave 65% *Ph_3PO*, 38% *(1-$C_{10}H_7$)$_3$PO*, 49% *tri-9-phenanthrylphosphine oxide*, m. 354-6°, 65% *tris(1,2-benzanthr-10-yl)phosphine oxide*, m. 191-3° (from Et_2O-benzene); alteration of the proportions of the reagents failed to yield products other than R_3PO. Use of $C_5H_{10}NPOCl_2$, followed by hydrolysis, gave 64% *Ph_2PO_2H*, m. 192-4°, 71% *(1-$C_{10}H_7$)$_2$PO$_2$H*, m. 198-200°; 9-phenanthryllithium (2 moles/mole chloride) gave 2 acids, *9-phenanthrenephosphonic acid*, m. 228-9°, and di-9-phenanthrylphosphinic acid, giving insol. *Na salt*, in 33% and 47% yield, resp.

G. M. Kosolapoff

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The complex nature of the colored organic compounds of alkali metals. B. M. Mikhailov and N. G. Chernova (Acad. Med. Sci. U.S.S.R., Moscow). *Doklady Akad. Nauk S.S.S.R.* **74**, 939-42(1950). By complete elementary analysis, Ph_3CNa in soln. in Et_2O (*E*) actually forms a complex of the compn. $Ph_3CNa.E$ and the structure $[Ph_3C]^-[Na.OEt_2]^+$; failure by Schlenk and Markus (*C.A.* **8**, 2728) to detect that complex was due to incomplete analysis. The corresponding Li complex has the compn. $Ph_3CLi.2E$ and the structure $[Ph_3C]^-[Et_2O.Li.OEt_2]^+$. Further complexes in Et_2O soln. are: $Ph_2C:CPh_2.2Na.2E$, $PhCH:CPh_2.2Na.E$, $PhCH:CPh_2.2Li.E$, and the anthracene (*A*) complexes $A.2Li.2E$ and $A.2Na.E$; in the latter complex, Schlenk, *et al.* (*C.A.* **8**, 1580), failed to detect the *E* owing to faulty analysis. The following amine complexes were obtained in soln. in the corresponding amine: $PhCH:CPh_2.2Na.Et_3N$ (black), $PhCH:CPh_2.2Li.Et_3N$ (carmine-red), $Ph_2C:NPh.2Li.Et_3N$ (dark carmine-red), $Ph_2C:NPh.2Na.Et_3N$ (carmine-red), a Na-*A* complex in Et_3N (black), Na-$Ph_3C.CPh_3$ in $PhNMe_2$ (black), Na-*A* and Li-*A* complexes in $PhNMe_2$ (red), Na-$Ph_2C:NPh$ in $PhNMe_2$ (red), and the corresponding Li complex (purple-red). The presence of 2 metal (*M*) atoms in the $PhCH:CPh_2$ complexes with Et_3N suggests the structure $[PhCHM.CPh_2]^-[M\text{-}NEt_3]^+$. Of the 2 possible structures of the $Ph_2C:NPh$ complexes, the more plausible one is $[Ph_2CM.NPh]^-[M\text{-}NEt_3]^+$, i.e., with the metal bound to the C atom rather than the N atom of the $Ph_2C:NPh$. The most plausible structures for the Et_2O complexes are, resp., $[Ph_2CLi.CPh_2]^-[Li\text{-}OEt_2]^+$ and $[Ph_2CNa.CPh_2]^-[Et_2O\text{-}Na\text{-}OEt_2]^+$. The structures proposed for the other complexes are: $[PhCHM.CPh_2]^-[M\text{-}OEt_2]^+$, [illegible] $[A\text{-}Na]^-[Na\text{-}OEt_2]^+$, [illegible] N. Thon and $[A\text{-}Li]^-[Et_2O\text{-}Li\text{-}OEt_2]^+$.

CB

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Synthesis of 4-benzylparaconic acids B. M. Mikhailov *Zhur. Obshchei Khim.* (J. Gen. Chem.) 21, 350-61(1951).—Addn. of di-Et benzylsuccinate (50 g.) and 18 g. EtO_2CH to 5 g. Na in 10 g. abs. EtOH with ice cooling, keeping 2 days at 0-2° and 5 days at room temp., addn. of ice, extn. with Et_2O, acidification of the aq. layer, and its extn. with Et_2O gave 59.5% *$PhCH_2CH(CO_2Et)CH(CHO)CO_2Et$*. The crude ester reduced with Al-Hg [Wislicenus, *J. prakt. Chem.* 54, 51(1896)] overnight in Et_2O at 25° in the presence of a little H_2O gave 32.5 g. undistillable *$PhCH_2CH(CO_2Et)CH(CH_2OH)CO_2Et$*; this (88 g.) on distn. *in vacuo* lost EtOH and yielded 72.8 g. mixed *Et paraconates*, which after several distns. were sepd. into the *solid form*, m. 55.5-6.0°, b_4 180-2°, and the *liquid form*, b_4 171-2°, n_D^{20} 1.5150, d_4^{20} 1.1562. The latter (5.1 g.) boiled 4 hrs. with 10% HCl gave 4.49 g. *4-benzylparaconic acid* (I), m. 102-3° (from Et_2O-petr. ether), while similar hydrolysis of the *solid ester* gave an *acid* m. 134.5-5.0° (from H_2O). The latter kept *in vacuo* at 180-200° 6 hrs. changed its m.p., and when crystd. from Et_2O-petr. ether it m. 99.5-100.5° and did not depress the m.p. of I. G. M. Kosolapoff

1951

MIKHAYLOV, B. M.

191T25

USSR/Chemistry - Pharmaceuticals Jul 51
Organic Lithium Compounds

"Organic Lithium Compounds of 1, 2-Benzanthracene and Their Conversion," B M. Mikhaylov, T. K. Kozminskaya, Inst Normal and Pathol Morphol, Acad Med Sci USSR

"Zhur Obshch Khim" Vol XXI, No 7, pp 1276-1283

Org Li compds of 1, 2-benzanthracene (not obtainable by action of Li on halogen derivs) are smoothly prepd by action of n-BuLi or PhLi on halogen derivs and can be used successfully for synthesis of homologues and O derivs of 1, 2-

191T25

USSR/Chemistry - Pharmaceuticals Jul 51
(Contd)

benzanthracene. Synthesis of 10-ethyl-1, 2-benzanthracene and higher homologues requires use of 1, 2-benzanthryl-10-lithium obtained with aid of PhLi.

191T25

M KHAYLOV, B. M.

188T20

USSR/Chemistry - Phenanthrene Derivatives — Aug 51

"Research Into the Phenanthrene Series. I. Synthesis of Phenanthrene Derivatives With the Aid of Organic Lithium Compounds," B. M. Mikhaylov, N. G. Chernova, Inst of Gen and Exptl Pathol, Acad Med Sci USSR

"Zhur Obshch Khim" Vol XXI, No 8, pp 1517-1524

To synthesize phenanthrene derivs, use of org Li compd of Phenanthrene has advantage as to rate of conversion and yield over method using org Mg compds. Prepd several new phenanthrene derivs using org Li compds. Bromination of phenanthrene

188T20

USSR/Chemistry - Phenanthrene Derivatives (Contd) — Aug 51

and 9-methylphenanthrene with PBr_5 yields 9-bromophenanthrene and 9-methyl-10-bromophenanthrene, resp.

188T20

MIKHAYLOV B. M.

PA 194T64

USSR/Chemistry - Benzanthracene Derivatives Dec 51

"Action of Phosphorus Pentahalides on 1, 2-Benzanthracene and Its Derivatives," B. M. Mikhaylov, T. K. Kozminskaya, Inst of Norm and Pathol Morphol, Acad Med Sci USSR

"Zhur Obshch Khim" Vol XXI, No 12, pp 2184-2188

Found that PCl_5 and PBr_5 halogenate compds of 1, 2-benzanthracene series. Action of PCl_5 on 1, 2-benzanthracene (I) and 3, 4'-ace-1,2-benzanthracene (II) yielded corresponding 10-chloro-derivs. PBr_5 had the same action as Br_2 on I, II, and 9-methyl-1,2-

194T64

USSR/Chemistry - Benzanthracene Derivatives (Contd) Dec 51

and 10-methyl-1,2-benzanthracene. PBr_5 reacted with 10-bromo-1,2-benzanthracene to form 9, 10, 10-tribromo-9, 10-dihydro-1, 2-benzanthracene. Latter conversion occurs in like manner under action of Br_2 in presence of pyridine.

194T64

USSR/Chemistry - Lithium Compounds 21 May 51

"Constitution of Organic Compounds of Alkali Metals: Lithium Aryls and Their Ether Addition Compounds," B. M. Mikhaylov, N. G. Chernova, Inst Norm and Pathol Morphol, Acad Med Sci USSR

"Dok Ak Nauk SSSR" Vol LXXVIII, No 3, pp 489-492

Prior work by authors (1950) established that Na and Li derivs of triarylmethyls, phenylated ethylenic hydrocarbons, dehydrodrivs of condensed polynuclear hydrocarbons, and azomethines (organometallic compds that are colored and conduct electricity) are complex compds contg ether or tertiary amine. When

186T10

USSR/Chemistry - Lithium Compounds 21 May 51
(Contd)

phenyl, alpha-naphthyl 9-phenanthryl, or 9-anthryl Li is prepd by reacting n-BuLi with aryl bromides in benzene, simple ArLi compds are formed. In ether soln, complex Li aryl-ether adducts are formed.

186T10

MIKHAYLOV, B. M.

MIKHAYLOV, B. M.

184T10

USSR/Chemistry - Organophosphorus Compounds 1 Jun 51

"New Method for the Preparation of Primary Arylphosphonic Acids," B. M. Mikhaylov, N. F. Kucherova, Inst Normal and Path Morphol, Acad Med Sci USSR

"Dok Ak Nauk SSSR" Vol LXXVIII, No 4, pp 709-711

Describes synthesis of primary arylphosphonic acids by reacting lithium aryls with dipiperidine-N-oxychlorophosphine, and subsequent hydrolysis of resulting aryldipiperidine-N-oxyphosphines.

184T10

MIKHAYLOV, B. M.

USSR/Chemistry - Sulfur Compounds 21 Sep 51

"A New Type of Reaction Between Thiolic and Unsaturated Compounds," B. M. Mikhaylov, A. N. Blokhina, Inst of Org Chem, Acad Sci USSR

"Dok Ak Nauk SSSR" Vol LXXX, No 3, pp 373-376

The action of thioacetic acid on anthracene occurs at the 9,10 positions and consists of the addn of 2 radicals of CH COS^{-} rather than 2 thiol groups.

210T29

MIKHAYLOV, B. M.

USSR/Chemistry - Pharmaceuticals Jan 52

"Synthesis of Polycyclic Compounds. XVI. Preparation of Meso Derivatives of Anthracene Using Organic Lithium Compounds," B. M. Mikhaylov, V.P. Bronovitskaya, Inst of Gen and Exptl Path, Acad Med Sci USSR

"Zhur Obshch Khim" Vol XXII, No 1. pp 147-162

Studied reaction of meso-halogen derivs of anthracene with n-BuLi and PhLi, leading to formation of org Li compds of anthracene series. PhLi is recommended due to absence of side reactions which occur in case of n-BuLi Prepd

207T27

USSR/Chemistry - Pharmaceuticals (Contd) Jan 52

number of meso derivs of anthracene. Replacement of 2 Br atoms in dibromo derivs by 2 Li atoms under action of excess PhLi occurs to inconsiderable extent. Meso-chloro derivs do not react with PhLi. Org Li compds of anthracene series are relatively stable in ether.

207T27

MIKHAYLOV, B. M.

USSR/Chemistry - Pharmaceuticals Jan 52

"Research in the Naphthacene Series. I. Addition of Alkali Metals to 1,2,3,4-Tetrahydronaphthacene. Conversions of Bimetallic Compounds of 1,2,3,4-Tetrahydronaphthacene," B. M. Mikhaylov, A. D. Chinayeva

"Zhur Obshch Khim" Vol XXII, No 1, pp 162-166

Li and Na are added to 1,2,3,4-tetrahydronaphthacene (I) in ether or in dimethyl ether of ethylene glycol (II). Org Li compd of I is hydrolyzed by II into mono-Li compd. Action of CO_2 or MeCl on di-Li compd of I yielded, resp, 1,2,3,4,6,11-

207T30

USSR/Chemistry - Pharmaceuticals (Contd) Jan 52

hexahydronaphthacene-6,11-dicarboxylic acid or 6,11-dimethyl-1,2,3,4,6,11-hexahydronaphthacene in form of cis- and trans-isomers.

207T30

MIKHAYLOV B.M.

USSR/Chemistry - Phosphorus Organic Compounds
Medicine - Cancerogenic substances

May 52

"Synthesis of Triaryl Phosphines and Triaryl Phosphine Oxides Using Lithium Organic Compounds,"

B. M. Mikhaylov, N. F. Kucherova; Inst of Normal and Pathological Morpholody, Acad Med Sci USSR.

Zhur Obshch Khim, 22, No 5, pp 792-797, 1952

Aromatic Li compds can be used as reagents for the synthesis of carbocyclic phosphorus compds. Triaryl phosphines are obtained by the action of lithium aryls on PCl_3, and triaryl phosphine oxides are formed by the reaction between lithium aryls and phosphorus oxichloride. With this method, the simplest members of the groups of phosphine derivs contng both tri- and tetracyclic hydrocarbon radicals can be obtained.

CHINAYEVA, A. D.

MIKHAYLOV, B.M.; CHINAEVA, A.D.

Naphthacene series. II. Lithium-organic compounds of 1,2,3,4-tetrahydronaphthacene and their transformations. Zhur. Obshchey Khim. 22, 1887-90 '52. (MLRA 5:11)
(CA 47 no.14:6924 '53)

MIKHAYLOV, B. M.

USSR/Chemistry - Organo-Lithium Compounds 11 Jun 52

"Complex Formation in a Series of Organic Compounds of Lithium, B. M. Mikhaylov, N G. Chernova, Inst of Normal and Pathol Morphol, Acad Med Sci SSSR

"Dok Ak Nauk SSSR" Vol LXXXIV, No 5, pp 967 - 970

There are 9 theoretically possible types of compds of lithium having a coordination number of 4. They are complexes of lithium with ethers, dioxanes, amines, and hydrocarbon radicals. Complex compds of aromatic Li derivs were also found to exist. Dioxane and amine complexes were prepd. Presented by Acad A. N. Nesmeyanov 8 Apr 52.

223T13

MIKHAYLOV, B.M.; CHERNOVA, N.G.

Structure of metallic compounds of aromatic ketones. Doklady Akad. Nauk S.S.S.R. 85, 341-4 '52. (MLRA 5:8)
(CA 47 no.15:7467 '53)

MIKHAYLOV, B.M.

Naphthacene series. III. Organometallic compounds of naphthacene and their transformations. B. M. Mikhailov and A. D. Chinaeva. *Sbornik Statei Obshchei Khim., Akad. Nauk S.S.S.R.* 1, 620-9(1953); cf. *C.A.* 48, 4403b.—Alkali metals add to naphthacene in the presence of Et_2O or $(CH_2OMe)_2$, yielding heteropolar complexes which contain ethers. Heating 1 g. 1,2,3,4-tetrahydronaphthacene with 0.4 g. Se 10 hrs. at 280° gave 80.5% *naphthacene*, m. 345-6°; S gives the same yield. All following reactions with alkali metals were run under N. Shaking 0.5 g. naphthacene, 0.06 g. Li and 6 ml. $(MeOCH_2)_2$ 80 hrs. at room temp. gave a green-colored mixt. (I) which was filtered, the ppt. washed with pure solvent, and the combined filtrate and washings were evapd. *in vacuo* yielding 0.775 g. black complex which treated with MeOH-Et_2O gave an orange ppt.; this was taken up in C_6H_6 and the soln. was washed with H_2O; the aq. layer was titrated for its Li content, while the org. layer was evapd. to dryness; the difference between the wt. of the complex and the sum of wts. of Li and naphthacene (as dihydro deriv.) gave the wt. of the complexed ether. The results indicate that the complex was $C_{18}H_{12}Li_2.2Et_2O$). Shaking 0.1 g. naphthacene, 0.01 g. Li, and 15 ml. Et_2O 200 hrs., followed by addn. of MeOH-Et_2O gave a ppt. which was sublimed to yield 0.07 g. naphthacene while the org. soln. gave 0.023 g. *6,11-dihydronaphthacene* (II), m. 206-7°; similar reaction with Na instead of Li gave 50% II; the complex in this case was blue. Dry Ice and I kept 26 hrs. gave 71.4% *6,11-dihydronaphthacene-6,11-dicarboxylic acid*, decomp. 253-65°, in the form of mixed *cis-trans* isomers; when attempts were made to recrystallize the product from EtOH, neutral products were obtained. If the reaction mixt. (with Li) is treated with MeCl, there is obtained mixed *6,11-dimethyl-6,11-dihydronaphthacene* (III): 1 isomer, m. 153-4°, the other, m. 106-7.5°. Oxidation of III with chromic acid in AcOH at room temp. gave *6,11-naphthacenequinone*, m. 289-92°. G. M. Kosolapoff

MIKHAYLOV, B.M.

USSR.

Naphthacene series. IV. Synthesis of alkyl- and aryl derivatives of 1,2,3,4-tetrahydronaphthacene. B. M. Mikhailov and A. D. Chinaeva. *Sbornik Statei Obshchei Khim.* 2, 1083-6(1953); cf. *C.A.* 49, 903h.—To MeMgI from 20.4 g. MeI in 120 ml. Et_2O was added 6 g. 1,2,3,4,6,11-hexahydronaphthacen-6-one in 200 ml. C_6H_6 and the mixt. was refluxed 3 hrs., allowed to stand overnight, and treated with ice and NH_4Cl; the org. layer gave 62.1% *6-methyl-1,2,3,4-tetrahydronaphthacene*, m. 127-9°, identical with that formed through the Li deriv. (cf. *C.A.* 47, 6924g). Similar reaction with EtMgI gave 23.2% *6-ethyl-1,2,3,4-tetrahydronaphthacene*, m. 77-8°, while PhMgBr similarly gave 30.2% *6-Ph analog*, m. 142-3°, which for purification was passed over Al_2O_3 in petr. ether. The reaction with $PhCH_2MgCl$, however, gave 90.5% *6-benzyl-1,2,3,4,6,11-hexahydronaphthacen-6-ol*, m. 155.5-6° (from Me_2CO). This refluxed in C_6H_6 with a few drops concd. HCl 1 hr. gave 82.9% *6-benzyl-1,2,3,4-tetrahydronaphthacene*, m. 155-6° (from C_6H_6). G. M. Kosolapoff

MIKHAYLOV, B.M.

USSR

[illegible] in soln. and spectra of the monomer were studied. It was shown that the spectrum of I is radically different from that of the monomer. From a comparison of their properties and spectra the structure of these two forms is detd. It follows that in the dimerization a redistribution of the bonds in the mol. occurs and, in I, the aromatic ring structure is kept in the center ring. I. Revtar Leach

MIKHAYLOV, B. M.

5

Structure of the molecule of dimers of anthracene and its homologous substances. V. S. Medvedev, B. M. Mikhailov, A. F. Prikhot'ko, and O. P. Kharitonova. *Izvest. Akad. Nauk S.S.S.R., Ser. Fiz.* 17, 715-16(1953).—Pure 9-methylanthracene (m. 79.5-80.5°) was transformed into its dimer (m. 228-228.5°) by irradiation of its acetone soln. by a Hg arc-lamp and recrystn. Absorption spectra of the crystals show 2 electronic transitions. The first series of broad absorption bands begins with a strongly polarized triplet λ = 3990.1; 4004.5; 4030.5 A.; the second series has a long-wave limit of absorption at λ = 2560 A. for one polarization and 2600 A. for the other. This spectrum is entirely different from the monomer spectrum. The photochem. reaction takes place not only in soln. but also by irradiation of monomer crystals; it can be detd. by the loss of birefringence. The transformation is effected by a change in the valence bond which leads to a configuration similar to that of hydrated anthracene derivs. The aromatic structure is lost in the central ring.

S. Pakswer

MF
11-10-54

MIKHAYLOV, B.M.

7 Orientation phenomena in substitution reactions with participation of organic compounds of the alkali metals. B. M. Mikhailov and V. P. Bronovitskaya. *J. Gen. Chem. U.S.S.R.* 23, 127-31(1953)(Engl. translation).—See *C.A.* 48, 658A. H. L. H.

MIKHAY

Chem Abs
v.48 25 Jan 54

Organic Chem

Orientation phenomena in substitution reactions with participation of organic compounds of the alkali metals. B. M. Mikhailov and V. P. Bronovitskaya. *Zhur. Obshchei Khim.* 23, 120-5(1953).—Refluxing 5 g. 2-methylanthraquinone, 4.5 g. Sn, and 34 ml. AcOH was treated over 2 hrs. with 11.5 ml. concd. HCl, then dild. with H_2O yielding methylanthrone, which was refluxed 3 hrs. with 6 g. Zn dust and 100 ml. 2*N* NaOH yielding 72.7% 2-methylanthracene, m. 208-9°. This (3 g.) in 75 ml. cold CS_2 was treated slowly with 2.5 g. Br in CS_2; after heating on a steam bath until HBr evolution ceased, the reaction mixt. yielded 75% crude or 63% pure *2-methyl-9-bromoanthracene* (I), m. 94.5-5.5° (from EtOH). Addn. of 2 g. 2-methyl-9,10-dibromoanthracene to 0.0058 moles PhLi in Et_2O and hydrolysis of the mixt. after 0.5 hr. with MeOH-Et_2O, and H_2O, gave 24% I, m. 93-5°; the mother liquor gave a mixt. (0.81 g.) of 2-methyl-9(and 10)-bromoanthracenes m. 43-63°. Similarly 0.0037 moles PhLi in soln. treated with 1 g. 2-methyl-9-bromoanthracene, then treated with 1.58 g. MeI gave 68.7% *2,9-dimethylanthracene*, m. 81-2°. BuLi (from 1.4[illegible] g. BuCl, 0.21 g. Li, and 30 ml. Et_2O) treated with 2 g. I, kept 0.5 hr. then poured on Dry Ice, gave 51.7% *2-methylanthracene-9-carboxylic acid*, m. 197-8° [cf. Liebermann, *Ann.* 212, 35(1882); *C.A.* 6, 2602]. This (0.9 g.) treated with 0.63 g. Br in CS_2 at 0°, then heated on steam bath as above, gave 50% *2-methyl-9-bromo-10-anthracenecarboxylic acid*, m. 229-30.5° (from C_6H_6). Oxidized with CrO_3 in AcOH it gave 2-methylanthraquinone. To 3 g. 2-methyl-9,10-dibromoanthracene was added 0.729 g. PhLi in EtO-C_6H_6; after 90 min. the mixt. was treated with Dry Ice yielding 69% *2-methyl-9-bromoanthracene-10-carboxylic acid*, m. 235-8° (decompn., from dil. EtOH). Thus organometallic compds. of alkali metals behave as nucleophilic reagents. In such compds. with the metal being in *o*-position in respect to a neg. substituent there is established a link between the metal and the hetero-atom, that is similar to a H-bond, which apparently controls the orientation phenomena. G. M. K.

MIKHAYLOV, B. M.; KOZMINSKAYA, T. K.

Benzanthracene

Synthesis of derivatives of 3, 4'-ace-1, 2-benzanthracene with the aid of [illegible] reagents. Zhur. ob. khim. 23, No. 3, 1953.

9. Monthly List of Russian Accessions, Library of Congress, [illegible] 1953. Unclassified.

MIKHAYLOV, B.M.; KOZMINSKAYA, T.K.

Synthesis in the benzanthracene series with the aid of lithium reagents. Zhur.ob.khim. 23 no.7:1220-1224 Jl '53. (MLRA 6:7)

1. Institut normal'noy i patologicheskoy morfologii Akademii meditsinskikh nauk SSSR. (Benzanthracene series) (Lithium)

[illegible], B. M.

USSR/Chemistry Organic chemistry

Card : 1/1 Pub. 40 - 12/27

Authors : Mikhaylov, B. M., and Ter-Sark[illegible]yan, G. S.

Title : Condensation reactions of benz-derivatives of 9-methylacridine. Part 3.- Condensation with p-nitrosodimethylaniline

Periodical : Izv. AN SSSR. Otd. khim. nauk 4, 656 - 662, July - August 1954

Abstract : The condensation of 9-methylacridine, 9-methyl-1,2-benzacridine, 9-methyl-1,2,7,8-dibenzacridine, 4-methyl-5,6-benzquinoline and 4-methyl-7,8-benzquinoline with p-nitrosodimethylaniline, was investigated to determine the activity of the methyl groups, of the above mentioned compounds, in relation to the number and orientations of the benzene rings in the molecule. The effect of ultraviolet rays, on the rate of condensation reaction, is explained. It was found that 9-methylacridine condenses easily with p-nitrosodimethylaniline in darkness, at room temperature and without the aid of catalysts. Other results are described. Ten references: 3 USSR; 2 USA; 2 Swiss and 3 German (1911 - 1951).

Institution : Acad. of Sc. USSR, The N. D. Zelinskiy Institute of Organic Chemistry

Submitted : June 23, 1953

MIKHAYLOV, B.M.

Relative reactivity of methyl groups of benzo analogs of 4-methylpyridine. B. M. Mikhaĭlov and G. S. Ter-Sarkisyan. *Bull. Acad. Sci. U.S.S.R., Div. Chem. Sci.* 1954, 731-7 (Engl. translation).—See *C.A.* 49, 13994*i*. CH

B. M. R.

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USSR/Organic Chemistry - Synthetic Organic Chemistry, E-2

Abst Journal: Referat Zhur - Khimiya, No ., 1957, 961

Author: Mikhaylov, B. M., and Ter-Sarkisyan, G. S.

Institution: Academy of Sciences USSR

Title: Relative Reactivity of the Methyl Group in the Benzene Homologs of 4-Methylpyridine

Original Periodical: Izv. AN SSSR, Section on Chemical Sciences, 1954, No 5, 846-853

Abstract: The reactivity of the CH_3-group in picoline (I), lepidine (II), 5,6-benzolepidine (III), 7,8-benzolepidine (IV), 9-methylacridine (V), 9-methyl-1,2-benzacridine (VI), 9-methyl-3,4-benzacridine (VII), 9-methyl-1,2,7,8-dibenzacridine (VIII), and 9-methyl-3,4,5,6-dibenzacridine (IX) has been studied in the condensation with $m-NO_2C_6H_4CHO$ (X). It has been established that the reactivity of the investigated compounds in the reaction is expressed by the series $I > II$, $II > IV$ and $V > VI > VII > VIII > IX$ and, as a result, that the mobility of the hydrogen of the CH_3-group in the benzene homologs of I depends

Card 1/3

USSR/Organic Chemistry - Synthetic Organic Chemistry, E-2

Abst Journal: Referat Zhur - Khimiya, No 1, 1957, 901

Abstract: both on the number and on the position of the benzene nuclei condensed with the pyridine molecule. A mixture of 0.19 mole of β,β-dinaphtylamine, 0.19 mole $(CH_3CO)_2O$ (XI), and 26 gms anhydrous $ZnCl_2$ is heated for 5 hours at 185-190°. The CH_3COOH is distilled off and the residue heated 30 minutes at 250-260°, followed by repeated treatment with 10% H_2SO_4 and neutralization with 25% NH_4OH; VIII is obtained in yields of 46.8% (crude), mp 180-183° (successive crystallization from benzene, ethylacetate, and alcohol). Chromatographic purification of crude VIII yields an isomer with mp 215-216°. A mixture of 2.7 moles of II and 5 ml of XI is heated in a sealed tube for 1.5 hours at 1.5 hours at 150-153°; the contents of the tube are dissolved in 20 ml C_6H_6. The solution is treated with 30 ml 6 N HCl; 4-(m-nitrostyryl)-pyridine is obtained by the neutralization of the HCl-solution (yield, 48.2%); the unreacted II is recovered as the semicarbazone after extraction with benzene (yield 47.85%, based on II charged). Similar procedures were used in the condensation of the above-named benzene homologs of I with X and of II with $o-NO_2C_6H_4CHO$. A mixture of 2.2 moles of the hydrochloride of III, 2.2 moles of X, and 1.5 mole of XI is refluxed 3 hours; 10 ml of water are added after cooling and the solution is

Card 2/3

USSR/Organic Chemistry - Synthetic Organic Chemistry, E-2

Abst Journal: Referat Zhur - Khimiya, No [illegible], 1957, 961

Abstract: made alkaline with 25% NH_4OH. The precipitate is washed twice with 3-ml portions of alcohol; the yield of m-nitro-benzylidene-5,6-benzolepidine is 30%, mp 168-169° (from alcohol). Similar methods were used in the synthesis of n-dimethyl-aminobenzylidene-5,6-benzolepidene in yields of 26.9%, mp 170.5-171.5° (from alcohol); m-nitrobenzylidene-7,8-benzolepidine in yields of 21.6%, mp 156-157° (successive crystallization from methyl and ethyl alcohol); and 9-(n-dimethylaminostyryl)-2-methylacridine in yields of 94% (crude), mp 225-226° (successive crystallization from CH_3OH and a mixture of benzene and petroleum ether). Condensation of V and X under UV-irradiation yields α-(m-nitrophenyl)-β-(γ-acrydil)-ethanol (XII): a mixture of 7 mmoles of V, 7 mmoles of X, and 14 ml of C_6H_6 is irradiated with UV light for 100 hours in a N_2-atmosphere; the yield of XII is 54%, mp 146.5-147.5° (successive crystallization from benzene and dioxane). Similar methods were used in the condensation of X with II, III, and VI.

Card 3/3

MIKHAYLOV, B.M.

USSR/Geology - Minerals

Card 1/1 : Pub. 22 - 37/49

Authors : Mikhaylov, B. M.

Title : Mineralogical-petrographic characteristics of the erosion crust in the north-western part of the Turgansk depression

Periodical : Dok. AN SSSR 98/4, 645-647, Oct. 1, 1954

Abstract : The mineralogical-petrographic properties of the erosion crust of the north-western part of the Turgansk depression are described. Beidellite, which is gradually being displaced by kaolinite and montmorillonite, appear to be the basic minerals of the erosion crust. Three USSR references (1949-1954). Drawing.

Institution : All-Union Scientific Research Geological Institute

Presented by : Academician D. V. Nalivkin, June 26, 1954

MIKHAYLOV, B.M.

USSR/Chemistry - Boron organic compounds

Card 1/1 Pub. 22 - 25/47

Authors : Mikhaylov, B. M., and Aronovich, P. M.

Title : Complex boron-organic compounds. Diisobutoxydiphenylboronlithium and triisobutoxyphenylboronlithium.

Periodical : Dok. AN SSSR 98/5, 791-794, Oct 11, 1954

Abstract : The reaction of phenyl lithium (PhLi) with diisobutyl phenylborate and triisobutyl borate, was investigated for the purpose of obtaining complex B-organic compounds. Two component compounds, formed during the reaction of PhLi with diisobutyl phenylborate, were analyzed. The entire reaction process, and the results obtained, are described in detail. Fourteen references: 6-German; 5-USA; 2-USSR and 1-French (1862-1953).

Institution : Acad. of Sc. USSR, The N. D. Zelinskiy Institute of Organic Chemistry

Presented by : Academician B. A. Kazankskiy, May 27, 1954

MIKHAYLOV, B.M.

3

Preparation of o-terphenyl. B. M. Mikhailov and P. M. Aronovich. *Bull. Acad. Sci. U.S.S.R., Div. Chem. Sci.* 1955, 857-8 (Engl. translation).—See *C.A.* 50, 4080g.
B. M. R.

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MIKHAYLOV, B.M.

The complex nature of dimetal compounds of phenazine. B. M. Mikhailov and G. N. Blokhina (N. D. Zelinskii Inst. Org. Chem., Moscow). *Izvest. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk* 1955, 850-62; cf. *C.A.* 44, 9452*e*.—Dimetal compds. of phenazine obtained in $(CH_2OMe)_2$ are complexes contg. several mols. of the ether, the no. depending on the nature of the metal as shown below. The products conduct current and are ionic; one atom of the metal is a complex cation, the 2nd is covalently bound with the negatively charged mol. of phenazine. All expts. were done under N_2. To 0.6 g. 9,10-dihydrophenazine in 9 ml. $(CH_2OMe)_2$ was added 80 ml. Et_2O soln. of PhLi contg. 2 equivs. of PhLi; the brown ppt. was sepd. and dried *in vacuo* to const. wt., treated under Et_2O with MeOH, then with H_2O, and the aq. soln. was analyzed for Li; the wt. difference between the complex and the combined wt. of phenazine and Li indicated that the complex was $C_{12}H_8N_2.2Li.6(CH_2OMe)_2$; its molar cond. was 0.252 $cm.^{-1}$ $ohm.^{-1}$ To a soln. of di-Na deriv. of anthracene prepd. by shaking 1 g. anthracene and 0.3 g. Na 25 hrs. in $(CH_2OMe)_2$, was added 0.7 g. dihydrophenazine in 10 ml. $(CH_2OMe)_2$; the red-brown ppt. was sepd. and identified as $C_{12}H_8N_2.2Na.2(CH_2OMe)_2$, molar cond. 0.828 $cm.^{-1}$ $ohm.^{-1}$ To the filtered red soln. of disodiobenzophenonephenylimide, prepd. by shaking 4.5 g. benzophenonanil, 1.1 g. Na and 80 ml. Et_2O, was added 0.6 g. phenazine in 50 ml. Et_2O; the ppt. was sepd. and identified as $C_{12}H_8N_2.2Na.Et_2O$. If the prepn. is made with but a slight excess of the di-Na deriv., the product varies much in metal content (cf. Schlenk and Bergmann, *C.A.* 22, 4490). G. M. Kosolapoff

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1. Organoboron compounds. III. Preparation of isobutyl esters of propylphenylboric and butylphenylboric acids. B. M. Mikhailov and P. M. Aronovich (N. D. Zelinskii Inst. Org. Chem., Moscow). *Izvest. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk* 1955, 940-7; cf. *C.A.* 49, 13142*g*; 50, 4813*d*.—A soln. of PrLi prepd. at 0° from 32 g. PrBr, 3.5 g. Li, and 200 ml. Et_2O treated over 30–40 min. at −60° with 46.8 g. $PhB(OCH_2CHMe_2)_2$ in 60 ml. Et_2O, stirred 5 hrs. at −70°, kept overnight, satd. with dry HCl, freed of the bulk of solvent, filtered from the LiCl and LiBr, evapd. *in vacuo*, refiltered, and fractionated yielded 85.8% *$PrPhBOCH_2CHMe_2$*, b_4 86–7°, d_{20} 0.8913. Similarly was prepd. 67.4% *$BuPhBOCH_2CHMe_2$*, b_3 96–7°, d_{20} 0.88[illegible]. All operations were performed under dry N. O. M. K.

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Organoboron compounds. IV. Synthesis of esters of dialkylborinic acids with the use of lithium reagents. B. M. Mikhailov and T. A. Shchegoleva (N. D. Zelinskii Inst. Org. Chem., Acad. Sci. U.S.S.R., Moscow). Izvest. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk 1955, 1121-6; cf. preceding abstr.—A soln. of BuLi, prepd. from 41 g. BuBr, 4.17 g. Li, and 225 ml. Et_2O at 0°, treated over 1 hr. at -70° with 6.1 g. $BuB(OBu)_2$ in 60 ml. Et_2O, stirred 4 hrs., kept overnight at this temp., satd. treated with dry HCl, freed of Et_2O, filtered, and the filtrate freed of solvents, refiltered, and distd. yielded 71.5% Bu_2BOBu, b_{10} 122-4°, d_{20} 0.8077. Similarly PrLi gave 67% Pr_2BOBu, b_{14} 84-6°, d_{20} 0.7888.

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