Recording system for an [illegible] chamber. [illegible], L. I. Levikov, [illegible]. *Soviet Phys.-Tech. Phys.* 1, 314-20(1957)(English translation).—See C.A. 50, 14378d. B. M. R.

S/120/60/000/005/031/051
E032/E314

AUTHORS: Lapitskiy, Yu.Ya. and Slivkov, I.N.

TITLE: A Beam Control Device for the Output of an Accelerator 19

PERIODICAL: Pribory i tekhnika eksperimenta, 1960, No. 5, pp. 121 - 123

TEXT: In the operation of charged-particle accelerators it is necessary to have continuous information about the form and position of the beam at the output. The device described in the present paper was designed to provide the control desk with this information. The device consists of six screened probes, each having a diameter of 1 mm, which are fixed to a disc which rotates eccentrically with respect to the beam and in the plane perpendicular to it with a velocity of 1.5 rps. The probes are fixed to the disc in such a way that their current detectors intersect the beam along six different trajectories spaced at a distance of about 2 - 3 mm. The current detectors are earthed through a common resistor and the potential difference across the latter is fed into an

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S/120/60/000/005/031/051
E032/E314

A Beam Control Device for the Output of an Accelerator

oscillograph. In this way the current-density distribution can be obtained in six practically parallel sections of the beam. A special photo-electric device produces a marker signal indicating that one of the probes passes across the centre of the beam. A schematic drawing of the device is shown in Fig. 1 and a typical oscillogram is obtained in Fig. 2. The beam control unit is being used with the high-voltage accelerator of the Institute of Chemical Physics of the AS USSR. There are 2 figures and 1 Soviet reference.

ASSOCIATION: Institut khimicheskoy fiziki AN SSSR (Institute of Chemical Physics of the AS USSR)

SUBMITTED: August 14, 1959

Card 2/2

MALYSHEV, I.F.; POPKOVICH, A.V.; ROSHAL', G.Ya.; ZHELEZNIKOV, F.G.; LYSOV, A.V.; TSEPAKIN, S.G.; SOLNYSHKOV, A.I.; BOYTSOV, A.S.; ASTAKHOV, Ye.Ya.; MIRONOV, B.V.; LAPITSKIY, Yu.Ya.; GATALIN, V.A.; KHOROSHKOV, V.S.

Electrostatic accelerator-injector in a proton synchrotron. Prib. i tekh. eksp. 7 no.4:37-45 Jl-Ag '62. (MIRA 16:4)

1. Nauchno-issledovatel'skiy institut elektrofizicheskoy apparatury Gosudarstvennogo komiteta po ispol'zovaniyu atomnoy energii SSSR i Institut teoreticheskoy i eksperimental'noy fiziki Gosudarstvennogo komiteta po ispol'zovaniyu atomnoy energii SSSR.

(Particle accelerators) (Synchrotron)

VLADIMIRSKIY, V.V.; KOSHKAREV, D.G.; ONOSOVSKIY, K.K.;
SMOLYANKINA, T.G.; SMIRNITSKIY, V.A.; DANIL'TEV, Ye.N.;
LAZAREV, N.V.; LAPITSKIY, Yu.Ya.; PLIGIN, Yu.S.; BATALIN, V.A.

Ion guide and beam injection system in a proton synchrotron.
Prib. i tekh. eksp. 7 no.4:70-75 Jl-Ag '62.
(MIRA 16:4)

1. Institut teoreticheskoy i eksperimental'noy fiziki Gosudarstvennogo komiteta po ispol'zovaniyu atomnoy energii SSSR.
(Synchrotron)

VLADIMIRSKIY, V.V.; GOL'DIN, L.L.; PLIGIN, Yu.S.; VESELOV, M.A.; TALYZIN, A.N.; TARASOV, Ye.K.; KOSHKAREV, D.G.; LAPITSKIY, Yu.Ya.; BARABASH, L.Z.; KLEOPOV, I.F.; LEBEDEV, P.I.; KUZ'MIN, A.A.; BATALIN, V.A.; ONOSOVSKIY, K.K.; UVAROV, V.A.; VODOP'YANOV, F.A.

Adjustment of acceleration in the 7 bev. proton synchrotron. Prib. i tekh. eksp. 7 no. 4:248-255 Jl-Ag '62. (MIRA 16:4)

1. Institut teoreticheskoy i eksperimental'noy fiziki Gosudarstvennogo komiteta po ispol'zovaniyu atomnoy energii SSSR.

L 27069-66 EWT(m) IJP(c) JXT(CZ)

ACC NR: AT6012259 SOURCE CODE: UR/3138/65/000/381/0001/0012

AUTHOR: Lapitskiy, Yu. Ya.; Khoroshkov, V. S.; Onosovskiy, K. K. 46

ORG: none*

B+1

TITLE: The injector of the ITEF proton synchrotron 19

SOURCE: USSR. Gosudarstvennyy komitet po ispol'zovaniyu atomnoy energii. *Institut teoreticheskoy i eksperimental'noy fiziki. Doklady, no. 381, 1965. Inzhektor protonnogo sinkhrotrona ITEF, 1-12

TOPIC TAGS: proton accelerator, synchrotron, particle accelerator component, electrostatic generator/ ZG-5 electrostatic generator 10

ABSTRACT: The authors describe the improvements recently made on the ITEF proton synchrotron injector, which originally was a revamped ZG-5 electrostatic generator. The injector is designed for a two-week operating cycle, with minimum maintenance shutdown (12 hours) and minimum low-voltage preconditioning (20-30 hours). The vacuum system and the ion system (source, optical system, and ion transporter) are described in detail. With the ion source delivering a maximum pulse current of 0.3 a, the injector operates at present with a generator voltage of 4 Mev, a dc ion current 1-3 μa, an unseparated beam pulse of 40 ma at a pulse duration of 40 μsec, a proton pulse of 8-10 ma into the synchrotron at a pulse duration 20 μsec, and an energy

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L 27069-66

ACC NR: AT6012259

stability 0.1%. It is claimed that from 1 January 1965 through 15 May 1965, the electrostatic generator served as an injector for 1924 out of the planned 2070 hours. Oirg. art. has: 3 figures.

SUB CODE: 20/ SUBM DATE: 23Aug65/ ORIG REF: 002/ OTH REF: 001

Card 2/2

L 39641-66 EWT(m) IJP(c) GD-2

ACC NR: AP6002892 SOURCE CODE: UR/0286/65/000/024/0048/0048

AUTHOR: Lapitskiy, Yu. Ya.; Khoroshkov, V. S.

9
6

ORG: none

TITLE: Proton pulse source with a cold cathode. Class 21, no. 177001 [announced by Institute of Theoretical and Experimental Physics (Institut teoreticheskoy i eksperimental'noy fiziki)]

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 24, 1965, 48

TOPIC TAGS: proton, cold cathode, linear accelerator

ABSTRACT: The proton pulse source with a cold cathode, in the form of a small flat plate with a fixed discharge area, intended for the use on linear direct-action accelerators,/9 is characterized by the fact that the cathode is equipped with a needle, from stainless steel for example, which is set on the axis of the source. This is done in order to facilitate the firing, holding, and stabilization of the discharge, to prolong the lifetime of the cathode, and to increase the discharge current at relatively low voltages.

SUB CODE: 18/ 09,20/ SUBM DATE: 09Oct64

Card 1/1

L 32805-66 EWT(1)/T IJP(c) AT

ACC NR: AT6012258 SOURCE CODE: UR/3138/65/000/380/0001/0012

61
54
B+1

AUTHOR: Lapitskiy, Yu. Ya.; Khoroshkov, V. S.

ORG: none

TITLE: Pulsed ion source with a cathode needle.

SOURCE: USSR. Gosudarstvennyy komitet po ispol'zovaniyu atomnoy energii. Institut teoreticheskoy i eksperimental'noy fiziki. Doklady, no. 380, 1965. Impul'snyy ionnyy istochnik s katodnoy igloy, 1-12

TOPIC TAGS: ion source, cold cathode, ~~cathode needle~~, ion emission, steel/ IKhI8N9T steel

ABSTRACT: The article describes a pulsed ion source with a cold cathode and a cathode needle for stabilizing the discharge position with respect to the emission aperture. The ion emission current is 0.3 amp., the pulse duration is 50 microseconds, the pulse repetition rate is 0.2 cps. power intake is 35 w, hydrogen consumption is 25 cm^3/hr, proton concentration is 85% of the density of the beam, and cathode longevity is over 3000 hr. The cathode was made of 1Kh18N9T steel, which is resistant to ion bombardment in petroleum-cracking products. The ion source has been in operation for two yr with an electrostatic generator-injector of the ITEF proton synchrotron averaging 600-700 hr/month. The device was opened several times for maintenance and cleaning; no changes on the cathode surface were observed.

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L 32805-66

ACC NR: AT6012258

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The authors express their gratitude to L. L. Gol'din, K. K. Onosovskiy, and V. A. Batalin for discussing the results and to A. P. Zotov, V. V. Zubarev, Yu. G. Petrov, and R. P. Yudintson for participation in producing and studying the ion source. Orig. art. has: 5 figures. [LD]

SUB CODE: 20/ SUBM DATE: 23Aug65/ ORIG REF: 003

Card 2/2

PECHUK, V.; LAPIY, V.

Electronic level indicator. V pom. radioliub. no.11:57-64 '61.
(MIRA 15:6)

(Electronic apparatus and appliances) (Level indicators)

LAPIY, V.A., inzh.

Contactless electronic equipment for liquid level control.
Ugol' Ukr. 5 no.10:37-40 O '61. (MIRA 14:12)

1. Institut avtomatiki Gosplana USSR.
(Coal mines and mining—Electronic equipment)
(Liquid level indicators)

LAPIY, V.A

~~Folkman K. Yu.~~

PHASE I BOOK EXPLOITATION SOV/3778

Ukrainian SSR. Gosudarstvennaya planovaya komissiya

Avtomatizatsiya i priborostroyeniye; sbornik nauchnykh trudov, vyp. 1. (Automation and Instrument Making: Collected Scientific Works, No. 1) Kiyev, Gostekhizdat USSR, 1959. 107 p. 3,000 copies printed.

Ed.: V. Demskiy; Tech. Ed.: K. Ousarov; Editorial Board: P.M. Mel'nik (Chief Ed.), N.T. Zharov, G.S. Kryshtab, I.A. Orlov, (Resp. Ed.), L.A. Shoykhet, and N.V. Yarin.

PURPOSE: This collection of articles is intended for scientific and technical workers and for students of schools of higher education specializing in automation, telemechanics, and computing.

COVERAGE: The collection contains papers on the automation of metallurgical, chemical and power engineering and on the development of new instruments, telemechanical units, and a program control system for turret lathes. A bibliography on automatic analysis of solutions containing 86 items: 42 Soviet, 34 English, 5 German, 4 French and 1 Polish, is included. No personalities are mentioned.

AUTOMATION OF INDUSTRIAL PROCESSES

AUTOMATION EQUIPMENT

AUTOMATIC CONTROL

S/123/61/000/022/020/024
A004/A101

AUTHORS: Pechuk, V.I., Lapiy, V.A.

TITLE: Electronic level signaling device

PERIODICAL: Referativnyy zhurnal. Mashinostroyeniye, no. 22, 1961, 24, abstract 22E173 (V sb. "Avtomatiz. i priborostroyeniye", no. I, Kiev, Gostekhizdat UkrSSR, 1959, 61 - 64)

TEXT: The authors describe the principle of action, circuits and design of the level signaling device whose sensitive element is not in contact with the medium being measured. The device represents a 2-circuit quartz free self-excited oscillator. The anode circuit of the self-excited oscillator consists of a h-f inductance coil, adapter capacitance and coaxial cable with pickup which is inductively or capacitatively connected with the anode circuit coil. If the device is switched on, an electromagnetic h-f current field originates around the pickup. If the power lines of the field are crossed by any substance, a power drop occurs which is equivalent to the change in equivalent circuit resistance. If the pickup is approached to the medium being measured, the resonance frequency is changed, the phase balance in the grid and anode circuits is disturb-

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Electronic level signaling device

S/123/61/000/022/020/024
A004/A101

ed, the anode-grid current is abruptly changed, and a relay starts operating which is connected into the circuit of the servomechanism. The necessary sensitivity of the device for materials with different loss magnitudes is ensured by selecting the generator frequency. The sensitive element can be placed in a jacket of refractory or insulating material or on the outer wall of the vessel. Tests of the device showed that it can be used for controlling the portioning and level measuring of aggressive, explosive and other liquids, as well as solid powdery and lump materials. The operating temperature is in the range of -60 to +800°C, the sensitivity for liquids amounts to ± 0.5 mm and for solid bodies to ± 5 mm. There are 6 figures.

A. Pavlovskiy

[Abstracter's note: Complete translation]

Card 2/2

L 10531-63 EWT(d)/FCC(w)/BDS--APGC/ASD/ESD-3--Pg-4/Pk-4/Po-4/
Pq-4--IJP(C)/GG

ACCESSION NR: AP3001097 S/0103/63/024/006/0850/0855 78
77

AUTHOR: Bartkus, T. I. (Vilnius); Gikis, I. I. (Vilnius); Lapienis, F. P. (Vilnius); Lukoshevichyus, S. K. (Vilnius); Meshcheryakov, V. V. (Vilnius); Tel'ksnis, L. A. (Vilnius)

TITLE: Specialized electronic computer 16C for correlation and spectral analysis of visual and magnetic recordings of random processes

SOURCE: Avtomatika i telemekhanika, v. 24, no. 6, 1963, 850-855

TOPIC TAGS: computer, automatic reader, correlation, correlation computation

ABSTRACT: Special features are described of a computer which will read large amounts of raw random statistical data in the form of continuous visual tape records and then perform on the analog signal the desired calculations of correlation and spectral density. The computer has three basic sections: an input electron-optical data reader, a delayed memory storage, and an electronic computation section. The reader is a TV pickup of the vidicon type, on whose screen is projected the image of the moving signal trace. The vidicon output, after integration and detection, is the voltage analog of the scanned trace.

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0

The original tape recording may be any usual type (photosensitive, direct-writing, 25-mm film), providing the trace is black, blue, or green and the tape background is white or transparent. The voltage signals obtained are stored on magnetic tape in FM form and are fed to a special delay section which automatically time-shifts one taped signal with respect to another as required in correlation computation. The delay section (See Fig. 1 of Enclosure) has a playback head (1), an eraser head (2), and a record head (3) for each signal of a pair. Both signals are picked off prior to erasure, amplified (5), and re-recorded via the record heads (3), except that one of the latter is mechanically advanced a distance Δl, causing a shift in its re-recorded trace. By rewinding and repeating, the process gives any desired time shift up to 18 sec. The remaining circuitry includes the required multiplication and integration, the output of which is the correlation function in graphical form on punched tape. To determine power spectral density (PSD), the taped correlation function is in turn fed to the computer input; necessary sinusoidal functions and frequency selection are included in the computing section for PSD computation. Fourier series coefficients may also be calculated. Other operating data include an accuracy of correlation calculation of approximately 5%, PSD of approximately 8%, an overall dynamic range of 40 db, and a maximum continuous computation

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ACCESSION NR: AP3001097

interval of 20 minutes. The computer is built in three consoles, all operated by one person. It is in current production at the Vil'nyusskiy zavod schetny*kh mashin (Vilnius Computer Plant). Orig. art. has: 5 figures and 5 formulas.

ASSOCIATION: none

SUBMITTED: 00 DATE ACQ: 01Jul63 ENCL: 01

SUB CODE: CP NO REF SOV: 000 OTHER: 000

Card 3/4

L 10531-63
ACCESSION NR: AP3001097 ENCLOSURE: 01

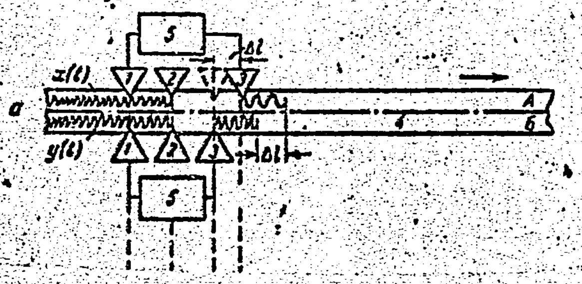


Fig. 1. Delayed memory storage section

LAPKA, Frantisek, inz.

Foundation of the first 200 MW turboaggregate in Czechoslovakia. Inz. stavby 12 no.7:287-291 Jl'64

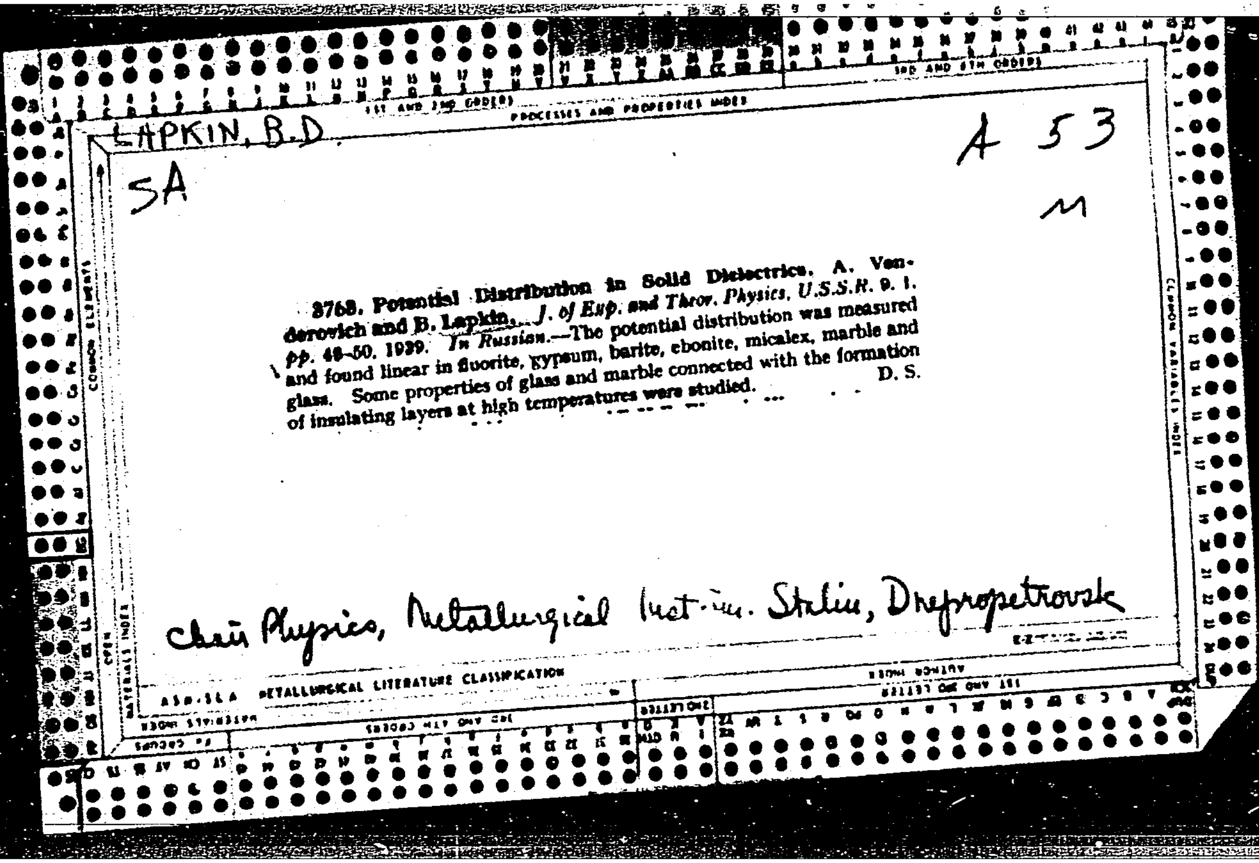
1. Energoprojekt, Prague.

LAPKES, Ya.B. [translator]; GOL'DBERG, M.L., redaktor; ZUBRILINA, Z.P., tekhnicheskiy redaktor; PEVZNER, V.I., tekhnicheskiy redaktor

[Problems of labor productivity in U.S. agriculture] Voprosy
proizvoditel'nosti truda v Sel'skom khoziaistve SShA. [Sbornik
sostavlen i pereveden IA.B.Lapkesom.] Moskva, Gos.izd-vo sel'khoz.
lit-ry, 1957. 324 p. (MIRA 10:11)
(United States--Labor productivity)
(United States--Agriculture--Economic aspects)

LAPKES, Yakov Bentsionovich; KOSTIN, V.P., red.

[Intensification and systems of agriculture] Intensifikatsiia sel'skogo khoziaistva i sistemy zemledeliia. Moskva, Ekonomika, 1964. 238 p. (MIRA 17:8)



LAPKIN, B.D.

SA

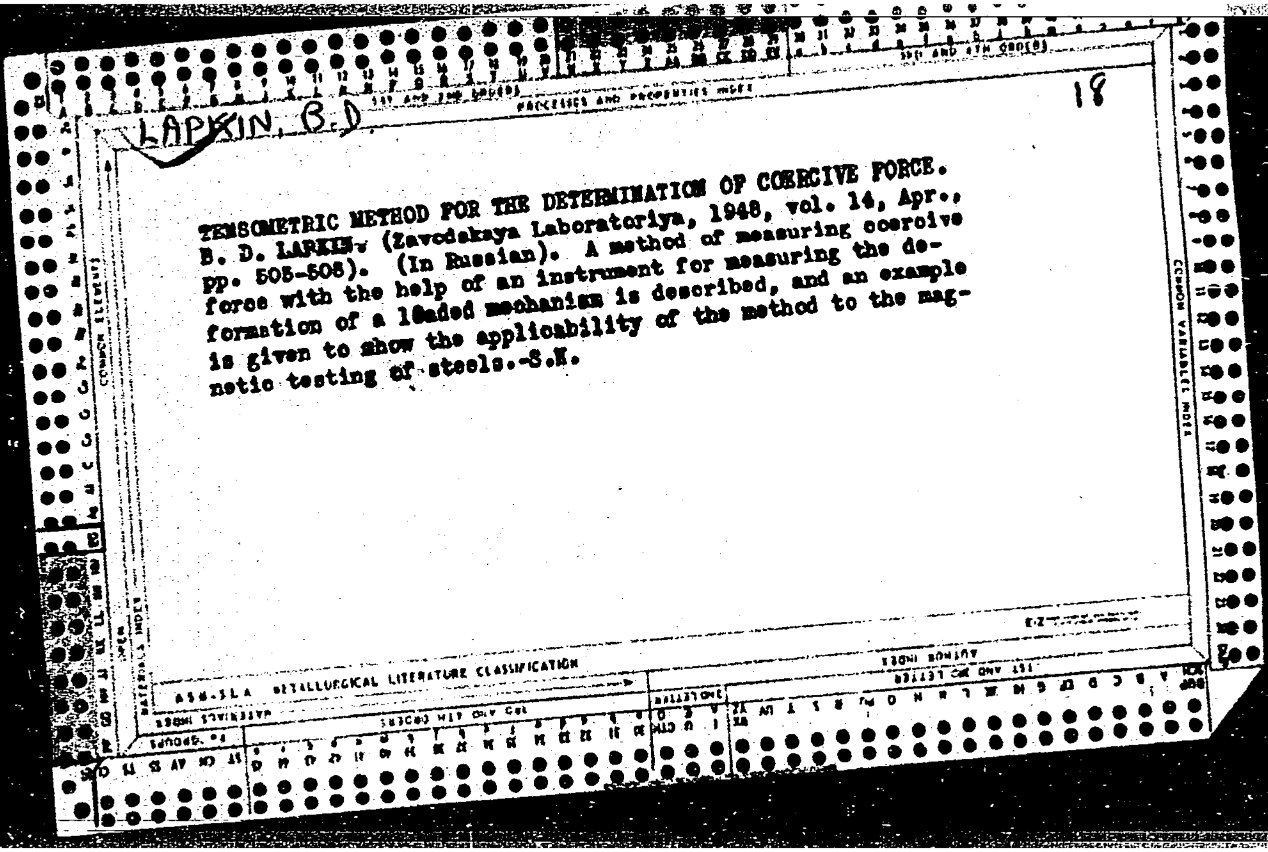
A 53

M

3768. Potential Distribution in Solid Dielectrics. A. Venderovich and B. Lapkin. *J. of Exp. and Theor. Physics, U.S.S.R.* 9. 1. *pp.* 48-50, 1939. *In Russian.*—The potential distribution was measured and found linear in fluorite, gypsum, barite, ebonite, micalex, marble and glass. Some properties of glass and marble connected with the formation of insulating layers at high temperatures were studied. D. S.

Chair Physics, Metallurgical Inst. im. Stalin, Dnepropetrovsk

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



LAPKIN, B.D.

18

TENSOMETRIC METHOD FOR THE DETERMINATION OF COERCIVE FORCE. B. D. LARKIN. (Zavodskaya Laboratoriya, 1948, vol. 14, Apr., pp. 505-508). (In Russian). A method of measuring coercive force with the help of an instrument for measuring the deformation of a loaded mechanism is described, and an example is given to show the applicability of the method to the magnetic testing of steels.-S.K.

LAPKIN, B.D.

Electric modeling of dynamic stresses produced in mine hoisting ropes during lifting of loads from bases at rest. Prykl. mekh. 2 no.1:29-39 '56. (MLRA 10:2)

1. Dnipropetrovs'kiy institut inzheneriv transportu.
(Strains and stresses) (Electromechanical analogies)
(Mine hoisting)

LAPKIN, B.D., kandidat fiziko-matematicheskikh nauk, dotsent.

Electromechanical models of dynamic forces in hoisting cables. Trudy DIIT no.25:152-171 '56. (MIRA 10:1)
(Electromechanical analogies) (Cables)

LAPKIN, B. D.

LAPKIN, B.D. (Dnipropetrovs'k)

Electric modeling of stresses in cables during removal of the load from an immobile foundation (with initial lap). [In Ukrainian with summaries in Russian and English]. Prykl.mekh.3 no.3:317-324 '57. (MIRA 10:12)

1. Dnipropetrovs'kiy institut inzheneriv transportu.
(Electromechanical analogies) (Cables)

(Boris Davydovich) SOV/144-58-9-2/18

AUTHORS: Lapkin, B.D., Candidate of Physico-Mathematical Sciences, Docent, and Lomazov, D.B., Docent, Candidate of Technical Sciences, Head of the Chair of Electrical Engineering

TITLE: Influence of the Installation of Station Tracks on the Intensity of Stray Currents (Vliyaniye razvitiya stantsionnykh putey na velichinu bluzhdayushchikh tokov)

PERIODICAL: Izvestiya Vysshikh Uchebnykh Zavedeniy, Elektromekhanika, 1958, Nr 9, pp 6-15 (USSR)

ABSTRACT: Methods of calculation of the stray currents in uniform railroad track lines, i.e. sections not containing stations, are well known. In this paper the authors deal with calculation of the magnitudes of stray currents in non-uniform track circuits which include track networks of stations. For ordinary track sections with a longitudinal resistance of the rails per kilometre r_p and a contact resistance per kilometre r_n, the distribution of the voltage and current in the rails, taking into consideration adjacent sections, can be expressed by the following differential equations:

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$$-\frac{\partial u}{\partial x} = r_p i, \qquad (1)$$

$$-\frac{\partial i}{\partial x} = \frac{u}{r_n}, \qquad (2)$$

the solutions of which are:

$$U = Ae^{ax} + Be^{-ax}, \qquad (3)$$

$$i = y(Ae^{ax} - Be^{-ax}), \qquad (4)$$

where $a = \sqrt{r_p/r_n}$, the leakage characteristic of the rail circuit, $y = -1/\sqrt{r_p r_n}$, A and B are integration constants which are determined from the boundary conditions. For a train moving at a constant speed $v = L/T$, we obtain the following relation for the leakage current in the case of a constant tractive effort $I = const$, at the instant of the train being in the central section:

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Influence of the Installation of Station Tracks on the Intensity of Stray Currents

$$Q = IT\left[1 - \frac{2}{aL}\left(1 - e^{-\frac{aL}{2}}\right)\right]. \qquad (13)$$

For rails of the Soviet type R-50, r_p = 0.02 Ohm/km and in the case of the ballast being in a satisfactory state r_n = 2 Ohm/km. In this case for a line section L = 22 km (between the location of the locomotive and the point where the current is fed in), Q = 0.393 IT, i.e. the stray currents amount to over one-third of the electricity consumption of the locomotive. Next to be examined is the case of two stations having a length of line between them. Each station is assumed to occupy a length ℓ of line, and the line between the stations has length L (Fig 2). The labels 1,2,3,4,5 are then applied as follows: "1" corresponds to all points to the left of the first station; "2" corresponds to all points in the length ℓ of line occupied by the first station; "3" corresponds to all points in the length L of line between the stations; "4" corresponds to all points in the length

Card 3/7 ℓ of line occupied by the second station; "5" corresponds to all points to the right of the second station. With these labels for suffices the authors then formulate the logical extension, to each length of track of their Eqs (3) and (4), Eqs (14) of the text. Numerical calculations are carried out for the case of a locomotive moving along a 20 km stretch of a line, at the two ends of which there are stations with tracks extending over 1 km each. The presence of the extended tracks at the stations resulted in an increase in the stray currents by 13%; in the given case each of the two stations contained nine tracks. Experimental investigations of the influence of extended station tracks were carried out on the single track section Nikopol'-Marganets of the Stalinsk railroad (Ref 1). In the short circuit experiment the conductor was connected to the rails at the "neck" of the station Marganets and the current was fed from the traction sub-station of Nikopol'. 30% (477 A) of the current from the short circuit point flowed through the two rails, whilst 70% (1123 A) flowed towards the station

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Influence of the Installation of Station Tracks on the Intensity of Stray Currents

tracks in a direction opposite to that of the current supply source. The here obtained calculated results, which are graphed in Fig 5, confirm these experimental results. The relations derived by the authors for calculating the influence of track systems and stations enabled gaining more accurate information on the reduction of the resistance of the stray current paths as a result of the shunting effect of the ground. If the potential difference at the ends of a rail section, without taking into consideration stations, adjacent sections and the shunting effect of the ground, is Δu and, taking into consideration these factors, it is Δu_2, the ratio $k_p = \Delta u_2/\Delta u_1$ characterizes the reduction in the resistance (to ground) of the rail network resulting from the presence of stations, adjacent sections and the shunting effect of the ground. For single track lines ($n = 1$) the value of this coefficient k_p can be expressed by means of the equation:

Card 5/7

$$k_p = \frac{1-e^{-a(L + \ell)}}{a(L + \ell)} . \qquad (29)$$

In Fig 8 k_p values are graphed for single track lines as well as for station sections containing 7, 14 and 25 pairs of tracks. The equations hitherto used for determining the resistances, on the basis of which the short circuit currents are calculated, also have to be modified taking into consideration the correction coefficients k_p. By comparing the respective formulae, Eqs (30) and (31) it can be seen that introduction of the correction coefficient leads to an increase in the minimum values of the short circuit currents, which is of considerable practical importance.

L. A. Manashkin assisted in calculating the numerical data.

There are 8 figures and 3 Soviet references.

SOV/144-58-9-2/18

Influence of the Installation of Station Tracks on the Intensity of Stray Currents

ASSOCIATION: Kafedra elektrotekhniki Dnepropetrovskogo instituta inzhenerov zheleznodorozhnogo transporta (Chair of Electrical Engineering, Dnepropetrovsk Institute of Railway Transportation Engineers)

SUBMITTED: July 7, 1958

Card 7/7

124-58-9-10337

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 9, p 134 (USSR)

AUTHOR: Lapkin, B. D.

TITLE: Dynamic Loads in a Mine-shaft Hoisting Rope With Due Account of an Overlap (Dinamicheskiye usiliya v shakhtnom kanate s uchetom napuska)

PERIODICAL: Tr. Dnepropetr. in-ta inzh. zh.-d. transp., 1958, Nr 26, pp 199-210

ABSTRACT: Bibliographic entry

1. Mines--Equipment 2. Cordage--Stresses

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LAPKIN, B.D.

25(2) PHASE I BOOK EXPLOITATION SOV/2967

Akademiya nauk SSSR. Institut mashinovedeniya. Seminar po teorii mashin i mekhanizmov

Trudy, tom XIX, vyp. 74 (Transactions of the Institute of Machine Science, Academy of Sciences, USSR. Seminar on the Theory of Machines and Mechanisms, Vol 19, No. 74) Moscow, Izd-vo AN SSSR, 1959. 66 p. Errata slip inserted. 2,500 copies printed.

Scientific Supervisor of the Seminar: I. I. Artobolevskiy, Academician; Ed. of Publishing House: G. B. Gorshkov; Tech. Ed.: I. F. Koval'skaya; Editorial Board: I. I. Artobolevskiy, Academician (Resp. Ed.); G. G. Baranov, Doctor of Technical Sciences, Professor; V. A. Gavrilenko, Doctor of Technical Sciences, Professor; V. A. Zinov'yev, Doctor of Technical Sciences, Professor; A. Ye. Kobrinskiy, Doctor of Technical Sciences; N. I. Levitskiy, Doctor of Technical Sciences, Professor; N. P. Rayevskiy, Candidate of Technical Sciences; L. N. Reshetov, Doctor of Technical Sciences, Professor; and M. A. Skuridin, Doctor of Technical Sciences, Professor.

PURPOSE: This book is intended for engineers interested in the theory of machines and mechanisms.

COVERAGE: The book consists of five scientific papers dealing with machines and mechanisms. The topics covered include dynamic principles of shockproof screens, electrical simulation of dynamic loads acting in mine hoisting equipment, dynamic loads in spur gears, an analytical method of designing cam profiles, and the analysis of forced vibrations in a system with a nonlinear restoring force. No personalities are mentioned. References follow several of the articles.

TABLE OF CONTENTS:

LAPKIN, B.D.; MANASHKIN, L.A.

Electric modeling of mine hoists with clearance. Nauch.dokl. vys.shkoly; energ. no.1:259-264 '59. (MIRA 12:5)

1. Dnepropetrovskiy institut inzhenerov transporta.
(Hoisting machinery--Models)

LAPKIN, B.D.

Electric analog representation of dynamic stresses in mine hoists. Trudy Inst. mash. Sem. po teor. mash. 18 no.74:14-24 '59. (MIRA 13:2)

(Strains and stresses--Electromechanical analogies)
(Mine hoisting)

29221

24.4200 1327, 1103, 1191

S/198/61/007/005/002/015
D274/D303

AUTHORS: Lapkin, B.D., and Tsukanov, O.A. (Dnipropetrov'sk)

TITLE: Dynamic stresses in a visco-elastic fiber on instantaneous application of an end load by means of an elastic element

PERIODICAL: Prykladnaya mekhanika, v. 7, no. 5, 1961, 483 - 486

TEXT: The problem is considered of determining the longitudinal dynamic stresses which arise in a homogeneous visco-elastic fiber, to which an end load is indirectly applied (through a spring). For such a stress

$$S(x, t) = EF\left(1 + \mu \frac{\partial}{\partial t}\right) \frac{\partial u(x, t)}{\partial x}, \qquad (1)$$

where u is the displacement, [illegible] - the cross section. In addition

$$\frac{\partial S(x, t)}{\partial x} = \rho \frac{\partial^2 u(x, t)}{\partial t^2} \qquad (2)$$

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Dynamic stresses in a ...

where ρ is the mass of unit length. The boundary conditions are set up. Thereupon

$$s(l,\ t) + Q\ddot{u}\ (l,\ t) + \frac{Q}{K}\ddot{S}(l,\ t) = Qg \qquad (7)$$

where Q is the mass of the load, and K the rigidity of the spring. Introducing the images S^* and u^* of the functions S and u, one obtains, with zero initial conditions

$$p^2S^* = a^2(1 + \mu p)\ \frac{d^2S^*}{dx^2}, \qquad (8)$$

$$\frac{dS^*}{dx} = \rho p^2u^*, \qquad (9)$$

$$S^*(l,\ p) + Qp^2u^*(l,\ p)\ \text{[illegible]}\ \frac{Q}{K}\ p^2S^*(l,\ p) = Qg, \qquad (10)$$

$$u^* = (0,\ p) = 0. \qquad (11)$$

The function S* which satisfies Eqs. (8) and (9), and conditions

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Dynamic stresses in a ...

(10), (11) is expressed by

$$S^*(x,\ p) = \frac{\alpha Qg\ \mathrm{ch}\ \gamma x}{\alpha(1 + \delta p^2)\ \mathrm{ch}\ \gamma l + \gamma l\ \mathrm{sh}\ \gamma l}, \qquad (12)$$

where $\delta = Q/K$; $\alpha = P/Q$ (P being the mass of the fiber). In order to find the original $S(x,\ t)$ of $S^*(x,\ p)$ it is necessary to first solve

$$\alpha(1 + \delta p^2)\mathrm{ch}\ \gamma l + \gamma l\ \mathrm{sh}\ \gamma l = 0. \qquad (13)$$

An analysis shows that all the solutions of this equation are complex. The solution of such equations is very cumbersome. For convenience, the solution of Eq. (13) is sought in the form

$$p_n = \frac{k^2 e^{\pm i2\varphi} - 1}{\mu}. \qquad (14)$$

Thereby, Eq. (13) decomposes into two transcedental equations with real arguments, viz.

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S/198/61/007/005/002/015
D274/D303

Dynamic stresses in a ...

$$\frac{\operatorname{sh} 2\frac{l}{a\mu}x}{\operatorname{ch} 2\frac{l}{a\mu}x+\cos 2\frac{l}{a\mu}y}+\alpha\frac{a}{l}\left(b\mu+\frac{\delta m}{\mu}\right)=0, \qquad (15)$$

$$\frac{\sin 2\frac{l}{a\mu}y}{\operatorname{ch} 2\frac{l}{a\mu}x+\cos 2\frac{l}{a\mu}y}+\alpha\frac{a}{l}\left(\frac{\delta n}{\mu}-\mu d\right)=0. \qquad (16)$$

where $x = (k - \frac{1}{k}) \cos \varphi$; (17) $y = (k + \frac{1}{k}) \sin \varphi$; (18)

(b, d, m, n are given by expressions). Thereupon, the first two solutions (p_1 and p_2) found for $\alpha = 0.5$, $1/a\mu = 1$ and $\delta = \mu^2 = 0.01$ are:

$$p_1 = -1.068 \pm i5.411, \qquad (22)$$
$$p_2 = -12.458 \pm i23.293.$$

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Dynamic stresses in a ...

S/198/61/007/005/002/015
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These solutions permit finding approximate values of S(x, t), (in the form of rapidly converging series). The effect of δ and μ on the dynamic stresses is ascertained and the results are listed in the table. It is noted that a knowledge of δ only, is insufficient [illegible] evaluate the rigidity K. There are 1 table and 4 Soviet-bloc references.

ASSOCIATION: Dnipropetrovs'kyy instytut inzheneriv transportu (Dnipropetrov'sk Institute of Transportation Engineers)

SUBMITTED: August 25, 1960

Card 5/5

ACCESSION NR: AP4018288 S/0144/64/000/001/0018/0023

AUTHOR: Lapkin, B. D.

TITLE: Constructing approximate solutions for transient processes in lines with distributed constants

SOURCE: IVUZ. Elektromekhanika, no. 1, 1964, 18-23

TOPIC TAGS: electric transmission line, distributed parameter line, distributed parameter line transients, line transient approximate evaluation, elastoviscous bar

ABSTRACT: The problem of transients in distributed-parameter electric transmission lines which simulate elastoviscous bars is theoretically considered. The bar, each of whose elements is subjected both to the internal elastic forces and viscous friction and the external viscous friction, can be simulated by an infinite number of elementary line sections shown in Fig 1 (see Enclosure 1).

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ACCESSION NR: AP4018288

The voltage distribution in the electrical line will simulate the distribution of the longitudinal dynamic forces in the bar. A line consisting of the above sections and containing an input $R_0 L_0$ section (see Fig 2) will simulate an elastoviscous bar with one end fixed and the other carrying a weight applied through a buffer spring. Differential equations describing this case are set up, transformed, and (by the operational-calculus method) brought up to a transcendent equation with complex roots. As no solution of the latter is seen, the frequency method (well-known in the theory of automation) adapted by the author is used for "constructing" an approximate solution. Orig. art. has: 3 figures and 24 formulas.

ASSOCIATION: none

SUBMITTED: 01Nov62 DATE ACQ: 23Mar64 ENCL: 01

SUB CODE: EE NO REF SOV: 006 OTHER: 000

Card 2/82

LAPKIN, B.D., dotsent, kand fiziko-matem. nauk

Natural frequencies of lines with distributed parameters.
Sbor. trud. DIIT no.39:53-59 '63. (MIRA 18:4)

LAPKIN, G.I.

DECEASED

SEE ILC

PERMAFROST

LAPKIN, I.; POLUPINSKIY, M.

On a new road. Grazhd.av. 14 no.1:3-5 Ja '57. (MIRA 10:4)
(Airplanes--Maintenance and repair)

LAPKIN, I.

[redacted] Characteristics of the borderland between the Russian Platform and Hercynian folding in the Donets Valley and Northern Caucasus. Geol. sbor. [Lvov] no.5/6:226-227 '58. (MIRA 12:10)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut gazovoy promyshlennosti Moskva.

(Russian Platform--Geology, Structural)

ACC NR: AT7004524 SOURCE CODE: UR/2563/66/000/268/0078/0088

AUTHOR: Korobkov, A. V.; Lapkin, D. T.; Sitnikova, L. I.; Khoroshaylov, V. G.

ORG: Leningrad Polytechnical Institute (Leningradskiy politekhnicheskiy institut)

TITLE: Concerning the improved properties of dispersion hardening heat-resistant alloys and steels

SOURCE: Leningrad. Politekhnicheskiy institut. Trudy, no. 268, 1966. Metallovedeniye (Metal science), 78-88

TOPIC TAGS: heat resistant alloy, heat resistant steel, metal heat treatment, high temperature strength, ~~aging process~~, dispersion hardening, metal aging

ABSTRACT: The effects of heat treatment on the mechanical properties of the heat-resistant alloys EI437BU and EI617, as well as the steel EI787, were studied. Samples of EI437BU and EI787 were cut from billets, and forgings of turbine discs and buckets. The alloy EI437BU was given two types of heat treatments: (1) air quenching after 8 hrs at 1080°C + aging for 16 hrs at 750°C and air cooling, (2) just aging for 16 hrs at 750°C. Tensile and impact testing were done at room temperature, 500, 600, and 700°C. Creep testing was done at 600, 700, and 750°C. Treatment #2 raised the strength, ductility, and impact resistance above that for #1 by as much as 10%. The creep resistance of #1 at 600°C and 70 kg/mm^2 was higher than for #2, but at 700 and

ACC NR: AT7004524

750°C the creep resistances were similar. Annealed and cold worked (30 and 65% deformation) rods of EI617 were also given two heat treatments: (1) air quenching after 2 hrs at 1190°C + air quenching after 4 hrs at 1050°C + aging at 800°C for 16 hrs and air cooling, (2) just aging at 800°C for 16 hrs and air cooling. Room temperature tensile data and stress rupture data at 550 and 600°C were given. Again higher strength, ductility, and creep resistance resulted from #2. Similar conclusions were obtained for EI787 steel. Macrostructures of the three materials showed that after #1 a nonuniform grain distribution resulted, while #2 gave a fine-grained homogeneous structure. The dislocation arrangements occurring after the different heat treatments were discussed. Higher strengths resulted because of greater dislocation density. The plasticity was correlated with dislocation mobility. Orig. art. has: 6 tables, 2 figures.

SUB CODE: 11/ SUBM DATE: none/ ORIG REF: 003

Card 2/2

ACC NR: AT7004525 SOURCE CODE: UR/2563/66/000/268/0089/0096

AUTHOR: Korobkov, A. V.; Lapkin, D. T.; Sitnikova, L. I.; Khoroshaylov, V. G.

ORG: Leningrad Polytechnical Institute (Leningradskiy politekhnicheskiy institut)

TITLE: The effect of holding time at high temperatures on the properties of economical grades of heat-resistant steel

SOURCE: Leningrad. Politekhnicheskiy institut. Trudy, no. 268, 1966. Metallovedeniye (Metal science), 89-96

TOPIC TAGS: austenitic steel, stainless steel, boron steel, heat resistant steel, heat treatment, ~~aging process,~~ high temperature steel, impact strength, metallographic examination, metal aging

ABSTRACT: A study was done on the effects of aging EI696 and EI696A austenitic steels up to 500 hrs at 600 and 650°C. Also studied were the effects of reheating to 700 and 750°C after the first aging treatment, and the influence of boron additions. Four heats of steel were made having the following compositions: 0.06-0.08% C, 0.32-0.85% Mn, 0.31-0.82% Si, 11.24-11.77% Cr, 18.25-20.1% Ni, 2.66-3.08% Ti, 0.26-0.50% Al, nil--0.015% B, 0.005-0.012% S, and 0.016-0.06% P. Rod samples were heated to 1170°C, held for 2 hrs, air cooled, reheated to 750°C for 16 hrs, and air cooled. Aging was done by heating to 600 or 650°C for 16, 100, 200, and 500 hrs. Some samples were aged again

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ACC NR: AT7004525

at 700 or 750°C for 16 hrs. Tensile testing was done at room temperature and at 600, 650, and 700°C. Impact resistance was measured at room temperature and a metallographic examination of the heat treated samples was made. The aging treatment at 600 and 650°C for 100-500 hrs changed the mechanical properties: the tensile strength increased by 10-15% and impact strength decreased by 25-50%. A recovery of properties in EI696 and EI696A occurred after reheating to 750°C and holding for 16 hrs. A eutectic phase developed in EI696 containing 0.015% B which segregated at the grain boundaries and caused the greatest change in mechanical properties. In the low boron steels, $Ni_3(Ti, Al)$ caused strengthening after aging at 600 and 650°C. The restoration of mechanical properties by reheating to 700 and 750°C was caused by resolution of the $Ni_3(Ti, Al)$ phase. Orig. art. has: 3 figures, 4 tables.

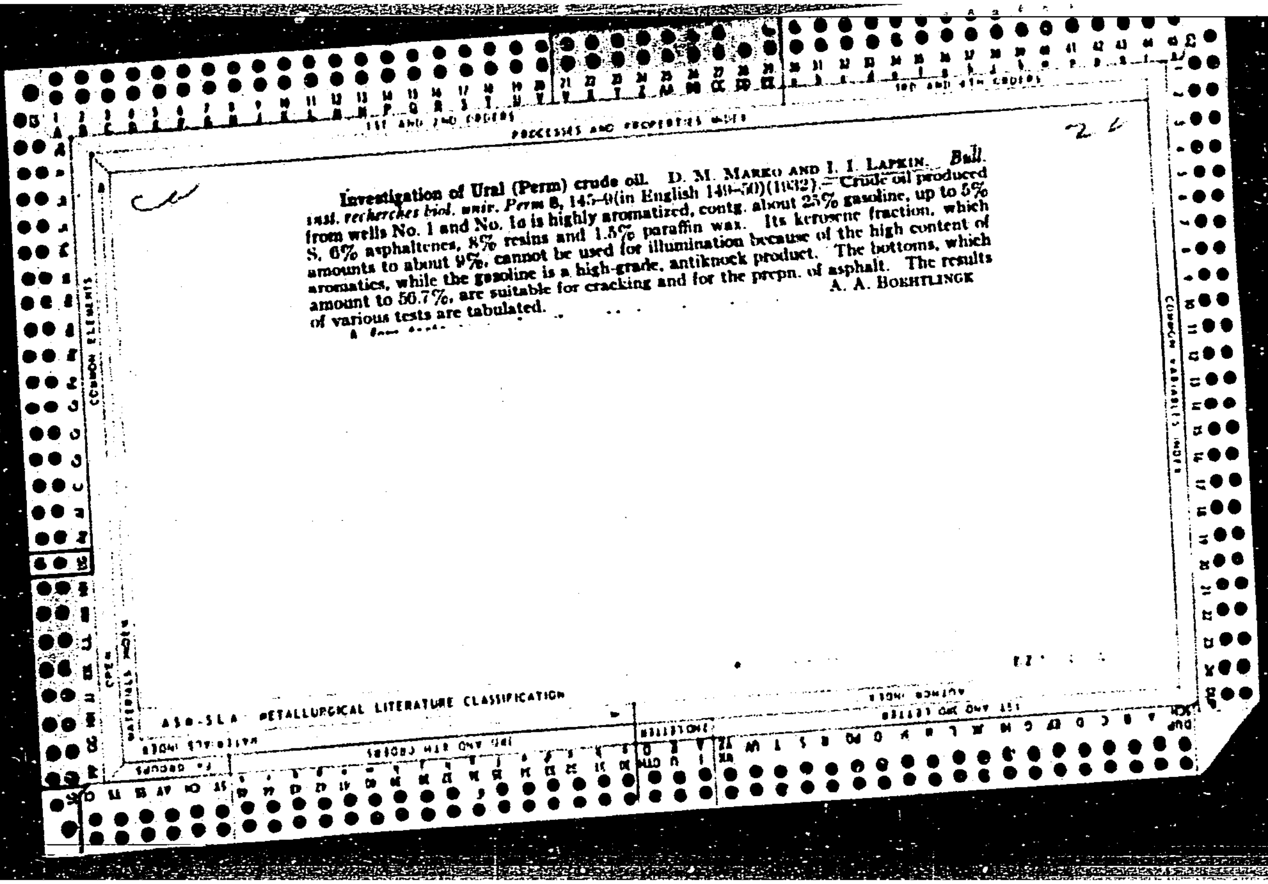
SUB CODE: 11/ SUBM DATE: none

Card 2/2

LAPKIN, I.I.; POVARNITSINA, T.N.

Organosilicon compounds. Part 1: Compounds containing alkoxyphenyl radicals. Zhur.ob.khim. 32 no.4:1314-1318 Ap '62. (MIRA 15:4)

1. Permskiy gosudarstvennyy universitet.
(Silicon organic compounds)

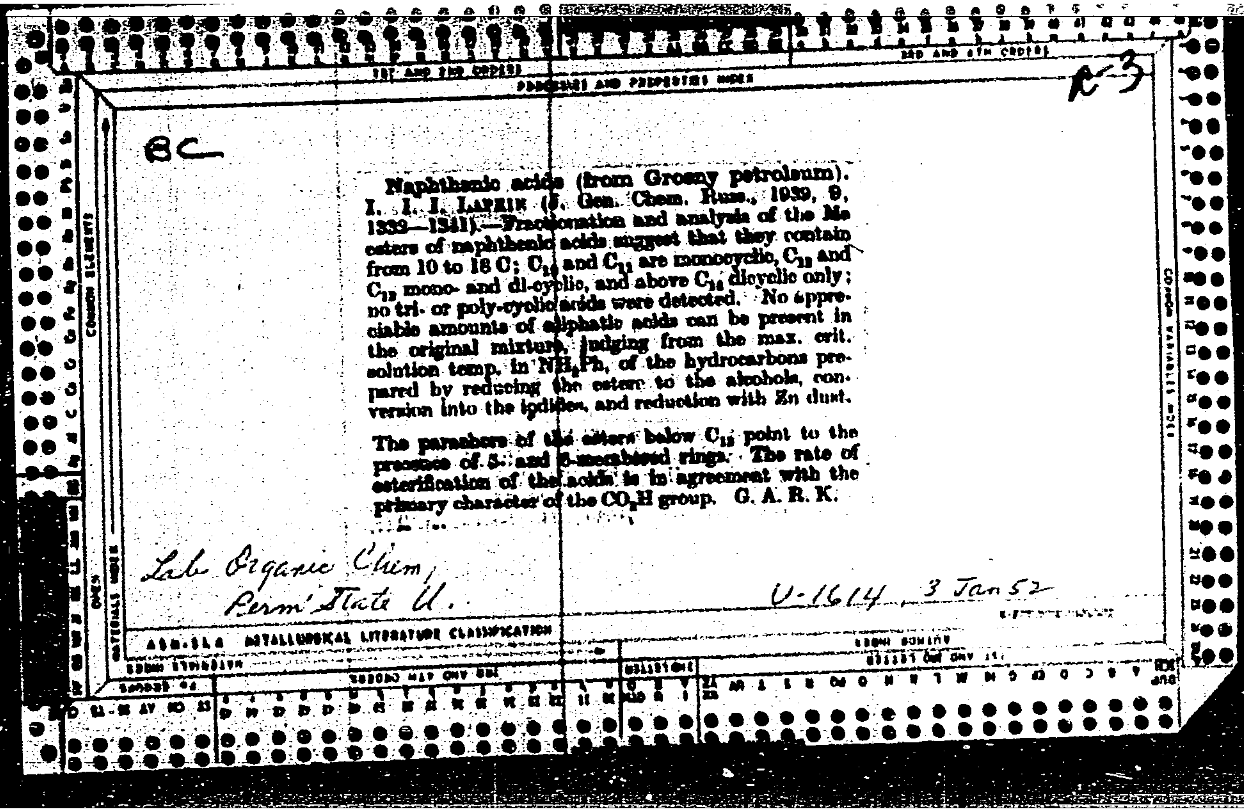


PROCESSES AND PROPERTIES INDEX

Investigation of Ural (Perm) crude oil. D. M. MARKO AND I. I. LAPKIN. *Bull. inst. recherches biol. univ. Perm* 8, 145-9(in English 149-50)(1932).—Crude oil produced from wells No. 1 and No. 1a is highly aromatized, contg. about 25% gasoline, up to 5% S, 6% asphaltenes, 8% resins and 1.5% paraffin wax. Its kerosene fraction, which amounts to about 9%, cannot be used for illumination because of the high content of aromatics, while the gasoline is a high-grade, antiknock product. The bottoms, which amount to 56.7%, are suitable for cracking and for the prepn. of asphalt. The results of various tests are tabulated.

A. A. BOEHTLINGK

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



8C

C-3

Naphthenic acids (from Grosny petroleum). I. I. I. LAPKIN (J. Gen. Chem. Russ., 1939, 9, 1339—1341).—Fractionation and analysis of the Me esters of naphthenic acids suggest that they contain from 10 to 18 C; C_{10} and C_{11} are monocyclic, C_{12} and C_{13} mono- and di-cyclic, and above C_{14} dicyclic only; no tri- or poly-cyclic acids were detected. No appreciable amounts of aliphatic acids can be present in the original mixture, judging from the max. crit. solution temp. in NH_2Ph, of the hydrocarbons prepared by reducing the esters to the alcohols, conversion into the iodides, and reduction with Zn dust.

The parachors of the esters below C_{13} point to the presence of 5- and 6-membered rings. The rate of esterification of the acids is in agreement with the primary character of the CO_2H group. G. A. R. K.

Lab Organic Chem,
Perm' State U.

U-1614 3 Jan 52

1ST AND 2ND ORDERS

3RD AND 4TH ORDERS

PROCESSES AND PROPERTIES INDEX

CA

10

Steric hindrance in Grignard reactions. I. Reaction of 2-mesitylmagnesium bromide with ethyl formate and ethyl acetate. I. I. Lepkin, V. S. Shklyaev and T. I. Shklyaeva. *J. Gen. Chem.* (U. S. S. R.) 10, 1449-52 (1940).—The normal reaction products of 2-mesitylmagnesium bromide (I) and HCO_2Et were not obtained. Di-2-mesitylmethane and mesitol (II) were isolated instead. Due to steric hindrance the reaction of I and AcOEt does not work at all under ordinary conditions and proceeds only slightly on continuous heating for 30 hrs., at temps. up to 100°. II and 2-mesityl acetate were isolated. On the basis of elementary analysis the formation of the acetate of methyldi-2-mesitylcarbinol is assumed.

James J. Lichtin

Lab. Organic Chem, Molotov State U.

ASD-SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

10

Steric hindrance in Grignard reactions. II. Reaction of mesitylmagnesium bromide with oxalic acid esters. I. I. Lapkin (Molotov State Univ.). *J. Gen. Chem.* (U.S.S.R.) 16, 721-8(1946).—The reaction of mesitylmagnesium bromide and $(CO_2Et)_2$ stops due to steric effects at the intermediate-product stage; 3 such products were isolated. Bromomesitylene (50 g.) and 6.4 g. Mg were reacted in Et_2O and treated with 18 g. $(CO_2Et)_2$ in Et_2O; the mixt. was boiled 6 hrs. and decompd. with H_2O and 10% AcOH; after washing the Et_2O soln. with 10% Na_2CO_3 and drying, there was obtained 12.5 g. *Et 2,4,6-trimethylmandelate*, m. 52-3° (from petr. ether), b_6 162° (hydrolysis by 5% alc. NaOH gave the corresponding acid, m. 153-4° (from water)); the mother liquor from the above gave 3.2 g. *bimesityl*, m. 101-2° (from EtOH). Further distn. of the reaction mixt. gave *dimesityl diketone*, b_7 190-210°, m. 120.5-21° (from EtOH) (1.5 g.); the mother liquor from this on freezing gave 1.2 g. *Et dimesitylglycolat.* m. 80-1° (from EtOH). When the reaction was run with equimolar amts. of reagents which were mixed in reverse order from the above, there was obtained 40% Et 2,4,6-trimethylmandelate, b_7 130-65°, which was isolated by distn., followed by crystn. from petr. ether. The mother liquor from this was redistd. (b_7 120-40°) and hydrolyzed by 5% alc. NaOH, yielding *2,4,6-trimethylphenylglyoxylic acid*, m. 116° (from CS_2), which appears to be the source of the mandelic acid derivs. through the reducing action of the Grignard reagent. Repetition of the above with $(CO_2CHMe_2)_2$ gave 30% *iso-Pr 2,4,6-trimethylmandelate*, m. 63°, b_{10} 155-60°, while $(CO_2CH_2CHMe_2)_2$ gave 40% *iso-Bu ester*, m. 55° (from petr. ether), b_6 155-65°, and $(CO_2Bu)_2$ gave 40% *Bu ester*, m. 43-4° (from petr. ether), b_6 165-75°. A control expt. showed that the bimesityl isolated was probably formed from the reducing action of the Grignard reagent on dimesityl diketone. **III. Reaction of pentamethylphenylmagnesium bromide, durylmagnesium bromide, mesitylmagnesium bromide, and ethyl formate.** *Ibid.* 729-34.—Pentamethylbromobenzene (46 g.), 27 g. EtBr, and 13 g. Mg were reacted in Et_2O soln. (this procedure avoids coating of the Mg with the insol. layer of C_6Me_5MgBr) and the soln. was treated with 15 g. HCO_2Et and heated 10 hrs.; after the usual decompn. with ice and 10% AcOH there was obtained 4 g. *bis(pentamethylphenyl)methane*, m. 217-18°, b_{15} 180-250° (crude), and 3 g. *bis(pentamethylphenyl) ketone*, m. 281-2° (from benzene). In a similar reaction 43 g. bromodurene gave 2 g. *bis(2,3,5,6-tetramethylphenyl)methane*, m. 157.5-8° (from petr. ether), and impure *bis(tetramethylphenyl) ketone*, which could not be purified. Also, mesityl bromide in a similar reaction gave a small amt. of *dimesitylmethane*, m. 135° (from petr. ether), and *dimesityl ketone*, m. 137-8° (from benzene-EtOH). In no instance could the normally expected product, a secondary alc., be isolated.

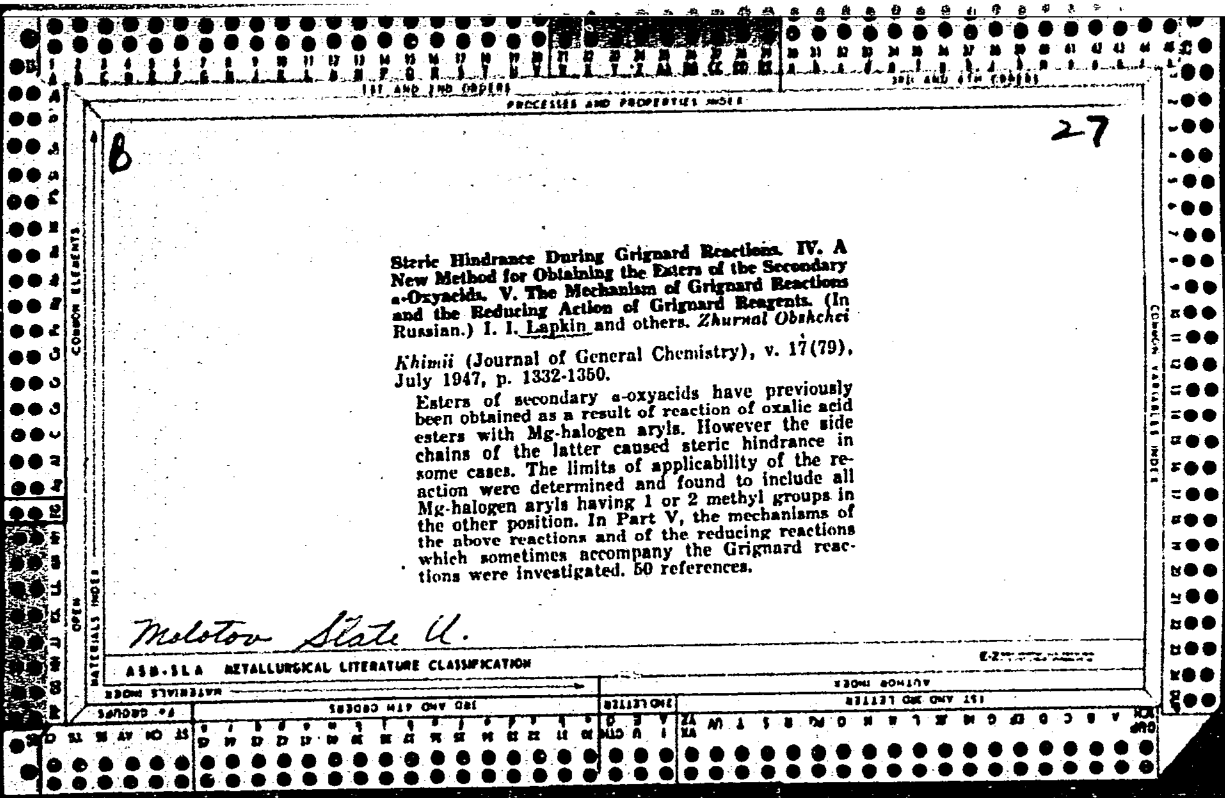
G. M. Kosolapoff

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

LAPKIN, I. I.

"Steric hindrance in grignard reactions. III. Reaction between pentamethylbenzene-MgBr, durene-MgBr, mesitylene-MgBr and ethyl-formiate" by I. I. Lapkin (p. 733)

SO: Journal of General Chemistry (Zhurnal Obshchei Khimii) 1946, Volume 16, No. 4-5



1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

b

27

Steric Hindrance During Grignard Reactions. IV. A New Method for Obtaining the Esters of the Secondary α-Oxyacids. V. The Mechanism of Grignard Reactions and the Reducing Action of Grignard Reagents. (In Russian.) I. I. Lapkin and others. *Zhurnal Obshchei Khimii* (Journal of General Chemistry), v. 17(79), July 1947, p. 1332-1350.

Esters of secondary α-oxyacids have previously been obtained as a result of reaction of oxalic acid esters with Mg-halogen aryls. However the side chains of the latter caused steric hindrance in some cases. The limits of applicability of the reaction were determined and found to include all Mg-halogen aryls having 1 or 2 methyl groups in the other position. In Part V, the mechanisms of the above reactions and of the reducing reactions which sometimes accompany the Grignard reactions were investigated. 50 references.

Molotov State U.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

PA 69T80

USSR/Chemistry - Acids, Oxo, Esters of Mar 1948
Chemistry - Synthesis

"Steric Barriers in Grignard Reactions. VI. Reactions of Compound Esters of Keto Acids With Magnesium-Haloid-(Ortho Substituted) Aryls," I. I. Lapkin, A. I. Golovkova, Lab Org Chem, Natural Sci Inst, Moscow State U imeni A. M. Gor'kiy, 10 pp

"Zhur Obshch Khim" Vol XVIII (LXXX), No 3

Explains purpose and course of experiments and tests conducted. Describes properties of series of new substances which have as yet not been discussed in chemical literature: ethyl esters alpha-(2,4,6-trimethyl-phenyl)-lactic, alpha-(4-methyl-phenyl)-lactic, alpha-

69T80

USSR/Chemistry - Acids, Oxo, Esters of Mar 1948
(Contd)

(2-methyl-phenyl)-lactic and alpha-(alpha-naphtyl)-lactic acid, alpha-(2,4,6-trimethyl-phenyl)-lactic acid. Submitted 15 Mar 1947.

69T80

LAPKIN, I

PROCESSES AND PROPERTIES INDEX

CA

10

Steric hindrance in Grignard reactions. VII. Limits of applicability of the new method of preparation of esters of secondary α-hydroxy acids. I. I. Lapkin and A. V. Lyubimova. *Zhur. Obshchei Khim.* (J. Gen. Chem.) 18, 701-9(1948); cf. *C.A.* 42, 7273*h*, 4978*a*.—The previously described Grignard method of ester formation can be used with RMgX having 1 or 2 alkyls in the ortho position, as well as with primary alkylmagnesium X with long chains; secondary and tertiary alkyls cannot be used, as the Wurtz type reaction interferes. All oxalate esters, except the di-Me, may be used. Mg (5 g.), 28.5 g. o-BrC_6H_4Me, and 24.3 g. $(CO_2Et)_2$, with the Grignard soln. being added to the ester in the cold, then heated 12 hrs., gave 40% *Et 2-methylmandelate*, b_6 121-2°, b_{15} 140-1°; hydrolysis by 5% alc. KOH gave the *free acid*, m. 95-7° (from xylene); in addn. there was also obtained 7 g. crude (unstated amt. pure) $(2\text{-}MeC_6H_4)_2C(OH)CO_2Et$, m. 55° (crude, b_6 140-200°), which on hydrolysis by 5% alc. KOH gave the *free acid*, m. 147-8° (from xylene-petr. ether). Similar reaction with 36.5 g. $(CO_2Et)_2$ and the Grignard reagent from 53.25 g. 3,4-$Br(Me_2CH)C_6H_3Me$, heated 14 hrs., gave 30% *Et 5-methyl-4-isopropylphenylglycolate* b_7 153-4°, b_{11} 165-6°; *free acid*, m. 139° (from MePh). $(CO_2Bu)_2$ (40.4 g.) and the Grignard reagent from 41.4 g. 1-$BrC_{10}H_7$, after 12 hrs.' heating, gave 40% *Bu 1-naphthylglycolate*, b_7 205-7°; *free acid*, m. 93° (from H_2O). In addn. there was obtained a fraction, 7 g., b_7 250-320°, which with Me_2CO gave some *di-1-naphthyl diketone*, m. 193-4°. The iso-Bu ester gave 40% *iso-Bu 1-naphthylglycolate*, b_7 195-7°; *free acid*, m. 93°. Addn. of the Grignard reagent from 48.3 g. $C_8H_{17}Br$ to 30.5 g. cooled $(CO_2Et)_2$ and heating 12 hrs. gave 25% *Et octylglycolate*, b_6 119-20°, b_{16} 139-40°, m. 34-5° (from petr. ether). The Grignard reagent from 5.5 g. Mg and 40.4 g. Ph_2CHCl was treated with 29 g. $(CO_2Et)_2$ in Et_2O, the ppt. which persisted from the prepn. of the Grignard reagent (m. 211°, probably *sym*-$Ph_4C_2H_2$) was filtered off, and the soln. worked up as usual, yielding only addnl. amts. of the same material; total yield, 90%. $(CO_2Et)_2$ (0.25 mol.) and 0.25 mol. 5-$BrMgC_9H_{19}$ (from 5-bromononane) gave 14 g. b_7 110-30°, which was hydrolyzed by alc. KOH (6 hrs.) to *sym-tetrabutylethane*, b_6 117°, d_4^{18} 0.7933, n_D^{18} 1.4440 (30%), and 2 g. of *unidentified acid*. The Grignard reagent from 58.3 g. Me_2CBrPh with 43 g. $(CO_2Et)_2$ gave after 12 hrs.' boiling 60% $(PhMe_2C)_2$, m. 118°.

G. M. Kosolapoff

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

Steric hindrance in organomagnesium reactions. VIII. Preparation of α-hydroxy ketones. I. I. Lapkin and A. I. Golovkova. *Zhur. Obshchei Khim.* (J. Gen. Chem.) 19, 701-6(1949); cf. *C.A.* 43, 1880*a*; Fuson and Robertson, *C.A.* 37, 1406⁹.—The synthesis of α-HO ketones from RMgX and diketones fails only with low-mol. unbranched RMgX reagents; the majority of the latter (*o*- and *o*,*o*-substituted aryls and branched alkyls) give upon reversed order of addn. to the diketones satisfactory yields of HO ketones. Thus, 50 g. bromomesitylene and 7 g. Mg in Et_2O added, after reaction, to 21.5 g. Ac_2 in Et_2O with cooling and stirring, followed by 10 hrs. heating, gave upon decompn. by 10% AcOH, followed by washing with 10% Na_2CO_3, 24% *methylmesitylacetylcarbinol*, b_3 113-15°, d_4^{20} 1.0344, n_D^{20} 1.5165; *phenylhydrazone*, m. 174-5° (from EtOH). Similarly, RMgX from 34.2 g. *o*-MeC_6H_4Br gave with 17.2 g. Ac_2 42% *methyl-o-tolylacetylcarbinol*, $b_{1.5}$ 105-6°, d_4^{20} 1.0593, n_D^{20} 1.5235; *phenylhydrazone*, m. 135-7° (from EtOH). 3-Bromocymene (43 g.) similarly gave 25% *methyl(3-methyl-6-isopropylphenyl)acetylcarbinol*, b_7 127-30°, d_4^{20} 1.0156, n_D^{20} 1.5135, while 41.4 g. 1-$BrC_{10}H_7$ gave 45% *methyl-1-naphthylacetylcarbinol*, b_1 155-6°, crystg. from H_2O as a monohydrate,
a which loses H_2O *in vacuo*. PhMgBr (31.4 g.) gave 30% *methylphenylacetylcarbinol*, b_3 88-90°, d_4^{20} 1.0016, n_D^{20} 1.5340. **IX. Preparation of ketones by reaction of acyl halides with organomagnesium compounds.** I. I. Lapkin and A. V. Lyubimova. *Ibid.* 707-16.—The common idea of the impossibility of ketone synthesis from RMgX and RCOCl is true only for small R groups; steric hindrance in either R is sufficient to yield the desired ketones. Di-ortho-substituted derivs. of the RMgX type yield only
b ketones on reaction with RCOCl, while mono-ortho derivs. (primary with long chains, or secondary or tertiary derivs.) give ketones with proper techniques: equimolar proportions and reverse order of addn. RMgBr from 50 g. bromomesitylene and 7 g. Mg heated 10 hrs. in Et_2O with 35 g. BzCl and decompd. with 10% AcOH yielded 34% *phenyl mesityl ketone*, b_1 156° (on Clemmensen reduction yields benzylmesitylene, m. 36°); 2 moles RMgX failed to change the result. RMgX from 57 g. *o*-MeC_6H_4Br in Et_2O added with ice-cooling to 46.6 g. BzCl in Et_2O and treated as above gave 50% *o-methylbenzophenone*, b_1 134-7°; *syn-oxime*, m. 104-5° (from petr. ether); 2 moles RMgX gives the ketone and some $(o\text{-}MeC_6H_4)_2C(OH)Ph$. RMgX (from 52 g. 1-$C_{10}H_7Br$) in Et_2O added as above to 35 g. BzCl in Et_2O and heated 5 hrs. gave 60% *Ph 1-naphthyl ketone*, b_1 107-8°, m. 75° (Clemmensen reduction gave *1-benzylnaphthalene*, m. 58°). RMgX from 43 g. *p*-MeC_6H_4Br with 10 hrs. heating gave 40% *Ph p-tolyl ketone*, b_1 151-5°, m. 53-4° (from EtOH), while RMgX from 31.4 g. PhBr gave with 28 g. BzCl, after standing 1 hr. at room temp., 40% Ph_2CO and 14% Ph_3CCl (probably formed from Ph_3COH and excess BzCl during the reaction), b_1 160-200°, m. 110° (from C_6H_6). RMgX from 40 g. bromomesitylene treated in Et_2O with 15.7 g. AcCl in Et_2O, followed by 10 hrs. heating, with stirring 3 hrs., gave 10% *Me mesityl ketone*, b_3 99-105° (reduced by the Clemmensen method to *ethylmesitylene*, b. 207-9°). RMgX (from 114 g. *o*-MeC_6H_4Br) added in Et_2O to 52 g. AcCl with cooling and heated 10 hrs. gave 30% *Me o-tolyl ketone*, b_1 68-9° (Clemmensen reduction gave *2-EtC_6H_4Me*, b_{760} 164-5°), and 14% $(o\text{-}MeC_6H_4)_2C{:}CH_2$, $b_{1.5}$ 124-8°, formed from dehydration of $(o\text{-}MeC_6H_4)_2C(OH)Ph$. RMgX from 52 g. 1-$C_{10}H_7Br$ added as above to 19.5 g. AcCl with cooling, followed by 10 hrs.' heating, gave 50% *Me 1-naphthyl ketone*, b_3 122-4° [*oxime*, m. 136° (from dil. EtOH)], as well as 2.5% $(1\text{-}C_{10}H_7)_2C{:}CH_2$, b_1 160-240°, m. 106-7° (from EtOH-Me_2CO).

G. M. Kosolapoff

LAPKIN, I. I.

PA 65/49T25

USSR/Chemistry - Steric Hinderances Apr 49
Ketones

"Steric Hinderances During Organomagnesium Reactions: IX, Preparing Ketones by Reacting Acid Halides With Organomagnesium Compounds," I. I. Lapkin, A. V. Lyubimova, Lab of Organometallic Compounds, Natural Sci Inst, Molotov State U imeni A. M. Gor'kiy, 9½ pp

"Zhur Obshch Khim" Vol XIX, No 4

Claims that, despite prevailing opinion, ketones can be obtained in this manner except in the case where both the acid halides and the organomagnesium compounds have such low-molecular weights that they do

[redacted] 65/49T25

USSR/Chemistry - Steric Hinderances Apr 49
(Contd)

not produce the necessary steric hinderances. Di-ortho-substituted magnesium aryl halides produce the ketones regardless of conditions, but reactions with monoortho-substituted magnesium aryl halides require specified conditions. Submitted 18 Jan 48.

[redacted] 65/49T25

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Steric hindrance in organomagnesium reactions. X. Peculiar course of reaction between α-monochloro-substituted ethers and arylmagnesium halides. New method of preparation of sterically hindered symmetric diarylethane hydrocarbons. I. I. Lapkin and O. M. Lapkina (A. M. Gor'kii State Univ., Molotov). *Zhur. Obshchei Khim.* (J. Gen. Chem.) 21, 108-17(1951); cf. *C.A.* 41, 1219a; 44, 1058a.—While mono-*o*-substituted ArMgX react with $ClCH_2OMe$ or $ClCH_2OEt$ normally, the action of di-*o*-substituted ArMgX also yields *o*-substituted benzyl chlorides or diarylethanes. From 2,4,6-$Me_3C_6H_2MgBr$ (from 50 g. $Me_3C_6H_2Br$ and 7 g. Mg) in Et_2O treated with cooling with 14.6 g. $(ClCH_2)_2O$ in Et_2O, refluxed 7 hrs., and worked up in the usual way was isolated 45% *(2,4,6-$Me_3C_6H_2CH_2)_2O$*, m. 146-7° (sublimed for purification). Similarly, a 3-hr. reaction of *o*-MeC_6H_4MgBr and $ClCH_2OMe$ gave 51% *o*-*$MeOCH_2C_6H_4Me$*, b_{12} 97°, d_4^{20} 0.9777, n_D^{20} 1.5040; 1-$C_{10}H_7$-MgBr gave 55% *1-$C_{10}H_7CH_2OMe$*, b_5 106-7°, d_4^{20} 1.0830, n_D^{20} 1.6037, and some unknown higher-boiling products. Cl-CH_2OEt gave 54% *1-$C_{10}H_7CH_2OEt$*, b_6 115-16°, d_4^{20} 1.1001, n_D^{20} 1.6076. Addn. of 40 g. $ClCH_2OMe$ in Et_2O to 2,4,6-$Me_3C_6H_2MgBr$ (from 100 g. $Me_3C_6H_2Br$) with ice cooling and refluxing 7 hrs. gave 40 g. *2,4,6-$Me_3C_6H_2CH_2OMe$*, b_8 93-4°, d_4^{20} 0.9484, n_D^{20} 1.5100, and 9% *1,2-dimesitylethane* (I), m. 117-18° (crude $b_{0.4}$ 130-90°) (from petr. ether); reversing the order of addn. gives 42% of the above ether and 58% *2,4,6-$Me_3C_6H_2CH_2Cl$*, which was not isolated as such but detected by treatment of the crude distillate (b_4 90-107°) with iso-AmONa in iso-AmOH, which gave 2,4,6-*$Me_3C_6H_2CH_2OAm$-iso*, b_4 127-8°, d_4^{20} 0.9115, n_D^{20} 1.4950. The Et_2O soln. of RMgBr from 40 g. bromomesitylene decanted from the excess Mg and added to 16 g. $ClCH_2OMe$, followed by addn. of 2 mole-% $CuCl_2$ and 2 g. activated Mg (by EtBr), and refluxed 5 hrs., gave 24% I. Addn. of 19 g. $ClCH_2OEt$ to RMgBr (from 40 g. bromomesitylene) gave 10 g. *2,4,6-$Me_3C_6H_2CH_2OEt$*, $b_{1.5}$ 89-90°, and about 3 g. I. Addn. of the decanted Et_2O soln. (from the excess Mg) in the prepn. of *durylmagnesium bromide* (from 30.4 g. bromodurene, 16 g. EtBr, and 9 g. Mg) to 23 g. $ClCH_2OMe$ in Et_2O and refluxing 6 hrs. gave no normal ether and chiefly (8 g.) product, b_4 120-30°, free of OH or OMe groups, apparently RCH_2Cl (*2,3,5,6-tetramethylbenzyl chloride*) being formed

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exclusively; if the excess Mg is not removed and the Cl ether is added to the RMgX, there forms 2.1 g. (10%) *1,2-didurylethane*, m. 234-5° (from MePh). Addn. of 2,4,6-Me$_3$C$_6$H$_2$CH$_2$OMe (20.5 g.) in xylene to 2,4,6-Me$_3$C$_6$H$_2$MgBr (from 7 g. Mg and 50 g. RBr) in Et$_2$O, removal of the Et$_2$O, and refluxing 10 hrs. gave 20% *dimesitylmethane*, m. 132-3°, b$_7$ 154-6°; no ethane analog was detected. **XI. Reaction of esters of formic acid with organomagnesium compounds.** I. I. Lupkin and A. I. Golovkova. *Ibid.* 117-23.—The direction of reaction of ArMgX with EtO$_2$CH depends on the metallic impurities in Mg which affect only the slow reactions; CoCl$_2$ has a similar effect. The reaction of EtO$_2$CH with 2,4,6-Me$_3$C$_6$H$_2$MgBr made from relatively impure Mg (impurities unstated) has been described before (*C.A.* 35, 2470^4); a similar reaction of 0.125 mole ester with 0.25 mole RMgX from a better grade of Mg gave 10.5 g. mixed *dimesitylcarbinol* and *dimesitylmethane*, b$_7$ 160-200°, sepd. with petr. ether into the less sol. *carbinol*, m. 148-9° (4 g.), and 1 g. of the *methane*, m. 133-4°; repetition of the expt. with omission of strong heating or distn. gave 5 and 2.5 g., resp. When 2 mole-% CoCl$_2$ was added to the RMgX above, the usual procedure gave only the methane deriv., no carbinol being detected. Reaction of RMgX from 42 g. 3-bromocymene with 7.5 g. EtO$_2$CH gave about 4 g. *di-3-cymylmethane*, b$_{11}$ 230-50°, m. 222°, and an unknown product, b$_{11}$ 200-30°. *o*-MeC$_6$H$_4$MgBr (0.25 mole) gave 7 g. *di-o-tolylcarbinol*, m. 119-20° (from petr. ether), and about 5 g. *1,1,2,2-tetra(o-tolyl)ethane*, m. 253-4°; if the heating was extended 10 hrs. the yield of the latter was 14 g. If purer Mg is used, 42.8 g. *p*-MeC$_6$H$_4$Br, 6.5 g. Mg, and 9.3 g. EtO$_2$CH give 10.5 g. *di-p-tolylcarbinol*, m. 69-70°, 1.5 g. *p,p-bitolyl*, m. 119-20°, and 3.4 g. *1,1,2,2-tetra-p-tolylethane*, m. 276-7°; if CoCl$_2$ is added to the reaction mix., the main product is the carbinol and (MeC$_6$H$_4$)$_2$CH$_2$ does not form. 1-C$_{10}$H$_7$MgBr gave *di-1-naphthylcarbinol* and a smaller amt. of *bis(1-naphthylmethyl) ether*, and CoCl$_2$ failed to affect the results. G. M. Kosolapoff

1957

LAPKIN, I. I.

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Chemical Abst.
Vol. 48 No. 5
Mar. 10, 1954
Organic Chemistry

Steric hindrance in organomagnesium reactions. XII. Reaction of dimethyl oxalate with di-*o*-substituted arylmagnesium halides. I. I. Lapkin, N. K. Ponomareva, and L. Yu. Pinegina (Gorkii-Molotov State Univ.). *J. Gen. Chem. U.S.S.R.* 22, 1407-10(1952)(Engl. translation).—See *C.A.* 47, 4881*c*. **XIII. Preparation of ketones by the reaction of acyl halides with organomagnesium compounds.** I. I. Lapkin, N. I. Latosh, and E. S. Belov. *Ibid.* 1411-14.—See *C.A.* 47, 4881*c*.

H. L. H.

LAPKIN, I. I., LATOSH, N. I., BELOV, YE. S.

Ketones

Steric hindrances in organomagnesium reactions. Part 13. Preparation of ketones by interaction of acyl halides with organomagnesium compounds. Zhur. ob. khim. 22 no. 8, 1952

Monthly List of Russian Accessions, Library of Congress, November 1952. Unclassified.

LAPKIN, I.I.; LAPKINA, O.M.

Steric hindrance in organomagnesium reactions. XIV. Peculiar course of reaction between α-monochloro-substituted ethers and arylmagnesium halides. Zhur. Obshchey Khim. 22, 1602-12 '52. (MLRA 5:9)
(CA 47 no.18:9293 '53)

1. A.M.Gor'kiy State Univ., Molotov.

Steric hindrance in organomagnesium reactions. XV. Synthesis of esters of alkoxy-containing secondary α-
hydroxy acids. I. I. Lapkin (A. M. Gor'kii State Univ.,
Molotov). *Zhur. Obshchei Khim.* 23, 623-8(1953); cf. *C.A.*
43, 188*a*; 48, 4428*d*.—RMgX (from 33.8 g. 1,2-$BrC_{10}H_6$-
OMe and 4.5 g. Mg) in Et_2O-MePh was added with cooling
to 21 g. $(CO_2Et)_2$ in Et_2O; after 6 hrs. refluxing and the
usual aq. treatment, the mixt. gave with dil. AcOH 41% *Et*
2-methoxy-1-naphthylglycolate, *2,1-$MeOC_{10}H_6CH(OH)CO_2$*-
Et, b_4 183-5°, m. 92°; hydrolysis with 5% alc. NaOH gave
the free *acid*, m. 126-7° (from dil. MeOH). Similarly was
obtained 40% *Et 2-ethoxy-1-naphthylglycolate*, b_4 186-8°, m.
62°. RMgX from 4,1-$MeOC_{10}H_6Br$ gave 45% *Et 4-*
methoxy-1-naphthylglycolate, b_4 200-2°, m. 84°. In the
isolation of the ester the Et_2O soln. gave on standing a small
amt. of yellow *4,4'-dimethoxy-1,1'-dinaphthyl*, m. 229-30°,
and *4,4'-dimethoxy-1,1'-naphthoin*, m. 238°, sepd. by extn.
with hot MePh, in which the latter was insol. Similarly
was obtained 42% *Et 4-ethoxy-1-naphthylglycolate*, b_5 192-4°,
m. 76-7°; free acid, m. 127°. 2,5-$(MeO)_2C_6H_3MgBr$ gave
40% *Et 2,5-dimethoxymandelate*, b_3 168-70°, d_{20} 1.2241,
n^{20}_D 1.5322; free *acid*, m. 97-8° (cf. Takei, *et al.*, *C.A.* 26,
5301^1). *2-Ethoxy-1-naphthylglycolic acid*, m. 137-8° (from

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Steric hindrance in organomagnesium reactions. XVI. Preparation of ketones by the reaction of acyl halides with organomagnesium compounds. I. I. Lapkin (A. M. Gor'kii State Univ., Molotov). *Zhur. Obshchei Khim.* 23, 780-3(1953); cf. *C.A.* 47, 9293*f*.—The ketone synthesis from acyl halides and RMgX is possible even in complex cases where there are substituents such as OR groups. RMgBr from 20.6 g. 2,1-MeOC$_{10}$H$_6$Br in Et$_2$O-MePh was treated with cooling with 17.5 g. BzCl and the mixt. refluxed 1 hr.; hydrolysis with 10% Na$_2$CO$_3$ (heating 0.5 hr.) gave 34% *Ph 2-methoxy-1-naphthyl ketone*, b$_8$ 220-80° (crude), b$_7$ 240-2°, m. 125-6° (from petr. ether). RMgBr from 31.1 g. 2,1-EtOC$_{10}$H$_6$Br and 8.8 g. BzCl gave 70% *Ph 2-ethoxy-1-naphthyl ketone*, b$_4$ 211-12°, m. 79-80°. RMgX from 39.5 g. 4,1-MeOC$_{10}$H$_6$Br and 23.4 g. BzCl gave 52% *Ph 4-methoxy-1-naphthyl ketone*, b$_4$ 213-15°, m. 81-2° (from petr. ether-MePh). RMgX from 41.8 g. 4,1-EtOC$_{10}$H$_6$Br and 23.4 g. BzCl gave 50% *Ph 4-ethoxy-1-naphthyl ketone*, b$_3$ 245-7°, m. 71-2°. Similarly an equimolar mixt. of RMgBr and *m*-BrC$_6$H$_4$COCl gave the following *m-bromophenyl alkoxy-1-naphthyl ketones* [alkoxy, yield (%), b.p., and m.p. shown]: *2-MeO*, 48, b$_3$ 250-3°, 99-100°; *2-EtO*, 50, decompn. on distn., 97-8°; *4-MeO*, 55, b$_3$ 214-5°, 120°; *4-EtO*, 56, —, 95-6°.

G. M. Kosolapoff

Lab. Organic Chem.

LAPKIN, I. I., PUCHKIN, N. M. and LYKOV, P. A.

Steric Hindrance in Organo-Magnesium Reactions. XVII. Preparation of Ketones by Interaction of Acid Halides with Organic Magnesium Compounds, page 823, Sbornik statey po obshchey khimii (Collection of Papers on General Chemistry), Vol II, Moscow-Leningrad, 1953, pages 1680-1686.

Laboratory of Organic Chemistry, Molotov State U imeni A. M. Gor'kiy

LAPKIN, I. I.

Rumania /Chemical Technology. Chemical Products and Their Application I-27

Wood chemistry products. Cellulose and its manufacture. Paper.

Abs Jour: Referat Zhur - Khimiya, No 9, 1957, 32697

Author : Lapkin I.I., Ushakov L.I.

Title : Rapid Method for Determination of Resin in Cellulose

Orig Pub: Ind. lemn. celul. si hirt., 1954, No 9, 349-350

Abstract: A translation. See RZhKhim, 1955, 22622.

Card 1/1

LAPKIN, I.I.

The rapid determination of extractives in pulp. I. I. Lapkin and L. I. Ushakov (A. M. Gor'kii State Univ., Molotov). *Bumazh. Prom.* 29, No. 4, 10-11(1954).—The extractives (I) in pulp are detd. by means of the acid no. The pulp, approx. 2 g. in 5×5-mm. squares, was refluxed 1 hr. with 30 cc. 95% EtOH and Et_2O, the solvent filtered, and the extd. pulp washed with 30-40 cc. solvent mixt., and filtrate and washings were titrated with 0.1*N* NaOH in the presence of phenolphthalein. The percentage Et_2O-EtOH I in a pulp is given by $(a - b)(0.001)(100 - n)/0.08178c$, where a = cc. 0.1*N* NaOH used in the titration, b = cc. 0.1*N* NaOH used in a blank titration on the solvent mixt., 0.8178 is the acid no. of the resin, c is the wt. of sample in g., and n is the % H_2O of the pulp sample. The av. % I in 10 samples of sulfite pulp by the acid no. method was 1.260, and the av. % I extd. by Cl_2CHCH_2OH and weighing the residue after evapn. of the solvent was 1.205. The detn. required 2 hrs.

John Lake Keays ①

LAPKIN, I. I

Reactions of halometal alcoholates. [illegible] Reactions of halomagnesium [illegible] I. I. Lapkin [illegible] 25, [illegible] R. 25, 281-6(1955)(Engl. translation). — Ar_2CHOH in 3 [illegible]

[illegible] stated yield of crude product [illegible]

LAPKIN, I I

Reaction of halometal alcoholates. II. Reactions of halomagnesium alcoholates of primary aromatic, secondary, and tertiary alkaromatic alcohols with esters. I. I. Lapkin (State Univ., Molotov). Zhur. Obshchei Khim. 23,

90% ester, while the corresponding iodide gave 8% carbinol and 92% ester. The usual Grignard procedure was used for synthesis of new carbinols: *1-$C_{10}H_7CHPrOH$*, b_4 133-4°, d_{20} 1.0710, n_D^{20} 1.5002; *(2-ethoxy-1-naphthyl)phenylcarbinol*,

LAPKIN, I.I.

LAPKIN, I.I.; LAPKINA, O.M.

Reaction of metal halide alcoholates. Part 3. Control of magnesium organic reactions. Zhur.ob.khim.25 no.5:947-950 My'55.
(MIRA 8:10)

1. ~~Moskovskiy~~ Molotov Gosudarstvennyy universitet
(Magnesium organic compounds)
(now Perm)

Distr: 4E4j

Reactions of halometal alcoholates. IV. Reactions of halometal alcoholates of primary and secondary aromatic alcohols with esters. I. I. Lapkin and M. N. Rybakova (State Univ., Molotov). *Zhur. Obshchei Khim.* 27, 2232–4 (1957); cf. *C.A.* 50, 3356*b*.—To a suspension of powd. $ZnCl_2$ under Et_2O was added an equimolar amt. of EtMgBr and after refluxing 1 hr. the resulting soln. of EtZnCl was treated with a desired carbinol, refluxed 0.5 hr., treated with desired ester, heated as needed 3-12 hrs. and treated with aq. AcOH. Thus were obtained the following results: $Ph_2CHOZnCl$ and HCO_2Et gave 100% *$Ph_2CHOCHPh_2$*, m. 110°; $(EtO_2C)_2$ gave 100% of the same ether, but $(EtO_2CCH_2)_2$ gave 100% initial carbinol; $CH_2(CO_2Et)_2$ gave 70% original carbinol and 30% dibenzhydryl ether; EtOBz gave 100% dibenzhydryl ether; Et_2SO_4 gave 30% above

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[illegible]

LAPKIN I. I.

79-2-25/64

AUTHORS: Lapkin, I. I., Lapkina, O. M., Rybakova, M. N.

TITLE: Reactions of Metal Halide Alcoholates (Reaktsii galoidmetallalkogolyatov) V. Mechanism of the Interaction of Magnesium Halide Carbinolates With Esters (V. Mekhanizm vzaimodeystviya galoidmagniykarbinolyatov so slozhnymi efirami)

PERIODICAL: Zhurnal Obshchey Khimii, 1958, Vol. 28, Nr 2, pp. 391 - 398 (USSR)

ABSTRACT: The authors began the present work with the aim of determining the number of orthosubstituents in which hydrocarbons of the type of diarylmethane form instead of haloidides. The investigations carried out with magnesium halide diarylcarbinolates with a gradual increase in the number of orthosubstituents showed that in case of a number of substituents smaller than four this reaction leads to the formation of diarylmethylhaloidides. It is assumed that the formation of diarylmethanes will take place in three secondary and tertiary radicals which are, however, more complicated than methyl. The problem was, however, not yet solved by the authors. Oxalic acid esters react with magnesium halide diarylcarbinolates analogous to formic acid esters. A deviation is only observed in the case of magnesium halide diarylcarbinolate with 4 occupied ortho--positions, as the carbinol is regenerated in the separation of the products of their interaction with diethyloxalate, water and

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Reactions of Metal Halide Alcoholates. V. Mechanism of the Interaction of Magnesium Halide Carbinolates With Esters

acid. In connection with the results of the present and earlier works the problem concerning the mechanism of the reaction of magnesium halide carbinolates with esters (references 1-3) rises. Its solution might contribute toward anticipating new forms of transformation of magnesium halide carbinolates as well as toward explanation of the nature of numerous anomalies which are observed in organic magnesium reactions. The occurrence of anomalies is the consequence of a side reaction between the initially formed magnesium halide alcoholates and esters. The authors found the conditions for the elimination of haloidides by means of interaction of magnesium halide diarylcarbinolates with esters. In this connection the yield of the haloidides is as well dependent on the nature of diarylcarbinoles as on the nature of the esters. Numerous tests for the investigation of the reaction of the magnesium halide phenolates and magnesium halide naphthalates with esters showed that the phenolates and naphthalates, in contrast to the alcoholates, have no interaction with esters. Summary: 1) The authors suggested the investigation of the reaction of magnesium halide diarylcarbinolates with esters. It was found that only the magnesium halide diarylcarbinolates with formic acid esters form diarylmethanes in

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Reactions of Metal Halide Alcoholates. V. Mechanism of the Interaction of Magnesium Halide Carbinolates With Esters

which all four ortho-positions are occupied. In the case of a smaller substitution these reactions lead to the formation of diarylmethylhaloidides. 2) It was shown in new examples that in the interaction with esters of malonic acid magnesium halide diarylcarbinolates are converted to diarylmethylethers. 3) It was found that magnesium bromide phenolates and magnesium bromide naphthalates do not react with esters of formic, oxalic, sulfuric and succinic acid in the case of equal molecular quantities under assumed reaction conditions. 4) The mechanism of the interaction of magnesium halide alcoholates and esters was investigated. There are 1 table, and 11 references, 7 of which are Slavic.

ASSOCIATION: State University, Perm' (Permskiy gosudarstvennyy universitet)

SUBMITTED: January 8, 1957

AVAILABLE: Library of Congress

Card 3/3

AUTHORS: Lapkin, I. I., Belonovich, M. I. 79-28 3-8/61

TITLE: Reactions of Metal Halide Alcoholates.
(Reaktsii galoid_metallalkogolyatov)
VI. New Method for the Synthesis of Monoxytriarylmethane
(VI. Novyy sposob sintezamonooksitriarilmetanov)

PERIODICAL: Zhurnal Obshchey Khimii, 1958, Vol. 28, Nr 3, pp. 605-608
(USSR)

ABSTRACT: Based on earlier investigations of their own (Ref 1) in which they found that the equimolecular effect of the esters of formic acid and oxalic acid on magnesium halide diarylcarbinolates leads to the formation of diarylmethyl halides, the authors began to elaborate the synthesis of monoxytriarylmethane. The method consists of a conversion of a mixture of diarylcarbinol and phenol(or naphthol) with the addition of a corresponding amount of bromoethylmagnesium to a mixture of boromagnesium-diarylcarbinolates and phenolates. When then oxalic acid ester is added to the reaction mixture the bromomagnesium-diarylcarbinolate converts to diarylmethylbromide, which again forms a mono-

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Reactions of Metal Halide Alcoholates
VI. New Method for the Synthesis of Monoxytriarylmethane 79-28 3-8/61

xytriarylmethane with the unchanged bromomagnesium phenolate (or -naphtholate). (See the reaction process mentioned). The fact that in this no products of a carbinol- or phenol grouping, which according to Shorygin are characteristic for the ether group, were observed proves that the intermediate products of the reaction are not ethers. Contrary to the results of the investigations (Refs 3,4) according to which c-oxytriphenylmethane is formed in the reaction of diphenylmethylbromide with sodium phenolate -c somers of oxytriarylmethane are formed in the present reaction of bromomagnesiumphenolate, as well as of bromomagnesium-o-cresolate, with diphenylbromide (obtained, as mentioned above, in the reaction process from bromomagnesium-benzohydrolate and oxalic acid ester); these isomers are those of n -oxytriphenylmethane. The ortho-isomers are only formed when the π-position is occupied, which is, for instance, the case when π-cresol is added to the reaction. Thus two compounds which have not been described earlier are synthetized: diphenyl-(2-oxynaphthyl-2)-methane and diphenyl-(2-ethoxynaphthyl-1)-carbinol.

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VI. New Method for the Synthesis of Monoxytriarylmethane

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There are 10 references, 1 of which is Soviet

ASSOCIATION: Permskiy gosudarstvennyy universitet
(Perm State University)

SUBMITTED: March 7, 1957

Card 3/3

AUTHORS: Lapkin, I. I., Vlasova, V. Ya. 79-28-4-24/60

TITLE: Steric Hindrances in Organomagnesium Reactions (Prostranstvennyye prepyatstviya pri magniyorganicheskikh reaktsiyakh). XVIII. The Synthesis of Complex Esters of α-(β-Alkoxynaphthyl--1)-Lactic Acids (XVIII. Sintez slozhnykh efirov α-(β-alkoksinaftil-1)-molochnykh kislot)

PERIODICAL: Zhurnal Obshchey Khimii, 1958, Vol. 28, Nr 4, pp. 955-957 (USSR)

ABSTRACT: The earlier described method (Ref. 3) was employed by the authors in the present work for the synthesis of such interesting and important substances, as complex esters of the α-(β-alkoxynaphthyl-1) lactic acid. As is known, the naphtalene nucleus possesses a number of peculiarities differentiating it form the benzene ring. Of these peculiarities, above all the increased reactivity of the carbon atom in the α-position is worth mentioning. Here, the second nucleus contained in naphthalene is stereochemically almost equivalent to an orthosubstituent, which is bound to the benzene nucleus and which causes steric braking. When alkoxy groups occupy the β-position in the naphthalene ring

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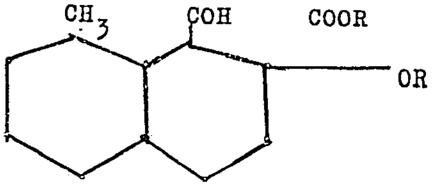
a system is formed, which also is almost equivalent to the benzene nucleus with two ortho substituents. For this reason organomagnesium compounds obtained from α-bromo-β-methoxy- and α-bromo-β-ethoxynaphthalene, react in the same way with the esters of pyroacemic acid as the di-ortho-substituted arylmagnesium halides, that is to say, only with the ketones, but not with the complex ester group. In this process they form complex esters of the α-(β-methoxynaphthyl-1)- as well as of the α-(β-ethoxynaphthyl-1) lactic acids with a common formula:



(I)

The activity of the α-carbon-atom of the naphthalene nucleus becomes manifest in a relatively high yield of reaction products. The experimental resultsare given in a table. It

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Steric Hindrances in Organomagnesium Reactions. XVIII. The Synthesis of Complex Esters of α-(β-Alkoxynaphthyl-1)-Lactic Acids

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was found, that the formation of complex esters of α-(2-alkoxynaphthyl-1) lactic acids represents the final stage of the described reaction. There are 1 table and 3 references, 2 of which are Soviet.

ASSOCIATION: Permskiy gosudarstvennyy universitet (Perm' State University)

SUBMITTED: March 2, 1957

Card 3/3

AUTHORS: Lapkin, I. I., Lapkina, O. M. 79-28-4-25/60

TITLE: Steric Hindrances in Organomagnesium Reactions (Prostranstvennyye prepyatstviya pri magniyorganicheskikh reaktsiyakh).
XIX. The Synthesis of Esters of α-(4-Alkoxynaphthyl-1) Lactic Acids (Sintez slozhnykh efirov α-(4-alkoksinaftil-1)-molochnykh kislot)

PERIODICAL: Zhurnal Obshchey Khimii, 1958, Vol. 28, Nr 4, pp. 957-960 (USSR)

ABSTRACT: In the previous papers (References 1 and 2) it was shown that only the ketone group reacts with di-ortho-substituted arylmagnesium halides in the interaction of the esters of α-ketonic acids (being comparatively weak in comparison to oxalic acid (Reference 3)). The ester group does not even react at a considerable excess of organomagnesium compounds. It was also shown that the mixed organomagnesium compounds which are obtained from α-bromo-β-alkoxynaphthalenes, and which as compounds are

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Steric Hindrances in Organomagnesium Reactions. XIX. The Synthesis of Esters of α-(4-Alkoxynaphthyl-1) Lactic Acids

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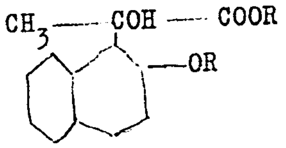
stereochemically almost equivalent to di-ortho-substituted arylmagnesium halides, only react with the ketone group. The organomagnesium compounds which are obtained from 1-bromo-4-alkoxynaphthalenes are stereochemically analogous to mono-ortho-substituted arylmagnesium halides. For this reason they react identical to the latter in reactions with esters of α-ketonic acids (pyroacemic acid) (Reference 1), that is to say, they react with the more active ketone group. This circumstance can be utilized for a convenient production of the esters of α-(4-alkoxynaphthyl-1) lactic acids, with the general formula (I).



(I)

This is confirmed by the experimental results given in a table.

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Steric Hindrances in Organomagnesium Reactions. 79-28-4-25/60
XIX. The Synthesis of Esters of α-(4-Alkoxynaphthyl-1)
Lactic Acids

There are 1 table and 3 references, all of which are Soviet.

ASSOCIATION: Permskiy gosudarstvennyy universitet (Perm' State University)

SUBMITTED: March 2, 1957

Card 3/3

5.3400

80797

S/079/60/030/04/38/080
B001/B016

AUTHORS: Lapkin, I. I., Rybakova, M. N.

TITLE: Reactions of Metallic Halide Alcoholates. VII. Reaction of Magnesium Halide Carbinolates of Tertiary Alcohols With Esters

PERIODICAL: Zhurnal obshchey khimii, 1960, Vol. 30, No. 4, pp. 1227-1230

TEXT: In continuation of the papers of Refs. 1-13 dealing with the above reactions, the authors made use of the fact that the excess in one of the reactive products or a third component artificially introduced into the reaction may change the direction of organomagnesium reactions, with a view of regulating the reactions of ketones with organomagnesium compounds, in order to obtain unsaturated hydrocarbons instead of alcohols. Ethyl formic and ethyl oxalic esters were used as the third component introduced. The unsaturated hydrocarbons synthesized in this way are mostly contaminated by the initial products. In order to determine the real course of reaction and the nature of the end products, also magnesium halide carbinolates were allowed to react which were obtained

X

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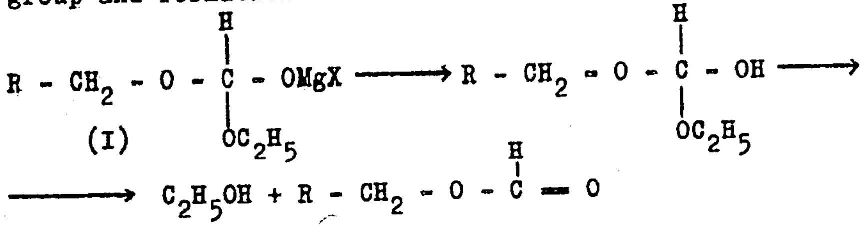
80757

from pure carbinols with ethyl formate. The results given in the table show that magnesium bromide alcoholates of the tertiary aliphatic and aliphatic-aromatic alcohols give unsaturated hydrocarbons, and partly bromides, when treated with equimolecular quantities of ethyl formate. Alcoholates of tertiary alcohols with two aryl radicals are readily converted to the unsaturated hydrocarbons under the influence of the same ester (Ref. 25). The reaction of magnesium halide alcoholates of primary alcohols with ethyl formate yields the stable compound (I) which is converted by dilute acid to the unstable ester of orthoformic acid, the stabilization of which occurs under separation of the ethoxy group and formation of the formate:



$$\underset{\text{(I)}}{R-CH_2-O-\overset{\overset{H}{|}}{\underset{\underset{OC_2H_5}{|}}{C}}-OMgX} \longrightarrow R-CH_2-O-\overset{\overset{H}{|}}{\underset{\underset{OC_2H_5}{|}}{C}}-OH \longrightarrow C_2H_5OH + R-CH_2-O-\overset{\overset{H}{|}}{C}=O$$

30727

Reactions of Metallic Halide Alcoholates.
VII. Reaction of Magnesium Halide Carbinolates of Tertiary Alcohols With Esters

S/079/60/030/04/38/080
B001/B016

The magnesium halide alcoholates of tertiary alcohols form with formates a less stable compound of type (I) which is stabilized under formation of unsaturated hydrocarbons (principal reaction) and of bromides (side reaction). The side reaction becomes the principal reaction by reaction with magnesium halide diaryl carbinolates (Refs. 13, 25) (Scheme 2). Some novel aliphatic-aromatic tertiary alcohols and unsaturated hydrocarbons have thus been synthesized and described. There are 1 table and 25 references, 4 of which are Soviet.

ASSOCIATION: Permskiy gosudarstvennyy universitet (Perm' State University)

SUBMITTED: March 2, 1959

Card 3/3

30711

S/079/60/030/05/50/074
B005/B125

5.3200
5.3700

AUTHORS: Lapkin, I. I., Karavanov, N. A.

TITLE: Steric Hindrances in Organomagnesium Reactions. XX. The Synthesis of Esters of Secondary α-Hydroxy Acids of the Aliphatic and Alicyclic Series

PERIODICAL: Zhurnal obshchey khimii, 1960, Vol. 30, No. 5, pp. 1638-1643

TEXT: It had been determined in earlier papers by the first-named author (Refs. 1-6) that the reaction of oxalic acid diesters with aromatic organomagnesium compounds can be checked in the first stage of the reaction under relatively simple conditions. The complex compound which forms in this first stage of the reaction is unstable and decomposes at the boiling point of the ethereal solution (40-42°) according to a given pattern (Ref. 3). Esters of α-hydroxy acid, which contain the hydroxyl group secondarily bound, form by hydrolysis from the decomposition products. In the present report this process is used for the synthesis of aliphatic and alicyclic α-hydroxy carboxyl acid esters. When the organomagnesium compound contains an alkyl radical in the place of an aryl

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00711

Steric Hindrances in Organomagnesium Reactions.
XX. The Synthesis of Esters of Secondary
α-Hydroxy Acids of the Aliphatic and Alicyclic Series

S/079/60/030/05/50/074
B005/B125

radical, the complex compound forming in the first stage of the reaction is more stable and decomposes at temperatures of 110-120°. The complete decomposition of the complex can be attained by the addition of toluene, the distilling of the ether and the subsequent boiling of the toluene solution for two hours. When the complex compound contains an alicyclic radical, it decomposes just as in the case of an aryl radical at the boiling of the ethereal solution. The carrying out of all the named organomagnesium syntheses is thoroughly described in an experimental section. The authors synthesized in this way 19 α-hydroxy acid esters, which had not yet been described in publications. The yield, boiling point (or melting point), gross formula, and percentage composition of the elements are given in a Table for each of these new esters; the refractive index, the density, and molar refraction are given additionally for the liquid esters. There are 1 table and 8 references, 6 of which are Soviet.

ASSOCIATION: Permskiy gosudarstvennyy universitet (Perm' State University)

SUBMITTED: May 28, 1959

Card 2/2

LAPKIN, I.I.; RYBAKOVA, M.N.

Reactions of metal halide alcoholates. Part 8: Control of organomagensium reactions. Zhur.ob.khim. 30 no.8:2674-2677 Ag '60. (MIRA 13:8)

1. Permskiy gosudarstvennyy universitet.
(Magnesium organic compounds)
(Alcoholates)

LAPKIN, I.I.; KARAVANOV, N.A.

Reactions of metal halide alcoholates. Part 9: Interaction between esters of keto acids and magnesium halide alcoholates. Zhur. ob.khim. 30 no.8:2677-2680 Ag '60. (MIRA 13:8)

1. Permskiy gosudarstvennyy universitet.
(Esters) (Alcohclates) (Magnesium organic compounds)

82681

S/079/60/030/008/006/008
B004/B064

5.3700

AUTHORS: Lapkin, I. I. and Sedel'nikova, V. A.

TITLE: On the Quantitatively Possible Combination of Radicals Bound to the Central Atom. I. Organic Tin Compounds

PERIODICAL: Zhurnal obshchey khimii, 1960, Vol. 30, No. 8, pp. 2771 - 2777

TEXT: On the basis of published data (Refs. 1-3) the authors state that the number of organic radicals that can be bound to a central atom, does not always correspond to the valency of the central atom. Thus, it is impossible to produce SnR_4 compounds in which R is a tert-butyl-, tert-amyl-, mesityl-, or ortho-substituted aryl radical. Contrary to the data of Ref. 4, the authors did not succeed in producing tetramesityl tin. The authors explain this by the occurrence of steric obstacles. They carry out a calculation of the crossing of the ortho-substituents (Figs. 1,2). Geometrically, the addition of 4 mesityl radicals would be possible under certain angles of a pyramidal configuration. Since this

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