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. Bezdnikova, 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 CH_4, 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 by the attack of CH_3 radicals at the 2nd C atom of the alkane 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
gmk

SHUYKIN, N.I.

USSR.

High-temperature contact-catalytic dehydrogenation of ethylcyclohexane. I. General direction of the reaction. N.I. Shuikin and I.I. Levitskii. *Bull. Acad. Sci. U.S.S.R., Div. Chem. Sci.* 1953, 895–902 (Engl. translation).—See *C.A.* 49, 2337h. H. L. H.

SHUYKIN, N. I.

High-temperature contact-catalytic dehydrogenation of ethylcyclohexane. I. General direction of the reaction. N. I. Shuykin and I. I. Levitskii (Inst. Org. Chem., Acad. Sci. U.S.S.R., Moscow). *Izvest. Akad. Nauk. S.S.S.R., Otdel. Khim. Nauk* 1953, 1003–11.—Ethylcyclohexane was passed over either an Al-Cr-Mo or Al-V catalyst at 405° or 547°, with or without dilu. with CO_2. The principal products of dehydrogenation were EtPh and styrene, along with small amts. of unsatd. material, probably ethylcyclohexene. The content of EtPh in the catalyzate drops sharply as the space velocity of the gas over the catalyst is increased, while the content of unsatd. products, including styrene, remains substantially const. and does not depend on the extent of aromatization of the starting material. The content of styrene in catalyzates with EtPh dehydrogenation also does not change with variation of the velocity and greatly exceeds the concn. of unsatd. hydrocarbons in catalyzates from ethylcyclohexane. It is thus suggested that the dehydrogenation of ethylcyclohexane proceeds in 2 steps: formation of EtPh and dehydrogenation of this to styrene. Dilu. with 1:2 parts of CO_2 gives a 0.33-fold increase of the yield of unsatd. materials from either EtPh or ethylcyclohexane. The results indicate that dehydrogenation of EtPh takes place on equil. state under the conditions employed. II. Thermodynamic-equilibrium of dehydrogenation of ethylcyclohexane formed from ethylcyclohexane. I. I. Levitskii and N. I. Shuikin. *Ibid.* 1012–16.—Thermodynamic calcn. by the previously derived equation (*C.A.* 46, 10818*f*) of the dehydrogenation of EtPh in its formation from ethylcyclohexane, at 547° shows that the equil. yield of styrene from ethylcyclohexane varies only by 1.4% with a change of the degree of aromatization by 20%. The exptl. results (preceding abstr.) agree satisfactorily with the theoretical values. Hence equil. is actually attained in the dehydrogenation of EtPh.

G. M. Kosolapoff

1. PETROV, A.D., SHUYKIN, N.I.

2. USSR (600)

4. Krentsel, B.A.

7. "Chemical use of petroleum hydrocarbon gases." A. S. Nekrasov, B. A. Krentsel', Reviewed by A. D. Petrov, N. I. Shuykin. Sov kniga No. 1 1953.

9. Monthly List of Russian Accessions, Library of Congress, April 1953, Uncl.

1. POPOV, M. A., ZHUYKH, N. I., BARANOVSKAYA, O. I.

2. USSR (600)

4. Ketones

7. Catalytic amination of ketones of different structures. Izv. AN SSSR. Otd. khim. nauk no. 1, 1953

9. Monthly List of Russian Accessions, Library of Congress, June 1953, Uncl.

(3)

Hydrogenating and dehydrogenating ability of nickel catalysts on various carriers. N. I. Shuikin, Kh. M. Minachev and T. M. Feofanova (*Izvest. Akad. Nauk SSSR, Otdel. Khim. Nauk*, 1953, No. 1, 96—99).—Catalysts containing 15—20% Ni on Al_2O_3, ZnO, Cr_2O_3, MgO, and Fe_2O_3 are prepared by pptn. of the mixed nitrates with 30% NaOH, washing free of NO_3', drying at 120—130°, grinding and pelleting into rods 3—4 mm. diameter and 5—6 mm. length. The catalysts are reduced by electrolytic H_2 at 350—360°; vol. of catalyst was 50 ml., space velocity of *cyclo*hexane (I) vapour 0·3 l. per l. of catalyst per hr., that of C_6H_6 vapour 0·06 l. per l. of catalyst per hr. Activity and stability of catalyst are estimated from the degree of conversion of C_6H_6 to I (hydrogenation) and of I to C_6H_6 (dehydrogenation): Ni–Al_2O_3 and Ni–ZnO are most active, Ni–Cr_2O_3 and Ni–MgO less active, and Ni–Fe_2O_3 practically useless for dehydrogenation; all samples (Fe_2O_3 excepted) hydrogenate C_6H_6 after only one passage at 160—170°. The stability of the catalysts to prolonged use is obtained by admitting first I and then C_6H_6 after initial activity had been determined. Ni–Al_2O_3 had unchanged activity after 80 hr. use; for Ni–ZnO and Ni–Cr_2O_3 the activity fell gradually to 18—20% of initial value. This stability is probably due to comparatively small concn. of finely dispersed Ni on the highly developed surface of the carrier. The active Ni distributed itself in such a way that its power of decomposing hydrocarbons is reduced. Special experiments show that CH_4 is not evolved from I at <350°, and that it is influenced by the type of carrier.

W. MANZ.

Inst. Org. Chem.

11-5-54

SHUYKIN, N.I.; BERDNIKOVA, N.G.; NOVIKOV, S.S.

Catalytic transformations of five- and six-membered cyclanes at high temperatures and hydrogen pressure. Izv. AN SSSR. Otd.khim.nauk. no.2:269-277 Mr-Ap '53. (MLRA 6:5)

1. Institut organicheskoy khimii Akademii nauk SSSR.
(Cyclanes) (Catalysis)

Over a Pt-Al_2O_3 catalyst, cyclopentane at 460° and 20 atm of H pressure is transformed into n-pentane and isopentane, methylcyclopentane, n-hexanes and isohexanes, benzene, toluene, xylene, and polymethylbenzenes. Under the same conditions, but at a H pressure of 15 atm, methylcyclopentane is transformed into cyclopentane, n-pentane, 2-methylbutane, n-hexanes and isohexanes, benzene, toluene, xylene, and polymethylbenzenes; cyclohexane into benzene, methylcyclopentane, cyclopentane, hexanes, pentanes, toluene, xylenes, and polymethylbenzenes. The synthetic reactions, as distinguished from those of hydrogenolysis are due to the alkylation of hydrocarbon molecules (e.g., those of cyclopentane, benzene, toluene) with methylene radicals.

256T26

SHUYKIN, N.I.

5

CZECH

Mechanism of vapor-phase alkylation of benzene with acetals in the presence of aluminosilicate catalyst. N. I. Shuikin and N. A. Pozdnyak (Moscow State Univ.). *Sbornik Statei Obshchei Khim.* 2, 1008-13(1953).—Passage of CH_2O, dry or in 32% aq. soln., over aluminosilicate catalyst at 185–230° in N gave 10–40% HCO_2Me, b_{760} 32.5°, $n^{25}D$ 1.3121; the best yield was obtained at 200° with 32% aq. CH_2O at space velocity 0.15. Small amts. of MeOH, HCO_2H, and unchanged CH_2O are recovered. At 350–500° the main products are gases and H_2O. Passage of C_6H_6 with CH_2O at 500° over the catalyst gave a range of products, b. 79–140° and higher, contg. small amts. of MePh. HCO_2H failed to yield any MePh. Passage of C_6H_6 and HCO_2Me over the catalyst at 500° gave the best yield (14.3%) of MePh with a 1:1 proportion of the reactants. The alkylation is believed to be a radical reaction, with esters or ethers as the active agents; acetals used as alkylating agents appear to react through the intermediacy of ethers resulting from their pyrolysis.

G. M. Kosolapoff

Lab. Chemistry of Petroleum im. Zelinskii, Moscow State U.

SHUKKIN, N.I.
SHUYKIN, N.I.

4

USSR.

Contact-catalytic alkylation of benzene by acetals. II. Ethylation of benzene by ethylal (diethyl formal), diethyl acetal, and diethyl ether. N. I. Shukkin and N. A. Pozdnyak (Moscow State Univ.). *Sbornik Statei Obshchei Khim.* 2, 1014-19(1953).—Refluxing 40% formalin with 1.5 parts EtOH contg. 2% HCl 30 min. in the presence of $CaCl_2$ (to bind all the H_2O in the formalin), cooling, and treating the upper layer with $CaCl_2$ 20–30 min. with shaking, gave 67% $CH_2(OEt)_2$, b_{744} 87.5°, n_D^{20} 1.3749, which, passed over aluminosilicate catalyst at 150–500°, yielded mainly unsatd. hydrocarbons (C_2H_4), along with Et_2O (formed up to 200°), EtOH, H_2O, HCO_2Et, and unchanged starting material. Similar treatment of $MeCH(OEt)_2$ gave C_2H_4, Et_2O (up to 200°), EtOH, and EtOAc, along with an unknown solid, m. 115°. Passage of C_2H_4 with $CH_2(OEt)_2$ over the catalyst at 300–500° gave a range of products; at 500° at space velocity of the charge of 0.15 were obtained 4.9% MePh, 2.4% EtPh, and 3.5% xylenes. Similar reaction with $MeCH(OEt)_2$ or Et_2O gave 0% and 13.8% resp. EtPh.

G. M. Kosolapoff

SHUYKIN, N. I.; YUSHKEVICH, M. V.; and BELIKOVA, G. S.

On Contact Decomposition of Furfuralazine, page 1112, Sbornik statey po obshchey khimii (Collection of Papers on General Chemistry), Vol II, Moscow-Leningrad, 1953, pages 1680-1686.

Laboratory of the Chemistry of Petroleum imeni N. D. Zelinskiy, Moscow State U

SHUYKIN, N.I.; LEVITSKIY, I.I.

Theoretical and experimental yield of styrene during catalytic dehydrogenation of ethyl benzene. Izv.AN SSSR Otd.khim.nauk no.3:403-408 My-Je '53. (MLRA 6:8)

1. Institut organicheskoy khimii Akademii nauk SSSR.
(Styrene) (Dehydrogenation) (Benzene)

USSR/Chemistry - Hydrocarbons, Jul/Aug 53
Aromatization, Isomerization

"Investigation of Transformations of Individual Hydrocarbons at an Activated Troshkovo Clay Catalyst. I. Transformations of Cyclohexene (I), 4-Methylcyclohexene-1 (II), and Octene-1 (III)," N. I. Shuykin, Ye. A. Timofeyeva, Inst Org Chem, Acad Sci USSR

Iz Ak Nauk SSSR OKhN, No 4, pp 678-688

Studied transformations of I, II, and III at the catalyst investigated. Found that there is redistribution of hydrogen with formation of aromatic and unsatd hydrocarbons, that six-membered cyclenes are partially isomerized into five-membered rings, and that formation of aromatics from six-membered cyclenes is accompanied by alkylation. Showed that III is subjected to dehydrocyclization with formation of aromatics and that I, II, and III are partially cracked with isomerization of some of the products of decompn of III.

270T12

270T12

SHUYKIN, N.I.

USSR/ Scientists - Chemistry

Card 1/1 ; Pub. 40 - 1/22

Authors ; Nesmeyanov, A. N.; Topchiev, A. V.; Kazanskiy, B. A.; and Shuykin, N. I.

Title ; In memory of Academician N. D. Zelinskiy

Periodical ; Izv. AN SSSR. Otd. khim. nauk 5, 765-774, Sep-Oct 1953

Abstract ; Eulogy by the president and staff members of the Academy of Sciences USSR honoring the death of academician Nikolay Dmitrievich Zelinskiy, famous Russian chemist who died on July 31, 1953 at the age of 93. Illustration.

Institution : ...

Submitted : ...

SHUYKIN, N.I.

USSR/Chemistry - Catalytic conversion

Card 1/1 : Pub. 40 - 15/22

Authors : Shuykin, N. I.; Berdnikova, N. G.; and Novikov, S. S.

Title : Contact-catalytic conversion of normal structure alkanes at increased temperature and hydrogen pressure

Periodical : Izv. AN SSSR. Otd. khim. nauk 5, 879-888, Sep-Oct 1953

Abstract : An investigation was conducted to determine the contact-catalytic conversion of n-hexane, n-heptane and n-octane in the presence of platinised Al_2O_3 at 460° and 15-20 atm hydrogen pressures. Dehydrocyclisation and isomerization of alkanes, methylation and hydrogenolysis of the alkanes and benzene homologues, formed as result of catalytic dehydrocyclization, was observed in all instances. The role of methylene decomposition of alkanes and cyclanes, in the reaction of formation of isoalkanes and higher benzene homologues, is explained. Two USSR references (1937 and 1953). Tables; graphs.

Institution : Academy of Sciences USSR, Institute of Organic Chemistry

Submitted : December 19, 1952

SHUYKIN, N. I.

USSR/Chemistry - Aromatic Hydrocarbons Nov/Dec 53

"High-Temperature Catalytic Dehydrogenation of Ethylcyclohexane (I). Part I. The Basic Direction of the Reaction," N.I. Shuykin, I.I. Levitskiy, Inst Org Chem, Acad Sci USSR

Iz Ak Nauk SSSR, OKhN, No 6, pp 1003-1011

Investigated the dehydrogenation of I. and ethylbenzene over 2 catalysts (Al-Cr-Mb and Al-V oxides) at 495° and 547° on dilution with various quantities of CO_2.

273T9

SHUYKIN, N. I.

USSR/Chemistry - Aromatic Hydrocarbons Nov/Dec 53

"High-Temperature Catalytic Dehydrogenation of Ethylcyclohexane (I). Part II. Thermodynamic Equilibrium in the Dehydrogenation of Ethylbenzene Formed From Ethylcyclohexane," I.I. Levitskiy, N.I. Shuykin, Inst Org Chem, Acad Sci USSR

Iz Ak Nauk SSSR, OKhN, No 6, pp 1012-1016

Established that the yields of styrol in the dehydrogenation of I do not depend on the yield of the intermediate product (ethylbenzene - II) within a wide range. This is due to the fact that the dehydrogenation of II reaches an equilibrium.

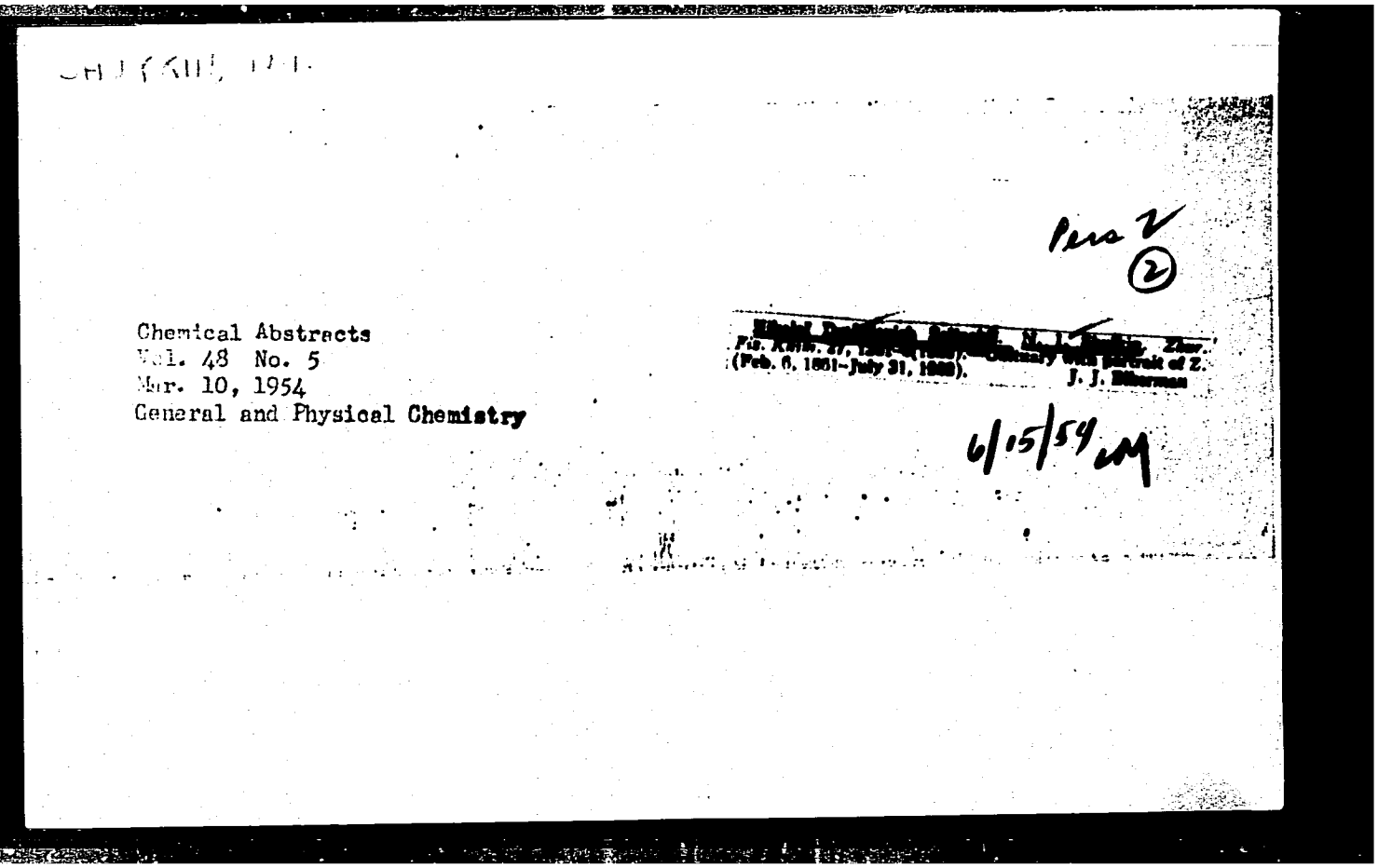
273T10

NEKRASOVA, V. A.; SHUYKIN, N. I.

Chlorination

Chlorination of alkanes. Usp. khim. 22, No. 2, 1953.

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



Chemical Abstracts
Vol. 48 No. 5
Mar. 10, 1954
General and Physical Chemistry

Pers V (2)

(Feb. 6, 1881–July 31, 1953). J. J. Silverman

6/15/54 CM

SHUYKIN, N.I.

Chemical Abstracts
May 25, 1954
Organic Chemistry

(3)

Contact-catalytic transformations of alkanes and cyclanes at elevated temperature and pressure of hydrogen. N. I. Shuikin, S. S. Novikov, and N. G. Berdnikova. *Doklady Akad. Nauk S.S.S.R.* 89, 1029–32(1953); cf. preceding abstr.—Yields, n^{20}_D, d_{20}, and compositions of the catalyzates obtained from cyclopentane, methylcyclopentane, cyclohexane, hexane, pentane, and octane are tabulated. Reaction schemes are presented for the production of aromatic and branched-chain aliphatic hydrocarbons from the alkanes by hydrogenolysis. E. H.

10-12-54
mld

SHUYKIN, N.I.

Dehydrogenation of pentane. E. A. Timofeyeva, S. S. Novokov, and N. I. Shuikin. *Doklady Akad. Nauk S.S.S.R.* 92, 345–8(1953).—Contact of *n*-pentane with alumo-chromo-magnesium catalyst (45 mole-% Cr_2O_3, 30 Al_2O_3, 25 MgO) at 500° at space velocity 1.2, gave a catalyzate with 21–2% pentene content, most of which (95%) consisted of 2-pentene. In addition the catalyzate contained smaller amounts of 1-pentene, pentadienes, isopentane, C_6H_6, and *m*-xylene. When MgO is omitted from the catalyst formulation the extent of dehydrogenation declines; when KOH or K_2CO_3 are added to the original catalyst the results are also negative. G. M. Kosolapoff.

SHUYKIN, N.I.

Vapor phase alkylation of benzene by alcohols and ethers. N. I. Shuikin, A. B. Kuchkarev, and N. A. Pozdnyak (Inst. Org. Chem., Acad. Sci. U.S.S.R., Moscow). *Doklady Akad. Nauk S.S.S.R.* 92, 785–8(1953).—Alkylation of C_6H_6 with iso-PrOH over $ZnCl_2$ on Al_2O_3 at atm. pressure at 175–200° with a 4:1 reactant ratio gave 50% crude iso-PrPh at a space velocity of 0.15–0.2 l./hr. At higher rates the yield declines; increase of the C_6H_6 proportion to 86 mole-% raises the yield to 54%. Some 12–15% dialkylate also forms. Alkylation with PrOH requires 250°, when 45% alkylbenzene is formed, the product also being iso-PrPh. The 4:1 ratio of reactants with BuOH at 250° gave 38% crude BuPh, from which was isolated some 35% *sec*-BuPh. Alkylation with MeOH or EtOH requires 300°, when 10% MePh or 16% EtPh is obtained. iso-Pr_2O at 250° with a 4:1 reactant ratio gave 48% iso-PrPh and 20% dialkylation product. Bu_2O is less reactive and at 250–300° gave 30% crude BuPh with a 6:1 reactant ratio; at 160° the yield was 14% only at a space velocity of about 0.15; rates higher than this (0.6) led to complete cessation of alkylation. Et_2O at 300° with a 2:1 reactant ratio gave but 5.4% EtPh. The results indicate that the alkylation proceeds through formation of unsatd. intermediates. G. M. K.

SHUYKIN, N. I.

Specific character of action of water vapor in catalytic dehydrogenation of ethylbenzene. I. I. Levitskii and N. I. Shuikin (Inst. Org. Chem., Acad. Sci. U.S.S.R., Moscow). *Doklady Akad. Nauk S.S.S.R.* 92, 971–4(1953); cf. Wennet and Dybdal, *C.A.* 42, 3722*f*; 46, 10818*f*.—The dehydrogenation catalysts for EtPh must possess not only a high order of selectivity, activity and ability to initiate the water reaction with coke, but must also have a low adsorption coeff. for H_2O vapors. Dehydrogenation of EtPh-H_2O vapor mixts. at 600° over alumovanadate or alumochromomolybdate catalysts was examd. The yield of styrene is about 31%; the K_p is 0.1048. Change of the molar ratio (H_2O-PhEt) from 2.1 to 13.8 lowers the yield of styrene to 16% over alumovanadate, while over the alumochromomolybdate catalyst, changing the molar ratio from 2.9 to 10.4. only increased the yield 2–6% over the yield when no diluent was used. Both of these catalysts are rather active adsorbers of H_2O vapor. G. M. Kosolapoff

SHUYKIN, N.I.

NEKRASOVA, V.A.; SHUYKIN, N.I.

Thermal chlorination of alkanes. Soob.o nauch.rab.chl.VKHO no.1:11-14 '54. (MIRA 10:10)
(Chlorination) (Hexane) (Heptane)

NEKRASOVA, V.A., SHUYKIN, N.I.

SHUYKIN, N.I.

Thermal chlorination of alkanes. Report No.4: Preparation of 1-chloroctane, 1-chlorononane, and 1-chlorodecane. Soob.o nauch. rab.chl.VKHO no.1:15-17 '54. (MIRA 10:10)
(Octane) (Nonane) (Decane)

SHUYKIN, N. I.

Hydro- and dehydrogenation of hydrocarbons in the presence of ruthenium and rhodium catalysts with a low content of the metal. Kh. M. Minachev, N. I. Shuikin, and I. D. Rozhdestvenskaya (N. D. Zelinskii Inst. Org. Chem., Acad. Sci. U.S.S.R., Moscow). *Izvest. Akad. Nauk S.S.S.R., Otdel Khim. Nauk* 1954, 338–43.—The activity of 1% Ru-Al_2O_3, 1% Ru-C, 1% Rh-Al_2O_3, and 1% Rh-C catalysts was examd. in hydrogenation and dehydrogenation reactions involving C_6H_6, cyclohexane, 1-methylcyclopentene, and 1-octene. Rh catalysts were active in dehydrogenation even at 300°, while at 340–60° they gave 92–5% yield of benzene; Ru was less active. In hydrogenation reactions both types were close to Pt in activity. For dehydrogenation of cyclohexane the activation energy of Rh-C was 16,800 cal./mole, with K_0 1.44 × 10^9, while Ru-C had 30,200 and 1.77 × 10^{22}, resp. X-ray examn. of the catalysts showed that Ru-C gave only one weak band for d = 2.06 A.; Ru-Al_2O_3 gave d = 2.12, 1.91, and 1.37 A. Rh-C gave only one weak band for d = 2.04 A.; Rh-Al_2O_3 gave d = 2.14, 1.92, and 1.38 A. In all cases the bands were wide, indicating high order of dispersion. G. M. Kosolapoff

(1) 12

MF

Summary of a portion of the above article - D418295

SHUYKIN, N.I.

4

USSR. / Complex compounds of metal halides and alcohols. A. B. Kuchkarov and N. I. Shuikin. *Bull. Acad. Sci. U.S.S.R., Div. Chem. Sci.* 1954, 397-403(Engl. translation).—See *C.A.* 48, 13514*b*. H. L. H.

SHUYKIN, N. I.

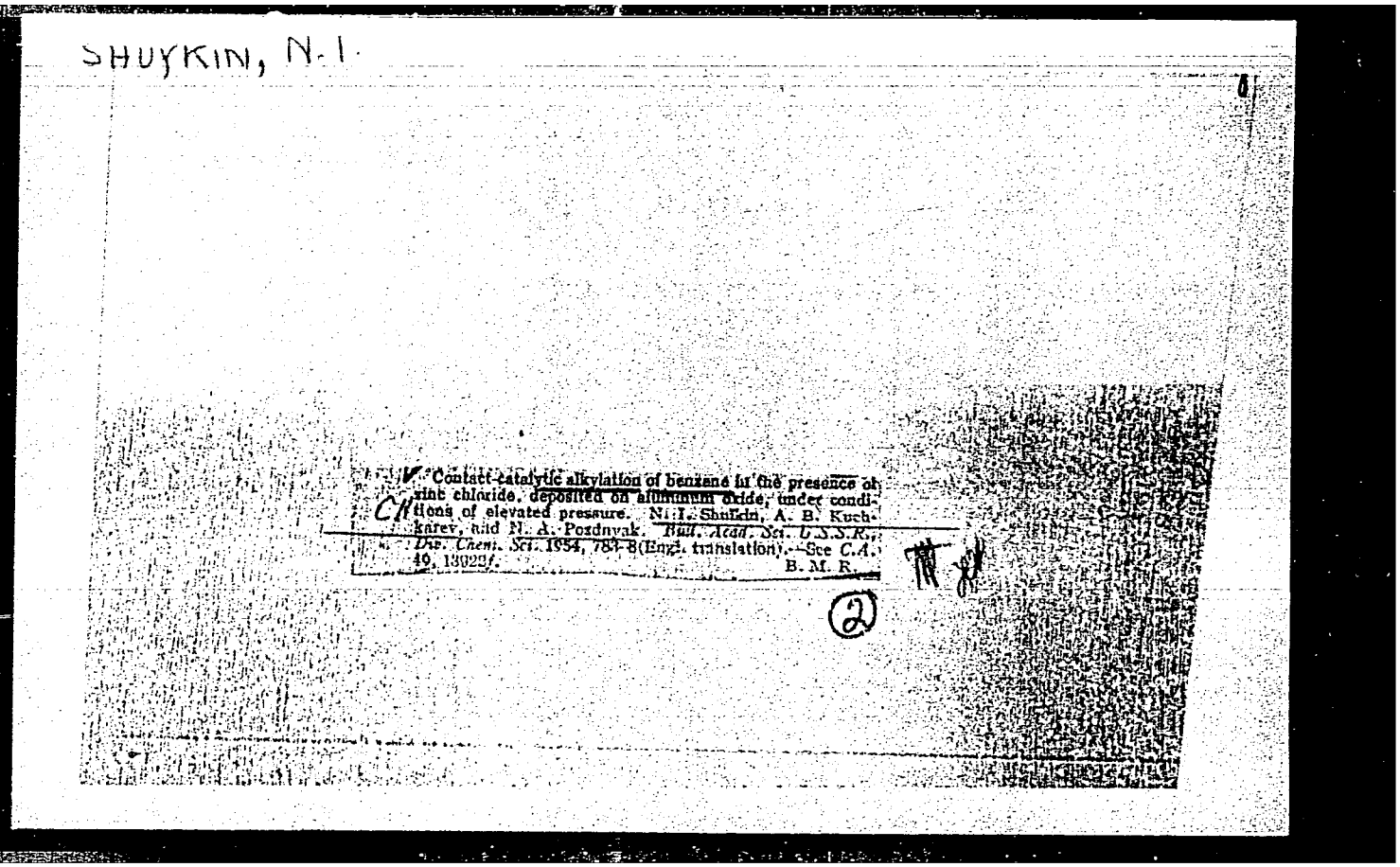
Complex compounds of metal halides and alcohols. A. B. Kuchkarov and N. I. Shuikin (N. D. Zelinskii Inst. Org. Chem., Acad. Sci. U.S.S.R., Moscow). *Izvest. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk* 1954, 470–7; cf. *C.A.* 47, 6336g.—Heating 30 g. cyclohexanol and 22.4 g. dry $ZnBr_2$ 6 hrs. at 120–5° gave $ZnBr_2.2C_6H_{11}OH$ (I), colorless needles, m. 74–6° (from Et_2O-petr. ether), which decomp. above 140° to cyclohexene, $ZnBr_2$, and H_2O. I (10.5) heated with 14 g. PhOH 4 hrs. at 145–50° gave after treatment with H_2O and extn. with C_6H_6, *p*-cyclohexylphenol, m. 128–9° (60%). Similar reaction with AcOH gave in 10 hrs. at 100–20° $C_6H_{11}OAc$ in 44% yield. Addn. of 3.5 g. $AlCl_3$ over 10 hrs. to stirred 20 g. $C_6H_{11}OH$ and 15 ml. petr. ether gave after 24 hrs. 84% $AlCl_3.6C_6H_{11}OH$, decomp. 60–5°, sol. in org. solvents and giving an acidic reaction in soln., like the other similar complexes. Heating this complex to 150–200° gave cyclohexene, chlorocyclohexane, cyclohexanol, and HCl. Heating the complex in petr. ether on a steam bath gave a solid $AlCl_3OC_6H_{11}.5C_6H_{11}OH$, decomp. 50–5°. $C_6H_{11}OH$ and $MgCl_2$ gave in 10 hrs. at 125–30° a very hygroscopic $MgCl_2.3C_6H_{11}OH$, which decomp. before melting and is very sparingly sol. in org. solvents, but sol. in EtOH. Me_2EtCOH and $MgCl_2$ in 6 hrs. at 100–10° gave $MgCl_2.3C_6H_{11}OH$, which decomp. before melting, yielding alc. and $MgCl_2$; its solns. are not acidic; heated with PhOH it does not yield the alkylated product. $CaCl_2$ and $C_6H_{11}OH$ in 6 hrs. at 120–30° gave $CaCl_2.3C_6H_{11}OH$, which decomp. on heating into its original components. With $CdCl_2$ (8 hrs. at 125–30°) there is formed hygroscopic, sparingly sol. $CdCl_2.C_6H_{11}OH$, which dissoc. on heating; $CdCl_2$:*iso-PrOH* is similarly prepd. *l-Menthol* and $ZnCl_2$ in 8 hrs. at 100–10° gave $ZnCl_2.C_{10}H_{19}OH$, decomp. 103–5°, whose solns. are acidic. Me_2COH and $ZnCl_2$ kept in sealed tube 25 days gave $ZnCl_2.2Me_2COH$, m. 56–8°, whose solns. are acidic; heated with AcOH it forms Me_2COAc, while heated with PhOH it gives *p-tert*-butylphenol. $ZnCl_2$, and Me_2EtCOH gave in 45 days at room temp. $ZnCl_2.2Me_2EtCOH$, m. 62–4°, whose solns. are acidic; with AcOH it yields *tert*-amyl acetate, while heated with PhOH it gives *p-tert*-amylphenol. $ZnBr_2$ and Me_2EtCOH gave $ZnBr_2.2Me_2EtCOH$, m. 60–2°; with AcOH and PhOH it gives, resp. *tert*-amyl acetate and *p-tert*-amylphenol. Me_2COH and $ZnBr_2$ gave $ZnBr_2.2Me_2COH$, m. 53–5°, which decomp. in aq. soln. and whose solns. are acidic. The complex esterifies AcOH readily. Keeping trimethylethylene with moist $ZnBr_2$ in sealed tube 10 months gave needles of $(C_5H_{10})_3.ZnBr_2.3H_2O$, m. 60–2°; this complex is hygroscopic, its org. solns. are acidic, and treatment with H_2O yields *tert*-amyl alc.; heating with PhOH gives *p-tert*-amylphenol. Mixt. of 2,3-dimethyl-1- and 2-butenes with moist $ZnBr_2$ gave in 6 months prisms of $C_6H_{12}.2ZnBr_2.H_2O$, which were very hygroscopic and whose properties were similar to those listed above. G. M. K.

SHUYKIN, N.I.

4

Thermal transformations of 1,3-pentadiene. N. I. Shulkin, S. S. Novikov, and T. I. Naryshkina. *Bull. Acad. Sci. U.S.S.R., Div. Chem. Sci.* 1954, 779-82(Engl. translation).—See *C.A.* 49, 13950*i*. B. M. R.

(1)



SHUYKIN, N.I.

Contact-catalytic alkylation of benzene in the presence of zinc chloride, deposited on aluminum oxide, under conditions of elevated pressure. N. I. Shuikin, A. B. Kuchkarev, and N. A. Pozdnyak. *Bull. Acad. Sci. U.S.S.R., Div. Chem. Sci.* 1954, 783-8 (Engl. translation).—See *C.A.* 49, 13922f.

B. M. R.

(2)

SHUYKIN, N-I

62

Contact-catalytic alkylation of benzene in the presence of zinc chloride, deposited on aluminum oxide, under conditions of elevated pressure. N. I. Shuikin, A. B. Kuchkarev, and N. A. Pozdnyak (N. D. Zelinskii Inst. Org. Chem., Acad. Sci. U.S.S.R., Moscow). *Izvest. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk* 1954, 904–10.—Alkylation of C_6H_6 by means of Et_2O, EtOH, or iso-PrOH in vapor phase at elevated pressure was achieved by contact with $ZnCl_2$ deposited on Al_2O_3. With Et_2O a 41–3.5% yield of crude EtPh is obtained (calcd. on Et_2O) at 20 atm. and in the range of 250–400°. At 300° an increase of pressure from 20 atm. to 60 atm. results in a moderate increase of alkylate. At 300–50° and 20 atm. with a C_6H_6/Et_2O ratio of 4.5–1 to 6–1 there is obtained a crude cut of EtPh amounting to 74–86% yield based on Et_2O or 13–14% based on C_6H_6. Alkylation with C_2H_4 gives 16% yield (based on C_6H_6) at 300°, 40 atm. and 2:1 reagent ratio; the catalyzate contains, besides EtPh, some MePh and $C_6H_4Et_2$ (15.4% *o*, 46.2 *m*, and 38.1% *p*). Iso-PrOH is most effective at 300–50° and at 20–40 atm. yields iso-PrPh in 66.3% yield (based on the alc.).

G. M. Kosolapoff

(2)

SHUYKIN, N.I.; NOVIKOV, S.S.; NARYSHKINA, 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)

SHUYKIN, N.I.; KUCHKAREV, A.B.; POZDNYAK, N.A.

Contact-catalytic alkylation of benzene in presence of zinc chloride deposited on aluminum oxide, under increased pressure. Izv.AN SSSR Otd.khim. nauk no.5:904-910 S-O '54. (MLRA 8:3)

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

SHUYKIN, N.I.

USSR/ Chemistry - Catalytic conversion

Card 1/2 Pub. 40 - 17/27

Authors : Minachev, Kh. M.; Shuykin, N. I.; Feofanova, L. M.; Treshchova, E. G. and Yudkina, T. P.

Title : Conversions of n-heptane in presence of metals of the Pd group at high temperatures and hydrogen pressures

Periodical : Izv. AN SSSR. Otd. khim. nauk 6, 1067-1074, Nov-Dec 1954

Abstract : The conversions of n-heptane over Ru, Rh, Pd and Pt contacts deposited on silica gel was investigated at hydrogen pressures of 20 at, and temperatures of 460°. It was found that the n-heptane, subjected to above described conditions, experiences several deep conversions with a part of it undergoing complete dehydrocyclization.

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

Submitted : February 17, 1954

Priodical : Izv. AN SSSR. Otd. khim. nauk 6, 1067-1074, Nov-Dec 1954

Card 2/2 Pub. 40 - 17/27

Abstract : Benzene and xylenes (in addition to toluene) paraffinic part of the catalysate revealed hydrocarbons of the iso-structure (C_5-C_7). The catalysis products of n-heptane over Ru-SiO_2 showed considerable amounts of methylcyclohexane. Eleven references: 8 USSR, 2 English and 1 German (1903-1953). Tables; graph; drawing.

SHUYKIN, N.I.

USSR/ Chemistry - Catalytic conversion

Card 1/2 Pub. 40 - 18/27

Authors : Timofeyeva, E. A., and Shuykin, N. I.

Title : Conversions of individual hydrocarbons in contact with natural aluminum silicates. Part 2

Periodical : Izv. AN SSSR. Otd. khim. nauk 6, 1075-1081, Nov-Dec 1954

Abstract : Studies were made to determine the conversions of cyclohexane, methylcyclohexane and toluene over activated Troshkovsk clay ($Al_2Si\theta_3$) at 450 and 500°. It is shown that the degree of cyclane conversion increases with the increase in the molecular weight. Benzene and its homologues, as well as methylcyclopetane and unsaturated hydrocarbons were found among the cyclohexane conversion products.

Institution : Acac. of Sc., USSR, The N. D. Zelinskiy Institute of Org. Chemistry

Submitted : January 22, 1954

Periodical : Izv. AN SSSR. Otd. khim. nauk 6, 1075-1081, Nov-Dec 1954

Card 2/2 Pub. 40 - 18/27

Abstract : The conversion of methylcyclohexane (under identical conditions), yielded toluene, m- and p-xylenes and other benzene homologues, as well as dimethylcyclopentane, and alkanes, which apparently are the ring splitting products. Ten references: 7 USSR, 2 USA and 1 English (1940-1953). Tables; graphs.

USSR/Chemistry - Plastics FD-1206

Card 1/1 Pub. 129-9/19

Author : Shuykin, N. I.; Tulupov, V. A.

Title : The behavior of the geometric isomers of piperylene to ultraviolet illumination

Periodical : Vest. Mosk. un., Ser. fizikomat. i yest. nauk, 9, No. 5., 91-95, Aug 1954

Abstract : Established the fact that the cis- and trans-isomers of piperylene can be converted from one to the other under the action of ultraviolet light. Also established the approximate composition of the equilibrium mixture. Demonstrated the effect of powdered silver in this conversion. Fifteen references (two USSR).

Institution : Chair of Petroleum Chemistry

Submitted : March 25, 1954

Shuikin, N. I.

AID P - 1121

Subject : USSR/Chemistry

Card 1/1 Pub. 119 - 4/5

Authors : Minachev, Kh. M. and Shuikin, N. I. (Moscow)

Title : Metals of group VIII as catalysts in conversion of hydrocarbons

Periodical : Usp. khim., 23, no. 6, 737-765, 1954

Abstract : Preparation of catalysts, effect of various factors on their activity, and catalytic conversion of various hydrocarbons based on the work of Zelinskiy and his followers are reviewed. Six tables, 1 diagram, 196 references (157 Russian: 1911-1953).

Institution : None

Submitted : No date

SHUYKIN, N.I.

USSR

Characteristic test for cyclopentadiene. N. I. Shufkin and V. A. Tulupov (Moscow State Univ.). *Zhur. Obshchi Khim.* 24, 2199–2201(1954).—If a soln. contg. cyclopentadiene (1–1.5 ml.) is added to 1 ml. soln. of Fe alum in 90% H_2SO_4, contg. about 0.03% Fe, a characteristic black color with deep-green fluorescence appears. The color is readily visible even in 1% solns. of cyclopentadiene in: heptane, C_6H_6, 1-pentene, mixed pentenes, piperylene. In the latter case (same for diisocrotyl and diisobutenyl, which give red colors) addn. of a little H_2O results in a green color with violet shading in the aq. layer. G. M. Kosolapoff

SHUYKIN, N.I.

13

USSR

The poisoning of nickel catalysts on carriers under the conditions of dehydrogenation catalysis. N. I. Shulkin and Kh. M. Minachev. *Doklady Akad. Nauk S.S.S.R.* 94, 105–8(1954); cf. *C.A.* 48, 4940*h*.—The nature of the poisoning of Ni-ZnO and Ni-Al_2O_3 catalysts was studied in dehydrogenation catalysis. Thiophene was used as the poisoning material. Both the activity for the dehydrogenation of cyclohexane and the poisoning were detd. at 285° with a flow rate of the cyclohexane (or the mixt. of cyclohexane and thiophene) of 0.34 l./l. of catalyst. Almost all of the S introduced as thiophene was bound to the catalyst. The Ni-ZnO catalyst required 6 times as much S to decrease its activity as did the Ni-Al_2O_3; this indicates that the S reacts with the carrier as well as with the active metal. This fact is discussed in terms of the lattice parameters of the catalyst.
J. Rovtar Leach

Inst. Org. Chem., AS USSR

SHUYKIN, N. I.

USSR/Chemistry

Card 1/1

Authors : Shuykin, N. I., Member-Correspondent of the Acad. of Scs. of the USSR, Minchev, Kh. M; Tulupova, E. D., and Egorov, Yu. P.

Title : Transformations of ethylcyclopentane in the presence of Ru- and Pd-catalysts under the pressure of hydrogen in a flowing system.

Periodical : Dokl AN SSSR 95, 6, 1211 - 1214, 21 Apr 1954

Abstract : The article gives the specific characteristics of metallic catalysts in relation to their chemical properties and the special features of carrying agents, especially, render the pressure of hydrogen in flowing systems. Tables, a diagram.

Institution : N. D. Zelinskiy's Institute of Organic Chem. of the Acad. of Scs. of the USSR

Submitted : 17 Feb 1954

Evaluation B-85325, 14 Jun 55

SHUYKIN, N. I.

USSR/Chemistry - Organic Syntheses

Card 1/1 : Pub. 22 - 23/43

Authors : Nekrasova, V. A., and Shuykin, N. I., Memb. Corresp. of Acad. of Sc. USSR.

Title : Chlorination of n-undecane

Periodical : Dok. AN SSSR 97/5, 843-846, August 11, 1954

Abstract : The reaction of vapor-phase chlorination of n-undecane, was investigated in the presence of nitrogen dioxide. A narrow ligroin fraction of straight run Crimean petroleum, was used as the basic product for the derivation of chloro-derivatives. The results indicate that the application of nitrogen dioxide as a hydrocarbon chlorination initiator makes it possible to reduce the reaction temperature and to obtain large yields of mono-chloro-substituted hydrocarbons. Ten references: 5-USSR; 3-USA and 2-English (1930-1954). Tables; drawing.

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

Submitted : June 3, 1954

USSR/Chemistry - Conversion processes

Card 1/1 Pub. 22 - 29/56

Authors : Minachev Kh. M., Memb. Corresp. of Acad. of Sc. USSR.; Shuykin, N. I.; Tulupova, E. D.; and Yegorov, Yu. P.

Title : Conversions of ethylcyclopentane in the presence of Rh and Pt-catalysts under hydrogen pressure in a flowing system

Periodical : Dok. AN SSSR 99/5, 777-780, Dec 11, 1954

Abstract : The experimental data obtained during the catalysis of ethylcyclopentane over Rh - Al_2O_3, Pt - Al_2O_3 and Pt - SiO_2, under conditions as described in the title, are presented. The specific characteristics of Rh deposited on Al_2O_3 and Pt on SiO_2, during ethylcyclopentane conversions, are described. The catalyzates obtained, after determining their specific weight, index of refraction and aromatic hydrocarbon content were subjected to rectification for the purpose of separating the hydrocarbons. Physico-chemical analysis of ethylcyclopentane cat-conversion products showed that this hydrocarbon isomerizes when in contact with Rh - Al_2O_3 with the expansion into a six-membered cycle and finally dehydrogenates into toluene. Five USSR references (1934-1954). Tables; graph.

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

Submitted : July 20, 1954

[illegible]

"Transformations of Hydrocarbons on Oxide-Metal Catalysts Under Elevated Temperatures and Hydrogen Pressures," a paper presented at the 4th World Petroleum Congress, Rome, 6-15 June 55.

SHUYKIN, N.I.

[Transformations of hydrocarbons on oxide-metal catalysts under elevated temperatures and hydrogen pressures]. Prevrashcheniia uglevodorodov na okisnometallicheskikh katalizatorakh pri provyshennykh temperaturakh i davleniiakh vodoroda. Moskva, Izd-vo Akademii nauk SSSR, 1955. 47 p. (MLRA 8:7)

(Hydrocarbons)

ZELINSKIY, Nikolay Dmitriyevich, 1861-1953 [deceased] KAZANSKIY, B.A., akademik; BALANDIN, A.A., akademik; KOCHESHKOV, K.A.; SHUYKIN, N.I.; KAVERZNEVA, Ye.D, doktor khimicheskikh nauk; LEVINA, R.Ya., doktor khimicheskikh nauk; PLATE, A.F., doktor khimicheskikh nauk; RUBINSHTEYN, A.M., doktor khimicheskikh nauk; YUR'YEV, Yu.K., doktor khimicheskikh nauk; KISELEVA, A.A., tekhnicheskiy redaktor.

[Collected works] Sobranie trudov. Moskva, Izd-vo Akademii nauk SSSR. Vol. 2. 1955. 743 p. (MLRA 8:11)

1. Chlen-korrespondent AN SSSR(for Kocheshkov and Shuykin)
(Hydrocarbons) (Petroleum)

NAMETKIN, Sergey Semenovich, 1876-1950; TOPCHIYEV, A.V. akademik, redaktor; SHUYKIN, N.I., redaktor; BRUSOV, I.I., redaktor; POLYAKOVA, T.V., tekhnicheskiy redaktor.

[Collected works] Sobranie trudov, Moskva, Izd-vo Akademii nauk SSSR Vol. 3. 1955. 799 p. (MLRA8:11)

1. Chlen-korrespondent AN SSSR, (for Shuykin).
(Petroleum--Refining)

ZELINSKIY, N.D.; KAZANSKIY, B.A., akademik; BALANDIN, A.A., akademik; KOCHESHKOV, K.A.; SHUYKIN, N.I.: KAVERZNEVA, Ye.D., doktor khimicheskikh nauk; LEVINA, R.Ya., doktor; khimicheskikh nauk; PLATE, A.F.; doktor khimicheskikh nauk; RUBINSHTEYN, A.M. doktor khimicheskikh nauk; YUR'YEV, Yu.K., doktor khimicheskikh nauk.

[Collected works] Sobranie trudov. Moskva, Izd-vo Akad.nauk SSSR. Vol. 3 1955 719 p. (MLRA 8:8)

1. Chlen-korrespondenty AN SSSR (for Kocheshkov, Shuykin).

NAMETKIN, Sergey Semenovich, 1876-1950;TOPCHIYEV, A.V., akademik, redaktor; SHUYKIN, N.I., redaktor; BRUSOV, I.I., redaktor; POLYAKOVA, T.V., tekhnicheskiy redaktor.

[Petroleum chemistry] Khimiia nefti. Moskva, Izd-vo Akademii nauk SSSR, 1955. 799 p. (MLRA 8:12)

1. Chlen-korrespondent AN SSSR (for Shuykin).
(Petroleum)

SHUYKIN, N.I. [redacted]

Contact-catalytic transformations of benzene and its nearest homologs under the conditions of elevated temperatures and hydrogen pressure. N. I. Shuikin and N. G. Berdnikova (N. D. Zelinskii Inst. Org. Chem., Acad. Sci. U.S.S.R., Moscow). *Izvest. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk* 1955, 100-10; *Bull. Acad. Sci. U.S.S.R., Div. Chem. Sci.* 1955, 95-100(Engl. translation); cf. *C.A.* 48, 12086a; 49, 6259f.—Passage of C_6H_6 over Pt-Al_2O_3 at 460° under 20 atm. H at a space velocity 0.43 l./l. hr. gave 98.3% catalyzate which on fractionation was shown to contain 0.3% isopentane, 0.42% *n*-pentane, 0.65% mixed *n*-pentane, cyclopentane and methylcyclopentane (in 20:75:5 ratio), 0.66% mixed C_6H_{14} and methylcyclopentane contaminated with some C_5 hydrocarbons with branched chains and a trace of cyclohexane, 96.8% mixed C_6H_6 and MePh and about 1.2% higher b. fractions which on oxidation gave BzOH and the 3 isomeric $C_6H_4(CO_2H)_2$; some Ph_2 was also found. Thus C_6H_6 is partly hydrogenated to cyclohexane which is isomerized to methylcyclopentane, which undergoes hydrogenolysis to *n*-pentane and 2-methylbutane, while part of it undergoes hydrogenolysis of hexanes with iso-structures. Since CH_4 was also found, it is believed that CH_3 radicals are also formed in hydrogenolysis of the cyclopentane ring and that they are the source of MePh and xylenes. Similar treatment of MePh gave 8% conversion the products consisting of C_6H_6, lower alkanes, *m*-xylene, *p*-xylene and *o*-xylene (the latter in 50:30:20 ratio), some $C_{10}H_8$ and polyalkylbenzenes. Similar treatment of EtPh gave 22.1% conversion, the products containing *n*-pentane, 2-methylbutane, 2-methylpentane, other hexanes with branched chains, C_6H_6, isomeric xylenes and lower alkanes, as well as $C_{10}H_8$ and diethylbenzenes; CH_4 was also formed along with C_2H_6 and C_3H_8. Thus the MePh and EtPh tend largely toward the elimination of the side chain, which competes with the hydrogenolysis of the ring and its conversion to the cyclopentane ring. CH_3 radicals appear to form in all 3 cases studied. G. M. K.

SHUYKIN, N. I.

The mechanism and kinetics of heterogeneous catalysis in organic chemistry. A. A. Balandin and N. I. Shuikin. *Voprosy Khim. Kinetiki, Kataliza i Reaktsionnoi Sposobnosti, Akad. Nauk S.S.S.R.* 1955, 441–60.—A historical review of the development of heterogeneous catalysis. 85 references. W. M. Sternberg

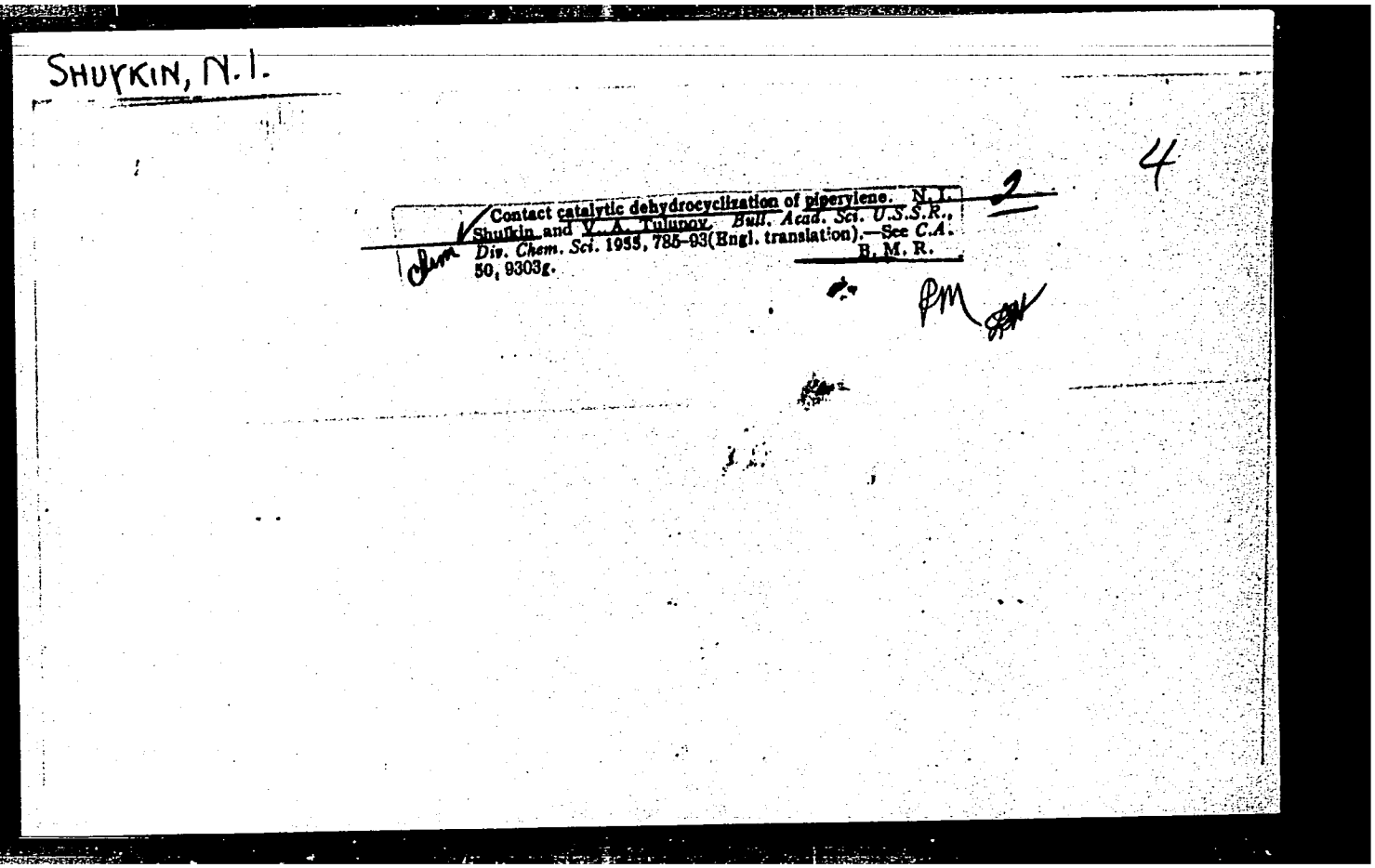
2

SHUYKIN, N. I.

10
8
0

Transformation of methylcyclohexane in contact with metals of the palladium group in a flow system at elevated temperature and pressure of hydrogen. N. I. Shuikin, Kh. M. Minachev, I. M. Feofanova, E. G. Treshchova, T. P. Vasilina, and A. E. Agronomov (N. D. Zelinskii Inst. Org. Chem., Acad. Sci. U.S.S.R., Moscow). *Izvest. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk* 1955, 501–11; *Bull. Acad. Sci. U.S.S.R., Div. Chem. Sci.* 1955, 441–9 (Engl. translation).—The passage of methylcyclohexane at 400° and 20, 35, and 50 atm. H over dispersed Pt, Pd, Rh, and Ru on Al_2O_3 and SiO_2 was studied. At 20 atm. the main reaction is the formation of MePh; with $RhSiO_2$ catalyst the highest content of C_7H_8 (32%) was attained. Along with dehydrogenation, there occur isomerization reactions which yield isomeric dimethylcyclopentanes, as well as demethylation reactions. Usually the isomerization reactions with ring contraction are favored by higher operating pressures. Methylcyclohexane is catalytically converted to dimethylcyclopentanes by contact with Al_2O_3 or SiO_2. Pt-Al_2O_3 and Pd-Al_2O_3 yield principally *trans*-1,2-dimethylcyclopentane; Rh-Al_2O_3 and Ru-Al_2O_3 yield in addn. appreciable amounts of *cis*- and *trans*-1,3-dimethylcyclopentanes. Small amts. of cyclohexane are also formed. G. M. Kosolapoff

(5)



SHUYKIN, N. I.

Contact catalytic dehydrocyclization of piperylene. N. I. Shuikin and V. A. Tulupov. *Bull. Acad. Sci. U.S.S.R., Div. Chem. Sci.* 1955, 785–93(Engl. translation).—See *C.A.* 50, 9303g.

B. M. R.

SHUYKIN, N. I.

3

Chlorination of *n*-dodecane. V. A. Nekrasova and N. I. Shuikin. *Bull. Acad. Sci. U.S.S.R., Div. Chem. Sci.* 1955, 807–8 (Engl. translation).—See *C.A.* 50, 9270e. B. M. R.

Chem 2

SHUYKIN, N.I.

6000

Contact catalytic dehydrocyclization of piperylene. N. I. Shuikin and V. A. Tulupov (M. V. Lomonosov State Univ., Moscow). *Izvest. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk* 1955, 869-70; cf. Frank, *et al.*, *C.A.* 42, 102*h*; Kennedy and Hetzel, *C.d.* 44, 5825*h*.—Dehydrocyclization of piperylene into cyclopentadiene was examd. over: 1:1 Al_2O_3-Cr_2O_3, 1:1, 1:2, 1:4, and 1:6 Al_2O_3-MnO, Al_2O_3-ZnO, $ZnSiO_4$, Mg_2SiO_4, dispersed forms of Pt and Pd, and Pt on SiO_2. The cyclization reaction is definitely catalytic in nature. The yield of cyclopentadiene does not depend on the proportion of cis-trans form content of the initial piperylene, but does depend on the pressure, being lowest at atm. pressure (0.4% at 760 mm.) and highest at 10 mm. (9.7%). The rate consts. for the dehydrocyclization are: 8.03×10^{-5} mole/cm. at 550° and 5.41×10^{-4} mole/cm. at 600°. The activation energy is estd. at 59105 cal./mole. The reaction mechanism is discussed and it is suggested that the cyclization is initiated by a metal-compd. complex of the radical type, the odd electron being located at either the 3- or 5-position of the C chain.

G. M. Kosolapoff

2 Chem Phys

SHUYKIN, N.I

5

Chlorination of *n*-dodecane. V. A. Nekrasova and N. I. Shuikin (N. D. Zelinskii Inst. Org. Chem., Moscow), *Izvest. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk* 1955, 950–1.—The app. and technique employed in this chlorination were described earlier (cf. *C.A.* 49, 10161*e*). Chlorination of dodecane in the presence of NO_2 in best conducted in the liquid phase. About 2% NO_2 gives the best results. At 420° or higher, much decompn. of the products takes place. At 390° in the vapor phase are formed 27.3% 1-chlorododecane, 46.2% secondary chlorides, and 20.8% dichlorides, as shown by fractionation, hydrolysis, and oxidation. A rise in temp. favors the yields of all 3 types of products slightly (1–2% per 30° rise to 420°). In the liquid phase at reflux (215°) the reaction gave 18% primary chloride, 45% secondary chlorides, and 30% dichlorides, with 7% residue. G. M. Kosolapoff

2

Chem

SHUYKIN, N. I.

4

4E3d

1-H/V

Reforming of Tulmazin gasoline in the presence of Troshkov kaolin. N. I. Shuikin and E. A. Timofeeva (N. D. Zelinskii Inst. Org. Chem., Acad. Sci. U.S.S.R., Moscow). *Izvest. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk* 1955, 1053-6.—Tulmazin gasoline was passed at 500° in a flow system over Troshkov activated clay; the S content decreased 95.6%, the octane no. by 19.5 points (Et_4Pb); the aromatic content increased 11%, six-membered cyclanes decreased 60%; five-membered cyclanes increased slightly, and alkanes decreased slightly. This treatment of a gasoline fraction which had been freed of the lightest fractions and most of the normal alkanes gave a product having an octane no. 18.7 points above the original (without Et_4Pb), a 13% higher content of aromatic compds., and 1/7 of the original S content. When the crude gasoline was passed over glass wool at 500°, the decrease of the S content was considerably smaller and the octane no. increased only slightly. G. M. Kosolapoff

gmB

SHUYKIN, N. I.

USSR/ Chemistry - Organic chemistry

Card 1/1 Pub. 40 - 15/26

Authors : Popov, M. A., and Shuykin, N. I.

Title : Catalytic amination of alcohols

Periodical : Izv. AN SSSR. Otd. khim. nauk 2, 308 - 313, Mar-Apr 1955

Abstract : Experiments were conducted to determine whether the conversion of alcohols into amines is followed by an intermediate phase of formation of aldehydes, ketones, ethers or unstable alcohol-catalyst compounds. It was established that amines are formed during catalytic amination of alcohols through direct separation of water elements from the alcohol and ammonia molecules or directly from the amine or alcohol during their collision on the surface of the catalyst. The most favorable conditions for the amination of alcohols were found to be in the presence of platinum coated silica gel or active carbon as catalysts. Twenty-six references: 11 Russian and USSR, 10 German, 2 USA and 3 French (1880-1953). Tables.

Institution : Acad. of Sc., USSR, The N. D. Zelinskiy Inst. of Organ. Chem.

Submitted : March 16, 1954

SHUYKIN, N.I.

USSR/ Chemistry - Organic chemistry

Card 1/1 Pub. 40 - 16/26

Authors : Shuykin, N. I., and Timofeyeva, Ye. A.

Title : Conversions of individual hydrocarbons during contact with natural aluminosilicates. Part 3.

Periodical : Izv. AN SSSR. Otd. khim. nauk 2, 314 - 322, Mar-Apr 1955

Abstract : The conversion of two representatives of five-membered cyclanes - cyclopentane and ethylcyclopentane as well as ethylcyclohexane and ethyl benzene - was investigated at 500° with activated Torshkov clay in the role of contact. It was established that the depth of cyclane conversion increases with the increase in their molecular weight. A study of the characteristics of ethylcyclohexane and ethyl benzene showed that the catalytic reaction leading to the synthesis of alkyl substitutes has a much higher rate than the dehydrogenation reaction of the basic ethylcyclohexane. Three USSR references: (1951-1954). Tables; graphs.

Institution : Acad. of Sc., USSR, The N. D. Zelinskiy Inst. of Organ. Chem.

Submitted : April 14, 1955

SHUYKIN, N.I.; MINACHEV, Kh.M.; FEOFANOVA, L.M.; TRESHCHOVA, Ye.G.; YUDKINA, T.P.; AGRONOMOV, A.Ye.

Conversions of methylcyclohexane in contact with metals of the palladium group in flow and at increased temperature and increased hydrogen pressure. Izv.AN SSSR. Otd.khim.nauk no.3: 501-511 My-Je '55. (MLRA 8:9)

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

(Cyclohexane) (Catalysts, Platinum metals)

SHUYKIN,N.I.; TIMOFEYEVA,Ye.A.; SLADKIKH,V.M.

Contact-catalytic conversions of n-pentane in presence of a chromium aluminum magnesium catalyst. Izv.AN SSSR. Otd.khim. nauk no.3:567-569 My-Je '55. (MLRA 8:9)

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

(Pentane)

SHUYKIN, N.I.;TULUPOV, V.A.

Contact-catalytic dehydrocyclization of piperylene. Izv.AN SSSR.Otd. khim.nauk no.5:869-879 S-O '55. (MLRA 9:1)

1.Moskovskiy gosudarstvennyy universitet imeni M.V.Lomonosova.
(Piperylene)

NEKRASOVA, V.A.; SHUYKIN, N.I.

Chlorination of n-dodecane. Izv.AN SSSR. Otd.khim.nauk no.5:950-951 S-O '55. (MLRA 9:1)

1.Institut organicheskoy khimii imeni N.D.Zelinskogo Akademii nauk SSSR.

(Dodecane)

SHUYKIN, N.I.;DOBRYNINA, T.P.;TIMOFEYEVA, Ye.A.;YEGOROV, Yu.P,

Catalytic dehydrogenation of isopentane. Izv.AN SSSR.Otd.khim. nauk no.5:952-953 S-O '55. (MLRA 9:1)

1.Institut organicheskoy khimii imeni N.D.Zelinskogo Akademii nauk SSSR. (Butane) (Dehydrogenation)

SHUYKIN, N.I.

Conversions of hydrocarbons on metal catalysts at increased temperatures and hydrogen pressures. Uch.zap. AGU no.8:23-36 '55. (MLRA 9:11)

(Hydrocarbons) (Catalysts)

SHUYKIN, N.I.

5

Chem 2

Synthesis of primary alcohols. N. I. Shuikin and V. A. Tulupov. *Vestnik Moskov. Univ.* 10, No. 12, *Ser. Fiz. Mat. i Estestven. Nauk* No. 8, 93–4(1955).—The monomeric CH_2O necessary for good yields of primary alcs. in the reaction with RMgX (cf. Ziegler, *C.A.* 15, 3090) is conveniently generated in a glass vessel with a wide sidearm which leads into the reaction flask; the vessel and the sidearm are wound with an electric heater wire. Best yields are obtained by the use of but 1.3 moles paraformaldehyde per mole of RMgX.

G. M. Kosolapoff

PM

SHUYKIN,N.I.; TULUPOV,V.A.; BEL'SKIY,I.F.

On the hydration of the furan ring. Zhur.ob.khim.25 no.6:1175-1178 Je'55. (MLRA 8:12)

1. Moskovskiy Gosudarstvennyy universitet
(Furan) (Hydration)

SHUYKIN, N.I.

6

Contact-catalytic transformations of tetrahydrosylvan into cyclopentadiene. N. I. Shuikin, V. A. Tulupov, and I. G. Ilel'skii (State Univ., Moscow). *Zhur. Obshchel Khim.* 25, 1023-9(1955); cf. *C.A.* 33, 1310[1].—Passage of tetrahydrosylvan over oxide catalysts (mixed TiO_2–Al_2O_3 in various proportions, ThO_2–TiO_2, Mn oxide-alumina, or Zn_2SiO_4) at 550–600° under 18–60 mm. pressure yields up to 20% cyclopentadiene and 60% piperylene. These result from parallel reactions, but cyclopentadiene also forms in part from piperylene. The best yield (20%) of cyclopentadiene resulted from 5% Al_2O_3–TiO_2 catalyst at a space velocity of 1 of the feed at 600° and 25–30 mm. pressure. G. M. K.

CH

(2)

SHUYKIN, N.I.; TIMOFEYEVA, Ye.A.

Reforming of Tuimaza gasoline in contact with Treshkov kaolin. Izv.AN SSSR Otd.khim.nauk 86 no.6:1056 My '55. (MLRA 9:4)

1.Institut organicheskoy khimii imeni N.D.Zelinskogo Akademii nauk SSSR.
(Tuimazy--Gasoline) (Kaolin)

Shoykin, N. E.

USSR/ Chemistry - Catalysts

Card 1/2 Pub. 22 - 23/52

Authors : Freydlin, L. Kh.; Tulupova, E. D.; Borunova, N. V.; Minachev, Kh. M.; and Shuykin, N. E., Memb. Corresp. of Acad. of Sc. USSR

Title : Selective increase of $Ni-Al_2O_3$ catalyst stability by compressing

Periodical : Dokl. AN SSSR, 100/2, 283-286, Jan 11, 1955

Abstract : Investigation was conducted to determine the effect of two different organic substances on the stability of $Ni-Al_2O_3$ catalysts prior and after compressing the catalyst. The relative stability of the compressed and uncompressed catalysts was established by the change in their activity during dehydrogenation reactions of cyclohexane and narrow Maykop gasoline fractions.

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

Submitted : July 13, 1954

Periodical : Dok. AN SSSR, 100/2, 283-286, Jan 11, 1955

Card 2/2 Pub. 22 - 23/52

Abstract : It was found that compressing will increase the stability of an $Ni-Al_2O_3$ catalyst during the dehydrogenation of hydro-aromatic hydrocarbons in the presence of a poison-five-membered cyclene. In the case of poisoning with thiophene, which occurs according to a different mechanism, compressing shows no effect on the catalyst stability. Six USSR references (1926-1953). Graphs.

SHUYKIN, N.I.

USSR/ Chemistry - Hydrocarbon conversion

Card 1/1 Pub. 22 - 32/60

Authors : Shuykin, N. I., Memb. Corresp. of Acad. of Sc., USSR.; and Tulupov, V. A.

Title : The kinetics of piperylene conversion into cyclopentadiene

Periodical : Dok. AN SSSR 100/4, 731-733, Feb 1, 1955

Abstract : The kinetics of C_5H_8 conversion into C_5H_6 was investigated to determine the nature of the C_5H_8 cyclization process. It was established that the yield of C_5H_6 at temperatures of 600° and pressures of 30 mm depends upon the presence and nature of the catalyst and that the cyclization process is quite complicated leading to the formation of pentenes, pentanes and gases (in addition to C_5H_6), which are formed as result of cracking of the basic C_5H_8 and probably also as result of secondary conversion of the pentanes and pentenes. The conversion reaction was found to be catalytic and the activation energy was estimated at 59105 cal/mol. Three references: 2 USSR and 1 English (1948 and 1950). Table.

Institution : The M. V. Lomonosov State Universtity, Moscow

Submitted : September 8, 1954

SHUYKIN, N. I.

USSR/ Chemistry - Dehydrogenation catalysts

Card 1/1 Pub. 22 - 28/51

Authors : Shuykin, N. I., Memb. Corresp. of Acad. of Sc., USSR.; Minachev, Kh. M.; and Ryashentseva, M. A.

Title : Active and st ble Pd catalyst for dehydrogenation of six-membered cyclanes

Periodical : Dok. AN SSSR 101/1, 107-109, Mar 1, 1955

Abstract : The activity and stability of a newly produced catalyst (containing only 0.5% Pd) were tested on a benzene fraction dehydrogenated at 450-460°, 20 atm of hydrogen pressure and molar hydrogen - hydrocarbon ratio of 5 : 1. The throughput ratio was 1 liter/liter of the catalyst per hr. The results obtained are briefly described. The sulfur content of the benzene fraction showed no effect of the activity of the catalyst. Ten Russian and USSR references (1911-1954). Graph.

Institution : Acad. of Sc., USSR, The N. D. Zelinskiy Institute of Org. Chem.

Submitted : October 4, 1954

SHUYKIN, N.I.

USSR/ Chemistry - Organic chemistry

Card 1/1 Pub. 22 - 21/51

Authors : Popov, M. A., and Shuykin, N. I., Memb, Corresp. of Acad. of Sc. USSR

Title : Catalytic synthesis of cyclopentylamine

Periodical : Dok. AN SSSR 101/2, 273-276, Mar 11, 1955

Abstract : The synthesis of cyclopentylamine (high yield) through reduction amination of various ketones in vaporous phase in the presence of a suitable catalyst is described. In view of the fact that the catalyst in this case was required to produce reducing and amination effects it was decided to use nickel on pumice or nickel on active Al_2O_3 in the role of catalysts. The choice of the above-mentioned catalysts was found to bring successful results. Five references: 2 USSR, 2 German and 1 French (1885-1953). Table.

Institution : Acad. of Sc. USSR, The N. D. Zelinskiy Inst. of Org. Chem.

Submitted : October 4, 1954

TOPCHIYEV,A.V.; ZAVGORODNIY,S.V.; PAUSHKIN,Ya.M.; SHUYKIN,N.I., redaktor; STRUCHKOV,Yu.T., redaktor; ZELENKOVA,Ye.V., tekhnicheskiy redaktor

[Boron fluoride and its compounds as catalyzers in organic chemistry] Ftoristyi bor i ego soedineniia kak katalizatory v organicheskoi khimii. Moskva, Izd-vo Akademii nauk SSSR, 1956. 356 p. (MLRA 9:4)

1. Chlen-korrespondent AN SSSR (for Shuykin)
(Boron fluoride)

SHUYKIN, N. I.

USSR/Chemistry - Conversion processes

Card 1/2 Pub. 40 -10/25

Authors : Shuykin, N. I.; Berdnikova, N. G.; and Yegorov, Yu. P.

Title : Conversions of n-propyl-and isopropylbenzene over a nickel-alumina catalyst at increased temperatures and hydrogen pressures

Periodical : Izv. AN SSSR. Otd. khim. nauk 1, 43-49, Jan 1956

Abstract : An investigation was made to determine the catalytic conversions of n-propyl- and isopropylbenzenes over a nickel-alumina catalyst at various temperatures and hydrogen pressures. Results showed that approximately 98% of the basic hydrocarbons experience a thorough conversion at a 465° temperature. Hydrogenolysis of the side chain with the formation of dealkylation products was found to be the basic reaction in the conversion of isomeric propyl benzenes.

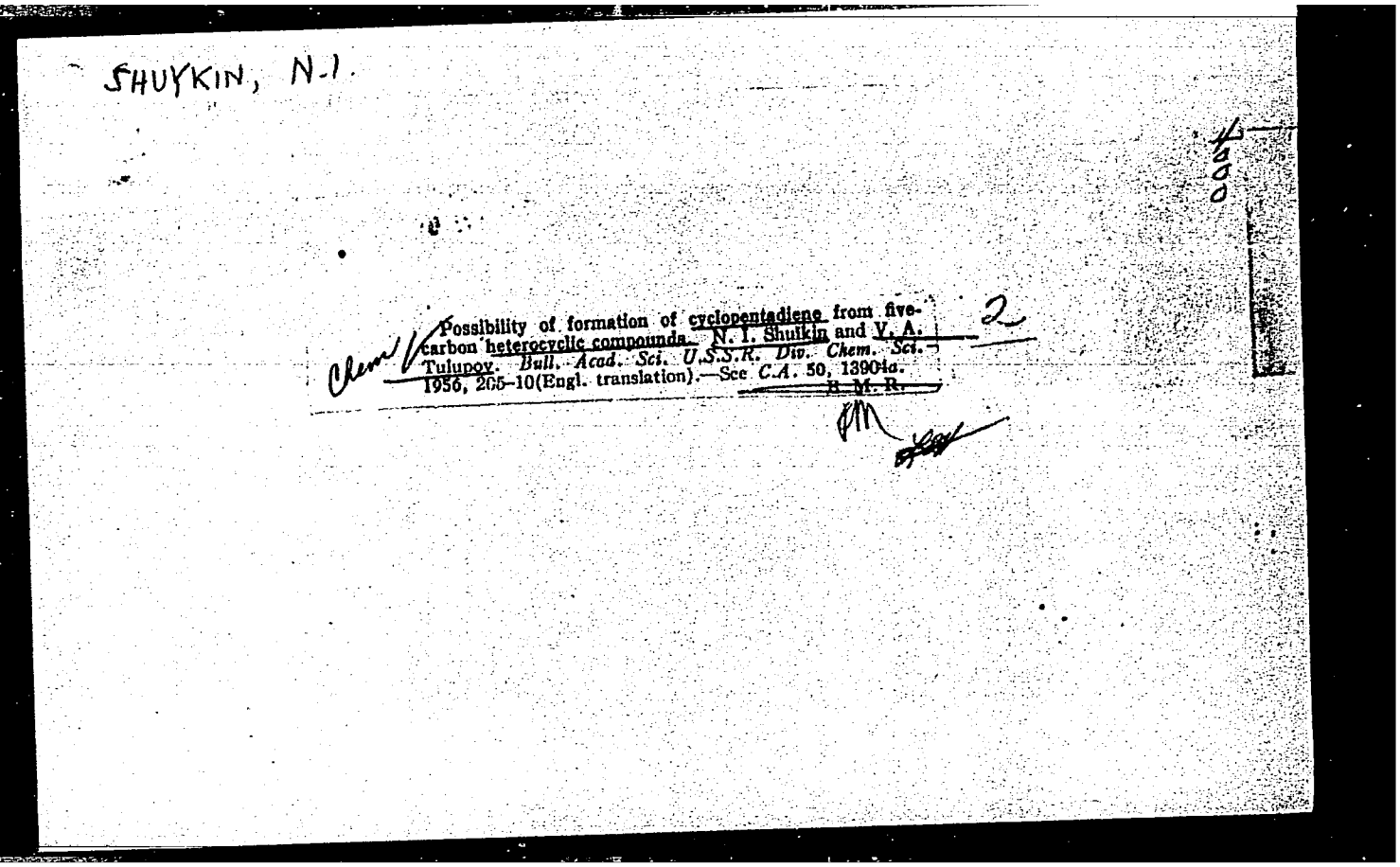
Institution : Acad. of Sc., USSR, Inst. of Organ. Chem. im. N. D. Zelinskiy

Submitted : March 12, 1955

Card 2/2 Pub. 40 - 10/25

Periodical : Izv. AN SSSR. Otd. khim. nauk 1, 43-49, Jan 1956

Abstract : The hydrogenation of the benzene nucleus, contraction of the six-membered cycle into a 5-membered one follow parallel with the hydrogenolysis. The formation of methylation products by the methylene radicals due to the decomposition of the catalyst was observed. Twelve references: 9 USSR, 1 Germ. and 2 Eng. (1903-1955). Tables

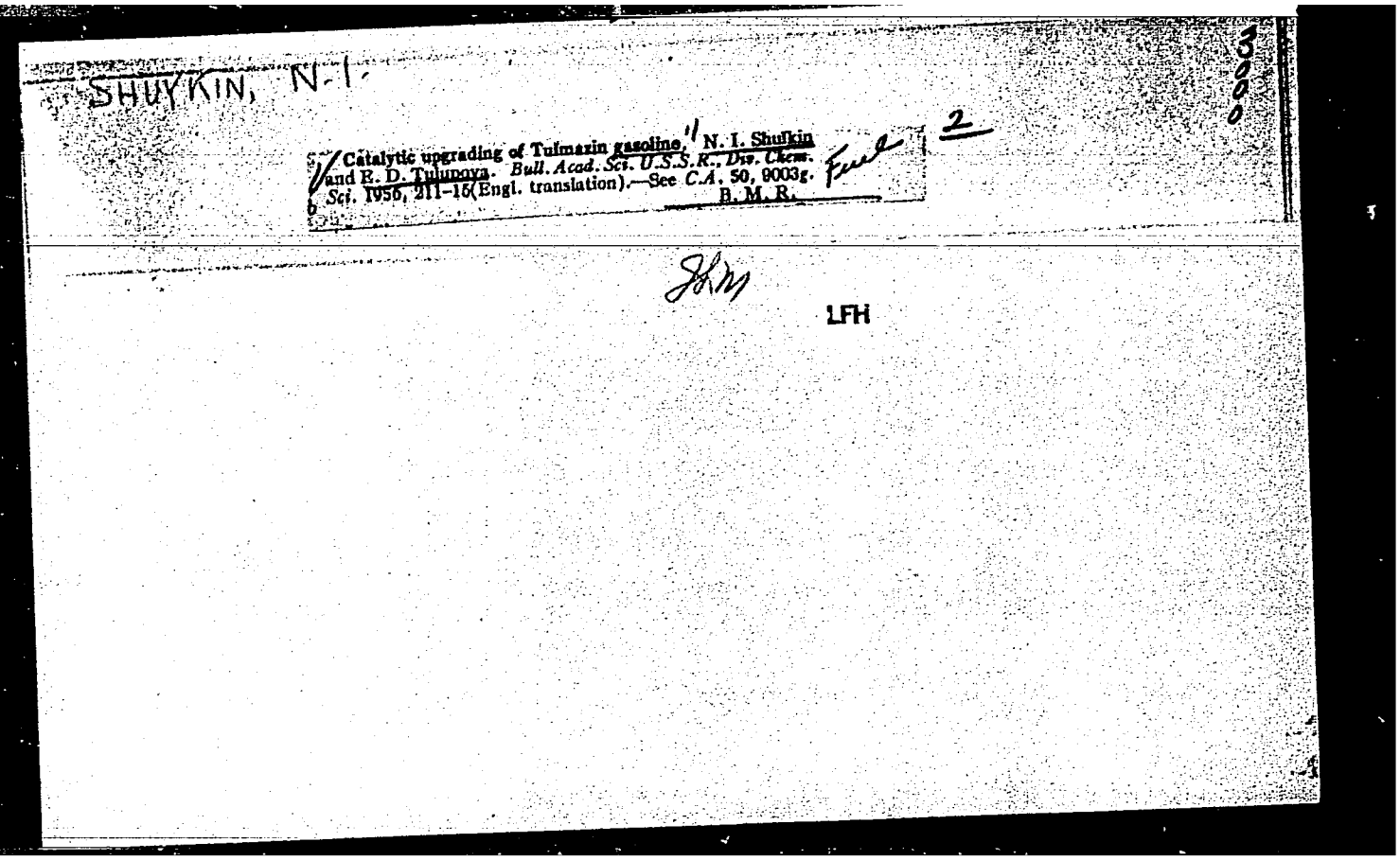


SHUYKIN, N.I.

Chem

Possibility of formation of cyclopentadiene from five-carbon heterocyclic compounds. N. I. Shuikin and V. A. Tulupov. *Bull. Acad. Sci. U.S.S.R. Div. Chem. Sci.* 1956, 265-10(Engl. translation).—See *C.A.* 50, 13904a. B. M. R.

2



SHUYKIN, N.I.

Catalytic upgrading of Tulmazin gasoline. N. I. Shulkin and R. D. Tulupova. *Bull. Acad. Sci. U.S.S.R., Div. Chem. Sci.* 1956, 211-16(Engl. translation).—See *C.A.* 50, 9003g. B. M. R.

Fuel 2

3000

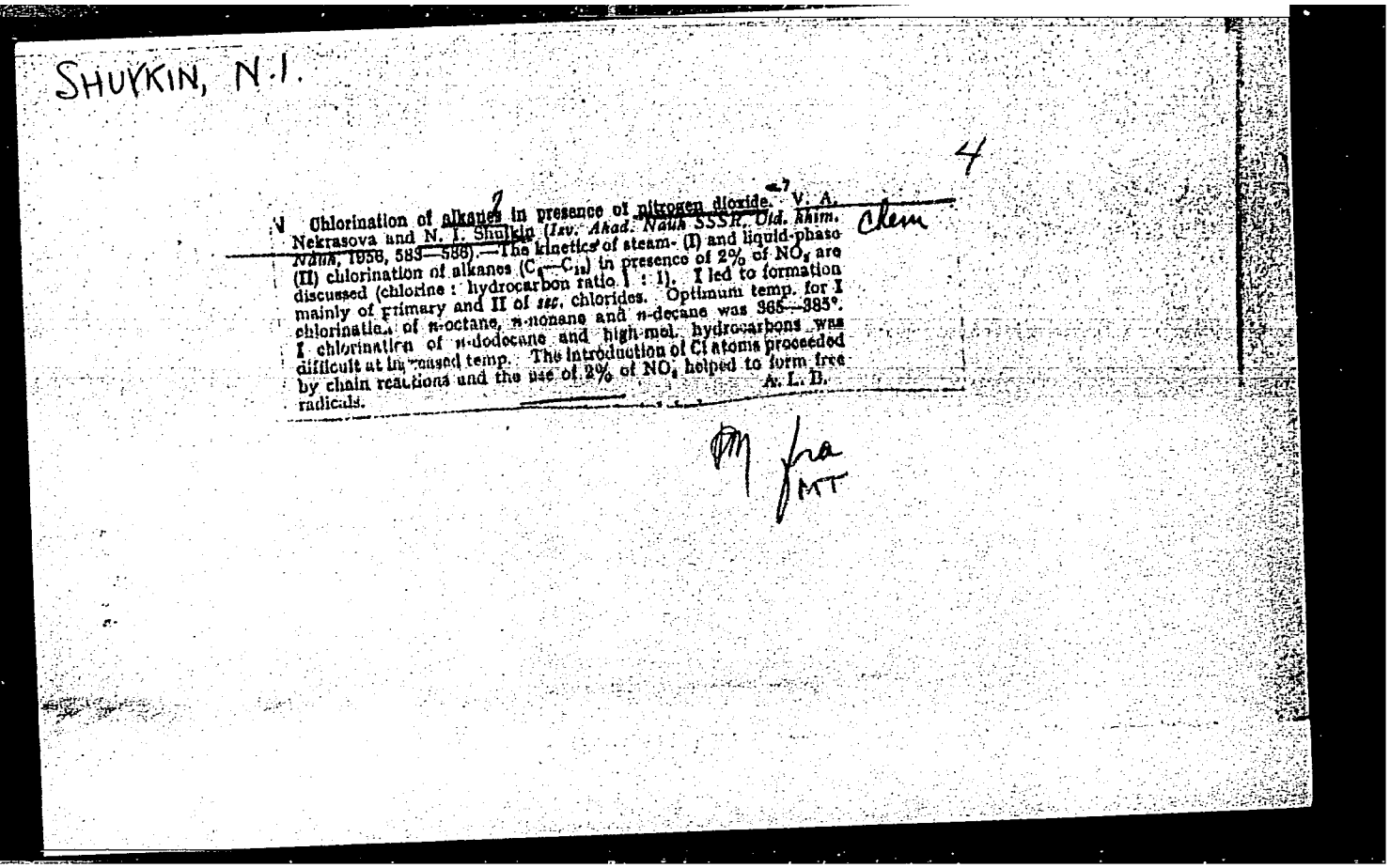
LFH

SHUYKIN, N. I.

Transformation of *n*-decane under hydrogen pressure in the presence of platinized alumina at elevated temperature. Kh. M. Minachev, N. I. Shuikin, L. M. Feofanova, and Yu. P. Egorov (N. D. Zelinskii Inst., Org. Chem., Moscow). *Izvest. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk* 1956, 352–7; *Bull. Acad. Sci. U.S.S.R., Div. Chem. Sci.* 1956, 337–41(Engl. translation).—*n*-Decane (I) was passed over 1% Pt-Al_2O_3 at 460° under 30–50 atm. H at an H-I ratio of 5:1. Among the substances found in the catalyzate were aromatic hydrocarbons (MePh and xylenes), 5- and 6-membered cycloalkanes and mono- and disubstituted isoalkanes with C_{7-10} skeletons. These were characterized by phys. properties including the infrared spectra. Identification was made of 2- and 3-methylhexane and methylcyclopentane. The fraction of mixed isodecanes contained 70% singly branched compds. G. M. Kosolapoff

4

Phys

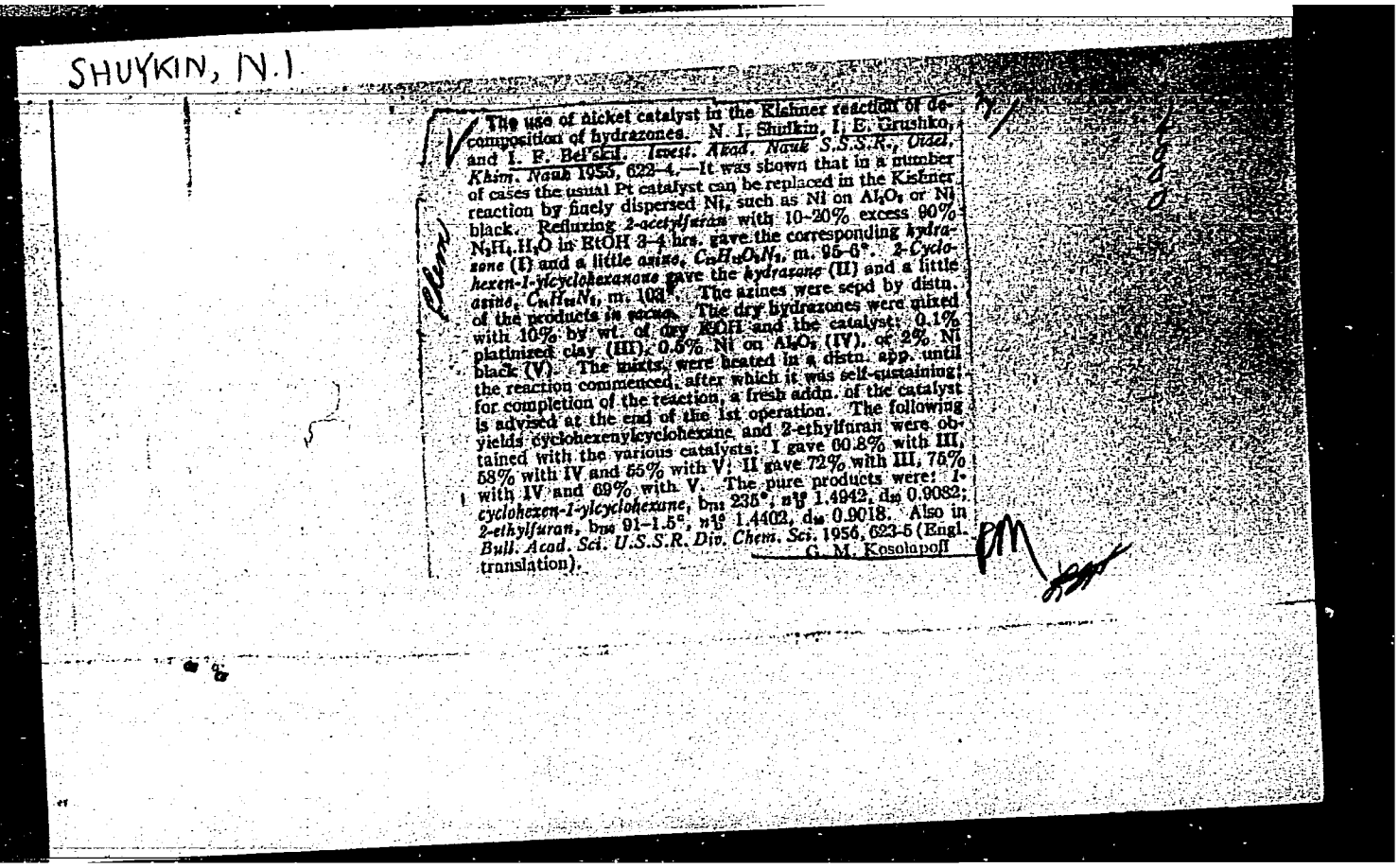


SHUYKIN, N.I.

4

Chlorination of alkanes in presence of nitrogen dioxide. V. A. Nekrasova and N. I. Shuikin (*Izv. Akad. Nauk SSSR, Otd. khim. Nauk*, 1958, 583—586).—The kinetics of steam- (I) and liquid-phase (II) chlorination of alkanes (C_6—C_{12}) in presence of 2% of NO_2 are discussed (chlorine : hydrocarbon ratio 1 : 1). I led to formation mainly of primary and II of *sec.* chlorides. Optimum temp. for I chlorination of *n*-octane, *n*-nonane and *n*-decane was 365—385°. I chlorination of *n*-dodecane and high-mol. hydrocarbons was difficult at increased temp. The introduction of Cl atoms proceeded by chain reactions and the use of 2% of NO_2 helped to form free radicals. A. L. B.

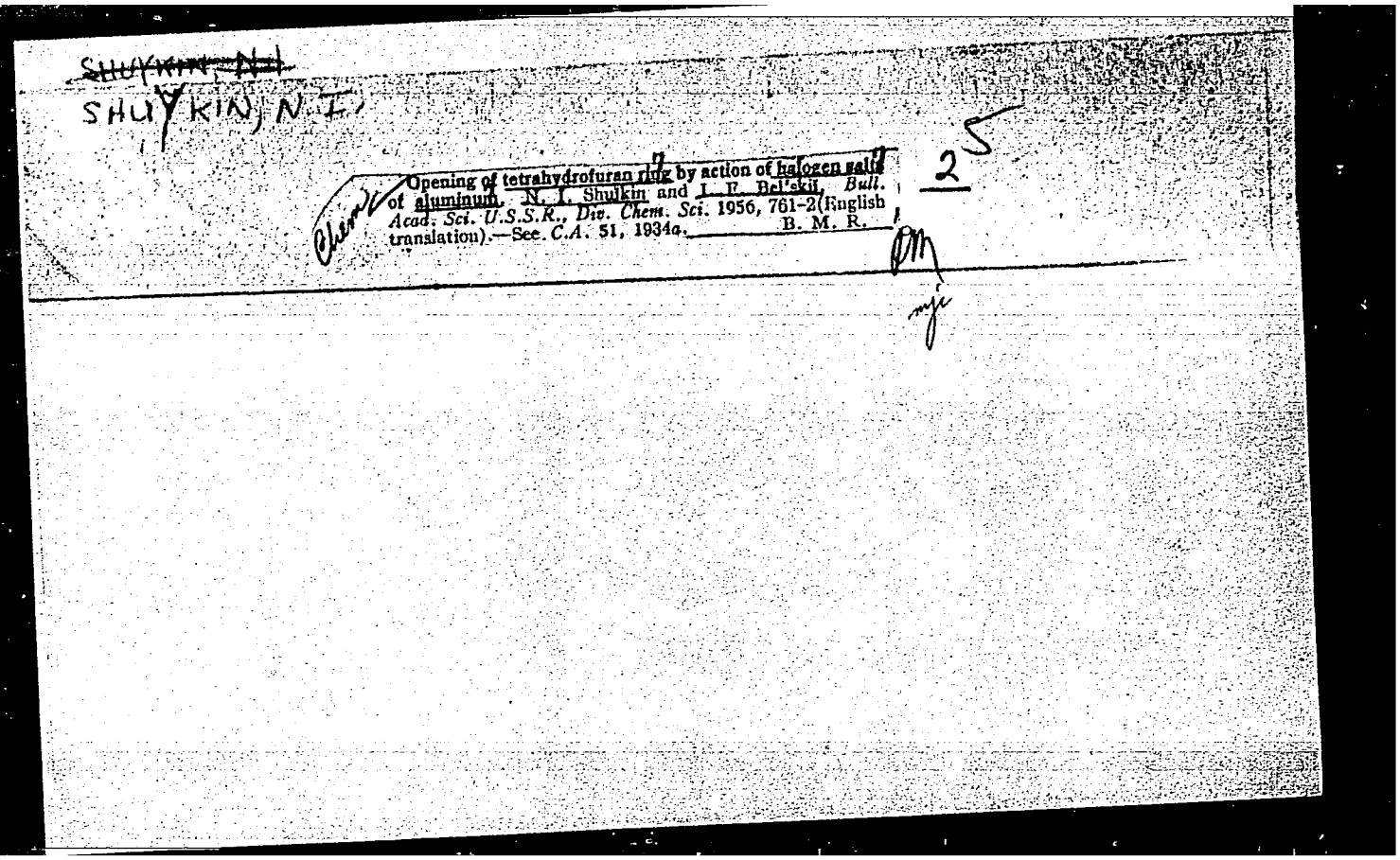
Chem



SHUYKIN, N.I.

The use of nickel catalyst in the Kishner reaction of decomposition of hydrazones. N. I. Shuikin, I. E. Grushko, and I. F. Bel'skii. *Izvest. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk* 1955, 622–4.—It was shown that in a number of cases the usual Pt catalyst can be replaced in the Kishner reaction by finely dispersed Ni, such as Ni on Al_2O_3 or Ni black. Refluxing *2-acetylfuran* with 10–20% excess 90% $N_2H_4.H_2O$ in EtOH 3–4 hrs. gave the corresponding *hydrazone* (I) and a little *azine*, $C_{10}H_{10}O_2N_2$, m. 95–6°. *2-Cyclohexen-1-ylcyclohexanone* gave the *hydrazone* (II) and a little *azine*, $C_{24}H_{36}N_2$, m. 103°. The azines were sepd by distn. of the products in vacuo. The dry hydrazones were mixed with 10% by wt. of dry KOH and the catalyst: 0.1% platinized clay (III), 0.5% Ni on Al_2O_3 (IV), or 2% Ni black (V). The mixts. were heated in a distn. app. until the reaction commenced, after which it was self-sustaining; for completion of the reaction, a fresh addn. of the catalyst is advised at the end of the 1st operation. The following yields cyclohexenylcyclohexane and 2-ethylfuran were obtained with the various catalysts: I gave 60.8% with III, 58% with IV and 55% with V; II gave 72% with III, 76% with IV and 69% with V. The pure products were: 1-*cyclohexen-1-ylcyclohexane*, b_{11} 238°; n_D^{20} 1.4942, d_4^{20} 0.9082; *2-ethylfuran*, b_{760} 91–1.5°, n_D^{20} 1.4402, d_4^{20} 0.9018. Also in *Bull. Acad. Sci. U.S.S.R. Div. Chem. Sci.* 1956, 623-5 (Engl. translation).

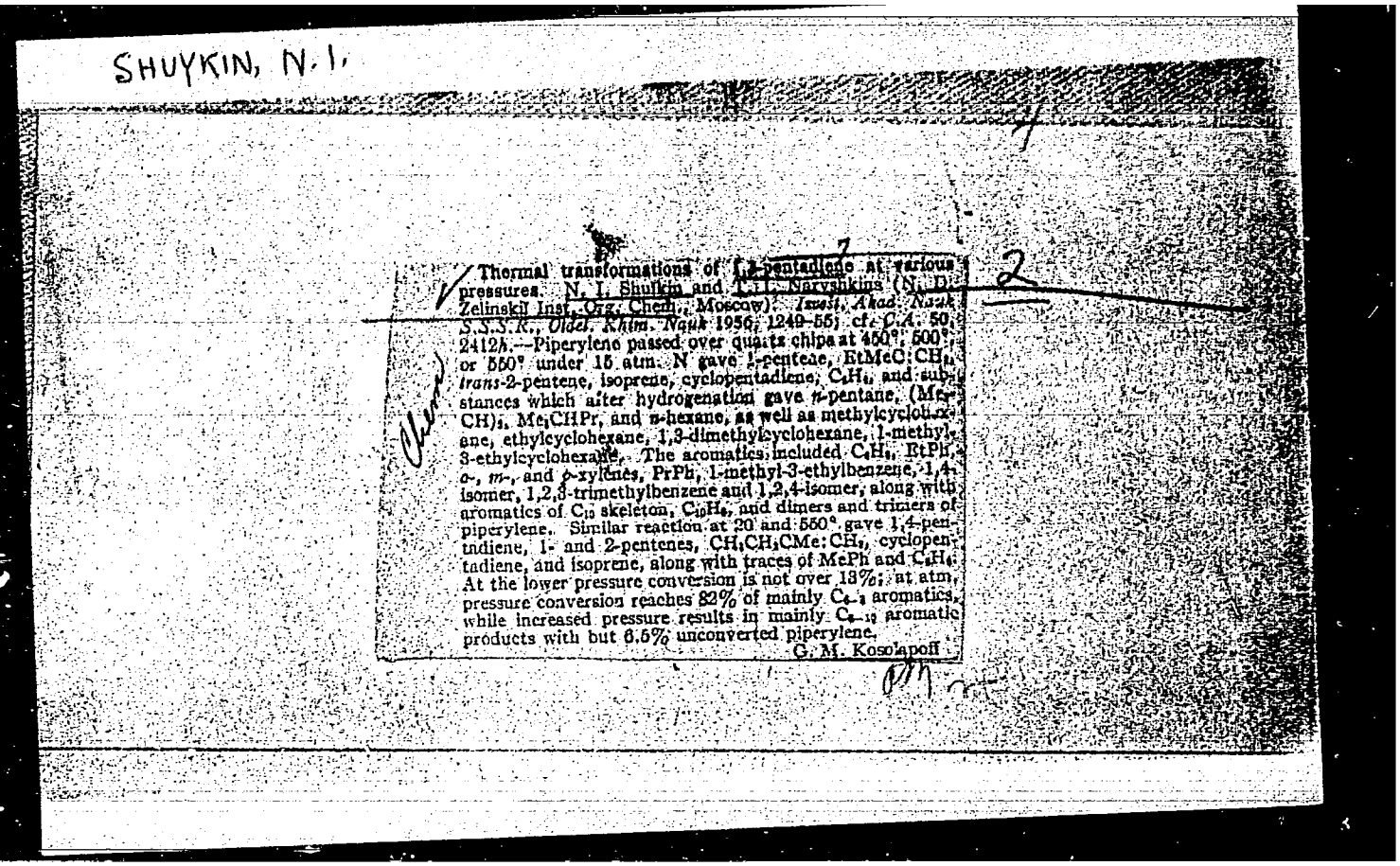
G. M. Kosolapoff



SHUYKIN, N.I.

Opening of tetrahydrofuran ring by action of halogen salts of aluminum. N. I. Shuikin and I. F. Bel'skii, *Bull. Acad. Sci. U.S.S.R., Div. Chem. Sci.* 1956, 761-2(English translation).—See *C.A.* 51, 1934a. B. M. R.

25



SHUYKIN, N. I.

Thermal transformations of 1,3-pentadiene at various pressures. N. I. Shuikin and T. L. Narvshkina (N. D. Zelinskii Inst. Org. Chem., Moscow). *Izvest. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk* 1956, 1249–55; cf. *C.A.* 50, 2412h.—Piperylene passed over quartz chips at 450°, 500°, or 550° under 15 atm. N gave 1-pentene, EtMeC:CH$_2$, *trans*-2-pentene, isoprene, cyclopentadiene, C_5H_6, and substances which after hydrogenation gave *n*-pentane, $(Me_2CH)_2$, Me_2CHPr, and *n*-hexane, as well as methylcyclopentane, ethylcyclohexane, 1,3-dimethylcyclohexane, 1-methyl-3-ethylcyclohexane. The aromatics included C_6H_6, EtPh, *o*-, *m*-, and *p*-xylenes, PrPh, 1-methyl-3-ethylbenzene, 1,4-isomer, 1,2,3-trimethylbenzene and 1,2,4-isomer, along with aromatics of C_{10} skeleton, $C_{10}H_8$, and dimers and trimers of piperylene. Similar reaction at 20° and 550° gave 1,4-pentadiene, 1- and 2-pentenes, $CH_3CH_2CMe:CH_2$, cyclopentadiene, and isoprene, along with traces of MePh and C_6H_6. At the lower pressure conversion is not over 18%; at atm. pressure conversion reaches 82% of mainly C_{6-8} aromatics, while increased pressure results in mainly C_{8-10} aromatic products with but 6.5% unconverted piperylene.

G. M. Kosolapoff

SHUYKIN, N.I.

4

Mechanism of reaction of hydration and dehydration in the presence of zinc halides. A. E. Kuchkarev and N. I. Shuikin (N. D. Zelinskii Inst. Org. Chem., Moscow).

Izvest. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk 1956, 1469–77.—The possible mechanisms of dehydration of alcs. and hydration of olefins in the presence of $ZnCl_2$ or ZnX_2 in general, are discussed, with 23 references. It is concluded that such reactions proceed usually through carbonium ion formation, with participation of Zn in the form of complex ions such as $ZnX_2(OH)_2^{--}$ or complexes such as $ZnCl_2 \cdot 2ROH$. Such complexes are essentially identical for reactions of olefins or of alcs. G. M. Kosolapoff

Proof

PETROV, A.D.; SHUYKIN, N.I.

A month spent among the chemists of France. Khim.nauka i prom. 1 no.5:583-588 '56. (MLRA 9:12)

1. Chlen-korrespondenty Akademii nauk SSSR.
(France--Chemistry, Industrial)

SHUYKIN, N.I.; TULUPOV, V.A.

Possible formation of cyclopentadiene from heterocyclic compounds with five carbon atoms in a molecule. Izv.AN SSSR Otd.khim.nauk no.2:213-219 F '56. (MLRA 9:7)

1.Moskovskiy gosudarstvennyy universitet imeni M.V.Lomonosova.
(Cyclopentadiene)

SHUYKIN, N.I.; TULUPOVA, Ye.D.

Contact-catalytic refining of the Tuimazy gasoline. Izv.AN SSSR Otd. khim.nauk no.2:220-225 F '56. (MLRA 9:7)

1.Institut organicheskoy khimii imeni N.D.Zelinskogo Akademii nauk SSSR.

(Tuimazy--Gasoline)

SHUYKIN, N.I.

B-9

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

Abs Jour : Referat Zhur - Khimiya, No 4, 1957, 11293

Author : Shuykin N.I., Tulupov V.A.
Inst : Moscow University
Title : On Catalytic Hydrogenation of Pyridine

Orig Pub : Vestn. Mosk. un-ta, 1956, No 3, 73-79

Abstract : A study was made of hydrogenation of pyridine under flow conditions at space velocity 0.1 hour^{-1} on skeleton Ni-catalyst (prepared from an alloy 73% Al + 27% Ni), having an excess H_2. It is shown that besides piperidine there are formed 1-aminopentane, pyrrole, alpha-, beta- and gamma-picoline and alpha- aminopyridine. There is proposed a mechanism of formation of the reaction by-products over the groups CH_2, CH_3, NH_2, C_5H_4N and H atoms.

1/1

SHUYKIN, N. I.

USSR/Organic Chemistry - Synthetic Organic Chemistry, E-2

Abst Journal: Referat Zhur - Khimiya, No 19, 1956, 61424

Author: Minachev, Kh. M., Shuykin, N. I., Feofanova, L. M., Yegorov, Yu. P.

Institution: None

Title: Conversions of n-Decane in the Presence of Platinized Alumina at Elevated Temperature and Hydrogen Pressure

Original Periodical: Izv. AN SSSR, Otd. khim. n., 1956, No 3, 352-357

Abstract: Investigated were contact-catalytic conversions of $n\text{-}C_{10}H_{22}$ in flow system over platinized alumina (Referat Zhur - Khimiya, 1956, 12800) at elevated temperature and H_2 pressure. $n\text{-}C_{10}H_{22}$ (BP 174.11°) prepared by Grignard reaction by action of C_3H_7CHO on C_6H_{13}[illegible]r, and subsequent dehydration of the formed $sec\text{-}C_{10}H_{21}OH$ over Al_2O_3 at 320° and hydrogenation of the reaction product in vapor phase in presence of 1% Pt/C at 210° and normal pressure. $n\text{-}C_{10}H_{22}$ was brought in contact with catalyst at [illegible]pace velocity 1.1 hour^{-1}, and molal ratio H_2:n $C_{10}H_{22}$ = 5:1, H_2 pressure 30-50 atm

Card 1/2

USSR/Organic Chemistry - Synthetic Organic Chemistry, E-2

Abst Journal: Referat Zhur - Khimiya, No 19, 1956, 61424

Abstract: and temperature 460°. Catalyzates are characterized by $n^{20}D$ and d_4^{20} and content in aromatic hydrocarbons which were separated by adsorption on silica gel. n-alkanes were separated from isoalkanes by means of urea. Products of catalysis were subjected to spectral analysis in IKS-11 spectrometer (slit 0.2 mm, concentration of hydrocarbon in CCl_4 1:50 by volume). It was found that greatest changes on increase in number of CH_3-groups are observed at peaks 3.51, 3.42 and 3.38 μ. With increasing branching of hydrocarbon the first 2 peaks decrease and the third increases. From the magnitude of ratios 3.51:3.38 and 3.42:3.38 an opinion was formed of the extent of branching of the hydrocarbon. It was found that under the described conditions n-$C_{10}H_{22}$ undergoes a series of extensive conversions as a result of which are formed aromatic hydrocarbons 5 and 6-membered cyclanes and mono- and disubstituted isoalkanes C_7 - C_{10}. The content of monosubstituted decanes in the total mass of isodecanes is 70%.

Card 2/2

SHUYKIN, N.I.; BEL'SKIY, I.F.

Disclosure of the tetrahydrofuran cycle with aluminum halides.
Izv.AN SSSR.Otd.khim.nauk no.6:747-748 Je '56. (MLRA 9:9)

1.Institut organicheskoy khimii imeni N.D.Zelinskogo Akademii nauk SSSR.
(Furan) (Aluminum halides)

SHUYKIN, N. I.

Catalytic hydrogenation of pyridine. N. I. Shuĭkin and V. S. Tulupov. *Vestnik Moskov. Univ.* 11, No. 3, *Ser. Fiz.-Mat. i Estestven. Nauk* No. 2, 73–9(1956).—Hydrogenation of pyridine over Ni-Al contg. 27% Ni by using the previously described technique (cf. *C.A.* 33, 1310[1]) at 150° with flow rate of pyridine of 0.1 hr.$^{-1}$ space velocity and with substantial excess of H resulted in inactivation of the catalyst in 6–8 hrs.; it was regenerated by H_2 4–5 hrs. at 260°. The products of hydrogenation included piperidine as well as 1-aminopentane, pyrrole, 2-, 3-, and 4-methylpyridines, and 2-aminopyridine. The by-products are formed apparently by a reaction of a radical type, the mechanism of which is discussed at length. The yields of the higher-boiling products were relatively low and no precise data were supplied as to the real yields of these substances, all of which were identified by their phys. consts. and numerous derivs.

G. M. Kosolapoff

SHUYKIN, N. I.

Chem

Contact catalytic transformations of phenols. I. Transformations of 3,4-xylenol on a nickel-alumina catalyst in a stream of hydrogen. N. I. Shuikin, E. A. Viktorova, and M. I. Cherkashin. *Vestnik Moskov. Univ.* 11, No. 6, *Ser. Fiz.-Mat. i Estestven. Nauk* No. 4, 57-60(1956).—When 3,4-xylenol (I) was heated in H at atm. pressure with an Al_2O_3-Ni (20% Ni) catalyst in a Mo glass reactor, the catalysis products (in 92-3% yield based on the original I) at 150°, 200°, and 250°, resp., were: NaOH-sol. matter (residual I), 18.3, 4.9, 36.4%; nonphenolic, 79.3, 82.2, 56.2%; water, 2.4, 12.9, 8.4%. The compn. of the nonphenolic portion was, resp.: methylcyclohexane, 2.0, 4.3, 6.2%; toluene, trace, 0.5, 2.4%; mixed *cis*- and *trans*-1,2-dimethylcyclohexane (II), 36.2, 75.4 (62% of theoretical), 54%; *o*-xylene, 3.0, 19.8, 37.4%; 3,4-dimethylcyclohexanol, 48.8%, none, none; 3,4-dimethylcyclohexanone, 10%, none, none. In this catalysis I is hydrogenated, dealkylated, and dehydrated in several steps, ultimately yielding II. Heating the II isomers on this catalyst at 300° gave *o*-xylene. The I was prepd. by carefully fusing 160 g. powd. Na 3,4-dimethylbenzenesulfonate with 300 g. NaOH contg. 36 ml. water at 310-20° 3 hrs. This was cooled, ground, placed in aq. HCl, and the I sepd. by ether extn.; after evapg. the ether, I was distd. Malcolm Anderson.

7 3 6

Chem Petroleum Chem Moscow State U

CM MT

SHUYKIN, N. I.

Catalytic dehydrogenation of 2-methylbutane. N. I. Shuikin, T. P. Dobrynina, and B. A. Timofeeva (State Univ. Moscow). *Rev. inst. franç. pétrole et Ann. combustibles liquides* 11, 1485–8(1950).—Isopentane (I) was dehydrogenated by passage through a glass tube contg. 25 ml. catalyst (II) at atm. pressure, 527°, and 0.5 vol. I/vol. II/hr. II comprised the oxides of Al and Cr, with K_2O as a promoter. After charging each 40-ml. batch of I, II was regenerated with air for 2 hrs. at 550°. Yield of isopentenes (III) was increased by reduction of II with electrolytic H 2 hrs. at 527–30° prior to reuse. During a 55.5-hr. period the yield of catalyzate (IV) was 80–8% and its content of III ranged from 64 to 42% with the 2-methyl-2-butene isomer predominating. Also found in IV was unreacted I and small amts. of 1-pentene, 2-pentene, toluene, and, probably, pentane. The av. yield of III was 37.8% of I charged.

W. I. Barnet

SHUYKIN, N. I.

New palladium catalyst for dehydrogenation of cyclohexanes. N. I. Shuikin and Kh. M. Minachev (*Rev. Inst. franç. Pétrole*, 1956, 11, 1611—1615).—Precipitated $Al(OH)_3$ is washed and dried at 130—140°, treated with aq. HF, calcined at 500° for 3 hr., powdered and pelleted. The pellets are impregnated with aq. $PdCl_2$, dried and treated at 110° with H_2S until no more aq. vapour is evolved. The catalyst contains Pd 0·5% and is an active, stable, and specific catalyst for the dehydrogenation of alkyl cyclohexanes at 450°/20 atm. H_2. At space velocity 1, the catalyst increased the aromatic content of a 93—109° fraction of a Caucasian gasoline from 7·5 to 36—40% with only slight loss of activity after 160 hr. although the feed contained org. S. No cracking occurred, and the outlet gas was 99% H_2. (41 references.)

A. R. PEARSON.

~~SHUYKIN, N.I.~~

SHUYKIN, N.I.

4/2

6762* (Russian.) Reaction Mechanism of Hydration and Dehydration in the Presence of Zinc Halides. O mekhanizme reaktsii gidratatsii i degidratatsii v prisutstvii galogenidov tsinka. A. B. Kuchkarev and N. I. Shuikin. *Izvestiia Akademii Nauk SSSR, Otdelenie Khimicheskikh Nauk*, no. 12, Dec. 1956, p. 1469-1477.

A study of olefin hydration and alcohol dehydration with $ZnCl_2$ or $ZnBr_2$ as catalysts. A possible structure of the intermediate complexes is offered.

Inst. Org. Chem. im. N.D. Zelinskiy, AS USSR

BEL'CHEV, F.V.; SHUYKIN, N.I.

Catalytic synthesis of n-butylamine on mixed oxide catalysts. Zhur. ob. khim. 26 no.8:2218-2223 Ag '56. (MLRA 10:11)

1. Belorusskaya sel'skokhozyaystvennaya akademiya i Institut organicheskoy khimii AN SSSR.
(Butylamine)

PETROV, A.D.; SHUYKIN, N.I.

Visiting French chemists. Vest. AN SSSR 26 no.10:55-60 O '56. (MLRA 9:11)

1. Chlen-korrespondenty Akademii nauk SSSR.
(France--Chemical industries)

SHUYKIN, N.I.

SHUYKIN, N. I.

Catalytic synthesis of *n*-butylamine over mixed oxide catalysts. F. V. Bel'chev and N. I. Shuikin. *Zhur. Obshchei Khim.* 26, 2218–23(1950). Passage of BuOH and NH_3 over Al_2O_3 or mixed oxide catalysts of Al_2O_3-Fe_2O_3-TiO_2 was studied at 375–420° with mole ratio of 1:4 ROH:NH_3 at space velocities 0.6–0.9. The best activity in comparison with pure Al_2O_3 was found in catalyst of 85% Al_2O_3 and 15% Fe_2O_3. The TiO_2-Al_2O_3 catalyst, while very active, rapidly loses its activity with use. The 85:15 catalyst (above) permits a 30% increase in reaction rate and gives lesser decompn. of ROH. The yield of amino-N over this catalyst is 3.3–3.8%, with gaseous by-products contg. 20–5% olefins, 65–70% H, and a small amt. of alkanes. The best yield of amine is obtained at 390° with a space velocity of feed of 0.75; under these conditions the yield of amino-N reaches 25%, based on ROH introduced.

G. M. Kosolapoff

Chem 2