

BOGDANOVA, N.M.

Unusual step-type gully ("korb-bash") forms in the piedmont plain
of southwestern Kopet Dagh. Izv. AN Turk. SSR no.1:108-111 '57.
(MLRA 10:4)

1. Institut geografii Akademii nauk SSSR.
(Kopet Dagh--Erosion)

BOGDANOVA, N.M.

Relief of the Kara Kum Canal region. Izv.AN Turk.SSR. no.2:
56-63 '57. (MLRA 10:5)

1. Institut geografii Akademii nauk SSSR.
(Kara Kum Canal region--Physical geography)

BOGDANOVA, N.M.

Origin and age of the Mashed sand massif in southwestern Turkmenia.
Trudy Inst. geog. 80:60-82 '60. (MIRA 13:8)
(Mashed massif--Geology)

BOGDANOVA, N.M.

Old terrace-deltas in northern Afghan rivers in the southeastern
Kara Kum. Trudy Inst. geog. 80:83-86 '60. (MIRA 13:8)
(Kara Kum--Terraces (Geology))

PIOTROVSKIY, Vladimir Vladimirovich; PODOBKDOV, N.S., prof., retsenzent;
BOGONOLOV, L.A., dotsent, retsenzent; GELLER, S.Yu., doktor geograf.
nauk, retsenzent; BLAGOVOLIN, N.S., nauchnyy sotrudnik, retsenzent;
BOGDANOVA, N.M., nauchnyy sotrudnik, retsenzent; DOSKACH, A.G.,
nauchnyy sotrudnik, retsenzent; ZHIVAGO, A.V., nauchnyy sotrudnik,
retsenzent; RANTSMAN, Ye.Ya., nauchnyy sotrudnik, retsenzent; NIKOLAYEV,
N.I., prof., retsenzent; DOBROVOL'SKIY, V.V., dotsent, retsenzent;
VOSKRESENSKIY, S.S., red.; SHAMAROVA, T.A., red.isd-va; PREYS, E.M.,
tekh.n.red.

[Geomorphology and fundamentals of geology] Geomorfologiya s osnovami
geologii, Riga, Isd-vo geodez.lit-ry, 1961. 283 p.

- (MIRA 14:12)
1. Nachal'nik otdela geomorfologii Instituta geografii AN SSSR (for Geller).
 2. Otdel geomorfologii Instituta geografii AN SSSR (for Blagovolin, Bogda-
nova, Doskach, Zhivago, Rantsman).
(Geomorphology) (Geology)

BOGDANOVA, N.M.

Special features of the geomorphological structure of Karabil
(southeastern Turkmenistan) in connection with the stratigraphy
of the Quaternary formation. Izv. AN SSSR. Ser.geog. no.6:60-
66 N-D '62. (MIRA 15:12)

1. Institut geografii AN SSSR.
(Karabil Upland—Geomorphology)

BOGDANOVA, N.P.

BOGDANOVA, N.P., inzh.

Mechanization of fabric laying on the cutting-out table. Leg.
prom.17 no.9:43-46 S '57. (MIRA 10:12)
(Clothing industry--Equipment and supplies)

BOGDANOVA, M. P.

"Effect of Fog on the Radiative Balance of the Active Surface."
Cand Phys-Math Sci, Main Geophysical Observatory, Leningrad, 1953.
(RZhFiz, 1954)

SO: Sum 432, 29 Mar 55

BOGDANOVA, N. P.

"Experimental Investigation of the Influence of Fog on the Radiational Balance of an Active Surface".

Trudy Gl. geofiz. observ., No 46, pp 80-86, 1955

An experimental investigation of the radiational effect of fog in an adiabatic chamber of the Main Geophysical Observatory (volume 110 cubic meters, height 9 meters, diameter 4 meters). Compared are the radiational losses from a layer of ice at the bottom of the chamber without fog and for the case of fog. At a height of 4 meters from the surface of the ice a Yanishevskiy effective pyranometer was placed with cylindrical cap for protection from radiation of the chamber wall. The author compared the experimental values of effective radiation and values computed according to the formulas of K. S. Shifrin (ibid., No 27, 1951; No 46, 1955), and found the results satisfactory (RZhGeol, No 9, 1955)

SO: Sum No 812, 6 Feb 1956

BOGDANOVA, N. P.

"Precalculation of the Temperature of the Soil's Surface in the Presence of Fog".

Trudy Gl. geofiz. observ., No 46, pp 87-89, 1955.

An equation for the calculation of nighttime lowering of the temperature of the soil's surface in the presence of fog which influences the effective radiation is proposed. The author gives an example of calculation for one case in Koltushi, but without any indication of the date. (RZhGeol, No 10, 1955)

SO: Sum No 884, 9 Apr 1956

Bogdanova, N. P.

36-71-6/16

AUTHOR: Bogdanova, N. P.

TITLE: The Theory of Nonzonal Distribution of Moisture in the Atmosphere During the Cold Time of the Year (Teoriya nezonal'nogo raspredeleniya vlazhnosti v atmosfere dlya kholodnogo vremeni goda)

PERIODICAL: Trudy Glavnoy geofizicheskoy observatorii
, 1957, Nr 71, pp. 94-102 (USSR)

ABSTRACT: The author develops a quantitative theory regarding the transfer of moisture, a factor of considerable practical significance bearing on the amount of precipitation. Assuming a uniform zonal distribution of moisture distorted by meridional irruptions, the basic equation for transfer may be solved by the method of consecutive approximations. Using substitutions or transformations depending on different limiting conditions, it is possible to arrive at separate solutions for land and ocean surfaces within a latitudinal belt divided into four areas: the Pacific, North American, the Atlantic and Eurasian. By application of the turbulent-exchange principle, i.e., the vertical velocity of the wind and its latitudinal component, a practical solution for distribution of vapor on the surface of

Card 1/2

16-71-6/16

The Theory of Nonzonal Distribution of Moisture in the (Cont.)

earth is developed. To provide a better solution for some occasions the meridional transfer of moisture is also considered. One case, for lat. 50° N. indicated that moisture decreased in moving from the ocean to the continent, a well-known fact. Other systems of differential equations led to graphic presentations of the distribution of moisture under variable vertical velocities of the wind. The distribution is considerably affected by the last-mentioned factor and which should not be omitted in calculations. There are 5 figures, and 3 references of which 2 are USSR.

AVAILABLE: Library of Congress

Card 2/2

B. G. DANCOVA, N. P.
3(7)

PHASE I BOOK EXPLOITATION

SOV/2547

Leningrad. Glavnaya geofizicheskaya observatoriya

Voprosy dinamicheskoy meteorologii (Problems in Dynamic Meteorology)
Leningrad, Gidrometeoizdat, 1959. 91 p. (Series: Its Trudy, vyp. 81)
Errata slip inserted. 1,200 copies printed.

Sponsoring Agency: Glavnoye upravleniye gidrometeorologicheskoy sluzhby
pri Sovete Ministrov SSSR.

Ed. (Title page): M.I. Yudin, Doctor of Physical and Mathematical Sciences
and M.Ye. Shvets, Doctor of Physical and Mathematical Sciences; Ed.
(inside book): L.P. Zhdanova; Tech. Ed.: O.G. Vladimirov.

PURPOSE: This issue of the Geophysical Institute's Transactions is intended for
scientific workers and specialists in dynamic and synoptic meteorology.

COVERAGE: This collection of articles treats problems in dynamic meteorology.
The articles, for the most part, discuss computation methods of forecasting
meteorologic elements. Closely related to this is a study aimed at determining
Card 1/23

Problems in Dynamic Meteorology

SOV/2547

vertical velocities according to aircraft vibration data. No personalities are mentioned. References accompany each article.

TABLE OF CONTENTS:

Shvets, M.Ye. The Problem of Advance Computation of the Field of Relative Humidity	3
Bogdanova, N.P., and M.Ye. Shvets. Determining the Lower Boundary of Intramass Stratus Clouds	13
Yudin, M.I., N.I. Yakovleva, L.V. Rukhovets, L.S. Orlova, and P.A. Sel'tser. The Problem of Cyclone Evolution	20
Pyatygina, K.V., and M.A. Yemel'yanova. Results of Advance Computation of the Displacement of Near Surface Cyclone Centers	34
Dubov, A.S., T.G. Zaytseva, and Z.S. Rakova. Comparative Analysis of Some of the Simplest Methods of Numerical Forecasting	46
Gandin, L.S. and T. Dolod. Methods for Integrating the Vorticity Equation Along an Isobaric Surface	53

Card 2/3

Problems in Dynamic Meteorology

SOV/2547

- Gandin, L.S., and T.A. Alimova. The Problem of Stabilizing the Smoothed-out Currents Used in Graphoanalytical Forecasting Methods 58
- Pyatygina, K.V. Formulas for Advance Computation of Upper-Air Baric Center Displacements 64
- Dubov, A.S. The Problem of Determining Vertical Wind Velocities From Aircraft Accelerograph Data 73
- Zavarina, M.V. Determining the Critical Values of Richardson's Number as an Index Criterion of Increased Atmospheric Turbulence 85

AVAILABLE: Library of Congress

3
3

MM/gmp
10-28-59

BOGDANOVA N.P.

PHASE I BOOK EXPLOITATION

SOV/4174

SOV/2-S-99

Leningrad. Glavnaya geofizicheskaya observatoriya

Voprosy chislennogo prognoza i teorii klimata (Problems in Numerical Weather Forecasting and Climatology). Leningrad, Gidrometeoizdat, 1959. 129 p.
(Series: Its. Trudy, vyp. 99) Errata slip inserted. 1,000 copies printed.

Additional Sponsoring Agency: USSR. Glavnoye upravleniye gidrometeorologicheskoy sluzhby.

Eds.: M.Ye. Shvets, Doctor of Physics and Mathematics, and M.I. Yudin, Doctor of Physics and Mathematics; Ed. (Inside book): T.V. Ushakova; Tech. Ed.: N.V. Volkov.

PURPOSE: The publication is intended for specialists in the field of dynamic and synoptic meteorology and climatology, as well as for graduate students in these fields.

COVERAGE: This is a collection of 11 articles published as No. 99 of the Transactions of the Main Geophysical Observatory imeni. A.I. Voyeykov and dealing Card 1/5

Problems in Numerical Weather (Cont.)

SOV/4174

with new methods of numerical analysis prognosis. Individual articles are concerned with contiguous problems of climatology: temperature anomalies in the atmosphere, effect of the heat of condensation on pressure changes, numerical prognosis of the pressure pattern affected by orographic factors, and the hydrodynamic theory of frontal cyclogenesis. References accompany each article.

TABLE OF CONTENTS:

Rakipova, L.R. Formation of the Mean Monthly Anomalies of Atmospheric Temperature	3
Kagan, R.L. Calculating the Effect of the Condensation Heat Flow and of the Stratosphere on Change in the Pressure Pattern	15
Bogdanova, N.P. Approximative Evaluation of the Effect of Heat Released by Condensation on the Change in Pressure Pattern Near the Ground	37
Du Sin-yuan'. More Precise System of Calculating the Irregularities of the Earth's Surface in Numerical Methods of Forecasting	43

Card 2/3

Problems in Numerical Weather (Cont.)	SOV/4174	
Gandin, L.S. Numerical Methods of Map Analysis		48
Gandin, L.S. The Problem of Optimum Interpolation		67
Gandin, L.S., and Ye. I. Bagrova. The Structure of the Height Pattern for a Surface at 500 Millibars		77
Du Sin-yuan'. Spatial Problem in the Numerical Forecast of a Baric Field Taking into Account the Influence of High Plateaus		93
Du Sin-yuan'. Problem of the Hydrodynamic Theory of Frontal Cyclogenesis		105
Arrago, L.R. Vertical Currents in the Atmosphere over a Thermally Non-uniform Surface		112
Shvets, M.Ye., and R.L. Kagan. Problem of Calculating Vertical Velocity in the Atmosphere		123
AVAILABLE: Library of Congress		

Card 3/3

JA/cdw/gmp
9-8-60

BOGDANOVA, N.P.

Studying the baric-circulation regime of the European part of
the U.S.S.R. during the fall period. Trudy GIG no. 114:111-112
'60. (MIA 14:1)

(Meteorology)

BOGDANOVA, N.P.; LEBEDEV, A.M.

Relation of weather and climatic characteristics with the radiational
temperature of the underlying surface. Trudy GGO no.109:38-52 '61.
(MIRA 14:5)

(Solar radiation)

TSYGANOV, V. A.; ZHUKOVA, R. A.; ^GBODANOVA, N. P.; NAMESTNIKOVA, V. P.

"A new species of the streptomycete 2732/3, producing an antibiotic pigment."

report submitted for Antibiotics Cong, Prague, 15-19 Jun 64.

Cent Antibiotic Inst, Leningrad.

BOGDANOVA, N.P.; KOVALEVA, L.A.; SHENIN, Yu.D.; SOLOV'YEV, S.N.; TSYGANOV, V.A.;
ZHUKOVA, R.A.; NAMESTNIKOVA, V.P.

Violacein, a new antibiotic. Mikrobiologiya 34 no.4:623-626 JI-Aa
'65. (MIRA 18:10)

1. Leningradskiy nauchno-issledovatel'skiy institut antibiotikov.

BOGDANOVA, N.P.; KONEV, Yu.Ye.; SANNIKOV, V.A.; SOLOV'YEV, S.N.;
SOKOLOV, B.V.; TSYGANOV, V.A.

Identification of the antibiotic 1160 produced by actino-
mycetes from the Actinomyces griseus group. Antibiotiki 10
no.3:195-201 Mr '65. (MIRA 18 10)

1. Leningradskiy nauchno-issledovatel'skiy institut anti-
biotikov.

TSYGANOV, V.A.; KONEV, Yu.Ye.; FURSENKO, M.V.; IOFINA, E.I.; AL'BERT, M.M.;
MUSTAFOVA, N.N.; VENKOVA, I.B.; SOLOV'YEV, S.N.; MALYSHKINA, M.A.;
BOGDANOVA, N.P.; KOTENKO, T.V.; FILIPPOVA, A.I.

Isolation and characteristics of actinomycetes producing the
antibiotic trichomycin. Antibiotiki 9 no.4:291-296 Ap '64.
(MIRA 19:1)

1. Leningradskiy nauchno-issledovatel'skiy institut antibiotikov.

POPOVA, Ye.G.; KRAFT, M.Ya.; BOGDANOVA, N.S.; PERSHIN, G.N.

Quaternary ammonium salt derivatives of alkylaminoalkylamides of
10-undecenoic acid. Med. prom. SSSR 14 no.12:3-9 D '60.

(MIRA 13:12)

1. Vsesoyuznyy nauchno-issledovatel'skiy khimiko-farmatsevticheskiy
institut imeni S. Ordzhonikidze.

(UNDECENOIC ACID)

5 2420

25049
S/064/61/000/007/001/005
B124/B206

AUTHORS: Boguslavskiy, I. M., Vol'fkovich, S. I., Kazakova, S. B.,
Bogdanova, N. S.

TITLE: Production of hydrogen fluoride from silicon tetrafluoride

PERIODICAL: Khimicheskaya promyshlennost', no. 7, 1961, 6 - 8

TEXT: During the production of superphosphate fertilizers by decomposition of apatite and phosphorites with sulfuric acid, about 45% of the fluorine present in the ore escapes in the form of SiF_4 , together with the waste

gases. HF can be produced from SiF_4 by the process studied and proposed in this paper, without great capital investment for the raw material production. Production cost of HF is also greatly reduced due to complete utilization of SiF_4 for the production of HF and high-quality SiO_2 . The process

consists of two main stages: production of solid ammonium fluoride and -bifluoride from SiF_4 -containing gases and decomposition of ammonium

fluoride and -bifluoride by means of sulfuric acid, by which HF and $(\text{NH}_4)_2\text{SO}_4$ are obtained. The main reactions of the first stage are:

Card 1/6

Production of hydrogen...

25049
S/064/61/000/007/001/005
B124/B206

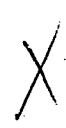
$\text{SiF}_4 + 2\text{NH}_4\text{F} = (\text{NH}_4)_2\text{SiF}_6$ (1); $(\text{NH}_4)_2\text{SiF}_6 + 4\text{NH}_3 + 2\text{H}_2\text{O} = 6\text{NH}_4\text{F} + \text{SiO}_2$ (2); $2\text{NH}_4\text{F} \longrightarrow \text{NH}_4\text{F} \cdot \text{HF} + \text{NH}_3$ (3). SiF_4 is absorbed by a recycled NH_4F solution; reaction (1) takes place in the absorption apparatus. The $(\text{NH}_4)_2\text{SiF}_6$ solution obtained is led from the absorption apparatus for neutralization with ammonia, which is carried out under continuous cooling of the NH_4F solution formed. The precipitated SiO_2 is filtered off and rinsed with water. The greater part of the mother liquor is led to the evaporator, and the rest in the form of a 10-12% solution to the absorption of SiF_4 . The NH_4F solution is evaporated to a salt concentration of 94-95%, reaction (3) taking place. The ratio between ammonium fluoride and -bifluoride in the evaporated solution depends on the boiling point of the solution. Table 1 shows data on the evaporation of NH_4F at various temperatures and pressures; practically no fluorine is present in the condensate at 147°C, and the sum of the salts in the solution reaches 98% in this case. The solution solidifies at about 100°C. The solid $\text{NH}_4\text{F} \cdot \text{HF}$ - NH_4F salt mixture with a total fluorine content of 60% represents an

Card 2/6

25049
S/064/61/000/007/001/005
B124/B206

Production of hydrogen...

intermediate product in the production of HF. The second stage of the process can be characterized by the reactions: $\text{NH}_4\text{F} \cdot \text{HF} + \text{H}_2\text{SO}_4 = \text{NH}_4\text{HSO}_4 + 2\text{HF}$ (4); $\text{NH}_4\text{F} + \text{H}_2\text{SO}_4 = \text{NH}_4\text{HSO}_4 + \text{HF}$ (5) and $\text{NH}_4\text{HSO}_4 + \text{NH}_3 = (\text{NH}_4)_2\text{SO}_4$ (6). 93-95% sulfuric acid is used for the decomposition of the salt mixture consisting of 80% ammonium bifluoride and 20% ammonium fluoride; decomposition is carried out at 180-190°C. Table 2 shows the experimental results for the decomposition of NH_4F with sulfuric acid in a steel-boat, which was placed in an electric tubular furnace with a constant stream of dry air; the experiments were conducted with temperatures maintained constant to within $\pm 3^\circ$. The heating time varied from 5 to 30 min. The HF evolved was absorbed by water in vessels made from organic glass, the melt was weighed, analyzed for residual fluorine, and the fluorine yield was calculated. With 30 min reaction time and 180-190°C, the fluorine yield amounts to 97-98%. The ammonium bisulfate melt obtained contains about 40% free sulfuric acid. Neutralization of the latter with the calculated amount of ammonia converts the ammonium bisulfate into ammonium sulfate. Fig. 4 shows the decomposition curve of ammonium fluoride and -bifluoride with sulfuric acid as a function of its concentration, calculated for ammonium bisulfate (decomposition time 40 min at 195°C). On the basis of Card 3/6



25049
S/064/61/000/007/001/005
B124/B206

Production of hydrogen...

laboratory results, the pilot plant of the NIUIF under the direction of V. D. Podkopayev, designed a pilot installation for the production of HF by decomposition of ammonium fluoride and -bifluoride with sulfuric acid, which yielded good results. In order to select the most corrosion-resistant material for the thickener and reactor, the steel types investigated were immersed in an aqueous solution with 26% NH_4F and 19% $\text{NH}_4\text{F}\cdot\text{HF}$; the specimens were in a vessel made from ATM-1 (ATM-1) graphite, with an external heating coil. The solution was periodically heated for 7 hr daily, the specimens being held for 120 hr at 80°C and 880 hr at room temperature. Steel of the type X23H28M3A3T (Kh23N28M3D3T) was most corrosion-resistant. Moreover, the most resistant material was ascertained in a molten mixture of H_2SO_4 , NH_4F , and $\text{NH}_4\text{F}\cdot\text{HF}$ at 190-200°C, the specimen being fixed to the bottom of the vessel by a Teflon strip and the melt being mixed by a mechanical mixer. The test lasted 92 hr with a continuous feed of the mixture, and showed that steels of the type X23H23M3A3 (Kh23N23M3D3) and OX23H28M3A3T (OKh23N28M3D3T) are the most resistant. Data obtained for St-0 (St-0) steel (loss in weight 43.0 g/m².hr) need a checkup under working conditions. There are 4 figures and 2 tables.

Card 4/6

25049
S/064/61/000/007/001/005
B124/B206

Production of hydrogen...

ASSOCIATION: NIUIF

Table 1: Evaporation of ammonium fluoride solutions at various temperatures and pressures.

Legend: 1) pressure, mm Hg; 2) temperature, °C; 3) composition of the evaporated solution, %; 4) sum of the salts.

Давление мм рт. ст. 1)	Температура °C 2)	3) Состав упаренного раствора, %			NH ₄ F 4)
		P	NH ₃	сумма солей	
760	126	40,65	27,69	70,49	0,681
760	146	57,14	30,89	91,99	0,542
760	151	59,55	31,30	93,98	0,525
560	113	35,53	25,13	62,54	0,707
560	115	38,06	26,69	64,75	0,703
460	109	36,79	26,54	65,61	0,722
460	123	50,47	29,79	82,91	0,590
460	130	54,70	30,86	88,43	0,560
460	142	59,50	32,63	95,25	0,549
460	147	62,33	32,61	98,21	0,523

Card 5/6

Tab. 1

Production of hydrogen...

Table 2: Decomposition of ammonium fluoride with sulfuric acid (heating temperature 180°C)

Legend: 1) length of heating, min;
2) taken, g; 3) fluorine yield, %;
4) heating temperature 190°C.

1) Продолжительность нагрева, минуты	2) Взято, г		3) Выход по фтору, %
	NH ₄ F	H ₂ SO ₄	
5	5	10,72	42,0
10	5	10,72	80,0
20	5	10,72	93,0
20	15	34,4	96,0
20	15	34,4	94,0
30	5	10,72	96,8
30	5	10,72	98,3
30	15*	33,8	97,4
30	15*	33,8	96,7
40	5	10,72	97,0
60	5	10,72	98,0

Card 6/6

25049

S/064/61/000/007/001/005

B124/B206

Fig. 4: Decomposition curve of ammonium fluorides with various amounts of H₂SO₄ (% of the stoichiometric amount, calculated for ammonium bisulfate).

Legend: A) degree of separation of F, %.

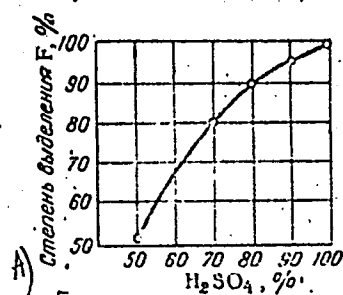


Fig. 4

BOGUSLAVSKIY, I.M.; VOL'FKOVICH, S.I.; BOGDANOVA, N.S.

- Production of hydrogen fluoride from silicon tetrafluoride.
Izv. prom. no.7:450-452 J1 '61. (MIRA 14:7)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut udobreniy i
insktefungitsidov.

(Hydrofluoric acid)

(Silicon fluoride)

FERSHIN, G.N.; BOGDANOVA, N.S.

Anti-influenzal activity of onium base salts. Farm. i toks.
25 no.2:209-220 ~~Mr. Ap~~ '62. (MIRA 15:6)

1. Vsesoyuznyy nauchno-issledovatel'skiy khimiko-farmatsevticheskiy institut imeni S.Ordzhonikidze.
(INFLUENZA--MICROBIOLOGY)
(ONIUM COMPOUNDS)

PERSHIN, G.N.; BOGDANOVA, N.S.; ZNAYEVA, K.I.; KRAFT, M.Ya.

Some regularities in the suppression of influenza virus multiplication by synthetic compounds. Farm.1 toks. 24 no.6:690-695 N-D '61.
(MIRA 15:11)

1. Vsesoyuznyy nauchno-issledovatel'skiy khimiko-farmatsevticheskiy institut imeni S.Ordzhonikidze.
(INFLUENZA—MICROBIOLOGY)

GUNAR, W.I.; ZAV'YALOV, S.I.; PERSHIN, G.N.; MILOVANOVA, S.N.;
BOGDANOVA, N.S.; MAKEYEVA, O.O.; KROTOV, A.I.

β-Dicarbonyl compounds. Part 14: Synthesis, transformations,
and biological activity of 2-prenyldihydroresorcinol. Zhur.
ob.khim. 31 no.12:3975-3984 D '61. (MIRA 15:2)

1. Institut organicheskoy khimii imeni N.D.Zelinskogo AN
SSSR; Vsesoyuznyy nauchno-issledovatel'skiy khimiko-farma-
tsevticheskiy institut imeni S.Ordzhonikidze i Institut
malyarii, meditsinskoy parazitologii i gel'mintologii.
(Resorcinol)

MAKAROV, N.V.; POPOVA, Ye.G.; KRAFT, M.Ya.; BOGDANOVA, N.S.; POLUKHINA, L.M.;
PERSHIN, G.N.

Effect on influenza viruses and synthesis of N-acyl derivatives of
uracil. Farm. i toks. 27 no.1:63-68 Ja-F '64.

(MIRA 17:11)

1. Vsesoyuznyy nauchno-issledovatel'skiy khimiko-farmatsevticheskiy
institut imeni Ordzhonikidze.

PERSHIN, G.N.; BOGDANOVA, N.S.; MAKIN, S.M.; LIKHOSHERSTOV, V.M.

Antiviral activity of 2,6-dialkoxy-pyrans and
2-alkoxy- Δ^5 -dihydropyrans (cyclic acetals of glutaric
aldehyde derivatives). Farm. i toks. 28 no.1:66-69 Ja-F
'65. (MIRA 18:12)

1. Vsesoyuznyy nauchno-issledovatel'skiy khimiko-farmatsevti-
cheskiy institut imeni S.Ordzhonikidze i Moskovskiy institut
tonkoy khimicheskoy tekhnologii imeni M.V.Lomonosova, Moskva.
Submitted September 5, 1963.

CC NR: AP6034263 (N) SOURCE CODE: UR/0390/66/029/005/0597/0600

AUTHOR: Kraft, M. Ya.; Katyshkina, V. V.; Parshin, G. N.; Bogdanova, N. S.

ORG: All-Union Scientific Research Chemical and Pharmaceutical Institute im. S. Ordzhonikidze, Moscow (Vsesoyuznyy nauchno-issledovatel'skiy khimiko-farmatsevticheskiy institut)

TITLE: Cyclic oxocompounds as potential antiviral agents

SOURCE: Farmakologiya i toksikologiya, v. 29, no. 5, 1966, 597-600

TOPIC TAGS: cyclic oxocompound, antiviral agent, drug effect, pharmacology, virus, virology, nucleic acid, protein

ABSTRACT: The antiviral properties of the compounds in Table 1 were determined. These compounds were tested on influenza RR-8 type A virus *in vitro* and *in ovo* in tissue cultures. All possessed antiviral activity *in vitro* and some inhibited viral growth in chick embryo epithelium. These cyclic oxocompounds are highly reactive and are thought to produce their inhibitory activity by acting on viral protein in such a way that the viruses cannot adhere to the cell membranes of sensitive cells. Related compounds have been effective against keratitis infections when applied locally. Quinone derivatives with comparatively low redox po-

Card 1/3

UDC: 615.753.5-017.78+616.988-085.753.5

ACC NR: AP6034263

Table 1. Activity of mono- and bicyclic compounds

No.	Compound	Activity 1/10000		Compound	Activity 1/10000	
		+	+		+	+
I	<chem>O=C1C=CC(=O)C=C1</chem>	+	+	<chem>O=C1C=CC(=O)C=C1</chem>	+	+
II	<chem>O=C1C=CC(=O)C=C1</chem>	+	+	<chem>O=C1C=CC(=O)C=C1</chem>	+	+
III	<chem>O=C1C=CC(=O)C=C1</chem>	+	+	<chem>O=C1C=CC(=O)C=C1</chem>	+	+
IV	<chem>O=C1C=CC(=O)C=C1</chem>	+	+	<chem>O=C1C=CC(=O)C=C1</chem>	+	+
V	<chem>O=C1C=CC(=O)C=C1</chem>	+	+	<chem>O=C1C=CC(=O)C=C1</chem>	+	+
VI	<chem>O=C1C=CC(=O)C=C1</chem>	+	+	<chem>O=C1C=CC(=O)C=C1</chem>	+	+
VII	<chem>O=C1C=CC(=O)C=C1</chem>	+	+	<chem>O=C1C=CC(=O)C=C1</chem>	+	+
VIII	<chem>O=C1C=CC(=O)C=C1</chem>	+	+	<chem>O=C1C=CC(=O)C=C1</chem>	+	+
IX	<chem>O=C1C=CC(=O)C=C1</chem>	+	+	<chem>O=C1C=CC(=O)C=C1</chem>	+	+
X	<chem>O=C1C=CC(=O)C=C1</chem>	+	+	<chem>O=C1C=CC(=O)C=C1</chem>	+	+

Explanation of symbols

- 0 - compound inactive in dilutions of 1:1000
- +
- ++ - compound active in dilutions of 1:1000
- +++ - preparation active in dilutions of 1:10000
- ++++ - preparation active in dilutions of 1:100000
- Not studied

ACC. NR. AP6034263

entials have been discovered to possess good antiviral properties, thus refuting a theory that antiviral activity and high Eh were connected. The compounds involved in the present study were tested more for their effects on amino groups of nucleic acids and proteins with emphasis on their extracellular interference with the virus, and only secondarily for their intracellular effects on reproducing viruses. The object was to find a compound that reacts easily with viral protein but which is comparatively indifferent to the protein of the host cell. The configuration of the molecule of the compound is very important and plays a great role in the specificity of the drug. Little antiviral activity was displayed by 4-hydroxy-beta-naphthoquinone and its tautomeric form 2-hydroxy-alpha-naphthoquinone. The most effective compound was 7-hydroxy-beta-naphthoquinone. The activities of the other compounds tested are shown in Table 1. The most effective virus neutralizing compounds (no. I, II, III, VIII, XI, and XV) were used in the treatment of pneumonia in white mice, but were not effective. Orig. art. has: 1 table.

[W.A. 50]

SUB CODE: G6/ SUBM DATE: 20Dec65/ ORIG REF: 002/ OTH REF: 005

Card 3/3

LOZINSKIY, L.Ya.; BOGDANOVA, N.T.

Toxic allergic neuritis of the optic nerve during streptomycin therapy. Probl.tub. 36 no.1:115-116 '58. (MIRA 11:4)

1. Iz Skvirskogo protivotuberkuleznogo dispansera (glavnyy vrach L.Ya.Lozińskiy), Kiyevskaya oblast'.

(NERVES, OPTIC, dis.

toxic allergic neuritis caused by streptomycin (Rus))
(STREPTOMYCIN, inj. eff.

toxic allergic neuritis of optic nerve (Rus))

MAZOKHINA, N.N.; BOGDANOVA, N.V.

Capillary method for determining the heat resistance of
micro-organisms. Kons. i ov. prom. 18 no.12:32-34 D '63.
(MIRA 17:1)

1. Tsentral'nyy nauchno-issledovatel'skiy institut konservnoy
i ovoshchesushil'noy promyshlennosti.

ECCLAROVA, N. V.

Verch'iyav, A. A. and Bordanov, N. V. "Avoiding the condensation of moisture and the formation of an ice crust on power lines by using corona discharge", *Izvestiya Tomskogo politekh. in-ta im. Kirova*, Vol. LXVI, Issue 1, 1947, p. 21-28, -
Bibliog: 6 items.

SC: U-4631, 16 Sept. 53, (Istoria Zhurnal'nykh Stat'iy, No. 22, 1949).

KOSTROVA, Ye.I.; BOGDANOVA, N.V.

Bacterial spoilage of canned fish in tomato sauce. Kons.i ov.
prom. 17 no.9:37-39 S '62. (MIRA 15:8)

1. Tsentral'nyy nauchno-issledovatel'skiy institut konservnoy i
ovoshchesushil'noy promyshlennosti.
(Fish, Canned) (Food--Bacteriology)

SEMENDYAYEVA, M.Ye.; BOGDANOVA, N.V.

Neuropsychic changes in hormone therapy of Botkin's disease.
Sovet. med. 27 no.6:61-65 Je'63 (MIRA 17:2)

1. Iz laboratorii deystvitel'nogo chlena AMN SSSR prof. Ye.M. Tareyeva i Klinicheskoy infektsionnoy bol'nitsy No.7 (glavnyy vrach N.G. Zaleskver).

SEMENDYAYEVA, M.Ye.; MUKHINA, O.N.; BOGDANOVA, N.V.

Recurrence of Botkin's disease after hormonal therapy. Vop.med.
virus. no.9:248-254 '64. (MIRA 18:4)

DALMATSKAYA, Ye.I. Pririmali uchastiye: GONCHAROVA, L.G., mladshiy nauchnyy
sotrudnik; ZHELEBOVA, V.K.; BOGDANOVA, N.V., laborant

Kinetics and statistics of the carbonization of sodium silicate
solutions. [Trudy] NIOKHIM 15:83-96 '63.

(MIRA 18:2)

3
S/552/62/000/034/002/003
E192/E382

AUTHORS: Kalenov, Ye.N. and Bogdanova, O.I.
TITLE: The significance of electric sounding in the investigation of the foundation relief of the Russian platform
SOURCE: Moscow. Vsesoyuznyy nauchno-issledovatel'skiy institut geofizicheskikh metodov razvedki. Prikladnaya geofizika. no. 34. 1962. 116 - 134
TEXT: An attempt is made to summarize the results obtained with deep vertical electric sounding during investigation of the foundation relief of the Russian platform and to evaluate the possibilities of this method of investigation by employing the concrete results. The method of vertical electric sounding can be completely successfully used to investigate the surface of pre-Cambrian crystalline foundations, not only in the west and south-west but also in the east of the Russian platform, including the territories of the south-eastern and eastern slopes of the Voronezh massif, Ryazan'-Saratov depression, southern half of the Tokmov ridge with its slopes and a large part of the Tartar ridge with its western and eastern dips. However, even with the base
Card 1/3

S/552/62/000/034/002/003

E192/E382

The significance of

lines AB = 50-60 km it is not possible to use the method for studying the foundations if the top deposits contain dolomites or hydrochemical matter of high resistivity, such as encountered in some areas of the Moscow and associated regions. The most significant results for AB up to 30-40 km can be obtained by the method in those areas where hydrochemical deposits are absent and where the upper deposit contains mainly lower terrigenous conducting substances or where the resistance of carbonate or sulphate-carbonate deposits is low. It is therefore recommended that investigation by vertical electric sounding should be continued since this not only permits investigation of the foundation relief but can yield information on the general characteristic of the thickness and lithological composition of the carbonate or sulphate-carbonate deposit. Further, investigations by means of dipole equatorial sounding (carried out over limited areas) indicate that the results of this type of sounding are "distorted" by horizontal irregularities but this conclusion has not been fully verified due to the comparatively few data available. It is probable that under different geological conditions the equatorial

Card 2/3

The significance of

S/552/62/000/034/002/003
E192/E382

sounding method will be more economical than vertical sounding and will produce fully satisfactory results. Recent years have brought new methods of electric prospecting (telluric currents, measurement of the magnetic field, magnetotelluric measurements) which appear to be more effective for investigating the relief of the foundations than vertical or equatorial sounding. There are 8 figures. ✓

Card 3/3

MOKEYEVA, Ye.A.; BOGDANOVA, O.Kh.

Activity of potato lenticels in the process of ontogeny.
Uzb. biol. zhur. 7 no.5:15-18 '63. (MIRA 18:11)

1. Tashkentskiy gosudarstvennyy universitet imeni Lenina i
Tashkentskiy sel'skokhozyaystvennyy institut.

Handwritten: A. A. Roldan, G. G. ...

Study of the dehydrogenation of butyrene on a chromic catalyst. A. A. Roldan, G. G. ... (Institute of Chemistry, ... 1960, 287-292; ... (1) All experiments were made with the same type of Cr catalyst ("No. 41") tested for const. activity by the rate of dehydrogenation of butylene (I) to butadiene (II) at const. space velocity and temp., and regenerated in an air stream between runs. Convenient conditions for kinetic study are 540-70° and high space velocity, 11,000 l./l. catalyst/hr.; in this temp. range, under $p = 0.25$ atm. (final pressure), equilibria at not less than 30°; dehydrogenation to II. Higher temp. favors side reactions. The amt. of II formed is independent of the length of the run (0, 9, and 12 min.). At a time of contact $\tau = 0.3$ sec., the apparent activation energy of $I \rightarrow II$, E_a is 23.20-27.04 kcal./mole at 551-600° and 31.31-31.74 at 535-550°. Examples of balance for 4 min., $\tau = 0.1$ sec., vol. of catalyst 2 ml., $p = 180$ mm. Hg: at 540°, I passed 1.54 l., gas collected 1.56 l. (in Vol. %): II, by maleic anhydride, 3.5, absorbed in H₂SO₄

0.3, absorbed in H₂O, 0.1, H₂ 3.2, satd. hydrocarbons (0.1), yield of II 0.0 mole %; at 570°, 1.02, 1.20 (5.9, 25.1, 0.0, 3.9, 0.4) 5.7, at 588°, 1.02, 2.0 (7.3, 22.0, 0.0, 6.3, 1.1) 8.1. For $\tau = 0.3$ sec., 12 sec., vol. of catalyst 2 ml., $p = 180$ mm. Hg: at 551°, 3.43, 3.84 (6.8, 21.3, 0.4, 7.5, 0.0) 7.1; at 563°, 3.62, 4.15 (14.5, 22.7, 0.4, 15.4, 1.2) 10.0; at 600° (15 min.) 5.0, 5.58 (16.73, 21.1, 0.4, 17.2, 1.2) 10.1. (2) Variation of p from 180 to 350 mm. decreased the yield only from 6.5 to 4.8 mole % (at 547°, $\tau = 0.1$ sec., 5 min.). This confirms, on the whole, complete coverage of the catalyst surface, the deviation being ascribed to some extent of decompn. of II. (3) In mixts. of I + II, over the same catalyst, both the dehydrogenation $I \rightarrow II$ and decompn. of II occur. The decompn. increases with the temp. and with the initial content of II in the mixt.; at 547 and 560°, the rate of decompn. of II exceeds that of its formation when the content of II is 20.7%. Examples of balance: vol. of catalyst 2 ml., + 8 ml. crushed quartz, $\tau = 0.1$ sec., $p = 180$ mm. Hg, 2 l. mixt. passed in 5 min.: at 547°, I in initial mixt. 103, 27.8, 70.3, and 50.0 mole %; II obtained 278, 274,

ASB-558 METALLURGICAL LITERATURE CLASSIFICATION

and 97 ml.; at 660°, 100, 87.8, 70.8, 50.6, 26.2, and 0 mode °; 150, 264, 57.5, 125, 1200, and 1625 ml.; at 565°, 100, 91.6, 87.2, 83.2, 74.2, 23, and 0 mode °; 175, 211, 379, 263, 439, 1478, and 1674 ml. Similarly, decomposition of EtOH + II where no dehydrogenation can take place, the rates of decomposition of II in these mixts, permit correction of the exptl. data for I + II mixts. to allow for the decomposition of II. Pure II is also decomposed on this catalyst, the decomp. attaining 8.7% at 547 and 569°, ± 0.1 sec., and 30% at 600°, ± 0.2 sec. (4) Propylene undergoes decomposition to the extent of 5-6% at 600° ± 0.3 sec. (18), vol. of catalyst 5 ml. About 25-30% of the C₃H₆ decomposed, forms C. In the products one finds, further, C₂H₄, H₂, CH₄, and C₂H₂. Example: 18 min., C₃H₆, C₂H₄, H₂, and C₂H₂ collected 6.17 l. (C₃H₆, 91.3, C₂H₄, 11.74 g., gas collected 6.17 l. (C₃H₆, 59.4, 60.0, 42.2, 1.2, H₂ 5.4, acid, 2.9 vol. %). C₂H₂ reacted 5.9 mode °, C 0.14 g. (5) Examples of the data for correction for 0.1 sec. vol. of catalyst 2 ml. total vol. of mixt. passed 2.1: for 0, 5.4, 11.6, 21.6, 31.0, 54.2 mode °; H₂ in the mixt., amt. of II obtained in 9 min.: (at 547°) 116, 185, 163, 84, 82, 39 ml., and (at 591°) 159, 142, 137, 129, 149, 59 ml. At 565°, 0, 20.2, 35.0, 59.4, 60.0, 42.2 mode °; H₂ amt. of II in 5 min. 159, 139, 87, 07, 49, 0 ml. These expts. supply the data for correction for dehydrogenation by the H₂ formed in the reaction I → II. This correction is seen to be small at low contents of H₂. % Evidently, only II, not I, suffers recombination and decomposition to C; it appears as if the II formed were removed from the active centers of the dehydrogenation, its decomposition taking place outside these centers. (7) The formula $\gamma = 2B_1/(1-B_1) + \beta(1-B_1) + H$ (C.A. 57, 2645) (where γ = no. of moles of the product leaving the catalyst tube per min., relative to the no. Z.A. of moles of mixt. entering the tube, β = ratio of the adsorption coeff. of the admixed compd. and that of the reactant, H = kl/Zd , where k = rate const. for 1 ml. catalyst, l = cross-section of the tube, d = length of catalyst column) can be simplified (by disregarding H) into $\gamma = 2B_1/(1-B_1) + \beta(1-B_1)$, where β corresponds to passing of the pure reactant. As $B_1 = \beta/19$ (where $\beta = 1/2$), $\gamma = 1/(10) \beta - 1$. The exptl. data give for (a) relative adsorption coeffs. β (with respect to I, $\beta = 1$) of the admixed substances: II (at 547 and 590°) 9; and I, resp. II; (at 540 and 565°) 0.79 and 1.27, resp. More rigorous treatment leads to values very close to those obtained by the simplified formula. With these curves, the kinetic equation for I → II + H₂ becomes $k_1 H_2 / (1 + 104.5 [C_3H_6] / (C_3H_6) + 9.5 [C_2H_4] + 0.82 [H_2])$, relative to 1 ml. of catalyst. (8) The high adsorption coeff. of II as compared with that of I (very nearly 10 times as high) may be due to its conjugated double bond. On the other hand, the near equality of the adsorption coeffs. of I and II ($\beta = 1$) is corroborated by the small velocity of dehydrogenation lying close to 30% conversion of the mixt., indicating approx. equality of the fractions of the active surface occupied by I and II.

N. Tom

✓ The far energy of the surface
due by 2.2 eV on a catalytic surface
hydrogen and 5.1 eV on a surface
of the metal.

where the vapor was about 0.1, decreased with
the distance of 2.0 at 100°. The curve
of the intensity of the vapor.

BOGDANOVA, O.K.

PHASE I BOOK EXPLOITATION 1181

Akademiya nauk SSSR. Institut fizicheskoy khimii

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

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

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

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

Card 1/14

Problems of Kinetics and Catalysis (Cont.) 1181

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

TABLE OF

CONTENTS: From the editor	3
Roginskiy, S.Z. Isotopes in Catalysis	5
PART I. CATALYTIC REACTIONS OF HYDROGEN	
Voyevodskiy, V.V. Mechanism of the Homogeneous and Heterogeneous Homolytic Deuterium Exchange	33

Card 2/14

Problems of Kinetics and Catalysis (Cont.) 1181

Balandin, A.A., Neyman, M.B., Bogdanova, O.K., Isagulyants, G.V.,
Shcheglova, A.P., Popov, Ye. I. Tagged-atom Study of the
Dehydrogenation of Butane - Butylene Mixtures 45

Avdeyenko, M.A., Boreskov, G.K., Slin'ko, M.G. Catalytic
Activity of Metals in Relation to the Homomolecular Isotopic
Exchange of Hydrogen 61

Golovina, O.A. Roginskiy, S.Z., Sakharov, M.M., Eydus, Ya.T.,
Dokukina, Ye. S. Study of the Role of Plane Chains in the
Synthesis of Hydrocarbons from CO and H₂ 76

Tverdovskiy, I.P., Tupitsyn, I.F. Study of the Nickel-Boride
Catalyst 84

Discussion:

R.Kh. Burshteyn 91

G.K. Boreskov 92

Card 3/14

Problems of Kinetics and Catalysis (Cont.)	1181
S.Z. Roginskiy	92
G.V. Isagulyants	94
PART II. CATALYTIC OXIDATION	
Antonova, I.N., Moshkina, R.I., Nalbandyan, A.B., Neyman, M.B., Feklisov, G.I. Tracer Study of the Mechanism of the Reaction of Methane Oxidation	97
Langenbeck, Wolfgang. Autoxidation of Normal Paraffins	104
Margolis, L. Ya., Roginskiy, S.Z. Mechanism of the Catalytic Oxidation of the Unsaturated Hydrocarbons on Metals and Semi- conductors	107
Miklukhin, G.P., Rekasheva, A.F. Study of the Redox Reactions of Organic Compounds Conducted With the Aid of Deuterium	117
Card 4/14	

Problems of Kinetics and Catalysis (Cont.)	1181
Vartapetyan, B.B. Use of the Heavy Isotope of Oxygen O^{18} in the Study of Biological Oxidation in Plants	124
Yelovich, S. Yu., Margolis, L.Ya. Connection Between the Ion Mobility in the Oxide Lattice and the Rate of Isotopic Exchange	129
Stukanovskaya, N.A., Royter, V.A., Vaynshteyn, F.M. Explanation of the role of oxygen of vanadium catalysts in the Oxidation of Sulfur Dioxide (theses)	133
Discussion:	
R.I. Moshkina	134
Ye. A. Shilov	134
G.K. Boreskov	135
N.S. Yenikolopyan	135
B.P. Bruns	137
F.M. Vaynshteyn	139

Card 5/ 14

Problems of Kinetics and Catalysis (Cont.) 1181

S.Z. Roginskiy 140
A.F. Rekasheva 141

SECTION III. CATALYTIC CRACKING OF
HYDROCARBONS

Panchenkov, G.M., Gryaznova, Z.V., Yemel'yanova, V.M., Ganichenko,
L.G. Conversion of Hydrocarbons on Deuterated Aluminosilicate
Catalysts 145

Andrianova, T.I., Roginskiy, S.Z. Study of the Mechanism of
the Conversion of Alkanes on an Aluminosilicate Catalysis With
the Aid of Molecules Labeled With C¹⁴ 152

Dorogochinskiy, A.Z., Mel'nikova, N.P., Shakhzadova, I.A.
Deutero-hydrogen Exchange of Certain Hydrocarbons on Alumino-
silicate Cracking Catalysts 162

Card 6/14

Problems of Kinetics and Catalysis (Cont.) 1181

Discussion:

S.Z. Roginskiy	168
G.M. Panchenko	168
I.I. Starostin	170

SECTION IV. OTHER CATALYTIC REACTIONS

Vinogradova, O.M., Keyyer, N.P., Roginskiy, S.Z. Study of the Mechanism of Divinyl Synthesis by the Method of S.V. Lebedev With the Use of Radioactive Carbon 175

Zhabrova, G.M., Kadenatsi, B.M. Study of the Coke Formation and Divinyl Polymerization on the Catalyst of S.V. Lebedev 187

Brezhneva, N. Ye., Roginskiy, S.Z. Radiobromide Study of the Mechanism of Homogeneous Catalytic Bromination and Isomerization of Bromides 201

Card 7/14

Problems of Kinetics and Catalysis (Cont.) 1181

Discussion:

A.F. Rekasheva 215
G.V. Isagulyants 215

SECTION V. ISOTOPIC EXCHANGE

Shatenshteyn, A.I., Zvyagintseva, Ye. N., Yakovleva, Ye.A.,
Izrailevich, Ye. A., Varshavskiy, Ya. M., Lozhkina, M.G.,
Vedeneyev, A.V. Acid-Base Catalysis of the Reaction of Isotopic
Hydrogen Exchange 218
Setkina, V.N., Kursanov, D.N., Bykova, Ye. V. Carbonyl Ions in
the Hydrogen Exchange Reactions 234
Kursanov, D.N., Setkina, V.N., Vitt, S.V., Parnes, Z.N. Study
of the Mechanism of Certain Reactions by the Method of Hydrogen
Exchange 242

Card 8/14

Problems of Kinetics and Catalysis (Cont.)	1181
Brodskiy, A.I., Vysotskaya, N.A. Oxygen Exchange in Inorganic Acids and Salts	245
Rozen, A.M., Karpacheva, S.M., Shavelev, Ya. V. Oxygen Mobility in Oxides and the Kinetics of Oxygen Exchange	251
Spitsyn, Vikt. I. , Finikov, V.G. Study of the Isotopic Exchange Between Gaseous Oxygen and Salts of Certain Oxygen-containing Acids at High Temperatures	264
Oziraner, S.N. Isotopic Exchange Between a Solid and a Gas	267
Discussion:	
Ye. A. Shilov	274
A.I. Shatenshteyn	275
A.I. Brodskiy	275
V.N. Setkina	276

Card 9/14

Problems of Kinetics and Catalysis (Cont.)	1181	
A.N. Frumkin		276
A.I. Brodskiy		277
S.Yu Yelovich		278
S.M. Karpacheva		278
A.I. Brodskiy		280

SECTION VI. STUDY OF CATALYSTS BY THE ISOTOPIC METHODS

Keyer, N.P., Isotopic Data on Active Surfaces of Catalysts	283
Krylov, O.V., Fokina, Ye.A. Study of Sulfide Stability in the Catalytic Decomposition of Isopropyl Alcohol with the Use of Radiosulfur S ³²	294
Krylov, O.V., Fokina, Ye.A. Study of the Acid-base Properties of Catalytic Surfaces by the Differential Isotope Method	304

Card 10/14

Problems of Kinetics and Catalysis (Cont.)	1181	
Starik, I.Ye., Melikova, O.S. Emanation as a Criterion of the Solid State(theses)		314
Protashchik, V.A. Determination of the Surface of Magnesium Oxide Formed During the Thermal Decomposition of a Carbonate From the Chemisorption of Radioactive Carbon Dioxide C ¹⁴ O ₂		315
Murin, A.N., Lur'ye, V.G. Electric Conductivity and Diffusion in Silver Halide Samples Subjected to Plastic Deformation		321
Korneychuk, G.P., Royter, V.A., Stukanovskaya, N.A., Rzayev, P.B., Zhigaylo, Ya. V. Study of the Effect of the Conditions of Catalysis on the Sulfur Content in the Barium-Aluminum-Vanadium Sulfate Catalyst		329
SECTION VII.. THE ISOTOPE EFFECTS		
Tatevskiy, V.M. Methods for the Statistical Computation of the Isotopic Exchange Equilibrium in the Gaseous Phase		339
Card 11/14		

Problems of Kinetics and Catalysis (Cont.)	1181	
Mayants, L.S. Calculation of the Isotopic Shift in the Zero Vibrational Energy of Polyatomic Molecules from Spectroscopic Data		345
Lifshits, I.M., Stepanova, G.I. The Thermodynamics of Solutions of Isotopes		354
Brodskiy, A.I. Connection Between the Kinetic Isotopic Effect and the Isotopic Content Variation in the Course of the Reaction		360
Varshavskiy, Ya. M. Effect of the Thermodynamic Isotopic Effect on the Kinetics of Exchange Reactions		363
Discussion:		
S.Z. Roginskiy		369
A.I. Brodskiy		370
Ya. M. Varshavskiy		370
Card 12/14		

Problems of Kinetics and Catalysis (Cont.) 1181

SECTION VIII. PHYSICAL AND PHYSICOCHEMICAL RESEARCH METHODS

Gragerov, I.P. Rapid Mass Spectrometric Method for the Isotopic Analysis of Oxygen in Organic Substances 373

Panchenkov, G.M., Akishin, P.A., Vasil'yev, N.N. Mass Spectrometric Study of Aluminosilicate Catalysts 378

Karpacheva, S.M., Rozen, A.M. Method of Total Isotopic Analysis of Water 386

Yanovskiy, M.I., Kapustin, D.S., Nogotkov-Ryutin, V.A. Method of Rapid Determination of Molar Radioactivity in Conjunction with the Chromatography of Gases Labeled with C^{14} 391

Brodskiy, A.I., Kalinenko, R.A., Lavrovskiy, K.P. Application of Adsorption Methods to the Analysis and Separation of Gaseous Hydrocarbons in the Study of Kinetics With the Aid of Tracers 399

Card 13/14

Problems of Kinetics and Catalysis (Cont.) -1181

Gaziyev, G.A., Yanovskiy, M.I. A Radiometric Cell for
Measuring the Radioactivity of Gases During the Volumetric-
Chromatographic Separation of Mixtures 405

SECTION IX. SYNTHESIS OF TAGGED SUBSTANCES

Roginskiy, S.Z. Basic Procedure in the Chemical Synthesis
of Compounds With Unusual Isotopic Composition 411

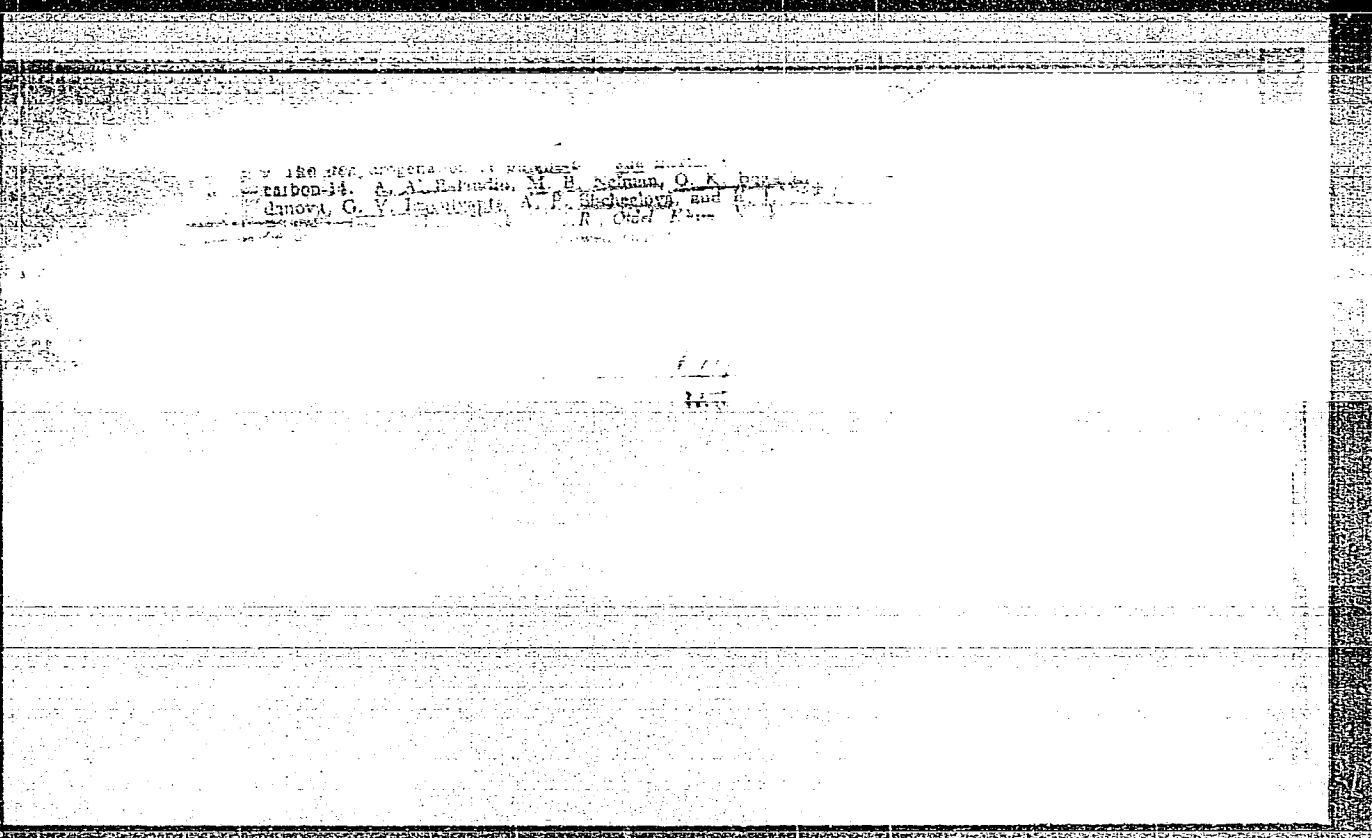
Kukhtenko, I.I. Synthesis of Certain Labeled Organic Compounds 423

Shatenshteyn, A.I., Izrailevich, Ye. A. Preparation of Deuterated
Organic Compounds 430

AVAILABLE: Library of Congress

TM/ksv
1-26-59

Card 14/14



27
10
40 50
Process of forming carbon dioxide in the preparation of
divinyl from butane-butylene mixtures. A. A. Bannik,
M. B. Kuznetsov, E. E. Sokolova, G. V. Isagulyants, A.
Sachegina and H. L. Gips. *Izv. Akad. Nauk SSSR*
1957, No. 10, p. 2703. The formation of CO₂
in the regeneration of butane-butylene mixtures was
studied. It was shown that the major part of the CO₂ is
formed as a result of the decompo. of divinyl. J. R. L.

DM
MT

Instit. Organic Chem. im. N. D. Zelinskiy 45 USSR

BOGDANOVA, O.K.; BALANDIN, A.A.; SHCHEGLOVA, A.P.

Effect of the structure of alcohol molecules on the kinetics
of their dehydrogenation. Izv. AN SSSR. Otd. khim. nauk. no. 7:787-794
Jl '57. (MIRA 10:10)

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

Bogdanova, O.K.

BOGDANOVA, O.K.; BALANDIN, A.A.; SHCHEGLOVA, A.P.

Effect of the structure of alcohol molecules on the kinetics
of their dehydrogenation. Report No. 2: Alcohols $C_4 - C_8$.

Izv. AN SSSR. Otd. khim. nauk. no. 7: 795-800 JI '57. (MIRA 10:10)

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

BOGDANOVA, O.K.

BALANDIN, A.A.; BOGDANOVA, O.K.; SHCHEGLOVA, A.P.

Effect of the structure of alcohol molecules on the kinetics of their dehydrogenation. Report No.3: Comparing the results obtained for different alcohols. Izv. AN SSSR, Otd. khim. nauk no.8:909-915 Ag '57. (MIRA 11:2)

1. Institut organicheskoy khimii im. N.D. Zelinskogo AN SSSR.
(Alcohols) (Chemical structure) (Dehydrogenation)

BOGDANOVA, O.K.

BALANDIN, A.A.; NEYMAN, M.B.; BOGDANOVA, O.K.; ISAGULYANTS, G.V.; SHCHENKOVA,
A.P.; POPOV, Ye.I.

Dehydrogenation of butane - butylene mixtures using tagged atoms.
Probl. kin. i kat. 9:45-60 '57. (MIRA 11:3)
(Dehydrogenation) (Butane)

BOGDANOVA O. K

AUTHORS: Balandin, A. A., Bogdanova, O. K., 62-1-4/29
Isagulyants, G. V., Neyman, M. B., Popov, Ye. I.

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

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

ABSTRACT: The investigation (with the application of C¹⁴) was carried
out by means of a special catalyst under conditions especi-
ally favorable for the obtaining of divinyl. Since it turned
out that divinyl can be formed from butylene and that butane
cannot be transformed into divinyl, it was concluded that the
reaction (divinyl from butane) passes only through the stage
of the formation and desorption of butylene. Therefore the
desorption of butylene cannot be a final stage of the entire
reaction. The authors report on the carrying out of the in-
vestigation: The correlation between the dehydrogenation
velocity of butane and butylene in divinyl at the chromium
catalyst was found by means of computations -corresponding
to the experimental data obtained already before. It was

Card 1/2

The Application of Radioactive Carbon in the Comparison
Between the Dehydrogenation Velocities of Butane and Butylene

62-1-4/29

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

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

SUBMITTED: January 4, 1957

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

Bogdanova, O. K.

AUTHORS:

Balandin, A. A., Academician
Bogdanova, O. K., Shcheglova, A. P.,

20-2-30/60

TITLE:

On Free Energy, Heat, and Entropy of the Adsorption Displacement of Alcohols From the Surface of an Oxide Catalyst by Means of Water (O svobodnoy energii, teploty i entropii adsorbtsionnogo vytesneniya spirtov vodoy s poverkhnosti okisnogo katalizatora)

PERIODICAL:

Doklady AN SSSR, 1958, Vol. 118, Nr 2, pp. 312-314 (USSR)

ABSTRACT:

This work examined the kinetics of dehydrogenizing of binary mixtures of normal structured primary alcohols by water by means of an oxide catalyst. The authors ascertained the coefficients of relative adsorption of water and examined the dependence of these quantities on the length of the carbon chain of alcohol. n-propyl alcohol, n-butyl alcohol, and n-hexyl alcohol were examined. The initial mixtures alcohol-water were produced by addition of water to a dosed quantity of alcohol. The experiments were made in the temperature interval of from 300 - 360°C. The data obtained here are grouped in a table. Another table contains the values of the coefficients of the relative adsorption of water, which were computed for the experimental data by a formula

Card 1/3

On Free Energy, Heat, and Entropy of the Adsorption Displacement of Alcohols From the Surface of an Oxide Catalyst by Means of Water 20-2-30/60

which is given here. The coefficient of the relative adsorption of water decreases in the case of increasing temperature. The addition of water diminishes the velocity of dehydrogenisation of alcohol by more than 45% at a temperature of 320° C. In case of increasing temperature the slowing-down effect of water decreases. This makes it possible to draw the following conclusions: The steam gets adsorbed by the catalyst the more, the lower the temperature. The coefficients of adsorption of water at the active centers of the catalyst are, in the examined temperature interval, in the case of water 3,5 to 1,3 times as high as in the case of alcohol. The coefficients of adsorption of water at the various values, mentioned above, have similar values. From the results of the experiments which were obtained here, the following appears: The coefficients of absolute adsorption of water-alcohols are, in case of primary alcohols of normal structure a function of temperature and do not depend on the length of the carbon chain of the alcohol. There are 2 figures, 2 tables, and 5 references, 4 of which are Slavic.

Card 2/3

On Free Energy, Heat, and Entropy of the Adsorption Displacement of Alcohols From the Surface of an Oxide Catalyst by Means of Water 20-2-30/69

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

SUBMITTED: August 23, 1957

AVAILABLE: Library of Congress

Card 3/3

AUTHORS:

Balandin, A. A., Member, Academy of Sciences, USSR;
Bogdanova, O. K., Shcheglova, A. P.

SOV/ 20-120-2-19/63

TITLE:

The Production of Isoprene by Catalytic Dehydrogenation
of Isopentenes
(Polucheniye izoprena putem kataliticheskoy degidrogenizatsii izopentenov)

PERIODICAL:

Doklady Akademii Nauk SSSR, 1958, Vol. 120, Nr 2,
pp. 297-300 (USSR)

ABSTRACT:

This synthetic production in connection with the polymerization of isoprene and the production of isoprene-rubber with better properties than natural rubber makes the method of isoprene production a problem of topical interest. Cheapest and most promising are mineral oil and its derivatives as raw material. The mineral-oil industry disposes of considerable supplies of isopentane and isopentenes which can be utilized for the above-mentioned purpose by the method mentioned in the title. The conditions of reaction according to publications (References 1-4) are given. For determining the optimum conditions the authors investigated this reaction at different tem-

Card 1/2

The Production of Isoprene by Catalytic Dehydrogenation SOV/20-120-2-19/63
of Isopentenes

peratures and supply velocities of isopentenes as well as by different dilution with steam. The results are given in table 1 and figures 1-3. The best conditions for the dehydrogenation of isopentenes to isoprene are: temperature 580-620°C, supply velocity per 1 liter catalyst 5000-8000 ml/hour, and dilution with steam 1 : 2,3-3,3 (by weight). The catalyst does not need regeneration for a longer period of time. Experiments of results were also made at 600°C and supply velocities of 6700-7200 ml/liter/hour as well as a steam dilution of 1 : 3. The results are given in table 2. Finally the kinetics of the reaction was investigated and a velocity constant of 4,3 ml/min at 530°C and 12,25 ml/min at 590°C was determined. The activation energy of the reaction is equal to 23,3 Kcal/mol.

There are 3 figures, 2 tables, and 5 references, 1 of which is Soviet.

ASSOCIATION:

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

SUBMITTED:

March 7, 1958

Card 2/2

- | | |
|---------------------------------|--------------------------------|
| 1. Isopentenes--Dehydrogenation | 2. Isopentenes--Polymerization |
| 3. Synthetic rubber--Production | 4. Mineral oils--Applications |

5(3)
AUTHORS: Bogdanova, O. K., Shcheglova, A. P., Balandin, A. A. SOV/62-59-2-27/40

TITLE: Catalytic Dehydrogenation of Isopentane-Isopentene Mixtures
(Kataliticheskaya degidrogenizatsiya izopentan-izopentenovykh smesey)

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk,
1959, Nr 2, pp 350-352 (USSR)

ABSTRACT: In this news in brief the authors report on the dehydrogenation of isopentane-isopentene mixtures by means of the continuous flow method in a device described in reference 1. The results obtained showed that the dehydrogenation of isopentane-isopentene mixtures can be carried out on the "chromo-aluminum" catalyst by dilution with steam. Optimum conditions are: 600-620°, flow rate 5000-6000 ml/l per hour, dilutions with steam in a weight ratio of 1:3. Under these conditions the yield of isoprene is 38-40% of the initial isopentenes and 88-92% of the reacted mixture. The high yield of isoprene indicates that no decomposition of hydrocarbons takes place under the influence of steam. The catalyst is distinguished by a considerable selectivity and is able to operate for some time

Card 1/2

SOV/62-59-2-27/40

Catalytic Dehydrogenation of Isopentane-Isopentene Mixtures

without regeneration. The mixtures used were produced in the laboratory of B. A. Kazanskiy and N. I. Shuykin. There are 1 figure, 3 tables, and 3 references, 2 of which are Soviet.

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

SUBMITTED: July 4, 1958

Card 2/2

5(4)
AUTHORS: Bogdanova, O. K., Balandin, A. A., SOV/62-59-8-5/42
Shcheglova, A. P.

TITLE: Effect of the Structure of Alcohol Molecules on the Kinetics of Dehydrogenation. Communication 4: Catalytic Dehydrogenation of Benzyl Alcohol

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1959, Nr 8, pp 1372-1377 (USSR)

ABSTRACT: A flow system described in (Ref 1) was used for the investigation of the dehydrogenation kinetics. The constancy of catalytic activity was checked in the course of the experiment by means of benzyl alcohol and a mixture of benzyl alcohol and its reaction products. The benzaldehyde contents of the catalyst were determined by the method described in reference 4. The reaction rate was determined from the amount of hydrogen separated out per time unit. The two determinations were in good agreement. The reaction was investigated at 4 different rates of passage (1.02, 1.23, 1.33, and 1.8 ml in 5 min). The benzaldehyde yield increased from 8.2% to the predetermined yield of 61%. The results are compiled in table 1. The calculated degree of dehydrogenation and benzaldehyde yield are

Card 1/3

Effect of the Structure of Alcohol Molecules on the Kinetics of Dehydrogenation. Communication 4: Catalytic Dehydrogenation of Benzyl Alcohol SOV/62-59-8-5/42

in agreement. In order to investigate the mixture mentioned above the adsorption coefficient of benzaldehyde was determined during the reaction. (Results in Table 2). It is stated that the reaction is slowed down when benzaldehyde is added. A temperature increase results in a reduction of the adsorption coefficient. A change in the initial mixture of benzaldehyde and benzalcohol does not effect the adsorption coefficient. With high passage rates it is reduced, but becomes constant with particularly high rates (Table 4). According to formula (1) $\Delta = -RT \ln z_2$ (z_2 adsorption coefficient of benzaldehyde) the heat content and entropy in the adsorption displacement of the alcohol by the aldehyde were determined. When the dehydrogenation temperature is increased the aldehyde yield can be increased greatly. This may be of practical value in the preparation of benzaldehyde. There are 4 figures, 4 tables, and 5 references, 4 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)

Card 2/3

Effect of the Structure of Alcohol Molecules on the Kinetics of Dehydrogenation. Communication 4: Catalytic Dehydrogenation of Benzyl Alcohol SOV/62-59-8-5/42

SUBMITTED: November 20, 1957

Card 3/3

5(3)

SOV/79-29-7-23/83

AUTHORS:

Bogdanova, O. K., Balandin, A. A., Shcheglova, A. P.

TITLE:

Preparation of Butadiene by Catalytic Dehydrogenation of Butane - butylene Mixtures in the Presence of Steam (Polucheniye butadiyena kataliticheskoy degidrogenizatsiyey butan-butilenovyykh smesey v prisutstvii parov vody.)

PERIODICAL:

Zhurnal obshchey khimii, 1959, Vol 29, Nr 7, pp 2204-2212 (USSR)

ABSTRACT:

One of the most important methods of synthesizing butadiene is the catalytic dehydrogenation of butylene into butadiene. Butylene may be obtained from cracking gases and in petroleum pyrolysis or by dehydrogenolysis of butane. In this connection, however, butylene is obtained in a mixture with butane so that this mixture must be fractionated in the presence of a third component. Industrial preparation of butadiene should practically be carried out without separating butylene from butane in the above mixture. Earlier (Ref 1) the authors investigated the dehydrogenolysis of butane-butylene mixtures over a chromium catalyst at reduced pressure and obtained good yields in butadiene. Some patents (Refs 2-4) offered only low yields. The authors of this paper tried to investigate the effect of steam on the dehydrogenolysis of butane-butylene mixtures,

Card 1/2

Preparation of Butadiene by Catalytic Dehydrogenation of SOV/79-29-7-23/83
Butane - butylene Mixtures in the Presence of Steam

viz over a catalyst suited for dehydrogenolysis carried out in the presence of steam since the latter is the most convenient diluent. Steam is known to favor, in the presence of some catalysts and at increased temperatures, the cracking process of hydrocarbons. Dehydrogenolysis of the above mixtures may take place in the presence of steam over an oxide catalyst for the dehydrogenolysis of butylene. Under these conditions the butadiene yields were 40% computed for the butylene passing through, and 75-80% computed for the reacted mixture. It is not necessary to regenerate the catalyst also after longer usage. The chromium-aluminum catalyst retards the dehydrogenolysis of butane into butylene in the presence of steam and converts the latter partially into decomposition products. Without diluent at 635° the butadiene yields over the same catalyst were 11.6%, computed for the mixture passed through, in this case the catalyst had to be regenerated several times. There are 4 figures, 5 tables, and 10 references, 6 of which are Soviet.

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

SUBMITTED: April 15, 1958
Card 2/2

5. J200

66861

5(4)

SOV/76-33-11-16/47

AUTHORS:

Balandin, A. A., Bogdanova, O. K., Shcheglova, A. P.

TITLE:

Influence of the Structure of Alcohol Molecules on the Kinetics of Their Dehydrogenation†

PERIODICAL:

Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 11, pp 2476-2479 (USSR)

ABSTRACT:

The dehydrogenation kinetics of the following alcohols was investigated on oxide catalysts: ethanol, n-propanol, n-butanol, allyl alcohol, isoamyl alcohol, isopropanol, benzyl alcohol, and β -phenyl ethyl alcohol. The experiments were carried out by means of a device and method earlier described (Ref 1). The reaction constants of alcohol dehydrogenation obtained (Table 1) increase from allyl alcohol to benzyl alcohol.† The values of the free energy of displacement from the active catalyst surface and of the change ΔH are listed (Table 2). Moreover, the authors explain the effect of the structure on the activation energy (Ref 3) and the variation in the heat of adsorption displacement and entropy. In addition, they found that the structure has some effect. Accordingly, an extension of the hydrocarbon chain in the primary alcohol leads to a decrease of the acti-

Card 1/2

66861

SOV/76-33-11-16/47

Influence of the Structure of Alcohol Molecules on the Kinetics of Their Dehydrogenation

vation energy. Replacement of the hydrogen by a phenyl group in β -position increases the activation energy by 0.3 kcal. However, if the phenyl group is found on the same carbon atom as the hydroxyl group, the activation energy decreases. A parallelism was observed between the variations in entropy (ΔS) and enthalpy (ΔH) (Fig 2) in adsorption displacement of the alcohol molecules by corresponding aldehydes or ketones from the catalytically active centers which occurs during alcohol dehydrogenation. This parallelism was observed for the first time in adsorption processes. A logarithmic dependence between activation energy and reaction constant was found. There are 2 figures, 2 tables, and 10 Soviet references.

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

Card 2/2

5.3200

~~5(3)~~

67920

SOV/20-129-5-30/64

AUTHORS: Shcheglova, A. P., Balandin, A. A., Academician, Bogdanova, O. K.

TITLE: Kinetics of Dehydrogenation of Isopentenes

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 129, Nr 5,
pp 1071 - 1074 (USSR)

ABSTRACT: In one of their previous papers the authors had dealt with the investigation of the dehydrogenation kinetics of butylene on a mixed oxide catalyst (Ref 1). Equation (1) holds for the results obtained (Ref 2). It, however, holds also for the dehydrogenation of alcohols on an oxide catalyst (Ref 3). Of late, the catalytic dehydrogenation of isopentenes has been acquiring great practical importance as a method of producing isoprene for the caoutchouc synthesis. The authors had earlier (Ref 4) determined the conditions of isopentene dehydrogenation under dilution with steam on an oxide catalyst. The same catalyst served for the investigation under review. It was confirmed by special experiments that steam does not influence the reaction rate on diluting the isopentenes (Fig 1). Steam acts in a similar way as the

Card 1/4

Kinetics of Dehydrogenation of Isopentenes

67920

SOV/20-129-5-30/64

inert gases nitrogen and argon. The principle supporting the method was described in reference 4. Isopentenes were obtained by the dehydrogenation of isoamyl alcohol on aluminum oxide. The experiment was made with the fraction having a boiling temperature at 31-38°; it contained 2-methyl butene-1 and 2-methyl butene-2. Experiments with pure isopentenes were carried out at 520-600°. Table 1 shows the results obtained. As may be observed therefrom the reaction runs without the formation of appreciable amounts of decomposition side products. Experiments with isopentenes and isoprene were carried out between 530 and 580°. These mixtures contained 22.2 mol% of isoprene. Data obtained are given in table 1. On comparing the data obtained from mixtures with those of isopentenes it may be observed that the degree of transformation of the latter into isoprene is much lower in the case of mixtures than with pure isopentenes. Isoprene is adsorbed more strongly on the active centers of the catalyst, and inhibits the reaction. Figure 2 shows the dependence of the relative adsorption coefficient Z_2 of isoprene on temperature, calculated on the basis of formula (2). Table 2 summarizes the data concerning the determination of

Card 2/4

Kinetics of Dehydrogenation of Isopentenes

67920

SOV/20-129-5-30/64

Z_3 (relative adsorption coefficient of hydrogen). As may be seen from table 2, $Z_3 = 0.8$ holds and is independent of temperature. Thus, hydrogen is adsorbed on the catalyst almost as strongly as isopentene. On the strength of data obtained, rate constants were determined by the aid of equation (1). At 530°, 540°, 560°, and 580° the constants are 4.3; 5.4; 7.7; and 10.7. The corresponding activation energy is 23.3 kcal/mol. Figure 3 shows the dependence between $\lg k_c$ and the reciprocal temperature. The points are situated on a straight line. The Arrhenius equation is satisfied. On the strength of the known formulas (Ref 3) the authors calculated the change of free energy, of heat capacity, and of entropy of the adsorptive displacement (Table 3). The authors state that isopentenes are more quickly dehydrogenated than butylenes. Butadiene is more strongly adsorbed on the active centers of the catalyst than isoprene. There are 3 figures, 3 tables, and 4 Soviet references. ✓

Card 3/4

67920

Kinetics of Dehydrogenation of Isopentenes

SOV/20-129-5-30/64

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: August 2, 1959

Card 4/4

5.3200

68152

~~5(3)~~

AUTHORS:

Bogdanova, O. K., Shcheglova, A. P.,
Balandin, A. A., Academician

SOV/20-129-6-26/69

TITLE:

Kinetics of Dehydrogenation of Butylene¹

PERIODICAL:

Doklady Akademii nauk SSSR, 1959, Vol 129, Nr 6, pp 1293 - 1296
(USSR)

ABSTRACT:

The authors proved in a previous paper (Ref 3) that butadiene is adsorbed on the aluminum chromium catalyst, that the relative adsorption coefficient of butadiene is high, and that its numerical value increases with decreasing temperature. In their investigations of butylene dehydrogenation, N. A. Shcheglova and S. Ya. Pshezhetskiy (Ref 4) found a deviating equation (2) which is similar to equation (1) of the authors (Ref 3). Adsorption was not considered in deriving equation (2), and it was maintained that the addition of hydrogen and butadiene does not remarkably influence the reaction rate. This contradicts the authors' assumptions mentioned in the beginning. The paper under review describes the investigation of the kinetics mentioned in the title on a mixed oxide catalyst. The investigations were carried out in a device described earlier (Ref 6). The α -butylene used contained about 7% of β -butylene. The pure butylene

Card 1/3

Kinetics of Dehydrogenation of Butylene

68162

SOV/20-129-6-26/69

as well as butylene-hydrogen-butadiene mixtures were diluted with steam (1 : 10 mol). The hydrogen content was varied from 21.8 to 75 mol% (Table 1). Figure 1 shows the curves of butylene displacement by hydrogen at 600° (a) and at 620° (b). Table 2 shows the dehydrogenation rates of the mixtures butylene-butadiene at 580, 600, and 625°. The butadiene¹ content was varied between 26.4 and 92%. It appeared that butadiene is formed as well as disintegrated in the catalyst. Its decomposition increases with temperature and its increase in the mixture (Fig 2:1,2). The correction with regard to butadiene disintegration was determined from the results and considered in the data on the reaction of butylene-butadiene mixtures. The curves 3 (Fig 2) were found by subtracting curves 2 from curve 1. The relative adsorption coefficients were computed according to formula (3). For butadiene, this coefficient $z = 4.9$ at 580°. It decreases at 620°: $z_2 = 2.9$. For hydrogen, $z_3 = 0.8$; it depends on temperature between 580 and 620°. Steam does not influence the reaction rate. The reaction constant = 7.26 at 580°, 9.3 at 600°, and 12.1 at 620°. Figure 3 shows

Card 2/3

Kinetics of Dehydrogenation of Butylene

68162
SOV/20-129-6-26/69

the linear dependence between $\log k_c$ and the reciprocal absolute temperature. The activation energy, computed from the velocity constants (k_c), was 19.1 kcal, the pre-exponential term of the Arrhenius equation was 5.75. The change of free energy, of heat capacity, and of entropy (Table 3), as well as the displacement of butylene from the active catalyst centers by butadiene due to adsorption (Table 3), could be computed from the adsorption coefficients and their temperature dependence according to known formulas (Ref 7). The adsorption coefficients of butylene, butadiene, and hydrogen (equation (1)) are 1 : 4.9 : 0.8 at 580° and 1 : 3.7 : 0.8 at 600°. The names of Podbil'nyak and Bushmarin are mentioned in the text. There are 3 figures, 3 tables, and 7 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: August 2, 1959

Card 3/3

S/595/60/000/000/009/014
E134/E485

AUTHORS: Balandin, A.A., Bogdanova, O.K., Shcheglova, A.P.
TITLE: Catalytic dehydrogenation of isopentenes to isoprene
SOURCE: Vsesoyuznoye soveshchaniye po khimicheskoy
pererabotke neftyanykh uglevodorodov v poluprodukty
dlya sinteza volokon i plasticheskikh mass. Baku, 1957.
Baku, Izd-vo AN Azerb. SSR, 1960. 233-239

TEXT: The paper is concerned with the catalytic dehydrogenation of isopentenes and the conversion of isopentane-isopentenes mixtures to isoprene as part of the general problem of manufacture of isoprene rubber from the isopentane fraction in petroleum. The authors studied dehydrogenation of isopentene and isopentane-isopentenes mixtures in the presence of steam at atmospheric pressure. Artificial mixtures as well as mixtures obtained by dehydrogenation of isopentane on an Al-Cr catalyst were used. The experiments were carried out by continuous flow over a mixed oxide catalyst. Work on isopentene was concerned with the effect of temperature, flow rate and steam dilution ratio on isoprene yield. Yield based on isopentene feed increased from 14.5 to 36% as temperature rose from 540 to 620°C but dropped from Card 1/4

Catalytic dehydrogenation ...

S/595/60/000/000/009/014
E134/E485

92 to 85% of the reacted isopentene. Curves showing the effect of temperature and flow rate on isoprene yield are given (Fig. 1 and 2). Best dilution ratios are 1:2 or 1:3 by weight. A complete mass balance for operation with a 1:3 ratio at 600°C at a rate of 4500 g/litre catalyst/hour is given. Under these circumstances, yield is 28 to 30% on feed and 88 to 92% on reacted isopentene. The removal of carbon from the catalyst in the form of carbon dioxide makes prolonged reaction without regeneration possible. The results show that the catalyst acts selectively. Investigations of mixtures 55% isopentane-45% isopentene were carried out under identical conditions to study the effect of flow rate and temperature. Conversion of mixture and yield of isoprene increased with rising temperature but yield of isoprene based on reacted isopentene dropped from 94 to 86.5%. A full analysis is given. At 600°C, a flow rate of 4400 g/litre catalyst/hour and 1:3 dilution ratio yield of isoprene on isopentane present was 38 to 40% and was more than 90% of the reacted isopentene. Under identical conditions dehydrogenation of isopentane to isopentene only took place to the extent of 4 to 6% and there is no direct

Card 2/4