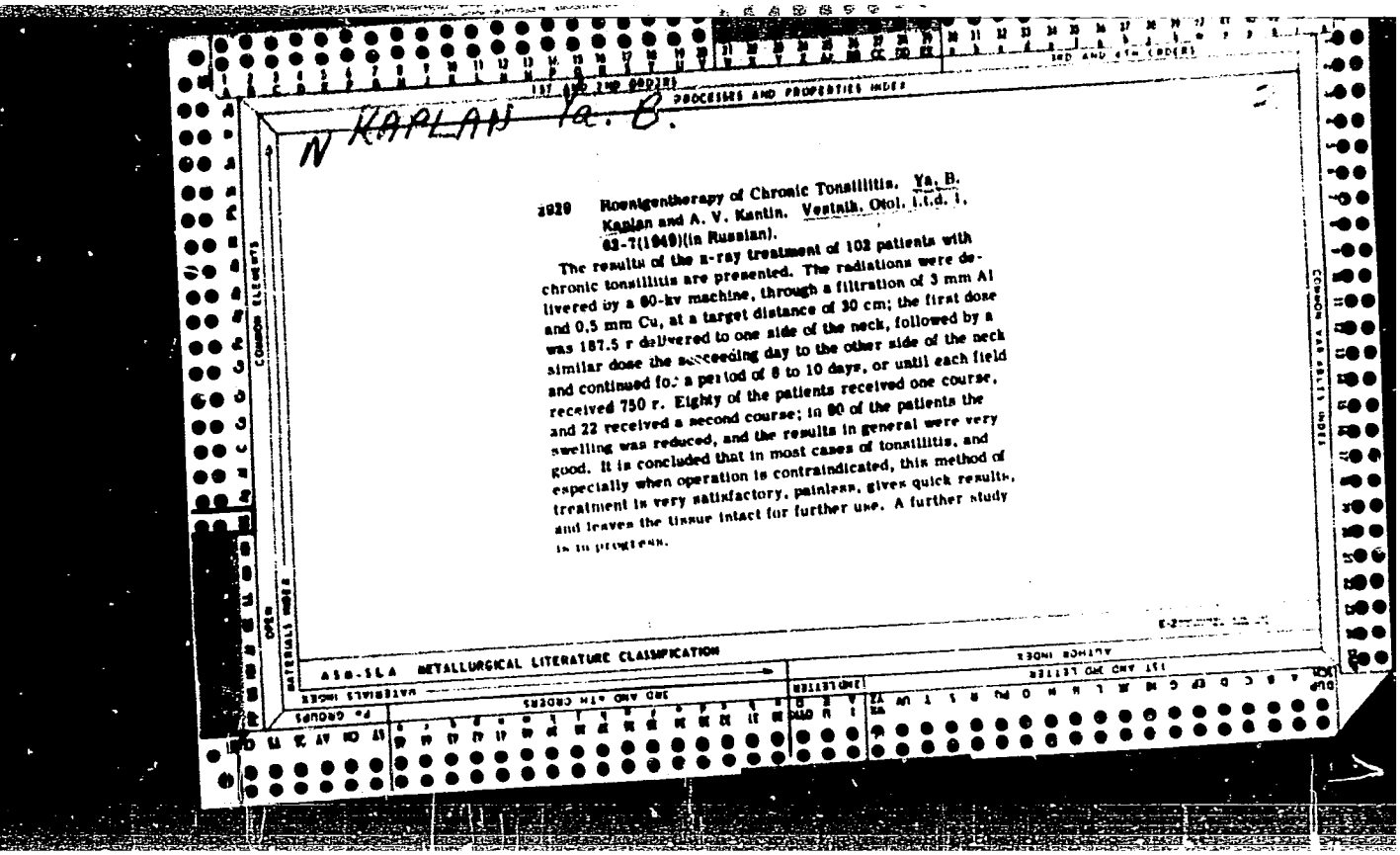
KAPLAN, Ya.

Activities and needs of rural firemen. Pozh.delo 7 no.5:12 My '61. (MIRA 14:5)

1. Predsedatel' rayonnogo soveta Dobrovol'nogo pozharnogo obshchestva. Novouzensk, Saratovskaya oblast'.
(Novouzensk District—Farm buildings—Fire prevention)



N KAPLAN Ya. B.

3929 Roentgentherapy of Chronic Tonsillitis. Ya. B. Kaplan and A. V. Kantin. Vestnik. Otol. i.t.d. 1, 62-7(1940)(in Russian).

The results of the x-ray treatment of 102 patients with chronic tonsillitis are presented. The radiations were delivered by a 80-kv machine, through a filtration of 3 mm Al and 0.5 mm Cu, at a target distance of 30 cm; the first dose was 187.5 r delivered to one side of the neck, followed by a similar dose the succeeding day to the other side of the neck and continued for a period of 8 to 10 days, or until each field received 750 r. Eighty of the patients received one course, and 22 received a second course; in 80 of the patients the swelling was reduced, and the results in general were very good. It is concluded that in most cases of tonsillitis, and especially when operation is contraindicated, this method of treatment is very satisfactory, painless, gives quick results, and leaves the tissue intact for further use. A further study is in progress.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

KAPLAN, V. V. Veniamin Vul'fovich

PA 51/49T18

USSR/Electricity May 49
Transmission Lines, High-Voltage

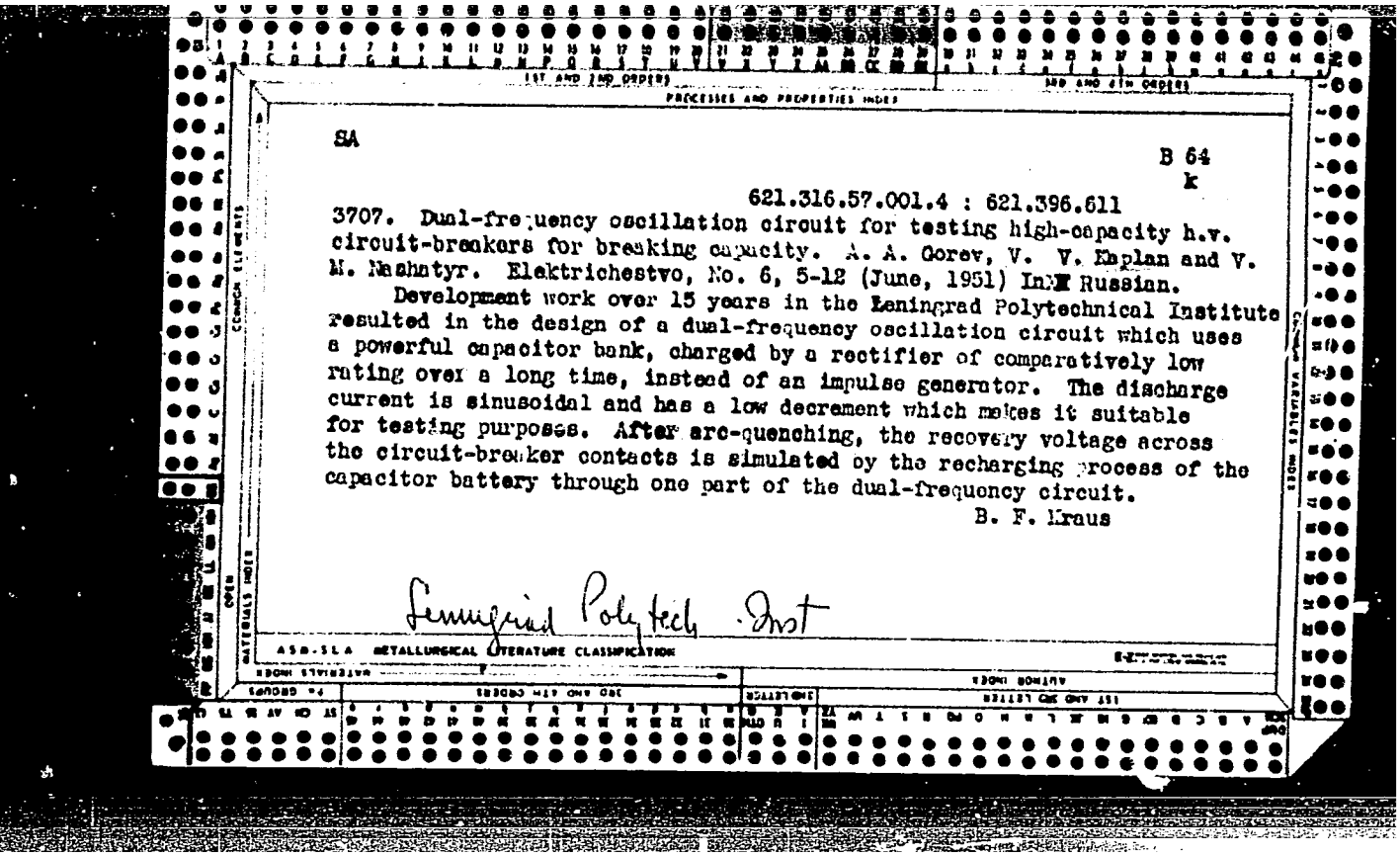
"Diagram for Simultaneous Connection of Several High-Voltage Circuits" V. V. Kaplan, V. M. Nashatyr', Leningrad Polytech Inst, 3 pp

"Zhur Tekh Fiz" Vol XIX, No 5

Describes arrangement worked out in Lab of High-Voltage Techniques, Leningrad Polytech Inst, which permits practically instantaneous inclusion of a number of circuits, making use of small charging condensers, a dividing resistance, auxiliary switches, and a spark gap. Tests showed stability of arrangement. Time lag in switching in separate circuits was almost completely eliminated.

Submitted 7 Jul 48.

51/49T18



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621.316.57.001.4 : 621.396.611

3707. Dual-frequency oscillation circuit for testing high-capacity h.v. circuit-breakers for breaking capacity. A. A. Gorev, V. V. Khplan and V. M. Nashatyr. Elektrichestvo, No. 6, 5-12 (June, 1951) In Russian.

Development work over 15 years in the Leningrad Polytechnical Institute resulted in the design of a dual-frequency oscillation circuit which uses a powerful capacitor bank, charged by a rectifier of comparatively low rating over a long time, instead of an impulse generator. The discharge current is sinusoidal and has a low decrement which makes it suitable for testing purposes. After arc-quenching, the recovery voltage across the circuit-breaker contacts is simulated by the recharging process of the capacitor battery through one part of the dual-frequency circuit.

B. F. Kraus

Leningrad Polytech. Inst

KAPLAN, V. V

Electrical Engineering Abst.
Section B
March 1954
Installations.
Switchgear.

621.316.57.031.4 : 621.372.41

524. Use of coupled oscillatory circuits for testing slow-acting h.v. circuit breakers. V. V. KAPLAN AND V. M. NASHATYR'. *Elektrichestvo*, 1953, *No.* 5, 13–17. *In Russian.*

The use of a synchronous generator for loss compensation in the oscillation circuit makes it possible, in principle, to obtain an undamped testing current for a considerable period, but requires costly additional installations. In testing modern h.v. circuit breakers in which the arc may last an appreciable time, it is necessary to maintain an undamped testing current for as long as 3–8 half-periods of the commercial frequency. This is better achieved by the use of coupled oscillation circuits than by the conventional single and double-frequency oscillation circuits. If the circuit breakers are tested for breaking capacities smaller than the test power of the oscillatory circuit, such coupled circuits may be built up from the elements of the original oscillatory circuit and only simple synchronizing devices are required.

B. F. KRAUS

Lenugrad Polytech. Inst

KAPLAN, V. V.

AID P - 952

Subject : USSR/Electricity

Card 1/1 Pub. 27 - 21/25

Authors : Kaplan, V. V., Kand. of Tech. Sci. and Nashatyr', V. M., Eng.

Title : In defense of authors' rights

Periodical : Elektrichestvo, 10, 90, 0 1954

Abstract : The authors protests against the violation of their authors' rights by the German firm AEG. Namely an article in No. 8, 1954 of the periodical ETZ, by F. Petermichl: "Die Einrichtung des Hochspannungsinstitutes der AEG" shows a testing connection diagram apparently based on the original diagram introduced by the authors in an article in Elektrichestvo, No. 6, 1951. No credit was given in the ETZ to the authorship of the diagram.

Institution : Not given

Submitted : No date

Submitted : No date

KAPLAN, V.V.

621.316.923 : 621.373.42 : 620.1

3795. TESTING CURRENT-LIMITING H.V. FUSES IN AN OSCILLATORY CIRCUIT. V.V.Kaplan and V.M.Nashatyr, Elektrichestvo, 1956, No. 5, 38-42. In Russian.

Despite the considerable active losses and the non-sinusoidal character of the current in current-limiting fuses, the latter may be tested in a synthetic testing circuit by using special methods to produce conditions equivalent to service conditions. When fuses are tested in this circuit at extreme breaking currents and with considerable current-limitation, the equivalent testing power of the circuit may be increased several times over the actual power of the oscillatory circuit, so that such tests are absolutely conclusive. On the other hand, this oscillatory circuit also enables fuses to be tested at breaking currents exceeding the current rating of the fuse only by a small amount, so that the fusing time is of the order of several half-periods. In this case it is convenient to use coupled oscillatory circuits so that undamped current and voltage curves are obtained in the testing circuit.

B.F.Kraus

AUTHOR: Kaplan, V.V., Cand. Tech. Sci., and Nashatyr', V.M., Cand. Tech. Sci.

TITLE: Method of Investigating the Closing of Powerful High Voltage Circuit Breakers (Metod issledovaniya vklyuchayushchey sposobnosti moshchnykh vyklyuchateley vysokogo napryazheniya)

PERIODICAL: Vestnik Elektropromyshlennosti, 1957, No. 2, pp.46-50 (U.S.S.R.)

ABSTRACT: New types of switch gear being developed must be tested for closing against a short-circuit. This may be done either on a full power circuit or by various substitution methods. There is some doubt whether the substitution methods applied hitherto have always been sufficiently stringent. It is certainly necessary to reproduce as nearly as possible the amplitude of the initial impulse currents which may occur in operation. The test should be made both with a maximum aperiodic current component and without such a component.

TITLE: Method of Investigating the Closing of Powerful High Voltage Circuit Breakers (Metod issledovaniya vklyuchayushchey sposobnosti moshchnykh vyklyuchateley vysokogo napryazheniya)

At the Leningrad Polytechnical Institute methods have been developed of carrying out all the necessary tests on circuit breakers using oscillatory circuit installations. The power available in existing laboratories is insufficient to carry out full scale tests and, therefore, synthetic conditions equivalent to those in real circuits have to be set up in the laboratory.

Synthetic circuits are then described for testing circuit breakers for closing against a short circuit with and without an aperiodic component in the current.

The installations were used to test a small-oil-volume circuit breaker type МГ-110 closing on currents corresponding to rupturing capacities of 2500 - 4000 MVA. The test results are given in the form of an oscillogram

Card 2/4

TITLE: Method of Investigating the Closing of Powerful High Voltage Circuit Breakers (Metod issledovaniya vklyuchayushchey sposobnosti moshchnykh vyklyuchateley vysokogo napryazheniya)

for the case of presence of full aperiodic component in the current curve. The peak current amplitude was 31 800 A which corresponds to an alternating component of 13 200 A and a symmetrical power of 2 500 MVA; the length of the gap at breakdown was 3 1/2 mm. The tests showed that the circuit breaker copes successfully with closure on short circuit with currents corresponding to a power of 3 500 - 4 000 MVA. When closing on these currents no damage was incurred which could prevent normal operation of the circuit breaker, and contact damage was not serious.

The tests also showed that multiple closure of the circuit breaker on to a short circuit, like opening a short circuit, reduces the electric strength of the internal insulation by contamination with carbon from

Card 3/4

TITLE: Method of Investigating the Closing of Powerful High Voltage Circuit Breakers (Metod issledovaniya vklyuchayushchey sposobnosti moshchnykh vyklyuchateley vysokogo napryazheniya)

the oil and fine metal particles from the contacts. Therefore, the number of closures on short circuit that should be permitted in service before inspection should be limited. The limitations should include the number of times of breaking short circuits as well as closing on short circuits.

The article contains 6 diagrams; there are no references.

ASSOCIATION: Leningrad Polytechnical Institute (Leningradskiy politekhnicheskiy institut)

PRESENTED BY:

SUBMITTED:

AVAILABLE: Library of Congress

Card 4/4

KAPLAN, V.V.

105-7-15/29

AUTHOR KAPLAN, V.V., Cand. tech. sc., NASHATYR, V.M., Cand. tech. sc.

TITLE Investigating the Interrupting Capacity and Internal Insulation Reliability of Circuit Breaker MG-110
(Issledovaniya otklyuchayushchey sposobnosti i nadezhnosti vnutrenney izolyatsii vyklyuchatelya MG-110. Russian)

PERIODICAL Elektrichestvo, 1957, Nr 7, pp 68 - 71 (U.S.S.R.)

ABSTRACT From 1952 - 1953 such investigations were carried out in the TVN laboratory, Goreva, Leningrad Polytechnical Institute with circuit breaker MG-110, with 110 kV, 600 A, 2.500 MVA, a construction of the "Electro-Apparatus" works after the short-circuit currents had been switched off several times. For this purpose a two-frequency oscillatory circuit of a synthetic scheme, developed earlier in the same laboratory, was subjected to further elaboration. The two-frequency oscillatory circuit was supplemented by two schemes: one for maintaining not-fading current oscillations during the whole process and a second to exclude the possibility of a premature elimination of the arc of the circuit breaker investigated on the occasion of the first (or second) zero passage of the current when the circuit of the reconstructive voltage is not yet connected and the experimental circuit breaker does not yet receive reconstructive voltage. The investigations showed that the circuit breaker MG-110 can manage the circuit breaking in the whole range of their modi

Card 1/2

Investigating the Interrupting Capacity and Internal Insulation Reliability of Circuit Breaker MG-110

fication up to the nominal circuit-breaker capacity of 13.200 A. The circuit-breaking capacity of the circuit breaker investigated experimentally corresponds to its standardized circuit-breaking capacity of 2.500 MVA. The investigation of the internal insulation of the arc-eliminating piles of the circuit breaker MG-110 showed their considerable reliability after the short-circuit currents had been switched off several times. The author found out that circuit-breaking of ten short circuits with MG-110 is possible during operation without any checking or changing of the oil. (With 5 illustrations, 1 table and 9 Slavic references).

ASSOCIATION Leningrad Polytechnical Institute
(Leningradskiy politekhnicheskiy institut)

PRESENTED BY

SUBMITTED 11.11.1955

AVAILABLE Library of Congress

Card 2/2

KAPLAN, V. V.

AUTHOR: 1) Cand.Techn.Sc.V.V.KAPLAN, Cand.Techn.Sc. . 105-8-17/20
NASHATYR', V.M.
2) Dr.Techn.Sc.Prof.G.I.SHTURMAN, Cand.Techn.Sc.E.A.YAKUBAYTIS, Cand.Techn.Sc.A.F.KROGERIS, Cand.Techn.Sc.V.V.APSIT, Cand.Techn.Sc.A.G.ZDROK, Cand.Techn.Sc.Ass.Prof.G.P.SMIRNOV

TITLE: 1) On the Testing of Current-Limiting High-Frequency Fuses in an Oscillatory Circuit. (Ispytaniye vysokovol'tnykh tokoogranichivayushchikh predokhraniteley na kolebatel'nom konture)
2) On the Work of the Saturation Impedance with a Semiconductor Rectifier and Active Induction Load. (Rabota drosselya nasyshcheniya s poluprovodnikovym vypryamitelem i aktivno-induktivnoy nagruzkoy)

PERIODICAL: Elektrichestvo, Nr 8, pp 74 - 77 (U.S.S.R.) , 1957

ABSTRACT: 1) Refers to the article by both authors in Elektrichestvo, 1956, Nr 5. Reference is made to the letter by Dr.A.Myslitskiy (Poland). The latter writes that only symmetrical short-circuit current curves are given in the article, whereas in a number of cases especially difficult conditions develop for the switching off of an arc in a high-frequency fuse, due to the presence of an aperiodic component in the short-circuit current. The authors announce that in later works a system was used by means of which investigations can be made on

Card 1/2

105-8-17/20

1) On the Testing of Current-Limiting High-Frequency Fuses in an Oscillatory Circuit.
2) On the Work of the Saturation Impedance with a Semiconductor Rectifier and Active Induction Load.

1) The circuit-breaking capacities of the current-limiting fuses in an oscillatory circuit not only in the case of symmetrical short-circuit current curves, but also in the presence of an aperiodic component in the current curve. (2 illustrations)
2) Refers to the article by A.G.Zdrok and G.P.Smirnov in Elektrichestvo, 1956, Nr 10. Zdrok and Smirnov are reproached by the first four above-mentioned authors the following: it is only in the third part of the paper that a concrete statement of problems may be comprehended; it is completely unintelligible which problem is exactly treated in the first part of the paper; why they cite data by Komar and Kaganov as their own; the paper is only a great disorder without giving any solution. The authors state that they only wanted to give recent data and point out experiments without describing them. (With 2 Slavic references)

Card 2/2

KAPLAN, V V.

8(2,3) PHASE I BOOK EXPLOITATION SOV/1550

Gurvich, Venyamin Betsalelevich, and V.V. Kaplan

Malomaslyanyye podstantsionnyye vyklyuchateli i privody k nim (Low-Oil-Content Substation Circuit Breakers and Their Drives). Moscow, Gosenergoizdat, 1958. 131 p. 10,000 copies printed.

Ed.: L.K. Greyner; Tech. Ed.: Ye.M. Soboleva.

PURPOSE: This book is intended for engineers, technicians and qualified personnel engaged in the installation and operation of high-voltage power-distribution equipment. It may also serve as a textbook for students of power-engineering tekhnikums and technical schools.

COVERAGE: The authors explain the general principles of the construction and operation h-v circuit breakers. They also provide a classification of basic structural diagrams of low-oil-content substation circuit breakers. They describe in detail the construction of Soviet-made circuit breakers and their drives and present information necessary for their operation and repair. No personalities are mentioned. There are no references.

Card 1/3

TABLE OF CONTENTS:











AVAILABLE: Library of Congress (TK2842.G8)



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KAPLAN, V.V.; NASHATYR', V.M.

Synthetic bifrequency method for testing high-voltage circuit breakers for their commutation ability. Izv. vys. ucheb. zav.; elektromekh. 1 no.4:82-91 '58. (MIRA 11:8)
(Electric circuit breakers--Testing)

KAPLAN, V.V.; NASHATYR', V.M.; IVANOV, V.L.

Methods of synthetic testing of high-voltage switches for their disconnecting ability. Izv. vys. ucheb. zav.; elektromekh. 1 no.5:63-71 '58. (MIRA 11:8)
(Electric switchgear--Testing)

110-58-6-7/22

AUTHORS: Kaplan, V.V., Nashatyr', V.M., Candidates of Technical Sciences and Ivanov, V.L., Engineer.

TITLE: Switching Over-voltages When Using Small-oil-volume Circuit-breaker Type MG-110 to Disconnect Unloaded Transformers and Lines (Kommutatsionnyye perenapryazheniya pri otklyuchenii malomaslyanym vyklyuchatelem tipa MG-110 nenagruzhennykh transformatorov i liniy)

PERIODICAL: Vestnik Elektropromyshlennosti, 1958, Nr 6, pp 31 - 37 (USSR)

ABSTRACT: Over-voltages that are set up when switching unloaded lines and transformers largely determine the insulation level. Over-voltage measurements can rarely be made on full-scale systems and laboratory tests of circuit-breakers are therefore necessary. The article describes tests on a 110-kV small-oil-volume circuit breaker of 2 500 MVA, type MG-110, built by the Elektroapparat Works, breaking small inductive and capacitive currents. The tests were made in the Gorev laboratory of the Leningradskiy politekhnicheskiy institut (Leningrad Polytechnical Institute) on equivalent circuits specially designed for this application and using oscillatory circuits as the source of e.m.f.

Card 1/7

Switching Over-voltages When Using Small-oil-volume Circuit-breaker Type MG-110 to Disconnect Unloaded Transformers and Lines

The circuit of Figure 1 was employed in experiments on disconnecting an unloaded transformer. As the oscillatory circuit can provide undamped oscillations for only a short time, the test must be so arranged that steady no-load current flows in the transformer as soon as possible after it is connected to the supply. Therefore, the transformer is connected through a damping resistance.
The first tests were made with the transformer de-magnetised by a special procedure. The test procedure is fully described. The circuit-breaker was tested under single-phase conditions, to represent disconnection by one pole of the circuit-breaker of a transformer with grounded neutral. The test voltage equalled the system phase-voltage. To represent tests on transformers with unearthed neutral, some of the tests used a voltage of one-and-a-half times the system voltage. Tests were made with one arc-quenching chamber and with two connected in series. Other tests corresponded to disconnection of three-phase transformers with earthed and isolated neutral, with outputs of 31.5 to 189 MVA. The current amplitude ranged from 6 to 64 A.

Switching Over-voltages When Using Small-oil-volume Circuit-breaker Type MG-110 to Disconnect Unloaded Transformers and Lines

The circuit-breaker was tested both with and without arrangements for high-speed reclosure. The results of all the tests are summarised in Figure 2. They show that both types of small-oil-volume circuit-breaker successfully break transformer magnetising current without appreciable over-voltages. In most tests, the over-voltage was not more than double the normal power-frequency voltage and in one case, only, it rose to 240%. For a given value of current there is considerable scatter of the time for which the arc burns: in most cases it was from 0.01 to 0.03 sec and only occasionally did it rise to 0.04 sec when the current was more than 30A. The relationship between the over-voltage factor on the transformer and the number of occurrences as a percentage of the total is plotted in Fig.3, which shows that, over the current range 5 - 15 A, the highest over-voltage was 134% of the normal value. Oscillograms showed that the current was interrupted somewhat before the current would normally pass through zero and whilst it still had some finite value. This effect is important in evaluating the operation of switchgear, since

Switching Over-voltages When Using Small-oil-volume Circuit-breaker Type MG-110 to Disconnect Unloaded Transformers and Lines

the instantaneous-current value at the instant of interruption largely governs the transformer over-voltage. Many attempts have been made to explain the phenomena of interrupting small inductive currents, but none is completely convincing. Typical current oscillograms at the instant of interruption are shown in Figure 4 and indicate that the effect of interruption at a finite current value may occur whether or not high-frequency oscillations are present. The conditions under which the arc becomes unstable in this way are discussed.

The process of this kind of interruption can be characterised by a system of differential equations relating the circuit-breaker current and the transformer inductive and capacitative currents. Calculated curves of the current at the moment of interruption are plotted in Figure 5 for the initial conditions of the oscillograms of Figures 4a and 4b. A comparison of curves 5a and 4a shows that the calculated current curves are near enough to the experimental ones. The time interval from the instant of start of fall

Switching Over-voltages When Using Small-oil-volume Circuit-breaker Type MG-110 to Disconnect Unloaded Transformers and Lines

of current to zero current is the same in both cases. Thus, it follows that the presence of high-frequency oscillations does not determine whether the current is interrupted before the normal zero, as is required by current theories of the subject. The new explanation offered in the article does not preclude occurrence of preliminary high-frequency oscillations but suggests that the mode of current interruption in any particular case depends on the conditions and that even with given conditions considerable scatter is observed.

Investigations on the circuit-breaker when disconnecting unloaded lines were made on an equivalent circuit with concentrated constants, as shown in Figure 6. The requirements that must be met to reproduce the actual conditions are stated and can be satisfied by this circuit. The source of undamped sinusoidal e.m.f. is a system of interconnected oscillatory circuits. Both types of breaker were tested whilst reproducing the conditions of an unloaded line of 200 km, which is about the longest Soviet 110-kV line. The power-frequency current interrupted was up to 40 A. The arc-suppression

Switching Over-voltages When Using Small-oil-volume Circuit-breaker Type MG-110 to Disconnect Unloaded Transformers and Lines

device of the small-oil-volume 220-kV circuit-breakers developed by the Elektroapparat Works (type MG-220) has four series arc-suppression chambers of the same construction as that used in the 110-kV breaker: hence, it was decided to verify the performance of the 220-kV breaker on a circuit equivalent to open lines 400 km long.
The tests were made on a single arc-suppression chamber and preliminary tests showed that such partial testing is accurate enough for practical purposes. In no case, did the over-voltage exceed double the normal value and the arc is finally interrupted before the contacts reach the fully-open position. Power-frequency current is usually interrupted at the first current-zero; then the arc usually re-strikes and finally the high-frequency interruption takes place, without, however, giving rise to high over-voltages. This re-striking effect is of a highly statistical nature; it may or may not occur under given conditions and the duration of the current also varies. Similar observations have been made by the Swedish ASEA company when testing small-oil-volume circuit breakers.

110-58-6-7/22

Switching Over-voltages When Using Small-oil-volume Circuit-breaker Type MG-110 to Disconnect Unloaded Transformers and Lines

On the basis of all the tests made, it is concluded that small-oil-volume circuit-breakers, types MG-110 and MG-110B successfully disconnect unloaded transformers and lines without giving rise to dangerous over-voltages. There are 6 figures and 6 references, 1 of which is Soviet, 2 German and 3 English.

ASSOCIATION: Leningradskiy politekhnicheskiy institut (Leningrad Polytechnical Institute)

SUBMITTED: July 29, 1957

Card 7/7 1. Circuit breakers--Test results

AUTHORS: Kaplan, V. V., Candidate of Technical Sciences, Nashatyr', V. M., Candidate of Technical Sciences SOV/105-58-10-14/28

TITLE: On the Utilization of the Method of Testing Individual Arc-Extinguishing Elements in High-Voltage Circuit Breakers (O primenenii metoda ispytaniy otdel'nykh dugogasitel'nykh elementov vysokovol'tnykh vyklyuchateley)

PERIODICAL: Elektrichestvo, 1958, Nr 10, pp 59 - 65 (USSR)

ABSTRACT: The majority of 110 - 400 kV circuit breakers are, when subjected to test runs in laboratories, at present checked by means of testing the individual series breaks. This procedure gives rise to the question whether such checks can be equivalent to actual operating conditions and to what degree they are reliable. In this study the problem is approached from a somewhat different point of view. The investigation of which this paper gives an account is based upon the experimental information resulting from the testing of circuit breakers with several series breaks. These test runs were carried out in the Laboratory TVN imeni Goreva LPI in 1954. In this

Card 1/3

paper, part of the information known from literature is presented. On the strength of the analysis of the breaker performance, utilizing principles from the theory of probability, which procedure is partially substantiated by the experimental data presented, the following conclusions can be drawn: 1) The interruptive duty of a circuit breaker with several series breaks can be determined in a rather reliable manner by summing the lower limits of the interrupting duty of the individual breaks. These values are determined under the following conditions, at equal current values for the individual breaks: a) The breaker elements have an identical construction and do not exert a noticeable influence upon each other. b) No low-ohmic parallel resistances or larger capacitors are connected with the individual breaker elements. 2) If low-ohmic resistances of larger capacitors are connected in parallel to each break the computation of the total interrupting duty from the duties of the individual

elements may become inadmissible. This is due to the fact that the arc-extinguishing power at the full voltage across the breaker may probably be lower than the sum of the individual values determined for the separated breaker elements. 3) The installation of high-ohmic parallel resistances will, under certain conditions, exert no noticeable influence upon the interrupting duty of the circuit breaker. There are 5 figures and 3 references, 2 of which are Soviet.

ASSOCIATION: Leningradskiy politekhnicheskiy institut (Leningrad Polytechnical Institute)

SUBMITTED: August 23, 1957

8(2)

AUTHORS: Kaplan, V. V., Candidate of Technical Sciences, Nashatyr', V. M., Candidate of Technical Sciences, Ivanov, V. L., Engineer

SOV/105-58-11-7/29

TITLE: A Synthetic Method of Testing High-Voltage Switches (Sinteticheskiy metod ispytaniya vysokovol'tnykh vyklyuchateley)

PERIODICAL: Elektrichestvo, 1958, Nr 11, pp 29-35 (USSR)

ABSTRACT: In 1957 a wiring circuit was elaborated and put into practice at the Laboratoriya tekhniki vysokikh napryazheniy imeni Goreva Leningradskogo politekhnicheskogo instituta (Laboratory for High-Voltage Engineering imeni Gorev at the Leningrad Polytechnic Institute) on the basis of an oscillatory circuit. This makes it possible to test quick-break switches by synthetical means. The switches operate with a single automatic reclosure cycle (switching off - switching on - switching off). Conditions for carrying out equivalent synthetical switch tests in the automatic reclosure cycle and the basic wiring scheme of the testing device are described. The synthetic scheme was checked in connection with the testing of air-switches. The oscillogram obtained shows that with lacking compensation of current- and voltage reduction the amplitude of the switching-of

Card 1/2

current at the third operation of the automatic reclosure cycle is smaller by about 25% than that of the initial current. The re-established voltage is reduced by the same amount with respect to the initial voltage. - When testing switches by means of compensating circuits, the reduction of current and voltage is entirely avoided. The amplitudes of all three currents as well as the initial and re-established voltages have the same values. The electron beam oscillograms show that the synchronizing devices worked out permit a very accurate adjustment of the testing device. There are 6 figures and 3 Soviet references.

ASSOCIATION: Leningradskiy politekhnicheskiy institut
(Leningrad Polytechnic Institute)

SUBMITTED: January 20, 1958

SOV/112-59-5-8974

8(2, 3)

Translation from: Referativnyy zhurnal. Elektrotekhnika, 1959, Nr 5, p 78 (USSR)

AUTHOR: Kaplan, V. V., and Nashatyr', V. M.

TITLE: Testing Large High-Voltage Circuit-Breakers Whose Arcing Lasts for a Few Half-Periods by Means of a Two-Frequency Oscillatory Circuit

PERIODICAL: Tr. Leningr. politekhn. in-ta, 1958, Nr 195, pp 451-459

ABSTRACT: Testing large high-voltage circuit-breakers whose arcing lasts for a few half-periods by means of a two-frequency oscillatory circuit requires scheme parameters which would lower the effective testing power of the oscillatory circuit. To ensure the above tests and to increase efficiency of the testing outfit, the scheme is to be supplemented by these two additional hookups: an igniting circuit that would ensure maintaining the arc during the first current zeros, and a feeding circuit that would ensure a continuous working current for the entire period of arcing in the circuit-breaker. A precharged capacitor bank that is automatically connected in parallel with the circuit-breaker being tested

Card 1/2

Testing Large High-Voltage Circuit-Breakers Whose Arcing Lasts for a Few . . . .

by means of a synchronizing device is used for the arc ignition. To ensure a continuous working current, a scheme of coupled oscillatory circuits and a scheme of combining the oscillatory currents developed by the authors are used. A sequence of circuit-component functioning in the two-frequency oscillatory circuit with the above feed and ignition is shown. Tests of a low-oil-content circuit-breaker have shown that, with the equipment available at the laboratory, the combined-oscillatory-currents scheme is preferable for obtaining a continuous working current. Bibliography: 3 items.

I.P.Shch.

SOV/112-59-5-8976

8(2, 3)

Translation from: Referativnyy zhurnal. Elektrotekhnika, 1959, Nr 5, pp 78-79 (USSR)

AUTHOR: Kaplan, V. V., and Nashatyr', V. M.

TITLE: Methods for Producing Continuous Oscillations, Without Rotating Machinery, in Outfits Similar to A. A. Gorev's Oscillatory Circuit

PERIODICAL: Tr. Leningr. politekhn. in-ta, 1958, Nr 195, pp 425-450 * High-Voltage Technique, Moscow, Gosenergoizdat. *

ABSTRACT: To secure equivalent test conditions, schemes are necessary which would produce continuous oscillations in the oscillatory circuit used for testing the rupturing capacity of circuit-breakers with a few half-cycles arcing and for testing other arc-interrupting equipment. Continuous oscillations can be produced in coupled oscillatory circuits where, under certain conditions, the current in the inductance and the voltage on the capacitor are beat oscillations. If the energy supply to the testing circuit over each half-cycle be equal to the energy consumption in the equipment being tested plus the active losses in the circuit, then, for a certain time, a practically continuous current will flow in

* This collection of articles sums up the principal results of investigations and stu made by Prof. A. A. Gorev, Dr. Tech. Sci., and his staff in the field of high volt phenomeena and techniques at LPI (Leningrad Polytech Inst.). It was at this instit Prof. Gorev completed his higher sci. education & taught and carried out his invest gations until his death in 1953. In '56 High-Voltage Lab at LPI was named after A. A. Gor

Card 1/3

Methods for Producing Continuous Oscillations, Without Rotating Machinery, . . . .

the equipment. A scheme of coupled oscillatory circuits and its parameters for the case when the additional circuit is connected to the testing circuit with a delay was described elsewhere. It was pointed out that optimum conditions of the coupled circuits can also be obtained with a simultaneous switching on of the batteries. Circuit parameter selection and tuning conditions are presented. To obtain continuous oscillations of current and voltage, an incomplete scheme of the oscillatory circuit comprising two inductances and two capacitances can be used; also, schemes that combine oscillatory currents and voltages can be used. An analysis of scheme functioning and a selection of optimum parameters are given. Sometimes, it is difficult to obtain the optimum mode of operation in the incomplete coupled-circuit scheme. It is preferable to use a current-combining scheme; for testing in a conventional oscillatory circuit, an incomplete coupled-circuit scheme should be used; for the case of long-time arcing, the complete coupled-circuit scheme should be used. Scheme functioning is analyzed with a view toward testing the carrying capacity of valve

Methods for Producing Continuous Oscillations, Without Rotating Machinery . . . .

type lightning arresters and the interrupting capacity of high-voltage circuit-breakers. Test oscillograms are presented. The coupled oscillatory circuits and the combining schemes can be used for testing the interrupting capacity of high-voltage circuit-breakers in the entire range of their interrupting currents and for testing the carrying capacity of valve-type lightning arresters. Coupled oscillatory circuits can be used in both conventional and synthetic schemes. The oscillatory-voltage combining scheme can be used for testing circuit-breakers that interrupt small currents and for testing valve-type arresters; the oscillatory-current combining scheme can be used for synthetic schemes. Bibliography: 6 items.

I.P.Shch.

8(3) SOV/112-59-3-4927

Translation from: Referativnyy zhurnal. Elektrotekhnika, 1959, Nr 3, p 90 (USSR)

AUTHOR: Kaplan, V. V., Nashatyr', V. M., and Sherman, Ya. N.

TITLE: Determination of Permissible Number of Short-Circuit-Current Interruptions by a Low-Oil-Content Circuit Breaker on the Basis of the Impaired Electric Strength of Its Internal Insulation (Opredeleniye dopustimogo chisla otklyucheniy toka korotkogo zamykaniya malomaslyanym vyklyuchatelem po usloviyam snizheniya elektricheskoy prochnosti yego vnutrenney izolyatsii)

PERIODICAL: Tr. Leningr. politekhn. in-ta, 1958, Nr 195, pp 460-475

ABSTRACT: Methods are developed for determining the guaranteed number of short-circuit-current interruptions by a low-oil-content circuit breaker; the methods are based on investigations of the internal insulation of a type MG-110 low-oil-content "Elektroapparat" make circuit breaker, conducted in the high-voltage laboratory of LPI. (1) First, the circuit breaker is to be tested for

Card 1/4

8(3)

Determination of Permissible Number of Short-Circuit-Current Interruptions . . . . .

many interruptions of its rated short-circuit current. It is permitted to stage these tests at a considerably lower voltage; however, the time of arc burning should be as long as the time under actual short-circuit clearing conditions. From the standpoint of chamber-insulation contamination, such test conditions are equivalent to the conditions of breaker operation under its rated voltage. (2) Then the internal-insulation resistance should be measured by a megommeter, leakage currents due to an applied rectified voltage should be determined, and oil samples should be taken. (3) As a next step, the insulation of the breaker with open contacts is tested by an oscillatory voltage similar to the actual recovery voltage; the crest value of the testing voltage is selected equal to the most probable surge voltage observed in the network in question. The above tests can be staged by means of a "switching-surge generator" developed and built in the high-voltage LPI laboratory (a detailed description of the device is presented). In selecting frequency of the test voltage, it

Determination of Permissible Number of Short-Circuit-Current Interruptions . . . .

should be kept in mind that the insulation is more strained with a lower frequency of the surge-voltage oscillations. (4) Measurements according to items 2 and 3 are repeated with gradually increasing surge amplitudes in order to determine the margin of the insulation under test. (5) The insulation measurement according to item 2 is repeated; thereupon to the breaker or to its individual arc-rupturing contacts a commercial-frequency voltage is applied which exceeds by 20-25% the voltage most probable under the operating conditions of the breaker in question. (6) If the state of insulation permits, the testing procedure (items 1-5) is again repeated. The investigations by the above method have shown that, after 80 or more openings (of currents close to the rated duty 13,200 amp), the MG-110 breaker and its internal insulation have been in good condition: infinite insulation resistance and leakage current of 1 microamp or less, the insulation has withstood AC voltage for 8 hours and also surge impulses with peak values as high as 7 times the line-to-ground

8(3)

SOV/112-59-3-4927

Determination of Permissible Number of Short-Circuit-Current Interruptions . . . .

voltage. The chamber insulation was impaired only when surge impulses were applied after 94 openings of short-circuit currents. The authors permit 10 openings of short-circuit currents by the MG-110 breaker under operating conditions, with inspection or oil change. Investigation results are tabulated.

R.A.M.

Card 4/4

SOV/112-59-2-2948

Translation from: Referativnyy zhurnal. Elektrotekhnika, 1959, Nr 2, p 98 (USSR)

AUTHOR: Kaplan, V. V., and Nashatyr', V. M.

TITLE: Some Points Concerning the Physics of AC Arc Extinguishing in High-Voltage Circuit-Breakers. (O nekotorykh voprosakh fizicheskogo predstavleniya protsessa gasheniya dugi peremennogo toka v vysokovol'tnykh vyklyuchatelyakh)

PERIODICAL: Tr. Leningr. politekhn. in-ta, 1958, Nr 195, pp 476-494

ABSTRACT: On the basis of investigations and tests of high-voltage equipment made on A. A. Gorev's impulse generator at the high-voltage laboratory, Leningrad Polytechnic Institute, and also on the basis of a generalization of published theoretical and experimental data, an attempt is made to consider qualitatively some fundamental physical notions associated with the AC arc. The article considers arc-gap current and voltage waveshapes that are observed in the course of rupturing inductive currents (in long arcs) at and past current zero for the cases of zero and nonzero capacitance $C_a$ that shunts the

Card 1/4

Some Points Concerning the Physics of AC Arc Extinguishing in High-Voltage . . . .

arc gap. A theoretical analysis shows that with $C_a = 0$, the current approaches zero more rapidly than, and passes zero with equal rapidity as in the case of the sinusoidal shape. It is noted that with the voltage recovering across the arc gap a small reverse current, the residual current, passes through the gap; this current was discovered experimentally. An analysis given in the article shows that the recovery voltage can assume values exceeding its steady-state value even with no shunting capacitance. This phenomenon was confirmed experimentally. It is pointed out that with $C_a \neq 0$, the extinguishing peak, other things being equal, must be lower than with $C_a = 0$, and that the voltage across the arc gap and the current in it with $C_a \neq 0$ and also with $C_a = 0$ pass their zero values simultaneously. It is noted that in the case of $C \neq 0$, a residual current, too, flows through the arc gap. If this residual current amounts to a fraction of the current through $C_a$, it has no appreciable effect on the waveshape of the recovery voltage; however, this residual current sustains the arcing (or

Some Points Concerning the Physics of AC Arc Extinguishing in High-Voltage . . . .

near-arcing) type of the discharge and predetermines further development of the process. In those arc interrupters where residual currents are considerable, so that they are commensurable with the currents in the shunting capacitance, these currents determine the waveshape of the recovery voltage. Various cases of arc extinguishment in circuit-breakers observed during the tests are considered and reduced to 6 fundamental groups. Voltage waveshape on the arc gap during the arc interruption is a criterion for subdividing into the above 6 groups. It is pointed out that various phenomena observed during arc interruption in a circuit-breaker cannot be explained by the theory of recovery of the arc-gap dielectric strength after zero current. (For example, this viewpoint cannot explain the cases when the gap breakdown takes place a considerable time after the voltage has been applied to it; before the breakdown occurs, the voltage passes zero several times and attenuates appreciably; nor can this theory explain the cases when the breakdown occurs on the falling-off section of

Some Points Concerning the Physics of AC Arc Extinguishing in High-Voltage . . . .

the recovery-voltage amplitude curve.) It is shown theoretically that the energy theory of arc extinguishing permits explaining all cases subdivided into the above 6 groups and all phenomena accompanying arc interruption in a circuit-breaker. This, however, does not exclude the probability that further studies may detect more complicated cases, when along with energy relations at individual stages of the interruption process, other phenomena associated with the rising dielectric strength of the arc gap can be of significance. Curves are presented that explain the phenomena in the region of zero current and the phenomena of voltage recovery across the circuit breaker.
Bibliography: 10 items.

T.V.V.

Card 4/4

8(3) SOV/112-59-4-6906

Translation from: Referativnyy zhurnal. Elektrotekhnika, 1959, Nr 4, p 71 (USSR)

AUTHOR: Kaplan, V. V., and Nashatyr', V. M.

TITLE: Methods for Investigating High-Voltage Circuit-Breakers in a Laboratory Under Conditions Equivalent to Cutting-Off a No-Load Line

PERIODICAL: Tr. Leningr. politekhn. in-ta, 1958, Nr 195, pp 495-506

ABSTRACT: A laboratory outfit intended to imitate conditions of actual equipment should have the following fundamental quantities represented: amplitude and frequency of voltage, amplitude and frequency of capacitive current, transient-current curve (the natural frequency of the current and its average value over a half-cycle), damping factor of the current curve and transient-voltage curve, the recovery-voltage curve corresponding to the transient-current zero (for a terminal or a through substation). The suggested equivalent testing scheme consists of an EMF source, a single-section no-load-line equivalent circuit, and suitable absorbing resistors. An impulse generator or A. A. Gorev's oscillatory circuit can serve as an EMF source.

S.S.Sh.

Card 1/1

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(Electric apparatus and appliances--Testing)

KAPLAN, V.V., kand.tekhn.nauk (Leningrad); NASHATYR', V.M., kand.tekhn.nauk (Leningrad); IVANOV, V.L., inzh. (Leningrad)

Statistical method for substantiating the selection of voltage in testing the interrupting capacity of circuit breakers. Elektrichestvo no.2:69-73 F '60. (MIRA 13:5)
(Electric circuit breakers)

ZAKHAROV, S.N., kand.tekhn.nauk; KAPLAN, V.V., inzh.; IONOV, V.V., inzh.; OSIPOVA, T.V., inzh.; SHERMAN, Ya.N., inzh.; SHESHIN, B.A., inzh.

New MG-10 and MG-20 generator switches. Vest. elektroprom. 32 no.3: 73-76 Mr '61. (MIRA 15:6)
(Electric switchgear)

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YANCHUS, E.I., inzh.

The LPI stand for testing high-voltage equipment. Vest.elektroprom.
33 no.4:33-39 Ap '62. (MIRA 15:4)
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NASHATYR', V.M., kand.tekhn.nauk; SHCHERBACHEV, O.V., kand.tekhn.nauk

Problem concerning the use of two-way switches with shunting resistances. Elektrichestvo no.8:61-65 Ag '62. (MIRA 15:7)

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(Electric switchgear)

KAPLAN, V.V., kand.tekhn.nauk; NASHATYR', V.M., kand.tekhn.nauk

Standardization of voltage recovery with commercial frequency during the testing of switches. Vest. elektroprom. 34 no.1: 64-66 Ja '63. (MIRA 16:1)
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Synthetic tests of electric cutouts. Elek. sta. 34 no.5:65-68 My '63. (MIRA 16:7)

(Electric cutouts—Testing)

KAPLAN, V. V.; BRONSHTEYN, A. M.; BRON, O.B.; BUTKEVICH, G. V.; ZAKHAROV, S. N.; AKODIS, M. M.; MASLENNIKOV, D. S.; RUDNYY, V. M.

"Some Problems of Constructing High Power Circuit-Breakers."

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BRON, O. B.; BRONSHTEYN, A. M.; BUTKEVICH, G. V.; ZAKHAROV, S. N.; KAPLAN, V. V.; AKODIS, M. M.; MASLENNIKOV; RUDNYY, V. M.

"Some Problems of Constructing High Power Circuit-Breakers."

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Development of a synthetic method for testing high-voltage apparatus. Elektrotekhnika 35 no.2:27-30 F '64. (MIRA 17:3)

KAPLAN, V.V., kand. tekhn. nauk; NASHATYR', V.M., kand. tekhn. nauk

Basic criteria for appraising the equivalency of synthetic networks for determining the switching capability of high-voltage apparatus. Elektrichestvo no.5:22-27 My '64. (MIRA 17:6)

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KAPLAN, V.V., kand.tekhn.nauk (Leningrad); NASHATYR', V.M., kand.tekhn.nauk (Leningrad)

Methodology for statistical treatment of the results of the investigations of the switching performance of high-voltage circuit breakers. Elektrichestvo no.11:58-62 N '64.
(MIRA 18:2)

BOGATENKOV, I.M., inzh.; IVATSIK, Ye.Ye., inzh.; KAPLAN, V.V., kand. tekhn. nauk; KOSTENKO, M.V., doktor tekhn. nauk, prof.; NASHATYR', V.M., kand. tekhn. nauk

Network system for combined tests of magnetic-valve dischargers. Izv. vys. ucheb. zav.; energ. 8 no.8:23-28 Ag '65. (MIRA 18:9)

1. Leningradskiy politekhnicheskiy institut im. M.I. Kalinina. 2. Chlen-korrespondent AN SSSR (for Kostenko). Predstavlena kafedroy tekhniki vysokikh napryazheniy Leningradskogo politekhnicheskogo instituta.

KAPLAN, V.V., kand.tekhn.nauk; NASHATYR', V.M., kand.tekhn.nauk; POPOVA, V.A., inzh.

Method for compensating losses in a load during the formation of plane current impulses in an experimental system. Elektrichestvo no.9:55-59 S '65. (MIRA 18:10)

1. Leningradskiy politekhnicheskiy institut im. Kalinina.

BOGATENKOV, I.M., inzh.; IVATSIK, Ye.Ye., inzh.; KAPLAN, V.V., kand. tekhn. nauk; NASHATYR', V.M., kand. tekhn. nauk

Combined test of magnetic valve-discharges with 6-500 kv. ratings. Elektrotekhnika. 36 no.9:55-57 S '65. (MIRA 18:9)

L 27274-66 EWT(1)

ACC NR: AP6016875 SOURCE CODE: UR/0281/65/000/006/0078/0093

AUTHOR: Bogatenkov, I. M. (Leningrad); Kaplan, V. V. (Leningrad); Kostenko, M. V. (Leningrad); Nashatyr', V. M. (Leningrad); Yanchus, E. I. (Leningrad)

ORG: none

TITLE: Testing the commutation capacity of a high voltage apparatus for high-power networks

SOURCE: AN SSSR. Izvestiya. Energetika i transport, no. 6, 1965, 78-93

TOPIC TAGS: circuit breaker, electric power transmission, electric inductance, electric capacitance

ABSTRACT: Results are presented from investigations performed using a network mock-up to synthetically test high-voltage circuit breakers and dischargers to be used in 500-1250 kv power networks. The testing of individual spark-damping elements of breakers is statistically justified. A circuit for combined testing of valve dischargers, including a power system which serves as a source of accompanying current, is analyzed. This system provides full correspondence in current and voltage levels, capacitance and inductance to an actual power network, allowing the breakers to be tested with assurance that the test will correspond to actual operating conditions of the breakers after they are installed in power systems. Orig. art. has: 13 figures. [JPRS]

SUB CODE: 09, 10 / SUBM DATE: 05Jun65

Card 1/1 CC UDC: 621.316.542.064.241.027.3.001.4: 621.316.933.001.4

L 1[illegible] EWT(1)/EPF(k)-2 WG/AT

ACC NR: AP6011546 SOURCE CODE: UR/0105/66/000/004/0079/0084

AUTHOR: Kaplan, V. V. (Candidate of technical sciences); Nashatyr', V. M. (Candidate of technical sciences) 45 B

ORG: Leningrad Polytechnic Institute (Leningradskiy politekhnicheskiy institut)

TITLE: Using dynamoelectric storages for physics research

SOURCE: Elektrichestvo, no. 4, 1966, 79-84

TOPIC TAGS: physics research, nuclear physics apparatus, shock generator, energy storage, generator/ TI-75 generator, TI-100-2 generator

ABSTRACT: Methods of short-time energy storing by means of rotating machines (shock generators) being investigated by the Electric System and High-Voltage Laboratory, LPI, are reviewed in general terms. The machine-type storage can handle much greater energies than a capacitor bank and can be easily built. A synchronous shock generator (TI-75, TI-100-2 Soviet-built) can be used as an energy storage either with a protective reactor in the main circuit or without it (at a correspondingly higher stored energy); a TI-75 generator can develop up to

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ACC NR: AP6011546

$4.78 \times 10^6$ j. A combination machine-and-capacitor storage increases the amount of stored energy to 6 or 8 million joules. In an inductance-storage system, the shock generator is used to supply energy to several inductance coils (multishock operation), and a special circuit is used to sum up the stored energy and to transfer it to the load. The compensation of resistance loss in an inductive load can be performed in various ways: (a) when long (tenths of a sec to a few sec) impulses are required, a high-power d-c source, such as a machine-and-rectifier outfit, is suitable; (b) with an impulse of a few hundredths of sec duration, capacitors can be recommended; (c) in the case of a dynamoelectric shock generator, its third phase can be used for supplying additional energy to cover the resistance loss. Orig. art. has: 6 figures, 26 formulas, and 1 table.

SUB CODE: 18, 09 / SUBM DATE: 10Nov63 / ORIG REF: 001 / OTH REF: 005

Card 2/2 af

KAPLAN, Ya.I., inzhener; RUBINSHTEYN, D.A., inzhener

Improving the electrical circuits controlling elevators. Gor.khoz. 29 no.9:19-20 S'55. (MIRA 8:12)

1. Trest "Soyuzlift"
(Elevators)

KAPLAN, Ya.I.; OBUKHOV, A.I.; PILEVSKIY, M.V.; SHNITMAN, I.L.; VYSHESLAVTSEV, S.I., nauchnyy red.; VOLNYANSKIY, A.K., glav. red.; SOKOLOV, D.V., zam. glav. red.; TARAN, V.D., red.; SEREBRYANNIKOV, I.G., red.; MIKHAYLOV, K.A., red.; STAROVEROV, I.G., red.; VOLODIN, V.Ye., red.; NIKOLAYEVSKIY, Ye.Ya., red.; SHIROKOVA, G.M., red. izd-va; GOL'BERG, T.M., tekhn. red.

[Assembly of elevators] Montazh liftov. Moskva, Gosstroizdat, 1962. 227 p. (MIRA 15:7)

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SOKOLOV, Yu.D.; KAPLAN, Ya.L., redaktor; POLITIENKO, S.R., tekhnicheskiy redaktor.

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KOVALENKO, Anatoliy Dmitriyevich; SAVIN, G.N., redaktor; KAPLAN, Ya.L., redaktor; KRYLOVSKAYA, N.S., tekhnicheskiy redaktor.

[Plates and casings in rotors of turbine machinery] Plastiny i obolochki v rotorakh turbomashin. Kiev, Izd-vo Akademii nauk USSR, 1955. 302 p. (MLRA 8:12)

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DOBRONEVSKIY, O.V.[Dobronevs'kyi, O.V.]; SAVANCHUK, V.O.; KAPLAN, Ya.L., red.; KLIMENKO, L.I., tekhn. red.

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(Electronic digital computers)

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Smelter S. Bezdeneznyi's brigade composed of Communist Youth League members. Metallurg 7 no.10:13 O '62. (MIRA 15:9)

1. Starshiy inzh. nauchno-issledovatel'skoy laboratorii zavoda "Dneprospetsstal'" (for Kaplanskiy).
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YEVLASHENKO, Fedor Vasil'yevich; GRINIKH, A.K., inzh., retsenzent; KAPLAN, Ye.D., inzh., retsenzent; NOVIKAS, M.N., inzh., red.; BOBROVA, Ye.N., tekhn. red.

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(Railroads--Signaling)
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KAPLAN, Ye.G.

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1. Institut khimicheskoy fiziki Akademii nauk SSSR.
(Molecules)

SMIRNOV, Ye., arkhitektor; KAPLAN, Ye., inzh.

House built of prefabricated apartment units. Na stroi. Mosk. 2 no.11:9-13 N '59. (MIRA 13:3)
(Moscow--Apartment houses)
(Precast concrete construction)

KAPLAN, Ye. G.

Category: USSR B 9



Abs Jour: Zh--Kh, No 3, 1957, 7520

Author : Stepukhovich, A. D. and Kaplan, Ye. G.
Inst : Not given
Title : Kinetics and Mechanism of the Decomposition of Hydrocarbons. I. Initiation of the Cracking of Ethane by the Addition of Azomethane

Orig Pub: Zh. Fiz. Khimii, 1956, Vol 30, No 4, 928-933

Abstract: It has been shown that azomethane (I) initiates the cracking of ethane at 368°; the extent of cracking, however, is less than that observed with other hydrocarbons. The initiating effect of I depends on the rate of its decomposition. Increasing the concentration of I decreases its effectiveness. A mechanism for the initiation step of the reaction is given based on the double

Card: 1/2

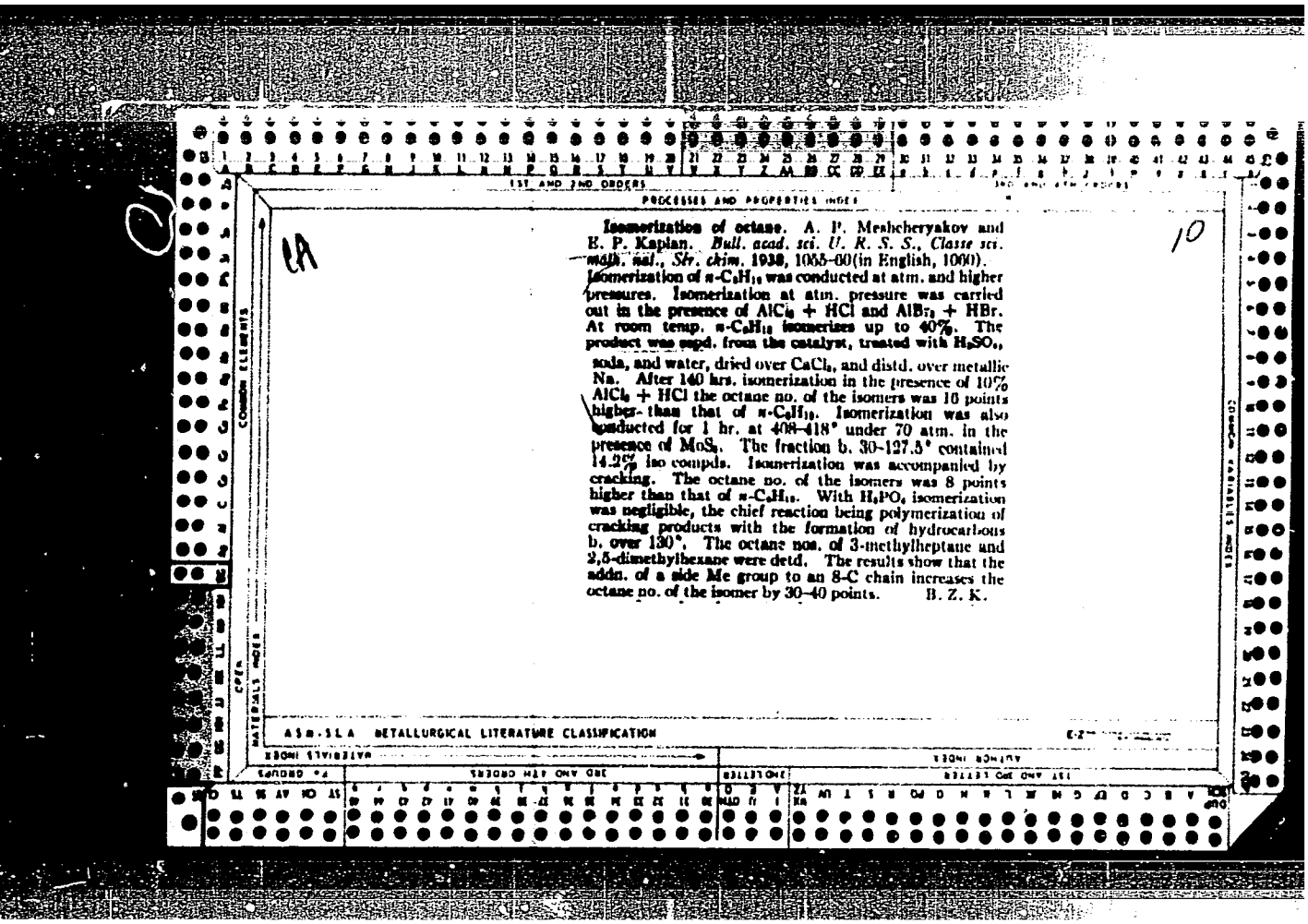


Saratov State Univ.

B 9

Category: USSR

Zh-Kh, No 3, 1957, 7520



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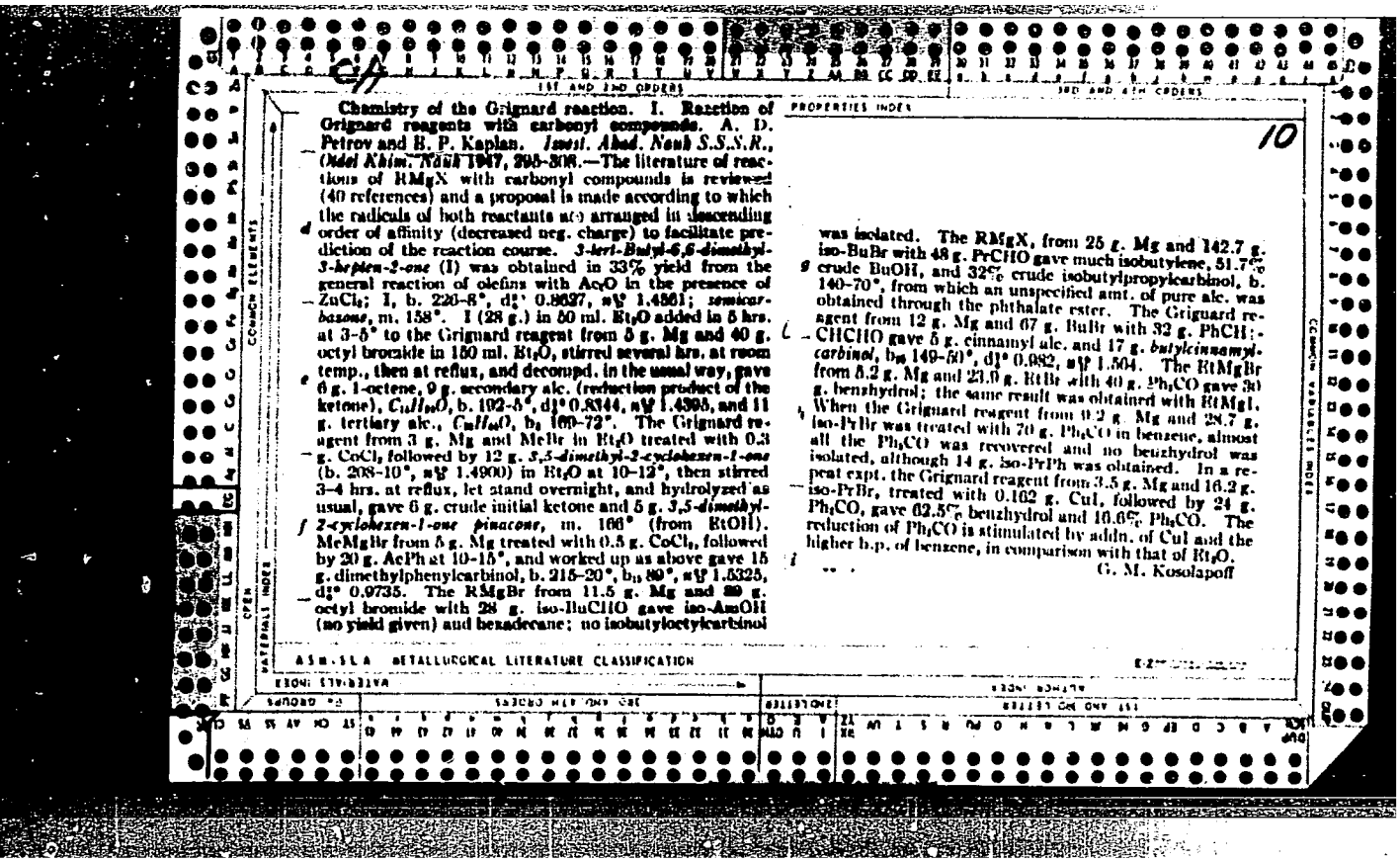
**Isomerization of octane.** A. P. Meshcheryakov and E. P. Kaplan. *Bull. acad. sci. U. R. S. S., Classe sci. math. nat., Sér. chim.* **1938**, 1055–60(in English, 1060). Isomerization of $n$-$C_6H_{14}$ was conducted at atm. and higher pressures. Isomerization at atm. pressure was carried out in the presence of $AlCl_3$ + HCl and $AlBr_3$ + HBr. At room temp. $n$-$C_6H_{14}$ isomerizes up to 40%. The product was sepd. from the catalyst, treated with $H_2SO_4$, soda, and water, dried over $CaCl_2$, and distd. over metallic Na. After 140 hrs. isomerization in the presence of 10% $AlCl_3$ + HCl the octane no. of the isomers was 16 points higher than that of $n$-$C_6H_{14}$. Isomerization was also conducted for 1 hr. at 408–418° under 70 atm. in the presence of $MoS_2$. The fraction b. 30–127.5° contained 14.2% iso compds. Isomerization was accompanied by cracking. The octane no. of the isomers was 8 points higher than that of $n$-$C_6H_{14}$. With $H_3PO_4$ isomerization was negligible, the chief reaction being polymerization of cracking products with the formation of hydrocarbons b. over 130°. The octane nos. of 3-methylheptane and 2,5-dimethylhexane were detd. The results show that the addn. of a side Me group to an 8-C chain increases the octane no. of the isomer by 30–40 points. B. Z. K.

KAPLAN, E. P.

"Synthesis and Properties of Isoparaffin Hydrocarbons of the Composition $C_{12}$ - $C_{22}$. II." Petrow, A. D., and Kaplan, E. P. (p. 102)

SO: Journal of General Chemistry (Zhurnal Obshchei Khimii) 1942, Vol 12, No 1-2.



Chemistry of the Grignard reaction. I. Reaction of Grignard reagents with carbonyl compounds. A. D. Petrov and B. P. Kaplan. *Izvest. Akad. Nauk S.S.S.R., Otdel Khim. Nauk* 1947, 295-306.—The literature of reactions of RMgX with carbonyl compounds is reviewed (40 references) and a proposal is made according to which the radicals of both reactants are arranged in descending order of affinity (decreased neg. charge) to facilitate prediction of the reaction course. *3-tert-Butyl-6,6-dimethyl-3-hepten-2-one* (I) was obtained in 33% yield from the general reaction of olefins with $Ac_2O$ in the presence of $ZnCl_2$; I, b. 220–8°, $d_4^{20}$ 0.8627, $n_D^{20}$ 1.4561; *semicarbazone*, m. 158°. I (28 g.) in 50 ml. $Et_2O$ added in 5 hrs. at 3–5° to the Grignard reagent from 5 g. Mg and 40 g. octyl bromide in 150 ml. $Et_2O$, stirred several hrs. at room temp., then at reflux, and decompd. in the usual way, gave 6 g. 1-octene, 9 g. secondary alc. (reduction product of the ketone), $C_{14}H_{30}O$, b. 102–5°, $d_4^{20}$ 0.8344, $n_D^{20}$ 1.4395, and 11 g. tertiary alc., $C_{14}H_{30}O$, $b_5$ 169–72°. The Grignard reagent from 3 g. Mg and MeBr in $Et_2O$ treated with 0.3 g. $CoCl_2$ followed by 12 g. *3,5-dimethyl-2-cyclohexen-1-one* (b. 208–10°, $n_D^{20}$ 1.4900) in $Et_2O$ at 10–12°, then stirred 3–4 hrs. at reflux, let stand overnight, and hydrolyzed as usual, gave 6 g. crude initial ketone and 5 g. *3,5-dimethyl-2-cyclohexen-1-one pinacone*, m. 166° (from EtOH). MeMgBr from 5 g. Mg treated with 0.5 g. $CoCl_2$, followed by 20 g. AcPh at 10–15°, and worked up as above gave 15 g. dimethylphenylcarbinol, b. 215–20°, $b_{15}$ 89°, $n_D^{20}$ 1.5325, $d_4^{20}$ 0.9735. The RMgBr from 11.5 g. Mg and 89 g. octyl bromide with 28 g. iso-BuCHO gave iso-AmOH (no yield given) and hexadecane; no isobutyloctylcarbinol was isolated. The RMgX, from 25 g. Mg and 142.7 g. iso-BuBr with 48 g. PrCHO gave much isobutylene, 51.7% crude BuOH, and 32% crude isobutylpropylcarbinol, b. 140–70°, from which an unspecified amt. of pure alc. was obtained through the phthalate ester. The Grignard reagent from 12 g. Mg and 67 g. BuBr with 32 g. PhCH:CHCHO gave 5 g. cinnamyl alc. and 17 g. *butylcinnamylcarbinol*, $b_{10}$ 149–50°, $d_4^{20}$ 0.982, $n_D^{20}$ 1.504. The EtMgBr from 5.2 g. Mg and 23.0 g. EtBr with 40 g. $Ph_2CO$ gave 30 g. benzhydrol; the same result was obtained with EtMgI. When the Grignard reagent from 9.2 g. Mg and 28.7 g. iso-PrBr was treated with 70 g. $Ph_2CO$ in benzene, almost all the $Ph_2CO$ was recovered and no benzhydrol was isolated, although 14 g. iso-PrPh was obtained. In a repeat expt. the Grignard reagent from 3.5 g. Mg and 16.2 g. iso-PrBr, treated with 0.102 g. CuI, followed by 24 g. $Ph_2CO$, gave 62.5% benzhydrol and 10.6% $Ph_2CO$. The reduction of $Ph_2CO$ is stimulated by addn. of CuI and the higher b.p. of benzene, in comparison with that of $Et_2O$.

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CA

**The synthesis and the physical properties of $C_n$-branched hydrocarbons.** A. D. Petrov and E. P. Kaplan. *Izvest. Akad. Nauk S.S.S.R., Otdel Khim. Nauk* **1949**, 539-44; cf. *C.A.* **37**, 1983⁹.—The following hydrocarbons with low f.ps. were synthesized by the Grignard and Wurtz techniques. Passage of caproic acid over MnO on pumice at 400-20° gave 60% *6-hendecanone*, b. 222°, $n_D^{20}$ 1.4365, $d_4^{20}$ 0.8300, f.p. 13° (*semicarbazone*, m. 43°; *p-nitrophenylhydrazone*, m. 68°); this gave on hydrogenation over Ni oxide at 180-200° an unstated yield of *6-hendecanol*, m. 20°, $d_4^{20}$ 0.8360, $n_D^{20}$ 1.4390, which (60 g.) with 100 g. $PBr_3$ gave 85 g. *6-bromohendecane*, $b_{16}$ 110°, $n_D^{20}$ 1.4550, $d_4^{20}$ 1.04; the latter (75 g.) added to 15 g. Na in 100 ml. $Et_2O$ and refluxed 8 hrs. gave 22% *6,7-diamyldodecane*, $b_{17}$ 186-8°, $n_D^{20}$ 1.4520, $d_4^{20}$ 0.8053. Addn. of 18 g. Na and 16 ml. $H_2O$ in small portions to 60 g. 6-hendecanone in 100 ml. moist $Et_2O$ over 40 hrs. (200 ml. $Et_2O$ also added to preserve fluidity) gave 20% *6,7-diamyl-6,7-decanediol*, $b_{16}$ 225-30°, m. 42°, as well as 25 g. 6-hendecanol; the diol (10 g.), 25 g. red P, and 250 g. HI heated 12 hrs. to 240-50° gave 8 g. 6,7-diamylhendecane, identical with the above. $C_5H_{11}MgBr$ (from 270 g. RBr) in 300 ml. $Et_2O$, treated at 5-6° with 65 g. $CO(OEt)_2$ and refluxed 3 hrs. gave a small amt. of *8-pentadecanone*, $b_{16}$ 60-109° (crude), m. 41° (from EtOH) (*oxime*, m. 20°; *p-nitrophenylhydrazone*, m. 95°), and 105 g. *8-heptyl-7-pentadecene*, $b_{16}$ 205-8°, $n_D^{20}$ 1.4515, $d_4^{20}$ 0.8035; no 8-heptyl-8-pentadecanol was obtained, and Moyer and Marvel's (cf. *C.A.* **25**, 2113) alc. might be the above olefin; the olefin (70 g.) hydrogenated over Raney Ni at 180° gave *8-heptylpentadecane*, $b_{16}$ 215-16°, $n_D^{20}$ 1.4515, $d_4^{20}$ 0.8036. Passage of $C_6H_{11}CO_2H$ over MnO at 400-20° gave 55% *7-tridecanone*, b. 251°, m. 30° (*p-nitrophenylhydrazone*, m. 90°); this (198 g.) and $PhCH_2CH_2CH_2MgBr$ (from 224 g. RBr, $b_{16}$ 118°) yielded 40% $Ph(CH_2)_3C(OH)(C_6H_{13})_2$, $b_{17}$ 212-3°, $d_4^{20}$ 0.8980, $n_D^{20}$ 1.4910, which on dehydration over $KHSO_4$ in vacuo gave *1-phenyl-4-hexyl-3-decene*, $b_{16}$ 215-16°, $n_D^{20}$ 1.4972, $d_4^{20}$ 0.8767 [ozonization gave dihexyl ketone, m. 30°, and $PhCH_2CH_2CO_2H$, m. 147° (amide, m. 103°)]; hydrogenation of the olefin over Raney Ni in MeOH gave *1-phenyl-4-hexyldecane*, $b_{16}$ 198-216°(?), $d_4^{20}$ 0.8745, $n_D^{20}$ 1.4935, which on further hydrogenation at 180° gave the *1-cyclohexyl analog*, $b_{16}$ 200-2°, $n_D^{20}$ 1.4750, $d_4^{20}$ 0.8332.

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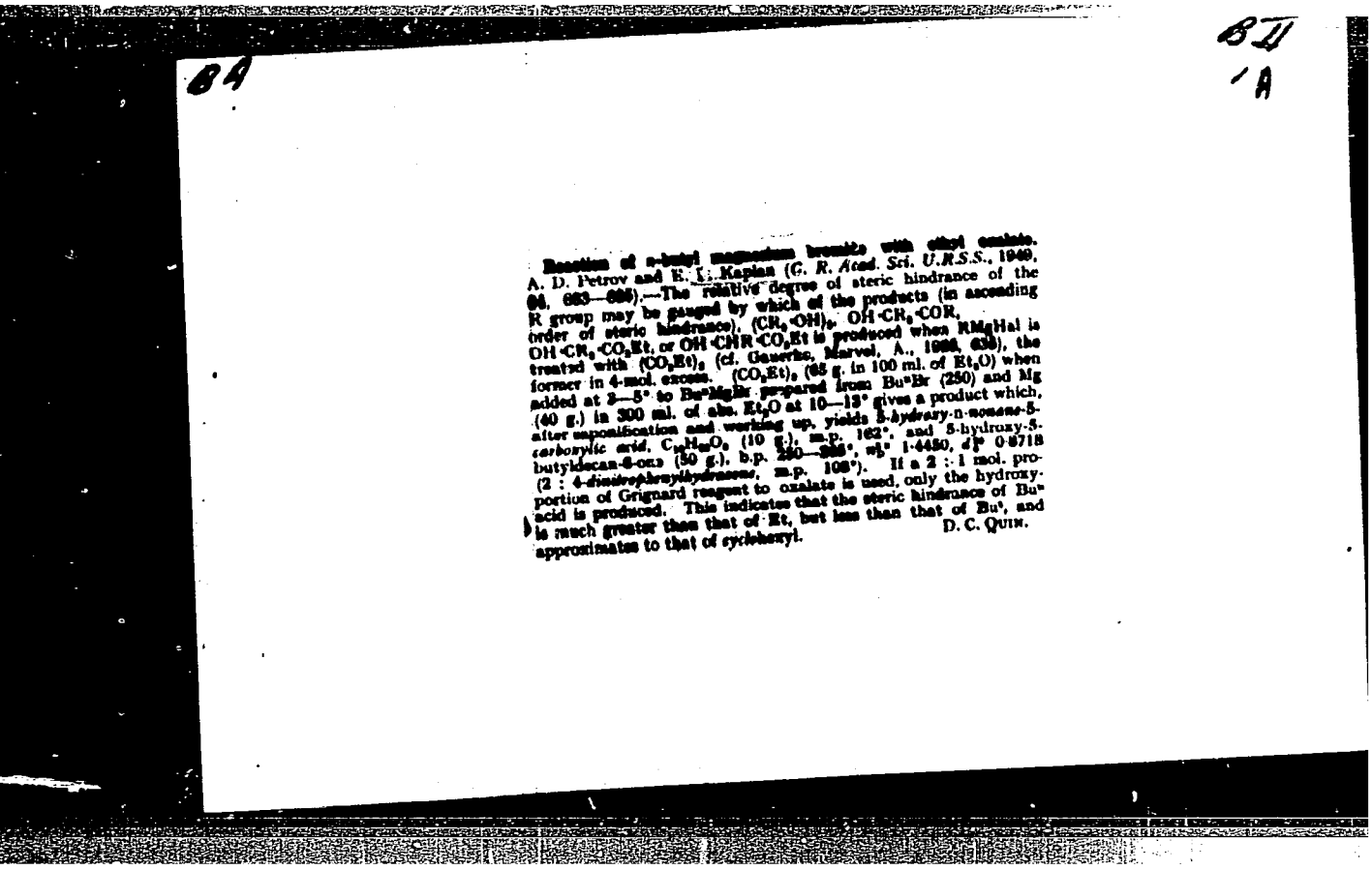


B4

B II
1A

**Reaction of n-butyl magnesium bromide with ethyl oxalate.** A. D. Petrov and E. I. Kaplan (*C. R. Acad. Sci. U.R.S.S.*, 1949, **64**, 683—686).—The relative degree of steric hindrance of the R group may be gauged by which of the products (in ascending order of steric hindrance), $(CR_2{\cdot}OH)_2$, $OH{\cdot}CR_2{\cdot}COR$, $OH{\cdot}CR_2{\cdot}CO_2Et$, or $OH{\cdot}CHR{\cdot}CO_2Et$ is produced when RMgHal is treated with $(CO_2Et)_2$ (cf. Gaverke, Marvel, A., 1928, 630), the former in 4-mol. excess. $(CO_2Et)_2$ (65 g. in 100 ml. of $Et_2O$) when added at 3—5° to $Bu^nMgBr$ prepared from $Bu^nBr$ (250) and Mg (40 g.) in 300 ml. of abs. $Et_2O$ at 10—13° gives a product which, after saponification and working up, yields *5-hydroxy-n-nonane-5-carboxylic acid*, $C_{10}H_{20}O_3$ (10 g.), m.p. 162°, and 5-hydroxy-5-butyldecan-6-one (50 g.), b.p. 250—255°, $n_D^{15}$ 1·4450, $d_4^{15}$ 0·8718 (2 : 4-*dinitrophenylhydrazone*, m.p. 108°). If a 2 : 1 mol. proportion of Grignard reagent to oxalate is used, only the hydroxy-acid is produced. This indicates that the steric hindrance of $Bu^n$ is much greater than that of Et, but less than that of $Bu^t$, and approximates to that of cyclohexyl. D. C. QUIN.

KAPLAN, Ye.P.

NESMEYANOV, A.N., akademik, otvetstvennyy redaktor; BOBROV, P.A., doktor khimicheskikh nauk, otvetstvennyy redaktor; YELIZAROVA, A.N., kandidat khimicheskikh nauk, chlen redaktsionnoy kollegii; KAPLAN, Ye.P., kandidat khimicheskikh nauk, sekretar'; LIBERMAN, A.L., kandidat khimicheskikh nauk, chlen redaktsionnoy kollegii; NAGIBINA, T.D., kandidat khimicheskikh nauk, chlen redaktsionnoy kollegii; RUDENKO, V.A., kandidat khimicheskikh nauk, zamestitel' otvetstvennogo redaktora; RYDUS, Ya.T., doktor khimicheskikh nauk, chlen redaktsionnoy kollegii.

[Syntheses of organic compounds] Sintezy organicheskikh khimii. Moskva, Izd-vo Akademii nauk SSSR. Vol.2. 1952. 190 p. (MLRA 6:5)

1. Akademiya nauk SSSR, Institut organicheskoy khimii.
(Chemistry, Organic)

KAPLAN, E. P.

USSR/ Chemistry Reaction processes

Card : 1/1 Pub. 151 - 13/33

Authors : Petrov, A. D., and Kaplan, E. P.

Title : Grignard-Wuertz reactions between beta- and gamma-alkyl halides

Periodical : Zhur. ob. khim. 24/8, 1355 - 1360, August 1954

Abstract : The behavior of primary alkyl halides with ternary bond, in beta- and gamma positions in condensation reactions, was investigated. The products obtained from the reaction between primary alkyl-halide, having a ternary bond in beta-position with RMgX, are described. It was found that halohydrin, having a ternary bond in gamma position, does not condense with RMgX. Fourteen references: 7 USSR; 4 USA; 1 English and 2 German (1907 - 1953).

Institution : Acad. of Sc. USSR, Institute of Organic Chemistry

Submitted : February 19, 1954

KAPLAN, E. P.

C11

Isomeric transformations of acetylenic halides in the synthesis of alcohols. A. D. Petrov and E. P. Kaplan (Inst. Org. Chem., Acad. Sci. U.S.S.R., Moscow). *Zhur. Obshchei Khim.* 25, 1323-7(1955).—Reaction of β-acetylenic halides with ketones in the presence of Mg and Zn results in propargylic rearrangement yielding a mixt. of acetylenic and allenic ales. $MeC{:}CCH_2Br$ (from ROH and $PBr_3$, $b_{20}$ 40-1°, $n_D^{20}$ 1.5093, $d_4^{20}$ 1.5187) (67 g.) was added to 36 g. Mg, 0.1 g. $HgCl_2$ in $Et_2O$ over 16 hrs. at 25-30°, after which 48 g. cyclohexanone was added; usual treatment of the mixt. with dil. HCl-ice gave 20% $C_9H_{16}O$ ales. (I), $b_5$ 90-2°, $n_D^{20}$ 1.4994, $d_4^{20}$ 0.9696, whose infrared absorption at 4.94, 5.8, 4.58 and 6.07 μ indicated the presence of both allenic and acetylenic bonds; ozonolysis gave $HCO_2H$, AcOH, cyclohexanol-1-acetic acid and Me 1-hydroxycyclohexyl ketone. The above RMgBr with $Me_2CO$ gave again a *mixt.* of $C_7H_{12}O$ *ales.*, $b_4$ 42-4°, $n_D^{20}$ 1.4625, $d_4^{20}$ 0.8745, contg. allenic and acetylenic bonding as shown by infrared absorption. AcPh gave similar mixed $C_9H_{14}O$ *ales.* (II), $b_5$ 118-19°, $n_D^{20}$ 1.5450, $d_4^{20}$ 1.0056. To 20 g. Zn shavings, 0.2 g. $HgCl_2$, and $Et_2O$ was added at 30° slowly 40 g. $MeCl{:}CCH_2Br$ and 30 g. cyclohexanone; after 30 min. a spontaneous reaction started, and after its subsidence the mixt. was stirred 3 hrs. and decompd. with aq. AcOH yielding 43% I, $b_{20}$ 110-12°, $d_4^{20}$ 0.9690, $n_D^{20}$ 1.4993, the ozonolysis of which gave the same result as above, except for the lack of 1-cyclohexanolacetic acid. Stirring the ales. with aq. MeOH-$H_2SO_4$ and $HgSO_4$ gave a ketone, whose semicarbazone, m. 162° (no analysis shown). Similar reaction with AcPh gave mixed ales. II, $b_4$ 130-8°, $n_D^{20}$ 1.5455, $d_4^{20}$ 1.0050, whose infrared spectrum was similar to the above and ozonolysis gave 2-phenyl-2-butanol-3-one, whose semicarbazone, m. 183°, $HCO_2H$ and AcOH. Cf. Woltz, *et al.*, *C.A.* 47, 4883a. Also in *J. Gen. Chem. U.S.S.R.* 25, 1269-73(1955)(Engl. translation).

G. M. Kosolapoff

(1)

enyls and dialkyldihydrodiphenyls in the proportion [illegible]
The latter solidifies at lower temperatures, often to a
glass-like form. 77g. of diphenyl(II), 400cc ether,
200 cc $C_6H_6$ and 7 g. Li are shaken for 60 hours, after
[illegible] is added 120 g. n-$C_6H_{13}Br$. After
fractional distillation are obtained 39 g. 4-hexyl-1,4-
dihydrodiphenyl b.p. 199-200°/5 mm, solid. p. 7°(crystals),



Card : 1/3

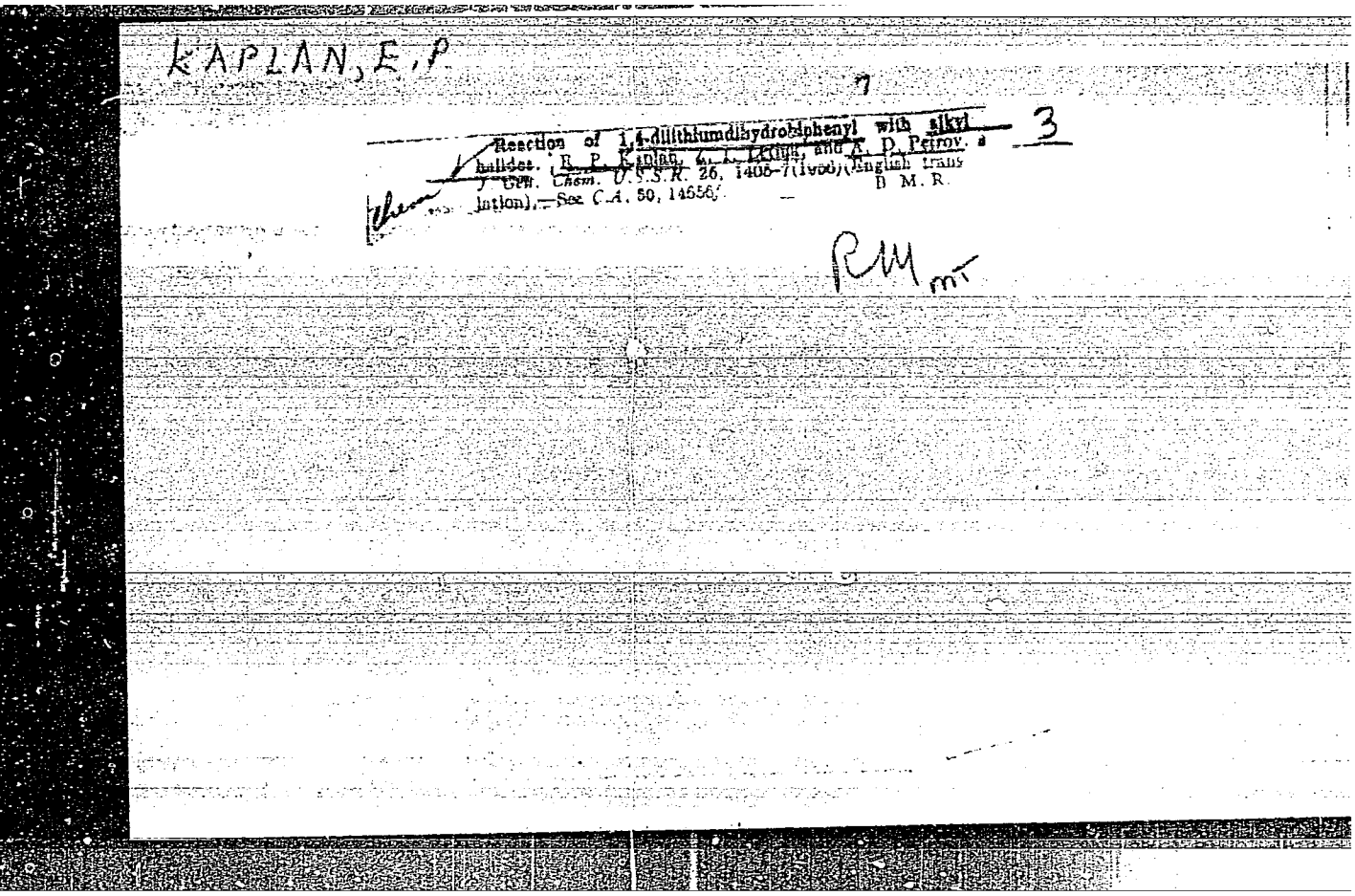
Abs Jour: Ref Zhur-Khimiya, No 6, 1957, 19251

$n^{20}D$ 1.5484, $d_4^{20}$ 0.9435, and 15 g. 1,4-dihexyl-1,4- dihydrodiphenyl, b.p. 220-221°/5 mm, solid. p. -35°(glass), $n^{20}D$ 1.5248, $d_4^{20}$ 0.9241. In an analogical way from I (from 77g. II) and 130 g. 2-ethylhexylbromide we obtained 25 g. 4-(-ethylhexyl)-1,4-dihydrodiphenyl, b.p. 210-211°/5 mm, solid. p. -40° (glass), $n^{20}D$ 1.5460, $d_4^{20}$ 0.9425 and 15g. 1,4-di-(2-ethylhexyl)-1,4-dihydrodiphenyl, b.p. 269-270°/5 mm, solid. p. -19°(glass), $n^{20}D$ 1.5200, $d_4^{20}$ 0.9187. From I and 140 g. sec-$C_8H_{17}Br$ is obtained 22g. 4-sec-octyl-1,4-dihydrodiphenyl, b.p. 208°/5 mm, solid. p. -38° (glass), $n^{20}D$ 1.5500, $d_4^{20}$ 0.9440 and 8g. of 1,4-di(sec-octyl)-1,4-dihydrodiphenyl, b.p. 258°/5 mm solid. p. 18° (glass), $n^{20}D$ 1.5297, $d_4^{20}$ 0.9285. From I and 105 g. n-$C_9H_{19}Br$ is obtained 18g. 4-n-nonyl-1,4-dihydrodiphenyl, b.p. 223-224°/5 mm, m.p. 28°, and 10 g. 1,4-di-(n-nonyl)-1,4-dihydrodiphenyl, b.p. 287-288°/5 mm, solid.

PETROV, A.D.; KAPLAN, Ye.P.; LETINA, Z.I.

Metal-organic synthesis of dibiphenylalkanes and their hydrogenation.
Zhur.ob.khim.26 no.5:1246-1248 My '56. (MLRA 9:9)

1.Institut organicheskoy khimii Akademii nauk SSSR.
(Paraffins) (Organometallic compounds) (Hydrogenation)



KAPLAN, E. P.

7

Reaction of 1,4-dilithiumdihydrodiphenyl with alkyl halides. R. P. Kaplan, G. I. Lichtin, and A. D. Petrov. J. Gen. Chem. U.S.S.R. 26, 1408-7(1956)(English trans lation).—See C.A. 50, 14656.

3

B. M. R.

RM mt

AUTHORS: Petrov, A. D., Kaplan, Ye. P., Letina, Z. I., Yegorov, Yu. P. 79-28-3-9/61

TITLE: Metallo-Organic Synthesis of Dibiphenylalkanes and Diphenylalkanes III (Metalloorganicheskiy sintez dibifenilalkanov i difenilalkanov III)

PERIODICAL: Zhurnal Obshchey Khimii, 1958, Vol. 28, Nr 3, pp. 608-612 (USSR)

ABSTRACT: The authors described in earlier works (Refs 1,2) an hydrocarbon synthesis of the dibiphenylalkane- and alkyl-1,4-dihydrophenyl series. In the present paper they give further supplementary investigations with respect to the synthesis of these series of hydrocarbons. The reaction of 4-bromomagnesiumdiphenyl with the ethyl ester of undecilen and palmitic acid furnished alcohols which by dehydration converted to olefines in order to convert subsequently above nickel step-by-step to naphthene hydrocarbons by hydrogenation. The heat of fusion as well as the viscosity at various temperatures were determined for the synthetized products. It was found that with an elongation of the

Card 1/3

alkyl radical to a certain limit the heat of fusion drops, irrespective of the increase of molecular weight, and then it suddenly rises (see formulae with heat of fusion). The viscosity of hydrocarbons decreases with the elongation of the lakylchain, the viscosity index changing little (fig.1). According to Schlenk and Bergmann (Ref 3) lithium is bound to diphenyl in the position 1,4. 1,4-dilithiumdihydrophenyl forming in this process. On the action of $n\text{-}C_4H_9Br$ and $n\text{-}C_{10}H_{19}Br$ on the latter monoalkyldihydrodiphenyls and dialkyldihydrodiphenyls were obtained (see reaction process). In order to determine the position (1 or 4) of the alkylchain in the monoalkyldihydrodiphenyls a dehydration of $n\text{-}C_4H_9$- and $n\text{-}C_6H_{13}$-1,4-dihydrophenyls with sulfur was carried out. The synthetized 4-butyl- and 4-hexyldiphenyls were almost identical with respect to their heat of fusion to the hydrocarbons earlier obtained by another method. This bears out the fact that the alkyl chains in monoalkyldihydrodiphenyls are in position 4.

Metallo-Organic Synthesis of Dibiphenylalkanes and Diphenylalkanes III 79-28-3-9/61

The dibicyclohexyldecylmethane and dibicyclohexylpentadecylmethane were synthetized. The 4-Butyl-, 1,4-Dibutyl-, 4-Decyl- and 1,4 Didecyl-1,4-dihydrodiphenyl were obtained. The ultraviolet spectra 12 of the alkyl-1,4-dihydrophenyls were determined and the authors showed that in the lithium-organic synthesis of these compounds mainly binding systems occur beside such of quinoid structure. There are 2 figures, 1 table, and 7 references, 2 of which are Soviet

ASSOCIATION: Institut organicheskoy khimii Akademii nauk SSSR (Institute for Organic Chemistry, AS USSR)

SUBMITTED: January 16, 1957

Card 3/3

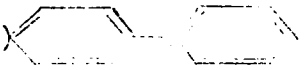
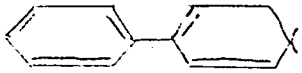
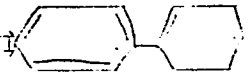
AUTHORS: Yegorov, Yu. P., Kaplan, Ye. P., Letina, Z. I., Shlyapochnikov, V. A., Petrov, A. D.

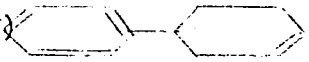
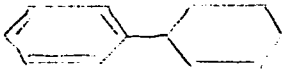
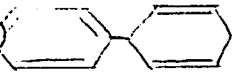
SOV/79-28-12-21/41

TITLE: On the Order of Affiliation of Lithium to Diphenyl (O poryadke prisoyedineniya litiya k difenilu)

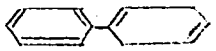
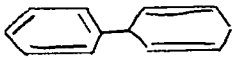
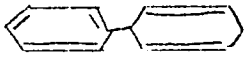
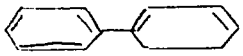
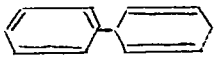
PERIODICAL: Zhurnal obshchey khimii, 1958, Vol 28, Nr 12, pp 3258-3262 (USSR)

ABSTRACT: Continuing the papers of references 1 - 6 the authors intended to determine more in detail the points of affiliation of lithium to diphenyl. In connection herewith the ultraviolet and infrared absorption spectra of the following hydrocarbons synthesized by them were taken:

(I)  (II)  (III) 

(IV)  (V)  (VI) 

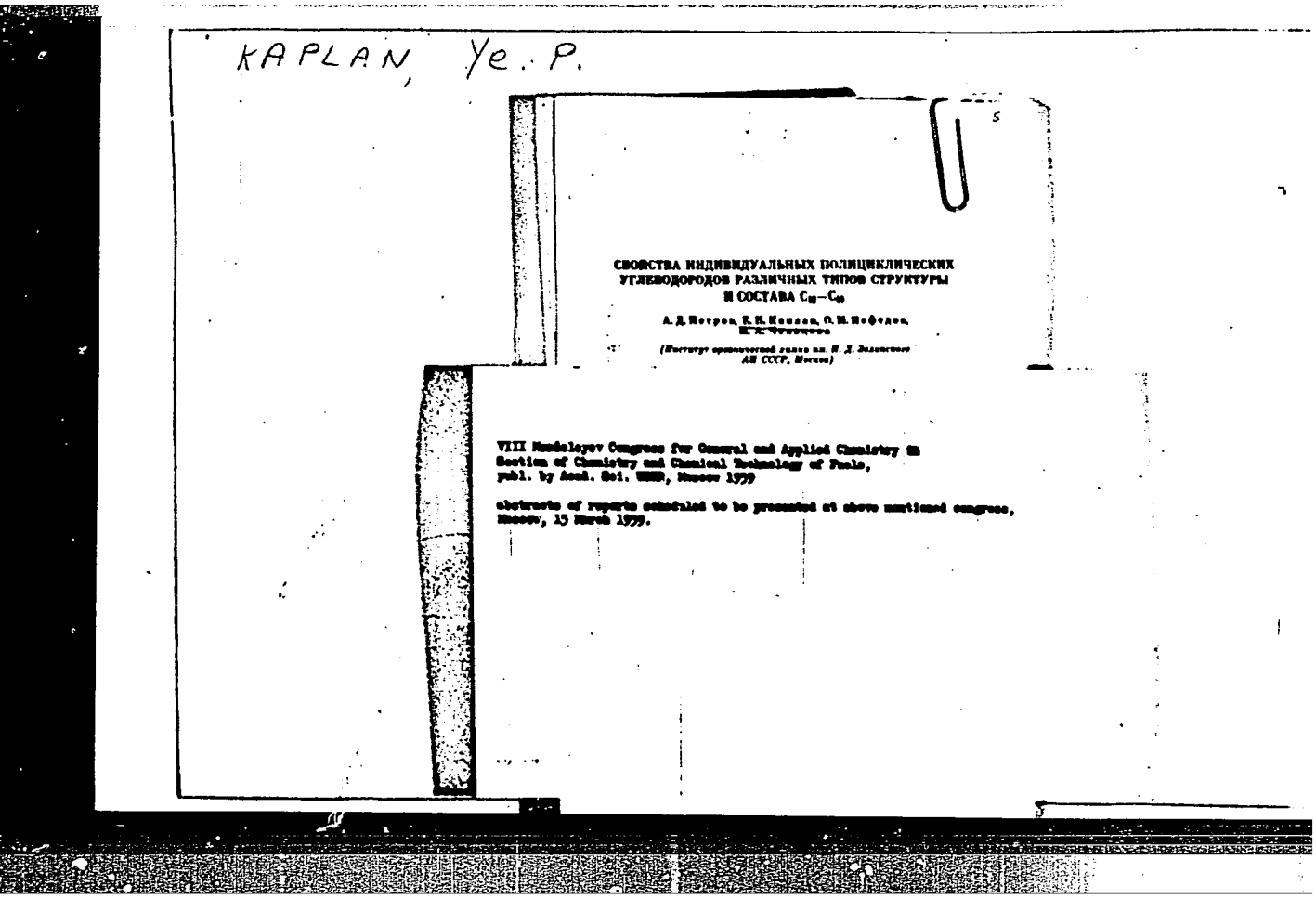
Card 1/3

The ultraviolet absorption spectra may be seen in figure 1; they show the abrupt deviation of the spectra (I), (II), (III) and (VI) from (IV) and (V). The spectra (IV) and (V) are the same and differ only slightly from the known ultraviolet spectra of monosubstituted benzenes. These data do not prove the quinoid structure of the second nucleus in (VI). Therefore, when taking into account the intensity ($\varepsilon$) in the spectrum (VI) (12,000), its structure corresponds to the form  . Generally speaking, it may be assumed that there is also a mixture of diphenyl with  or (II) with  , as well as  with  . The infrared absorption spectra taken agree with the ultraviolet ones as concernos their results; they show that the synthesized hydrocarbons may be divided into two groups, i.e. into those (I, II, III, VI) having con-

jugated bonds with the phenyl nucleus, and those (IV) and (V) not having such a bond (Fig 2). Starting from what was said it may be assumed that the affiliation of lithium to the diphenyl takes place in position 3,6, not in position 1,4, as reported by Schlenk and Bergmann (Shlenk, Bergman). There are 2 figures and 13 references, 3 of which are Soviet.

ASSOCIATION: Institut organicheskoy khimii Akademii nauk SSSR (Institute of Organic Chemistry, Academy of Sciences, USSR)

SUBMITTED: November 28, 1957



KAPLAN, Ye. P.

5

СВОЙСТВА ИНДИВИДУАЛЬНЫХ ПОЛИЦИКЛИЧЕСКИХ УГЛЕВОДОРОДОВ РАЗЛИЧНЫХ ТИПОВ СТРУКТУРЫ И СОСТАВА $C_{18}$–$C_{30}$

А. Д. Петров, Е. П. Каплан, О. М. Нефедов, [illegible]

(Институт органической химии им. Н. Д. Зелинского АН СССР, Москва)

VIII Mendeleyev Congress for General and Applied Chemistry in Section of Chemistry and Chemical Technology of Fuels, publ. by Acad. Sci. USSR, Moscow 1959

abstracts of reports submitted to be presented at above mentioned congress, Moscow, 19 March 1959.

5(3) SOV/62-59-8-14/42

AUTHORS: Landa, S., Weiser, O., Kaplan, Ye. P., Kao Ch'ing-lang, Petrov, A. D.

TITLE: Synthesis of Some Highly Branched Paraffin Hydrocarbons

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1959, Nr 8, pp 1425-1432 (USSR)

ABSTRACT: In the present paper the hydrogenation of tertiary alcohols and ditertiary glycols with two isopropyl or tertiary butyl groups at the carbon atom in the presence of molybdenum sulfide is carried out. By means of this hydrogenation hydrocarbons with an equal, or usually even lower, number of carbon atoms could be obtained. In the case of compounds with tertiary butyl radicals (one or two), these radicals split off in the dehydrogenation process while hydrocarbons were formed which contain 4 - 8 carbon atoms less than the initial products. Analogous alcohols and glycols with isopropyl groups remained stable during hydrogenation and hydrocarbons with the same carbon structure as the oxygen-containing initial products were formed. By means of hydrogenation a high yield of 2-methyl-3-isopropyloctane and 2,9-dimethyl-3,8-diisopropyldecane could be gained from the compounds of 2-methyl-3-isopropyloctanol and 2,9-dimethyl-3,8-diisopropyldecanediol-

Card 1/2

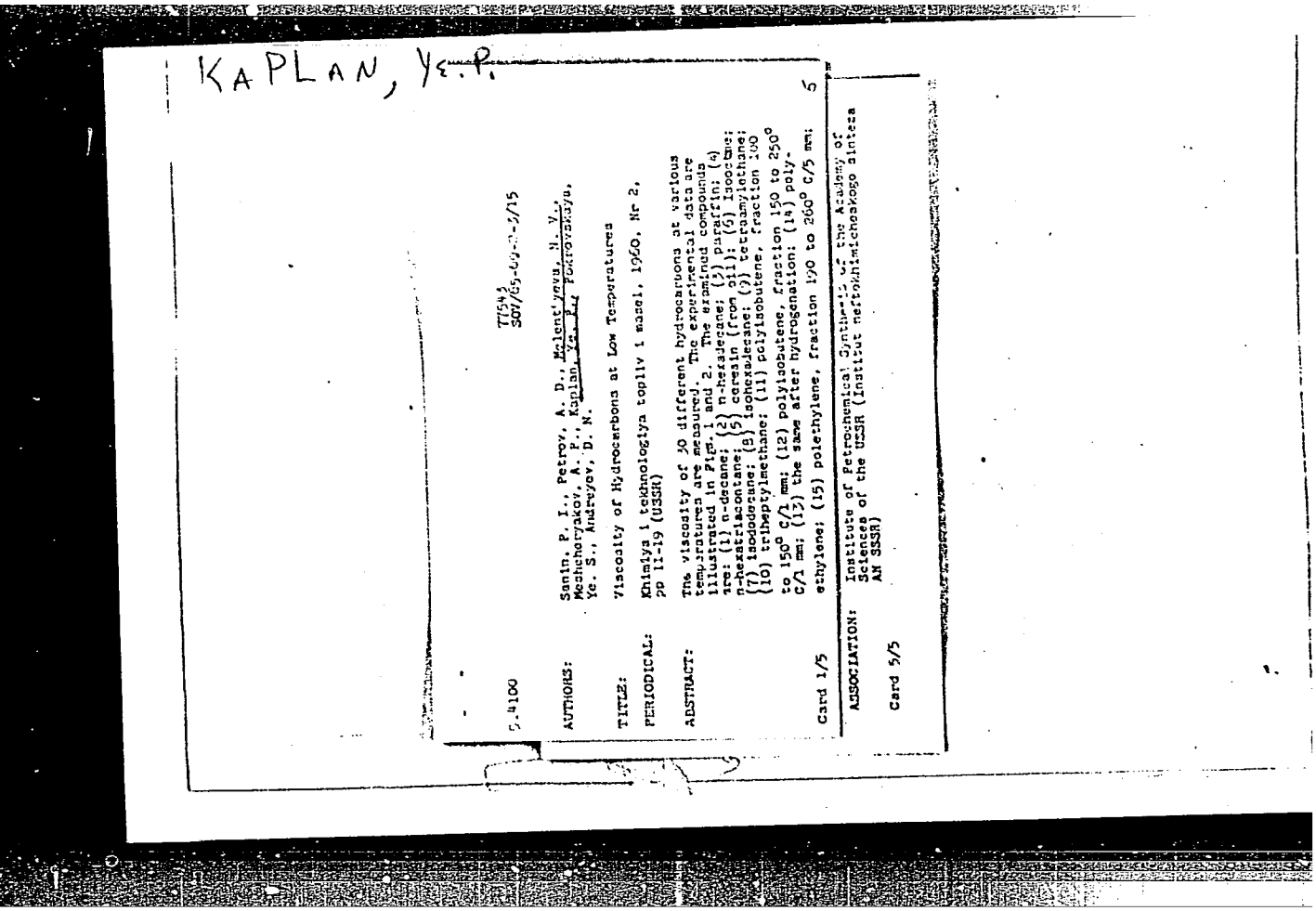
Synthesis of Some Highly Branched Paraffin Hydrocarbons SOV/62-59-8-14/42

3,8. The synthesis of the individual compounds and the hydrogenation reactions are described in the experimental part. A survey on the tests containing also the properties of the compounds is given in table 2. The individual substances were identified by means of infrared spectra and elementary analyses (Figs 1-3). The elementary analyses were carried out by T. Leki in the analytical laboratory of the Chair of Synthetic Motor Fuels of the Higher Education School of Chemical Technology in Prague The infrared spectra were taken at the Chair of Special Analytical Methods (Professor F. Cuta ) under the supervision of Engineer L. Novotný and A. Kchutova whom the authors thank for their work. There are 3 figures, 2 tables, and 12 references, 5 of which are Soviet.

ASSOCIATION: Higher Education School of Chemical Technology, Prague

SUBMITTED: January 28, 1959

Card 2/2



KAPLAN, Ye. P.

5.4100

TITLE: Viscosity of Hydrocarbons at Low Temperatures

PERIODICAL: Khimiya i tekhnologiya topliv i masel, 1960, Nr 2, pp 11-19 (USSR)

ABSTRACT: The viscosity of 30 different hydrocarbons at various temperatures are measured. The experimental data are illustrated in Figs. 1 and 2. The examined compounds are: (1) n-decane; (2) n-hexadecane; (3) paraffin; (4) n-hexatriacontane; (5) ceresin (from oil); (6) isooctane; (7) isododecane; (8) isohexadecane; (9) tetramylethane; (10) triheptylmethane; (11) polyisobutene, fraction 100 to 150° C/1 mm; (12) polyisobutene, fraction 150 to 250° C/1 mm; (13) the same after hydrogenation; (14) polyethylene; (15) polychylene, fraction 190 to 260° C/5 mm;

Card 1/5

ASSOCIATION: Institute of Petrochemical Synthesis of the Academy of Sciences of the USSR (Institut neftekhimicheskogo sinteza AN SSSR)

Card 5/5

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E196/E485

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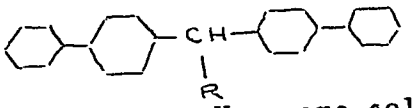
AUTHORS: Petrov, A.D., Kaplan, Ye.P., Letina, I.Z.

TITLE: Organomagnesium and lithium syntheses of di-biphenylalkanes, diphenylalkanes and their hydrogenated derivatives

SOURCE: Vsesoyuznoye soveshchaniye po khimicheskoy pererabotke neftyanykh uglevodorodov v poluprodukty dlya sinteza volokon i plasticheskikh mass. Baku, 1957. Baku, Izd-vo AN Azerb. SSR, 1960, 295-303

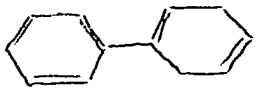
TEXT: Reduction with Cu-Cr catalyst of alcohols obtained by reaction between p-diphenylbromide and aliphatic esters (acetic, butyric, caprylic, undecylenic, palmitic) leads to alkylaromatic hydrocarbons which on hydrogenation with Raney Ni give naphthenic derivatives of general formula



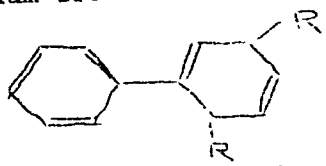
Those with R = $C_7H_{15}$ and $C_{10}H_{21}$ are colourless, mobile liquids at room temperature, the others (R = $CH_3$, $C_3H_7$, $C_{15}H_{31}$) are crystalline solids. Their viscosities (in centistokes) are

Organomagnesium and lithium ...

given for a temperature range 20 to 150°C. The viscosities decrease with increasing molecular weight. Chemical stability increases both in order of ascending molecular weight and with increasing length of side chains irrespectively of branching. Dialkyldiphenyls with two aliphatic chains attached to the same ring were prepared by treating dilithiumdihydrodiphenyl with an alkyl halide. Mono- and di-substituted derivatives were obtained and were separated by vacuum fractionation:



and




The mono derivatives, R = $C_4H_9$, $C_6H_{13}$, $C_6H_{19}$, $C_{10}H_{21}$ crystallize at -1, 7, 20 and 35°C, the disubstituted ones solidify to glasses at -19, -25, -12 and 15°C respectively. Viscosities in the range 20 to 150°C are also given. The UV spectra of both the mono and di-substituted dihydrodiphenyls are identical but for the intensities of their characteristic bands. The UV and IR spectra provide conclusive evidence that diphenyl [illegible] with lithium at

Card 2/3

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77854
SOV/79-30-2-5/78

AUTHORS: Kaplan, Ye. P., Kazakova, Z. I., Petrov, A. D.

TITLE: Synthesis and Properties of 4-Alkyl- and 4,4'-Dialkylbiphenyls and Their Hydrogenation Products of Composition $C_{16}$-$C_{32}$

PERIODICAL: Zhurnal obshchey khimii, 1960, Vol 30, Nr 2, pp 369-376 (USSR)

ABSTRACT: The authors synthesized 4-alkyl- and 4,4'-dialkylbipheny with the alkyl chains--$C_4H_9$, $C_6H_{13}$, $C_7H_{15}$, $C_8H_7$, and $C_5H_{11}$—$CH(C_3H_7)$-- by stepwise acylation of biphenyl with the butyryl chloride in nitrobenzene at -2 to -5° over $AlCl_3$ with subsequent reduction of the ketone (over amalgamated zinc). The 4,4'-bi-(decyl-4")-bicyclohexane was prepared by the scheme:

Card 1/9

Synthesis and Properties of 4-Alkyl- and 4,4'-Dialkylbiphenyls and Their Hydrogenation Products of Composition $C_{16}$-$C_{32}$

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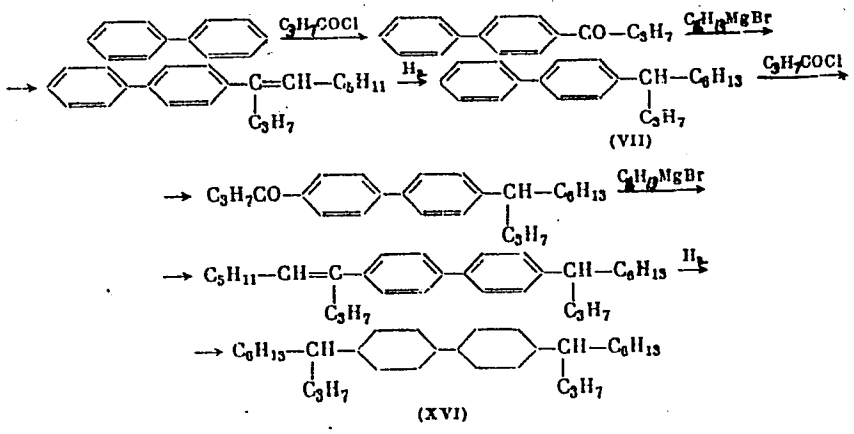
SOV/79-30-2-5/78




(VII)

(XVI)

Card 2/9