NEIMAN, M. B., YEFREMOV, V. Ya., and PANFILOV, V. N.

"Determination of the Alchol Content in the oxidation products of propylene and butane (C^{14} was used)."

report presented at The Use of Radioactive Isotopes in Analytical Chemistry, Conference in Moscow. 2-4 Dec 1957.
Vestnik Ak Nauk SSSR, 1958, No. 2, (author Rodin, S. S.)

NEYMAN, ~~M.B.~~ M.B.

21

10

4E2c(j)

2 may

Process of forming carbon dioxide in the preparation of divinyl from butane-butylene mixtures. A. A. Balandin, M. B. Neiman, O. K. Bogdanova, G. V. Isagulyants, A. P. Shcheglova, and E. I. Popov. *Izvest. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk* 1957, 270-3.—The formation of CO_2 during the dehydrogenation of butane-butylene mixts. was studied. It was shown that the major part of the CO_2 is formed as a result of the decompn. of divinyl. J. R. L.

NEYMAN, M. G.

MOSHKINA, R.I.; NALBANDYAN, A.B.; NEYMAN, M.B.; FEKLISOV, G.I.

Tracer method for studying methane oxidation reaction. Report No.2: Mechanism of carbon dioxide formation. Izv.AN SSSR.Otd.khim.nauk. no.7:801-805 Jl '57. (MIRA 10:10)

1.Institut khimicheskoy fiziki AN SSSR.
(Chemical reaction--Mechanism)
(Carbon dioxide)

Neyman, M. B.

89-11-9/9

AUTHORS: Kurdyumov, G. V., Neyman, M. B., Frank, G. M.

TITLE: The Use of Radioactive Isotopes in the USSR (Primeneniye radioaktivnykh izotopov v SSSR)

PERIODICAL: Atomnaya Energiya, 1957, Vol. 3, Nr 11, pp. 465-478, (USSR)

ABSTRACT: Only some of the most important uses of radioactive isotopes in chemistry, biology, medicine and agriculture are described:

I. Radioactive isotopes in chemistry.
  1) Anorganic chemistry.
    a) Mechanism 66 the isotope of complex compounds of Pt, Br.
    b) Mechanism of the formation of thiosulphate.
    c) Establishment of the diffusion exchange theory for the systems solid body-gas, solid-liquid, etc.
  2) Analytical chemistry.
    a) Use of indicators.
    b) Absorption of carbon for the separation and purification of radioisotopes.
    c) Chromatographic separation of salts and gaseous mixtures.
  3) Physical chemistry.
    a) Determinations of the vapor pressure of metals, salts and oxides.
    b) Rapid method for the determination of solubility.
  4) Chemical kinetics
  5) Organic chemistry

Card 1/3

The Use of Radioisotopes in the USSR. 89-11-9/9

1) Determination of the actual course of photosynthesis
2) Determination of the actual process of nutrition in plants
3) Biosynthesis of chlorophyll
4) Improvement of fertilizers

There are 3 figures and 98 references.

AVAILABLE: Library of Congress

Card 3/3

NEYMAN, M.B.

Discovery of the 101st element, mendelevium. Dos. such. fiz. no.5:127-130 '57. (MIRA 16:6)

(Transuranium elements)

NEYMAN, M.B., doktor khimicheskikh nauk, professor

How one finds out about atomic blasts. Nauka i zhizn' 24 no.3: 63 Mr '57. (MLRA 10:5)

(Atomic bomb--Testing)

Neyman, M. B.

AUTHOR	NEYMAN M.B., MEDVEDEVA, N.I. 20-2-42/62 and TORSUYEVA, Ye. S.
TITLE	The Kinetic Method of the Use of Tagged Atoms in Propane Cracking Research (Kineticheskiy metod primeneniya mechenykh atomov pri issledovanii krekinga propana)
PERIODICAL	Doklady Akademii Nauk SSSR 1957, Vol 115, Nr 2, pp 347-350 (U.S.S.R.)
ABSTRACT	According to present conceptions the reactions of thermal decomposition of hydrocarbons are chain reactions which take place under participation of free radicals. It is known that the main products of propane cracking are: methane, ethylene, hydrogen and propylene. Ethane develops in small amounts. A system according to the Rice theory is given. The method of labeled atom makes it possible to answer the question whether the mentioned cracking products are final or whether they are subject to further transformations. In this connection some conclusions can be drawn on the mechanism of cracking. This paper studies the behaviour of ethylene developing on this occasion. The employment of the method mentioned in the title makes it possible to determine the order of formation of certain products from others, the speeds
CARD 1/4	

between

20-2-42/02

The Kinetic Method of the Use of Tagged Atoms in Propane Cracking Research

the amount of ethylene transformed in the course of the reaction and the amount of ethane developed. Curve 2 records the accumulation of ethylene, curve 3 the accumulation of ethane during the experiment. The amount of ethylene transformed - the difference between curves 1 and 2 - corresponds to the resulting quantity of ethane within the limits of the precision with which the quantities of ethane and ethylene were measured, and the balance of the activity of the introduced ethylene and of the active cracking products is equal. This confirms the chief formation of ethane from ethylene and not from a recombination of methyl radicals as it was hitherto supposed. There are signs that other products may also be obtained from ethylene in more farreaching stages of cracking. A way of formation of ethane from ethylene is represented by reaction schemata. The estimations made in this paper of the concentrations of radicals and atoms in the reaction zone indicate that there exist possibilities of further development of this method

20-2-42/62

The Kinetic Method of the Use of Tagged Atoms in
Propane Cracking Research

in the direction of elementary stages of complex processes.
(3 Illustrations, 2 Tables, 6 Slavic references)

ASSOCIATION: Institute for chemical physics of the Academy of Sciences of the USSR.
(Institut khimicheskoy fiziki Akademii nauk SSSR)

PRESENTED BY: V.N. Kondrat'yev, member of the Academy, Jan. 30, 1957

SUBMITTED: -

AVAILABLE: Library of Congress.

CARD 4/4

RUMYANTSEV, Stepan Vasil'yevich, kand. tekhn. nauk; MATSYUK, Lyubov' Nakhmanovna, kand. tekhn. nauk; BRYANTSEVA, V.P., inzh., ved. red.; NEYMAN, M.B., kand.tekhn.nauk, red.; PONOMAREV, V.A., tekhn. red.

[Thulium-170 as a radiation source for gamma-defectoscopy] Tulii-170 kak istochnik izlucheniia dlia gamma-defektoskopii. Moskva, Filial Vses.in-ta nauchn. i tekhn. informatsii, 1958. 29 p. (Peredovoi nauchno-tekhnicheskii i proizvodstvennyi opyt. Moskva, Tema 23. No.M-58-109/1) (MIRA 16:3)
(Thulium isotopes) (Gamma rays)
(Materials--Testing)

PHASE I BOOK EXPLOITATION 694

Neyman, Moisey Borisovich, Doctor of Chemical Sciences, Professor, and Sadilenko, Konstantin Mikhaylovich, Scientific Worker, U.S.S.R. Academy of Sciences.

Termoyadernoye oruzhiye (Thermonuclear Weapons) Moscow, Voyen. izd-vo M-va obor. SSSR, 1958. 234 pp, (Series: Nauchno-populyarnaya seriya) No. of copies printed not given.

Ed.: Sedov, A.I., Engineer Lieutenant Colonel, Candidate of Technical Sciences; Ed. of Publishing House: Kader, Ya.M.; Tech. Ed.: Mezheritskaya, N.P.; Consultants of Publishing House: Naumenko, I.A., Engineer Lieutenant Colonel, Candidate of Technical Sciences; Balabanov, Ye.M., Doctor of Physical and Mathematical Sciences.

PURPOSE: The book is intended for Soviet military personnel as well as the general reader interested in thermonuclear processes and weapons, their working principles and operation.

Card 1/5

Thermonuclear Weapons 694

COVERAGE: The authors relied on both Soviet and foreign data to present in semi-popular form a general survey of atomic weapons with emphasis on thermonuclear bombs, and a description of basic processes, bomb drawings and graphs. An extensive description is given of the effects of thermonuclear weapons and protective measures against them both during and after the detonation. Chapters 2, 3, 4 and 8 were written by M.B. Neyman, chapters 1, 6 and 7 by K.M. Sadilenko, while chapter 5 is the result of their collaboration. Personalities mentioned include Engineer Lt Col A.I. Sedov, Engineer Lt Col I.A. Naumenko, and Doctor of Physical and Mathematical Sciences Ye.M. Balabanov. There are 32 Soviet references (including 8 translations).

TABLE OF CONTENTS:

Card 2/ 5

Thermonuclear Weapons 694

Card 3/5

Thermonuclear Weapons

694

Card 4/5

Thermonuclear Weapons 694

AVAILABLE: Library of Congress

Card 5/5

BK/rm
11-17-58

NEYMAN, M. B. and SERDYUK, N. K. (Inst. of Chem. Phys. AS USSR)

"The Speed of Acetylene Radical Decomposition and Its Reaction With Free Oxygen," p. 35

Isotopes and Radiation in Chemistry, Collection of papers of 2nd All-Union Sci. Tech. Conf. on Use of Radioactive and Stable Isotopes and Radiation in National Economy and Science, Moscow, Izd-vo AN SSSR, 1958, 380pp.

This volume published the reports of the Chemistry Section of the 2nd AU Sci Tech Conf on Use of Radioactive and Stable Isotopes and Radiation in Science and the National Economy, sponsored by Acad Sci USSR and Main Admin for Utilization of Atomic Energy under Council of Ministers USSR Moscow 4-12 Apr 1957.

NEYMAN, M.B.

5(2); 21(5) PHASE I BOOK EXPLOITATION SOV/1900

Akademiya nauk SSSR. Komissiya po analiticheskoy khimii

Primeneniye radioaktivnykh izotopov v analiticheskoy khimii (Use of Radioactive Isotopes in Analytical Chemistry) Moscow Izd-vo AN SSSR, 1958. 366 p. (Series: Its: Trudy, t. 9 (12)) Errata slip inserted. 3,000 copies printed.

Resp. Ed.: I.P. Alimarin, Corresponding Member, USSR Academy of Sciences; Ed. of Publishing House: A.N. Yermakov; Tech. Ed.: T.V. Polyakova.

PURPOSE: The book is intended for chemists and chemical engineers concerned with work in analytical chemistry.

COVERAGE: The book is a collection of the principal papers presented in Moscow at the Second Conference on the Use of Radioactive Isotopes. The problems discussed at the Conference included coprecipitation, aging, and solubility of precipitates, determination of the instability constants

Card 1/10

of complex compounds, separation of rare earth metals, and ion-exchange chromatography. No personalities are mentioned. There are 351 references, 175 of which are Soviet, 33 German, 19 French, 8 Swedish, 2 Hungarian, and 2 Czech.

TABLE OF CONTENTS:

Use of Radioactive Isotopes (Cont.) SOV/1900

Yefremov, V. Ya., M.B. Neyman, and V.N. Panfilov. Determination of Alcohols by the Isotope Dilution Method 361

AVAILABLE: Library of Congress

TM/rj
7-17-59

Card 10/10

7

NEYMAN, M. B.

62-1-4/29

AUTHORS: Balandin, A. A., Bogdanova, O. K., Isagulyants, G. V., Neyman, M. B., Popov, Ye. I.

TITLE: The Application of Radioactive Carbon in the Comparison Between the Dehydrogenation Velocities of Butane and Butylene (Primeneniye radiougleroda dlya sravneniya skorostey degidrogenizatsii butana i butilena)

PERIODICAL: Izvestiya AN SSSR Otdeleniye Khimicheskikh Nauk, 1958, Nr 1, pp 18-23 (USSR)

ABSTRACT: The investigation (with the application of C^{14}) was carried out by means of a special catalyst under conditions especially favorable for the obtaining of divinyl. Since it turned out that divinyl can be formed from butylene and that butane cannot be transformed into divinyl, it was concluded that the reaction (divinyl from butane) passes only through the stage of the formation and desorption of butylene. Therefore the desorption of butylene cannot be a final stage of the entire reaction. The authors report on the carrying out of the investigation: The correlation between the dehydrogenation velocity of butane and butylene in divinyl at the chromium catalyst was found by means of computations -corresponding to the experimental data obtained already before. It was

Card 1/2

The Application of Radioactive Carbon in the Comparison Between the Dehydrogenation Velocities of Butane and Butylene 62-1-4/29

shown that the ratio of the velocities of the dehydrogenation of butane in butylene and of butane in divinyl is for both catalysts of the same order and corresponds to the ratio 20:1. In the experiments with chromium catalysts the velocity ratio in the formation of divinyl from butane corresponded to 1:1000 and in the experiments with an alumochromium catalyst to 1:25. Furthermore it was confirmed that the formation of divinyl from butane takes place over the stage of the formation of butylene. It was shown that the constants (in the denominator of the kinetic equation of dehydrogenation) represent adsorption coefficients. There are 6 figures, 4 tables, and 5 references, 4 of which are Slavic.

ASSOCIATION: Institute of Organic Chemistry imeni N. D. Zelinskiy, AS USSR (Institut organicheskoy khimii imeni N. D. Zelinskogo Akademii nauk SSSR),

SUBMITTED: January 4, 1957

Card 2/2

1. Butane-Dehydrogenation 2. Butylene-Dehydrogenation 3. Carbon isotopes (Radioactive)-Applications 4. Chromium catalyst-Applications

SOV/20-123-2-23/58

5(1,3)

AUTHORS: Moiseyev, V. D., Lyadova, Yu. I., Vedeneyev, V. I., Neyman, M. B., Voyevodskiy, V. V., Corresponding Member, AS USSR

TITLE: Ways of the Formation of Propylene and Ethylene in Isobutylene Cracking (Puti obrazovaniya propilena i etilena pri krekinge izobutilena)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 123, Nr 2, pp 292-294 (USSR)

ABSTRACT: As is known, up to 50% of the initial substance in thermal isobutylene decomposition are transformed into liquids (olefins, aromatic compounds). Apparently the polymerization of the initial olefin forms the first stage of the liquid formation, with dimeric and trimeric olefin being formed. The latter themselves are capable of being transformed in various ways with the final result being liquid cracking products. The ratio between carbon and hydrogen in these products is about 1 (Ref 2), whereas it is 2 in isobutylene. From this may be supposed that hydrogen and methane are separated in the formation of the liquids; in principle, also heavier cracking gases with 2 and 3 carbon atoms each in the molecule can be formed. The problem

Card 1/4

concerning the type and amount of the gases escaping from the liquids or in their formation is not investigated at all. Propylene is one of the main products of isobutylene cracking. If it were formed from isobutylene only, its formation velocity would decrease with the exhaustion of the isobutylene. If propylene is, however, formed from the liquid or from any other intermediate product of low stability (not from radicals), its formation velocity in the beginning of the reaction must be equal to zero, and then increase according to the law of successive reactions. If both ways of the formation of propylene are correct the two pictures must agree. This was the case in the present experiments. The change of the formation velocity of propylene was investigated by the isotopic kinetic method (Ref 3). Ye. D. Fedorov took part in the synthesis of the marked propylene (with C^{14} on the hydroxyl group). This propylene (15 torr) was subjected together with isobutylene (285 torr) to a cracking in vacuum at 542^{0}. The course of the specific activity α and of the C_3H_6 concentrations are given in figure 1. Figure 2 gives the formation velocity of propylene w_1. In the

SOV/20-123-2-23/50

Ways of the Formation of Propylene and Ethylene in Isobutylene Cracking

beginning of the reactions this value w_1 is not equal to zero; it increases during the first 10-12 minutes, i.e. to about 20% isobutylene transformation. This w_1 increase tends to show that a considerable propylene amount in isobutylene cracking is not formed from isobutylene but from any intermediate products of the cracking, obviously from liquids. As may be seen from figure 2, the formation velocity of propylene passes a maximum within the range of 10-14 minutes and then decreases. The authors consider it to be premature to draw any conclusions. The ethylene activity determined in some experiments besides the specific activity of propylene is given in figure 3. As this activity is much lower than that of propylene, this tends to show that only part of the ethylene is formed from propylene. Also ethylene can be formed either from isobutylene directly or from liquids. Based on the experimental results obtained it is not possible to make a decision as to the way of formation prevailing. The fact that propylene is formed from liquids tends to show the possibility of the ethylene formation from the latter. There are 3 figures and 4 references, 2 of which are

Card 3/4

SOV/20-123-2-23/[illegible]

Ways of the Formation of Propylene and Ethylene in Isobutylene Cracking

Soviet.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics, AS USSR)

SUBMITTED: July 28, 1958

Card 4/4

21(7) PHASE I BOOK EXPLOITATION SOV/2601

Neyman, Moisey Borisovich, Professor

Radioaktivnyye izotopy i ikh primeneniye (Radioactive Isotopes and Their Application) Moscow, Izd-vo "Znaniye," 1959. 45 p. (Series: Vsesoyuznoye obshchestvo po rasprostraneniyu politicheskikh i nauchnykh znaniy. Seriya IX, 1959, nr 13) 39,500 copies printed.

Sponsoring Agency: Vsesoyuznoye obshchestvo po rasprostraneniyu politicheskikh i nauchnykh znaniy.

Ed.: I.B. Faynboym; Tech. Ed.: L.Ye. Atroshchenko

PURPOSE: This book is intended for nuclear physicists, doctors, biologists, specialists in agriculture, industrial technologists and other persons interested in the utilization of radioactive isotopes for peaceful purposes.

COVERAGE: The book discusses the discovery, preparation and utilization of radioactive isotopes in many branches of the

Card 1/3

Radioactive (Cont.) SOV/2601

national economy. It mentions that extending the utilization of synthetic materials and the products of nuclear fission and radioactive isotopes is one of the problems in the current development of Soviet industrial capacity. The application of radioactive isotopes in industry, agriculture, research and medicine resulted in a saving of some 1.5 billion rubles to the national economy in 1957. No personalities are mentioned. There are no references.

TABLE OF CONTENTS:

Card 2/3

5(4), 5(3) SOV/62-59-1-33/38

AUTHORS: Babayan, A. T., Indzhikyan, M. G., Neyman, [illegible]. B

TITLE: On the Equivalence of Nitrogen Bonds in Tetramethyl-Ammonium Bromide (O ravnotsennosti svyazey azota v bromistom tetrametilammonii)

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1959, Nr 1, pp 174 - 174 (USSR)

ABSTRACT: According to modern concepts the 4 nitrogen bonds in $(CH_3)_4NBr$ formed by sp^3 bastardization are equivalent. In the present paper the authors checked these data. $(C^{14}H_3)(CH_3)_3NBr$ was synthesized according to the following scheme:

$$2C^{14}H_3OH+H_2SO_4 \rightarrow (C^{14}H_3)_2SO_4+2H_2O;$$

$$(C^{14}H_3)_2SO_4+KBr \rightarrow C^{14}H_3Br+K(C^{14}H_3)SO_4;$$

$$C^{14}H_3Br+(CH_3)_3N \rightarrow (C^{14}H_3)(CH_3)_3NBr.$$

The last process took place at -80^0. Furthermore, the product obtained was decomposed in liquid ammonia solution. The

Card 1/2

On the Equivalence of Nitrogen Bonds in Tetramethyl-Ammonium Bromide SOV/62-59-1-33/38

following reaction took place in the solution: $(CH_3)_4NBr+2K+NH_3 \rightarrow CH_4+(CH_3)_3N+KBr+KNH_2$. The results of the investigation are summarized in the table , It may be seen from it that methane separated during the decomposition of the ternary salt possesses 23% of the activity, whereas trimethyl amine possesses 78%. Thus, the experiments carried out at -80° confirmed the conclusions of the paper (Ref 1) and the generally assumed idea of the equivalence of the bonds of quadrivalent nitrogen. There are 1 table and 2 references, 1 of which is Soviet.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics of the Academy of Sciences, USSR) Institut organicheskoy khimii Akademii nauk ArmSSR (Institute of Organic Chemistry of the Academy of Sciences, Armenian SSR)

SUBMITTED: June 20, 1958

Card 2/2

NEYMAN, M.B.; GOLUBENKOVA, L.I.; KOVARSKAYA, B.M.; STRIZHKOVA, A.S.;
LEVANTOVSKAYA, I.I.; AKUTIN, M.S.; MOISEYEV, V.D.

Thermal degradation of condensation resins. Part 1: Thermal degradation of epoxide resins. Vysokom.soed. 1 no.10: 1531-1537 O '59.
(MIRA 13:3)

1. Nauchno-issledovatel'skiy institut plastmass, Moskva.
(Resins, Synthetic)

MOISEYEV, V.D.; NEYMAN, M.B.; KRYUKOVA, A.I.

Thermal degradation of polypropylene. Vysokom.soed. 1
no.10:1552-1557 O '59. (MIRA 13:3)

1. Institut khimicheskoy fiziki AN SSSR.
(Propene)

MILLER, V.B.; NEYMAN, M.B.; SHLYAPNIKOV, Yu.A.

Thermal oxidative degradation of polypropylene. Part 2: Kinetics of the initial stage of oxidation. Vysokom.soed. 1 no.11: 1703-1706 N '59.
(MIRA 13:5)

1. Institut khimicheskoy fiziki AN SSSR.
(Propene)

5(4)

SOV/62-59-2-9/40

AUTHORS: Miller, V. B., Neyman, M. B., Solodovnikov, S. P.

TITLE: Investigation of the Reaction of Isotopic Exchange Between Methyl Iodide and Iodine (Issledovaniye reaktsii izotopnogo obmena yodistogo metila s yodom)

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1959, Nr 2, pp 247-250 (USSR)

ABSTRACT: In the present paper the isotopic exchange between CH_3J and J_2 was investigated in absence of solvents at 30 and 45°. The irradiation of the reaction mixture was carried out by means of a 2 SVDSh-250-3 quartz lamp (Fig 1). The experimental results are given in the table. As it can be seen the exchange rates in the dark and on light exposure are in accordance within error limits. This indicates that the higher concentration of iodine atoms in the volume due to irradiation does not affect the rate of the isotopic exchange. It might therefore be assumed that the exchange reaction in the volume does not take place over iodine atoms. The addition of oxygen does not influence the rate of the isotopic

Card 1/3

Investigation of the Reaction of Isotopic Exchange Between Methyl Iodide and Iodine SOV/62-59-2-9/40

exchange. This suggests that in the volume no radical chain reaction takes place as it is the case in solutions where the disappearance of alkyl radicals in the oxygen reduces the rate of the isotopic exchange. The dependence of the reaction rate on the pressure of the components is shown in figure 2. Accordingly, the reaction rate depends up to 0.25 mm linearly on the pressure of iodine. At higher pressure it remains practically constant. This is apparently in connection with the fact that the reaction is proceeding on the surface in this case. At a pressure over 0.25 mm a saturation of the surface occurs whereby an increase in pressure does not cause any considerable change in the reaction rate. There are 2 figures, 1 table, and 6 references, 1 of which is Soviet.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics of the Academy of Sciences, USSR)

Card 2/3

MILLER, V.B.; NEYMAN, M.B., PUDOV, V.S.; LAFER, L.I.

Thermal oxidative degradation of polypropylene. Part 1: General
characteristics of the oxidation reaction. Vysokom.soed. 1
no.11:1696-1702 N '59. (MIRA 13:5)

1. Institut khimicheskoy fiziki AN SSSR.
(Propene)

5(4)

SOV/76-33-2-35/45

AUTHORS: Miller, V. B., Neyman, M. B., Solobovnikov, S. P.

TITLE: A Study of the Reaction of Isotopic Exchange Between $CH_2J_2^*$ and J_2 by the Intermittent Illumination Method (Issledovaniye reaktsii izotopnogo obmena mezhdu $CH_2J_2^*$ i J_2 metodom preryvistogo osveshcheniya)

PERIODICAL: Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 2, pp 457 - 462 (USSR)

ABSTRACT: The method mentioned in the title is based upon an impulse radiation (Ref 4) with a definite ratio between the illuminated and dark periods. This "pulsating" illumination is usually accomplished by means of a rotating disk with slits in it, which interrupts a light beam or allows it to penetrate the slits periodically. In the present work tagged methylene iodide was used which was obtained from CH_2J_2 and NaJ^{131}. The

Card 1/3

investigations were carried out using an apparatus (Fig 3) the reaction vessel of which was located in an air thermostat, and the reaction components could be separated after the experiment by adsorption of the iodine on silver. The irradiation was carried out using an SVDSh-250-3 Hg lamp and the light impulses could be varied from 1 to 10^{-4} seconds by means of a rotating disk. The exchange between $CH_2J_2^*$ and J_2 was tested in the dark in illuminations, under an iodine pressure of 0.2 mm and a methylene-iodide pressure of 1 mm and at 30°C. The experimental results obtained (Table) were represented in form of w_o/w_{st} as a function of $\lg\lambda$ (w_o = reaction rate (RR) at intermittent illumination; w_{st} = (RR) with constant illumination) (Fig 6). The constant of the (RR) for the reaction $CH_2J^* + J$ amounted to $3 \cdot 10^{-12}$ cm^3/second, and the value of the average life of the radicals was found to be: $2 \cdot 10^{-2}$ seconds. According to the mechanism $CH_2J_2^* + h\nu \longrightarrow$

A Study of the Reaction of Isotopic Exchange Between CH_2J and J_2 by the Intermittent Illumination Method SOV/76-33-2-35/45

$CH_2J^* + J^*$ (9) (and other reactions I - VI) the stationary concentration of the radicals was calculated to be $2 \cdot 10^{13}$ cm^{-3}. There are 6 figures, 1 table, and 4 references, 1 of which is Soviet.

ASSOCIATION: Akademiya nauk SSSR, Institut khimicheskoy fiziki, Moskva (Moscow Institute of Chemical Physics of the Academy of Sciences, USSR)

SUBMITTED: July 31, 1957

Card 3/3

05808
SOV/76-33-10-6/45

5(4)

AUTHORS: Yefremov, V. Ya., Neyman, M. B., Panfilov, V. N.

TITLE: A Kinetic Method Based on the Use of Tagged Atoms for the Investigation of Complex Chemical and Biochemical Processes. VIII. Formation and Consumption of Methanol in the Oxidation of Propylene

PERIODICAL: Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 10, pp 2151-2155 (USSR)

ABSTRACT: In order to explain the part played by alcohols as intermediates in the oxidation of hydrocarbons at low temperatures, the authors investigated the behavior of methanol in propylene oxidation. The presence of methanol in propylene oxidation has already been found by A. F. Lukovnikov (Ref 2), it was, however, not quantitatively determined. Methanol was determined here by the method of isotope dilution (Ref 5) (maximum error: 4-5%). The concentration of formaldehyde was determined polarographically (background: 0.1 n LiOH). Experiments were made under static conditions with the following mixture: ~ 50% O_2, 46.82% C_3H_6, 1.33% $C^{14}H_3OH$, 1.59% CH_3CHO, 0.13% CO and 0.13% CO_2.

Card 1/3

05808

SOV/76-33-10-6/45

A Kinetic Method Based on the Use of Tagged Atoms for the Investigation of Complex Chemical and Biochemical Processes. VIII. Formation and Consumption of Methanol in the Oxidation of Propylene

Temperature: 315 C, initial pressure: 245 mm Hg. Five cold flames were found after an induction period of 1'30". The variation in the concentration and the specific activity of methanol during the reaction (Fig 1) indicates that methanol is formed and also consumed. The latter is also indicative of the presence of radioactive carbon in formaldehyde, CO and CO_2. By graphic differentiation it was found (Fig 3) that the formation and consumption of methanol is most intense in the region of cold flames. Calculations of the rate of formaldehyde formation from methanol have shown that only a small part of formaldehyde was produced from methanol (Table 1), apparently no more than 5%. The scheme of reaction according to which methanol is formed only by acetaldehyde (Refs 8, 9) is insufficient since also other reactions take place which lead to the formation of methanol. There are 6 figures, 1 table, and 10 Soviet references.

Card 2/3

05808
SOV/76-33-10-6/45

A Kinetic Method Based on the Use of Tagged Atoms for the Investigation of Complex Chemical and Biochemical Processes. VIII. Formation and Consumption of Methanol in the Oxidation of Propylene

ASSOCIATION: Akademiya nauk SSSR, Institut khimicheskoy fiziki (Academy of Sciences of the USSR, Institute of Chemical Physics)

SUBMITTED: March 6, 1958

Card 3/3

5(4) SOV/20-128-4-34/65

AUTHORS: Yershov, Yu. A., Gonikberg, M. G.,
Neyman, M. B., Opekunov, A. A.

TITLE: Measurement of the Electrical Conductivity of KJ in Non-aqueous Solvents at High Pressures

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 128, Nr 4, pp 759-762 (USSR)

ABSTRACT: M. G. Gonikberg, V. B. Miller et al. (Ref 1) published, some time ago, a paper on the effect of the solvent (ethyl alcohol, acetone) on the reaction rate of isotope exchange $n\text{-}C_3H_7J + J^-$ at pressures up to 2500 kg/cm^2. The dependence of the dissociation degree of KJ on the pressure was not determined at that time. Now it is done by measuring the electrical conductivity on the assumption that the dissociation degree of KJ can be approximately determined by the ratio $\lambda : \lambda_\infty$. The apparatus is described (Fig 1) which is similar to the one of I. Buchanan and S. D. Hamann (Ref 4). The electrical conductivity of the sample was measured at 1,000 cycles per second (generator of type ZG-10). An oscillo-

Card 1/3

Measurement of the Electrical Conductivity of KJ in Non-aqueous Solvents at High Pressures

SOV/20-128-4-34/65

graph of type EO-7 served as zero instrument. The measuring bridge was regulated by the resistance box of type R-58. The measurements were made at 20°. Table 1 shows that the equivalent conductivity of the solutions investigated decreases with increasing pressure while the dissociation degree α of KJ computed from $\lambda : \lambda_{\infty}$ increases. Table 2 (values of α and k_{α} = constant of the ionic equilibrium) indicates that k_{α} in acetone increases more quickly than in ethyl alcohol. This corresponds to the result of reference 1 stating that the dissolution of KJ in acetone is accompanied by a more intense volume contraction than the dissolution in ethyl alcohol. This is also confirmed by the different signs of the volume variation under pressure influence (Table 3). Table 3 compares the values indicated in reference 1 and corrected in the present paper for the constants of the reaction rate of the isotope exchange $n.C_3H_7J + \overset{*}{J}^-$ at pressures of 1, 1500, and 2500 kg/cm^2. The correction does not change the

Card 2/3

Measurement of the Electrical Conductivity of KJ in Non-aqueous Solvents at High Pressures SOV/20-128-4-34/65

qualitative character of the dependence found. There are 1 figure, 3 tables, and 7 references, 2 of which are Soviet.

ASSOCIATION: Institut organicheskoy khimii im. N. D. Zelinskogo Akademii nauk SSSR (Institute of Organic Chemistry imeni N. D. Zelinskiy of the Academy of Sciences, USSR)
Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics of the Academy of Sciences, USSR)

PRESENTED: April 27, 1959, by N. N. Semenov, Academician

SUBMITTED: April 24, 1959

Card 3/3

NEYMAN, M. B.

PHASE I BOOK EXPLOITATION SOV/4984

International symposium on macromolecular chemistry. Moscow, 1960.

Mezhdunarodnyy simpozium po makromolekulyarnoy khimii SSSR, Moskva, 14-18 iyunya 1960 g.; doklady i avtoreferaty. Sektsiya III. (International Symposium on Macromolecular Chemistry Held in Moscow, June 14-18, 1960; Papers and Summaries) Section III. [Moscow, Izd-vo AN SSSR, 1960] 469 p. 55,000 copies printed.

Tech. Ed.: P. S. Kashina.

Sponsoring Agency: The International Union of Pure and Applied Chemistry. Commission on Macromolecular Chemistry.

PURPOSE: This book is intended for chemists interested in polymerization reactions and the synthesis of high molecular compounds.

COVERAGE: This is Section III of a multivolume work containing papers on macromolecular chemistry. The articles in general deal with the kinetics of polymerization reactions, the synthesis of special-purpose polymers, e.g., ion exchange resins, semiconductor materials, etc., methods of catalyzing polymerization reactions, properties and chemical interactions of high molecular materials, and the effects of various factors on polymerization and the degradation of high molecular compounds. No personalities are mentioned. References given follow the articles.

Yur'yev, V. M., A. N. Pravednikov, and S. S. Medvedev (USSR). The Effect of Formic Acid and Formates on the Oxidation of Hydrocarbons and Hydrocarbon Polymers 364

Popova, Z. V., and D. M. Yanovskiy (USSR). Study of the Effect of Some Organic and Organoelemental Compounds on the Thermal Degradation of Polyvinyl Chloride 372

Wichterle, O., E. Šittler, and P. Čefelin (Czechoslovakia). Degradation of Poly-ε-Caprolactam as a Result of Exchange Reaction Between Amide Bonds 380

Kučera, M., J. Lánikova, and M. Jelínek (Czechoslovakia). Neutralization of Residual Catalyst in Polydimethylsiloxane; Effect of Thermal Neutralization on the Thermal Stability of the Polymer 388

Godári, L., O. Mlejnek, and I. Stimcl (Czechoslovakia). Thermooxidational Degradation of Polyesters. Study of Degradation Reactions for Different Types of Linear Polyesters 405

Neyman, M. B., B. M. Kovarskaya, L. I. Golubenkova, A. S. Strizhkova, I. I. Levantovskaya, and M. S. Akutin (USSR). On the Degradation and Stabilization of Some Polymeric Materials 414

Angert, L. G., and A. S. Kuz'minskiy (USSR). Investigation of the Efficiency of Inhibitors of Rubber Oxidation at Various Temperatures 423

Pravednikov, A. N., and Ying Men-k'ang (USSR). Mechanism of the Protective Action of Benzene Rings During the Radiolysis of Polystyrene 433

Zhdanov, A. A., and K. A. Andrianov (USSR). On the Hydrolytic Stability of Side Groups in Polymers with Inorganic Chains of Molecules 440 25

Berlin, A. A., Ye. A. Penskaya, and G. I. Volkova (USSR). Mechanicochemical Transformations and Block Copolymerization During the Freezing of Starch Solutions 334

Usmanov, Kh. U., B. I. Aykhodzhayev, and U. Azizov (USSR). Modification of the Properties of Cellulose by Grafting 344 33

S/195/60/001/003/003/013
B013/B058

AUTHORS: Neyman, M. B., Yefremov, V. Ya., Serdyuk, N. K.

TITLE: Formation Mechanism of Methyl Alcohol During the Oxidation of Hydrocarbons

PERIODICAL: Kinetika i kataliz, 1960, Vol. 1, No. 3, pp. 345 - 355

TEXT: In this paper the authors studied the formation of methyl alcohol during the oxidation of propylene. The aim of the study was to obtain material for the evaluation of some elementary reactions leading to the formation of CH_3OH and on their competition with reactions leading to the formation of other products. This became possible with the aid of the kinetic isotope method (Refs. 13, 14). The experiments were made with an equimolecular $C_3H_6 + O_2$ mixture at a pressure of 244 mm Hg and at 315°C. Small amounts of tagged acetaldehyde $C^{14}H_3CHO$ were added to the mixture in some experimental series. Small amounts of tagged azomethane were added in other experimental series. Propylene was oxidized in a similar

Card 1/4

Formation Mechanism of Methyl Alcohol
During the Oxidation of Hydrocarbons

S/195/60/001/003/003/013
B013/B058

installation as mentioned in Ref 16 The analysis method was described in detail in Refs 18 and 19. Since it was of utmost importance to determine the methane content and its specific activity, a special chromatographic installation was designed for this purpose (Fig 1) The concentration of hydrogen, CO and methane could be determined with a hypothetical error of from 1 to 3%. The specific activity was determined by means of radiometric analysis. On the basis of data determined for the oxidation of propylene in the presence of $C^{14}H_3CHO$, the amount of methanol formed from acetaldehyde could be calculated by means of the kinetic isotope method It was shown that about 75% methanol are formed from the methyl group of the acetaldehyde during the oxidation of propylene $C^{14}H_4$ was determined during the oxidation of $C_3H_6 + O_2$ in the presence of $C^{14}H_3NNC^{14}H_3$. It results therefrom that azomethane can serve as source for the thermal formation of methyl radicals. It was shown that in $C_3H_6 + O_2$ mixture the methyl radicals cannot only react under formation of CH_4, but also of

Card 2/4

Formation Mechanism of Methyl Alcohol During the Oxidation of Hydrocarbons

S/195/60/001/003/003/013
B013/B058

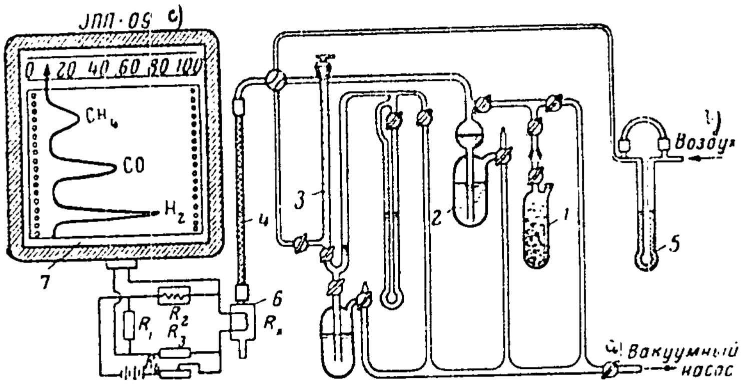
CH_2O, CH_3O, and CH_3CHO. It was further shown that the ratio of the rates of formation of CH_3OH and CH_2O grows larger with a more radical transformation of propylene. The ratio of the rates of formation of CH_4 and of oxygen-containing products from methyl radicals increases in the course of the reaction. This rule is presumably connected with the accumulation of aldehydes and other products having movable hydrogen, in the reaction solution. N. N. Semenov and V. Ya. Shtern are mentioned. There are 8 figures and 24 references: 15 Soviet, 5 US, 2 British, 1 Canadian, and 1 German.

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

SUBMITTED: March 28, 1960

Card 3/4

S/195/60/001/003/003/013
B013/B058



Legend to Fig. 1. 1) silica gel trap; 2) Tepler pump; 3) graduated burette; 4) chromatographic column; 5) flow meter; 6) detector for escaping gases; 7) electronic potentiometer. a) to the vacuum pump; b) air inlet; c) [illegible]-09 (EPP-09) recorder.

Card 4/4

S/190/60/002/009/015/019
B004/B060

AUTHORS: Shlyapnikov, Yu. A., Miller, V. B., Neyman, M. B., Torsuyeva, Ye. S., Gromov, B. A.

TITLE: Thermally Oxidative Destruction of Polypropylene. III. Study of the Relative Efficacy of Some Antioxidants

PERIODICAL: Vysokomolekulyarnyye soyedineniya, 1960, Vol. 2, No. 9, pp. 1409-1412

TEXT: With the aim of preventing the oxidation of polypropylene films the authors analyzed the stabilizing effect of the following substances: cyclohexyl benzene, thiourea, 2,4-dinitro-phenyl hydrazine, 2,5-di-t-butyl hydroquinone, diphenyl amine, benzidine, "Poligard"; 2,4,6-tri-t-butyl phenol; monobenzyl ester of hydroquinone, 2,6-di-t-butyl-4-methyl phenol (Ionol), propyl gallate, phenyl-β-naphthyl amine (Neozon D), and diphenyl-p-phenylene diamine. The authors determined the induction period before the start of the polypropylene oxidation after adding these substances under the following conditions: 140°C, 300 torr P_{O_2}, concentration

Card 1/3

Thermally Oxidative Destruction of Polypropylene. S/190/60/002/009/015/019
III. Study of the Relative Efficacy of Some B004/B060
Antioxidants

of the stabilizer 0.01 mole/kg (0.003 mole/kg in some cases). Fig. 1 shows the experimental apparatus which permitted the simultaneous analysis of seven samples. The polypropylene film was prepared by rubbing down pulverized polypropylene with the stabilizer, addition of solvent causing the stabilizer, but not the polypropylene, to dissolve, drying and pressing in inert gas at 120 - 130°C and 120 kg/cm^2 pressure. Fig. 2 shows the kinetic curves of oxidation a) of films with the same surface and different weight, b) of films having the same weight but differing in thickness. It follows that oxidation takes place within the film and not only on the surface. Fig. 3 shows the stabilizing effect of 0.003 mole/kg of benzidine, diphenyl amine, and Neozon D. Table 1 gives the induction periods for the examined stabilizers on addition of 0.01 mole/kg, Table 2 the same for several stabilizers on addition of 0.003 mole/kg. Diphenyl-p phenylene diamine proved to be the best stabilizer, followed by Neozon D, propyl gallate, and Ionol. These results contradict the statement made by S. Ye. Bresler et al. (Ref. 6) that such substances should be applied to polymer stabilization as poorly stabilize at room temperature. Also

Card 2/3

Thermally Oxidative Destruction of Polypropylene. III. Study of the Relative Efficacy of Some Antioxidants

S/190/60/002/009/015/019
B004/B060

easily oxidizing phenols or amines did not bring about a quicker oxidation. There are 3 figures, 2 tables, and 6 Soviet references.

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

SUBMITTED: April 18, 1960

✓

Card 3/3

83413

S/191/60/000/006/005/015
B004/B054

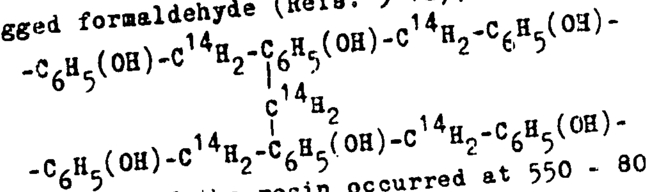
17.4410 also 2308
17.4312
5.3832

AUTHORS: Moiseyev, V. D., Neyman, M. B., Raspopova, Ye. N.

TITLE: On the Origin of Pyrolysis Products of Phenol Formaldehyde Resin

PERIODICAL: Plasticheskiye massy, 1960, No. 6, pp. 11 - 13

TEXT: The authors discuss the possibility of formation of graphitic structures by pyrolysis of polymers containing aromatic rings, which may lead to the production of substances resistant to high temperatures. To clarify this problem they synthesized a phenol formaldehyde resin with C^{14}-tagged formaldehyde (Refs. 9-12), the structure of which is specified:



$$\begin{array}{l} -C_6H_5(OH)-C^{14}H_2-C_6H_5(OH)-C^{14}H_2-C_6H_5(OH)- \\ \qquad\qquad\qquad\qquad\quad | \\ \qquad\qquad\qquad\qquad\; C^{14}H_2 \\ \qquad\qquad\qquad\qquad\quad | \\ -C_6H_5(OH)-C^{14}H_2-C_6H_5(OH)-C^{14}H_2-C_6H_5(OH)- \end{array}$$

Thermal destruction of the resin occurred at 550 - 800°C and 10^{-2} torr.

Card 1/2

83413

On the Origin of Pyrolysis Products of Phenol Formaldehyde Resin

S/191/60/000/006/005/015
B004/B054

After three hours' duration of the experiment, no gas was formed any longer. The composition of the resulting gases was analyzed chromatographically, the gas components were separated chromatographically by means of activated coal, burned, the resulting CO_2 was absorbed in barium hydroxide solution, and the activity was measured by the end window counter of a Б-2(B-2) apparatus. The coke formed was burned in an oxygen flow, and the CO_2 was also tested for its activity. Table 1 shows the specific activity of gases and coke. Table 2 indicates the activities of the resin and its pyrolysis products. Hence it follows that in the thermal destruction of the resin the greater part of the methylene bridges remains in the coke, and is not removed in the form of gas. The carbonaceous gases do not only develop from the methylene bridges but also by the rupture of part of the aromatic rings. There are 2 tables and 14 references: 7 Soviet, 1 US, 2 British, and 4 Japanese.

[Annotation: This may be an indication of work connected with nosecone research, vanes and valves, and ablation.]

Card 2/2

85:

S/191/60/000/007/005/015
B004/B056

15 8110
11 2217

AUTHORS: Neyman, M. B., Kovarskaya, B. M., Levantovskaya, I. I., Strizhkova, A. S., Akutin, M. S.

TITLE: Investigation of the Thermal Destruction of Condensate Resins. The Thermal Destruction of Hardened Epoxy Resins 15

PERIODICAL: Plasticheskiye massy, 1960, No. 7, pp. 17 - 20

TEXT: Following an earlier paper (Ref. 1) on the thermal destruction of ЭД-6 (ED-6) epoxy resin, the authors give a report on their investigation of the thermal destruction of ЭД-15 (ED-15) epoxy resin obtained by condensation of epichlorohydrin with diphenylpropane, as well as of ED-15 and ED-6 hardened with 7% polyethylene polyamine or with 30% maleic anhydride. They give the following experimental data: Kinetics of gas formation in the thermal destruction of ED-15 (Table 1, Fig. 1) on the basis of the chromatographical analysis by means of УХТ-2 (UKhT-2) or the Griffin apparatus (Fig. 2, chromatogram); kinetics of gas formation in ED-15 (Fig. 3) hardened with polyethylene polyamine and ED-15 hardened with maleic anhydride (Fig. 4); degree of decay of the hardened ED-6 as a

Card 1/2

85142

Investigation of the Thermal Destruction of Condensate Resins. The Thermal Destruction of Hardened Epoxy Resins

S/191/60/000/007/005/015
B004/B056

function of time at 345°C (Fig. 5) and as a function of temperature (Fig 6), as well as an electron paramagnetic spectrum (Fig. 7) that proves the formation of free radicals. From these data the following conclusions were drawn: Unhardened and hardened epoxy resins (low-molecular ED-6 and high-molecular ED-15) decompose in the absence of oxygen above 200° - 250°C. Liquid and gaseous products are formed which in unhardened resin consist of distilled-off low-molecular fractions contained already in the initial resin, and in hardened resin of destruction products. The destruction products contain CO, CO_2, CH_4, C_2H_4, C_3H_8, and other hydrocarbons, as well as saturated and unsaturated aldehydes. The mechanism of the destruction of hardened resins is analogous to that of unhardened ED-6. In both cases, a radical process occurs, which begins with the separation and decay of epoxy groups. Resins hardened with maleic aldehyde form CO and CO_2 in larger quantities as a result of the decay of the maleic aldehyde. Resin hardened with polyethylene polyamine is more easily decomposed than such hardened with maleic aldehyde and forms more low-molecular products. There are 7 figures, 2 tables, and 6 references: 1 Soviet, 2 US, 2 German, and 1 Swiss.

Card 2/2

S/062/60/000/010/020/031/XX
B002/B060

AUTHORS: Medvedeva, N. I., Neyman, M. B., Torsuyeva, Ye. S.

TITLE: Rate of Thermal Decomposition of Ethane Under Conditions of Equilibrium and Far From Equilibrium

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1960, No. 10, pp. 1759-1762

TEXT: The authors attempted to measure the rates of reaction and back-reaction $C_2H_6 \rightleftarrows C_2H_4 + H_2$. Determinations were made at 554° (146 mm Hg) and 600°C (142 mm Hg). A mixture in equilibrium, consisting of ethane, hydrogen, and C^{14}-tagged ethylene, was filled in a quartz vessel; at certain intervals, the reaction products were determined by gas chromatography, and their activity was measured. Thence, the decomposition rate w_{equ} was calculated at equilibrium for ethane. The values of w_{equ} are not constant, but drop slightly. This was explained by the formation of such side products as methane, propylene, and higher hydrocarbons. The w_{equ} values measured at the beginning of reaction are, therefore, to be preferred; they

Card 1/2

Rate of Thermal Decomposition of Ethane Under Conditions of Equilibrium and Far From Equilibrium

S/062/60/000/010/020/031/XX
B002/B060

amount at 600°C to 0.66 mm Hg/min, and at 554°C to 0.096 mm Hg/min. Decomposition of pure ethane was also investigated. According to V. V. Voyevodskiy's suggestion, w_{equ} should be smaller than w, the reaction rate prior to equilibrium, if the reaction proceeds by the chain mechanism. However, w_{equ} at 554°C is larger, and at 600°C smaller than w. The criterion is, therefore, not sufficiently sensitive, since the reaction undoubtedly proceeds by the chain mechanism. The authors thank V. V. Voyevodskiy for a discussion. There are 4 figures, 6 tables, and 4 references: 3 Soviet and 1 British.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics of the Academy of Sciences USSR)

SUBMITTED: June 6, 1959

Card 2/2

YERSHOV, Yu.A.; MILLER, V.B.; NEYMAN, M.B.; GONIKBERG, M.G.

Kinetics of the reaction n-C_3H_7I + KI^* in nonaqueous solvents at pressures up to 3000 kg./cm.2. Izv. AN SSSR.Otd. khim. nauk no.12:2103-2106 D '60. (MIRA 13:12)

1. Institut khimicheskoy fiziki AN SSSR i Institut organicheskoy khimii im.N.D.Zelinskogo AN SSSR.
(Propane) (Iodine—Isotopes)
(Potassium iodide)

86230

S/030/60/000/011/006/026
B021/B059

15,8000 also 1526

AUTHORS: Neyman, M. B., Doctor of Chemical Sciences
Kuz'minskiy, A. S., Doctor of Chemical Sciences
Angert, L. G., Candidate of Chemical Sciences

TITLE: Scientific Problems of Polymer Stabilization

PERIODICAL: Vestnik Akademii nauk SSSR, 1960, 30 No. 11, pp. 36-50

TEXT: This paper on the present state and future trends of Soviet research in the field of polymer stabilization is dedicated in its first part to the problem of aging and stabilization of plastic masses, in its second part to the same problems for rubbers. Degradation of polymers under the action of heat, oxygen, light, and radioactive radiation is discussed. Under external affections linkage, formation of structure between the polymer molecules may occur. Degradation as well as structuration lead to unwanted changes of mechanical and electrical properties of polymeric materials. Oxidation inhibitors, photostabilizers, aging inhibitors and other ingredients must be added to polymers in order to guarantee their working and to satisfy technical requirements. Therefore, production of polymers and of various stabilizers must be developed in parallel. Since years K. I. Ivanov

Card 1/5

86230

Scientific Problems of Polymer Stabilization S/030/60/000/011/006/026
B021/B059

and collaborators have been investigating the mechanism of oxidation inhibition of lubricants. Shortly ago it was shown in S. S. Medvedev's laboratory that formic acid and formates inhibit oxidizing of hydrocarbons and of some polymers. A. S. Danyushevskiy and collaborators investigated a large number of stabilizers 15 for polyvinylchloride. 15 A. A. Berlin investigated stabilization of polyvinylchloride with epoxy compounds. The mechanism of the oxidation of organic substances, among them also polymers, was explained by a theory of N. N. Semenov. At the Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics of the Academy of Sciences USSR) it was shown short time ago, that during a mild oxidation of some oxidation inhibitors, stable radicals 1 may form, which were discovered by means of the method of electron paramagnetic resonance (Fig. 1). The action of inhibitors is explained according to a theory by N. N. Semenov. Measurements of the induction period and its dependence on inhibitor concentration are mentioned. P. I. Levin and A. F. Lukovnikov investigated in the laboratory of the Institute of Chemical Physics a number of mixtures of mercaptane and sulfides with aromatic amines as inhibitors of thermal oxidation. It is possible to measure the diffusion coefficients of stabilizors with great accuracy by using the method of tagging with radioactive isotopes. This was shown by B. A. Gromov, V. B. Miller, and Yu. A. Shlyapnikov. The

Scientific Problems of Polymer Stabilization

86230
S/030/60/000/011/006/026
B021/B059

problem of finding appropriate inhibitor combinations for plastics should be solved not only by the Institutes of the Akademiya nauk SSSR (Academy of Sciences USSR) and the Academies of Sciences of the Republics of the Union, but also by the Institutes of the Gosudarstvennyy komitet Soveta Ministrov SSSR po khimii (State Committee of Chemistry of the Council of Ministers USSR) and the laboratories of the schools of higher learning. This paper deals only with a few problems of the manifold rubbers since many articles have been devoted to that task already. The chief reason for thermal aging of rubber at temperatures below 150°C is an oxidation of polymeric molecules with atmospheric oxygen. Secondary amines and phenols serve as oxidation inhibitors of rubber. The aging processes of rubbers are rendered complicated by various impurities. Aging of vulcanized rubbers is different in this respect from ordinary rubber, chiefly because of a number of various free and bound components. The Nauchnyy sovet po vysokomolekulyarnym soyedineniyam (Scientific Council for Highmolecular Compounds) at the Presidium of the Academy of Sciences USSR, together with the State Committee of Chemistry of the Council of Ministers USSR, on June 6, 1960, adopted a joint resolution concerning the development of scientific and industrial research on the stabilization of polymers. This resolution provides the organization of a new laboratory of the Academy of Sciences

Card 3/5

86230
S/030/60/000/011/006/026
B021/B059

Scientific Problems of Polymer Stabilization

USSR in Gor'kiy for the synthesis of stabilizers for the purpose of finding new types of inhibitors. A number of laboratories and test plants for the same purpose is planned for Tambov. The Institute of Chemical Physics and its Noginskiy filial (Noginsk Branch) are expanding their research work on polymers. The following institutes of the Academy of Sciences USSR are intended to be charged with these investigations: Institut elementoorganicheskikh soyedineniy (Institute of Elemental organic Compounds), Institut vysokomolekulyarnykh soyedineniy (Institute of Highmolecular Compounds), as well as the laboratories of the Moskovskiy universitet (Moscow University), Moskovskiy tekstil'nyy institut (Moscow Textile Institute), of the Kazanskiy khimiko-tekhnologicheskiy institut (Kazan' Institute of Chemical Technology), and of a number of schools of higher learning. The laboratories of the following institutes shall be enlarged and new ones for the stabilization of polymers are planned: Fiziko-khimicheskiy institut im. L. Ya. Karpova (Physicochemical Institute imeni L. Ya. Karpov), Institut plasticheskikh mass (Plastics Institute), Institut polimerizatsionnykh plasticheskikh mass (Institute of Polymerized Plastics), Institut sinteticheskogo kauchuka (Institute of Synthetic Rubber), Institut rezinovoy promyshlennosti (Institute of the Rubber Industry), Institut shinnoy promyshlennosti (Institute of Tire Manufacturing) and Institut iskusstvennogo volokna

Card 4/5

86230

Scientific Problems of Polymer Stabilization S/030/60/000/011/006/026
B021/B059

(Institute of Synthetic Fiber). A commission with Academician V. A. Kargin in the chair is entrusted with the coordination of the studies on the stabilization of polymers and with the preparation of construction plans for test plants for the sovnarkhoz. In 1961, the Institute of Chemical Physics intends to convere a special conference for the purpose of generalizing work in the field of the degradation and stabilization of polymers. There are 4 figures and 20 references: 17 Soviet, 2 US, and 1 British.

Card 5/5

S/076/60/034/009/026/041XX
B020/B056

AUTHORS: Moiseyev, V. D. and Neyman, M. B.

TITLE: Estimation of the Concentration of Atomic Hydrogen and the Chain Length in the Thermal Decomposition of Acetaldehyde

PERIODICAL: Zhurnal fizicheskoy khimii, 1960, Vol. 34, No. 9, pp. 1960 - 1966

TEXT: M. B. Neyman, N. I. Medvedeva and Ye. S. Torsuyeva (Ref. 1) suggested in 1957 that the concentration of atomic hydrogen in reacting gas mixtures be determined by means of a method based upon using the hydrogenation of C^{14}-tagged ethylene. This method may be used whenever no elementary reactions of the hydrogenation of ethylene takes place by means of molecules or radicals other than [H]. The authors of the abovementioned paper in this way determined the concentration of atomic hydrogen at the decomposition temperature of propane. In the present work the said method was applied to determine the concentration of atomic hydrogen at various instants of the reaction of the thermal decomposition of acetaldehyde, it being assumed that no disturbing side reactions occur. The experiments were carried out

Card 1/4

in a fixed glass device, whose scheme is given in Fig. 1. As a carrier gas in the chromatographic column, CO_2 was used. The initial mixture consisted of 3.80 cm^3 methane, 0.75 cm^3 ethane, and 0.40 cm^3 ethylene; from the column, 3.80 cm^3 methane, 0.75 cm^3 ethane, and 0.40 cm^3 ethylene emerged. A mixture of acetaldehyde and tagged ethylene with an activity of 2700 imp./min.·mg $BaCO_3$ was used. The experiments Nos. 3 - 9 were carried out exactly according to the method described, whereas experiments 1 and 2 were carried out with a cooled reaction vessel (these were the blank tests). In the experiments Nos. 3 - 9, from the measured activity α of ethylene 40 imp./min.·mg $BaCO_3$ was calculated, and the difference obtained, $\alpha' = \alpha - 40$, was considered to be the true activity of the ethane, i. e., the activity obtained by the formation of the ethane from tagged ethylene by means of its tagging. The results of the experiments Nos. 1 - 9 are given in Table 1, where also the quantities v of the tagged ethane are given, which were calculated from the isotope rarefication equation $v = V(\alpha/\alpha'')$. The dependence v on the time t and on Δp (fraction of the decomposed acetaldehyde) is given in Fig. 3. Also acetaldehyde without any addition of ethylene was

Estimation of the Concentration of Atomic Hydrogen and the Chain Length in the Thermal Decomposition of Acetaldehyde

S/076/60/034/009/026/041 XX
B020/B056

cracked at the same temperature and the same pressure, the reaction kinetics being the same as in the presence of 2% ethylene. The results of one experiment are given in Fig. 4. Table 2 shows the rate of the acetaldehyde consumption w at various points of time (obtained from Fig. 4) and the formation rate w′ of the marked ethane (from Fig. 3), it being assumed that $w' = w_1$ (concentration of the hydrogen atoms), and that the activity of the ethane obtained from marked ethylene is equal to that of the latter. The hydrogen atom concentration was calculated as $5.7 \cdot 10^{13} cm^3 sec^{-1} mole\text{-}equ.^{-1}$ (Table 2). Determination of the chain length in cracking of the acetaldehyde is given in Fig. 5, where the quantity of the decomposed acetaldehyde is observed as a function of the quantity of the resulting tagged ethane and of the sum $\Delta p_2 = \Delta p_{C_2^*H_6} \cdot 10^{-2} (-\Delta p_{CH_3CHO})$. Also Student Ye. D. Fedorov took part in these experiments. There are 5 figures, 2 tables, and 11 references: 3 Soviet, 2 US, 2 British, 3 French, and 1 German.

Card 3/4

Estimation of the Concentration of Atomic Hydrogen and the Chain Length in the Thermal Decomposition of Acetaldehyde

S/076/60/034/009/026/041 XX
B020/B056

ASSOCIATION: Akademiya nauk SSSR, Institut khimicheskoy fiziki (Academy of Sciences USSR, Institute of Chemical Physics)

SUBMITTED: December 16, 1958

Card 4/4

84249

S/076/60/034/009/010/022
B015/B056

11.1210

AUTHORS: Miller, V. B., Levin, P. I., Konareva, G. P., Neyman, M. B., and Yenikolopyan, N. S.

19

TITLE: Application of the Kinetic Method of Isotopes for Investigating the Oxidation of Methane in the Presence of Nitromethane

PERIODICAL: Zhurnal fizicheskoy khimii, 1960, Vol. 34, No. 9, pp. 1980-1986

TEXT: Two of the authors (Ref. 7) observed that in the oxidation of methane with small additions of NO_2, a slight temperature rise occurs. The latter is due to the formation of nitromethane, which acts as a catalyst and, at first, decays quickly into formaldehyde and carbon monoxides, and in the further course of the reaction it maintains a constant concentration for 1-1.5 minutes. For the time of concentration constancy of the nitromethane it may be assumed that nitromethane either does not take part in the reaction, or (which is more probable) is used up, but is re-formed in the same quantity. In the present case, it was found by the kinetic method that the latter assumption is correct. ...

Card 1/3

84249

Application of the Kinetic Method of Isotopes for Investigating the Oxidation of Methane in the Presence of Nitromethane

S/076/60/034/009/010/022
B015/B056

$C^{14}H_4$ used was produced from $BaC^{14}O_3$, and the $C^{14}H_3NO_2$ from marked acetic acid was obtained by a method developed by P. I. Levin (Ref. 11) and formaldehyde was separated by distillation from nitromethane (Table results of separation). Three series of experiments were carried out; in the first, a mixture of 74.0 torr CH_4 + 146 torr O_2 + 4.7 torr $C^{14}H_3NO_2$ was used at a temperature of 473°C. The activity curves (Fig. 3), show that nitromethane is formed from methane, and that nitromethane is not isolated. In the second series of experiments, $C^{14}H_4$ was oxidized besides nitromethane and it was found that formaldehyde is formed partly direct from nitromethane and partly from methane (Fig. 4). To explain the part played by O_2, a third series was carried out with 220.3 torr CH_4 + 4.7 torr $C^{14}H_3NO_2$ at 473°C, and it was found that in the presence of O_2 the maximum concentration of formaldehyde is four times lower, and is attained three times more rapidly. The fraction of formaldehyde not formed from nitromethane, is formed by a reaction of methane

Card 2/3

84249

Application of the Kinetic Method of Isotopes for Investigating the Oxidation of Methane in the Presence of Nitromethane

S/076/60/034/009/010/[illegible]
B015/B056

with nitrogen oxides. The isotopic exchange follows the scheme $C^{14}H_3NO_2 + CH_4 \rightleftarrows C^{14}H_4 + CH_3NO_2$. The formation and consumption rates of nitromethane in the presence and in the absence of oxygen were calculated. 2-3 methane molecules are oxidized for every nitromethane molecule. There are 8 figures, 1 table, and 11 references: 10 Soviet and 1 US.

ASSOCIATION: Akademiya nauk SSSR Institut khimicheskoy fiziki (Academy of Sciences USSR, Institute of Chemical Physics)

SUBMITTED: December 18, 1958

Card 3/3

S/076/60/034/012/014/027
B020/B067

AUTHORS: Medvedeva, N. I., Neyman, M. B., Torsuyeva, Ye. S., and Kravohuk, I. P.

TITLE: Kinetic Method of Using Labelled Atoms in the Study of Complex Chemical and Biochemical Processes. X. Study of the Rates of Formation and Consumption of Ethylene in the Cracking of Propane

PERIODICAL: Zhurnal fizicheskoy khimii, 1960, Vol. 34, No. 12, pp. 2780-2788

TEXT: Fig. 1 shows the scheme of a vacuum device for propane cracking, which was made under static conditions in a quartz reaction vessel. The reaction vessel was inserted into a horizontal tube furnace. The temperature of the furnace was controlled by a calibrated chromel-alumel thermocouple. Propane to which labelled ethylene $C_2^{14}H_4$ had been added was cracked and was synthetized from propylbromide via an organic magnesium compound. It contained 0.5% ethane and 1% propylene. The ethylene labelled

Card 1/4

Kinetic Method of Using Labelled Atoms in the Study of Complex Chemical and Biochemical Processes. X. Study of the Rates of Formation and Consumption of Ethylene in the Cracking of Propane

S/076/60/034/012/014/02
B020/B067

with radioactive carbon C^{14} was produced from $BaC^{14}O_3$. A chromatographic column filled with МСМ-1 (MSM-1) silica gel was used to isolate the reaction products. Fig. 3 shows the characteristic separation curves of the cracking products of propane: the time or the proportional amount of nitrogen which has passed through the column were plotted along the axis of abscissas, the values read from the interferometer were plotted along the axis of ordinates. The maximum measuring error was 10-15%. By means of the method described the authors studied the cracking of propane by adding labelled ethylene up to a 20-25% conversion at 580, 551, 532, and 510°C. Fig. 4 shows the kinetic curves of the decomposition of propane with a content of 0.5% of ethane and 1% of labelled ethylene at four temperatures. The activation energy of the entire propane cracking process increases from 65,500 cal/mole with a 3% conversion to 72,500 cal/mole with 17% conversion. Fig. 6 shows the change of the specific activity of ethylene (Curve 1) and ethane (Curve 2) with the degree of cracking for four experimental series at different temperatures. Table 1 gives data on

Card 2/4

Kinetic Method of Using Labelled Atoms in the Study of Complex Chemical and Biochemical Processes. X. Study of the Rates of Formation and Consumption of Ethylene in the Cracking of Propane

S/076/60/034/012/014/027
B020/B067

the activation balance at 580, 554, 532, and 510°C. Fig. 7 graphically illustrates the experimental curves of the accumulation of ethylene (1) and ethane (2) in the course of thermal decomposition of propane. Table 2 gives the rates of formation of ethane from ethylene in millimoles per second which were calculated from the equation $w = (1/\alpha)(dI_{C_2H_6}/dt)$ (2), where w is the rate of formation of ethane from ethylene, α the specific activity of ethylene, and $I_{C_2H_6}$ the total activity of ethane. The rate of accumulation of ethane during the reaction was experimentally determined and found to be equal to the rate of formation of ethane from ethylene which was calculated by the kinetic method (Table 3). Fig. 8 shows the rates of formation of ethylene w_1 calculated from four experimental series at different temperatures and without consideration of the ethylene consumption during the reaction. Fig. 9 shows that the temperature course of the initial rates of formation of ethylene leads to an activation energy of this process of E = 62,500 cal/mole. Table 4 shows the concentrations of n-propyl radicals at 580°C. The equation

Card 3/4

Kinetic Method of Using Labelled Atoms in the Study of Complex Chemical and Biochemical Processes. X. Study of the Rates of Formation and Consumption of Ethylene in the Cracking of Propane

S/076/60/034/012/014/027
B020/B067

$$w_2 = w = fk_o e^{-E/RT} \left[C_2H_4\right] \left[E^\bullet\right]$$

was given for the consumption of ethylene, where the values of $H^\bullet$ at 580° with $f = 0.01$, $k_o = 10^{-10}$ cm^{3}sec^{-1}mole sec^{-1} and $E = 5{,}000$ cal/mole are given in Table 5. A. V. Frost, A. D. Stepukhovich, and S.Z. Roginskiy are mentioned. There are 9 figures, 5 tables, and 15 references: 13 Soviet and 2 US.

ASSOCIATION: Akademiya nauk SSSR, Institut khimicheskoy fiziki (Academy of Sciences of the USSR, Institute of Chemical Physics)

SUBMITTED: March 26, 1959

Card 4/4

86837

15.8110

S/020/60/135/005/027/043
B016/B052

AUTHORS: [redacted], Kovarskaya, B. M., Strizhkova, A. S., Levantovskaya, I. I., and Akutin, M. S.

TITLE: The Mechanism of Thermal Destruction of Solidified Epoxy Resins

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 135, No. 5, pp. 1147-1149

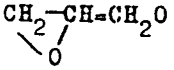
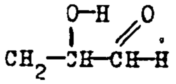
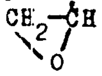
TEXT: The authors studied the kinetics of thermal destruction of epoxy resins solidified by maleic anhydride (see scheme) or polyethylene polyamine. They determined the forming radicals by the method of electron paramagnetic resonance. Fig. 1 schematically shows the results obtained from thermal processes: (1) gas separation; (2) weight losses of the residue; and (3) rate of radical accumulation. Considerable amounts of methane, carbon monoxide, formaldehyde, acetaldehyde, and acrolein were found in the gaseous products of destruction. According to the temperature, gas separation stops after 5 - 15 minutes. Thermal destruction, however, continues while liquid products of a comparatively low molecular weight

Card 1/4

86837

The Mechanism of Thermal Destruction of Solidified Epoxy Resins

S/020/60/135/005/027/043
B016/B052

are distilled from the polymer. The authors suggest the following scheme for the formation of the above products: They assume that the terminal  $\underset{\diagdown O \diagup}{CH_2-CH}-CH_2O$ groups are separated most easily from the polymer. This radical can be isomerized into a  $CH_2-\overset{\overset{O-H}{|}}{C}H-\overset{\overset{O}{\|}}{\dot{C}}-H$ radical which forms acrolein and hydroxyl. The original radical may also decompose into a CH_2O molecule and a  $\underset{\diagdown O \diagup}{CH_2-\dot{C}H}$ radical. By isomerization of the latter, the acetyl radical $CH_3-\dot{C}O$ may be formed which extracts hydrogen from the epoxy resin and forms acetaldehyde. Finally, the acetyl radical may decompose into CO and CH_3. By absorbing hydrogen, CH_3 is converted into methane. In all cases, the reaction takes place under the formation of active radicals which cannot accumulate in high concentrations and, therefore, cannot be detected by the e.p.r. method. This is only possible in later stages of the process. The authors assume that the bonds of diphenylol propane which cause the formation of stable radicals, may also be ruptured. The rupture of

Card 2/4

86837

The Mechanism of Thermal Destruction of Solidified Epoxy Resins

S/020/60/135/005/027/043
B016/B052

phenyl-hydrogen bonds probably leads to the formation of stable radicals and semiquinone structures. The singlet signals recorded by the authors indicate the presence of long-lived radicals. From these results the authors determined the activation energies of the three above-mentioned processes. For the resin solidified by maleic anhydride, they are 30, 26, and 53 kcal/mole, respectively, and for the resin solidified by polyethylene polyamine, they are 25, 35, and 44 kcal/mole. The authors also assume that processes (1) and (2) are related to the rupture of looser bonds, while process (3) is closely connected with the rupture of tight bonds. From their experiments the authors conclude that active radicals can not easily be detected by the available e.p.r. method, while this is possible in the case of weakly active radicals. They thank Z. P. Yegorova and O. L. Lependina for their assistance in taking spectra, and E. G. Gintsberg for the polarographic determination of aldehydes. L. A. Blyumenfel'd, A. V. Topchiyev, and V. V. Voyevodskiy are mentioned. There are 4 figures and 8 references: 7 Soviet and 1 British.

ASSOCIATION: Gosudarstvennyy nauchno-issledovatel'skiy institut plasticheskikh mass (State Scientific Research Institute of Plastics)

Card 3/4

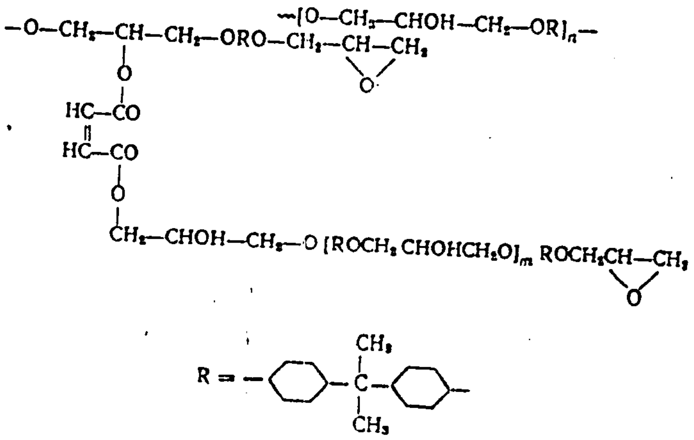
86837

The Mechanism of Thermal Destruction of
Solidified Epoxy Resins

S/020/60/135/005/027/043
B016/B052

PRESENTED: June 29, 1960, by V. A. Kargin, Academician

SUBMITTED: June 27, 1960



Card 4/4

NEYMAN, Moisey Borisovich; KONDRAT'YEV, V.N., akad., otv. red.; KLYAUS, Ye.M., red.izd-va; POLENOVA, T.P., tekhn. red.

[Atomic energy and its utilization] Atomnaia energiia i ee primenenie. Moskva, Izd-vo Akad.nauk SSSR, 1961. 142 p. (MIRA 14:12)
(Atomic energy)

[illegible]

S/081/62/000/005/[illegible]
B1[illegible]/B144

5.3[illegible]

AUTHORS: Buchachenko, A. L., Neyman, M. B., [illegible], A. [illegible]

TITLE: Photochemical liquid-phase oxidation of [illegible] and effect of inhibitors on the rate of [illegible]

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 5, [illegible], abstract 5B281 (Tr. po khimii i khim. tekhnol. (Gor'kiy), [illegible], 1961, [illegible]-38)

TEXT: Liquid-phase photochemical oxidation of 2,4,6-trimethyl[illegible] (I) by oxygen is carried out at 6-80°C in the presence of anthraquinone as a sensitizer. From the rate of oxidation of I the ratio of the rate constant of the chain growth reaction (k_1) to the square root of the rate constant of the chain rupture reaction (k_2) is determined. The values of $k_1 = 3.2 \cdot 10^{-16} \exp(-9100/RT)$ cm^3·sec^{-1} and of k_2 = [illegible]·10$^{-[illegible]}$ cm^3·sec^{-1} [illegible] determined using the rotating sector method. For studying the inhibited oxidation of I diphenyl amine is used as inhibitor. From the dependence

Card 1/2

S/081/62/000/005/[illegible]
Photochemical liquid-phase... B151/B144

of the rate of the inhibited oxidation on the inhibitor concentration the inhibition constant $k_7 = 1\cdot 10^{-16} \exp(-5500/RT)$ $cm^3 \cdot sec^{-1}$ is found. By oxidizing I in the presence of diphenyl amine, deuterized in the amino group, a small kinetic isotopic effect is found, equal to 1.25-1.30 at 59.5°C. Using electron paramagnetic resonance the presence of a stable diphenyl nitrogenous radical formed on oxidation of I in the presence of diphenyl amine has been found. [Abstracter's note: Complete translation.]

Card 2/2

S/081/62/000/005/007/112
B158/B110

111510

AUTHORS: Buchachenko, A. L. Neyman, M. B. Lebedev, Ya. S.

TITLE: Investigation of radical reactions of antioxidants in liquid phase by the method of electronic paramagnetic resonance

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 5, 1962, 59, abstract 5B380 (Tr. po khimii i khim. tekhnol. (Gor'kiy), no. 1, 1961, 39 - 43)

TEXT: By the method of electronic paramagnetic resonance it is shown that stable radicals are formed when a number of active radicals, obtained by decomposing benzoyl peroxide, cyclohexyl percarbonate, p-tert-butyl cumene peroxide, etc., in the presence of a catalyst, are reacted with antioxidants - aromatic amines, alkyl substitution phenols, naphthols, etc. Their lifetimes in a solution of toluene or benzene (in liquid phase) range from several minutes to several hours depending on the nature of the radicals and the temperature. For a number of antioxidants - phenols and amines - it was possible to identify the structures of the radicals formed and to study

Card 1/2

S/191/61/000/002/002/012
3118/B203

AUTHORS: Khloplyankina, M.S., Neyman, M.B., Moiseyev, V.D.

TITLE: Thermal destruction of polymers.
II. Comparative studies of gaseous olefins, products of destruction of polypropylene and polyethylene

PERIODICAL: Plasticheskiye massy, no. 2, 1961, 9 - 12

TEXT: The authors compare the structures of butenes and pentenes (Refs. 1, 2) resulting from the thermal destruction of polypropylene (PP) and polyethylene (PE). A few papers only (Refs. 5, 6) dealt with the ozonization of gaseous olefins which is important for the structural analysis. Besides, the gas quantities of olefins obtained in the experiments of this investigation were very small; the ozonization of such microquantities was only mentioned in one paper (Ref. 6) and not described in detail; also in other papers, the microozonization of olefins was only used for the group $> C = CH_2$. Therefore, it was necessary to elaborate this microozonization for the present investigation. An ozonizer according to

Card 1/5

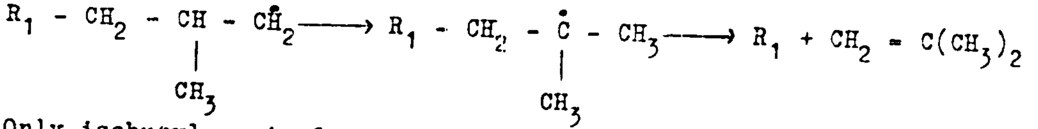
Thermal destruction of polymers ...

S/191/61/000/002/002/012
B118/B203

Berthelot was used. The ozonization of gaseous olefins was performed in an ozone-saturated solvent. The resulting ozonides were reduced to ketones and aldehydes which were determined polarographically (Refs. 9-13). It had to be established whether ozonides were also formed from the solvent; this was accomplished by polarographing the aqueous extracts of the unchanged and of the ozonized solvent. It was found that organic solvents partly passed into water and, in polarography, were reduced or ozonized at the same potentials; the cleavage products of ozonides formed from the solvent were also reduced, namely at the reduction potentials of the aldehydes. Therefore, water was used as solvent. An ozonization method for gaseous olefins was developed which proved to be particularly convenient in chromatographic purification. Ethylene, propylene, isobutylene, butene-1, and butene-2 were ozonized by this method. All aldehydes expected were detected polarographically, though in low yields. Olefins were also ozonized from the destruction products of PP and PE. Figs. 3 and 4 show the chromatograms which exhibit that the butene fraction in the destruction products consists of isobutylene only. The ozonolysis showed that the pentene fraction consisted of pentene 1 only.

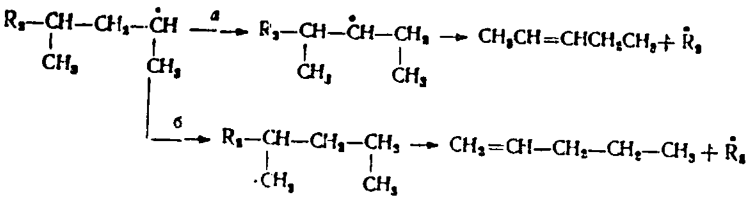
Card 2/5

The butene fraction in the destruction products of PE consists of butene-1, cis-butene-2, and trans-butene-2. On the basis of polarographic data, pentene-2 is present in much smaller amounts than pentene-1. On the basis of the ideas of isomerization of radicals in destruction (Ref. 1), it must be assumed that butenes are formed in the destruction of PP by the following reaction:



$$R_1-CH_2-\underset{\displaystyle CH_3}{\underset{|}{CH}}-\dot{C}H_2 \longrightarrow R_1-CH_2-\underset{\displaystyle CH_3}{\underset{|}{\dot{C}}}-CH_3 \longrightarrow R_1+CH_2=C(CH_3)_2 \quad (1).$$

Only isobutylene is formed, which is confirmed by the experiment. Pentenes are formed on the basis of the same ideas according to Eq. (2)



$$R_2-\underset{\displaystyle CH_3}{\underset{|}{CH}}-CH_2-\underset{\displaystyle CH_3}{\underset{|}{\dot{C}H}} \xrightarrow{a} R_2-\underset{\displaystyle CH_3}{\underset{|}{CH}}-\dot{C}H-\underset{\displaystyle CH_3}{\underset{|}{CH_2}} \rightarrow CH_3CH=CHCH_2CH_3+\dot{R}_2$$

$$\xrightarrow{б} R_2-\underset{\displaystyle \cdot CH_2}{\underset{|}{CH}}-CH_2-\underset{\displaystyle CH_3}{\underset{|}{CH_2}} \rightarrow CH_2=CH-CH_2-CH_2-CH_3+\dot{R}_2 \quad (2)$$

Thermal destruction of polymers ...

S/191/61/000/002/002/012
B118/B203

There are 4 figures, 3 tables, and 17 references: 7 Soviet-bloc and 10 non-Soviet-bloc.

√

Legend to Fig. 3: Chromatogram of gaseous products of thermal destruction of PP: 1) $CO+H_2$; 2) CH_4; 3) CrH_6; 4) C_3H_8; 5) C_3H_6; 6) $i-C_4H_8$; 7) C_5H_{12}

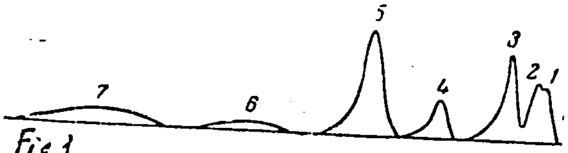


Fig 3

Card 4/5

S/191/61/000/002/002/012
B118/B203

Thermal destruction of polymers ...

Legend to Fig. 4: Chromatogram of gaseous products of thermal destruction of PE:
1) $CO+H_2$; 2) $C_2H_6 + C_2H_4$;
3) C_3H_8; 4) C_3H_6; 5) C_4H_{10};
6) C_4H_8-1; 7) cis-C_4H_8;
8) trans-C_4H_8; 9) C_5H_{12}
(various isomers)

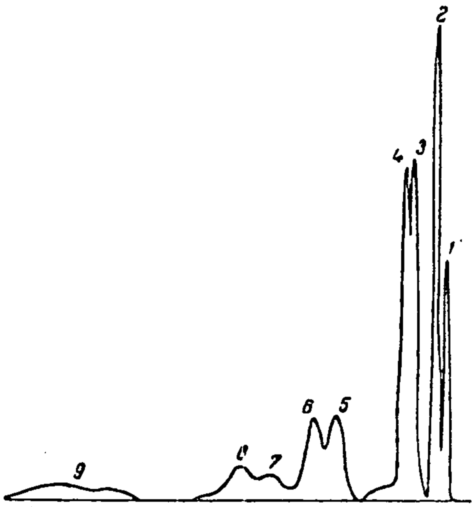


Fig 4

Card 5/5

BUCHANCHENKOV, A.L.; KAGANSKAYA, K.Ya.; NEYMAN, M.B.; PETROV, A.A.

Study of the mechanism underlying the oxidation of 2,4,6-trimethylheptane with the use of the intermittent illumination method. Kin. i kat. 2 no.1:44-49 Ja-F '61. (MIRA 14:3)

1. Institut khimicheskoy fiziki AN SSSR.
(Heptane)

BUCHACHENKO, A.L.; KAGANSKAYA, K. Ya.; NEYMAN, M.B.

Inhibited oxidation of 2,4,6-trimethylheptane. Kin. i kat. 2 no.2:161-164 Mr-Ap '61. (MIRA 14:6)

1. Institut khimicheskoy fiziki AN SSSR.
(Heptane)

5 5310

28971
S/192/61/002/005/001/00[illegible]
D202/D304

AUTHORS: Buchachenko, A.L., Lebedev, Ya.S. and Neyman, M.B.

TITLE: Investigating anti-oxidant radicals by means of electronic para-magnetic resonance
I. Phenoxyradicals

PERIODICAL: Zhurnal strukturnoy khimii, v. 2, no. 5, 1961, 558-561

TEXT: This experimental work is similar to that published by Becconsall and others in 1960, the difference between these two investigations lying in the use of active compounds, capable of splitting off hydrogen from the phenols. The Western scientists used lead peroxide and the Russians benzoyl peroxide, cyclohexyl percarbonate and p-tert-butylcumene hydroxy-peroxide with cobalt stearate to catalyze the decomposition. The authors state that the Western investigation was published when theirs

Card 1/6

Investigating anti-oxidant ...

S/192/61/002/00[illegible]/001/00[illegible]
D202/D[illegible]

was virtually finished. After briefly discussing the free radicals theory, based on Western publications, the authors state that their object was to obtain stable phenoxy radicals and to study their structure and life-span; it was found that the latter amounted to hours. Substituted phenols used in the present work are given in the Table together with the characteristics of their spectra. Experiments were carried out in sealed thin glass tubes in toluene solutions, with compounds in the ratio 1:1; the tubes were heated to 50-60°C, put in the resonator of the EPR spectrometer and the first derivatives of absorption spectra recorded on a self-recording EPR-09 potentiometer. The equipment was previously described by A.G. Semenov and N.M. Bubnov (Ref. 5: Pribory i tekhnika eksperim, 1, 92, 1959). The authors discuss in detail, the spectrum of 2,6-di-tert-butyl-4-methyl phenoxy radical, obtained by the action of benzoyl peroxide, cyclohexyl percarbonate or diphenyl-picryl hydrasine (DFPC); with the last component the formation of the phenoxy-

Card 2/6

Investigating anti-oxidant ... S/[illegible]
D202/D[illegible]

radical took place even at room temperature. [illegible]
were obtained by irradiating 2,6-di-tert-[illegible]
with high-speed electrons; the irradiation [illegible]
formed together with A.T. Koritskiy and A.[illegible]
oxygen through a solution of this compound [illegible]
xide for two hours at 100 °C did not change [illegible]
affected only slightly the intensity of the [illegible]
authors failed to obtain radical spectra [illegible]
nitro-benzene, p-cresol and unsubstituted [illegible]
that their results disprove the hypothesis [illegible]
nol-benzoyl peroxide reaction; the [illegible]
calized along the II bonds of the [illegible]
density is centered around the para-[illegible]
oxygen atom. It is proposed to continue [illegible]
other substituted phenols and to study [illegible]
tics. There are 1 table, 3 figures and [illegible]
bloc and 5 non-Soviet-bloc. The refe[illegible]

Card 3/[illegible]

S/[illegible] 1
Investigating anti-oxidant ,,, B[illegible]

English-language publications [illegible]
E. Kooyman, Y. Chem.Soc., 5211 ([illegible]); D. [illegible];
Soc., 4926 (1956); Ch. Walling, J. Amer. [illegible]
(1958); Y.K. Beconsall, S. Clough, J. S[illegible], [illegible]
Soc., 56, 459, (1960)

ASSOCIATION: Institut khimicheskoy [illegible], [illegible]
of Chemical Physics AS USSR,

SUBMITTED: July 14, 1960

Card 4/5

NEYMAN, M.B.; KOVARSKAYA, B.M.; YAZVIKOVA, M.P.; SIDNEV, A.I.; AKUTIN, M.S.

Destruction of condensation resins. Part 3: Thermooxidative destruction of hardened epoxy resins. Vysokom.soed. 3 no.4:602-606 Ap '61. (MIRA 14:4)

1. Nauchno-issledovatel'skiy institut plasticheskikh mass.
(Epoxy resins)

26298
S/190/61/003/008/011/019
B110/B218

15 8200 2209

AUTHORS: Gromov, B. A., Miller, V. B., Neyman, M. B., Shlyapnikov, Yu. A.

TITLE: Study of the mobility of ionol in polypropylene and polyformaldehyde

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 3, no. 8, 1961, 1231-1233

TEXT: It was the aim of the present work to determine the diffusion coefficient D of the antioxidant ionol (2,6-di-tert-butyl-4-methylphenol) in solid isotactic polypropylene (PP) and polyformaldehyde (PF). Ionol tagged with C_{14} was examined. In this, the authors followed the method by A. A. Zhukhovitskiy et al. (Primeneniye radioaktivnykh izotopov v metallurgii (Application of radioisotopes in metallurgy), Metallurgizdat, Sb. 34, 1955, p. 102). Tagged ionol (app. 1.2 mg for PP, and app. 0.5 mg for PF) was applied to the polymer plate (1-2 mm thick). The plates were heated to experimental temperature (60-110°C for PP, 80-110°C for PF).

Card 1/3

26298

Study of the mobility of ionol in ..   S/190/61/003/008/011/019
B110/B218

and the activity was measured, which decreased due to diffusion of ionol into the plates. According to Zhukhovitskiy, the curve $I/I_0 = f(t^{-1/2})$ has an asymptote which passes through the origin of coordinates. Between D and the tangent of the asymptote, the relation $D = (I_{\infty}^2 d^2)/(I_0^2 \cdot \pi \cdot m^2)$ holds, where d = thickness of the sample, m = tangent of the slope, and I_{∞} = activity after an infinite time of diffusion. With D being sufficiently large, the β rays of C_{14} cannot practically penetrate the plate so that one may write down for I_{∞}: $I_{\infty} \approx I_0/\mu d$. Here, μ is the absorption coefficient of β-radiation (as is the case with most organic substances it is 0.28 cm^2/mg). To exclude losses of ionol, the authors also chose an experimental arrangement in which the ionol was applied between two polymer plates. In this case, they measured the sum I_1+I_2 of the activity of both plates, and found: (1) for PP, $I = 5 \cdot 10^6 \exp(-23000/RT)$; (2) for PF, $D = 2.5 \cdot 10^1 \exp(-16300/RT)$. Due to the high diffusion rate of ionol

Card 2/3

26298

Study of the mobility of ionol in ... S/190/61/003/006/011/019
B110/B218

in PP, even an incomplete mixing of the antioxidant with the polymer is sufficient. There are 2 figures and 3 Soviet references.

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

SUBMITTED: November 30, 1960

Card 3/3

26301· 26302

15-8200 2203

S/190/61/003/008/014/019
B110/B208

AUTHORS: Levin, P. I., Lukovnikov, A. F., Neyman, M. B., Khloplyankina, M. S.

TITLE: Mutual increase of antioxidant activity (synergism). I. Occurrence of synergism in mixtures of mercapto benzimidazole with some inhibitors

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 3, no. 8, 1961, 1243 - 1246

TEXT: With reference to foreign papers the authors studied the effect of antioxidants. If the action of one inhibitor prevents the formation of free radicals, and that of another peroxide decomposition, joint use of both inhibitors may have a better effect than additivity. This was studied by the effect of mixtures of mercapto benzimidazole (MBA), p-hydroxyphenyl-β-naphthylamine (p-oxyneozone, ON), or П-24 (P-24) (condensation product of styrene and phenol) on the oxidation of polypropylene containing 10% atactic structure at 200°C and 200 mm Hg. The induction period of oxidation was determined from the drop of oxygen pressure to 1.0 mm Hg. It was found that the induction period linearly increased at

Card 1/3

26308

S/190/61/003/008/014/019
B110/B208

Mutual increase of...

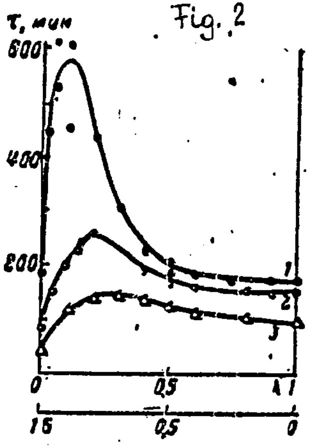
ASSOCIATION: Institut khimicheskcy fiziki AN SSSR (Institute of Chemical Physics AS USSR)

SUBMITTED: December 6, 1960

Fig. 2. Change of the induction period of polypropylene oxidation at 200°C as dependent on the composition of a mixture of p-hydroxyphenyl-β-naphthylamine (A) with mercapto benzimidazole (Б)

Legend: Total concentrations of mixtures:
(1) 0.1 moles/kg; (2) 0.05 moles/kg;
(3) 0.025 moles/kg.

Fig. 2



Card 3/3