

5.1100

78038
SOV/62-60-1-4/31

AUTHORS: Freydlin, L. Kh., Balandin, A. A., Borunova, N. V.,
Agronomov, A. Ye.

TITLE: Concerning Connections Between the Microstructure of
Aluminum Oxide and Activity of Nickel-Alumina Catalysts
of Various Nickel Content

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh
nauk, 1960, Nr 1, pp 21-25 (USSR)

ABSTRACT: This paper presents the results of investigations of
the connection between the microstructure of aluminum
oxide and activity of nickel-alumina catalysts of
various Ni content. The catalysts were prepared by
impregnation of alumina with $Ni(NO_3)_2$ and reduction
with H_2 at 350° . The alumina for the catalysts 1
and 2 (see Table) was prepared by ignition of com-
mercial aluminum oxide at 500° . Alumina for catalyst
3 was prepared by treatment of $Al(NO_3)_3$ with ammonia.
Activity of the catalysts was determined by the degree

Card 1/4

Concerning Connections Between the
Microstructure of Aluminum Oxide and
Activity of Nickel-Alumina Catalysts
of Various Nickel Content

18058
SOV/62-60-1-4/37

of cyclohexane dehydrogenation. The results are shown in Table 1. The following conclusions were made: Properties of nickel-alumina catalysts of various Ni content depend on the character of microstructure of alumina. Catalysts prepared with large-pore alumina, containing 5-10% Ni, are of high and practically the same activity. Activity of the catalyst, containing 50% Ni, is considerably lower. Catalysts prepared with fine-pore alumina and containing 5, 10, and 30% Ni are of a low activity and unstable. There are 1 table; and 9 references, 1 U.S., and 8 Soviet. The U.S. reference is: S. Brunauer, P. Emmet, A. Teller, J. Am. Chem. Soc., 62, 1723 (1940).

ASSOCIATION:

N. D. Zelinskiy Institute of Organic Chemistry Academy of Sciences USSR and M. V. Lomonosov Moscow State University (Institut organicheskoy khimii imeni N. D. Zelinskogo Akademii nauk SSSR, Moskovskiy gosudarstvennyy universitet imeni M. V. Lomonosova)

SUBMITTED:

May 5, 1958

Card 2/4

Concerning Connections Between the
 Microstructure of Aluminum Oxide and
 Activity of Nickel-Alumina Catalysts
 of Various Nickel Content

78053
 SOV/62-60-1-4/37

Table 1

a								
b	c	d	e	f	g	h	i	j
—	1	—	—	190	20-100	65	5.1	—
1	—	5	25	175	20-100	56	4.6	59.4
2	—	10	25	175	20-100	52	4.3	89.0
—	2	—	—	240	25-110	45	4.8	—
3	—	2	25	—	—	—	—	44.0
4	—	5	25	—	—	—	—	80.0
5	—	10	10	—	—	—	—	89.2
6	—	30	10	150	25-100	45	3.3	87.2
7	—	50	15	150	25-100	45	2.9	62.4
—	3	—	—	370	15-40	28	4.7	—
8	—	2	20	385	14-40	22	4.0	2.4
9	—	5	20	370	14-40	22	3.7	48.4
10	—	10	20	350	14-35	20	3.2	52.4
11	—	30	20	270	10-27	18	2.4	—

Card 5/4

(Key to Table on Card 4/4)

Concerning Connections Between the
Microstructure of Aluminum Oxide and
Activity of Nickel-Alumina Catalysts
of Various Nickel Content

78058
SOV/62-60-1-4/37

Key to Table 1: (a) number; (b) experiment; (c) sample
of aluminum oxide; (d) Ni content in % by weight; (e)
duration of reduction with H₂ in hr; (f) specific
surface in m²/g; (g) range of pore size in A; (h)
maximum distribution of volumes of pores along the
radius in A; (i) total amount of benzene absorbed on
saturation, in millimoles/g; (j) degree of cyclohexane
dehydrogenation in % of theoretical.

Card 4/4

5.3300

78619
SOV/62-60-1-25/37

AUTHORS: Nazarova, N. M., Freydlin, L. Kh., Gayvoronskaya, G. K.

TITLE: Brief Communications. Alkylation of Propane and Isopentane With Ethylene at High Temperatures Under Pressure

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1960, Nr 1, pp 129-131 (USSR)

ABSTRACT: This is a continuation of the study of alkylation of saturated hydrocarbons. Propane and isopentane were alkylated with ethylene in the presence of Al_2O_3 at 450° at 450-500 atm pressure. The methods of experiments and analysis were described previously (L. Kh. Freydlin, A. A. Balandin, N. M. Nazarova, Dokl. AN SSSR 96, 1011, 1954). The results are shown in Fig. 1 and in Table 1.

Card 1/6

Brief Communications. Alkylation of Propane
and Isopentane With Ethylene at High
Temperatures Under Pressure

78079
SOV/62-60-1-25/37

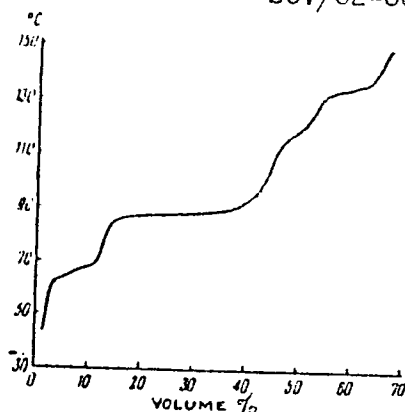


Fig. 1. Fractional distillation curve of the products
of alkylation of isopentane with ethylene (experiment
2).

Card 2/6

Brief Communications. Alkylation of
Propane and Isopentane With Ethylene at
High Temperatures Under Pressure

78079
SOV/62-60-1-25/37

Table 1. Alkylation of propane with ethylene at
450° in the presence of Al₂O₃

(a)	(b)	(c)	(d)	(e)	(f)	(g)						h		
						to 30°		30-35°		35-40°			45-50°	
						(k)	(l)	(k)	(l)	(i)	(k)		(i)	
1	450	13,3	1000	65	86	8,2	46	4,1	10,5	77	9,7	25	67,5	
2	500	18,4	1660	77	102	5,8	14	2,2	12,1	44	11,5	42	68,0	
3	500	16,4	850	63	75	6,4	13	2,6	15,0	46	15,4	15	60,6	
4	300	12,0	—	17	—		(k)		31					

Card 3/6

Brief Communications. Alkylation of
Propane and Isopentane With Ethylene at
High Temperatures Under Pressure

78079
SOV/62-60-1-25/37

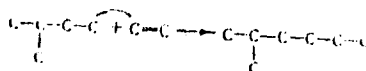
Key to Table 1. In experiment Nr 1 an industrial sample of Al_2O_3 was used; in experiment Nr 2 Al_2O_3 , treated first with potassium bifluoride and then with sulfuric acid, was used; in experiment Nr 3 Al_2O_3 saturated with 1% K_2CO_3 was used. (a) Experiment Nr; (b) pressure in atm; (c) ethylene content in the initial mixture in %; (d) space velocity in liters of gas per liter of catalyst per hour; (e) degree of C_2H_4 conversion in %; (f) yield of the products of alkylation based on ethylene taken, in % by weight; (g) characteristics of the alkylation products by fraction; (h) % by weight; (i) bromine number; (j) content of the higher boiling residues in % by weight; (k) bromine number of alkylation products.

Card 4/6

Brief Communications. Alkylation of
Propane and Isopentane With Ethylene at
High Temperatures Under Pressure

73079
SOV/62-60-1-25/37

Spectral analyses of the different fractions of the alkylation products show that in the first stage of reaction, ethylene adds propane, mainly with the participation of the secondary carbon atom, to form isopentane; and only to a smaller extent with the participation of the primary carbon atom to form n-pentane. In the second stage of the reaction, ethylene adds mainly isopentane with the participation of the primary carbon atom:

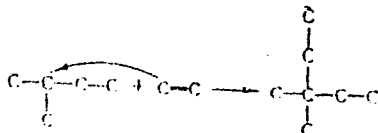


and only to a small extent with the participation of tertiary carbon atom:

Card 5/6

Brief Communications. Alkylation of Propane and Isopentane With Ethylene at High Temperatures Under Pressure

78079
SOV/62-60-1-25/37



Apparently the specific structure of propane make its alkylation with ethylene (as well as with propylene) more difficult than the alkylation of the normal high molecular aliphatic hydrocarbons. A. I. Pally participated in this work. There are 2 tables; 1 figure; and 7 references, 2 U.S., 5 Soviet. The U.S. references are: F. E. Frey, H. J. Hepp, *Industr. and Engng. Chem.*, 28, 1439 (1936); A. A. O'Kelly, A. M. Sachanen, *Industr. and Engng. Chem.*, 38, 462 (1946).

ASSOCIATION: N. D. Zelinskiy Institute of Organic Chemistry,
Academy of Sciences USSR (Institut organicheskoy
khimii imeni N. D. Zelinskogo, Akademii nauk SSSR)
SUBMITTED: June 2, 1959 Card 6/6

S/062/60/000/03/02/007
B008/B006

AUTHORS: Freydlin, L. Kh., Balandin, A. A., Nazarova, N. M.

TITLE: Catalytic Alkylation¹ of Isobutane¹ by Ethylene at High
Temperatures and Under Pressure

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh
nauk, 1960, No. 3, pp. 409-412

TEXT: The alkylation of isobutane in the presence of aluminum oxide at high temperatures was investigated. The experiments were carried out in the continuous-flow unit described in Ref. 5. The reaction conditions, degree of ethylene transformation, and alkylate yields are given in Table 1. The characteristics of the various alkylate fractions obtained in experiments No. 2 and 4 are shown in Table 2. The fractionation curve of the catalyzate obtained in experiment No. 4 is represented in Fig. 1. Experimental results show that ethylene and propylene react mainly with the tertiary carbon atom of isobutane, and only to a lesser extent with its primary carbon atoms. In these reactions, 2,2-dimethyl butane and

Card 1/2

Catalytic Alkylation of Isobutane by
Ethylene at High Temperatures and Under
Pressure

S/062/60/000/03/02/007
B008/B006

2-methyl pentane, respectively, are formed. An octane fraction was also obtained, which was identified to consist mainly of an alkylation product of 2,2-dimethyl butane. Alkylation at this stage, however, proceeds via the primary carbon atom at the unbranched end of the carbon chain. This fact confirms the stepwise character of the alkylation process established previously (Ref. 8). It was found that in the presence of aluminum oxide an olefin (ethylene, propylene) is added to the tertiary carbon atom of isobutane less easily than to the secondary carbon atom of n-butane. Yu. P. Yegorov and K. G. Gayvoronskaya analyzed the fractions by means of their Raman spectra. There are 1 figure, 2 tables, and 11 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: July 16, 1958

Card 2/2

S/062/60/000/006/025/025/XX
B020/B060

AUTHORS: Freydlin, L. Kh., Sharf, V. Z.

TITLE: Study of the Acidity of a Phosphate Catalyst and Its Changes
During Calcination by the Indicator Method

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye khimicheskikh nauk,
1960, No. 6, pp. 1128-1130

TEXT: It has been suggested already earlier that the catalytic activity of normal calcium phosphate in dehydration- (Ref. 1), hydrolysis- (Ref. 2), and hydration reactions (Ref. 3) in the vapor phase may be determined by its acidity. This assumption is substantiated by the fact that the phosphate catalyzes reactions which in the liquid phase are sped up by acids, and that it can be inactivated by potassium carbonate (Ref. 1), alkali hydroxides, or organic bases. The acidity of normal calcium phosphate is visibly dependent upon the presence of chemically bound water. Thus, there must be an interaction between acidity, the catalytic activity, and temperature, wherein the catalyst loses its crystal water.

Card 1/4

Study of the Acidity of a Phosphate
Catalyst and Its Changes During
Calcination by the Indicator Method

S/062/60/000/006/025/025/XX
B020/B060

The catalyst was obtained by reaction of an aqueous CaCl_2 solution with a diluted diammonium phosphate solution in the presence of ammonia at 40° . The acidity of the catalyst was determined by the Johnson method with an accuracy of $\pm 5\%$ (Ref. 5). The indicator was a solution of p-dimethyl amino azobenzene in anhydrous isooctane. The solution of the catalyst was then titrated with an n-butyl amine solution in anhydrous isooctane until the red coloring vanished definitely. This took 12 to 18 hours. The solution with the precipitate was left standing, poured off, and the excess amine was titrated with trichloroacetic acid. Mere traces of moistness will already lead to distorted results. A thoroughly washed out catalyst, dried at $100 - 110^\circ\text{C}$, does not effect any change in the color of the indicator. After calcination of the catalyst at 200°C , however, it turns a pale-rose color, and red at 400°C . These experiments proved that the catalyst surface actually has acid properties. The effect of the calcining temperature upon the phosphate acidity is shown in Fig. 1. On a calcination at temperatures above 400°C the amine consumption is again reduced, and at 800°C there is no more change in the indicator color. Data concerning the dependence of

Card 2/4

Study of the Acidity of a Phosphate
Catalyst and Its Changes During
Calcination by the Indicator Method

S/062/60/000/006/025/025/XX
B020/B060

acidity and catalytic activity of the phosphate on its calcining temperature were intercompared. A. V. Kazakov (Ref. 6) showed that apart from the adsorbed water, normal phosphate also contains 0.5 mole of chemically bound water which can be removed only by calcining at 400 - 800°C. A correlative course of the dependence of acidity and activity on the calcining temperature of the phosphate catalyst and on its structurally bound water content is thus observed. A calcination of the phosphate at temperatures below 400°C leads to the liberation of its acid zones from the adsorbed water, which blocks the active catalyst surface. If an acid zone is assumed to be neutralized by a butyl amine molecule, the number of active centers is then $A = 6.06 \cdot 10^{23} \cdot 1.3 \cdot 10^{-4} = 7.8 \cdot 10^{19}$. $1.3 \cdot 10^{-4}$ is the number of gram-mole butyl amine used up for the neutralization of 1 g of phosphate calcined at 400°C. There are 1 figure and 7 references: 6 Soviet and 1 US.

Card 3/4

Study of the Acidity of a Phosphate
Catalyst and Its Changes During
Calcination by the Indicator Method

S/062/60/000/006/025/025/XX
B020/B060

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: October 7, 1959

Card 4/4

FREYDLIN, L.Kh.

Selectivity of the action of catalysts in hydrogenation and reduction reactions. Probl. kin. i kat. 10:187-191 '60. (MIRA 14:5)

1. Institut organicheskoy khimii AN SSSR.
(Catalysts) (Hydrogenation) (Reduction, Chemical)

FREYDLIN, L.Kh.; SHARF, V.Z.

Kinetics of dehydration of alcohols on tri-substituted calcium phosphate and deactivation of the latter with organic bases.
Izv. AN SSSR Otd. khim. nauk no.10:1861-1867 O '60. (MIRA 13:10)

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

(Calcium phosphate) (Dehydration (Chemistry))
(Alcohols)

84860

5 3700

2209, 1273, 1274

S/062/60/000/010/014/018
B015/B064

AUTHORS: Freydlin, L. Kh., Petrov, A. D., Sladkova, T. A., and Vdovin, V. M.

TITLE: Catalytic Hydrogenation of Silicon Containing β - and γ -Nitriles

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1960, No. 10, pp. 1878 - 1881

TEXT: A hydrogenation of the β -cyanoethyl- and γ -cyanopropyl silanes to the corresponding primary amines was carried out on metal catalysts. The hydrogenation was made in a rotating steel autoclave (volume 0.175 l) by a method already described. The effect of the composition of the catalyst, the reaction conditions, and the molecular structure of the cyanoalkyl silanes upon the amine yield was investigated. First, the hydrogenation of cyanoalkyl silanes without alkoxy groups was studied, and then with two or three alkoxy groups on the silicon atom (Table 1, experimental conditions and results). Just as in the hydrogenation of

Card 1/2

Catalytic Hydrogenation of Silicon
Containing β - and γ -Nitriles

84860
S/062/60/000/010/014/018
B015/B064

aliphatic nitriles containing no silicon atoms, hydrogenation of silicon containing nitriles on cobalt skeleton catalysts was found to be most selective. Hydrogenation of β -cyanoethyl trialkoxy silanes can be carried out only in the presence of ammonia. In the presence of ammonia, primary amines are preferably formed. The properties of the silicon containing primary amines thus produced are given in Table 2. There are 2 tables and 8 references: 4 Soviet, 1 German, 2 US, and 1 Japanese. X

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: March 9, 1960

Card 2/2

FREYDLIN, L.Kh.; SHARF, V.Z.

Consecutive splitting off of the alcohol groups of 3,7-dimethyl-1,7-octanediol on a tricalcium phosphate catalyst. Izv. Akad. Nauk SSSR. Otd. khim. nauk no.11:2055-2056 N '60. (MIRA 13:11)

1. Institut organicheskoy khimii im. N.D. Zelinskogo AN SSSR.
(Octanediol) (Dehydration(Chemistry)) (Calcium phosphate)

S/062/60/000/012/019/020
B013/B054

AUTHORS: Freydlin, L. Kh., Zhukova, I. F., and Mironov, V. F.

TITLE: Study of the Hydrogenation Rate of Vinyl- and Allyl
Compounds of Carbon, Silicon, Germanium, and Tin on a
Skeleton Nickel CatalystPERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh
nauk, 1960, No. 12, pp. 2258-2260

TEXT: The authors briefly report on a study of the reactivity of α - and β -ethylene bonds in the following compounds: $(\text{CH}_3)_3\text{CCH}=\text{CH}_2$, $(\text{CH}_3)_3\text{SiCH}=\text{CH}_2$, $(\text{CH}_3)_3\text{GeCH}=\text{CH}_2$, $(\text{C}_2\text{H}_5)_3\text{SnCH}=\text{CH}_2$ and $(\text{CH}_3)_3\text{CCH}_2\text{CH}=\text{CH}_2$, $(\text{CH}_3)_3\text{SiCH}_2\text{CH}=\text{CH}_2$, $(\text{CH}_3)_3\text{GeCH}_2\text{CH}=\text{CH}_2$, $(\text{C}_2\text{H}_5)_3\text{SnCH}_2\text{CH}=\text{CH}_2$. The skeleton catalyst used was prepared by lixiviating a Ni-Al melt (1:1) with 20% alkali lye. The reaction rate was characterized by the rate of hydrogen absorption as a function of time (Fig.) and the half-life period $\tau/2$ of the reaction. Reading was performed in intervals of 15 seconds each. The investigation

Card 1/2

Study of the Hydrogenation Rate of Vinyl- and Allyl Compounds of Carbon, Silicon, Germanium, and Tin on a Skeleton Nickel Catalyst S/062/60/000/012/019/020 B013/B054

showed that the reaction rate of the compounds studied decreased on the skeleton nickel catalyst in the same order as their reactivity decreased in the radical polymerization: Si > Ge > C > Sn. Just as in radical additions, vinyl compounds of silicon hydrogenate faster than allyl compounds. Vinyl and allyl double bonds in germanium and tin compounds behave in a similar way. Carbon compounds, however, show a contrary dependence. There are 1 figure, 1 table, and 6 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: May 27, 1960

Card 2/2

FREYDLIN, L.Kh.; SHARF, V.Z.

Composition, methods of preparation, and nature of the activity of
the tricalcium phosphate catalyst. *Kin.i kat.* 1 no.2:247-256
Jl-Ag '60. (MIRA 13:8)

1. Institut organicheskoy khimii im.N.D.Zelinskogo AN SSSR.
(Calcium phosphate)

FREYDLIN, L.Kh.; BALANDIN, A.A.; ZHUKOVA, I.F.

Selective hydrogenation of butynediol to butenediol on a skeletal nickel catalyst. *Kin. i kat.* 1 no. 3:447-454
S-O '60. (MIRA 13:11)

1. Institut organicheskoy khimii imeni N.D. Zelinskogo
AN SSSR.
(Butynediol) (Butenediol) (Hydrogenation)

FREYDLIN, L.Kh.; GORSHKOV, V.I.

Selective action of a zinc catalyst in the hydrogenation of
mono- and diolefins. Kin. i kat. 1 no. 4:593-596 N-D '60.
(MIRA 13:12)

1. Institut organicheskoy khimii AN SSSR.
(Zinc) (Hydrogenation) (Olefins)

FREYDLIN, L.Kh., prof. (Moscow); GORSHKOV, V.I.

Catalytic reaction of the hydrogenation of zinc. Periodica polytechn
chem 4 no.2:119-124 '60. (EEAI 10:4)

1. Institut organicheskoy khimii im. N.D.Zelinskogo, Akademii nauk
SSSR, Moskva (for Freydlin)

(Catalysts)	(Hydrogenation)	(Zinc)	(Ethylene)
(Ketones)	(Isoprene)	(Styrene)	

27126

S/080/60/033/008/019/022/XX
D213/D305

5.3400

AUTHORS: Balandin, A.A., Freydlin, L.Kh., Rozina, V.S.,
Sorokin, P.Z., and Voroshilov, G.A.

TITLE: Method of preparing 2-isopropylantraquinone

PERIODICAL: Zhurnal prikladnoy khimii, v. 33, no. 8, 1960,
1893 - 1896

X

TEXT: Recently alkylantraquinones have been applied as hydrogen carriers in producing hydrogen peroxide. It has, therefore, been necessary to look for new methods of preparing these compounds on an industrial scale. The specific reaction with which the authors were concerned was to prepare 2-isopropylantraquinone in two stages, instead of four as in Scholl's method, which involved reacting isopropylbenzene with phthalic anhydride and reducing the resulting 4-isopropylbenzoyl-2-benzoic acid to 4-isopropanyl-benzyl-2-benzoic acid followed by cyclization of the latter in the presence of sulphuric acid. To avoid the formation of sulphonic acid

Card 1/3

27126

S/080/60/033/008/019/022/XX
D213/D305

Method of preparing ...

derivatives and to increase the yields of the required quinone the authors investigated the influence of the oleum concentration, temperature and period of heating. In the case of 3 % oleum and heating for 1 - 3 hours sulphonation occurred. When the concentration was increased to 8 % the yield of quinone was 15 %; however, this yield decreased when 12 - 20 % oleum was used. The effect of heating with 8 % oleum is shown, and it is clear that the time of reaction determines the yield of quinone. Best results were obtained with reaction times of 2.5 - 3 hours, and under optimum conditions the yield reached 55 - 60 %. In the earlier investigations the first stage, condensation of phthalic anhydride with isopropylbenzene, was conducted in a carbon disulphide medium. The authors, however, used chlorobenzene as a less hazardous solvent and achieved 88 % yields of 4-isopropylbensoyl-2-benzoic acid. The quinone obtained in the present work had a melting point of 56.5 - 57.0°C, (recrystallized from alcohol) as compared with 45°C given in the literature. The composition and properties of the resulting product corresponded to those of isopropylantraquinone. The quinone

Card 2/3

27126

Method of preparing ...

S/080/60/033/008/019/022/XX
D213/D305

obtained in both the laboratory apparatus and the model plant had a melting point of 56°C and its C and H contents corresponded with the formula $C_{17}H_{14}O_2$. The use of isopropylanthraquinone as a hydrogen transferring agent was studied by hydrogenating the compound in the presence of a skeletal nickel catalyst until a thick mass of 2-isopropylanthrahydroquinone was formed. After separation of the catalyst the product was oxidized with air and the hydrogen peroxide formed was removed with water. A similar reaction has been found to proceed with 2-ethylanthraquinone. In both cases the melting point of the material recovered corresponded to that of the original quinone. There are 1 figure, 1 table and 2 non-Soviet-bloc reference. The reference to the English-language publication reads as follows: A.T. Peters, F.M. Rowe, J. Chem. Soc., 181, 1945. X

SUBMITTED: February 25, 1960

Card 3/3

80005

S/O20/60/131/05/035/069
B011/B117

Meydlin, L. Kh., Gorshkov, V. I.
Catalysis of Hydrogenation Reactions by Zinc

Doklady Akademii nauk SSSR, 1960, Vol 131, Nr 5, pp 1109-1112 (USSR)

5-1190
AUTHORS:

APPROVED FOR RELEASE 06/13/2000 CIA-RDP86-0

TITLE:
PERIODICAL:

TEXT: It was established by the authors that the catalytic effect of Zn is a specific one. In hydrogenation and reduction reactions, the hydrogenation of olefines is not catalyzed by zinc. The hydrogenation of the ethylenic bond of activated by a phenyl group or a conjugated double bond is accelerated by zinc at elevated temperatures and pressures only. Zn catalyzes the selective hydrogenation of the acetylenic bond. Thus, the different order of energy barriers of these reactions are in accordance with values calculated for a considerable degree of the results as compared to the one on other metal catalysts. At present, it is explained by the mechanism of an intermediate complex. At present, it is more and more clearly recognized that the heterogeneous catalytic reaction passes through an adsorption stage. If both components of the reaction are activated during hydrogenation, they form a surface intermediate complex with the catalyst. In this case, the ease of hydrogenation of different intermediate atomic bonds depends on the

5.1190
AUTHORS:

Freydlin, L. Kh., Gorshkov, V. I.

80005

S/O20/60/131/05/035/069
B011/B117

TITLE:

Catalysis of Hydrogenation Reactions by Zinc

PERIODICAL:

Doklady Akademii nauk SSSR, 1960, Vol 131, Nr 5, pp 1109-1112 (USSR)

TEXT: It was established by the authors that the catalytic effect of Zn is a specific one. In hydrogenation and reduction reactions, the hydrogenation of olefines is not catalyzed by zinc. The hydrogenation of the ethylenic bond activated by a phenyl group or a conjugated double bond is accelerated by zinc at elevated temperatures or pressures only. Zn catalyzes the selective hydrogenation of the acetylenic bond down to an ethylenic bond. The reduction of the C=O group of aldehydes and ketones is accelerated to a considerable degree. The results are in accordance with values calculated for the energy barriers of these reactions on zinc. Thus, the different order of hydrogenation of bonds on zinc as compared to the one on other metal catalysts can be explained by the formation mechanism of an intermediate complex. At present, it is more and more clearly recognized that the heterogeneous catalytic reaction passes through an adsorption stage. If both components of the reaction are activated during hydrogenation, they form a surface intermediate complex with the catalyst. In this case, the ease of hydrogenation of different intermediate atomic bonds depends on the

Card 1/3

80005

Catalysis of Hydrogenation Reactions by Zinc

S/020/60/131/05/035/069
B011/B117

height of the energy barrier ($-E$) of the reaction (Ref 1). In the first place, the reaction will actually take place which has the least height of the energy barrier for formation (or decomposition) of the intermediate complex. The E values can be also calculated from the averages of the bond energies (Q). The $C\equiv C$ and $C=C$ bonds are hydrogenated more easily on Ni than the $C=O$ bonds. These reactions proceed in an order analogous to the one established on almost all known catalysts. As has been stated above, the situation is quite different with Zn. On Zn, the $C=C$ bond is not hydrogenated as a rule, the $C=O$ group can be hydrogenated to give $CH-OH$, whereas the acetylenic bond is selectively hydrogenated down to the ethylenic bond. The authors explain the formation of the intermediate complex on hydrogenation of the ethylenic bond by means of a scheme, and calculate its heat of formation E' which is -57.9 kcal/mole (I). The heats of formation for the hydrogenation of the acetylenic bond down to the ethylenic bond ($E'_2 = -48.6$ kcal/mole (II)) and the heat of formation for the complex which forms when the $C=O$ group is reduced ($E'_3 = -47.4$ kcal/mole (III)) are calculated in an analogous way. It is obvious that for all three reactions $E' < 0$, and $E'' > 0$ ($E'' =$ heat of decomposition). Thus, the rate of these processes has to be limited by an adsorption stage (Ref 1). From the calculations performed by the

C Card 2/3

353400

80093

S/020/60/131/06/37/071
B011/B005

AUTHORS: Freydlin, L. Kh., Litvin, Ye. F., Ditsent, V. Ye.

TITLE: Investigation of the Influence of Composition of Mixed Solvents on the Rate and Selectivity of the Process of Hydrogenation of 2-Ethylanthraquinone

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 131, No. 6, pp. 1362 - 1365

TEXT: The authors found that the rate and selectivity of the process mentioned in the title are essentially influenced by the composition of the mixed solvent. Hydrogenation of the 2-ethylanthraquinone ring is favored by dioxane. At 20° and normal pressure, one of its two aromatic rings hydrogenates in the dioxane medium. The authors could not find an octahydro derivative. The formation of the tetrahydro derivative starts immediately at the beginning of the process. By addition of a polar component to dioxane, the reduction of quinone groups is accelerated, whereas the hydrogenation of the quinone ring is suppressed. On addition of even small amounts of N,N-dimethyl formamide (0.3%) to dioxane, 2-ethylanthraquinone is selectively hydrogenated. A higher selectivity of the process is apparently achieved by acceleration of the hydrogenation of the quinone group and by

Card 1/3

80093

Investigation of the Influence of Composition of Mixed Solvents on the Rate and Selectivity of the Process of Hydrogenation of 2-Ethylanthraquinone

S/O20/60/131/06/37/071
B011/B005

adsorptive substitution of the hydroquinone molecules. The degree of selectivity depends on the nature and quantity of the polar solvent added. In their experiments, the authors used the following solvent mixtures: dioxane-N,N-dimethyl formamide and dioxane ethanol. The catalyst was produced by treating a Ni - Al alloy (50:50) with alkali. The reaction rate was determined by measuring the absorption rate of hydrogen. The quinones were determined after oxidation of the catalyzate by means of air with automatic photopolarographs of the type LP-55 (Methods, Ref. 4). Preliminary experiments showed that the reaction rate does not depend on the intensity of stirring. The reaction order in dimethyl formamide was equal to zero (Fig. 1). Fig. 1 shows the dependence of the hydrogenation rate of 2-ethylanthraquinone on its concentration in dimethyl formamide. Fig. 2 shows the dependence of the absorption rate of the first mole of hydrogen on the composition of the binary solvent. Table 1 shows that the reaction proceeds least selectively in dioxane. Already under smooth experimental conditions (20°, normal pressure), 2-ethyltetrahydroanthrahydroquinone begins to form. On hydrogenation in 90% of dioxane and 10% of ethanol (or equal volumes of dioxane and ethanol), no tetrahydroquinone was detected even after absorption of 0.95 mole of hydrogen. There are 2 figures, 1 table, and 4 references, 3 of which

Card 2/3

Investigation of the Influence of Composition of Mixed Solvents on the Rate and Selectivity of the Process of Hydrogenation of 2-Ethylantraquinone

80093
S/020/60/131/06/37/071
B011/B005

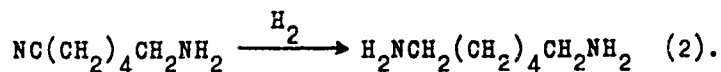
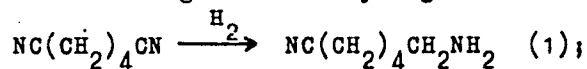
are Soviet.

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)

PRESENTED: November 23, 1959, by A. A. Balandin, Academician

SUBMITTED: November 12, 1959

Card 3/3

S/062/61/000/001/013/016
B101/B220AUTHORS: Freydlin, L. Kh. and Sladkova, T. A.TITLE: Selective reduction of adipyl dinitrile to ϵ -aminocapro-
nitrile on a nickel boride catalystPERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk,
no. 1, 1961, 151-156TEXT: The aim of the authors was to clear up the conditions under which
the two stages of the hydrogenation of adipyl dinitrile proceed: ✓

Moreover, it was intended to study the synthesis of the amino acid nitrile,
since ϵ -amino acid can be obtained easily by hydrolysis of the latter.
Hydrogenation has been performed in a steel autoclave at a hydrogen

Card 1/8

Selective reduction of adipyl...

S/062/61/000/001/013/016
B101/B220

pressure of 100 atm. The reaction products were divided into three fractions: I) hexamethylene imine (boiling point 137°C, boiling point of the azeotropic mixture with water 95°C); II) hexamethylene diamine (boiling point 95 - 100°C at 20 mm Hg); and III) ϵ -amino capronitrile (boiling point 118-120°C at 20 mm Hg). The high boiling residue was composed of non-reacted dinitrile and of bis-hexamethylene triamine. A Ni-Ti-Al skeleton catalyst and a nickel boride catalyst manufactured by the following method were used: A 20% aqueous solution of sodium boron hydride was added in an amount of 60 ml to 250 ml of a 10% aqueous solution of nickel chloride in such a way that the temperature did not surpass 50°C. This catalyst was modified with chromium by adding, moreover, 10 ml of a 10-30% chromium nitrate solution to the solution of the nickel salt. Results are listed in Tables 1 and 2. Furthermore, the hydrogenation of the reaction products has been studied (Table 3). The following conclusions were drawn from these data: The selectivity of the nickel-skeleton catalyst increases with increasing content of titanium. On the nickel boride catalyst, a selective hydrogenation of the dinitrile to amino-nitrile takes place. Under optimum conditions (20% catalyst, presence of NH_3 , 75-80°C, P_{H_2} = 95-100 atm) 50-60% amino nitrile and

Card 2/B
3

Selective reduction of adipyl...

S/062/61/000/001/013/016
B101/B220

only 2-5% diamine are formed. The incomplete conversion of the dinitrile is due to the fact that amino nitrile excludes it from adsorption. Cyclohexamethylene imine is formed only in the second stage of the process. The formation of bis-hexamethylene triamine increases if a mixture of dinitrile and hexamethylene diamine is hydrogenated. As in the case of other catalysts, ammonia suppresses the formation of secondary amines. These facts confirm the aldimine mechanism of the hydrogenation of dinitrile. There are 3 tables and 4 references: 2 Soviet-bloc and 1 non-Soviet-bloc.

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

SUBMITTED: August 4, 1959

Card 3/B

3

FREYDLIN, L.Kh.; GORSHKOV, V.I.

Reduction of cyclohexanone on a skeletal zinc catalyst under pressure.
Izv. AN SSSR. Otd. khim. nauk no.2:366 F '61. (MIRA 14:2)

1. Institut organicheskoy khimii im.N.D.Zelinskogo AN SSSR.
(Cyclohexanone)

FREYDLIN, L.Kh.; SHARF, V.Z.; ANDREYEV, N.S.

Stepwise dehydration of 1,6-hexanediol on a tricalcium phosphate catalyst. Izv. AN SSSR. Otd. khim. nauk. nauk no.2:373-375 F '61.
(MIRA 14:2)

1. Institut organicheskoy khimii im.N.D.Zelinskogo AN SSSR.
(Hexanediol) (Calcium phosphate)

FREYDLIN, L.Kh.; NAZAROVA, N.M.; PALIY, A.I.

*Alkylation of normal paraffins by olefins at high temperatures and pressures. Izv.AN SSSR Otd.khim.nauk no.4:709-714 Ap '61.
(MIRA 14:4)

1. Institut organicheskoy khimii im. N.D.Zelinskogo AN SSSR.
(Ether) (Cyclopentadiene)

ALIYEV, Ya.Yu.; ROMANOVA, I.B.; FREYDLIN, L.Kh.

Catalytic carbonylation of amines. Uzb.khim.zhur. no.5:
54-65 '61. (MIRA 14:9)

1. Institut khimii AN Uzbekskoy SSR i Institut organicheskoy
khimii im. N.D. Zelinskogo AN SSSR.
(Amines) (Carbonyl compounds)

53400

25045
S/062/61/000/006/007/010
B118/B220

AUTHORS: Freydlin, L. Kh., Polkovnikov, B. D., and Gorshkov, V. I.

TITLE: Catalytic hydrogenation of dimethyl vinyl ethynyl carbinol

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye khimicheskikh nauk, no. 6, 1961, 1120-1127

TEXT: The synthesis of dienes by selective catalytic hydrogenation of the obtainable vinyl acetylene hydrocarbons and alcohols concentrated, up to the present time, primarily on the hydrogenation of dimethyl vinyl ethynyl carbinol. Following their study (Ref. 7: Izv. AN SSSR, Otd. khim. n., 1944, 71) the authors made an attempt to synthesize the diene alcohol by selective hydrogenation, using a nickel skeleton catalyst poisoned by pyridine and a zinc skeleton catalyst behaving selectively on hydrogenation of enin hydrocarbons to enins. The hydrogenation of dimethyl vinyl ethynyl carbinol with addition of 1 to 3 moles of hydrogen was effected in methanol solution in the autoclave. The excess hydrogen was eliminated. The catalyst was washed with methyl alcohol. The methanol solution was added to the catalyzate; then, fractionation was effected

Card 1/3

Catalytic hydrogenation of dimethyl vinyl...

25045
S/062/61/000/006/007/010
B118/3220

after separation of the methanol. Since quantitative methods of determination for dimethyl vinyl ethynyl carbinol and its hydrogenation products had not been developed so far, the content of carbinol in the fractions was determined according to the amount of vinyl acetylene which forms due to the effect of metallic sodium. In the presence of the nickel skeleton catalyst, the addition of one mole of hydrogen to dimethyl vinyl ethynyl carbinol does not proceed selectively: A mixture forms, which contains the initial carbinol as well as the diene and ethylene alcohol. The partial poisoning of the catalyst surface by pyridine did not result in a considerable increase of the yield in diene alcohol. In the presence of the zinc skeleton catalyst, dimethyl vinyl ethynyl carbinol is hydrogenated selectively to form dimethyl butenyl carbinol. After addition of one mole of hydrogen, the catalyzate contains about 70 % of diene alcohol. Thus, the zinc catalyst develops the highest selective activity in this reaction. B. V. Lopatin and the woman-student I. Mikhel'son are thanked for taking the spectra and for their assistance. T. N. Nazarov, L. B. Fisher, and Kh. V. Bal'yan are mentioned. There are 4 figures, 2 tables, and 11 references: 8 Soviet-bloc and 3 non-Soviet-bloc. The reference to the English-language publication reads as follows: E. B. Bates, E. R. H. Jones,

Card 2/3

25045

S/062/61/000/006/007/010

B110/B220

Catalytic hydrogenation of dimethyl vinyl...

M. C. Whitung, J. Chem. Soc. 1954, 1954.

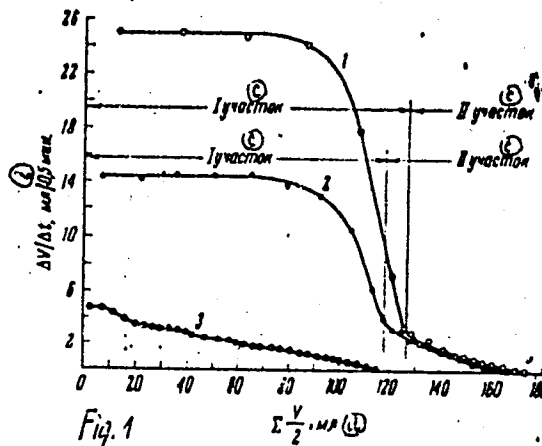
ASSOCIATION: Institut organicheskoy khimii im. N. D. Zelinskogo SSSR
(Institute of Organic Chemistry imeni N. D. Zelinskiy USSR)

SUBMITTED: July 11, 1960

Fig. 1: Hydrogenation of dimethyl vinyl ethynyl carbinol (curves 1-2) and dimethyl butenyl carbinol (curve 3) on the nickel skeleton catalyst at 25°C.

Legend: 1) 0.2574 g in 10 ml $\text{C}_2\text{H}_5\text{OH}$; 2) 0.2402 g in 10 ml $\text{C}_2\text{H}_5\text{OH}$; 3) 0.7134 g in 10 ml $\text{C}_2\text{H}_5\text{OH}$; a) ml; b) ml/0.5 min; c) section.

Card 3/3



25046
S/062/61/000/006/008/010
B118/B220

S-3300

AUTHORS: Freydlin, L. Kh., Nazarova, N. M., and Litvin, Ye. F.
TITLE: Thermal alkylation of cyclopentane with olefins
PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye khimicheskikh nauk, no. 6, 1961, 1146-1148

TEXT: Up to the present time, the alkylation of cycloparaffin hydrocarbons has hardly been studied. H. Pines and N. Ipatieff (see below) studied the alkylation of methyl cyclopentane with olefins in the presence of H_2SO_4 (100 %) or HF. The reaction proved to be very complicated.

Yu. G. Mamedaliyev and A. Kuliyeu (Dokl. AN SSSR, 88, 471 (1953)) as well as Yu. G. Mamedaliyev and Z. A. Mamedova (ibid., 112, 1063, (1957)) alkylated methyl, ethyl, and isopropyl cyclohexane with propylene and butylene under similar conditions. In the present study, the direct alkylation of cyclopentane with ethylene and propylene at elevated temperatures and under pressure was achieved for the first time. The main reaction products were isolated and identified. The influence of

Card 1/5

25046

S/062/61/000/006/008/010
B118/B220

Thermal alkylation of cyclopentane...

temperature and pressure on the course of reaction was studied. The alkylation with ethylene proceeds already at a temperature of 350°C and under a pressure of 200 atm. At elevated temperatures and pressures, the yield in alkylates and the degree of conversion increase. At 450°C, the ethylene was completely consumed. Diagram 1 shows the chromatogram of one of the catalyzates with carbons up to C₉, and also its distillation curve. The main reaction products were ethyl cyclopentane (peak III), the diethyl cyclopentanes (peaks IV and V), and butyl cyclopentane (peak VI). A horizontal section on the distillation curve corresponds to each of these peaks. After elimination of the cyclopentane from the alkylate by fractional distillation, the following fractions were obtained: I) monoethyl cyclopentane and II) diethyl cyclopentane. The unsaturated character of the alkylate is not strongly marked. The yield in ethyl cyclopentanes amounts to 36 % (related to the weight of the alkylate) and to 65 % (related to the weight of the large fraction). Alkylation with propylene is more difficult. On distillation under pressures between 200 and 450 atm, easily boiling cracking products, the fraction of propyl cyclopentane, and the higher boiling residue were separated from the

Card 2/5

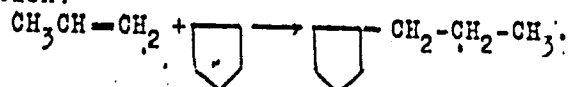
25046

3/062/61/000/006/008/010

3118/B220

Thermal alkylation of cyclopentane...

alkylates. Cyclopentane reacts with propylene like cyclohexane according to the equation:



On thermal alkylation, the cyclopentane adds to the outer unsaturated C-atom of the propylene. There are 2 figures, 1 table, and 6 references: 5 Soviet-bloc and 1 non-Soviet-bloc. The reference to the English-language publication reads as follows: H. Pines, N. Ipatieff, J. Amer. Chem. Soc. 67. 1631 (1945).

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

SUBMITTED: November 11, 1960

Card 3/5

FREYDLIN, L.Kh.; ZHUKOVA, I.F.; MIRONOV, V.F.

Effect of the structure of unsaturated organosilicon compounds
on the rate of their hydrogenation. Izv. AN SSSR. Otd.khim.nauk
no.7:1269-1274 J1 '61. (MIRA 14:7)

1. Institut organicheskoy khimii im. N.D. Zelinskogo AN SSSR.
(Silicon organic compounds) (Hydrogenation)

27496

155540

2203 1303, 1436

S/062/61/000/009/012/014
B117/B101

AUTHORS: Freydlin, L. Kh., Sladkova, T. A., Kudryavtsev, G. I.,
Sheyn, T. I., Zil'berman, Ye. N., and Fedorova, R. G.

TITLE: Catalytic hydrogenation of aromatic nitriles and the
properties of polyamides obtained from p-(β, β' -diamino-diethyl)
benzene

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye khimicheskikh
nauk, no. 9, 1961, 1713-1715

TEXT: The hydrogenation of p-phenylene diacetodinitrile to give p-(β, β' -
diamino-ethyl) benzene:

$NC-CH_2-C_6H_4-CH_2-CN \rightarrow H_2N-C_2H_4-C_6H_4-C_2H_4-NH_2$ and the properties of the
polyamides based on this diamine were studied. The p-phenylene diacetodi-
nitrile (m.p. $95^{\circ}-97^{\circ}C$) was prepared from acetone cyanohydride and
p-xylylene dibromide. Hydrogenation was carried out at $100^{\circ}-105^{\circ}C$ and an
initial hydrogen pressure of 100 atm in a rotating autoclave of 0.175 liter
capacity. Dioxane, methyl alcohol, or ethyl alcohol containing some
ammonia were used as mediums. The catalysts were prepared by exhaustively
Card 1/4

27496

S/062/61/000/009/012/014
B117/B101

Catalytic hydrogenation of ...

leaching powdered 50% nickel-aluminum- and cobalt-aluminum alloys with 10% aqueous NaOH solution. The catalysts were then washed with water up to neutral reaction against phenolphthalein. Cobalt skeleton catalyst leached with 25-30% aqueous alkali solution at maximally 15°C (Ref. 5: see below) was used in some experiments. Diamine yields are strongly influenced by the nature of the catalyst and its preparation method. The yield is 64-65% in the case of nickel skeleton catalyst, 74% with cobalt skeleton catalyst leached at 90°-100°C, and 94% with catalyst prepared by "cold leaching". The authors also studied the polycondensation of p-(β,β'-diamino-diethyl) benzene with adipic acid and terephthalic acid. Addition of acetone to an equimolar mixture of aqueous diamine- and adipic acid solutions precipitates the salt. This salt is crystallized twice from water, yielding a white crystalline substance, m.p. 200°-202°C (C₁₆H₂₆N₂O₄). The polyamide was obtained by polycondensation of this salt at 260°-280°C. Polycondensation occurs in the solid phase below the melting point of the polyamide. This polyamide based on p-(β,β'-diamino-diethyl) benzene and adipic acid was also prepared at 20°C by heterophase polycondensation: reaction between the aqueous diamine solution (with sodium carbonate added) and adipic chloride in benzene. Polyamides were

Card 2/4

27496

S/062/61/000/009/012/014
B117/B101

Catalytic hydrogenation of ...

also prepared in an analogous manner by reaction of terephthalic- and sebacic chlorides in methylene chloride with aqueous diamine solutions containing alkali to bind the hydrochloric acid formed, according to the method by P. W. Morgan (Ref. 8, see below). In all experiments, polycondensation of adipic acid with the diamine under investigation yielded a polyamide having a melting point of 314° - 320°C . It is soluble in concentrated H_2SO_4 , cresol, formic acid, hydrochloric acid, and insoluble in organic solvents. Polyamides of higher mol wt. are obtained by increasing the reaction temperature and reaction time. The relative viscosity of these polyamides in concentrated H_2SO_4 is increased from 1.73 to 2.69. By

spinning these high-molecular polyamides from their melts at 335° - 340°C fibers capable of orientation at high temperatures were obtained. The polymer properties are also affected by the purity of the amino salt used. If the salt is only recrystallized once, colored polyamides of lower molecular weight are formed. There are 2 tables and 8 references: 3 Soviet and 5 non-Soviet. The four most recent references to English-language publications read as follows: F. G. Lum, E. F. Carlston, Industr. and Engng Chem. 44, 1595 (1952); E. F. Carlston, F. G. Lum,

Card 3/4

27ii96

S/062/61/000/009/012/014
B117/B101

Catalytic hydrogenation of ...

Industr. and Engng Chem. 49, 1239 (1957); Ref. 5: B. V. Aller. J. Appl. Chem. 7, 130 (1957); Ref. 8: P. W. Morgan, SPE-Journal 15, 485 (1959).

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); Vsesoyuznyy nauchno-issledovatel'skiy institut iskusstvennogo volokna (All-Union Scientific Research Institute of Synthetic Fibers)

SUBMITTED: March 28, 1961

Card 4/4

AKIMOV, V.M.; LITVIN, Ye.F.; RUBINSHTEYN, A.M.; FREYDLIN, L.Kh.

Phase transitions during the preparation of Ni-MgO catalysts
by the decomposition of oxalates in a hydrogen stream. *Izv.AN*
SSSR.Otd.khim.nauk no.10:1892-1894 0 '61. (MIRA 14:10)

1. Institut organicheskoy khimii im. N.D.Zelinskogo AN SSSR.
(Nickel oxalate) (Magnesium oxide)

VDOVIN, V.M.; SULTANOV, R.; SLADKOVA, T.A.; FREYDLIN, L.Kh.; PETROV, A.D.

Addition of alkoxy silane hydrides to unsaturated nitriles and hydrogenation of ω -cyanoalkylalkoxysilanes obtained. Izv.AN SSSR.Otd.khim.nauk no.11:2007-2012 N '61. (MIRA 14:11)

1. Institut organicheskoy khimii im. N.D.Zelinskogo AN SSSR.
(Nitriles) (Silane)

FREYDLIN, L.Kh.; SHARF, V.Z.; LITVIN, Ye.F.; TUKHTAMURADOV, Z.T.

Dehydration of primary n-amy1 alcohol and the accompanying isomeric conversions of pentenes on a calcium phosphate catalyst. Neftekhimiiia 1 no.4:548-554. J1-Ag '61.

(MIRA 16:11)

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

FREYDLIN, L.Kh.; LITVIN, Ye.F.; SHUKOVA, I.F.; ENGLIN, B.A.

Effect of the nature of solvent and the amount of Raney
nickel catalyst on the orientation of hydrogen addition to
trans-piperylene. Neftekhimii 1 no.4:484-488 J1-Ag '61.
(MIRA 16:11)

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

33584

S/204/61/001/005/002/008

E075/E484

11. 0132

AUTHORS:

Nazarova, N.M., Freydlin, L.Kh., Shafran, R.N.,
Litvin. Ye.F.

TITLE:

Thermal alkylation of methylcyclohexane with olefins
under pressure

PERIODICAL: Neftekhimiya, v.1, no.5, 1961, 613-618

TEXT: The authors reported recently that alkylation of cyclohexane and cyclopentane can be achieved thermally (350 to 450°C) under pressure (50 to 200 atm). Further work on alkylation of methylcyclohexane with olefins was carried out to elucidate the influence of side chains on the direction and ease with which the reaction proceeds. The reaction was carried out in a reactor filled with quartz rings. Molar ratios of methylcyclohexane to ethylene were from 2.5 to 3.6 and for propylene 1.4 to 3.2. The space velocity varied between 0.81 and 0.99 litre/hour for ethylene and 0.52 to 1.43 litre/hour for propylene. All experiments with propylene were carried out at 450°C, whereas for ethylene the temperatures varied from 350 to 450°C. Results show that the main product of the reaction of methylcyclohexane with

Card 1/3

33584

S/204/61/001/005/002/008

E075/E484

Thermal alkylation ...

ethylene is a mixture of methylethylcyclohexanes, the proportions of various isomers differing from their equilibrium concentrations. With propylene the reaction proceeds with more difficulty and the yield of alkylate is lower than that obtained for ethylene (155% of propylene taken and 316% of ethylene respectively). Comparison with previous work (Ref.7: N.M.Nazarova, L.Kh.Freydlin. Dokl. AN SSSR, 137, 1961, 1125) shows that the alkylation of methylcyclohexane proceeds more easily than that of unsubstituted cyclohexane. The reaction begins at a lower temperature (350°C) and pressure (50 atm). The expected formation during the reaction of 1-methyl-1-ethylcyclohexane was not observed, which is explained by thermal instability of hydrocarbons with quaternary carbon atoms. It is postulated that 1,3 and 1,4-isomers are formed by an internal rearrangement of 1,1-isomer or via an intermediate stage of migration of free valency of methylcyclohexyl radical from position 1,1 to positions 1,3 and 1,4. Acknowledgments are expressed to A.L.Liberman and T.V.Vasina for supplying the methylethylcyclohexane samples. Yu.G.Mamedaliyev, Aladdin Kuliyeu and Z.A.Mamedova are mentioned in the article in connection with Card 2/3 ✓

33584

S/204/61/001/005/002/008
E075/E484

Thermal alkylation ...

their contributions in this field. There are 2 figures, 5 tables and 11 references: 6 Soviet-bloc and 5 non-Soviet-bloc. The four references to English language publications read as follows:
Ref.2: V.J.Komarowsky. J. Amer. Chem. Soc., no.59, 1937, 2715;
Ref.3: H.Pines, W.Ipatieff. J. Amer. Chem. Soc., v.67, 1945, 1631;
Ref.4: A.Schneider. J. Amer. Chem. Soc., v.76, 1954, 4938;
Ref.9: H.D.Orloff. Chem. Rev., no.54, 1954, 347.

ASSOCIATION: Institut organicheskoy khimii AN SSSR
im. N.D.Zelinskogo (Institute of Organic Chemistry
AS USSR imeni N.D.Zelinskiy) ✓

SUBMITTED: August 7, 1961

Card 3/3

33585

S/204/61/001/005/003/008
E075/E484

11.0132

AUTHORS: Freydlin, L.Kh., Nazarova, N.M.

TITLE: Alkylation of cycloparaffinic ring in tetralin with olefins

PERIODICAL: Neftekhimiya, v.1, no.5, 1961, 619-623

TEXT: It was observed recently that alkylation of cyclohexane can be accomplished under conditions (high temperatures and pressures) at which benzene is not alkylated. It was expected therefore that the saturated ring in tetraline will be selectively alkylated under similar conditions. The experiments were carried out in a flow apparatus described previously (Ref.5: Dokl. AN SSSR, v.37, no.5, 1961, 1125), the reactor (120 ml) being filled with crushed quartz. Tetraline used had a boiling point 78°C/12 mm Hg, d_{20}^{20} 0.9677 and n_D^{20} 1.5440. The ethylene contained 7% ethane; the propylene contained 12% propane. The reaction with tetralin was studied at 400 and 450°C and 50 to 200 atm pressure. The reaction with propylene was conducted under optimum conditions for the alkylation with ethylene, i.e. 450°C, initial pressure of 200 atm and mole ratio of tetralin to propylene of 2.3. The degree of

Card 1/3

33585

S/204/61/001/005/003/008
E075/E484

Alkylation of cycloparaffinic ...

conversion of propylene in one cycle was 51% and that for tetraline 29%. The yield of alkylate was 150% of propylene mixed with tetralin. Products obtained by the alkylation with ethylene are given in Table 1. The main product is 1-ethyltetralin. The products of the reaction with propylene are mainly mixed propyltetralins. It was not possible to obtain any information about the structure and position of the side chains in the constituents of the mixture but it is expected that mainly 1-n propyltetralin is formed. Acknowledgments are expressed to G.K.Gayvoronska and I.N.Lifanova for assistance. There are 3 tables and 15 references: 3 Soviet-bloc and 12 non-Soviet-bloc. The four most recent references to English language publications read as follows: Ref.7: H. Pines, C.N.Pillai. J. Amer. Chem. Soc., v.81, 1959, 3629; Ref.8: R. Closson, J. Napolitano, J. Ecke, A. Kolka. J. Organ. Chem., v.22, 1957, 646; Ref.9: C.M.Staveley, T.C.Smith. J. Inst. Petrol., v.42, no.386, 1956, 55; Ref.10: G.F.Hinsher, P.H.Wise. J. Amer. Chem. Soc., v.76, 1954, 1747. X

Card 2/4 3

33585

Alkylation of cycloparaffinic ...

S/204/61/001/005/003/008
E075/E484ASSOCIATION: Institut organicheskoy khimii AN SSSR
im. N. D. Zelinskogo (Institute of Organic Chemistry
AS USSR imeni N. D. Zelinskiy)

SUBMITTED: August 21, 1961

Table 1.

Conditions	Experiments			
	1	2	3	4
Temperature, °C	450	450	450	400
Pressure, atm	200	200	50	200
Molar ratio tetralin/ethylene	0.75	1.6	2.6	2.2
Space velocity of feed, ml/min	3	7	7	9
Yield of products, g	234	543	355	445
Distilled tetralin, g	103	313	-	325
Degree of conversion of ethylene, % wt	95	94	60	71
Degree of conversion of tetralin, % wt	44	36	-	18
Card 3/8				

FREYDLIN, L.Kh.; ZHUKOVA, I.F.; ZIMINOVA, N.I.; LAYNER, D.I.; KAGAN, N.M.

Deactivation of skeletal nickel catalyst by water vapor and enhancement of its stability by means of promoters. Kin. 1 kat. 2 no.1:112-117 Ja-F '61. (MIRA 14:3)

1. Institut organicheskoy khimii imeni N.D. Zelinskogo AN SSSR.
Institut giprotsvetmetobrabotka.
(Catalysts, Nickel)

FREYDLIN, L. Kh.; SHARF, V.Z.; KHOL'MER, O.M.; MALKINA, L.L.

Properties of a boron phosphate catalyst in the dehydration
of a pyrocatechol-methanol mixture. Kin. i kat. 2 no.2:228-234
Mr-Ap '61. (MIRA 14:6)

1. Institut organicheskoy khimii imeni N. D. Zelinskogo AN SSR
i Issledovatel'skaya laboratoriya zavoda "Slozhnyye efiry".
(Boron phosphate)
(Dehydration (Chemistry))

FREYDLIN, L.Kh.; BORUNOVA, N.V.; KRYLOV, V.D. (Moscow)

Interaction of NiO with Al_2O_3 in the atmosphere of water vapors and the effect of the latter on the properties of nickel-alumina catalysts. Zhur.fiz.khim. 35 no.11:2458-2464 N '61.

(MIRA 14:12)

1. Akademiya nauk SSSR, Institut organicheskoy khimii imeni N.D. Zelinskogo.

(Nickel oxide)
(Alumina)

S/020/61/136/005/018/032
B103/B208

AUTHORS: Freydlin, L. Kh. and Sharf, V. Z.

TITLE: Studies of stepwise dehydration of glycols on the tricalcium phosphate catalyst

PERIODICAL: Doklady Akademii nauk SSSR, v. 136, no. 5, 1961, 1108-1111

TEXT: The authors dehydrated several diols on the tricalcium phosphate catalyst (for its production see Ref. 11) in a wide temperature range. 1) 5, 20, and 49% of trimethylene glycol was converted at 250, 300, and 350°C, respectively, and gave allyl alcohol and propionaldehyde as the main products. No trimethylene oxide was found, but the authors assume that while this oxide does form, it is quickly isomerized to the two afore-mentioned end products. 2) Butene-2-diol-1,4 60% of which were converted at 280°C. The main products were: 2,5-dihydrofuran and crotonaldehyde. Butene-2-diol-1,4 is dehydrated mainly under oxide formation. 3) Butanediol-1,4 yields only 98% tetrahydrofuran between 260 and 320°C. At temperatures above 320°C the yield of tetrahydrofuran drops, giving at the same time buten-2-ol-4, divinyl, and butyraldehyde.

Card 1/4

Studies of stepwise dehydration ...

S/020/61/136/005/018/032
B103/B208

Dehydration of tetrahydrofuran to divinyl sets in above 380°C.

4) Pentanediol-1,5 is selectively dehydrated to tetrahydropyran (72% yield) between 280 and 343°C. At higher temperatures also pentenols and pentadienes are formed (the latter result from tetrahydropyran at 389-418°C). 5) Hexanediol-1,6 with the reaction products: hexamethylene oxide, hexenols, and hexadiene-1,5. On hydrogenation, the latter absorbs 2 moles H₂. At the same time, the following isomerization

products are formed: α-methyl tetrahydropyran, α-ethyl tetrahydrofuran, hexadiene-1,4, and others. 6) 3,7-dimethyl octanediol-1,7 is selectively dehydrated to citronellol (84% yield) in vacuo at 200°C. Only 5% diolefin is formed. At higher temperatures the quantitative ratio of these end products becomes reverse (90% diolefin at 290°C). Under these latter conditions citronellol is dehydrated to diolefins with about the same yield as the diol. The above results enabled the authors to judge the influence of the glycol structure upon the reaction direction, the conditions under which glycols are only partly dehydrated to oxides, and the ways of a complete dehydration to a diene hydrocarbon. C₄ and C₅ glycols are selectively dehydrated to oxides

Card 2/4

Studies of stepwise dehydration ...

S/020/61/136/005/018/032
B103/B208

between 280 and 320°C. The oxacyclanes resulting as intermediates are formed more and more difficultly in the order $C_4 > C_5 > C_6$. Tetrahydrofuran is formed in higher yield and at lower temperatures than tetrahydropyran, the latter being obtained more easily than hexamethylene oxide. Above 320°C, also unsaturated alcohols and diolefin hydrocarbons result. The authors further conclude from the results obtained that oxacyclanes are more difficultly dehydrated to diolefins than the corresponding glycols. The intense formation of diolefin above 350°C with simultaneously increasing yield of hexamethylene oxide, and decreasing yield of hexenol is regarded by the authors as proof for the fact, that diolefin mainly results from hexenol which is less stable than the oxide. Hence, the α -glycols $C_4 - C_6$ are gradually dehydrated. The following compounds are obtained: in the 1st stage - oxacyclane, in the 2nd stage - an unsaturated monovalent alcohol isomeric to oxacyclane (lower formula); in the 3rd stage - the end product, a diolefin, which mainly results via stage II, and not from the oxide I (upper formula). ✓

Card 3/4

6

2/10/75
BIB/B/208

11.210 also 2209
AUTHORS: Nazarova, N.M. and Freydlin, L.Kh.

TITLE: Thermal alkylation of cyclohexane by olefins under pressure

PERIODICAL: Doklady Akademii Nauk SSSR, v. 137, no. 5, 1961, 1125 - 1128

TEXT: The authors were the first to alkylate directly cyclohexane with 1) ethylene, 2) propylene, and 3) isobutylene. The catalytic device used by them has already been described (DAN, 25, no. 5, 1911 (1954)). $Ca_3(PO_4)_2$ and porcelain fragments or quartz pieces were put into the reaction vessel. The catalyzates were fractionated, the unsaturated and the resultant aromatic hydrocarbons were chromatographically separated on silica gel. The authors studied the structure of the resultant alkyl cyclohexanes by dehydrogenation on Pt/C catalyst (20% Pt) at 300°C to the corresponding aromatic hydrocarbons which were subsequently oxidized to acids. Ad 1). Ethylene was completely absorbed at 450°C and a pressure of 200 and 450 atm, but at 100 atm only to 90%. Having removed cyclohexane from the alkylate, three fractions were isolated: 1) Monocetyl

Card 1/10

21975

S/016/04/011/01/010/016
B102/B103

Thermal alkylation of ...

cyclohexane (boiling point 120-131°C) (31% of the alkylate). II) Diethyl cyclohexane (170-185°C) (23%), and a higher-boiling residue. I) Corresponded to ethyl cyclohexane according to data in publications. A narrow fraction was chromatographically isolated from II after dehydrogenation (80%, boiling point 178-180°C/340 mm Hg), corresponding to the isomers of diethyl benzene. *o*-Phthalic, isophthalic, and terephthalic acids resulted therefrom by oxidation (weight ratio 1 : 1.6 : 0). In addition to fractions I and II 3.2% of low-boiling (up to 75°C) cracking and dimerization products of the olefin were isolated. The rest of the alkylate consisted of intermediate fractions (85-125°C and 135-170°C) and of the high-boiling residue. 75% of the residue were divided among the fractions 185-220°C and 220-250°C. Apparently, it represents a mixture of polyethyl cyclohexanes. Experiment 3 gave 11% of unsaturated hydrocarbons. By increasing the ethylene concentration in the initial mixture or reducing the volume rate the yield of monoethyl cyclohexane dropped, while that of the higher-boiling residue increased. Ad 2). The propylene-propane fraction with 13% propane content was used. Table 2 shows the

Card 2/10

1175

2/20/61/131/005/019/026
B103/B208

Thermal alkylation of ...

results. The following was distilled from the alkylate: I) a low-boiling fraction of the cracking products, II) fraction with a boiling point of 150-157°C, and the residue. After elimination of the unsaturated compounds (5%), dehydrogenation, fractionation, and chromatographic separation a product (46%) with a boiling point of 159.2 - 159.5°C was obtained which corresponds to n-propyl benzene. From the residue a hydrocarbon boiling at 209-211°C/739 mmHg (about 30 wt% of the residue) was obtained whose properties resemble those of di-n-propyl cyclohexane. Experiments nos. 9 and 11 were made with quartz, nos. 10 and 12 with $\text{Ca}_3(\text{PO}_4)_2$. Ad 3). In these experiments quartz was used. The degree of conversion of isobutylene was lower than that of propylene. The fraction isolated from the alkylate by distillation boiled at 168 - 183°C. After elimination of unsaturated compounds and fractionation a hydrocarbon (51%) with a boiling point of 171-172°C/742 mmHg resulted which is closely related to isobutyl cyclohexane. Table 3 shows the constants of hydrocarbons with normal and with iso-structure (partly from publications). It may be seen from it that the constants of propylbenzene obtained by the authors resemble those of hydrocarbon with a normal side chain. The constants of the resultant bu-

Card 3/40

21975

S/030/61/157/005/619/026

B103/B208

Thermal alkylation of ...

tyl cyclohexane resemble those of isobutyl cyclohexane. It is therefore assumed that in both cases cyclohexane is added to the outermost unsaturated C-atom of the olefin. In the acidic alkylation of methyl cyclohexane with propylene, however, methyl isopropyl cyclohexane (Ref. 3) was obtained; this means, that the cyclohexane is added to the middle, unsaturated C-atom of the olefin. The following papers are mentioned: Yu. G.

Mamedaliyev, Aladdin Kuliyyev (Ref. 2: DAN, 99, 471, 1953), G.S.

Mamedaliyev, Z.A. Mamedova (Ref. 3: DAN, 112, 1005, 1957); L.Kh.

Froydlin, A.A. Balandin, N.M. Navarova (DAN, 95, no. 5, 1011, 1954).

There are 1 figure, 3 tables, and 9 references. 6 Soviet-bloc and 3 non-Soviet-bloc. The 3 most recent references to English language publications read as follows: H. Pines, M. Igatieff (Ref. 1: J.-Am.Chem.Soc., 67, 1631, 1945), J.E. Norris, G.T. Vanda (Ref. 6: J.-Am.Chem.Soc., 61, 2131, 1939), B.B. Elander, H.E. Strauss, T.J. Barbera, (J.-Am.Chem.Soc., 1957, 578).

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

Card 4/10

FREYDLIN, L.Kh.; LITVIN, Ye.F.; KAUP, Yu.Yu.

Sequence of reactions in the hydrogenation of 2,3-dimethyl-1,3-butadiene on a skeletal nickel catalyst. Dokl. AN SSSR 139 no.6:1386-1388 Ag '61. (MIRA 14:8)

1. Institut organicheskoy khimii im. N.D. Zelinskogo AN SSSR. Predstavleno akademikom M.I. Kabachnikom. (Butadiene) (Hydrogenation)

FREYDLIN, L.Kh.; SHARF, V.Z.; LITVIN, Ye.F.; TUKHTAMURADOV, Z.T.

Preparation of C₈ - C₁₂ α -olefins by catalytic dehydration
of primary alcohols. Neftekhimiia 3 no.1:10-12 Ja-F '63.
(MIRA 16:2)

1. Institut organicheskoy khimii AN SSSR imeni
Zelinskogo.

(Olefins) (Alcohols)
(Dehydration (Chemistry))

FREYDLIN, L.Kh.; SHARF, V.Z.

Stepped dehydration of 1, 5-pentanediol over a tricalcium
phosphate catalyst. Zhur.prikl.khim. 35 no.1:212-214 Ja '62.
(MIRA 15:1)

1. Institut organicheskoy khimii AN SSSR imeni N.D.Zelinskogo.
(Pentenediol) (Dehydration)

FREYDLIN, L.Kh.; LITVIN, Ye.F.; ZHUKOVA, I.F.; ENGLIN, B.A.

Sequence of reactions in the process of hydrogenation of piperylene
on a skeletal nickel catalyst. Kin.i kat. 4 no.1:128-133 Ja-F '63.
(MIB 16:3)

1. Institut organicheskoy khimii imeni N.D.Zelinskogo AN SSSR.
(Piperylene) (Hydrogenation) (Nickel catalysts)

FREYDLIN, L.Kh.; SLADKOVA, T.A.

Mechanism of secondary and tertiary amine formation in the process of catalytic hydrogenation of adiponitrile to hexamethylenediamine. Izv. AN SSSR Otd.khim.nauk no.2:336-341 F '62. (MIRA 15:2)

1. Institut organicheskoy khimii im. N.D.Zelinskogo AN SSSR.
(Adiponitrile)
(Hexanediamine)

FREYDLIN, L.Kh.; SLADKOVA, T.A.

Direction of the catalytic reduction of dinitriles as affected
by their structure. Dokl. AN SSSR 143 no.3:625-628 Mr '62.
(MIRA 15:3)

1. Institut organicheskoy khimii im. N.D.Zelinskogo AN SSSR.
Predstavleno akademikom A.A.Balandinym.
(Nitriles)(Reduction,Chemical)(Catalysis)

FREYDLIN, L.Kh.; KAUP, Yu.Yu.; LITVIN, Ye.F.; ILOMETS, T.I.

Selectivity and stereospecificity in reactions of n-hexene
hydrogenation on a skeletal nickel catalyst. Dokl. AN SSSR
143 no.4:883-886 Ap '62. (MIRA 15:3)

1. Institut organicheskoy khimii im. N.D.Zelinskogo AN SSSR.
Predstavleno akademikom A.A.Balandinym.
(Hexene) (Hydrogenation) (Catalysts, Nickel)

PREYDLIN, L.Kh.; ZHUKOVA, I.F.; LITVIN, Ye.F.; ANDERSON, A.A.

Mechanism of the hydrogenation of isoprene and its binary mixtures
with isoamylene. Neftekhimiia '2 no.5:670-675 S-0 '62.

(MIRA 16:1)

1. Institut organicheskoy khimii AN SSSR imeni N.D.Zelinskogo.
(Isoprene) (Butene) (Hydrogenation)

FREYDLIN, L.Kh.; SHARF, V.Z.; TUKHTAMURADOV, Z.T.

Stereospecificity of the dehydration of 3-pentanol on acid-type catalysts. Neftekhimiia 2 no.5:730-734 S-0 '62. (MIRA 16:1)

1. Institut organicheskoy khimii AN SSSR imeni Zelinskogo.
(Pentanol) (Dehydration (Chemistry)) (Stereochemistry)

ALIYEV, Ya.Yu.; ROMANOVA, I.B.; FREYDLIN, L.Kh.

Catalytic N-acylation of piperidine, α - and β - pipercolines
with carbon monoxide. Uzb.khim.zhur. 6 no.6:58-66 '62.

(MIRA 16:2)

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

(Piperdine)

(Pipercoline)

(Acylation)

ALIYEV, Ya.Yu.; ROMANOVA, I.B.; FREYDLIN, L.Kh.

Catalytic carbonylation of aliphatic amines in the presence of
alkali metal alcoholates. Uzb.khim.zhur. 6 no.5:75-83 '62.
(MIRA 15:12)

1. Institut khimii AN UzSSR i Institut organicheskoy khimii
imeni N.D.Zelinskogo AN SSSR.
(Amines) (Carbonyl group) (Alcoholates)

L 12344-63

EPF(c)/EWP(q)/EWT(m)/BDS AFTTC/ASD Pr-4
RM/WW/JW/JD

S/081/63/000/005/030/075

66

AUTHOR: Aliyev, Ya. Yu., Romanova, I. B. and Freydlin, L. Kh.TITLE: Catalytic carbonylation of aliphatic amines in the presence of nickel and cobalt halides 27

PERIODICAL: Referativnyy zhurnal, Khimiya, no. 5, 1963, 190, abstract 5Zh85 (Uzb. Khim. Zh., 1962, no. 4, 67-78)

TEXT: The carbonylation of aliphatic amines in the presence of Ni and Co halides was studied. The amines which were used: $[(C_2H_5)_2NH]$, $(iso-C_4H_9)_2NH$, $C_4H_9NH_2$, $H-C_5H_{11}NH_2$ and $H-C_6H_{13}NH_2$ have identical dissociation constants and form carbonyls almost identically. At a temperature lower than $260^\circ C$, the main direction of the process is toward the formation of formamides. At a temperature higher than $260^\circ C$, amines deaminate and dealkylize, and formamides decompose. The olefins which are formed in this process interact with CO and NH_3 , forming carboxylic acid amides. In this manner, the carbonylation process of amines goes in two directions: formation of formamides and formation of amides of carboxylic acids. Author's abstract.

[Abstractor's note: Complete translation]

Card 1/1

FREYDLIN, L.Kh.; KAUP, Yu.Yu.

Mechanism of hydrogenation of n.pentyne and n.hexyne on a skeletal nickel catalyst. Izv.AN SSSR.Otd.khim.nauk no.9:1660-1663 S '62.
(MIRA 15:10)

1. Institut organicheskoy khimii ii. N.D.Zelinskogo AN SSSR.
(Pentyne) (Hexyne) (Hydrogenation)

S/204/63/003/001/002/013
E075/E436

AUTHORS: Freydlin, L.Kh., Sharf, V.Z., Litvin, Ye.F.,
Tukhtamuradov, Z.T.

TITLE: Preparation of C₈-C₁₂ α-olefins by the catalytic
dehydration of primary alcohols

PERIODICAL: Neftekhimiya, v.3, no.1, 1963, 10-12

TEXT: The authors investigated the catalytic dehydration of C₈,
C₁₀ and C₁₂ n-alcohols after previous successful preparation of
98% pure α-olefins from n-C₄-C₆ alcohols using trisubstituted
calcium phosphate as catalyst (Neftekhimiya, v.1, no.6, 1961, 749).
The catalyst was prepared by treating the phosphate with 0.07 g
NaOH/g catalyst and baking at 400 to 450°C for 1 to 2 hours.
It preserved its activity without regeneration. The products of
the dehydration were 92 to 94% pure α-olefins (97 to 98% after
distillation) obtained with the yields of 58 to 88%. The purity
of the alcohols is of the same order as that obtained after the
pyrolysis of the acetates and is much better than that of the
alcohols produced with alumina as the dehydration catalyst. In
the latter case the products contain only 39 to 68% α-olefins and
Card 1/2

Preparation of C₈ - C₁₂ ...

S/204/63/003/001/002/013
E075/E436

the remainder - isomers with the double bond in different positions.
There are 1 figures and 1 tables.

ASSOCIATION: Institut organicheskoy khimii AN SSSR im.
H.D.Zelinskogo (Institute of Organic Chemistry AS USSR
imeni N.D.Zelinskiy)

SUBMITTED: July 26, 1962

Card 2/2

FREYDLIN, L. Kh.; SHARF, V. Z.; ABIDOV, M. A.

Isomerization of isopropenylcyclopropane and accompanying
conversions of dienes on catalysts of acidic nature.
Naftekhimiia 3 no.1:28-34 Ja-F '63. (MIRA 16:2)

1. Institut organicheskoy khimii AN SSSR imeni
Zelinskogo.

(Cyclopropane)

(Pentadiene)

(Catalysts)

ABIDOVA, M.F.; PITSARIS, V.K.; SULTANOV, A.S.; FREYDLIN, L.Kh.

Reduction of nitrobenzene and nitrocyclohexane in the presence
of a tin catalyst. Uzb.khim.zhur. 7 no.1:60-65 '63.
(MIRA 16:4)

1. Institut khimii polimerov AN UzSSR.
(Nitrobenzene) (Cyclohexane) (Reduction, Chemical)

NAZAROVA, N.M.; FREYDLIN, L.Kh.; SHAFRAN, R.N.; LOGINOV, G.A.

Alkylation of cyclohexene by ethylene at elevated temperatures and pressures. Neftekhimii 3 no.1:66-70 Ja-F '63. (MIRA 16:2)

1. Institut organicheskoy khimii AN SSSR imeni Zelinskogo.
(Cyclohexene) (Ethylene) (Alkylation)

FREYDLIN, L.Kh.; SHARF, V.Z.; SAMOKHVALOV, G.I.; MIROPOL'SKAYA, M.A.;
PRIVALOVA, I.M.; YANOTOVSKIY, M.TS.

Catalytic dehydration of 3-methyl-1,3-butanediol. Neftekhimija
3 no.1:104-107 Ja-F '63. (MIRA 16:2)

1. Institut organicheskoy khimii AN SSSR imeni Zelinskogo
i Vsesoyuznyy nauchno-issledovatel'skiy vitaminnyy institut.
(Butanediol)
(Dehydration (Chemistry))

S/062/63/000/001/016/025
B101/B186

AUTHORS: Freydlin, L. Kh., and Kaup, Yu. Yu.

TITLE: Study of the mechanism of hydrogenation of acetylene hydrocarbons on nickel skeleton catalyst

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye khimicheskikh nauk, no. 1, 1963, 166 - 170

TEXT: The applicability of the reaction equations $R-C \equiv C-R \xrightarrow[\text{ads}]{+H_2} R-C=C-R$ (1) and $R-C \equiv C-R \xrightarrow[\text{ads}]{+2H_2} R-C-C-R$ (2) was checked by hydrogenation of binary equimolar mixtures of hexyne-1 + pentene-1 and pentyne-2+hexene-2 on a nickel skeleton catalyst. The experiments were made with 20 ml of 0.5 M solutions in absolute methanol at 10°C with 0.1 g catalyst. Preliminary experiments showed that in mixtures of hexene-1+pentene-1, molar ratio 1:1, 1:2, 2:1, the two olefins were hydrogenated proportionally to their content in the mixture; they are adsorbed on the catalyst to the same extent and may, therefore, substitute one another in a mixture with pentyne-1 or hexyne-1. The same was found
Card 1/2

Study of the mechanism ...

S/062/63/000/001/016/025
B101/B186

for cis-pentene-2 and cis-hexene-2. Results of hydrogenation of the binary mixtures of acetylene and olefin hydrocarbons: The β -acetylene hydrocarbon is hydrogenated with a high degree of selectivity and stereospecificity. The reaction proceeds mainly by the formation of a cis-olefin. Saturated hydrocarbons, products of cis-trans-conversion and migration of the double bond are formed in the first stage of the reaction only in a small amount according to Eq. (2). α -acetylene hydrocarbon, however, is partially hydrogenated in the first stage to the saturated hydrocarbon, the α -olefin admixed being hydrogenated only to a small extent and without isomerization. Thus, hydrogenation of α -acetylene hydrocarbon occurs by both mechanisms at the same time. There are 4 figures and 2 tables.

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: April 24, 1962

Card 2/2

L 17066-63 EPF(c)/EWP(q)/EWT(m)/BDS S/062/63/000/004/016/022
AFFTC/ASD Pr-4/Pad RM/WW/JD/HW
AUTHOR: 27 Freydlin, L. Kh. and Kaup, Yu. Yu. 27 65
64
TITLE: Investigation of alpha-, beta-, and gamma-acetylenic hydrocarbon
hydrogenation in their binary mixtures on a skeleton nickel
catalyst 27
PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye khimicheskikh nauk,
no. 4, 1963, 742-748
TEXT: In binary systems composed of alpha- and alpha-(C₅-C₇), beta-
and beta-(C₅-C₆) and beta- and gamma-(C₅-C₆) normal acetylenic hydrocarbons, 7
components of the mixture are hydrogenated on a skeleton nickel catalyst simul-
taneously and with identical speed. Principally alpha-acetylenic hydrocarbons
are hydrogenated in the first stage of hydrogenation of the binary mixture of
alpha- and beta-, and alpha- and gamma-acetylenic hydrocarbons. The acetylenic
hydrocarbons studied (C₅-C₇) and the olefins formed from them are hydrogenated
in the sequence: alpha-acetylenes; beta- and gamma-acetylenes; alpha-olefins;
beta- and gamma-olefins characterizing their relative absorbability on nickel
catalyst. There are 5 figures and 3 tables. The most important English-language
Card 1/2

L 17066-63

S/062/63/000/004/016/022

Investigation of alpha-

references read as follows: G. C. Bond, J. Sheridan, Trans. Faraday Soc.,
48, 664 (1952); T. Fukuda, Bull. Chem. Soc. Japan, 32, No. 12, 1279 (1959).

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

SUBMITTED: June 6, 1962

Card 2/2

FREYDLIN, L.Kh.; KAUP, Yu.Yu.

Hydrogenation of isopropenylacetylene on a skeletal nickel catalyst.
Izv. AN SSSR. Otd.khim.nauk no.6:1091-1095 Je '63. (MIRA 16:7)

1. Institut organicheskoy khimii imeni Zelinskogo AN SSSR.
(Butenyne) (Hydrogenation) (Nickel catalysts)