Interaction of the weak...

the pressure wave in the products of combustion: $\delta u_2 = -(c_2/\gamma_2)(\delta p_2/p_2)$, $\delta\varrho_2 = \delta p_2/c_2^2$; the entropy wave in the products of combustion: $\delta w_2 = -[c_2/c_2(\gamma_2 - 1)]\delta\varrho_2^e$ (2). The authors state that the change of the propagation velocity of the flame is related to the change of the thermodynamic parameters of the combustible mixture as follows: $\delta U = A\delta p_1 + B\delta\varrho_1^e$ (3), where $A = (\partial U/\partial p_1)_{T_1} + [(\gamma_1 - 1)/\gamma_1 T_1/p_1)\,(\partial U/\partial T_1)_{p_1}$; $B = -c_1^2\left[\varrho_1 c_{p_1}(\gamma_1 - 1)\right](\partial U/\partial T_1)_{p_1}$. The function $U(p_1, T_1)$ is considered to be determined experimentally or theoretically. Using (1), (2) and (3), the authors obtain: for the pressure wave in the combustible mixture

$$\delta p_1 = \frac{\left[(\rho_1 - \rho_2)\,c_2 B + U c_2 - \frac{\gamma_2 - 1}{\gamma_2 - 1}\,c_1^2\,\frac{U}{c_2}\right]\delta p_1^*}{\left\{1 + \frac{\rho_2 c_2}{\rho_1 c_1} - (\rho_1 - \rho_2)\,c_2 A - \left[(\gamma_2 - 1)\frac{c_1}{c_2} + 2 - (\gamma_2 - 3)\frac{c_1}{c_1}\right]\frac{U}{c_1}\right\}}; \quad (4),$$

for the pressure wave in the products of combustion

Card 3/5

Interaction of the weak...

$$\delta p_2 = \frac{\left[(\rho_1 - \rho_2)\, c_2 B + U c_2 - \frac{\gamma_2 - 1}{\gamma_1 - 1} c_1^2 \frac{U}{c_2} - 2(\rho_1 - \rho_2) c_2 B\left(1 + \frac{c_2}{c_1}\right)\frac{U}{c_1}\right]\delta p_1'}{\left\{1 + \frac{\rho_2 c_2}{\rho_1 c_1} - (\rho_1 - \rho_2)\, c_2 A - \left[(\gamma_2 - 1)\frac{c_1}{c_2} + 2 - (\gamma_2 - 3)\frac{c_2}{c_1}\right]\frac{U}{c_1}\right\}}, \quad (5),$$

and for the entropy wave in the products of combustion $\delta p_2' = \delta p_1''$. In a perturbation of the heat supply δQ occurs in the combustible mixture, the values for δp_1, δp_2, and δQ_2^e may be determined. $\delta U = A\delta p_1 + D\delta Q$, where $D = (\partial U/\partial Q)_{p_1 T_1}$. Hence, (7) is expressed as follows:

$$\delta p_1 = \frac{\left[(\rho_1 - \rho_2)\, c_2 D + (\gamma_2 - 1)\frac{U}{c_2}\right]\delta Q}{\left\{1 + \frac{\rho_2 c_2}{\rho_1 c_1} - (\rho_1 - \rho_2)\, c_2 A - \left[(\gamma_2 - 1)\frac{c_1}{c_1} + 2 - (\gamma_2 - 3)\frac{c_2}{c_1}\right]\frac{U}{c_1}\right\}}. \quad (7)$$

The occurrence of perturbations δQ_1^e and δQ in the combustible mixture results in waves whose intensity equals the sum of wave intensities which are caused by each of these perturbations. The expressions of the intensity of pressure waves which are given in Ref. 2, may be derived from (7) [Card 4/].

Interaction of the weak...

and (7) if the variation of the propagation velocity of the flame is zero. There are 1 figure and 5 Soviet-bloc references.

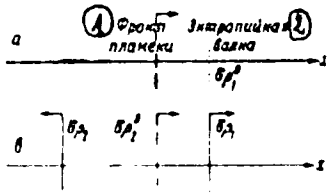
ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Physical Chemistry of the Academy of Sciences USSR) .

PRESENTED: March 11, 1961 by V. N. Kondrat'yev, Academician

SUBMITTED: March 8, 1961

Legend to Fig. 1: (1) Flame front, (2) entropy wave.

Fig. 1.



Card 5/5

A 075

S/020/61/140/002/020/033
B101/B110

11.7300

AUTHOR: [illegible], G. S., and Ryazantsev, Yu. S.

TITLE: [illegible] unstable combustion

PERIODICAL: [illegible] Akademii nauk SSSR. Doklady, v. 140, no. [illegible], [illegible]

TEXT: [illegible] kol for a possibility of avoiding the [illegible] difficulties in measuring the acoustic impedance of a burning surface. They proceed from a linear (tubular) model in which instabilities may appear in the longitudinal direction only. In linear approximation, the problem of instability of combustion of a condensed system in a tube is regarded as an [illegible] problem of natural oscillations in the tube between the two surfaces Z_0 and Z_1. Assuming a low combustion rate, the change of the tube length is neglected. The following relation holds for the eigenfrequencies: $(Z_0 + 1)/(Z_0 - 1) = (Z_1 - 1)/(Z_1 + 1)$ exp $-2ikl$, $k = \omega/c$ is the wave vector, Z_0 the impedance of the burning surface, Z_1 the impedance of the open tube end. The following

Card 1/3

condition is written for the self-excitation of the system: $r_0 r_1 > 1$, where $r_0 = 1$; $R_0 = r_0 \exp(2i\delta_0)$ is the reflection coefficient of the burning surface; $r_1 = |R_1|$; $R_1 = r_1 \exp(2i\delta_1)$ is the reflection coefficient of the open tube end. If Z_0 and Z_1 are known, it is possible to calculate the critical ω_{cr}, λ_{cr} for the limit combustion stability. If the system has a range of instability, it is possible to calculate the impedance Z_1 from ω_{cr}, λ_{cr}. Reference is made to L. Ya. Gutin, ZhTF, 7, [illegible], for the calculation of Z_1. The determination of ω_{cr}, λ_{cr} [illegible] parameters yields the frequency dependence $Z_1(\omega)$. If Z_1 is independent of ω, and $r_0 > 1$, then: (a, combustion is stable with $\lambda < \lambda_{cr}$; (b, with increasing combustion of the condensed phase, the eigenfrequency drops and finally reaches: $\omega_{cr} = (c/4l)\sqrt{1 - 1/r_0^2}$. At that instant the system becomes unstable, and the system [illegible] vibrations. There are 1 figure and 13 references: [illegible] Card 2/3

28675
S/020/61/140/002/020/023
B101/B110

Model of unstable combustion

Soviet. The four references to English-language [illegible] as follows: H. Grad, Comm. on Pure and Appl. Math., [illegible]; P. T. McClure, R. W. Hart, J. F. Bird, J. Appl. Phys., [illegible]; J. F. Bird, L. Haar, R. W. Hart, F. T. McClure, J. Chem. [illegible], [illegible] W. Maxwell, Fourth Symposium on Combustion, [illegible].

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

PRESENTED: April 13, 1961, by V. N. Kondrat'yev, Academician

SUBMITTED: April 10, 1961

Card 3/3

SOSNOVA, G.S.; VOSKOBOYNIKOV, I.M.; BRUSNIKINA, V.M.; NOVIKOV, S.S.; APIN, A.Ya.; LAPSHINA, Z. Ya.

Comparative data on the physicochemical properties of some liquid explosives. Izv. AN SSSR Otd.khim.nauk no.2:351-352 F '62. (MIRA 15:2)

1. Institut khimicheskoy fiziki AN SSSR i Institut organicheskoy khimii im. N.D.Zelinskogo AN SSSR.
(Explosives)

S/040/62/026/002/022/022
D299/D301

24 4300

AUTHORS: Novikov, S.S., and Myazantsev, Yu.S. (Moscow)

TITLE: On the reflection of plane sound waves from the open end of a circular tube

PERIODICAL: Prikladnaya matematika i mekhanika, v. 26, no. 2, 1962 376 - 380

TEXT: A formula is derived for the reflection coefficient of a plane sound-wave from the open end of a circular, semi-infinite tube with absolutely rigid walls; the contact discontinuity at the boundary combustion flow - surrounding medium, is taken into account. The reflection coefficient is required in the study of vibrational combustion. The axis of the unflanged tube, of radius a, coincides with the z-axis of a cylindrical system of coordinates (r, z); axial symmetry is assumed. Steady oscillations are considered; the time-dependence of the acoustic field is described by a function of type exp(- iωt). The equations of the acoustic field are:

$$\Psi_j + k_j^2 \Psi_j = 0 \quad (j = 1, 2;\ k_j^2 = \frac{\omega^2}{c_j^2};\ \Delta = \frac{1}{r}\frac{\partial}{\partial r}\left(r \frac{\partial}{\partial r}\right) + \frac{\partial^2}{\partial z^2}) \quad (1)$$

Card 1/4

On the reflection of plane sound ...

where c_j is the velocity of sound, and Ψ_j is the velocity potential. The boundary conditions are set up. The sought-for coefficient of reflection is expressed as the ratio R = B/A (of the amplitude B of the reflected wave, to the amplitude A of the incident wave). After transformations, one obtains

$$z_1^2 L(\zeta) H(\zeta) = \frac{2}{a} W(\zeta) \qquad (15)$$

$$L(\zeta) = \frac{2\rho_{01} J_1(az_1) H_1^{(1)}(az_2) z_2' z_1}{\rho_{01} az_2 J_0(az_1) H_1^{(1)}(az_2) - \rho_{02} az_1 J_1(az_1) H_0^{(1)}(az_2)} \qquad \zeta_j = \sqrt{k_j^2 - \zeta^2} \qquad (16)$$

where H is Hankel's function and J - Bessel's function. For convenience, it is assumed that the constants k_j are complex numbers. It is shown that

$$R = \frac{\operatorname{res}_{\zeta = -k_1} H(\zeta)}{\operatorname{res}_{\zeta = k_1} H(\zeta)} . \qquad (17)$$

From the asymptotic values of the function Ψ_1, for $z \longrightarrow \infty$, follows that

Card 2/4

$$H(\quad = - \frac{[illegible]}{- k_{[illegible]}} - \frac{[illegible]}{+ k_{[illegible]}} + \quad (\quad). \qquad ([illegible])$$

[illegible]. Thus, the problem reduces to [illegible] the function [illegible] from Eq. ([illegible]). This equation is solved by the [illegible] method. One obtains

$$H(\;) = \frac{[illegible]}{(k_{[illegible]}^2 - \;^2) L_{-}(\;)} . \qquad ([illegible])$$

From

$$R = /R/ e^{2i\varphi} = - [L_{-}(k_{[illegible]})]^{-2} \qquad ([illegible])$$

one obtains the formula for the reflection coefficient. If the frequency [illegible] and the radius a are small (so that $k_{[illegible]} a$ [illegible] 1), then the obtained formula is simplified, by retaining only the first terms in the expansion of cylindrical functions; thereupon integration yields

$$/R/ = \exp[- \frac{k_1 k_2 a^2}{2} \frac{c_{[illegible]}}{c_{[illegible]}}] \qquad ([illegible])$$

Card 3/4

This formula holds for k_1 [illegible] k_2. If the medium is [illegible], Eq. [illegible]) simplifies still further. It is noted that, according to Eq. [illegible]) in case of a hot flow and a cold medium, the radiation from the open end is larger (i.e. R is smaller) than that in a homogeneous medium, regardless of whether the medium is [illegible] by the parameters 1 or 2. There are [illegible] figures and [illegible] references: [illegible] Soviet-bloc and [illegible] non-Soviet-bloc (including 4 translations [illegible]); the references to the English-language publications read as follows: H. Levine, J. Schwinger, On the radiation of sound from unflanged circular pipe. Phys. Rev., 1948, v. 73, no. 4; G.F. Carrier, Sound transmission from tube with flow. Quart. Appl. Math., [illegible], v. 13.

[illegible]: December 2[illegible], 1961

Card 4/4

L 0443-6... EEO-2/TSS-2/EPA/EWT(1)/EPA(s)-2/EWT(m)/EPF(c)/EWA(d)/EPR/EWP(j)/H/
FCS(f)/EWA(b)/EWA/EED-2/FCS(k) Pc-4/Pr-4/Ps-4/Pt-10/Paa-4 RPL/AEDC(a)/SSD(a)/
AFWL/BSD/SSD/AFETR/AFTC(p)/ASD(m)-3/RAEM(i)/ESD(si)/AEDC(b) JWD/HWH/JW/WW/RM
ACCESSION NR: AP4043842 S/0020/64/157/005/1188/1191

AUTHOR: Novikov, S. S.; Ryazantsev, Yu. S.

TITLE: Analysis of mathematical models of combustion in the condensed phase

SOURCE: AN SSSR. Doklady*, v. 157, no. 5, 1964, 1188-1191

TOPIC TAGS: explosive, propellant, combustion, solid propellant, nitroglycerine

ABSTRACT: The combustion of condensed systems is characterized by the multistage conversion of the combustible in the combustion front. Therefore, the study of the individual stages and their interaction and determination of the controlling stage are of importance. It was previously shown that up to 70% of the heat required for heating the burning surface is liberated by chemical reactions in the condensed phase. In flameless combustion of nitroglycerine powder, combustion is sustained exclusively by heat liberated in the condensed phase. It was also previously found that with increasing pressure, the heat liber-

Card 1/2

L 8443-65
ACCESSION NR: AP4043842

ated in the condensed phase increases. In the present article the existence and uniqueness was proved of the solution of the equations describing the combustion process in the condensed phase. Ya. B. Zel'dovich's thermal theory of combustion in gases was generalized for the case of combustion in the condensed phase. Two models were considered, 1) the T_g -model, where T_g is fixed temperature analogous to the boiling point in the Zel'dovich-Belyayev model, and 2) the Q_k model, in which the condensed phase is gasified when a fixed amount of heat (Q_k) is evolved by chemical reaction in the condensed phase. The uniqueness of both solutions was proved. It was also shown that both models are not mutually exclusive and can be used simultaneously. For this case the possibility of a "subsurface" combustion regime as a function of pressure is discussed. Orig. art. has: 2 graphs and 9 formulas.

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

SUBMITTED: 02Mar64 ATD PRESS: 3098 ENCL: 00

SUB CODE: FP NO REF SOV: 009. OTHER: 000

Card 2/2

NOVIKOV, [illegible]; [illegible], V.[illegible].

Analysis of mathematical models of [illegible]-ordered phase [illegible].
Dokl. AN SSSR 157 no.5:1138-1141 Ap '64. [illegible]

1. Institut khimicheskoy fiziki AN SSSR. Predstavlena akademikom V.N. Kondrat'yevym.

L 14378-65 EPA/EPA(s)-2/EWT(m)/EPF(c)/EPR/EWP(j) Pc-4/Paa-4/Pr-4/Ps-4/
Pt-10/Pi-4 RPL/AFWL/AEDC(b)/AEDC(a)/SSD(a)/SSD/BSD/AFETR/AFTC(p)/RAEM(1)
ACCESSION NR: AP4044889 WW/JW/JWD/RM S/0020/64/157/006/1448/1450

AUTHOR: Novikov, S. S.; Ryazantsev, Yu. S.

TITLE: Combustion theory of condensed systems

SOURCE: AN SSSR. Doklady*, v. 157, no. 6, 1964, 1448-1450

TOPIC TAGS: combustion, combustion theory, explosive, solid fuel, propellant condensed phase

ABSTRACT: An analysis of the condensed phase process in the combustion of explosives was made on the assumption that the reaction is monomolecular and that heat flows from the gas phase to the condensed phase. The equations describing the condensed phase process were reduced to the following form:

$$\frac{dp}{dT} = \omega - \frac{\varphi(T)}{\omega} - \frac{\varphi(T)(T_s - T)}{p};$$
$$p = 0 \quad \text{at } T = T_0;$$
$$p = q_s \quad \text{at } T = T_s.$$

Card 1/2

L 14378-65
ACCESSION NR: AP4044889

2

where $p = \lambda\, dt/dx$ (λ is thermal conductivity), $\phi(T) = c\lambda\phi(T)$ ($\phi(T)$ is the dependence of the chemical reaction rate on temperature), $\omega = mc$ (m is mass burning rate, c is heat capacity), and q_s is heat flux through the hot surface. The equation was solved for the cases $T_* > T_s$, $T_\varepsilon < T_* \leq T_s$, and $T_* \leq T_\varepsilon$, where $T_* = T_0 + ha_0/c$ (h is heat of reaction and a is concentration), T_ε is a parameter introduced previously by Zel'dovich, and T_s is temperature of the hot surface. It was shown that when $q_s < q_{cr}$ no solution exists, but that when $q_s > q_{cr}$, there is a unique solution. The function ω is shown for different cases in a graph of p vs. T. Orig. art. has: 1 figure and 12 formulas.

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

SUBMITTED: 17Apr64 ENCL: 00

SUB CODE: WA, FP NO REF SOV: 010 OTHER: 000

Card 2/2

L 43719-65 EWT(l)/EPF(n)-2/EED(b)-3 Pu-4 IJP(c) WW
ACCESSION NR: AP5008501 S/0207/64/000/006/0077/0080

21
B

AUTHOR: Novikov, S.S. (Moscow); Ryazantsev, Yu.S. (Moscow)

TITLE: Acoustic admittance of the hot surface of condensed systems

SOURCE: Zhurnal prikladnoy mekhaniki i tekhnicheskoy fiziki, no. 6, 1964, 77-80

TOPIC TAGS: acoustic wave, condensed system, hot surface, wave front, acoustic admittance, sound field

ABSTRACT: On the basic of the theory of Ya.B. Zel'dovich, an expression is derived for the acoustic admittance of the hot surface of a condensed system which is dependent on three parameters, and it is shown that, depending on these parameters, acoustic waves reflected from the hot surface may be intensified or attenuated. Acoustic waves having a wavelength considerably greater than the width of the burning zone in the gas are considered, so that in the given case the front of the chemical reaction in the gas coincides with the surface of the condensed phase, and to determine the acoustic admittance of the hot surface it is necessary to determine the ratio of the magnitudes δu and δp (the velocity and pressure, respectively, of the sound field on this surface). Orig. art. has: 13 formulas and 1 figure.

Card 1/2 Declassified 09 Dec 64

L 37689-65 EPA/EPF(c)/EPR/KPA(s)-2/EWT(m)/EWA(c) Pr-4/Pt-10/Paa-4 WW/JDW

ACCESSION NR: AP5009543 S/0207/65/000/001/0057/0061

AUTHOR: Novikov, S. S. (Moscow); Ryazantsev, Ye. S. (Moscow)

TITLE: Theory of combustion stability of solid propellants

SOURCE: Prikladnoy mekhaniki i tekhnicheskoy fiziki, no. 1, 1965, 57-61

TOPIC TAGS: combustion stability theory, solid propellant, combustion stability criterion, combustion stability, combustion

ABSTRACT: Mathematical criteria of the combustion stability of solid propellants were derived for the zero- and 1st-order reactions in Q-model combustion (when the gasification of the condensed phase (k-phase) occurs as a result of the exothermic reaction in the k-phase) and for the zero- and 1st-order reactions in T_s-model combustion (when the gasification of the k-phase occurs as a result of the surface, gaseous-phase temperature, T_s). The proposed combustion stability theory takes into account the heat generated in the k-phase. The effect of the heat generated in the surface layer of the k-phase and the temperature fluctuations in the gaseous phase near the charge surface on the combustion stability of solid propellants is discussed. Orig. art. has: 1 figure and 21 formulas. [PS]

Card 1/2

L 57554-65 EPA/EPA(s)-2/EWT(m)/EPF(c)/EPR/EWA(c) Paa-4/Pr-4/Pt-7 WW/JWD

ACCESSION NR: AP5018193 UR/0207/65/000/003/0043/0048

AUTHOR: Novikov, S. S. (Moscow); Ryazantsev, Yu. S. (Moscow) 43 B

TITLE: The theory of the steady propagation velocity of an exothermic reaction front in the condensed phase

SOURCE: Zhurnal prikladnoy mekhaniki i tekhnicheskoy fiziki, no. 3, 1965, 43-48

TOPIC TAGS: solid propellant, combustion, combustion instability, burning velocity, condensed phase reaction

ABSTRACT: The exothermic reaction in the condensed phase may in some cases liberate up to 80% of the total heat release in the combustion of a solid propellant. However, even in cases when the heat release in the condensed phase is much smaller, this process is fully or partly responsible for the gasification and thus has a controlling effect on the overall combustion process. Formulas for the velocity of the reaction front propagating in the condensed phase are also of importance for analyzing non-steady state phenomena associated with combustion instability. In the present study the Zel'dovich-Frank-Kamenetskiy method for thermal flame propagation was applied, and formulas were derived for calculating the velocity of the reaction

Card 1/2

L 57554-65

ACCESSION NR: AP5018193

front propagating due to a first or zero order reaction in the condensed phase. Formulas for the maximum and minimum velocities were also obtained. Orig. art. has: 27 formulas. [PV]

ASSOCIATION: none

SUBMITTED: 15Feb65 ENCL: 00 SUB CODE: FP

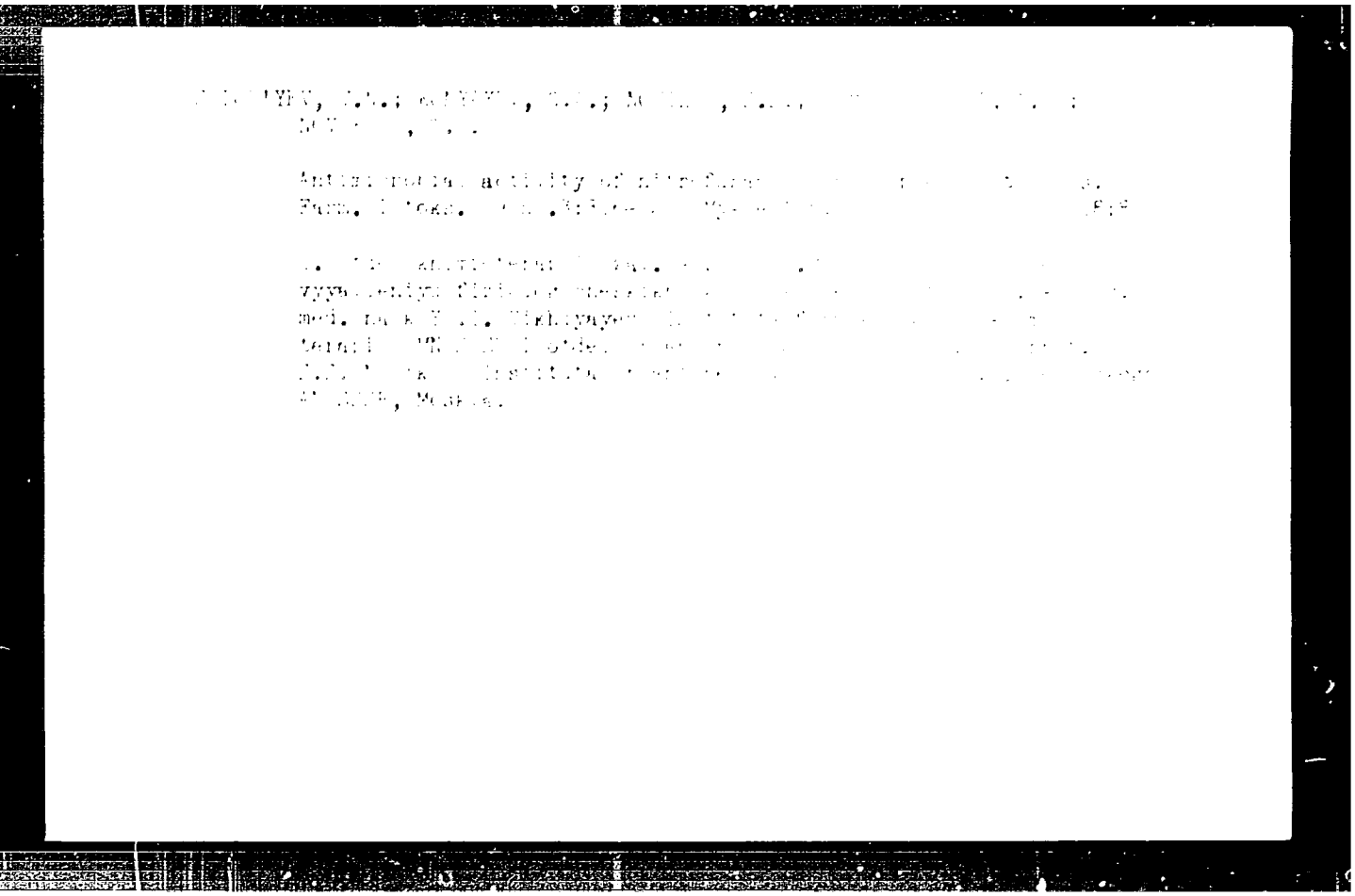
NO REF SOV: 012 OTHER: 001 ATD PRESS: 4039

Card 2/2

SLOVETSKIY, V.I.; OKHLOBYSTINA, L.V.; FAYNZIL'BERG, A.A.; IVANOV, A.I.; BIRYUKOVA, L.I.; NOVIKOV, S.S.

Spectrophotometric determination of the ionization constant of fluorodinitromethane. Izv. AN SSSR. Ser. khim. no.11:2063-2065 '65. (MIRA 18:11)

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



IOFFE, S.I.; TARTAKOVSKIY, V.A.; NOVIKOV, S.S.

Selective reduction of aliphatic functional nitro compounds.
Usp. khim. 35 no.1:43-69 Ja '66. (MIRA 19:1)

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

L 14708-66 EWT(l)/EWT(m)/EWA(d)/EWP(j)/EWP(k) IJP(c) WW/JW/RM

ACC NR: AP6002102 SOURCE CODE: UR/0062/65/000/011/2063/2065

AUTHORS: Slovetskiy, V. I.; Okhlobystina, L. V.; Faynzil'berg, A. A.; Ivanov, A. I.; Biryukova, L. I.; Novikov, S. S.

ORG: Institute of Organic Chemistry im. N. D. Zelinski, Academy of Sciences SSSR (Institut organicheskoy khimii Akademii nauk SSSR)

TITLE: Spectrophotometric determination of the ionization constant of fluorodinitromethane

SOURCE: AN SSSR. Izvestiya. Seriya khimicheskaya, no. 11, 1965, 2063-2065

TOPIC TAGS: ionization, fluorine compound, nitromethane / SF-4 spectrophotometer

ABSTRACT: Ionization constant of fluorodinitromethane (I) in water and absolute ethanol was determined spectrophotometrically according to the method described by V. I. Slovetskiy, S. A. Shevelev, A. A. Faynzil'berg, and S. S. Novikov (Zh. Vses. khim. ob-va im. D. I. Mendeleyeva, 6, 599, 707, 1961). The measurements were taken on a SF-4 spectrophotometer fitted with a thermostatic attachment. Concentration of I was kept within 2.2 x 10^{-5} to 5 x 10^{-5} mole/ℓ. The measurements were taken in the region 365-395 mμ. Spectra of the species present in solution are shown in Fig. 1. Acidity of I was found to be 10^{-4} less than that of the parent dinitromethane. Entropy, enthalpy, and free energy were calculated.

Card 1/2 UDC: 543.422+541.132+547.232

L 11708-66
ACC NR: AP6002102

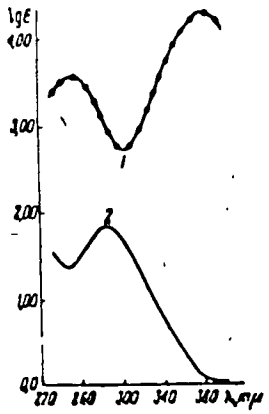


Fig. 1. UV spectra of fluorodinitromethane in aqueous solution: 1 - anion; 2 - nondissociated molecule.

Orig. art. has: 2 tables and 2 figures.

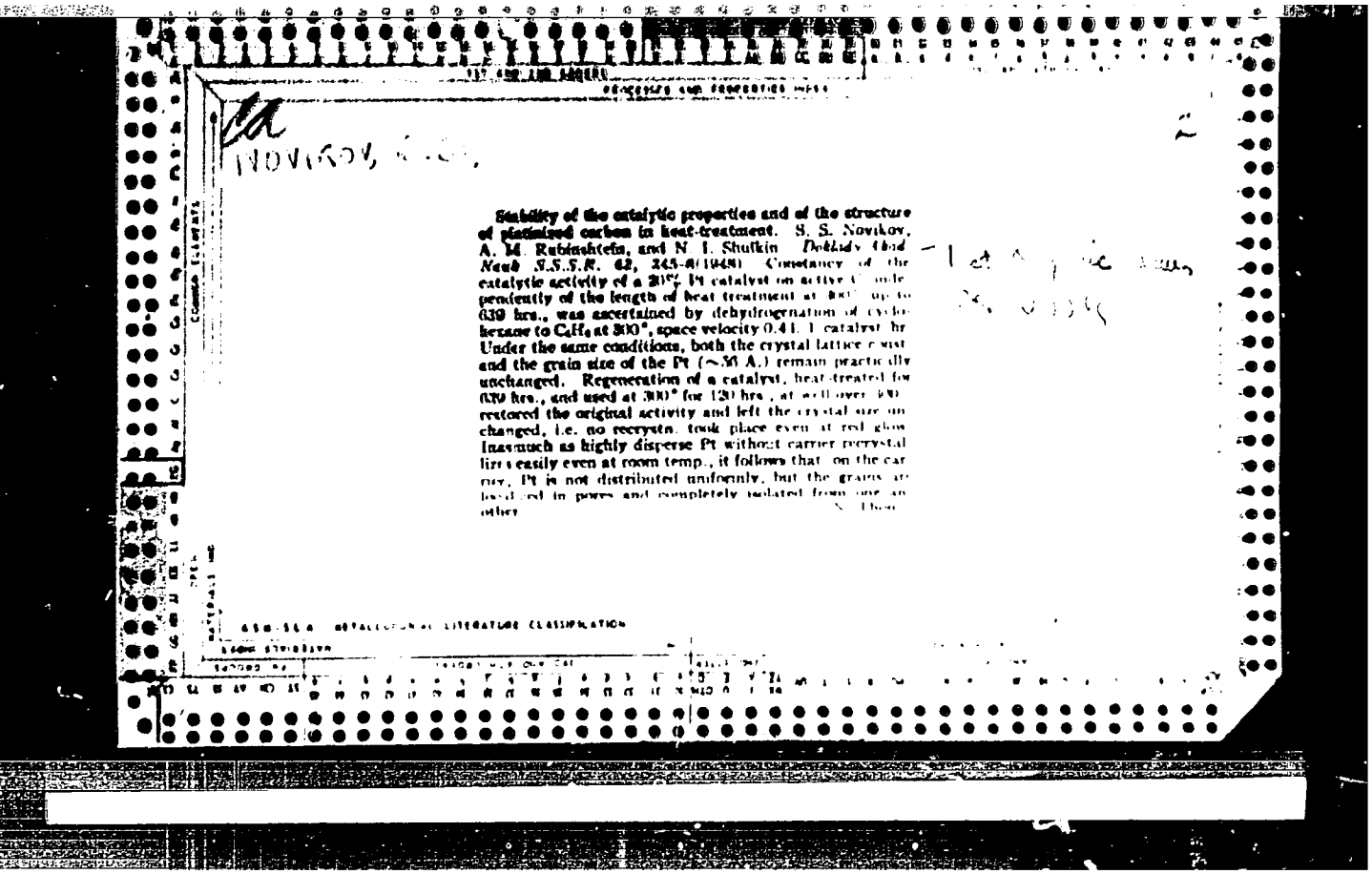
SUB CODE: 07/ SUBM DATE: 24Mar65/ ORIG REF: 004

Card 2/2

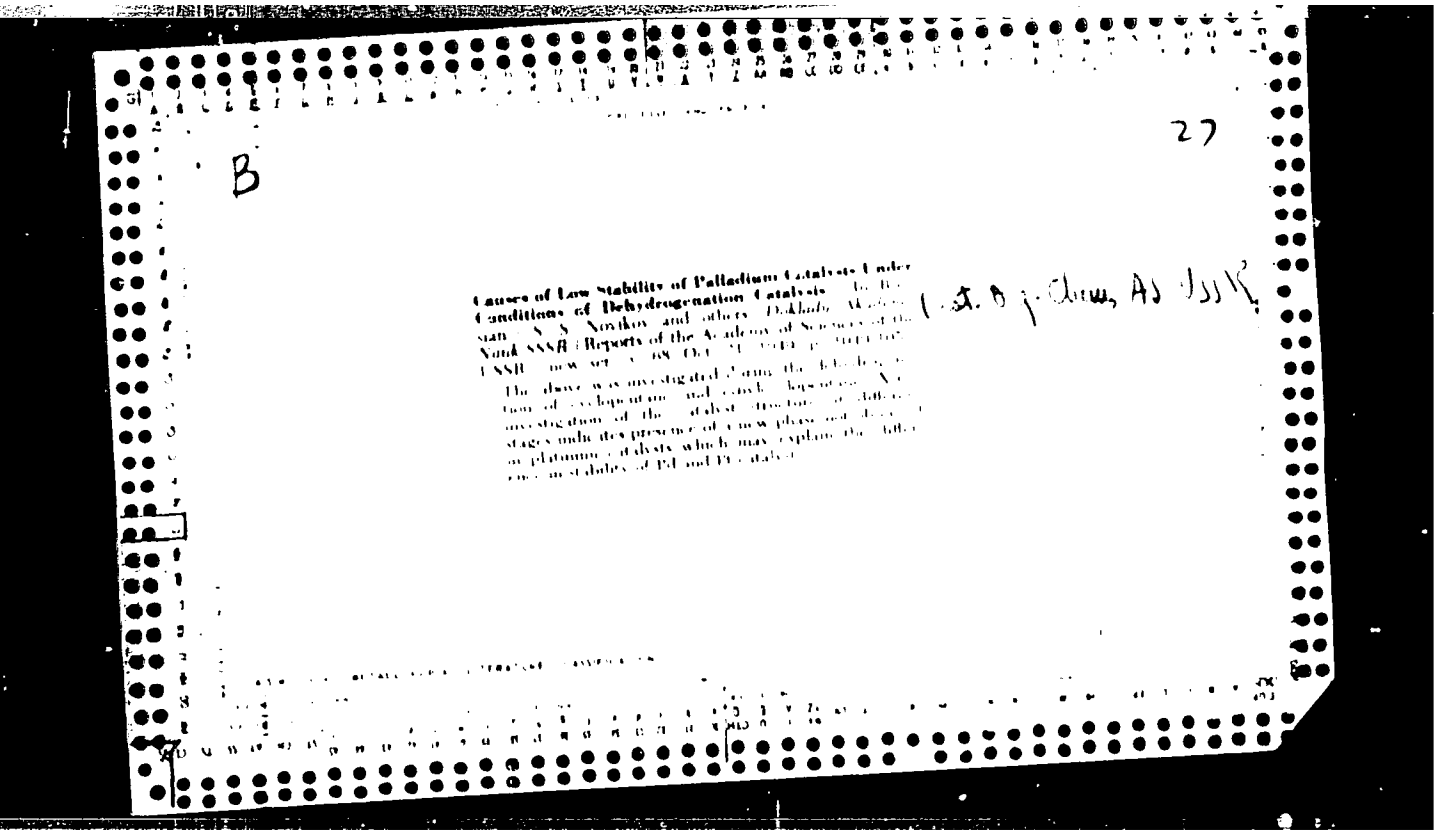
NOVIKOV, S. S.

Effect of unsaturated hydrocarbons on the dehydrogenating properties of platinum catalysts. N. I. Shuikin, S. S. Novikov, and E. D. Tulupova (Acad. Sci. U.S.S.R., Moscow). *Bull. acad. sci. U.R.S.S., Classe sci. chim.* 1947, [illegible] (in Russian). — Inst. Organic Chemistry

Mixts. of a previously dearomatized gasoline fraction (b. 98–101°, n_D^{20} 1.409[illegible], d_4^{20} [illegible]) with unsatd. hydrocarbons, in the wt. ratio hydrocarbon:gasoline = 1:10, were subjected to [illegible] dehydrogenations at 300–305° on a 5% Pt catalyst [illegible] C, 30 cm. high, 15 g., rate of flow 1 ml. [illegible] velocity = 0.[illegible]), and the activity of the catalyst [illegible] during, and after the runs was tested by the yield [illegible] dehydrogenation of cyclohexane [illegible] by the [illegible] catalyzate). Cyclohexene has no effect on [illegible] does not affect the activity and stability of the Pt catalyst. 1-Octene, 1-heptene, and 1-[illegible] have [illegible] a very slight inactivating effect. Marked inactivation is brought about by 1-ethyl-1-cyclopentene (y. falling from [illegible] to 78.5 [illegible]). Cyclohexene alone, in a slow H_2 stream, [illegible] the activity of the catalyst unchanged. 1-Hexene in a stream of H_2 or of CO_2 causes only a slight lowering of the activity; the products are, in the 1st case, hexane with a little 1-hexene, in the 2nd case, 2-hexene. 1-Ethyl-1-cyclopentene, 18.5 g., in a stream of CO_2, gave 11.8 g. catalyzate, fractionated into b_{10} 96–103° ([illegible].8 g.), 103–4° (4 g.), 104–5.5° (4.5 g.), residue [illegible] g. [illegible] 1st and 2nd fraction, treated with concd. H_2SO_4, gave a hydrocarbon with consts. close to those of [illegible] fraction [illegible] mainly unchanged [illegible] the activity of the catalyst has [illegible]. Allylcyclopentane, 16 g., in a stream [illegible] catalyzate [illegible] fraction b. 129–[illegible] close to those of propylcyclopentane [illegible] catalyst has decreased markedly. Since [illegible] and allylcyclopentane are hydro[illegible] presence of H_2 under CO_2, this can only [illegible] take place at the expense of the H_2 liberated in the dehydrogenation of other mols. to the corresponding cyclo[illegible] Cyclopentadiene itself, 2.52 g., mixed [illegible] under a stream of H_2, with [illegible] 18 g. heptane, at 300°, under a stream of H_2, gave [illegible] catalyzate of which [illegible].8 g. was very close to [illegible] cyclopent[illegible]; the activity of the catalyst has fallen to [illegible]. N. Thon



Stability of the catalytic properties and of the structure of platinized carbon in heat-treatment. S. S. Novikov, A. M. Rubinshtein, and N. I. Shutkin. *Doklady Akad. Nauk S.S.S.R.* 62, 345-8(1948). Constancy of the catalytic activity of a 20% Pt catalyst on active C was independently of the length of heat treatment at 800° up to 639 hrs., was ascertained by dehydrogenation of cyclohexane to C_6H_6 at 300°, space velocity 0.41. l. catalyst hr. Under the same conditions, both the crystal lattice const. and the grain size of the Pt (~30 A.) remain practically unchanged. Regeneration of a catalyst, heat-treated for 639 hrs., and used at 300° for 120 hrs., at well over 100 restored the original activity and left the crystal size unchanged, i.e. no recrystn. took place even at red glow. Inasmuch as highly disperse Pt without carrier recrystallizes easily even at room temp., it follows that on the carrier, Pt is not distributed uniformly, but the grains are localized in pores and completely isolated from one another.



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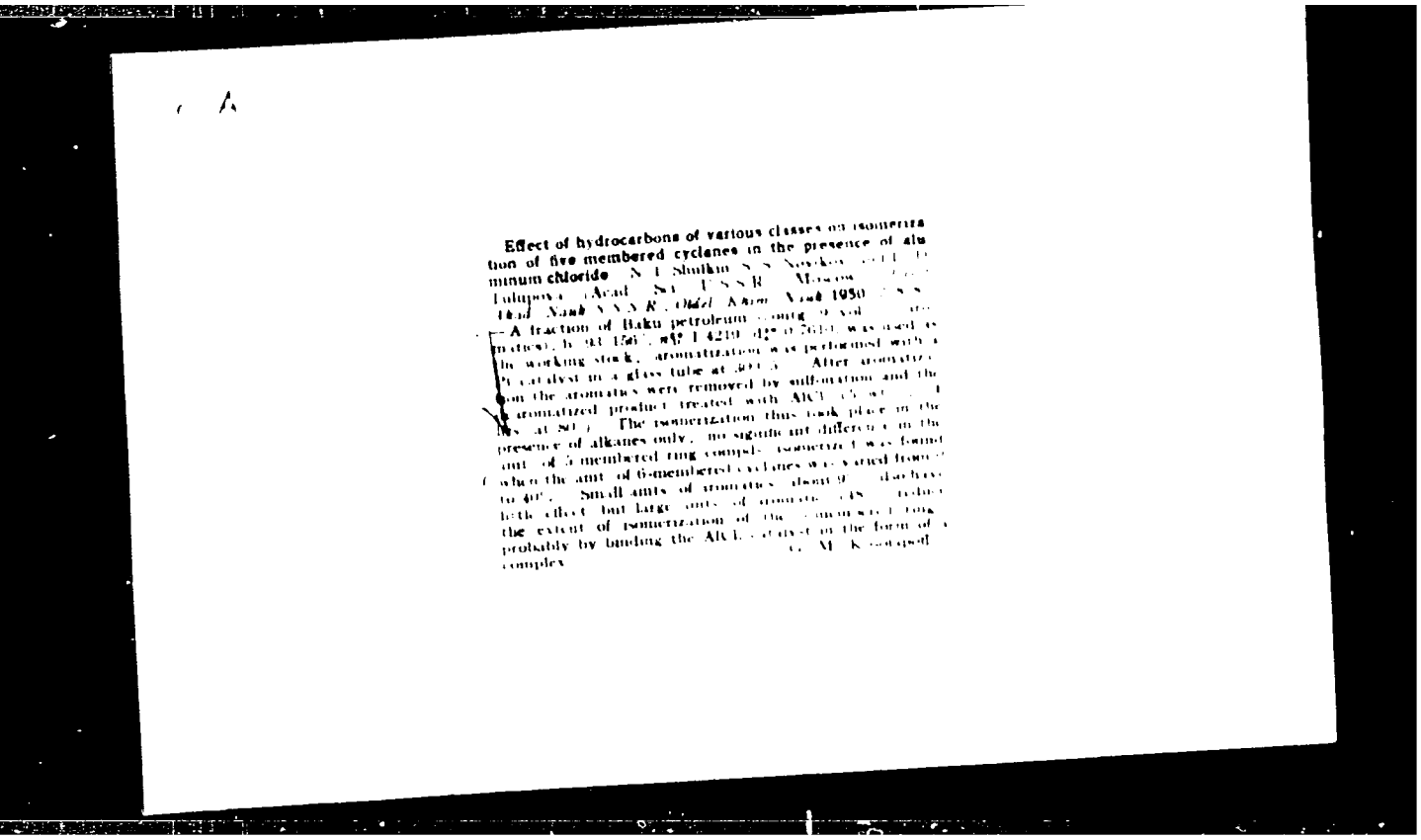
Causes of Low Stability of Palladium Catalysts Under Conditions of Dehydrogenation Catalysis



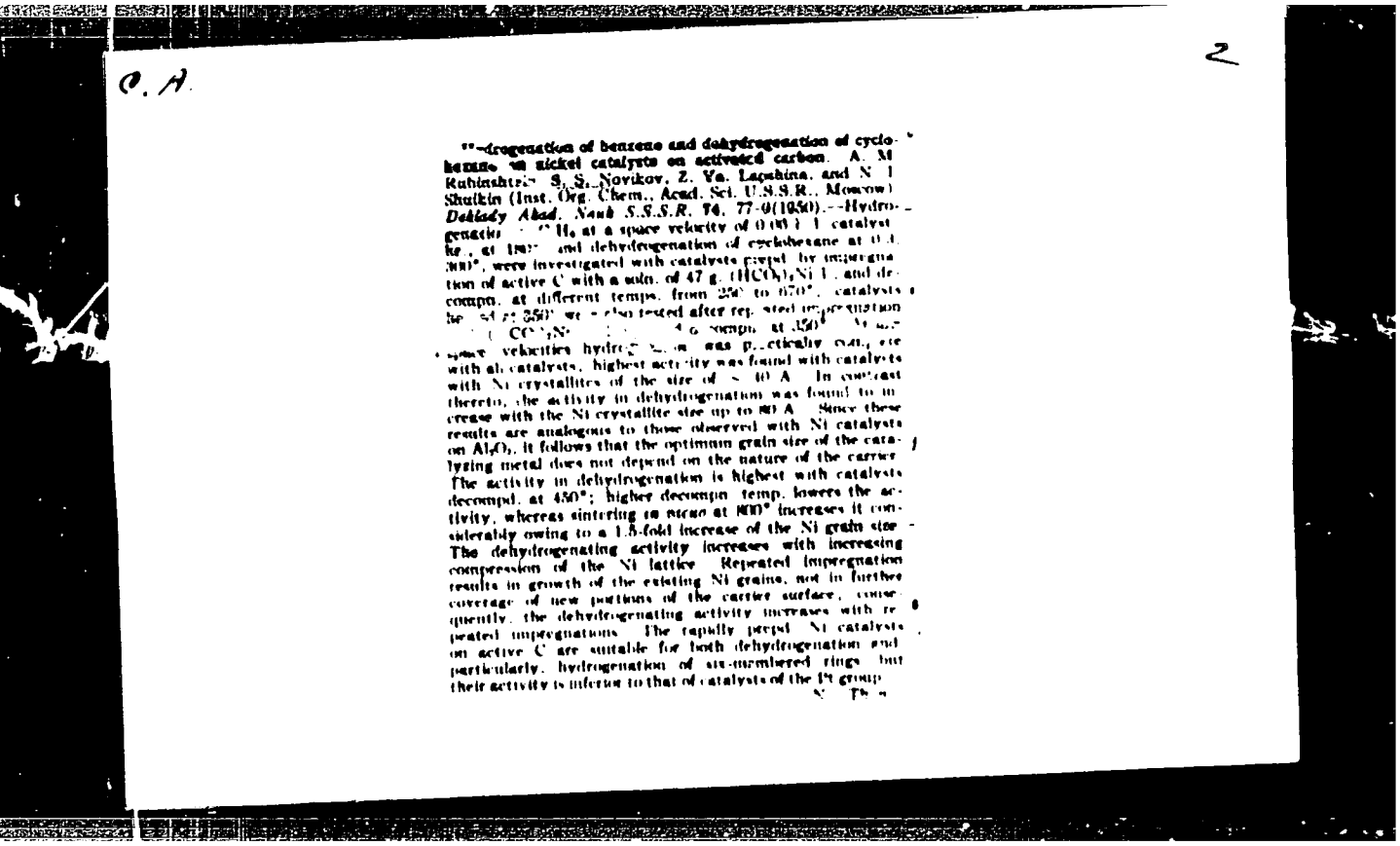
Effect of hydrocarbons of various classes on isomeriza tion of five membered cyclanes in the presence of alu minum chloride N. I. Shuikin, N. S. Nevskaya, and I. N. Tulupova. (Acad. Sci. U.S.S.R., Moscow) *Doklady Akad. Nauk S.S.S.R., Otdel. Khim. Nauk* 1950 [illegible]

A fraction of Baku petroleum [illegible] was used as [illegible] the working stock, aromatization was performed with a [illegible] catalyst in a glass tube at [illegible]. After aromatiza [illegible] the aromatics were removed by sulfonation and the [illegible] aromatized product treated with AlCl$_3$ [illegible] at 80°. The isomerization thus took place in the presence of alkanes only; no significant difference in the amt. of 5-membered ring compds. isomerized was found when the amt. of 6-membered cyclanes was varied from [illegible] to 40%. Small amts. of aromatics (about 9%) [illegible] both effect but large amts. of aromatics (45%) reduce the extent of isomerization of the [illegible] probably by binding the AlCl$_3$ [illegible] in the form of a complex [illegible] AlCl$_3$ complex.

NOVIKOV, S. S.

"Investigation of Boundary Films of Liquids by Blowing Off the Liquid," Vest. Ak. Nauk SSSR, 20, No.3, 1950

Digest W-12652, 1 Aug 50



C. A.

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"-drogenation of benzene and dehydrogenation of cyclo-
hexane on nickel catalysts on activated carbon. A. M
Rubinshtein, S. S. Novikov, Z. Ya. Lapshina, and N. I
Shulkin (Inst. Org. Chem., Acad. Sci. U.S.S.R., Moscow)
Doklady Akad. Nauk S.S.S.R. 74, 77-9(1950).--Hydro-
genatio[illegible] H_2 at a space velocity of 0.6[illegible] l. catalyst
hr., at 180° and dehydrogenation of cyclohexane at 0.1
300°, were investigated with catalysts prepd. by impregna
tion of active C with a soln. of 47 g. $(HCO_2)_2Ni$ l. and de-
compn. at different temps. from 250° to 670°, catalysts
he[illegible]d at 350° we[illegible] also tested after req. steel impregnation
[illegible] $(CO_2)_2Ni$[illegible] 4 g. compn. at 450°[illegible]
space velocities hydro[illegible]n was p[illegible]ctically com., ete
with all catalysts, highest activity was found with catalysts
with Ni crystallites of the size of ~ 40 A. In contrast
thereto, the activity in dehydrogenation was found to in-
crease with the Ni crystallite size up to 80 A. Since these
results are analogous to those observed with Ni catalysts
on Al_2O_3, it follows that the optimum grain size of the cata-
lyzing metal does not depend on the nature of the carrier.
The activity in dehydrogenation is highest with catalysts
decompd. at 450°; higher decompn. temp. lowers the ac-
tivity, whereas sintering in steam at 400° increases it con-
siderably owing to a 1.5-fold increase of the Ni grain size.
The dehydrogenating activity increases with increasing
compression of the Ni lattice. Repeated impregnation
results in growth of the existing Ni grains, not in further
coverage of new portions of the carrier surface, conse-
quently, the dehydrogenating activity increases with re-
peated impregnations. The rapidly prepd. Ni catalysts
on active C are suitable for both dehydrogenation and
particularly, hydrogenation of six-membered rings, but
their activity is inferior to that of catalysts of the Pt group.

SHUYKIN, N.I.; NOVIKOV, S.S.; MARYSHKINA, T.I.

Nature of sexavalent hydrocarbons of higher fractions in Maikopsk benzene. Izv.Akad.nauk SSSR; Khim.otd. no.2:111-119 Mar-Apr 51. (CLML 20:7)

1. Institute of Organic Chemistry of the Academy of Sciences USSR.

USSR/Chemistry - Aromatic Hydrocarbons Aug 52
Alkylation

"Catalytic Transformation of Ethyl-Substituted Five- and Six-Membered Hydrocarbons," S I. Khromov, S. S. Novikov, N. A. Radzhabli, and Acad N. D Zelinskiy, Inst of Org Chem Acad Sci USSR

"DA" SSSR" Vol 85, No 5, pp 1053-1056

A study was made of the stability of the C - C bond in the ethyl group of ethyl-substituted cyclopentane, cyclohexane, and benzene. It was found by means of catalytic transformation over a special Ni catalyst that ethyl cyclohexane dealkylates more easily than ethyl benzene, which dealkyl[illegible]s more easily than ethyl cyclopentane.

239T18

KHROMOV, S.I.; NOVIKOV, S.S.; RASULOVA, I.L.; ZELINSKIY, N.D.

Catalytic reactions of butyl-substituted benzene and cyclohexane. Doklady Akad. Nauk S.S.S.R. 87, 613-16 '52. (MLRA 5:11)
(CA 47 no.20:10489 '53)

1. M.V. Lomonosov State Univ., Moscow.

[redacted]

Novikov, S.S.

The depolymerization of dicyclopentadiene by a continuous method. N. F. Kopeney, Z. Ya. Lapshina, and S. S. Novikov. *Bull. Acad. Sci. U.S.S.R., Div. Chem. Sci.* 1953, 101–2 (Engl. translation).—See *C.A.* 48, 10377e.

H. L. H.

NOVIKOV, S. S.

(3)

The depolymerization of dicyclopentadiene by a continuous method. N. F. Kuranov, Z. Ya. Lanshina, and S. S. Novikov. *Izvest. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk* 1953, 112-13.—The continuous depolymerization of dicyclopentadiene to pure monomer was effected by feeding the dimer from a dropping funnel into a heated column packed with pieces of glass tubing 5 mm. in diam. and 5 mm. long. The column consisted of a 700 mm. length of 30 mm. tubing. The lower 500 mm. was electrically heated and the dimer was fed in at the top of this portion. The upper portion acted as a fractionating column to return any dimer entrained in the monomer vapor. The exit at the upper end of the column led to a water-cooled condenser and thence to an ice-cooled receiver. The lower end of the column led to a flask heated to decomp. any dimer getting by the column. The capacity of the app. was 150 g./l. of reaction vol. After about 100–150 hrs. of continuous operation it was necessary to stop and clean out the high polymer tars that had collected. A sample run with the column at 195–200° lasting 12 hrs. converted 582.6 g. of dimer to 575.6 g. of monomer. The dimer had the following characteristics: b.p. 58–60° at 14 mm.; n_D^{15} = 1.5125; d_4^{15} = 0.9772. The monomer characteristics were: b.p. 40–42°; n_D^{15} = 1.4446; d_4^{15} = 0.8010.

Joseph B. Levy

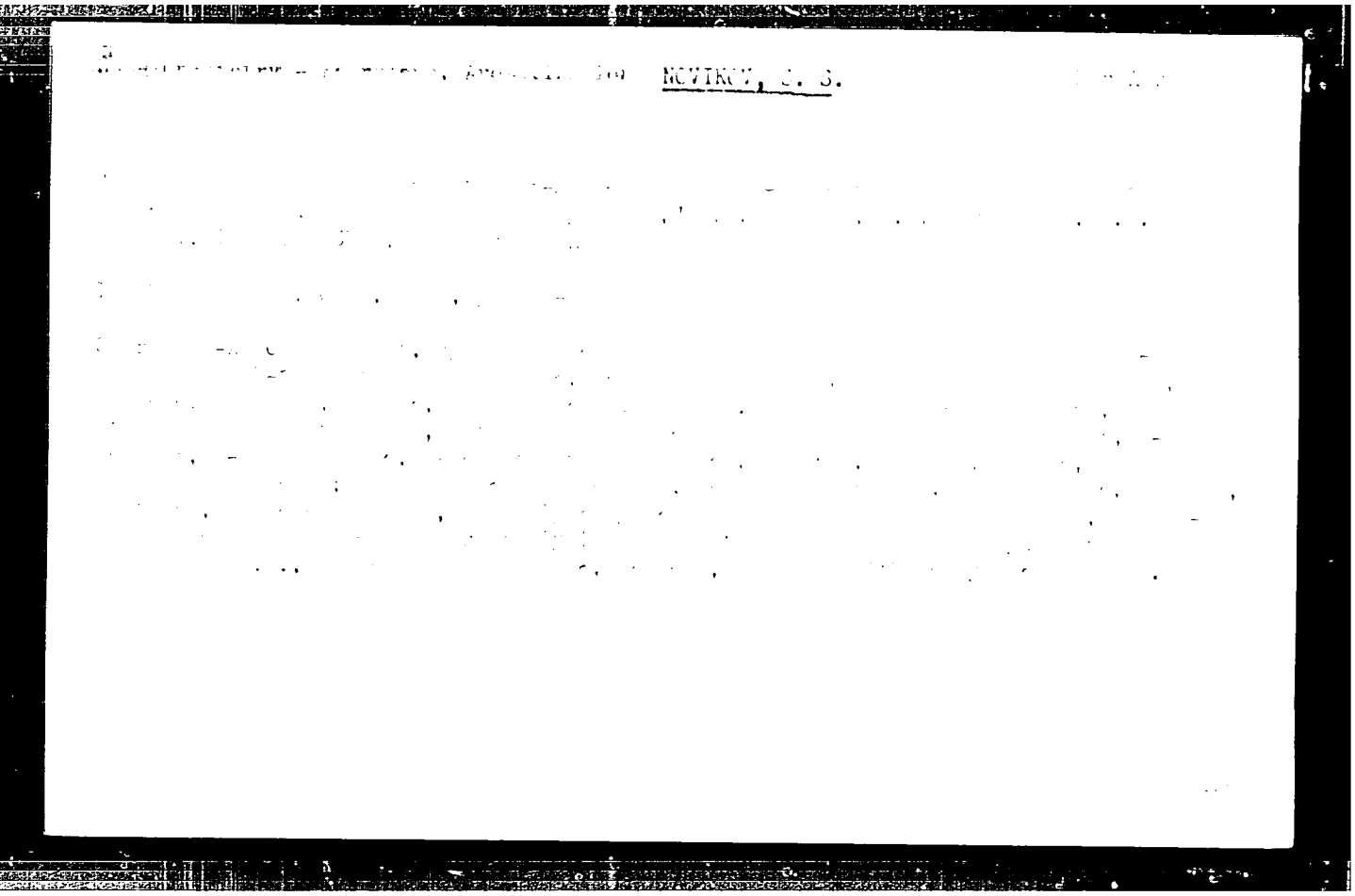
Novikov, S.S.

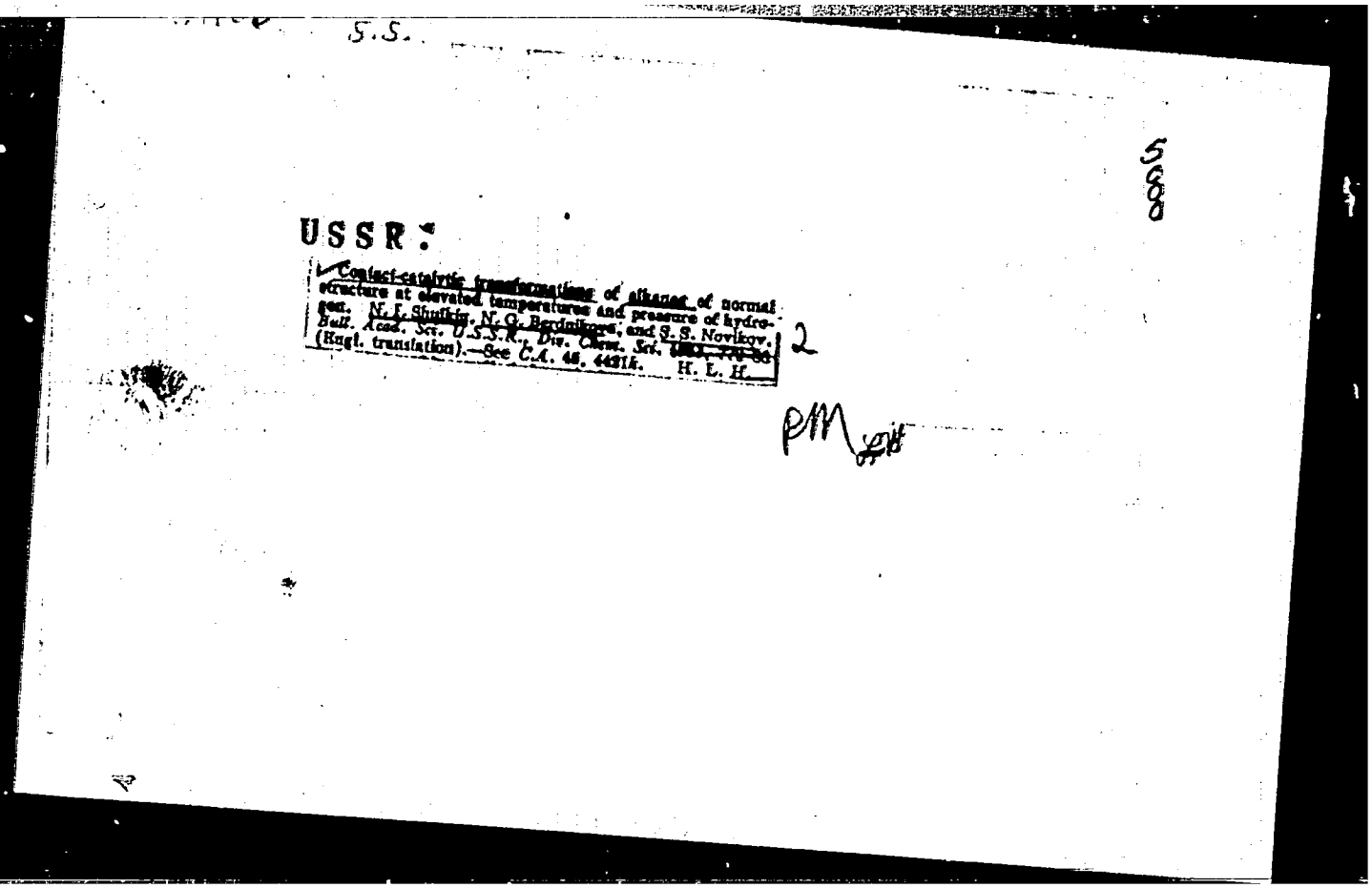
Contact-catalytic transformations of five- and six-membered cyclanes under conditions of elevated temperature and pressure of hydrogen. N. I. Shuikin, N. G. Berdnikova, and S. S. Novikov. *Bull. Acad. Sci. U.S.S.R., Div. Chem. Sci.* [illegible] (Engl. translation).—See *C.A.* 48, 5810*f*. H. L. H.

NAVIKOV, S. S.

Contact isomerization of ethylcyclopentane in vapor phase. N. I. Shuikin and S. S. Novikov. *Bull. Acad. Sci. U.S.S.R., Div. Chem. Sci.* 1953, 201-3 (Engl. translation).—See *C.A.* 48, 5810h.

H. L. H.





5.5.

568

USSR

Contact-catalytic transformations of alkanes of normal structure at elevated temperatures and pressure of hydrogen. N. I. Shuikin, N. G. Bardaliozov, and S. S. Novikov. Bull. Acad. Sci. U.S.S.R., Div. Chem. Sci. [illegible]. (Engl. translation).—See C.A. 48, 4431k. H. L. H.

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[illegible]IKOV, S. S.

12

Chemical Abst.
Vol. 48 No. 8
Apr. 25, 1954
Organic Chemistry

Contact-catalytic transformations of alkanes of normal structure at elevated temperatures and pressure of hydrogen. N. I. Shuikin, N. G. Berdnikova, and S. S. Novikov. (Inst. Org. Chem., Acad. Sci. U.S.S.R., Moscow). *Izvest. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk* 1953, 879-88; cf. *ibid.* 1953, 271. Catalytic transformations of *n*-hexane, *n*-heptane, and *n*-octane were studied over Pt-clay at 460° under 15-20 atm. H. In all cases the reaction of hydrocyclization was observed along with isomerization of the alkanes and methylation and hydrogenolysis of the alkanes as well as of the homologs of C_6H_6 which form as a result of dehydrocyclizations. Thus *n*-hexane yields 10% C_6H_6, but is mainly isomerized into 2- and 3-methylpentanes, 2,3-dimethylbutane, and 2,2-dimethylbutane along with minor amts. of *n*-pentane and 2-methylbutane arising through hydrogenolysis. Some 30% suffers cracking and small amts. of MePh and xylenes are formed. *n*-Heptane gave some MePh, xylenes, and higher homologs, along with formation of C_6H_6, and much 2- and 3-methylhexanes, 2,3- and 2,4-dimethylpentanes, and 2,2- and 2,3-dimethylpentanes. *n*-Octane gave mixed aromatic hydrocarbons as above, along with 2-methylpentane, *n*-hexane, 2,2-dimethylpentane, *n*-heptane, and 2,3- and 2,4-dimethylhexane, as well as 2-methylheptane and 4-methylheptane. It is suggested that the reaction of the alkanes proceeds via the attack of CH_3 radicals at the 2nd C atom of the [illegible] chain, yielding a 2-Me deriv., which under attack of H yields CH_4 and a shorter 2-methylalkane. The latter is attacked by a CH_3 radical and the cycle is repeated.
G. M. Kosolapoff

10-5-54
[illegible]

USSR/Chemistry - Petroleum, Mar/Apr 53
Aromatization

"Catalytic Isomerization of Ethylcyclopentane in the Vapor Phase," N.I. Shuykin, S.S. Novikov, Inst Org Chem, Acad Sci USSR

Iz Ak Nauk SSSR, OKhN, No 2, pp 278-281

The possibility of isomerizing ethylcyclopentane with a yield of 92% into methylcyclohexane over $AlCl_3$ - C was shown. At a volume velocity of 0.3, the optimal temp for this reaction is 120-125°. The nature of the other ingredients

256T27

of the gasoline fraction contg ethylcyclopentane does not make any difference. Dry HCl enhances the isomerizing effect of $AlCl_3$ deposited on activated carbon.

NOVIKOV, S.S.

USSR.

Conversion of the derivatives of cyclopentane on aluminosilica catalyst. K. V. Topchieva, E. N. Rosolovskaya, E. O. Trushchova, S. S. Novikov, and S. I. Khromov. *Vestnik Moskov. Univ.* 8, No. 12, *Fiz.-Mat. i Estestven. Nauk* No. 6, 97-100(1953).—Cyclopentane (I), methylcyclopentane (II), ethylcyclopentane (III), isopropylcyclopentane (IV), and butylcyclopentane (V) undergo thermal decompn. on tech. Al-silica catalyst (VI) at 500 ± 1°. I and II undergo negligible changes. III yields II, toluene, isopentane, and some unknown hydrocarbons. IV gave derivs. of cyclohexane (66%). V gave a mixt. of mono- and trisubstituted derivs. of C_6H_6 (60%), and also derivs. of cyclopentane. For each expt. 94 ml. of VI was used, and the hydrocarbons were introduced into the quartz tube at a vol. velocity of 0.5. VI is regenerated in air at 500°, and its activity standardized (cf. *Vestnik Moskov. Univ.* 3, No. 11, 133(1948)). M. D.

NOVIKOV, S.S.

Chemical Abstracts
May 25, 1954
Organic Chemistry

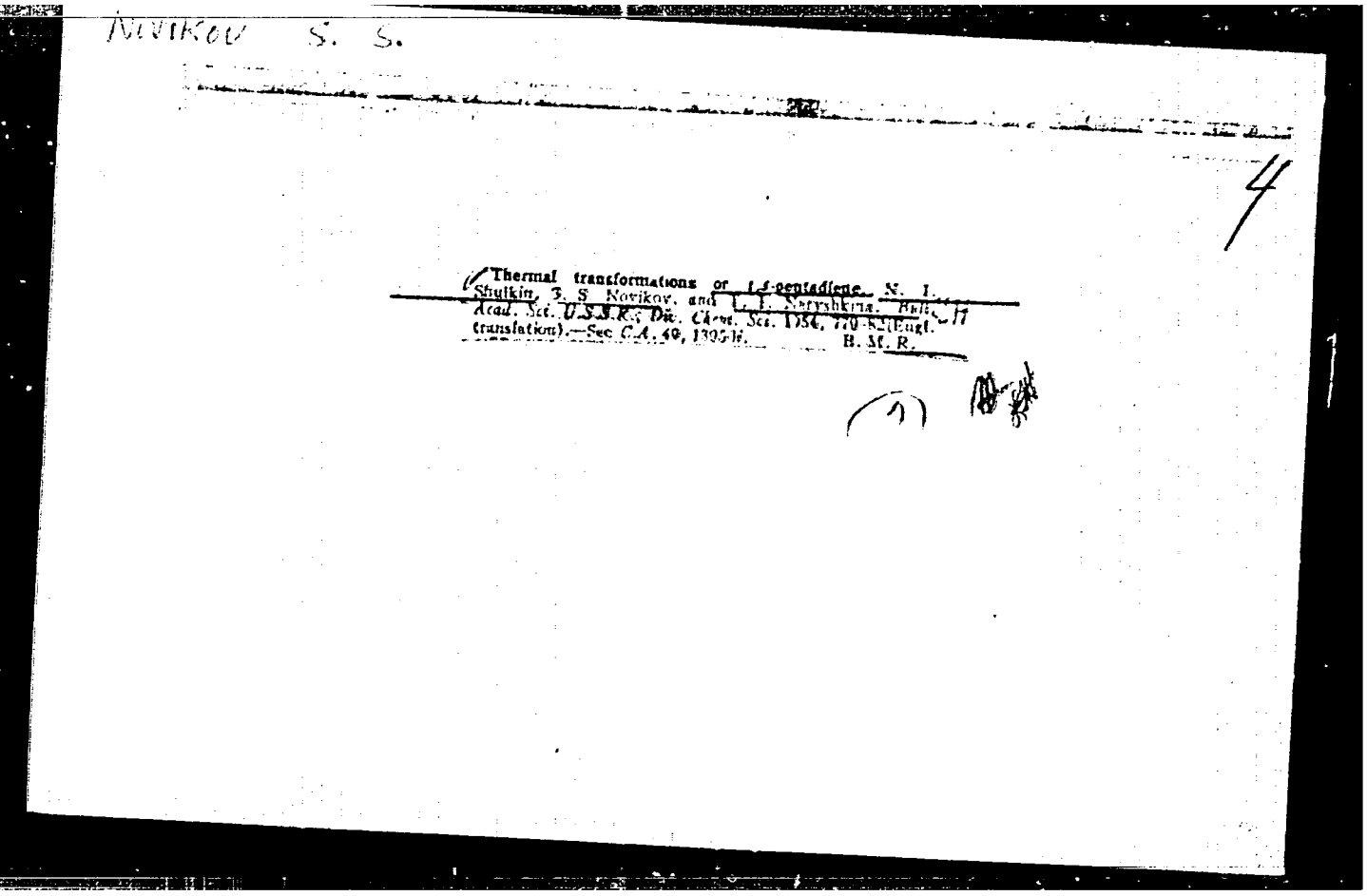
Contact catalytic transformations of olefines and cyclanes at elevated temperature and pressure of hydrogen. Shulkin, S. S.; Novikov, and N. G. Herdinskaya. *Izvest. Akad. Nauk S.S.S.R.* 82, [illegible] abstr.—Yields, n²⁰D, d₄, and composition of the catalysates obtained from cyclopentane, methylcyclopentane, cyclohexane, hexane, pentane, and octane are tabulated. The reaction schemes are presented for the production of aromatic and branched-chain aliphatic hydrocarbons from the olefines by hydrogenolysis.

Evaluation B-85325, 14 Jun 55

TIMOFEYEVA, Ye.A.; NOVIKOV, S.S.; SHUYKIN, N.I.; KAZANSKIY, B.A., akademik.

Dehydrogenation of n-pentane. Dokl.AN SSSR 92 no.2:345-348 S '53.
(MLRA 6:9)

1. Akademiya nauk SSSR (for Kazanskiy). (Dehydrogenation) (Pentane)



NOVIKOV S. S.

4

Thermal transformations of 1,4-pentadiene. N. I. Shulkin, S. S. Novikov, and L. I. Khmelnitskii. Bull. Acad. Sci. U.S.S.R., Div. Chem. Sci. 1956, 710-5 (Engl. translation).—See C.A. 50, 13955i.

B. St. R.

(1)

SHUYKIN, N.I.; NOVIKOV, S.S.; MARYSHKINA, T.I.

Thermal conversions of 1,3-pentadiene. Izv. AN SSSR Otd.khim. nauk no.5:898-903 S-O '54. (MLRA 8:3)

1. Institut organicheskoy khimii im.N.D.Zelinskogo Akademii nauk SSSR.
(Piperylene)

NOVIKOV, S. S.

USSR/ Chemistry

Card : 1/1

Authors : Khromov, S. I., Novikov, S. S., Petrova, G. B. and Zelinskiy, N. D. Acad.

Title : Contact conversions of propyl substitutes of benzene and cyclohexane

Periodical : Dokl. AN SSSR, 96, Ed. 6, 1175 - 1178, June 1954

Abstract : Contact conversion of propyl substitutes of benzene and cyclohexane was investigated. A study of the catalysate showed that complete or partial cleavage of the side chain carbon atoms takes place in the investigated hydrocarbons. This process is much smoother for proylcyclohexanes than in propyl benzenes whereas isopropylbenzene is more stable against contact conversions than n-propylbenzene which corresponds with the facts observed during catalytic conversions of ethyl- and butyl benzenes and ethyl- and butylcyclohexanes. Five references. Table, graph.

Institution : The M. V. Lomonosov State University, The N. D. Zelinskiy Lab. of Org. Chem., Moscow.

Submitted : April 5, 1954

NOVIKOV, S. S.

USSR/ Chemistry - Catalysts

Card : 1/1

Authors : Novikov, S. S., Khromov, S. I. and Sevostyanova, V. V.

Title : Contact conversions of ethyl- and butylcyclopentane in conditions of increased temperature and hydrogen pressure

Periodical : Dokl. AN SSSR, 97, Ed. 3, 463 - 466, July 21, 1954

Abstract The effect of oxide-metallic catalysts, increased temperatures and hydrogen pressure on the contact conversions of ethyl- and butylcyclopentanes, was investigated. The effect of catalyst composition and magnitude of the hydrocarbon side-chain on the contact conversion, is explained. The hydro- and dehydrogenation activity of the Pt and Ni catalysts was determined by the hydrogenation reaction of benzene and the dehydrogenation reaction of cyclohexane. The results obtained are shown in tables. Five references: 4-USSR and 1-German.

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

Presented by : Academician, B. A. Kazanskiy, March 24, 1954

AID P - 2809

Subject : USSR/Chemistry

Card 1/1 Pub. 119 - 5/7

Authors : Novikov, S. S. and Ye. A. Timofeyeva (Moscow)

Title : Isomerization of alkanes and cyclanes

Periodical : Usp. khim. 24, 4, 471-507, 1955

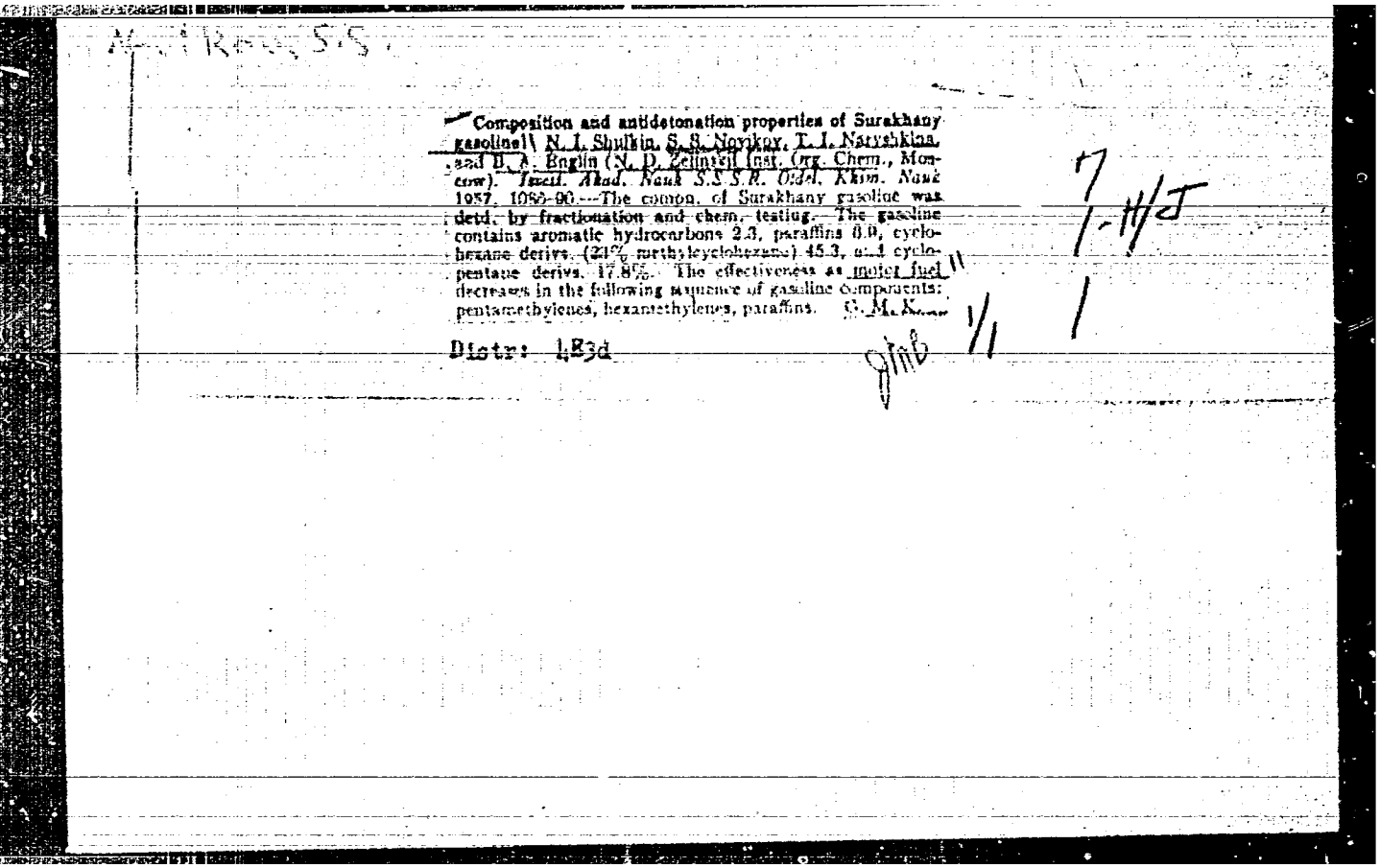
Abstract : A review is given of the literature on the isomerization of normal alkanes and of cyclanes in the presence of various catalysts. The effect of hydrogen and organic additives on the suppression of secondary reactions is discussed. Four diagrams, 16 tables, 186 references, 81 Russian: (1897-1954).

Institution : None

Submitted : No date

Novikov, S.S.

*Synthesis and catalytic transformations of [illegible] tuted cyclanes. 73. S. Novikov, S. I. Khromov, and [illegible] Nazarova (N. D. Zelinskii Inst. Org. Chem., Moscow). Izvest. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk 1957, 604-10.—MeMgI and cyclopentanone gave 1-methylcyclopentanol, converted to the chloride which with Et_2Zn gave 1-methyl-1-ethylcyclopentane (I), b. 121.2°, n_D^{20} 1.4272, d_{20} 0.7804. $CH_2:CHCH_2Cl$ with 1-methylcyclopentyl magnesium chloride gave 1-methyl-1-allylcyclopentane, [illegible] 53°, 1.4445, 0.8073, hydrogenated over Pt to 1-methyl-1-propylcyclopentane (II), b_{760} 143.9°, [illegible]. Friedel-Crafts condensation of C_6H_6 with 1-methylcyclohexanol gave (1-methylcyclohexyl)benzene, hydrogenated over Pt-C to (1-methylcyclohexyl)cyclohexane (III), b. 104.5-6°, 1.4521, [illegible]. I passed over [illegible] Pt-C at 320° in an H atm. gave $PrCMe_2Et$, [illegible], [illegible] xylenes, Et_2CMe, and [illegible]. II similarly gave PrPh, disubstituted benzenes (o-, m-, p-isomers), [illegible] Et, nonane isomers, and 1,1,3-trimethylcyclohexane. III gave fluorene, 1-methyl-1-phenylcyclohexane, [illegible] Me C_6H_4Ph isomers, and [illegible] Ph.
G. M. K[illegible]



Composition and antidetonation properties of Surakhany gasoline\ N. I. Shulkin, S. S. Novikov, T. I. Nazyrkina, and B. A. Englin (N. D. Zelinskii Inst. Org. Chem., Moscow). *Izvest. Akad. Nauk S.S.S.R. Otdel. Khim. Nauk* 1957, 1088–90.—The compn. of Surakhany gasoline was detd. by fractionation and chem. testing. The gasoline contains aromatic hydrocarbons 2.3, paraffins 0.0, cyclohexane derivs. (21% methylcyclohexane) 45.3, and cyclopentane derivs. 17.8%. The effectiveness as motor fuel decreases in the following sequence of gasoline components: pentamethylenes, hexamethylenes, paraffins. G. M. Kosolapoff

Distr: 4E3d

NOVIKOV, S. S.

Distr: 4E3d/4P4j/4E2c(j)

9
2 May
3

/Investigation of the antiknock properties of individual petroleum hydrocarbons. S. S. Novikov, B. A. Englin, T. I. Naryshkina, A. P. Smirnova, E. Ya. Lapshina, [illegible] Dobrynina, and I. D. Inozemtsev. *Khim. i Tekhnol. Topliv i Masel* 1957, No. 9, 7-11.—The following octane nos. were found for the synthetic hydrocarbons listed after addn. of 4.2 cc. of "R-9"/kg. before and after addn. of 20% naphthenes: cyclopentane 104.8 and 104.9; ethylcyclopentane 104.8 and—; isopropylcyclopentane 104.8 and 102.0; 1,1,3-trimethylcyclopentane 104.8 and 104.1. Octane ratings of the following nonsynthetics are given as: cyclohexane 93; methylcyclohexane 89; ethylcyclohexane 73; isopropylcyclohexane 82. H. L. Gilg.

NOVIKOV, S.S. (Moskva); KHMEL'NITSKIY, L.I. (Moskva)

Synthesis and properties of arylnitromethanes. Usp.khim. 26 no.4: 459-493 Ap '57. (MLRA 10:5)

(Methane) (Paraffins)

NOVIKOV, S.S.; KORSAKOVA, I.S.; BABIYEVSKIY, K.K. (Moskva).

Addition reaction of nitroalkanes with compounds having activated double bonds. Usp.khim. 26 no.10:1109-1124 O '57. (MIRA 10:10)
(Nitro compounds) (Paraffins)

AUTHORS: [illegible], V. M., Master [illegible], P. V., Zaytsev, S. M., Novikov, S. S.

TITLE: [illegible]

PERIODICAL: [illegible]

ABSTRACT: [illegible]

Heat of Hydrat[illegible]-Pyrr le

ASSOCIATION: [illegible] Akademii Nauk SSSR (Institute of Organic Chemistry imeni N. D. Zelinskogo Academy of Sciences, USSR)

SUBMITTED: [illegible]

Card 1/[illegible]

AUTHORS: Nekrasova, V. A., Shaykin, [illegible]

TITLE: The Chlorination of Five- and Six-Membered [illegible]
(Khlorirovaniye pyati- i shestichlenov[illegible]

PERIODICAL: Zhurnal [illegible]ey Khimii [illegible]

ABSTRACT: The chlorination processes [illegible]
been the subject of investigation [illegible]
tried to find a way of converting pro[illegible]
cycloparaffins to their [illegible]
rination reactions of cyclo[illegible]
respects similar but also [illegible]
other. Accurate results for the [illegible]
for example on the cyclo[illegible]
hitherto absent in [illegible]
the chlorination conversions of [illegible]
and cyclohexanes [illegible]
[illegible]
of cyclic secondary [illegible]

Card 1/2 for the utilization [illegible]

The Chlorination of Five- and Six-Membered [illegible]

nology. The halide derivatives [illegible] wide distribution as [illegible] and photochemical chlorination [illegible] humid chlorine in the [illegible] ated. Conditions were found [illegible] mono- or poly-chlorinated [illegible] tion performed in the liquid [illegible] other chlorinations of five [illegible] are 5 tables, and 5 refer[illegible]

ASSOCIATION: Crimean Agricultural Institute [illegible] Chemistry AN USSR (Krymskiy sel'skokhozyaystvennyy [illegible] Akademii nauk SSSR

SUBMITTED: January 7, 1957

AVAILABLE: Library of Congress

Card 2/2 1. Cyclic compounds 2. Cycloparaffins 3. Chlorination Reaction 3. Chemistry

AUTHORS: Novikov, S. S., Khmel'nitskiy, L. I., Lebedev, O. V. SOV 79-28-8-64/66

TITLE: Decomposition Reactions of N_2O_4 With Organic Compounds (Vzaimodeystviye N_2O_4 s organicheskimi soyedineniyami) I. Investigation of the Conditions for the Reaction of N_2O_4 With Benzaldoxime; Combination of the Products and the Reaction Equation (I. Izucheniye usloviy reaktsii N_2O_4 s benzal'doksimom, sostav produktov i uravneniye reaktsii)

PERIODICAL: Zhurnal obshchey khimii, 1958, Vol.28, Nr 8, pp. 2296 - 2302 (USSR)

ABSTRACT: Investigated were the influence of the molar ratio, the concentration, the method of mixing the reagents, and the nature of the solvent upon the course of the reaction between N_2O_4 and benzaldoxime under cooling with ice. In considering all these factors the highest phenyldinitromethane yield obtained was 43% of the theoretical yield. All the combinations of the products of the reaction between N_2O_4 and benzaldoxime which form under various conditions were determined qualitatively and quantitatively. It was

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Decomposition Reactions of N_2O_4 With Organic Compounds. SOV/79-28-8-64/66
I. Investigation of the Conditions for the Reaction of N_2O_4 With Benzaldoxime; Combination of the Products and the Reaction Equation

found that nitrogen is produced in this reaction. Equations were proposed which indicate the formation of phenyldinitromethane and benzaldehyde by the reaction of N_2O_4 with the sodium salt of benzaldoxime. The experimental results are given in table 1, and the following conclusions can be drawn from them: with about a [illegible] ratio of N_2O_4 to benzaldehyde in the solvent only phenyldinitromethane and benzaldehyde are formed; with a 0,5:1 ratio of these reagents in the solvent the main product is 3,4-diphenyl furoxan (46%), while lesser amounts of phenyldinitromethane (4%) and benzaldehyde (9%) also form. By carrying out the reaction without solvent the aldehyde is formed almost quantitatively (92%). Figures 1 and 2 indicate the dependence of the yield of phenyldinitromethane upon the factors indicated here. There are 2 figures, 2 tables, and [illegible] references, 3 of which are Soviet.

Card 2/3

Decomposition Reactions of N_2O_4 With Organic Compounds. SOV/79-28-8-64/66
I. Investigation of the Conditions for the Reaction of N_2O_4 With Benzaldoxime; Combination of the Products and the Reaction Equation

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

SUBMITTED: December 31, 1957

Card 3/3

AUTHORS: Khmel'nitskiy, L. I., Novikov, S. S., Lebedev, O. V.

TITLE: The Decomposition Reactions of Nitrogen Dioxide With Organic Compounds (Vzaimodeystviye N_2O_4 s organicheskimi soyedineniyami) II. The Reaction of N_2O_4 With Aci-Phenylnitromethane and Its Salts (II. Reaktsiya N_2O_4 s atsi-fenilnitrometanom i yego sol'yu)

PERIODICAL: Zhurnal obshchey khimii, 1958, Vol. 28, Nr 8, pp. 2303 - 2304 (USSR)

ABSTRACT: In the course of investigations on the decomposition reaction between nitrogen dioxide and benzaldoxime and its salts, which leads to the formation of phenyldinitromethane, the authors found it necessary to study more closely the reaction between N_2O_4 and aci-phenylnitromethane and its salts. In the literature the statement is made without further data that "the aci form of phenylnitromethane enters into reaction especially easily with nitrogen dioxide" (Ref 1). The experiments of the authors showed that, analogous to other aliphatic-aromatic compounds (Ref 1), the reaction of N_2O_4

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The Decomposition Reactions of Nitrogen Dioxide With Organic Compounds. II. The Reaction of N_2O_4 With Aci-Phenylnitromethane and Its Salts

SOV/79-28-8-65/66

with aci-phenylnitromethane and its salt produces the expected phenyldinitromethane:

$$C_6H_5CH = NOONa \xrightarrow{N_2O_4} C_6H_5CH(NO_2)_2 \xleftarrow{N_2O_4} C_6H_5CH = NOOH$$

The maximum yield of phenyldinitromethane was 44,5% based on the aci-phenylnitromethane, and 28% based on the salt. The reaction went in solution, and although it resembled externally the reaction between nitrogen dioxide and benzaldoxime and its salts, it required much less heating than this reaction. The results and the conditions of the experiment with aci-phenylnitromethane are indicated in table 1, while those for the sodium salt of phenylnitromethane are given in table 2. There are 2 tables and 2 references, which are Soviet.

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

Card 2/3

The Decomposition Reactions of Nitrogen Dioxide With Organic Compounds. II. The Reaction of N_2O_4 With Aci-Phenylnitromethane and Its Salts SOV/79-28-8-65/66

SUBMITTED: December 31, 1957

Card 3/3

NOVIKOV, S.S.; LEBEDEV, O.V.; KHMEL'NITSKIY, L.I.; YEGOROV, Yu.P.

Interactions of N_2O_4 with organic compounds. Part 3: Interaction of N_2O_2 with salts of aliphatic nitro compounds. Zhur. ob.khim. 28 no. 8:2305-2307 Ag '58. (MIRA 11:10)

1. Institut organicheskoy khimii AN SSSR.
(Nitro compounds)
(Nitrogen oxides)

SHUYKIN, N.I.; MINACHEV, Kh.M.; NOVIKOV, S.S.; KONONOV, N.F.; GARANIN, I.L.

Reforming straight-run gasolines by low-temperature dehydrogenation on platinized charcoal. Zhur.prikl.khim. 31 no.11:1732-1738 N '58. (MIRA 12:2)

(Gasoline)

SHUYKIN, N.I.; MINACHEV, Kh.M.; GARANIN, I.L.; NOVIKOV, S.S.; KONONOV, N.F.

Production of toluene concentrates from petroleum fractions by low-temperature dehydrogenation on platinated charcoal. Zhur.prikl.khim. 31 no.11:1765-1767 N '58. (MIRA 12:2)

(Toluene) (Petroleum products)
(Dehydrogenation)

AUTHORS: Novikov, S. S., Korsakova, I. S., Yatskovskaya, M. A.

20-118-5-29/59

TITLE: On the Reaction of the Addition of Nitroalkanes to Benzalacetone (O reaktsii prisoyedineniya nitroalkanov k benzal'atsetonu)

PERIODICAL: Doklady Akademii Nauk SSSR, 1958, Vol. 118, Nr 5, pp. 954-956 (USSR)

ABSTRACT: The authors give a bibliography going back to 1916 and state that nitroalkanes are added to α, β-unsaturated ketones in presence of basic catalysts and natriumethylate (references 1-3). Yet this reaction was not investigated in dependence on the number and on the position of the nitro groups in the nitroalkanes, which is done in the present paper. By interaction of nitroethane and benzalacetone (catalyst: alcoholic solution of ethoxy trimethylphenyl-ammonium) a small yield of 2-nitro-3-phenylpentanone-5 was obtained. 1,1-dinitroethane reacts much more easily and shows better yields of 2,2-dinitro-3-phenylhexanone-5. A much more acid nitroalkane-trinitromethane adds still more actively to

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benzalacetone and forms without catalysts 1,1,1-trinitro-2--phenylpentanone-4 with a good yield (80%). Dinitromethane is easily added to benzalacetone in presence of catalysts and forms 1,1-dinitro-2-phenylpentanone-4 without yielding an addition product of dinitromethane to 2 molecules of benzalacetone, as is the case as a consequence of several other reactions of dinitromethane (reference 4). This is followed by an experimetnal part with the usual data. There are 7 references, 2 of which are Soviet.

PRESENTED: October 26, 1957, by B. A. Kazanskiy, Member of the Academy

SUBMITTED: October 11, 1957

5(3)

AUTHORS: Bel'chev, F. V., Shuykin, N. I., Novikov, S. S. SOV/62-59-4-[illegible]-12

TITLE: Catalytic Synthesis of Aliphatic Amines Over Mixed Oxidizing Catalysts Under Increased Pressure (Kataliticheskiy sintez alifaticheskikh aminov na smeshannykh okisnykh katalizatorakh pri povyshennom davlenii)

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1959, Nr 4, pp 710-714 (USSR)

ABSTRACT: The experimental results found in the present work show that a considerable yield of amines can be obtained by a scientifically founded selection of catalysts and conditions of aminating alcohols. The relative activity of the following catalysts was investigated: pure aluminum oxide (85 %) + ferrous oxide (15 %), aluminum oxide (95 %) + titanium oxide (5 %), aluminum oxide (90 %) + magnesium oxide (10 %) and industrially produced aluminum silicate. The alcohols were twice distilled before the investigation was carried out. Their properties were in good agreement with those described in technical publications (Refs 4-6). The experiments were carried out in a continuous flow apparatus (Fig). The experimental results

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are shown in tables 1, 2, and 3. The optimum conditions for the catalytic amination of n-butanol were determined on an aluminum-titanium catalyst which showed the highest activity ammonia pressure 8.5 atmospheres, reaction rate 0.37 h^{-1} and 370°. A further pressure increase reduces the amine yield, probably because of the condensation of ammonia under the conditions assumed. With catalytic amination of alcohols less gas formation is observed, probably because of the slower process of alcohol decomposition. If the temperature exceeds the optimum value the gas formation is increased and amine yield reduced. It was observed that amination stops upon deviation from the optimum passage rate of the alcohol and ammonia vapors over the catalyst. As compared to pure aluminum oxide, almost all mixed catalysts developed a strong activity (Tables 2 and 3). Under the conditions assumed small quantities of unsaturated hydrocarbons, hydrogen, paraffin hydrocarbons, aldehydes, and nitriles were formed, in addition to the amines, on all catalysts investigated. The properties of the amines separated out of the catalysates are shown in

Catalytic Synthesis of Aliphatic Amines Over Mixed Oxidizing Catalysts Under Increased Pressure SOV/[illegible]-59-[illegible]-23/42

table 4. There are 1 figure, [illegible] tables, and 2[illegible] references, [illegible] of which are Soviet.

ASSOCIATION: Belorusskaya sel'skokhozyaystvennaya akademiya (Belorussian Agricultural Academy). Institut organicheskoy khimii im. N. D. Zelinskogo Akademii nauk SSSR (Institute of Organic Chemistry imeni N. D. Zelinskiy of the Academy of Sciences USSR)

SUBMITTED: July 12, 1957

Card 3/3

SOV/62-59-5-35/40

AUTHORS: Yershova, L. V., Gogitidze, V. N., Belikov, V. M., Novikov, S. S.

TITLE: Preparation of Gem-dinitroparaffins (O poluchenii gem-dinitroparaffinov)

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1959, Nr 5, pp 943-945 (USSR)

ABSTRACT: For the investigation of the influence exercised by the carbon chain in the gem-dinitro-compounds upon their physical properties the homologous series of gem-dinitro-compounds was synthetized. For this purpose the alkyl acetoacetic esters were nitrated. This method was applied for the first time by G. Chancel (Ref 1). It renders it possible to extend the carbon chain in stages, i.e. the initial product is extended each time by one carbon atom. In the course of the present investigation, a series of gem-dinitroparaffins from 1,1-dinitropropane to 1,1-dinitrodecane was in this way obtained. Of the synthetized compounds, the molar refraction of the dinitromethyl group was determined (Table 1). Moreover, also the physical constants and boiling points were determined (Table 2). There are 2 tables and 6 references, [illegible] of which is Soviet.

Card [illegible]

Preparation of Gem-dinitroparaffins SOV/62-59-5-35/40

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)

SUBMITTED: November 11, 1958

Card 2/2

5 (3)

AUTHORS: Novikov, S. S., Belikov, V. M. SOV/62-59-6-23/39

TITLE: Investigation in the Field of Nitropyrroles (Issledovaniye v oblasti nitropirrolov). Communication 1. New Synthesis Methods of the Pyrrole Ring (Soobshcheniye 1. Novyy metod sinteza pirrol'nogo tsikla)

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1959, Nr 6, pp 1098 - 1101 (USSR)

ABSTRACT: In continuation of a previous paper (Ref 1) in which the condensation of nitroacetic acid ester with aldehydes was investigated, this paper deals with the reaction of α,β,β-trinitropropione aldehyde with formalin and methylamine. Together with Mannich's base a compound with the melting point of 170° was found, to which according to its ultimate analysis and other chemical properties the chemical structure of 1-methyl-3,4-dinitropyrrole was ascribed. The reaction scheme is given. For the purpose of proving it, the splitting-off of the methylamino group in the cyclization was investigated in order to observe which hydrogen atom remains in the ring. With the diamines there is in this case a competition between the two amin-

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Investigation in the Field of Nitropyrroles. Communication 1. New Synthesis Methods of the Pyrrole Ring

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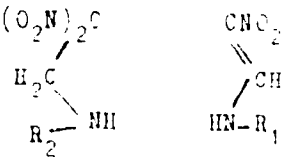
groups: $(O_2N)_2C$ CNO_2 $(R_1=CH_3)$



It was observed that, independently of the amin groups chosen, methyldinitropyrrole was always obtained. In general it could be determined that it is always the more basic methylamine that remains in the ring. The methylamino group may also compete with the methylamine. The reaction of methylimide with ethylamine and CH_2O yielded comparative quantities of methyl- and ethyldinitropyrrole. In the course of further reactions it was possible to synthetize dinitropyrrole immediately from dialkali salts of the trinitropropione aldehyle, by passing over the methylimide stage. By means of this new method of synthetizing dinitropyrroles also the previously unknown 3,4-dinitropyrrole could be produced. In the experimental part the production of

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Investigation in the Field of Nitropyrroles. Communication 1. New Synthesis Methods of the Pyrrole Ring

SOV/[illegible]

the different substances is described in detail. There are 7 references, 1 of which is 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)

SUBMITTED: September 30, 1957

Card 3/3

5(3)

AUTHORS: Safonova, E. N., Belikov, V. M., Novikov, S. S. SOV/62-59-6-30/36

TITLE: Some Reactions of the Nitropyrroles Associated With the Mobility of the N-H Bond (Nekotoryye reaktsii nitropirrolov, svyazannyye s podvizhnost'yu svyazi N-H)

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1959, Nr 6, pp 1130 - 1132 (USSR)

ABSTRACT: In a previous paper by the authors (Ref 1) it was found that the nitropyrroles, which do not have a substituent on the hydrogen, are acids, and that their acidity depends on the nitro groups bound to the pyrrole ring. (2-nitropyrrole weakly acid, 2,4-nitropyrrole stronger acid, and 2,3-nitropyrrole-acid). If, as is assumed, the chemical activity of the nitropyrroles is connected with the mobility of the hydrogen atoms in this compound, the change in chemical activity must depend on the dissociation constants of the nitropyrroles. In order to prove this, the formation of salts, the cyano-ethylation, and the methylation of the pyrroles mentioned was investigated. It was shown that all three nitropyrroles form stable sodium salts, while the ammonium salts are unstable. The hydracine salt of 2-nitropyrrole could not be produced, the other two pyrroles formed normal hydrazine salts. When put into diluted

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sulphuric acid all salts were again decomposed into the initial products. With the cyanoethylation it showed that the more acid the nitropyrrole, the more acid a catalyst had to be used for the reaction. (Catalysts in the order of the nitropyrroles mentioned: CH_3CNa, CH_3COOK, CH_3COOH). Methylation of the 2,5-dinitropyrrole by dimethylsulphate occurred less readily than with the two other pyrroles. The N-H bond which, in dependence on its mobility, is able to react in the aforementioned manner, is also responsible for the motion of the hydrogen atoms of the methyl group, of the alcohols, or of the carboxylic acid. The character of the atom to which the hydrogen is bound is of minor importance. In the experimental part the syntheses of the different salts, and of the cyanoethylated and methylated compounds of the nitropyrroles mentioned are described in detail. For some of the compounds synthetized, the bacteric-static activity was determined in the VNIKhFI (Vsesoyuzuyy nauchno-issledovatel'skiy khimiko-farmatsevticheskiy institut imeni Ordzhonikidze (All-Union Chemicopharmaceutical Scientific Research Institute imeni Ordzhonikidze)) by Professor N. G. Pershin to whom the authors therefore express their gratitude.

Some Reactions of the Nitropyrroles Associated With the Mobility of the N-H Bond

SOV/62-59-6-30/36

There are 2 Soviet references.

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)

SUBMITTED: December 8, 1958

Card 3/3

5(3) SOV/62-59-7-22/38

AUTHORS: Safonova, L. N., Belikov, V. M., Novikov, S. S.

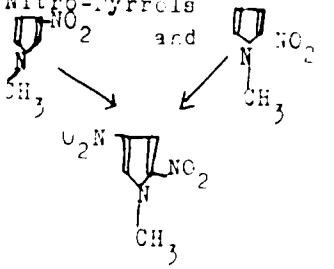
TITLE: An Investigation of Nitro-Pyrrols (Issledovaniye v oblasti nitropirrolov). Communication 2. Synthesis of Some Nitro-Pyrrols (Soobshcheniye 2. Sintez nekotorykh nitropirrolov)

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1959, Nr 7, pp 1307 - 1311 (USSR)

ABSTRACT: In a preceding paper a N-methyl-derivative of the configuration N-methyl-3,4-dinitro-pyrrol was obtained from the authors by a new method of synthesis. The anti-synthesis of this substance was not possible. Therefore, some other mono- and dinitro-pyrrols with or without N-substituents were synthesized and their chemical qualities and ultraviolet spectra were compared with those of the substances in the above named paper. In the table the data of all nitropyrrols are represented which are described in other publications (Refs 1-4). Some methods of the synthesis of nitro-pyrrols, which are described in publications are indicated (Refs 3,5,2). Like the scheme besides N-methyl-3,4-dinitropyrrol

Card 1/2

An Investigation of Nitro-Pyrroles. Co[illegible] Synthesis of Some Nitro-Pyrroles



2-nitro-pyrrol, 2,4- and 2,5-dinitro-pyrrol were [illegible] nitrification and methylation, which were not yet described in other [illegible]. The [illegible] method of nitrification by Kirpes, obtaining 2-nitro-pyrrol, was [illegible] and improved in [illegible]. In the experimental part the [illegible] described in detail. There [illegible] figures, 1 table, and [illegible] references, 1 of which is Soviet.

ASSOCIATION: Institut organicheskoy khimii im. N. D. [illegible] AN USSR (Institute of Organic Chemistry im. N. D. [illegible] of the Academy of Sciences, USSR)

SUBMITTED: September 30, 1957

Card 2/2

5(3), 5(4) SOV/62-59-8-16/42

AUTHORS: Novikov, S. S., Belikov, V. M., Yegorov, Yu. P., Safonova, E.N., Semenov, L. V.

TITLE: Investigations in the Field of Nitropyrroles. Communication 3. Ultra-violet Absorption Spectra and Tautomeric Transformations of Some Nitropyrroles

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1959, Nr 8, pp 1438-1444 (USSR)

ABSTRACT: In the present paper the ultra-violet spectra of 8 nitropyrroles are investigated. The bands of the various compounds are given in table 1 and shown in the figures. The spectra were interpreted as indicating that the position of the NO_2 group in the pyrrole nucleus can be determined by means of the ultra-violet spectrum. The already supposed structure of 1-methyl-3,4-dinitropyrrole (Ref 1) could be proved. The tautomeric phenomena were investigated in a series of derivatives not substituted at the nitrogen of nitropyrrole and it could be shown that the acidity of these compounds increases with the increasing number of nitro groups. The same effect could be observed by regrouping the nitro group from position β into α. This phenomenon was considered an inductive effect

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Investigations in the Field of Nitropyrroles. Communication 3. Ultra-violet Absorption Spectra and Tautomeric Transformations of Some Nitropyrroles

of the nitro group on the polarization of the N-H bond. There are 6 figures, 1 table, and 17 references, 6 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)

SUBMITTED: November 30, 1957

SOV/62-59-8-23/42

5(3)

AUTHORS: Novikov, S. S., Korsakova, I. S., Babiyevskiy, K. K.

TITLE: Addition of 1,1-Dinitroethane to 1-Nitroalkene-1

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikn nauk, 1959, Nr 8, pp 1480-1481 (USSR)

ABSTRACT: Here the addition of dinitroalkane with a mobile H-atom to nitroalkenes is investigated. An addition of similar kind has not yet been described. The initial materials were 1-nitropropene-1, -butene-1, and -pentene-1. The addition was carried out in methyl alcohol + 10% H_2O. The reaction took place quickly at 60° in the presence of small quantities of sodium acetate. The following mechanism is given:

$$R\text{-}CH{=}CHNO_2 + CH_3\text{-}CH(NO_2)_2 \longrightarrow CH_3\text{-}\overset{\displaystyle NO_2\ \ R}{\overset{\diagdown\ \ |}{C}}\text{-}CH\text{-}CH_2NO_2 \quad (NO_2 \text{ below } C)$$

R = H, CH_3, C_2H_5, n.-C_3H_7

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Addition of 1,1-Dinitroethane to 1-Nitroalkene-1 SOV/62-59-8-23/42

In the addition of 1,1-dinitroethane to nitroethylene ramifications may form which are caused by the polymers of the latter forming during the reaction. The addition reactions are described in detail in the experimental part. There are 7 references, 1 of which is Soviet.

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

SUBMITTED: July 29, 1958

Card 2/2

5(3)

AUTHORS: Shvekhgeymer, G. A., Pyatakov, N. F., Novikov, S. S. (Moscow) 307/74-28-4-6/6

TITLE: Synthesis and Reactions of Aliphatic Nitroalcohols (Sintez i reaktsii alifaticheskikh nitrospirtov)

PERIODICAL: Uspekhi khimii, 1959, Vol 28, Nr 4, pp 484-518 (USSR)

ABSTRACT: In this paper an attempt is made to summarize the data on the chemistry of nitroalcohols published in the technical literature. To begin with the author reports on the preparation methods of nitroalcohols. The method most thoroughly investigated and most frequently used is the condensation of carbonyl compounds with nitroparaffins (Refs 1 - 39, 41, 42, 50). Moreover, nitroalcohols can be obtained by the reaction of silver nitrite with halide hydrines (Refs 24, 43 - 45), by the effect of nitrogen oxides (Refs 46 - 60) and HNO_3 (Refs 43, 44) on olefins, and from α-oxides (Refs 61 - 65). Nitroalcohols could be obtained only in two cases in the nitration of alcohols (Refs 66, 67), otherwise, nitroalkanes are formed as main reaction products. A number of nitroalcohols were synthesized

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by the selective redution of the nitrocarbonyl compounds and the esters of nitric acids (Refs 68, 69). Halide--nitroalcohols containing the halide at the carbon atom connected with the nitro group can be reduced up to nitroalcohols in the presence of palladium and pyridine attached to barium sulphate (Refs 70, 71, 73). A great number of 2-nitropropanedioles-1,3 substituted by the p-nitrophenyl (Ref 73) or arylazo group (Ref 74) were synthesized in an acid medium by the decomposition of the dioxanes obtained from aldehydes or ketones and corresponding 2-nitropropanedioles-1.3. The effect of alkaline agents on trioles and dioles is also worth mentioning (Refs 70, 75). In the second part of this survey the author deals with the reactions of nitroalcohols. Numerous papers are devoted to the methods of esterification of nitroalcohols (Refs 39, 40, 68, 76 - 116). Moreover, the preparation of acetals and ketals (Refs 83, 117 - 121), the reaction with ammonia and amines (Refs 122 - 133), the reaction with amines and formaldehydes (Refs 134 - 136), the oxidation of the hydroxyl group into the carbonyl group (Refs 137 - 140), and the substitution of hydroxyl by a

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chlorine atom (Refs 18, 22 - 24, 102, 108, 141, 142) are described. Duden and Ponndorf discovered a spontaneous dehydration of nitroalcohols (Ref 37) which was later on confirmed and investigated by other authors (Refs 15, 138, 143 - 163). So far ether could not directly be obtained from nitroalcohols. But there are some indirect methods which were described in the papers 159 and 164 - 169. K- and Na-salts of nitroalcohols are formed already during the synthesis of nitroalcohols (Ref 41), moreover, with the decomposition of glucoles by the effect of alkali metal-alcoholates (Refs 70, 75, 130). Finally, they can be obtained by the effect of alcoholates of alkali metals or caustic lye on nitroalcohols (Refs 71, 172 - 175). There are no data in publications on the preparation of C-halogen derivatives of nitroalcohols by a direct substitution of the hydrogen atoms at the carbon atoms by halogen. In all cases the effect of the corresponding halogen on the sodium or potassium salt of nitroalcohol is used instead (Refs 70, 75, 139, 171, 173, 176, 177). Moreover, the reactions with aromatic aldehydes (Ref 178), the decomposition of 2-nitro-2-methylolpropanediol-1,3,

nitroglycols and nitroalcohols (Refs 37, 40, 70, 72, 75, 130, 171, 177, 179), the effect of phenyl diazonium chloride (Refs 175, 176) and the reduction of nitroalcohols (Refs 31, 58, 70, 123, 166, 180 - 190) are described. In conclusion, 3 reactions are mentioned: 1) The synthesis of 3,5-dinitrooctane by the interaction of nitrobutane with 2-nitrobutanol-1 in the presence of $(C_2H_5)_2NH$ in CHCl and after removal of water (Ref 191). 2) Only one case is known of C-alkylation of nitroalcohols. In 1924, 2-nitro-2-chloropropanol was synthesized by the reaction CH_3J with the Na-salt of 2-nitro-2-chloroethanol in boiling methanol (Ref 148). 3) It was shown in reference 192 that the K-salt of dinitroethanol combines with acrylate and esters of the γ, γ-dinitro-δ-oxyvalerianic acid are formed. The enclosed table shows the properties of some aliphatic nitroalcohols. There are 1 table and 309 references, 7 of which are Soviet.

AUTHORS: Novikov, S. S., Lebedev, O. V., Khmel'nitskiy, L. I., Yegorov, Yu. P. SOV/79-28-8-66/66

TITLE: Decomposition Reactions of Nitrogen Dioxide and Organic Compounds (Vzaimodeystviye N_2O_4 s organicheskimi soyedineniyami) III. Decomposition Reaction of N_2O_4 With Salts of the Aliphatic Nitro Compounds (III. Vzaimodeystviye N_2O_4 s solyami alifaticheskikh nitrosoyedineniy)

PERIODICAL: Zhurnal obshchey khimii, 1958, Vol. 28, Nr 8, pp. 2305 - 2307 (USSR)

ABSTRACT: In contrast to the reactions of the aromatic oximes and the arylnitromethane salts with N_2O_4 producing dinitro compounds, the reaction of the aliphatic oximes with nitrogen dioxide produces nitrosonitro compounds. Thus, for example, acetoxin and N_2O_4 react to form propylpseudonitrole (Ref 3) $(CH_3)_2C(NO)(NO_2)$. Analogous to the course of the reaction between the oximes and the nitro compounds of the aromatic series, it is to be expected that the aliphatic series would react in the same way, i.e. that the salts of the aliphatic nitro compounds must react with N_2O_4 to give nitrosonitro

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compounds. In the work reported in this paper this hypothesis was tested using the alkali salts of the following compounds: 2-nitropropane; ethylnitroacetate; and 1,1-dinitroethane. Thus propylpseudonitrile was obtained by the reaction between the sodium salt of -nitropropane and N_2O_4 (reaction diagram 4). In the reaction of the sodium salt of nitroacetate with N_2O_4 the ethyl ester of nitrooximeacetic acid was formed (Diagram 2). In the reaction between the potassium salt of 1,1-dinitroethane and N_2O_4 ethylnitrolic acid was produced; in this reaction a labile intermediate product, a nitroso compound, formed (Diagram 3). Contrary to expectation, only the nitromalonic acid ester separated out quantitatively in the reaction between N_2O_4 and the potassium salt of nitromalonic acid ester. Spectral analysis showed that this anomaly resulted from the fact that the potassium formed the salt not at the nitro group, but at the carbonyl group. There are 4 references, 1 of which is Soviet.

Decomposition Reactions of Nitrogen Dioxide and Organic Compounds. III. Decomposition Reaction of N_2O_4 With Salts of the Aliphatic Nitro Compounds

SOV/79-28-8-66/66

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

SUBMITTED: December 31, 1957

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5(3)

AUTHORS: Novikov, S. S., Fainzil'berg, A. ., Shevelev, G. ., Korsunova, I. S., Balyayevskiy, M. Y.

TITLE: On an Interesting Case of Isomerization in the Series of Saturated Aliphatic Nitro-Derivatives (O interesnom sluchaye izomerizatsii v ryadu nasyshchennykh alifaticheskikh nitro-soyedineniy)

PERIODICAL: Doklady Akademii nauk SSSR, 1957, Vol. 115, Nr 5, pp. 941-943 (USSR)

ABSTRACT: In the presence of ammonia 1,1,1,3-tetranitropropane is rearranged into the symmetric isomeric 1,1,3,3-tetranitropropane, which is precipitated as a diammonium salt. Besides, a small quantity of 1,1,1-trinitropropane is formed. If ammonia is replaced by other organic or inorganic bases, no symmetric tetranitropropane but 1,1,1-trinitropropane is formed. The formation of the last-mentioned compound is effected by the splitting-off of a nitro group by the action of the bases. Whereas, in the presence of ammonia, the isomerization of 1,1,1,3-tetranitropropane into symmetric tetranitropropane occurs parallel to this splitting-off reaction. It is suppressed in the presence of strong base. - The reaction mainly at 0°C

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On an Interesting Case of Isomerization in the Series of Saturated Aliphatic Nitro-Compounds

in an aqueous alcohol solution (it can not be effected in non-polar solvents). The yield of the symmetric diammonium salt was 40%. This salt is transformed, by potassium chloride, into the potassium salt, the latter being eventually converted into 1,3-dibromo-1,1,3,3-tetranitropropane. In the paper under review, these compounds have been described for the first time. The transformation of 1,1,1,3-tetranitropropane into the symmetric isomer is the first so far observed case of an isomerization by change of place of a nitro group in saturated aliphatic nitro-compounds. - The paper contains a detailed recipe for the isomerization of 1,1,1,3-tetranitropropane, for the preparation of the symmetric potassium salt, as well as of the 1,3-dibromide, and for the preparation of 1,1,3-trinitropropane in the presence of dimethylamine. There is 1 reference.

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5.2 3)

AUTHORS: Novikov, S. S., Godovikova, T. I., SOV/20-124-4-29/67
Tartakovskiy, V. A.

TITLE: Synthesis of Organomercuric Nitrogen Compounds (Sintez rtut'organicheskikh nitrosoyedineniy)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol. 124, Nr 4, pp 834-837 (USSR)

ABSTRACT: As is known, many mercury salts of organic and inorganic acids are used for mercurization reactions, for the addition to double and triple bonds, etc. The authors found that the trinitromethane mercury salt readily mercurizes those compounds of the aliphatic series which contain a mobile hydrogen atom, as well as those of the aromatic and heterocyclic series. In this process substances with a common formula $R - HgC(NO_2)_3$ are produced.

The authors studied this reaction with malonic, acetoacetic and nitroacetic esters, with acetylacetone, acetone, cyclopentane, benzene, toluene, aniline, dimethyl aniline, furan and thiophene. Table 1 contains the conditions of reaction, yields and analyses of the final products. Trinitromethyl mercury aryls

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Synthesis of Organomercuric Nitrogen [illegible]

form, on the action of brom[illegible] correspondi[illegible] mercury bromides and bromo-trinitro methane wh[illegible] are transformed into mercury chlorides by concentrated HCl. It may be assumed that the mercurization products and the trinitro-methane mercury salts can exist as two interconvertible tautomeric forms, depending on the nature of the solvent. In this connection the authors point to the fact that their ultraviolet spectra are very different in polar and apolar solvents (Ref 2). In crystalline state, these substances are pure organo-metallic compounds $R - HgC(NO_2)_3$. The reaction of trinitro-methane mercury salt with nitro-benzene, m-dinitro-benzene, p-nitrotoluene and o-nitro-anisole takes place in a very particular manner. The substances synthesized therein are complex addition products of a mercury salt molecule to the molecule of the respective aromatic compound. By the action of alkalis the complex is destroyed under formation of the nitro-aromatic initial compound, mercury oxide and a corresponding trinitro-methane salt. The trinitro-methane mercury salt does not react with any compound containing two substituents in meta-position with respect to the nitro group. A structure of the complex

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Synthesis of Organomercuric Nitrogen Compounds

SOV/20-124-4-24/67

is suggested according to [illegible]. By investigation of the interaction between $Hg[C(NO_2)_3]_2$ and ethylene in an aqueous or alcoholic [illegible] it is detected quite unexpectedly that in this case not an alcohol is formed but trinitro-methyl-β,β,β-[illegible] mercury. The same compound is obtained by the action of trinitro-methyl mercury salt in ethylene on mixture of trinitro-methane. Therefore it may be taken for granted that the latter product is synthesized by direct addition of the elements of trinitro-methane mercury salt to ethylene (Scheme II). This is a new reaction. It is [illegible] that not only the salt mentioned is capable of addition to the double bond but also the compounds [illegible] $HgC(NO_2)_3$. The addition of trinitro-methane mercury salt to the double bond was studied with propylene, styrene, hydroxy-ethyl alcohol as well as with the methyl ester of acrylic acid. The reaction takes place in any case according to Scheme II. The [illegible] of starting substances and yields of some substances [illegible] are given in Table 1. Whereas symmetrical mercuric-trinitro-methyl is completely resist the action of [illegible] and halogen salts, the

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asymmetrical ones enter into reaction with them according to the scheme mentioned. The trinitro-methane mercury salt cannot be added to olefins with a substructure (isobutylene, 3-ethyl pentene-3) which contain at least one quaternary hydrocarbon atom at the double bond. There are 3 tables and 5 references, 3 of which are Soviet.

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