

P. A.

A new type of topochemical reactions. M. B. Neiman and V. A. Shushunov (Gorkii State Univ.). *Doklady Akad. Nauk S.S.S.R.* 60, 1347-50 (1950).—The reaction $4 \text{NaSn} + 2 \text{EtBr} (\text{gas}) \rightarrow \text{SnEt}_4 + 4 \text{NaBr} + 2 \text{Sn}$ is characterized by an induction period τ which, at const. pressure of EtBr vapor = 300 mm. Hg, first decreases with rising temp., passes through a min. at 55°, and then increases with further rising temp.; under 400 mm. Hg, the induction periods become shorter, but the shape of the curve remains unchanged. A further example of this type is the reaction $\text{C} + \frac{1}{2} \text{H}_2 \rightarrow \text{CH}_4$ (Burke and Smith, *C.A.* 42, 8334), the half-time of which passes through a min. (i.e. the rate through a max.) at 225°. For the reaction between EtBr and the alloy NaSn, producing SnEt₄, τ has a min. at 50°, and then a max. at 62°, followed by a rapid fall with further rising temp., and corresponding to predominance of a new reaction $\text{NaSn} + 2 \text{EtBr} \rightarrow \text{NaSn} + \text{SnEt}_2\text{Br}_2$. The induction period of the low-temp. reaction between K (evapd. film) and CO, 10 or 5 mm. Hg, producing K carbonyl, passes through a shallow min. at about 120°K., followed by a peak at 170°K., then a fall to almost zero at 220°K., and steep rise on further rising temp. In this instance, too, the nature of the reaction varies with the temp. range; specifically, at low temps., the product is the K carbonyl dimer, whereas above 170°K. it is C₂O₂K₂. The min. of τ at 220°K., and its subsequent rise at still

higher temps., pertains to the latter reaction. At a sufficiently high, "crit." temp., τ becomes so large that the reaction is practically halted; under 5 and 10 mm. of CO, this crit. temp. is, resp., 273 and 280°K. Such a crit. temp. has been previously observed in the reaction between NaPb and EtCl vapor (Avtamenko, *et al.*, *C.A.* 41, 20004). The common feature of these topochem. reactions, their slow-down at higher temps., can be interpreted by a high activation energy of the reverse reaction of decomposition of intermediate products into the initial reactants. Specifically, if adsorption of the gaseous reactant on the surface of condensed reactant is followed by the formation of an intermediate that can either give the final product or regenerate the initial reactant, one finds, for the induction period, the relation $1/\tau = a - b\theta$, where $\theta = T - T_c$, the difference between the temp. of the expt. and the temp. of the min. of τ . This relation is verified by the linearity of the plot of $1/\tau$ against θ^2 for the reaction $\text{NaSn} + \text{EtBr}$, giving, for the activation energy E_1 of the formation of the intermediate, 3950 cal./mole, and for the activation energy E_2 of regeneration of the initial reactants, 10,200 cal./mole. For the reaction $\text{NaPb} + \text{EtCl}$, $E_1 = 21,000$, $E_2 = 29,000$. For K + CO, 5000 and 11,000, resp. The higher E_2 accounts for the slow-down at higher temps. These values of E_1 and E_2 permit complete reconstruction of the expt. curves. N. Thon

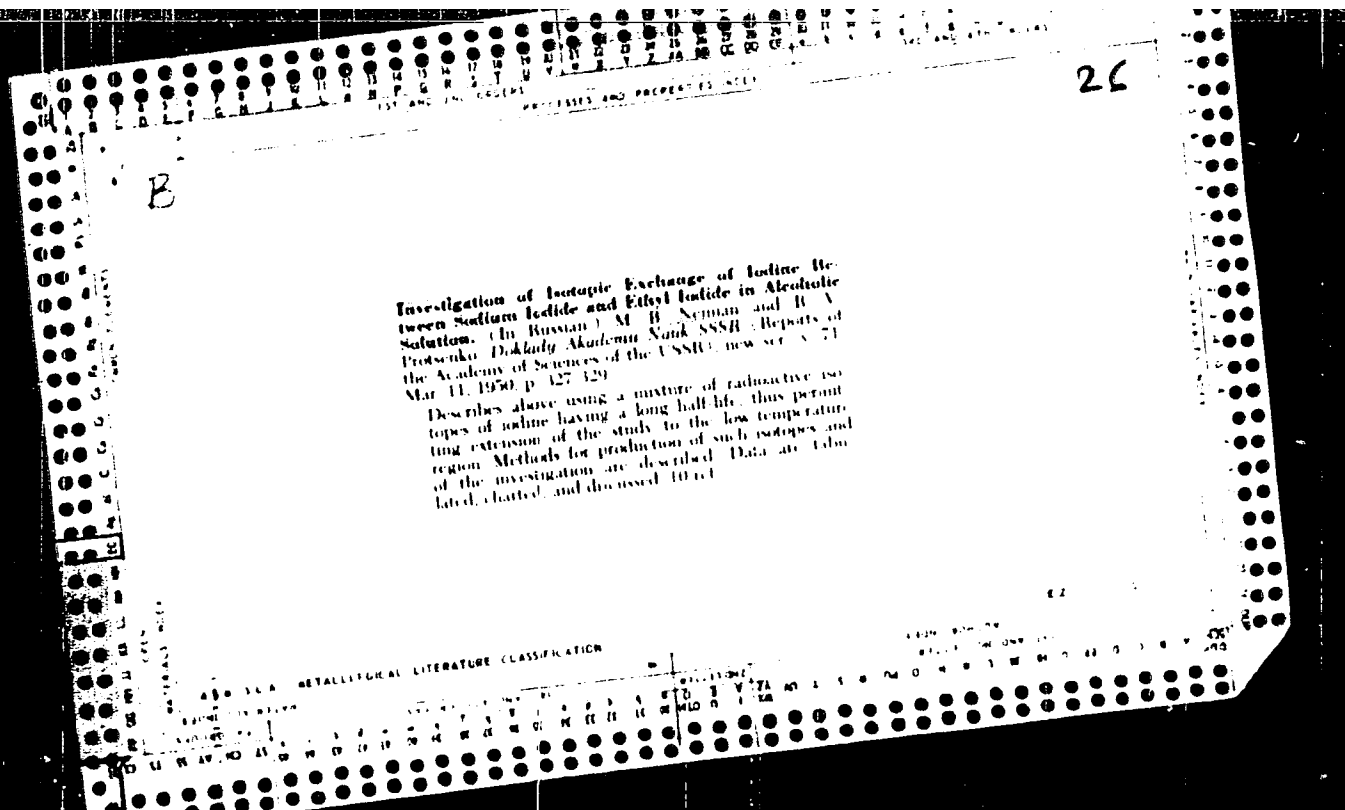
NEIMAN M. B., GORODISSKAIA G. Ia., RIVAKOVA S. I. and SHNOL R. B.

5185. GORODISSKAIA G. Ia., NEIMAN M. B., RIVAKOVA S. I. and SHNOL R. B. Effect of camphor and tetramethylammonium iodide on phosphorus metabolism in rat and frogs. Dokladi Akademii Nauk SSSR, Moscow 1950, 19/6 (233-236) Graphs 3 Tables 2

A study of phosphorus metabolism under the influence of camphor (I) and tetramethylammonium iodide (II), using radioactive phosphorus, showed that the I increases phosphorus metabolism in various tissues of the rat, while II has the opposite effect on phosphorus metabolism in frog muscles. The kinetic method of investigation used is recommended for this kind of work, since the usual methods sometimes lead to gross errors.

Fuks - Zareb

SO: Excerpta Medica, Section II, Volume III No. 9



NEYMAN, M. B., MILLER, V. B. and SHAF'OVALOV, Yu. M.

"Investigation of the Isotopic Exchange of Bromine Between Propyl Bromide and Sodium Bromide in an Alcohol Solution", Dokl AN SSSR (Novaya Seriya), Vol. LXXV, No. 3, 1950.

Inst. Chem. Phys., Acad Sci USSR

SO: W-18143, 18 May 1951

NEWMAN, M. B., MILLER, B. V. and FEDOSEYEVA, A. I.

"A New Method for the Determination of Solubility with The Aid of Radioactive Indicators", Dokl AN SSSR (Novaya Seriya), Vol. LXXV, No. 5, pp 719-721, 1950.

Inst Phys Chem, Acad Sci USSR

SC: W-17381, 16 Mar 1951

NEWMAN, M.B., IACR.

USSR/Chemistry - Isotopes

May 51

"Tracer Atoms," Part I, Prof. M. B. Neyman, Dr
Chem Sci Chair of Phys Chem, Gor'kiy State U;
Lab of Oxidation Reactions of Hydrocarbons, Inst
of Chem Phys, Acad Sci USSR.

"Nauka i Zhizn'" Vol XVIII, No 5, pp 17-20.

Presents general discussion of subject, emphas-
izing applications in fuel chemistry and petrol-
eum technology. Describes USSR work on kok-sag-
hyz, wherein, under application of radioactive
sugar, synthesis of rubber from sugar in the
plant was established.

190T3

REY III, V. 1.

U. S. S. R. Chemistry - Continuation

1971-71

"Investigation of the Limiting of Gaseous Mixtures. XXI. Investigation of Reaction of Low-Temperature Oxidation of Butane," A. A. Bohrinokov, V. P. Noyan.

"Zhurnal Khim" Vol XXV, No 10, pp 1170-1180.

Developed method for chromatographic analysis of intermediate products formed during low-temperature low-temperature oxidation of hydrocarbons. Investigation of oxidation products occurring during induction period of low-temperature combustion of butane revealed accumulation of peroxides and higher aldehydes according to certain laws. Processes of chain oxidation of hydrocarbons as a function in turn: alkyl, then peroxide, then aldehyde radicals.

PA 197112

CA

isotope exchange of bromine between sodium bromide and allyl bromide in alcoholic solution. M. H. Neuman and Yu. M. Klyaynovskiy (Acad. Sci. U.S.S.R., Moscow). *Doklady Akad. Nauk S.S.S.R.* 77, 423 (1954). The rate of exchange was investigated in a solution of 10 millimoles $\text{CH}_2\text{CHCH}_2\text{Br}$ and 10 millimoles NaBr tagged with radio-active Br in 100 ml. EtOH . The 2nd-order rate constants (l. mole⁻¹ sec.⁻¹) at 10, 20, 40, and 61° are $10^4 k = 0.6, 2.6, 12.5,$ and 46 . At equilibrium, Br⁷⁹ is equally distributed between $\text{CH}_2\text{CHCH}_2\text{Br}$ and NaBr . The activation energy $E = 15.5$ kcal./mole; the steric factor $P = 1 \times 10^{-2}$, as compared with $E = 18.0, P = 2 \times 10^{-2}$ for the exchange between PrEt and NaEt (C.I., 45, 3227). The fact that $\text{CH}_2\text{CHCH}_2\text{Br}$ exchanges Br about 25-30 times as rapidly as PrEt does is thus due to the lower E . The rate of isotopic exchange parallels the case of electroreduction on a dropping Hg cathode. Thus, in a 0.1 N Me_4NI solution, $\text{CH}_2\text{CHCH}_2\text{Br}$ is reduced at -0.6 v., PrEt only at -1.2 v. N. Thon

CA

110

Carbohydrates as the raw material for the synthesis of rubber in plants. M. B. Nelvan, A. A. Prokof'ev, and P. S. Shantarovich. *Doklady Akad. Nauk S.S.S.R.* 78, 307-310 (1951). Leaves of *kak-saghyz* plants were painted daily with a 1% soln. of C^{14} -labeled sucrose (contg. a small amt. of glucose) and the roots, which were suspended in a moist-air chamber, were milked of latex daily, and the C^{14} activity was detd. The C^{14} appeared in the latex within the 1st 10 days of the exp't., and its main location in the rubber proper was proved by isolation of the purified rubber and detn. of its C^{14} activity. No C^{14} was found in the water-sol. components but was found in Me₂CO-sol. components. Apparently the latex system is supplied, not with sugars as such, but with some products of their degradation or change; probably this change occurs in the parenchymatic tissues of the roots. The active sucrose was prepd. biologically by keeping Turkish tobacco plants in an atm. rich in $C^{14}O_2$. G. M. Kozlov

NEYMAN, M. B.

USSR/Chemistry - Isotopes
Combustion

21 May 51

"Synthesis of 2-C¹⁴-Propene," M. B. Neyman, A. F. Lukovnikov, B. Z. Iofa

"Dok Ak Nauk SSSR" Vol LXXVIII, No 3, pp 493-496

Use of 1-C¹⁴-propene-1 in combustion investigations is difficult, because (1) its synthesis is complicated, (2) the double bond migrates at high temps, and (3) there are many side reactions and low yield of radioactive products. Synthesized 2-C¹⁴-propene-1 from BaC¹⁴O₃ according to the scheme:
$$\text{C}^{14}\text{O}_2 + \text{MeMgI} \rightarrow \text{MeC}^{14}\text{OOMgI} \rightarrow (\text{MeC}^{14}\text{OO})_2\text{Ba} \rightarrow \text{Me.}$$

$$\text{C}^{14}\text{O.Me} \rightarrow \text{Me.C}^{14}\text{HOH.Me} \rightarrow \text{CH}_3.\text{C}^{14}\text{H=CH}_2.$$

186T11

CA

2

Polarographic reduction of sulfonyl chlorides. S. G. Mafranovskii and M. B. Nelman (Inst. Chem. Phys., Acad. Sci. U.S.S.R., Moscow). *Doklady Akad. Nauk S.S.S.R.* 79, 85-86 (1951).--Polarograms in soln. in 60% iso-PrOH on a background of 0.1 N PhSO₂H gave the half-wave potentials (against satd. calomel) MeSO₂Cl -0.02, PhSO₂Cl -0.20, p-Me(O)CONHC₆H₄SO₂Cl -0.03, p-ClC₆H₄SO₂Cl +0.05 v., unaffected by the pH between 1 and 9. Suppression of the max. requires 0.1% gelatin. The no. of electrons involved in the reduction is 2. Consequently, the reduction is represented by $RSO_2Cl + 2e^- \rightarrow RS^-O_2 + Cl^-$; formation of Cl⁻ ions in the course of the electrolytic reduction of PhSO₂Cl, and paralleling it, was demonstrated directly. This scheme accounts for the independence of the reduction potential of the pH. Polarographic reduction of PhSO₂H (product of the reduction of PhSO₂Cl) gave a half-wave only at -1.65 v., identical with the H wave of other acids; the anion PhSO₃⁻ is not reduced down to -2.4 v. The reduction of PhSO₂Cl to PhSO₂H confirms the structure of the latter with respect to direct bonding of H to S. The rate of hydrolysis of the sulfochlorides is of the 1st order, independent of the pH between 1 and 9; above pH = 9, the rate increases sharply. At 25°, at pH = 2, the 1st-order rate constn. for the hydrolysis are, for MeSO₂Cl, 10⁴h = 0.24, and for PhSO₂Cl, 10⁴h = 3.0 sec.⁻¹. The rate of hydrolysis is slower with RSO₂Cl reduced at lower potentials. The reduction potential is more pos. with a more neg. R. N. Thon

NEYMAN, M. B.

U S S R .

Chromatographic separation of dinitrophenylhydrazones on acetylated papers. M. B. Neyman, V. N. Lezhovskii, and A. P. Lukovnikov. *Doklady Akad. Nauk S.S.S.R.* 8: 341-4 (1951); cf. J. V. Kostik and K. Starik, *C.A.* 44, 8417c. — In order to adapt the methods of paper chromatography to nonpolar, hydrophobic substances the chemical treatment proposed by Kostik (loc. cit.) is used. This method consists of replacing the polar OH groups of cellulose by Ac groups, thereby increasing the hydrophobic character of paper. The optimum conditions for acetylation are discussed. The paper, thus treated, is used for the sepn. of the dinitrophenyl hydrazones of formaldehyde, acetaldehyde, propionaldehyde, butyraldehyde, and acrolein. Good separations were attained.

J. Roytar Leach

NEYMAN, M. B.

USSR/Chemistry - Isotopes

Sep/Oct 52

"General Method of Studying Co-Precipitation and Adsorption With the Aid of Tagged Atoms," V.B. Miller, M.B. Neyman, and L.A. Sazonov, Inst of Chem Physics, Acad Sci USSR, Moscow

Zhur Anal Khim, Vol 7, No 5, pp 269-280

Developed a general method for studying co-precipitation, using radioactive isotopes. Studied the relation of co-precipitation of SrCrO_4 with BaCrO_4 at different relative concns, at various pH values. The max co-precipitation

261T29

was detd at a definite pH value. A spatial diagram of the co-precipitation of SrCrO_4 with BaCrO_4 was plotted. With the aid of this diagram, improvements were made on the chromate method of separating Ba from Sr.

CA

Theory of the limiting currents in the reduction of hydrogen ions in solutions of weak acids. S. G. Matrasov and M. B. Nefzati (Izv. Chern. Phys., Acad. Sci. U.S.S.R. Moscow, *Doklady Akad. Nauk S.S.S.R.* 62, 80 (1972)).

The limiting current i of H^+ ions on a dropping-Hg electrode is the sum of the diffusion current, governed by Ilkovic's law (C. T. 29, 2500), and the kinetic current of discharge of H^+ ions formed through dissociation of the acid in the electrode, the latter is proportional to the concn. $[HA]$ of the undissociated acid in the soln. $N[HA]$. From the equations describing the changes of the surface concn. in the course of the discharge, there is found for the proportionality const. $N = k_1 k_2 a_{H^+} a_{HA} / (k_1 a_{H^+} + k_2 a_{HA})$, where S is the mean surface area of the Hg drop, k_1 the rate const. for HA . Practically the same result is found by integration of the differential equations of the diffusion. The dependence of i on the total concn. c of the acid is of the form $i = N / (K + 2c/a_{H^+})$, where $K = 1 + (k_1/k_2) a_{H^+}$, and $d_i/d_c = N / (N + (c/a_{H^+}) - N) / (1 + (k_1/k_2) a_{H^+})$. As $a_{H^+} \rightarrow N$, the deriv. d_i/d_c should fall with increasing concn. of the acid. At low concns. $c \ll K$, it should tend to the const. value a_{H^+} , and at high concns. $c \gg K$, it should tend to N . These conclusions were tested in expts. with a no. of weak acids on a dropping-Hg cathode in an air-free NaCl soln. of LiCl, at $25 \pm 0.2^\circ$. Curves of i as a function of c were constructed with the aid of values of N detd. from 2 values of a_{H^+} . For (CO_2H) , CH_3CO_2H , $o-OH-C_6H_4CO_2H$, HCO_2H , $BzOH$, $PhCH_2CO_2H$, and $AcOH$, the exptl. points lie very satisfactorily on the theoretical curves. Calcul. values on the assumption of very slow dissociation than exptl. values on the assumption of instantaneous dissociation. There is, consequently, a definite kinetic limitation of i in the discharge of H^+ ions in solns. of weak acids. N Then

NEYMAN M. B.

USSR/Chemistry - Radioactive Isotopes
Halogens

Aug 52

"The Exchange Mechanism between Alkyl Halides and
Metal Halides," M. B. Neyman, G. V. Maksimova, and
Yu. M. Shapovalov, Inst of Chem Phys, Acad Sci USSR

"DAN SSSR" Vol 85, No 6, pp 1289-1292

The kinetics in the exchange mechanism of halogens
between an alkyl halide and a metal halide were
studied with the aid of sodium bromide tagged with
radioactive Br. An eq is given for calcg the rate
constant of this exchange. Presented by Acad N. N.
Semenov 3 Jun 52

238F10

IA 235T26

USSR/Chemistry - Isotopes

11 Sep 52

"Investigation of the Reaction of Formation of Thio-
sulfate From H_2S and SO_2 With the Aid of Radioac-
tive Sulfur," M.B. Neyman, Ye. S. Torsuyeva, A.I.
Prdoseyeva, P.S. Shantarovich, Inst of Chem Phys,
Acad Sci USSR

"Dok Ak Nauk SSSR" Vol 86, No 2, pp 317-320

The mechanism of the reaction of the formation
of $H_2S_2O_3$ from SO_2 and H_2S was investigated using
active H_2S^{35} and inactive SO_2 . The H_2S^{35} was
prepared by reducing $BaS_3^{35}O_4$ at 900-1,000° to BaS_3^{35} ,

235T26

which was decomposed to H_2S^{35} with HCl. The cen-
tral S atom of the thiosulfate mol is derived from
the inactive SO_2 . The peripheral S atoms come
from both the H_2S and the SO_2 . Presented by
Acad N.N. Semenov 3 Jun 52.

235T26

NEYMAN, M. B.

1. NEYMAN, M. B.: VEKLISOV, G. I.
2. USSR (600)
4. Carbon - Isotopes
7. Synthesis of acetaldehyde tagged with radio-carbon. Dokl. AN SSSR 87 no. 4, 1952.

Radioactive acetaldehyde was prepd in two ways. In the first procedure the methyl group is tagged with C^{14} and in the other, the carbonyl group is tagged with C^{14} . $H_2C^{14}O_3$ as a starting material, and $LiAlH_4$ as a reagent for the reduction of Et acetate are used in both cases. Both procedures are described in detail. Presented by Acad N. N. Semenov 8 Oct 52. 256T12

(CA 48 no. 1:114 '54)

9. Monthly List of Russian Accessions, Library of Congress, February 1953. Unclassified.

MAYRANOVSKIY, S.G.; HEYMAN, M.B.

Polarographic reduction of sulfones and of sulfonic acid esters.
Doklady Akad. Nauk S.S.S.R., 87, 805-8 '52. (MLBA 5:12)
(CA 47 no.13:6271 '53)

1. Institut khimicheskoy fiziki, Akademiya nauk S.S.S.R., Moscow.

NEYMAN, M. B.

The use of radioactive carbon C^{14} in hydrocarbon oxidation investigations in the gas phase. M. B. Neyman, A. S. Ljuzovnikov, and G. F. Finklov. Voprosy Khim. Kinetiki, Kataliza i Reaktivnosti Spetsialnoi Akad. Nauk S.S.S.R. 1953, 184-90.—A method is described for the chromatographic separ. of aldehyde and alc. derivs. formed in the oxidation of tagged hydrocarbons. The radioactivity of hydrocarbons and of the C^{14} oxides can be measured with a counter which is located internally. α -HO aldehydes are formed together with various other aldehydes during hydrocarbon oxidation. The fact that AcH and CH_2O are found to form from different portions of the oxidized hydrocarbon contradicts the destructive hydrocarbon oxidation theory.

W. M. Sternberg

DM

5

USSR.

Synthesis of 1-C¹⁴-butane and 1-C¹⁴-butene. M. B. Nelman and G. I. Fekilsov, *Bull. Acad. Sci. U.S.S.R., Div. Chem. Sci.* 1953, 1003-6 (Engl. translation).—See *C.A.* 49, 22067.
H. L. H.

NEYMAN, M.B., professor.

Use of marked atoms in chemistry. Khim.v shkole no.4:20-32 J1-Ag '53.
(MLRA 6:8)
(Traces (Chemistry))

Jul/Aug 53

USSR/Chemistry - Kinetics of
Combustion

"Investigation of the Conditions That Produce Ignition of Gas Mixtures. XXII. Effects of Admixed Ethyl Peroxide (I) and Acetaldehyde (II) on the Kinetics of Cold-Flame Oxidation of Butane," A. A. Dobrinskaya, M. B. Neyman, Inst of Chem Phys, Acad Sci USSR

Iz Ak Nauk SSSR OZhN, No 4, pp 623-628

Demonstrated that admixture of I to a butane-oxygen mixt shortens the period of induction of a cold flame. With I added, org peroxides and aldehydes

27017

are formed during the induction period. Showed that added II shortens the induction period of a cold butane flame. With II added, organic peroxides are formed. These peroxides are reduced at -0.25 V and -0.6V. Admixture of peroxides and aldehydes in a quantity x shortens the induction period U according to the law. lg x = b - k

27017

NEYMAN, M. B.

Nov/Dec 53

USSR/Chemistry - Isotopes

Synthesis of 1-C¹⁴-Butene (I) and 1-C¹⁴-Butane (II)* M.B. Neyman, G.I. Feklison, Inst Chem Phys, Acad Sci USSR

Iz Ak Nauk SSSR, OKhN, No 6, pp 1129-1131

Describe the synthesis of I and II starting with active MeI prepared acc to a method published by them earlier (DAN SSSR, Vol 87, p 605, 1952).

272115

NEYMAN, M. B.

USSR/Chemistry - Combustion Kinetics Nov 53

"Investigation of Conditions of Ignition of Gas Mixtures. XXIV. Cold-Flame Ignition of Propane (I)." M. I. Gerber, M. B. Neyman, Inst Chem Phys, Acad Sci USSR

Zhur Fiz Khim, Vol 27, No 11, pp 1617-1621

Investigated the kinetics of the oxidation of I and the accumulation of peroxides and aldehydes in the beginning of the reaction. Demonstrated that addition of ethyl peroxide accelerates the oxidation of I and shortens the period of induction of the cold flame.

274717

NEYMAN, M. B.

USSR/Chemistry - Combustion Kinetics Nov 53

"Investigation of Conditions of Ignition of Gas Mixtures. XXV. Investigation of the Cold-Flame Oxidation of Butene (I)." A. A. Dobrinskiy, M. B. Neyman, N. K. Rudnevskiy, Inst Chem Phys, Acad Sci USSR

Zhur Fiz Khim, Vol 27, No 11, pp 1622-1630

Investigated the kinetics of cold-flame oxidation of I. Detd the extent of the cold flame in this oxidation. Derived the math relationship acc to which the period of induction of the cold flame of I is reduced with increased temp and pressure, and

274718

showed that during the period of induction, accumulation of peroxides, said higher aldehydes, and croton aldehyde (II) takes place acc to an exponential law. Proved that in the slow oxidation of I, O₂ is added not only at the double bond (with formation of CH₃CHO), but also at the terminal carbon (with formation of II).

DOBRIISKAYA, A.A.; NEYMAN, M.V.; RUDNEVSKIY, N.K.

Study of conditions for the ignition of gas mixtures. Part 26.
Effect of methyl amine on the cold-flame oxidation of butane and
butene-2. Zhur.fiz.khim. 27 no.12:1784-1791 D '53. (MLRA 7:2)

1. Akademiya nauk SSSR, Institut khimicheskoy fiziki, Moscow.
(Butane) (Butene) (Oxidation)

NEYMAN, I. I.

USSR/Chemistry - Combustion Kinetics Dec 53

"Investigation of the Conditions of Ignition of Gas Mixtures. Comm 26. The Effect of Methylamine (I) on the Cold-Flame Oxidation of Butane (II) and Butene-2 (III)," A. A. Dobrinskaya, M. B. Neyman, N. K. Rudnevskiy, Inst Chem Physics, Acad Sci USSR

Zhur Fiz Khim, Vol 27, No 12, pp 1784-91

Investigated the effect of I on the cold-flame oxidation of II and III. Derived the mathematical relationship according to which the period of induction of the cold-flame oxidation of II and III

275T11

is increased by addition of I. Found that admixt of I reduces the rate of accumulation of peroxides during induction and brings about formation of considerable quantities of CH_2O .

Dec 53

USSR/Chemistry - Combustion Kinetics

"Investigation of the Conditions of Ignition of Gas Mixtures. Comm 27. Kinetics of the Accumulation of Peroxides and Aldehydes in the Oxidation of Pentane (I)," M. I. Gerber, M. B. Neyman, Inst Chem Physics, Acad Sci USSR

Zhur Fiz Khim, Vol 27, No 12, pp 1792-96

Expts described show that the concn of aldehydes and org peroxides increases exponentially during the induction period of cold-flame oxidation of I. Admixt of hexadiene (II) inhibits formation of

275T12

intermediate products in this oxidation and increases the induction period. II increases the rate of formation of initial active centers and at the same time reduces the autocatalysis factor.

112 (MAY) 1954

M Phys (2)
4

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

Application of radioactive isotopes in analytic chemistry.
M. B. Neiman and V. B. Miller. Uspekhi Fiz. Nauk 50.
83-124 (1953).
S. Pakawce

6-16-54
R. R. R.

Describes applications of radioactive isotopes in analytic chemistry. Divides the material into 3 sections: phys methods, chem methods of analysis, and applications to research. Refers to own former works in Uspekhi Khimii 17 (1948); works of P. Daudel, Anal. Chim. Acta 5 (1951); and those of P. Sue, Bull. Soc. Chim. Fr., 9D, 5-6 (1951).

261T102

REYMAN, M. E.

1A 29 T18

USSR/Chemistry - Radioactive Isotopes 11 Jan 53

"The Synthesis of 1-C¹⁴-Pentane and 3-C¹⁴-Pentane,"
A. F. Lukovnikov, M. B. Neyman, A. A. Bag,
L. M. Rodionova, I. S. Samoukina, N. V. Bliznyak

DAN SSSR, Vol. 88, No 2, pp 297-300

1-C¹⁴-Pentane and 3-C¹⁴-Pentane were prepd by
starting with BaC¹⁴O₃ which yielded tagged CO₂.
This was then treated with the appropriate
organo-Mg-halide. Presented by Acad N. N. Semenov
15 Nov 52.

255T18

INCL. IVAN, 11-1

① 62

Tracing chain reaction of oxidation of acetyldehyde with
 radiocarbon. M. H. Netman and G. I. Pechkov. *Doklady
 Akad. Nauk S.S.S.R.* 90, 553 (1953). Two isotopic iso-
 mers of AcH were prepared with CH in the Me group (I)
 and in the CO group (II) (cf. Vol. 48, 114/1). Oxidation of
 these burners in a vacuum system was followed separately
 by measuring changes in pressure and analyzing the products
 of reaction at different time intervals. The mixt. of AcH +
 O (where α was varied from 2 to 14), was allowed to react
 prior to and within the region of cool flame (180-300°) at
 pressures from 10 mm. to 240 mm. Polarograms of reac-
 tion products from the outside cool flame zone for $\alpha = 14$, at
 60 mm. pressure and 400° revealed the presence of AcH only.
 Products of reaction from the cool flame indicated, in
 addition to O, CH₄, CO, CO₂, and AcH, convoluted CH₂O.
 The relative specific activity of the labeled CH₂O (in im-
 pulses/min. g.) formed from I was 86, 88, 88, and 87; and
 from II it was 11. This indicates that during oxidation of
 AcH the C atom of CH₂O comes from both the Me and CO
 groups. The probability of formation from Me group
 is 8 times as great as the probability of its formation from
 the CO group. On the basis of this new observation the
 following scheme of oxidation of AcH is suggested: (1)
 $C_2H_3CHO + O_2 \rightarrow HO_2 + C_2H_3CO_2$; (2) $C_2H_3CO_2 +$
 $O_2 \rightarrow C_2H_3COOO_2$; (3) $C_2H_3COOO_2 + C_2H_3CHO \rightarrow$
 $C_2H_3COOOH + C_2H_3CO_2$; (4) $C_2H_3COOOH \rightarrow CO_2 +$
 CH_2O ; (5) $C_2H_3CO_2 + C_2H_3CHO \rightarrow C_2H_3COH + CO_2$
 $\rightarrow H_2 + C_2H_3CO_2$; (6) $C_2H_3CO_2 + H_2O \rightarrow C_2H_3CO_2H + H_2O$
 Two parallel reactions (5 and 6) are taking place, however,
 4 requires greater energy of activation, and therefore with an
 increase of temp. in the cool-flame region its rate is greater
 than that of 5, resulting in a sharp increase in the concen-
 tration of CH₂O and CH₂O. The proposed 5, i.e., forma-
 tion of acetalum in cool-flame system, has been examined
 by its presence in the products of oxidation. A. P. K.

NE YMAN, P.D.

③ met

J. of the Iron & Steel Inst.
Feb. 1954
Protective Coatings

The Diffusion of Iron in Nickel. M. B. Neiman, A. Ye. Shlyapov, and B. V. Dzhinnov. (*Izvestiya Akademii Nauk S.S.S.R.*, 1953, 81, (2), 265-267). [In Russian]. The diffusion of iron in nickel in the temperature range 850-1130° C. was studied using radioactive Fe⁵⁵. Thin nickel foil was plated on one side with iron containing radioactive Fe⁵⁵, placed in a silica vessel and heated in vacuo to a given temperature. The rate of diffusion was followed by measurements of the radioactivity on both sides of the foil. The temperature dependence of the diffusion coefficient of iron in nickel and the activation energy were determined. The velocity of the diffusion of iron into nickel is considerably higher than that of nickel into iron.—v. o.

MEYMAN, M-S.

USSR

Study of the oxidation of propylene by means of radioactive carbon. A. P. Lukavnikov and M. B. Neyman. *Doklady Akad. Nauk S.S.S.R.* 91, 581-4(1953).—In order to study the oxidation of propylene, propene-2- C^{14} (I) was prepared and reacted with an equimolar amt. of O_2 . The kinetics of the reaction were followed by detg. the pressure change in the reaction vessel. The oxidation products were analyzed at the beginning and at the end of the period of rapid reaction (4 min. and 4 min. 30 sec., resp., after start of oxidation). From the results of the analysis, a step-wise scheme is proposed to represent the oxidation process. J. R. I.

NEYMAN, M. B.

USSR/Chemistry - Isotopes
1 Aug 53

"Investigation of the Oxidation of 1-C¹⁴-Butane and the Theory of Destructive Oxidation," M. B. Neyman and G. I. Feklisov, Inst of Chem Physics, Acad Sci USSR

DAN SSSR, Vol 91, No 4, pp 877-880

According to the theory of destructive oxidation of normal straight chain hydrocarbons, formaldehyde can only form from an end carbon atom of the chain. Synthesized 1-C¹⁴-butane and oxidized

272F8

It to check this theory. Results indicate that formaldehyde forms from the central atoms of the chain as well as the terminal ones. Presented by Acad N. N. Semenov 22 May 53.

272F8

NEYMAN, M. B.

✓ The kinetic method for studying the mechanism of chemical reactions by means of tagged atoms. M. B. Neyman and G. I. Pekliov (Inst. Chem. Phys. Acad. Sci. U.S.S.R.)

Doklady Akad. Nauk S.S.S.R. 91, 1137-40(1953); cf. following abstr.—A new, kinetic method of using tagged atoms to study the mechanism of a reaction is described. The method is used to study the formation and decompt. of AcH in the oxidation of butane. The exptl. results show that the AcH decomp. to a significant extent only during the initial and final periods when the butane is not being oxidized to any great extent. When the oxidation of butane is proceeding rapidly the oxidation of AcH stops almost completely. J. Ravitz Leisen

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①

NEYMAN, M. B.

USSR/Chemistry - Isotopes, Reaction Kinetics 21 Sep 53

"The Influence of the Structure of Alkyl Iodides on the Rate of Their Isotopic Exchange with Ions and Atoms of Iodine," M.B. Neyman, B.A. Kuznetsov, and Yu.M. Shapovalov, Inst of Chem Physics, Acad Sci USSR

DAN SSSR, Vol 92, No 3, pp 611-614

Using I^{131} in both the ionic and atomic form, studied the effect of the structure of normal as compared with iso-propyl iodide on the rate of exchange with iodine. Iso-propyl iodide exchanges

26875

iodine with iodine in the ionic form 20-25 slower than normal propyl iodide. The rate of isotopic exchange of iodine in isopropyl iodide with atomic iodine is 25 times faster than that of normal propyl iodide. Presented by Acad N.N. Semenov 17 Jun 53.

26875

NEYMAN, M. B.

11 Sep 53

USSR/Chemistry - Isotopes

"The Influence of Pressure on the Velocity of Ionic Reactions of Isotope Exchange," M. B. Neyman, M. G. Gonikberg, V. B. Miller, Yu. M. Shapovalov and V. S. Zvezdkin, Inst of Chem Phys and Inst of Org Chem, Acad Sci USSR

DAN SSSR, Vol 92, No 2, pp 365-368

Studied the effect of pressure on the reaction velocity of isotope exchange in reactions of propyl iodide with active iodide ions and of propyl bromide with active bromide ions at 19° and pressures of 1, 1500, and 2400 atm. Used alc solns of NaI¹³¹ and

269T20

NaBr⁸² as source of halogen ions. Found that the formation of an activated complex in these reactions is associated with a decrease in the volume of the complex characteristic for normal bimolecular reactions.

NEYMAN, M., (Professor, Doctor of Chemical Sciences)

Neyman, M., (Professor, Doctor of Chemical Sciences) - Listed as author of article, "The Energy of the Atomic Nucleus," which appears in Propagandist i Agitator, No 6, 1954, of the Main Political Administration, Ministry of Defense USSR. (Krasnaya Zvezda, Moscow, 4 Apr 54).

SG: SUM 132, 13 August 1954

NEYMAN, M. B.

Development of organic synthesis based on the oxidation of hydrocarbons from petroleum. S. R. Serpienko. *Problemy Oksidatsiya Uglevodorodov, Akad. Nauk S.S.S.R. Izv. Nauk* 1954, 4-10.—In the introductory remarks made at the Moscow All-Union meeting on 14-18 May 1951, an increase in the use of petroleum in chemical industry was advocated. A brief summary was given of the achievements in this field in U.S.S.R. during the last 10 years. Development in the theory of chain oxidation of hydrocarbons. N. N. Semenov. *Ibid.* 13-30.—A comprehensive review covering the following topics was given: direct reaction between two saturated hydrocarbons; chain length and activity of free radicals; effect of biradicals on the chain propagation; competition between the chain reaction and the direct reaction among the moles; branching of chain reactions and limiting phenomena; decay of chain reactions; oxidation of simple paraffins; wall effects in chain reactions. 47 references. Mechanism of negative catalysis in oxidation of hydrocarbons. M. B. Neyman. *Ibid.* 40-60.—A review with 12 references. Elementary reactions of simple hydrocarbons with atomic oxygen. L. I. Arrapenko and R. V. Kolesnikova. *Ibid.* 61-9.—Oxidation of methane, ethane, propane, and benzene is reviewed. 17 references. Oxidation of hydrocarbons in the presence of hydrogen bromide. Z. K. Mal'ev and N. M. Emanuel. *Ibid.* 60-77.—A review of kinetics. 4 references. Investigation of oxidation of C¹⁴-labeled propylene. A. F. Lukivskov. *Ibid.* 78-88.—Synthesis of C¹⁴-propylene; its oxidation; chromatographic separation, and detn. of radioactivity of the reaction products are reviewed. 11 references. Mechanism of oxidation of propane. V. Ya. Shtern. *Ibid.* 89-103.—A review with

13 references. Unique features of oxidation of paraffinic hydrocarbons in liquid phase. A. N. Bashk'rov and Ya. B. Chertkov. *Ibid.* 104-8; cf. *C.A.B.* 46, 1278.—A review with 5 references. The immediate effect of molecular oxygen on hydrocarbons of various structure in liquid phase. K. I. Ivanov. *Ibid.* 111-23.—Preparations of the following peroxides are fully reviewed: heptane 2-hydroperoxide, b.p. 38°, n_D²⁰ 1.4306, d₄ 0.8073, $\delta = (\nu_{\text{C-O}} - \nu_{\text{C-C}})/d \cdot 10^4 = 86.6$, M/Ro 37.88; 2-ethylhexane 2-hydroperoxide, b.p. 21°, n_D²⁰ 1.4370, d₄ 0.8554, M/Ro 37.91; 2,2,4-trimethyl-3-pentanone 4-hydroperoxide, b.p. 31°, m. 73°; cyclohexane hydroperoxide, m. -21°, n_D²⁰ 1.4638, d₄ 1.018, M/Ro 31.50; 1-ethylcyclohexane 1-hydroperoxide, b.p. 34°, n_D²⁰ 1.4473, d₄ 0.8607, δ 85.4, M/Ro 40.45; 1-propylcyclopentane 1-hydroperoxide, b.p. 34.5°, n_D²⁰ 1.4500, d₄ 0.8531, δ 85.9, M/Ro 40.00; indan 4-hydroperoxide, b.p. 75°; 1-methyl-1,2,3,4-tetrahydronaphthalene 1-hydroperoxide, b.p. 90-100°, n_D²⁰ 1.5584, d₄ 1.1114; fluorene 9-hydroperoxide, m. (3°); 1,4-dihydronaphthalene 1-hydroperoxide, b.p. 120-5°, n_D²⁰ 1.5685, d₄ 1.153; 1,1-diphenylethane 1-hydroperoxide, m. 82°; Ph₂COOH, m. 81°. 9 references. Peroxides from autoxidation of some alkanes and cycloalkanes. K. I. Ivanov, V. K. Savinova, and V. P. Zhukovskaya. *Ibid.* 124-30.—Preparations and phys. properties are reviewed and discussed in detail. 15 references. Oxidation products of Tetralin. A. I. Kanyeva and L. A. Salina. *Ibid.* 140-4.—The mechanism of tar formation was studied by analyzing the autoxidation products of Tetralin. The fraction extd. with 8% aq. NaHCO₃ contained enols of 3,4-dihydro-1(2H)-naphthalenone and dihydronaphthoquinone. Among the oxidation products were: 1,2,3,4-tetrahydro-1-naphthyl hydroperoxide; 3,4-dihydro-1(2H)-naphthalenone; 3,4-dihydro-2(1H)-naphthalenone; dihydronaphthoquinone; o-H₂CC=H₂CH₂CO₂H; and polymerization products. Synthesis of 1,1-diphenylethanol-hydroperoxide and thermal decomposition of tertiary hydroperoxides. T. I. Yurzhenko, H. K. Tolopko, and V. A. Puchin. *Ibid.* 145-51; cf. *C.A.B.*

S.P. SERGIENKO

45, 2010. Oxidation of petroleum jelly and kerosine with air and HNO₃. A. P. Losey and R. N. Svirnov. Ibid.
182-80.—A review. Oxidation of high-molecular weight hydrocarbons and petroleum oils in liquid phase. N. I. Chernobukov. Ibid. 167-74.—A review with 10 references. Industrial methods of oxidation of petroleum hydrocarbons in liquid phase. V. K. Tsykovskii. Ibid. 177-83.—A review with 17 references. Oxidation of paraffin wax. D. A. Chernyaev, N. S. Mal'vshinskaya, and G. P. Dobrovolskii. Ibid. 184-99.—Prepn. of lubricating oil from paraffin wax; industrial acide is described in detail with diagrams of equipment. Conditions for the optimum yields are given and discussed at length. Fatty acids from paraffins. A. Yu. Rabinovich. Ibid. 200-7.—Discussion of technological processes. No references. Use of hydroxy acids from oxidation of petroleum hydrocarbons as film-forming materials. P. V. Serbin-Serbin. Ibid. 208-21.—Compu., sepn., and properties of HO acids from oxidation of solid and liquid petroleum fractions are extensively discussed and the prepn. of varnishes on laboratory and plant scales is reviewed. A. P. K...

NEYMAN, M. B.

USSR/ Chemistry - Physical chemistry

Card 1/1 : Pub. 147 - 11/21

Authors : Neyman, M. B., and Peklsov, G. I.

Title : Kinetic method of employing marked atoms for the study of the mechanism of complex chemical and biochemical processes. Part 2.- Behavior of acetaldehyde during cold-flame oxidation of butane.

Periodical : Zhur. fiz. khim. 8, 1439-1450, Aug 1954

Abstract : The behavior of acetaldehyde in the reaction of butane oxidation at 303°C was investigated by the kinetic marked-atoms method. A diagrammatic scheme of the installations used in studying the behavior of acetaldehyde during butane oxidation is presented. Rapid formation of acetaldehyde was observed during the first stages of butane oxidation but it slowed down sharply during the very process of oxidation and after the extinction of the cold flame. Twenty references: 12-USSR; 4-USA and 4-English (1930-1954). Table; graphs; drawings.

Institution : Acad. of Sc. USSR, Institute of Chemical Physics, Moscow

Submitted : October 20, 1953

NEYMAN, M. B.

USSR/ Chemistry Analysis methods

Card : 1/1 Pub. 147 - 10/25

Authors : Neyman, M. B.

Title : Kinetic method of employing marked atoms for the study of the mechanism of complex chemical and biochemical processes

Periodical : Zhur. fiz. khim. 28/7, 1235 - 1242, July 1954

Abstract : A new kinetic method for the study of the mechanism of complex chemical and biochemical processes, by means of marked atoms, was introduced. Methods for the calculation of rate of formation and consumption constants of intermediate reaction products, based on data obtained by the above mentioned new kinetic method, are described. Possible application of the kinetic method, for solving many serious problems of complex reactions, was discussed. Eleven references: 7 USSR; 2 USA and 2 German (1902 - 1953). Graphs.

Institution : Acad. of Sc. USSR, Institute of Chemical Physics, Moscow

Submitted : October 20, 1953

NEYMAN, M. B.

USSR/Physical Chemistry - Kinetics. Combustion. Explosives. Topochemistry.
Catalysis, B-9

Abst Journal: Referat Zhur - Khimiya, No 19, 1956, 61060

Author: Neyman, M. B., Miller, V. B., Shapovalov, Yu. M.

Institution: None

Title: Investigation of the Influence of the Structure of Molecules on the Velocity of Ionic and Atomic Isotope Exchange Reactions. I. Influence of Lengthening of the Carbon Atom Chain of the Alkyl Radical on the Velocity of Isotope Exchange of Alkyl Halide with Halogen Ions. II. Influence of Isomerization of the Radical and Introduction of a Double Bond on the Velocity of Isotope Exchange of Alkyl Halide with Halogen Ions

Original

Periodical: Zh. fiz. khimii, 1954, 28, No 7, 1243; 1955, 29, No 5, 892-897

Abstract: I. A study has been made of the kinetics of the reaction of isotope exchange: $RX + X^* \rightleftharpoons RX^* + X^-$, where $R = CH_3, C_2H_5, n-C_3H_7$ and $X = Br^{82}$ or I^{131} . The reaction was carried out in C_2H_5OH

Card 1/3

USSR/Physical Chemistry - Kinetics. ~~Chemical Reaction Kinetics~~
Catalysis, B-9

Abst Journal: Referat Zhur - Khimiya, No 19, 1956, 61060

Abstract: solutions containing 10% H₂O in the temperature region of 10⁰-100⁰. Considered are the kinetics of different exchange mechanisms and it is shown that the velocity constant remains constant only with an ionic-molecular mechanism of the reaction. Energies (kcal/mol) and entropies (entropy units) of activation are for CH₃Br 17.5 and 19.5; C₂M₅Br 18 and 22.7; C₃H₇Br 18.4 and 22; CH₃I 15.4 and 19.5; C₂H₅I 19 and 17.4; C₃H₇I 19.3 and 13.3. From the obtained data it follows that alkyl iodides undergo exchange with I⁻ faster than alkyl bromides with Br⁻. Lengthening of the carbon-atom chain in the alkyl halide radical slows down its isotope exchange with ions of the halogen. II. In a 90% ethanol solution were determined the energies of activation in kcal/mol (first figure) and the forexponent (1/mol sec) for the following reactions: (1) (CH₃)₂CHBr + Br⁻ (at 90⁰-120⁰) 19.0 and 10⁸; (2) (CH₃)₂CHI + I⁻ (40⁰-80⁰) 20.0 and 6·10⁹; (3) CH₂=CHCH₂Br + Br⁻ (10⁰-61⁰) 16.0 and 2.8·10⁸. The data obtained confirm the assumption that in the case of ionic-molecular reactions associated with inversion of the configuration the velocity of the process is determined essentially

Card 2/3

USSR/Physical Chemistry - Kinetics. Combustion. Explosives. Topochemistry.
Catalysis, B-9

Abst Journal: Referat Zhur - Khimiya, No 19, 1956, 61060

Abstract: by the energy barrier which must be overcome by the carbon atom on passing through the facet of the tetrahedron between ~~sub~~ substituents. Replacement of 2 atoms of hydrogen at the apexes of the facet by methyl radicals slows down the isotope exchange by more than 100 times and increases the energy of activation by 3-4.5 kcal/mol. Lowering of energy of activation of isotope exchange and increase in velocity of the reaction on introduction of a double bond in α, β -position indicate the possibility of the occurrence of the reaction in the case of alkyl bromide without inversion of configuration in accordance with the scheme: $Br^{\cdot} + CH_2 = CHCH_2Br + Br^{\cdot}CH_2CH = CH_2 + Br^-$

Card 3/3

NEYMAN, M.B.; FERLISOV, G.I.

Kinetic method for using tracers for the study of the mechanism of complex chemical and biochemical processes. Part 2. Behavior of acetaldehyde during cold-flame oxidation of butane. Zhur.fiz.khim. 28 no.8:1439-1450 Ag '54. (MLRA 7:12)

1. Akademiya nauk SSSR. Institut khimicheskoy fiziki (Moscow)
(Radioactive tracers) (Acetaldehyde) (Butane)

USSR/Chemistry - Oxidation

Card 1/1 Pub. 147 - 4/25

Authors : Neyman, M. B., and Feklisov, G. I.

Title : Kinetic method of applying marked atoms for studying the mechanism of complex chemical and biochemical processes. Part 3.

Periodical : Zhur. fiz. khim. 28/10, 1737-1744. Oct 1954

Abstract : The role of acetaldehyde in the reaction of butane oxidation at high temperatures was investigated by means of marked atoms. The acetaldehyde was found to be totally consumed but only during a slow oxidation process. Rapid formation of acetaldehyde was observed in the zone of rapid butane oxidation; acetaldehyde does not appear to be a direct product of the development of basic butane oxidation chains. It was established that the specific maximum concentration of C_2H_4O is not connected with the competition between its formation and consumption processes but rather with the discontinuation

Institution : Academy of Sciences USSR, Institute of Chemical Physics
Submitted : October 20, 1953

BEYMAN, M.B., professor.

Applying radioactive isotopes in machine building. Vest.mash.34 no.4:
34-39 Ap '54. (MLRA 7:5)
(Radioisotopes--Industrial applications)

NEYMAN, M.B.

USSR/ Physics - Nuclear physics

Card 1/1 Pub. 86 - 3/37

Authors : Neyman, M. B., Prof.

Title : The use of radioactive isotopes in industry

Periodical : Priroda 43/10, 16-27, Oct 1954

Abstract : Radioactive isotopes of 26 different elements are listed with the lengths of their half-lives and the type of radiation of each. The Geiger counter is explained. It is called an ionization chamber which allows a current to pass in the presence of a radioactive object. Descriptions are given of methods of applying the principles of radioactivity to metallurgy, machine construction, the chemical industry, prospecting for petroleum and refining the textile industry, communications, construction work and in the manufacture of instruments. Illustrations; drawings; graphs; table.

Institution : ...

Submitted : ...

NEYMAN, M. V.; SHINYAYEV, A. Ya.

"Use of Electrolytic Polishing to Remove Layers of Metals and Alloys in the
Determination of the Coefficient of Diffusion," Doklady Akademii Nauk SSSR 96 (1954)
No 2, pp 345/348 (or 315/318?).

B-81524, 28 Dec 54 (Comments and Evaluation)

NEYMAN, M. B.

USSR/Physical Chemistry

Card 1/1

Authors : Neyman, M. B., and Shinyaev, A. Ya.

Title : Use of electrolytic buffing for the removal of metal and alloy layers during the determination of diffusion coefficients

Periodical : Dokl. AN SSSR, 96, Ed. 2. 315 - 318, May 1954

Abstract : The method of removing metallic layers through electrolytic buffing enables a direct determination of the diffusion coefficients. Using a 60-% sulfuric acid solution and a lead cathode at a current of 5 - 7 a/cm² for a period of 10 seconds the authors obtained a glossy surface of the tested specimen and the removed layer had an uniform thickness of several microns. The uniformity of the removed layers was measured with an optical indicator. The measurements showed that the electrolytic buffing method warrants a constancy in the thickness of the removed layers. Four USSR references since 1937. Graphs.

Institution : Academy of Sciences USSR, Institute of Chemical Physics.

Presented by : Academician A. N. Frumkin, March 9, 1954

Evaluation B-81524

USSR/Chemistry - Physical chemistry

Card 1/1 : Pub. 22 - 34/46

Authors : Neyman, M. B.; Shapovalov, Yu. M.; and Miller, V. B.

Title : Substitution of H-atoms in a CH_3Br molecule by Br-atoms and its effect on the rate of ion isotope exchange.

Periodical : Dok. AN SSSR 97/4, 703-706, Aug 1, 1954

Abstract : The substitution of H-atoms in a CH_3Br molecule by Br-atoms and its effect on the rate and activation energy constant of the isotopic exchange reaction of Br-substitutes of methane with Br-ions, were investigated in a 90% alcohol solution. Results indicated that the thermal effect of the isotope exchange reaction equalled zero and the equilibrium constant was independent of temperature. The mechanism of isotope exchange, is explained. Nine references: 8-USSR and 1-USA (1869-1953). Tables; graphs.

Institution : Acad. of Sc. USSR, Institute of Chemical Physics

Presented by : Academician H. N. Semenov, March 27, 1954

NEYMAN, M. B. Prof.

"The Application of Tagged Atoms in Industry," report presented at the 4th
Conference of Workers in Plant and Industrial Laboratories in Kazakh SSR and
Central Asia, Alma-Ata, 1955

SO: TI 170982

Inst. of Physical Chemistry
Inst. of ~~Physical~~ Chemistry, AS USSR

NEYMAN, M. B.

"The Kinetic Method of Studying the Chemical Reaction when Aided by Marked Atoms" from the book Chain Reaction on the Oxidation of Hydrocarbons in a Gaseous Phase, publ. by Inst. of Chem. Physics, AS USSR, 1955, p. 140.

112-3-6221

Translation from: Referativnyy Zhurnal, Elektrotehnika, 1957,
Nr 3, p. 168 (USSR)

AUTHOR: Neyman, M. B.

TITLE: Application of Radioactive Isotopes to Instrumentation
(Primeneniye radioaktivnykh izotopov v priborostroyeniі)

PERIODICAL: In sbornik: Avtomatizatsiya tekhnol. protsessov v mashinostr.,
Moscow, AN SSSR, 1955, pp. 55-73

ABSTRACT: The author presents a survey of uses of isotopes for the control of physical processes, and for measuring the properties of gases, liquids and solids. The application of radioactive isotopes in measuring and regulating temperature, accurate weighing, and chemical analysis is discussed. Radioactive isotopes can also be used in the preparation of stable standards of light and sources of high and low voltages. It is pointed out that the use of radioactive isotopes opens up new possibilities in instrumentation.

Card 1/1

L.A.V.

NEYMAN, M. B.

Radioactive isotopes in measuring techniques. Izv. tekhn. no. 1:
14-21 Ja-F '55. (MLBA 8:9)
(Mensuration) (Radioisotopes)

№ 1000000000

MAYRANOVSKIY, S.G.; NEYMAN, M.B.

Equation for the diffusional current with calculation of the screening effect for a part of the dropping-electrode surface.

Izv.AN SSSR. (Izd.khim.nauk. no.3:420-424 Ky-Je '55.

(MLRA 8:9)

1. Institut khimicheskoy fiziki Akademii nauk SSSR
(Electrodes, Dropping mercury) (Diffusion)

NEYMAN, M. B.

"Atomic Energy for Peaceful Purposes," Friroda, No.4, pp 9-23, 1955

Translation M-690, 16 Aug 55

Also D-300832, Sep 55

NEYMAN, M. B.

Use of Radioactive Isotopes for Controlling the Homogeneity of Solids and Determination of Linear Dimensions. M. B. Neyman. (*Stanki i Instrumenty*, 1955, (4), 1-5). [In Russian]. 62
A number of devices and techniques based on the use of radio-active isotopes are described and critically considered. For control of homogeneity and detection of internal defects, measurement of the difference in transmission of two beams of radiation from a common source is recommended. For wall-thickness determination, reflection and absorption techniques are satisfactory and examples of the industrial automatic control application of the latter are given. A section is included on the sensitivity and accuracy of apparatus for contactless thickness determination.—a. r.

ANTONOVA, I.M.; KUZ'MIN, V.A.; MOSHKINA, R.I.; HALBANDYAN, A.B.; NEYMAN, M.B.;
FEKLISOV, G.I.

Study of the reaction mechanism of the oxidation of methane by
means of labeled atoms. Izv. AN SSSR. Otd.khim.nauk no.5 S-0 '55.
Izv.AN SSSR.Otd. khim.nauk no.5:789-792 S-0 '55. (MLRA 9:1)

1. Institut khimicheskoy fiziki Akademii nauk SSSR.
(Methane) (Carbon--Isotopes) (Oxidation)

NEYMAN, M. B.

Polarographic method for determining saccharin. M. B. Neyman (Inst. Chem. Phys., Acad. Sci. U.S.S.R., Moscow). *Zhur. Anal. Khim.* 10, 175-9 (1965); *J. Anal. Chem. U.S.S.R.* 10, 103-7 (1965) (Engl. Translation).—The polarographic behavior of saccharin was studied in acid, alk., and neutral media. The medium for detg. saccharin should be chosen with regard to other reducible substances present. Two procedures for polarographic detn. of saccharin in sirups are described, one with 0.1N HCl as solvent and the other 0.1N KCl. The polarographic curves can be interpreted either with the aid of graduated curves or by the addn. method. M. Hosen

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

Rays that conquer disease. Nauka i zhizn' 22 no.6:11-13
Je '55. (MIRA 8:8)

(Radioisotopes--Therapeutic use)

NEYMAN, M-B.

13660² Theory of Destructive Oxidation of Hydrocarbons.
O teorii destruktivnogo okhisheniia uglevodorodov. (Russian)
M. B. Neyman, A. F. Lukovnikov, and G. I. Feklistov. ^{CH}
Zhurnal Obshchei Khimii, v. 25, no. 7, July 1955, p. 1317-1321.
Application of tagged atom method (C^{14}) for experimental
verification of the theory of destructive hydrocarbon oxidation.
Tables, 7 ref.

GERBER, M. I.; NEYMAN, M. B.

Study of conditions for the combustion of gaseous mixtures. Part
28. Kinetics of the accumulation of peroxides and aldehydes
during the oxidation of hexadiene-2,4. Zhur.fiz.khim. 29 no.3:
533-538 Mr '55. (MLBA 8:7)

1. Akademiya nauk SSSR, Institut khimicheskoy fiziki, Moscow
(Hexadiene) (Oxidation)

NEYMAN, M.B.; MILLER, V.B.; SHAPOVALOV, Yu.M.

Investigation of the influence of molecular structure on the rate of ionic and atomic reactions in isotopic exchange. III. Influence of the number of halogen atoms to carbon atoms on the speed of ionic isotopic exchange of halogen derivatives of methane. Zhur. fiz.khim. 29 no.6:1042-1049 Je '55. (MLRA 9:1)

1.Akademiya nauk SSSR, Institut khimicheskoy fiziki.
(Ion exchange) (Halides--Isotopes) (Methane)

Neyman, M. B.

B O

USSR/Physical Chemistry - Kinetics. Combustion.
Explosives Topochemistry. Catalysis.

Abstr Jour : Referat Zhur - Khimiya, No 2, 1957, 3786

Author : Lukovnikov A.V., Neyman M.B.

Title : Kinetic Method of Utilization of Tagged Atoms in the Investigation of Mechanism of Chemical and Biological Processes. IV. Formation of CO and CO₂ on Oxidation of Butene.

Orig Pub : Zh. fiz. khimii, 1955, 29, No 6, 1410-1421

Abstract : Rate of formation and of expenditure of CO during oxidation of C₄H₁₀ were determined. Only 1-4% CO₂ are formed from CO, the remaining 96-99% are formed from other predecessors. CO₂ was converted to BaCO₃. CO was oxidized with I₂O₅ and the resulting CO₂ was absorbed in Ba(OH)₂. In experiments with C¹⁴O and C¹⁴O₂ activity of BaC¹⁴O₃ was determined with an end-window counter. Non-occurrence of the reaction $C^{14}O_2 + CO \rightleftharpoons C^{14}O + CO_2$ was demonstrated by special...

Card 1/3

- 119 -

Abstract of the paper by Lukovnikov, A.V., Neyman, M.B. 1957

USSR/Physical Chemistry - Kinetics. Combustion. Explosives.
Topochemistry. Catalysis.

B-9

Abs Jour : Referat Zhur - Khimiya, No 2, 1957, 3786

experiments on oxidation of C_4H_{10} in the presence of $C^{14}O_2$ and CO. The CO isolated upon completion of the experiment was found to be inactive. Experiments on oxidation of C_4H_{10} have shown that with addition of $C^{14}O_2$ the CO_2 formed is of very low specific activity. Experiments with addition of small amounts of $C^{14}O$ and CO_2 have revealed that in the course of the reaction the specific activity α_{CO} drops sharply while specific activity α_{CO_2} increases at first, attains a maximum 2.7 minutes after the beginning of the reaction, and decreases thereafter. From the kinetic method formula $\frac{d}{dt} \alpha_{CO_2} = \alpha_{CO} w_1 - \alpha_{CO_2} w_2$ it was found that if the rate of formation w_1 of CO_2 from CO is equal to the total rate of formation of CO_2 , w_2 , the correlation $\alpha_{CO} = \alpha_{CO_2}$ holds at the maximum of α_{CO_2} . Experiments have shown that at the maximum $\alpha_{CO} \approx 27 \alpha_{CO_2}$.

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B-9

USSR/Physical Chemistry - Kinetics. Combustion.
Explosives. Topochemistry. Catalysis

Abs Jour : Referat Zhur - Khimiya, No 2, 1957, 3786

This means that $w_2 \approx 2/w_1$. An analogous result was obtained by comparison of the rate of accumulation of carbon dioxide $d[\text{CO}_2]/dt$ with the rate of its formation from CO, calculated in accordance with the formula $w_1(1/\alpha_{\text{CO}}) dJ_{\text{CO}_2}/dt$ where J_{CO_2} is total activity of

C^{14}O_2 . Maxima of rate of oxidation of C_4H_{10} , rate of formation of CO, rate of accumulation of CO_2 and of the rate of formation of CO_2 from CO are observed at the same point of time, after ~ 2.7 minutes from the start of the reaction. A small amount of CO_2 is formed from CO according to the reactions $\text{CO} + \text{OH} = \text{CO}_2 + \text{H}$, $\text{CO} + \text{HO}_2 = \text{CO}_2 + \text{OH}$ and $\text{CO} + \text{RCO} \rightarrow \text{CO}_2 + \text{RO}$.

Part III see RZhKhim, 1956, 15612.

Card 3/3

- 121 -

USSR/ Nuclear Physics - Atomic energy
Card 1/1 Pub. 86 - 2/37
Authors : Neyman, M. B., Prof.
Title : Atomic energy for peaceful purposes
Periodical : Priroda 44/4, 9 - 23, Apr 1955
Abstract : A comparison is made between coal, petroleum, gas, wind, and waterfalls as sources of power on the one hand, and atomic energy on the other. The chain reaction of uranium fission is explained, as well as the function of the nuclear reactor with methods of regulating its power and the formation and fission of plutonium. A description is given of the electric-power plant of the Academy of Sciences, which uses atomic energy for driving its dynamos and produces 5,000 kw of electric power. Various types of nuclear reactors are described. The outlook for peaceful use of atomic energy is discussed. Fifteen Soviet references (1948 - 1955). Illustrations; drawings; graph; tables.
Institution :
Submitted :

NEYMAN, M.B.

Production of element 101, meadelerium, M. B.
Neyman. *Prisoda* 44, No. 11, 87-8 (1965). Report on the
production and isolation of 101 by Seaborg and his workers
(C.A. 49, 12149f).
J. H. Seaborg
PML

NEYMAN, M. B.

USSR/ Chemistry - Isotopic exchange

Card 1/1 Pub. 22 - 26/49

Authors : Miller, V. B.; Neyman, M. B.; Savitskiy, A. V.; and Mironov, V. F.

Title : Study of the ion isotopic exchange of alpha-iodalkyltrialkylsilanes with iodine ions

Periodical : Dok. AN SSSR 101/3, 495-497, Mar 21, 1955

Abstract : The isotopic exchange of $(\text{CH}_3)_3\text{SiCH}_2\text{I}$, $(\text{C}_2\text{H}_5)_3\text{SiCH}_2\text{I}$ and $(\text{C}_2\text{H}_5)_3\text{SiCH}_2\text{CH}_3$ with sodium iodide was investigated in a 90% $\text{C}_2\text{H}_5\text{OH}$ solution. The radioisotope I^{131} with a life span of 8.0 days was employed in the role of the marked atom. The results obtained are shown in graphs. The rate of the ion exchange was determined by the energetic barrier which the carbon atom must penetrate when passing through the face of the tetrahedron the apexes of which are occupied by three substitutes. Ten references: 8 USSR and 2 USA (1935-1954). Tables; graphs.

Institution : Acad. of Sc., USSR, Inst. of Chem. Phys.

Presented by : Academician V. N. Kondratyev, October 23, 1954

NEYMAN, M. B.

USSR/Physics - Chemical physics

Card 1/2 Pub. 22 - 31/54

Authors : Neyman, M. B., and Shinyayev, A. Ya.

Title : Diffusion of iron in iron-nickel alloys

Periodical : Dok. AN SSSR 102/5, 969-972, Jun 11, 1955

Abstract : An investigation was conducted to determine the effect of component concentration on the magnitude of the diffusion coefficient in a binary system (Fe-Ni) characterized by the absence of interstitial compounds. By determining the activation energy of the process of iron diffusion in different alloys of the Fe-Ni system it became possible to determine the change in magnitude of the energy barrier which must be overcome by the diffused atom during its migration from one node of the crystal lattice

Institution : Acad. of Sc., USSR, Inst. of Chem. Phys.

Presented by : Academician I. P. Hardin, January 8, 1955

Card 2/2 Pub. 22 - 31/54

Periodical : Dok. AN SSSR 102/5, 969-972, Jun 11, 1955

Abstract : of the alloy to another. The results are analyzed. Twelve references:
7 USA, 2 German and 3 USSR (1936-1954). Diagrams.

NEYMAN, M. B.

USSR/ Chemistry - Physical chemistry

Card 1/1 Pub. 22 - 27/46

Authors : Neyman, M. B., and Shinyayev, A. Ya.

Title : The diffusion of iron in iron-molybdenum fusions

Periodical : Dok. AN SSSR 103/1, 101-104, Jul 1, 1955

Abstract : Studies were conducted to determine the coefficient of diffusion of iron in two different systems one of which is characterized by the formation of a chemical compound and the second as nonproductive. Results obtained during measuring the diffusion coefficients of Fe in Fe-Mo fusions at temperatures of 1106, 1148 and 1133° are described. The magnitude of the Fe diffusion coefficient was seen to be decreasing with the increase in percentage content of Mo and reaches a minimum at a point corresponding to the chemical composition of Fe₂Mo. The relation between the mobility of the diffusing atom and the chemical forces between the atoms in the crystal line lattice of the fusion is explained. Five references: 2 USA and 3 USSR (1948-1955). Graphs.

Institution : Acad. of Sc., USSR, Inst. of Chem. Phys.

Presented by : Academician I. P. Eardin, January 8, 1955

Heiman, M. B., Efremov, V. M.,
30% CO were formed from the carbonyl group of AcH.
Oxidation expts. were performed in a 200-ml. glass reaction
vessel of 4 cm. diam. connected to a vacuum line of un-
specified construction. Propylene was prepd. by catalytic
hydrogenation of iso-PrOH. Prepn. of C¹⁴O and CH₃C¹⁴H₂O
(C.A. 51, 819f; Petrov, C.A. 48, 12066i) and methods
of the detn. of specific activities and paper-graphic meas-
urement of CH₃CHO radions. (C.I. 49, 12253f; 51, 319f)
were reported previously. It was demonstrated that at
515-57° no transfer of H from CH₃C¹⁴H₂OH to CH₃CHO
took place. Ivan Petrov

7/2

EM

NEYMAN M. B.

Method in binary alloys as a new physicochemical
method of analysis. M. B. Neyman and A. Ya. Shlyuzer.
Zhur. Neorg. Khim. 1, 1217-1218 (1966). -- Diffusion of metals
through alloys is measured by electrocollating technique
on the samples to remove successive layers of metal, with
the metal thus removed.

2

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2877 AEC-42-2183
A KINETIC METHOD OF USING LABELLED ATOMS TO
INVESTIGATE COMPLEX CHEMICAL AND BIOCHEM-

VERKHOVSKIY, B.I.; NEYMAN, M.B., doktor khimicheskikh nauk.

Measuring the thickness of materials by means of radioactive isotopes.
Vest.AN SSSR 26 no.6:89-91 Ja '56. (MLRA 9'9)
(Radioisotopes--Industrial applications)

Neyman, M. B.

USSR/Physical Chemistry - Kinetics. Combustion.
Explosives. Topochemistry. Catalysis.

B-9

Abs Jour : Referat Zhur - Khimiya, No 2, 1957, 3799

Author : Neyman M.B., Miller V.B., Shapovalov Yu.M.

Title : Investigation of the Effect of Molecular Structure on
Velocity of Ionic and Atomic Reactions of Isotope
Exchange. IV. Investigation of Radical-Chain Reactions of
Isotope Exchange of Alkyl Iodides with Elemental Iodine.

Orig Pub : Zh. fiz. khimii, 1956, 30, No 3, 492-499

Abstract : Determination was made of the velocity of isotope ex-
change $RI^* + I_2$ in cyclohexane solution at room tempera-
ture ($R = CH_3, C_2H_5, n-C_3H_7, iso-C_3H_7, C_6H_5I$ and CHI_2).

Exchange occurred in accordance with a chain mechanism,
the I atoms being generated by means of illumination
with a Hg-arc. The chain develops according to the
scheme: $I + RI^* = II^* + R, R + I_2 = RI + I$. In the dark

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- 125 -

Moscow Inst. Chem. Physics.

NEYMAN, M.B.

USSR/Physical Chemistry - Kinetics, Combustion, Explosions, Topo-chemistry, Catalysis.

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Abs Jour: Referat. Zhurnal Khimiya, No 3, 1958, 7201.

Author : M.G. Gonikberg, V.B. Miller, M.B. Neyman, F.S. D'yachkovskiy,
G.I. Likhtenshteyn, A.A. Opekunov,Inst :
Title : Investigation of Solvent Influence on Reaction Rate of Isotope
Exchange $C_3H_7I + I^*$ under Pressures up to 2500 kg/sq.cm.

Orig Pub: Zn. fiz. khimi, 1956, 30, No 4, 784-788.

Abstract: The isotope exchange of $n-C_3H_7I + I^*$ in C_2H_5OH , alcohol-aqueous solutions and acetone was investigated at 20° and under the pressure of 1, 1500 and 2500 abs. atm. The reaction proceeds according to the ion-molecular mechanism; the rate constants $k \cdot 10^5$ (lit. mole⁻¹, sec⁻¹) are at 1, 1500 and 2500 abs. atm. correspondingly as follows: in alcohol - 10, 18 and 23.5; in 90%-ual alcohol - 8, 18 and 22; in 80%-ual alcohol - 8, and 20; in 70%-ual alcohol - 8.5, 16 and 18; in acetone - 2300, 1300 and 800.

Card : 1/2

-8-

NEYMAN, M.B.; FEKLISOV, G.I.

Kinetic method for the application of tracer atoms to study the mechanism of complex chemical and biochemical processes. Part 5. Formation of acetaldehyde and the oxides of carbon during oxidation of butane [with English summary in insert]. Zhur.fiz.khim. 30 no.5: 1126-1132 My '56. (MLRA 9-9)

1. Akademiya nauk SSSR, Institut khimicheskoy fiziki, Moskva.
(Butane) (Oxidation)

ADY MIRA, MIRA 11:1

NEYMAN, Moisey Borisovich, doktor khim.nauk, prof.; FAYNBOYM, I.B., red.;
GUBIN, M.I., tekhn.red.

[Chemistry in nuclear engineering] Khimii v atomnoi tekhnike.
Moskva, Izd-vo "Znanie," 1957. 31 p. (Vsesoiuznoe obshchestvo po
rasprostraneniuiu politicheskikh i nauchnykh znanii Ser.4, no.30)
(MIRA 11:1)

(Nuclear reactors--Materials)

8. 8. 1957. 278 p.
ASTAKHOV, Konstantin Vasil'yevich, inzhener-polkovnik, professor; HEYMAN,
M.B., professor doktor khimicheskikh nauk, redaktor; KADER, I.S.,
redaktor izdatel'stva; KOHOVALOVA, Ye.K., tekhnicheskii redaktor

[Atomic energy and ways of using it] Atomnaia energiya i puti ee
prakticheskogo izpol'zovaniia. Moskva, Voen. izd-vo M-va obor.
SSSR, 1957. 278 p. (MIRA 10:9)
(Atomic power)

NEYMAN, M B.

PHASE I BOOK EXPLOITATION 1181

Akademiya nauk SSSR. Institut fizicheskoy khimii

Problemy kinetiki i kataliza. [t] IX: Izotopy v katalize (Problems of Kinetics and Catalysis. [v] 9: Isotopes in Catalysis) Moscow, Izd-vo AN SSSR, 1957. 442 p. 3,500 copies printed.

Eds: Roginskiy, S.Z., Vinogradova, O.M., Keyer, N.P. and Yanovskiy, M.I., Corresponding Members, USSR Academy of Sciences; Ed. of Publishing House: Vasserberg, V.E.

PURPOSE: This book is for specialists interested in the theoretical and practical problems of the application of isotopes in catalysis.

COVERAGE: This collection of articles forms volume 9 of "The Problems of Kinetics and Catalysis." Most of the papers were presented at the Conference on Isotopes in Catalysis which took place in Moscow, March 31 - April 5, 1956. Scientists from the Academy of Sciences of

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of the USSR, the Ukrainian Academy of Sciences, institutes of the chemical and petroleum industries, and several vuzes took part. Scientists from the six people's republics China, GDR, Poland, Czechoslovakia, Hungary and Rumania also participated. This conference was the first of its sort not only in the Soviet Union, but internationally. Several articles which could not be included in the program of the conference are given in the text. Each article has figures, tables, and a bibliography.

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NEYMAN, M.B.

AS USSR

"A new tracer method for investigating the mechanism of chemical reactions," paper submitted at 16th International Congress of Pure and Applied Chemistry, Paris, 18-24 July 1957

NEYMAN, M. B., POPOV, Ye. I., ISAGULYANTS, G. V., BOGDANOVA, G. K., BALANDIN, A. A.

"Application of radio-carbon in investigating the mechanism of consecutive reactions of butane-butylene-divinyl," a paper submitted at the International Conference on Radioisotopes in Scientific Research, Paris, 9-20 Sep 57.

HURTAL, H. B., WALENBERG, A. B., and SHUHL, H. H.

"Employing the method of labelled atoms in studying the successive stages of hydrocarbon oxidation," a paper submitted at the International Conference on Radioisotopes in Scientific Research, Paris, 9-27 Sep 57.