

MARGOLIS, S., inzh.

Improving the maneuverability of tractor trains. Avt.transp. 41
no.4:59 Ap '63. (MIRA 16:5)
(Tractor trains)

L 35554-65

ACCESSION NR: AP5008209

elongated gear of the printing mechanism fits. To maintain strictly constant velocity and diminution in electrical power requirements, a dual supply electrical motor is used with a drum rotating in one direction, the AC winding of which is connected to a tuning-fork oscillator through a frequency and phase comparison circuit. This circuit is equipped with a relay safety link to protect the tuning fork from overloading, connected between the output of the tuning-fork oscillator and the winding of the electrical motor. To obtain a wide selection of directivity characteristics of seismic-control channels and to improve directional reception, a mixer is used that has a variable number of channels and decoupling elements with vector impedance proportional to the total vector impedance of the magnetic head and the instrumental resistance between the intake of the rerecording amplifier and the magnetic heads. This should report a weak signal. In using two-resonance rerecording, the frame of the device is connected to a regulating lever, the end of which is attached to a roller for keeping constant pressure of the pen on the paper.

ASSOCIATION: none

SUBMITTED: 24Dec59

ENCL: 00

SUB CODE: ES, DP

NO REF SOV: 000

OTHER: 000

Card 2/2

L 35554-65 EWT(1)/EWA(h) Feb GW
ACCESSION NR: AP5008209

S/0286/65/000/005/0075/0076
2/8

AUTHORS: Margolis, N. Ya.; Dondoshanskiy, L. K.; Fedorenko, A. N.; Pevzner, Z. I.; Nikitina, K. T.; Petrov, L. V.; Blagovestov, V. A.

TITLE: A device for multichannel magnetic record of seismic waves, Class 42, No. 168899

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 5, 1965, 75-76

TOPIC TAGS: seismic wave, magnetic recording

ABSTRACT: This Author Certificate presents a device for multichannel record of seismic waves based on Author Certificate No. 90068. It is distinguished by improved automation of seismic-station control. A step-type selector is used as the commutator, one sliding brush of which is connected to the intake of the rerecording amplifier, the other to the intake of the mixing circuit. The printing device for making time marks has the form of a geared drum, each tenth gear elongated, fastened on rotating brackets that are connected through a tie rod to a handle equipped with a stop. For matching a long time mark with shot time, the axis of the rerecording drum has a freely rotating lever arm, one end of which is equipped with a notch into which a lug corresponding to the tenth,

Card 1/2

ACCESSION NR: AP4039399

was photographed by a RKOP camera. A more accurate picture was obtained in an x-ray goniometer KFOR. It was established on the basis of the x-ray pattern analysis that praseodymium crystallized in the tetragonal rather than rhombohedral system and that its lattice parameters were $a = b = 3.74 \pm 0.01 \text{ \AA}$, $c = 3.76 \pm 0.1 \text{ \AA}$. The Laue diffraction pattern of the samarium crystal showed that it had a diffraction symbol $2/\text{mm}$. According to the Geller and Balla choice of the coordinate axes, the samarium crystal should have the third order axes, but the presence of such axes in samarium was not sustained. However, the investigation showed the presence of clearly defined second-order axes and less clearly defined fourth-order axes. It was decided to take the edges of the perovskite cell as the direction of the coordinate axes. For better results, the elementary cell constant 3.72 \AA was doubled (in the plane perpendicular to the Z axis). The results proved that samarium crystallized in the rhombic system with the lattice parameters $a = b = 7.46 \pm 0.01$; $c = 7.43 \pm 0.01 \text{ \AA}$. "We express our gratitude to V. A. Ioffe for the experimental material." Orig. art. has: 2 tables.

ASSOCIATION: Leningradskiy tekhnologicheskii institut im. Lensoveta (Leningrad Technological Institute)

Card 2/3

ACCESSION NR: AP4039399

S/0070/64/009/003/0408/0410

AUTHORS: Margolis, N. V.; Toropov, N. A.; Udalov, Yu. P.

TITLE: X-ray analysis of praseodymium and samarium aluminates

SOURCE: Kristallografiya, v. 9, no. 3, 1964, 408-410

TOPIC TAGS: x ray analysis, crystallographic analysis, praseodymium, lattice parameter, samarium, aluminate, camera RKOP, camera RKU, goniometer KFOR

ABSTRACT: The structure of praseodymium and samarium aluminates was studied in order to verify the hypothesis stating that the perovskite-type structures undergo transformations producing valuable physical properties. Powders and single crystals of the aluminates were prepared in Institut khimii silikatov AN SSSR (Institute of Silicate Chemistry, Academy of Sciences SSSR). Praseodymium and samarium were studied previously by S. Geller and V. B. Balla (Acta Crystallog., 9, 1019, 1956) who referred the first aluminate to the rhombohedral system with lattice parameters: $a = 5.307 \text{ \AA}$, $\alpha = 60.33^\circ$, and the second to the rhombic system with $a = 5.265$; $b = 5.290$; $c = 7.473 \text{ \AA}$. During the investigation the crystal symmetry

Card 1/3

MARGOLIS, N.V.

Determining the lattice constant of cubic crystals by the method
of nonstandard reversal photographs on a plane cassette. Inform.-
biul.NIIGA no.16:51-60 '59. (MIRA 15:3)
(Crystallography, Mathematical)

Some Remarks on the Paper by A. A. Mayorov

103-12-9/12

of disturbances and not during operation. It is shown, that the estimation defined by Mayorov is quite obviously obnoxious. Summing up, it can be stated, that for the estimation of the operation reliability in an arbitrary sense the probability of a breakdown-free operation of the regulator must be determined.

AVAILABLE: Library of Congress

Card 2/2

MARGOLIS, N.M.

AUTHOR: Margolis, N. M. (Moscow)

103-12-9/12

TITLE: Some Remarks on the Paper by A. A. Mayorov (Neskol'ko zamechanii po povodu stat'i A. V. Mayorova).

PERIODICAL: Avtomatika i Telemekhanika, 1957, Vol. 18, Nr 12, pp. 1142-1144 (USSR)

ABSTRACT: This publication is a critical review of the paper by A. A. Mayorov in Avtomatika i Telemekhanika, 1955, Vol. 16, Nr. 5. The following charges are brought up against the author; An insufficient critical consideration of the possibility to estimate the operation reliability of the regulator in the state of the elaboration of a principal scheme and a incorrect analysis of the operation reliability, a wrong recommendation for the compilation of such principal schemes of automatic regulator. It is shown, that such schemes, which show no dependence of the operation reliability on the technical execution, do not exist. Furthermore it is pointed to the fact, that the optimum criterium introduced by Mayorov gives no indication of the probability of the occurrence of defects, because the results are investigated in the case of the occurrence

Card 1/2

MARGOLIS, Mordukh Genakhovich, kand. med. nauk; NEYMAN, M.I., red.;
BEL'CHIKOVA, Yu.S., tekhn. red.

[Diseases of the eyelid margins; treatment and prevention]
Zabolevaniia kraev vek; lechénie i profilaktika. Moskva,
Medgiz, 1963. 17 p. (MIRA 16:7)
(EYELIDS--DISEASES)

MARGOLIS, M.G., kand.med.nauk (Moskva)

Eye burns. Fel'd. i akush. 27 no.3:18-20 Mr '62. (MIRA 15:4)
(BURNS AND SCALDS) (EYE--WOUNDS AND INJURIES)

MARGOLIS, M. G., kand. med. nauk

Blepharitis. Zdorov'ie 8 no.7:30-31 J1 '62.

(MIRA 15:7)

(EYELIDS—INFLAMMATION)

MARGOLIS, M.G., kand.med.nauk (Moskva)

Iritis and iridocyclitis. Fel'd. i akush. 26 no.7:19-21 J1 '61.
(MIRA 14:7)

(IRITIS)

MARGOLIS, M.G., kand.med.nauk (Moskva)

Blepharitis and blepharoconjunctivitis. Fel'd. i akush. 26 no.5:
12-15 My '61. (MIRA 14:5)
(EYELIDS—DISEASES) (CONJUNCTIVA—DISEASES)

MARGOLIS, M.; MONOGAROVA, T., inzh.

Large-panel housing construction in Lipetsk. Zhil. stroi. no.2:
16-~~47~~ '63. (MIRA 16:3)

1. Glavnyy inzhener tresta Zhilstroy, g. Lipetsk.
(Lipetsk--Precast concrete construction)

MARGOLIS, H.

Gas main on precast reinforced concrete supports. Stroitel' no.1:
14 Ja '58. (MIRA 11:2)

1. Glavnyy inzhener stroitel'nogo uchastka No.2 tresta lipetskstroy.
(Gas pipes) (Precast concrete construction)

MARGOLIS, Liya Yakovlevna

[The magic stick of chemistry; catalysis and its application] Volshebnaiia palochka khimii: kataliz i ego primeneniia. Moskva, Nauka, 1962. 116 p. (MIRA 17:10)

L 21224-66

ACC NR: AP6003820

shift relative to the absorption line of SnO_2 . This means that in these solid solutions the S-electron density at the tin nuclei does not differ from that in the SnO_2 . Other characteristics of the Mossbauer spectrum are likewise unaffected by the use of the oxide compounds. Although no clearcut quadrupole splitting of the absorption spectrum was observed for any of these substances, it is deduced that some slight quadrupole interaction is present, of the same order as in SnO_2 , and the reasons for the small values of the quadrupole interactions are briefly discussed. Orig. art. has: 1 figure and 1 table.

SUB CODE: 20/ SUBM DATE: 24Apr65/ ORIG REF: 005/ OTH REF: 002

Card 2/2 *dda*

L 21224-66 EWI(m)/I/EHP(t) LJP(c) JD

ACC NR: AP6003820

SOURCE CODE: UR/0181/66/008/001/0287/0290

AUTHOR: Karasev, A. N.; Margolis, L. Ya.; Polak, L. S.

ORG: Institute of Petrochemical Synthesis im. A. V. Topchiyev AN SSSR, Moscow
(Institut neftekhimicheskogo sinteza AN SSSR)

TITLE: Use of the Mossbauer effect for the study of solid solutions of Sn in 42
oxide semiconductors 18 27 B

SOURCE: Fizika tverdogo tela, v. 8, no. 1, 1966, 287-290

TOPIC TAGS: tin, inorganic oxide, solid solution, Mossbauer effect, semiconductor crystal, Mossbauer spectrum, line splitting

ABSTRACT: The authors investigated the Mossbauer effect on Sn¹¹⁹ nuclei introduced into the crystal lattice of the oxide semiconductors Sb₂O₅, Cr₂O₃, V₂O₅, MoO₃, and NiO. The solid solutions were prepared by different means. All samples were prepared at the Institute of Chemical Physics AN SSSR. The Mossbauer spectra were plotted with constant-speed apparatus. An SnO₂ source of 23.8-keV γ rays was used. The γ -ray detector was a resonant counter. Most measurements were made at room and liquid-nitrogen temperatures. The Mossbauer spectra of all the investigated solid solutions consisted of a single absorption line, with practically no

Card 1/2

ISAYEV, C.V.; RUSLANOVA, V.A.; URLENEV, V.I.; MOPALIN, I.Ya.; MIKHAYLOV, N.V.

Catalytic oxidation of propylene on a silver in a vertically
fluidized bed. Khim. pr. N. 11 no. 11-12, 1965, p. 1485.

(MIRA 1816)

L 0492-66

ACC NR: AP5028475

SUB CODE: 11 / SUB DATE: 27Jun64 / ORIG REF: 006 / OTH REF: 009

BVK
Card 2/2

L 8492-66 EWT(1)/EWT(m)/EWP(j)/T/EWP(t)/EWP(b) IJP(c) JD/RM

ACC NR: AP5026475

SOURCE CODE: UR/0195/65/006/005/0854/0859

AUTHOR: Krylova, A.V.; Margolis, L. Ya.; Chizhikova, G.I.

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

TITLE: Electric properties of the volume and surface of zinc oxide

SOURCE: Kinetika i kataliz, v. 6, no. 5, 1965, 854-859

TOPIC TAGS: zinc oxide, work function, electric conductivity, adsorption

ABSTRACT: The electronic work function, electrical conductivity, and adsorption of oxygen were determined on pure and modified zinc oxide (containing 1 at. % Li or 1 at. % In) calcined for 6 hr in air at 500, 900, and 1300C. The conditions of thermal pretreatment of the ZnO semiconductor were found to have a considerable effect: depending upon these conditions, a symbatic or antibatic relationship of the volume and surface electronic properties was found. The mechanism of the action of impurities on these properties is apparently determined by the previous history of the sample. The observed dependence of the adsorptive capacity of zinc oxide relative to oxygen on the work function indicates the important role of the surface charge in the processes of adsorption and catalysis. Orig. art. has: 3 figures and 4 tables.

Card 1/2

UDC 546.47-31:621.315.592

KOLCHIN, I.K.; GAL'PERIN, Ye.L.; BOBKOV, S.S.; MARGOLIS, L.Ya.

Catalytic oxidation and oxidative ammonolysis of propylene on
bismuth tungstate. Neftekhimiia 5 no.1:111-117 Ja-F '65.
(MIRA 18:5)

YEZHKOVA, Z.I.; IOFFE, E.I.; KAZANSKIY, V.B.; KRYLOVA, A.V.; LYUBARSKIY,
A.G.; MARGOLIS, L.Ya.

Activity, structure and the electric properties of mixed
vanadium catalysts. Kin. i kat. 5 no.5:861-867 S-0 '64.

(MIRA 17:12)

1. Nauchno-issledovatel'skiy institut organicheskikh poluprovod-
nikov i krasiteley i Institut khimicheskoy fiziki AN SSSR.

REBINDER, P.A., akademik; SHCHUKIN, Ye.D.; MARGOLIS, L. Ya.

Mechanical strength of porous disperse bodies. Dokl. AN SSSR
154 no. 3:695-698 Ja '64. (MIRA 17:5)

1. Institut fizicheskoy khimii AN SSSR i Institut khimicheskoy
fiziki AN SSSR.

KOLICHIN, L.K.; BOBKOV, S.S.; MARGOLIS, S.S.

Catalytic oxidation and decomposition of propylene on bismuth molybdates. *Neftekhimiya* 4 (1964) 1037-1044 (N. 84 17:8)

1. Institut khimicheskoy fiziki.

OFFE, I. I.; MARGOLIS, L. Ya. /

"Selective heterogeneous catalytic oxidation of hydrocarbons."

report submitted to 3rd Intl Cong on Catalysis, Amsterdam, 20-25 Jul 64.

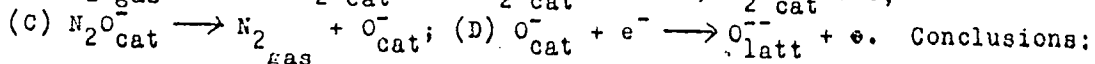
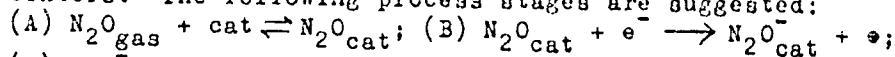
Inst of Chemical Physics, AS USSR, Moscow.

Reaction of nitrous oxide ...

S/062/63/000/001/004/025
B101/B186

sorption of O_2 and the decomposition of N_2O occurs at the same active

centers. The following process stages are suggested:



Stages A and B do not determine the order of the reaction, since they proceed faster than the decomposition; this leaves stages C and D. The kinetics of the process depends on whether stage C proceeds more rapidly or as rapidly as stage D (first-order reaction) or, on the contrary, D proceeds more rapidly than C (zero-order reaction). The reaction is faster on those spinels from which larger quantities of O_2 are desorbed on heating at 150°C in vacuo. Hence, the rate of N_2O decomposition depends on the O_2 mobility in the lattice of the spinel. There are 9 figures and 2 tables. ✓

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

SUBMITTED: May 5, 1962

Card 3/3

Reaction of nitrous oxide ...

S/062/63/000/001/004/025
B101/B186

but E_{IV} is 18.0. With II and III the reaction is zero-order, E_{II} is 19.2; E_{III} is 24.0. With V, VI, and VII the reaction is zero-order, E_V is 20.2, E_{VI} 18.0 and E_{VII} 17.0. Variation of p_{N_2O} between 0.085 and 0.640 mm Hg in the reaction with I (450°C) showed that the specific reaction constant related to the unit surface depends on p_{N_2O} : $k_{sp}^I = a/p_{N_2O}^0 + b$; for the p_{N_2O} investigated $a = 0.000308$, $b = 0.0014$. The effect of oxygen was studied, when I was not heated in vacuo before the test, by previously sorbing O_2 on I; and by adding oxygen to N_2O . Results: (1) The O_2 forming by N_2O decomposition on the annealed I retards N_2O decomposition; (2) the slight difference between the reaction rates on annealed and on O_2 -treated I proves that the active centers are rapidly regenerated; the oxygen penetrates rapidly into the spinel lattice; (3) O_2 contained in the gas phase inhibits the N_2O decomposition more than sorbed O_2 ; (4) the chemi-

Card 2/3

S/062/63/000/001/004/025
B101/B186

AUTHORS: Linde, V. R., Margolis, L. Ya., and Roginskiy, S. Z.

TITLE: Reaction of nitrous oxide with cobalt-manganese spinels
admixed with oxides of lithium, titanium or copper

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye
khimicheskikh nauk, no. 1, 1963, 21-30

TEXT: Decomposition of N_2O was studied in the 300-500°C temperature range by using $CoMn_2O_4$ (I); I + 21.4 atom% Li (II) in the form of Li_2O ; I + 10.4 atom% Ti (III) as TiO_2 ; I + 10.0 atom% Cu (IV) as CuO ; $MnCo_2O_4$ (V); V + 22.0 atom% Li (VI); and V + 11.0 atom% Ti (VII). In all tests the initial N_2O pressure was 0.3 mm Hg. Before the tests the spinels were heated for 3 hrs at 600°C and 10^{-6} mm Hg. The course of the reaction was studied by determining the N_2O content in the gas phase. Results: With pure I, the reaction is first-order, the activation energy E (here and below in kcal/mole) is 15.6. With IV the reaction is also first-order

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L 12631-63

ACCESSION NR: AP3002877

the salt catalysts such as MnO sub 2, Cr sub 2 O sub 3, CuCr sub 2 O sub 4, MnCr sub 4, V sub 2 O sub 5, CuO, MnCoO sub 4 and Pt on SiO sub 2, the oxidation of isobutylene takes place practically without the induction period. However, a substantial amount of oxygen-containing products are formed. The main products of this reaction are acetone and formic acid as well as traces of other compounds. When testing for the selectivity of these heterogeneous catalysts, it was discovered that these catalysts are only initiators of the oxidation process of isobutylene and do not possess any selectivity of the reaction. Orig. art. has: 1 table and 2 figures.

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

SUBMITTED: 20Mar63

DATE ACQ: 15Jul63

ENCL: 00

SUB CODE: 00

NO REF SOV: 007

OTHER: 002

mcs/aa

Card 2/2

L 12631-63

EPR/EWF(j)/EPF(c)/EWT(m)/BDS Ps-4/Pc-4/Pr-4 RM/WW

ACCESSION NR: AP3002877

S/0020/63/150/005/1066/1068 7/

AUTHOR: Blyumberg, E. A.; Buly*gin, M. G.; Margolis, L. Ya.; Emanuel', N. M. 7/TITLE: Liquid phase oxidation of isobutylene in the presence of heterogeneous catalysts

SOURCE: AN SSSR. Doklady*, v. 150, no. 5, 1963, 1066-1068

TOPIC TAGS: liquid phase oxidation, isobutylene, heterogeneous catalyst, salt catalyst, hydrocarbon gas oxidation, gaseous phase oxidation

ABSTRACT: The object of this work is to increase the selectivity of the oxidation processes in the liquid phase of hydrocarbon gases by means of utilization of heterogeneous catalysts. An assumption was made that the oxidation of hydrocarbons in the liquid phase does not have a principal difference between the analogous oxidation in the gaseous phase. The experimental product for the oxidation in this study was 99.8% pure isobutylene with an admixture of 0.1% by weight of butylene and 0.1% of saturated C sub 3 - C sub 4 hydrocarbons. The process of oxidation of isobutylene in the absence of catalysts did not take place even after 12 hours following the introduction of oxygen. With the introduction of any of

Card

1/2

LINDE, V.R.; MARGOLIS, L.Ya.

Oxidation of propylene on cobalt-manganese spinels with lithium, titanium, and copper oxides added. Izv. AN SSSR.Otd.khim.nauk no.10: 1723-1728 0 '62. (MIRA 15:10)

1. Institut khimicheskoy fiziki AN SSSR.
(Propene) (Oxidation) (Spinels)

KUTSEVA, L.N.; MARGOLIS, L.Ya.

Oxidation of propylene to acrolein on vanadium and molybdenum
catalysts. Zhur. ob. khim. 32 no.1:102-107 Ja '62. (MIRA 15:2)
(Propene) (Acrolein)

MARGOLIS, L.Ya.; YENIKEYEV, E.Kh.; ISAYEV, O.V.; KRYLOVA, A.V.; KUSHNEROV,
M.Ya.; Prinizhala uchastiye: VILENKINA, S.M., laborant

Modification of hydrocarbon oxidation catalysts. Kin.i kat.
3 no.2:181-188 Mr-Ap '62. (MIRA 15:11)

1. Institut khimicheskoy fiziki AN SSSR.
(Hydrocarbons) (Oxidation) (Catalysts)

Heterogeneous Catalytic Oxidation (Cont.)

SOV/6196

Principles for improving the selectivity of catalytic oxidation processes in industrial plants are advanced. The author thanks E. Kh. Yenikeev, A. V. Krylova, O. V. Isayev, I. L. Tsitovskaya, and A. S. Guryleva. There are 322 references: 195 Soviet, 92 English, 25 German, 8 French, 1 Spanish, and 1 Hungarian.

TABLE OF CONTENTS:

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Ch. I. Catalysts	18
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Change in the structure of a catalyst during oxidation	27
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Oxygen adsorption on oxidation catalysts	32
Card 2/5	

PHASE I BOOK EXPLOITATION

SOV/6196

Margolis, Liya Yakovlevna

Geterogennoye kataliticheskoye okisleniye uglevodorodov; sintez monomerov (Heterogeneous Catalytic Oxidation of Hydrocarbons; Synthesis of Monomers) Moscow, Gostoptekhnizdat, 1962. 246 p. Errata slip inserted. 2700 copies printed.

Chief Ed.: S. I. Babushkina; Tech. Ed.: A. S. Polosina.

PURPOSE: This book is intended for research chemists and engineers working on organic synthesis in the petroleum, petrochemical, and chemical industries.

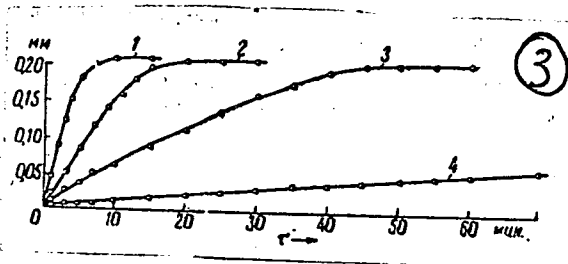
COVERAGE: This book is a compilation of published experimental data on selective catalytic oxidation of hydrocarbons in industry. The data concern the kinetics and reaction mechanisms of selective catalytic oxidation processes and methods for preparing and improving the properties of catalysts.

Card 1/5

BREZHNEVA, N.Ye.; MARGOLIS, L.Ya.; TODES, O.M.; DOBYCHIN, D.P.;
CHMUTOV, K.V.

Solomon IUL'evich Elovich. Zhur. fiz. khim. 35 no.5:1172-1173
My '61. (MIRA 16:7)

(Elovich, Solomon IUL'evich, 1898-1961)



S/020/61/136/004/020/026
B028/B060

Legend to Fig. 1: Kinetic isotherms for the oxidation of $2C_3H_6+9O_2$ at $250^\circ C$. $P^0 = 0.522$ mm Hg, a) minutes.

Legend to Fig. 2: Dependence of specific rate constants K^I K^{II} on the initial pressure P_0 , a) = spec.

Legend to Fig. 3: Kinetic isotherms for oxidation on $CoMnO_4$
1= $350^\circ C$, $S=0.14$ m²; 2= $300^\circ C$, $S=0.25$ m²; 3= $250^\circ C$, $S=0.50$ m²; 4= $200^\circ C$, $S=0.50$ m² a) minutes b) mm.

Card 5/5

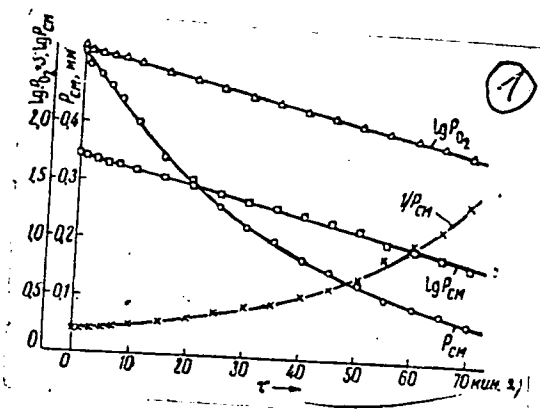
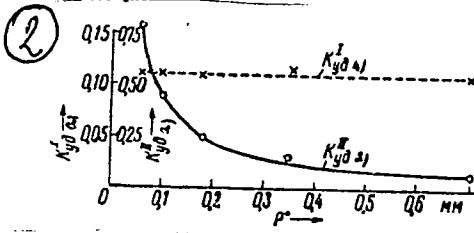
Catalytic Properties of Cobalt - Manganese Spinel

S/020/61/136/004/020/026
B028/B060

figures, 2 tables, and 14 references: 10 Soviet, 1 German, 1 British, and 1 Polish.

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR (Institute of Physical Chemistry, Academy of Sciences USSR)

SUBMITTED: October 19, 1960



Card 4/5

Catalytic Properties of Cobalt - Manganese
Spinel

S/020/61/136/004/020/026
B028/B060

$w = k^I [P_{O_2}]^1 [P_{C_3H_6}]^0$. It has been earlier pointed out that O_2 undergoes a chemically irreversible sorption on both spinels, the kinetics of chemisorption obeying equation $\theta = A\tau^{1/n}$ for $MnCo_2O_4$ and $\theta = a + b \log \tau$ for $CoMn_2O_4$. θ = occupation of surface, τ = time. Measurements of chemisorption of O_2 on both spinels yielded the following values for the activation energy: 18 kcal/mole for $CoMn_2O_4$ and 14 kcal/mole for $MnCo_2O_4$ for $\theta = 0.03 \text{ cm}^3/\text{m}^2$, temperature range $200^\circ - 350^\circ\text{C}$. The problem as to whether oxidation takes place by a homogeneous or a heterogeneous mechanism, was studied by the method of the separate calorimetric procedure devised by A. A. Koval'ckiy and M. L. Bogoyavlenskaya (Ref. 9). The reaction vessel was 50 mm in diameter. A nichrome constantan differential thermocouple was used for the measurement of the temperature difference. For both catalysts oxidation took place on the surface at 300° and a pressure of 0.5 and 40.0 mm Hg over a purely heterogeneous mechanism. The structural formula of the spinels $Co^{2+}(Mn^{3+}Mn^{3+})O_4^{2-}$ and $Co^{3+}(Mn^{2+}Co^{3+})O_4^{2-}$ shows that Mn cations present on the surface constitute more intense electron donors for oxygen atoms undergoing sorption, than Co cations. There are 4

Card 3/5

Catalytic Properties of Cobalt - Manganese
Spinels

S/020/61/136/004/020/026
B028/B060

(10^{-6} mm Hg) at 550° for 4 hours. The resulting water was frozen out. CO_2 was removed by absorption. The reaction kinetics obeys a monomolecular law. The diagram of Fig. 1 with the coordinates $\log P = f(\tau)$ contains the kinetic isothermal lines for the oxidation of the $2\text{C}_3\text{H}_6+9\text{O}_2$ mixture on MnCo_2O_4 at 250°C . On the assumption of a monomolecular law, they have a linear course, while the assumption of a square dependence leads to distortion. CO_2 molecules probably form complexes of the type CO_2 on the catalyst surface. The specific rate constant K^I calculated by a reaction equation of the 1st order remains steady (Fig. 2). For a $2\text{C}_3\text{H}_6+9\text{O}_2$ oxidation at different temperatures, without removal of CO_2 , the total velocity may be calculated approximately with a reaction equation of the 2nd order. The specific constant K^{II} , referred to surface unit of 1m^2 catalyst, was found for each temperature. K^{II} is a function of the initial pressure of the mixture. The reaction rate was found to be independent of the propylene concentration. An increase of the O_2 content from 0.096 to 0.433 mm Hg leads to an increase of the reaction rate. The latter depends on the O_2 concentration according to equation

Card 2/5

S/020/61/136/004/020/026
B028/B060

AUTHORS: Linde, V. R., Margolis, L. Ya., and Roginskiy, S. Z.,
Corresponding Member AS USSR

TITLE: Catalytic Properties of Cobalt - Manganese Spinels

PERIODICAL: Doklady Akademii nauk SSSR, 1961, Vol. 136, No. 4,
pp. 860-863

TEXT: The present paper deals with the effect of the structure of spinels CoMn_2O_4 and MnCo_2O_4 upon the catalytic action in propylene oxidation. The catalytic activity was determined by measuring the oxidation rate of propylene with O_2 in a stoichiometric ratio of $\text{C}_3\text{H}_6:\text{O}_2 = 2:9$. The reaction product contained CO_2 gas and water. The specific surface of the catalyst was determined by the BET method from the equilibrium isotherms of krypton sorption. The specific surface was $0.70 \text{ m}^2/\text{g}$ for CoMn_2O_4 and $0.25 \text{ m}^2/\text{g}$ for MnCo_2O_4 . The reaction took place at a constant initial mixture pressure of 0.450 mm Hg and in the temperature range of $200^\circ - 350^\circ\text{C}$. For purification, catalyst specimens were heated in vacuo -

Card 1/5

33482

S/195/61/002/005/007/027
E040/E485

Mobility of catalyst ...

5 non-Soviet-bloc. The two references to English language
publications read as follows: Ref.7: US Pat. 2680752, June 1954.
Ref.14: US Pat. 9307, February 1957.

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

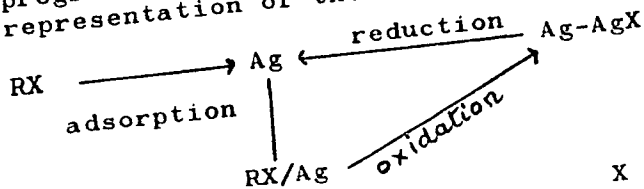
X

Card 4/4

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S/195/61/002/005/007/027
E040/E485

Mobility of catalyst ...

reaction medium are first adsorbed on the surface of silver catalyst and then oxidized to silver halide (in the presence of oxygen) and progressively removed from the reaction system. A schematic representation of these reactions is as follows:



X - halogen.

The optimum conditions of the catalyst modification by the presence of organic halides are determined by the relative velocities of the oxidation and reduction reactions in the Ag-AgX system. All the radiographical measurements were carried out by M.Ya.Kushnerev. J.Mikulski, T.Werber, S.Z.Roginskiy and M.I.Yanovski are mentioned in the article. There are 5 figures, 4 tables and 16 references: 11 Soviet-bloc and Card 3/4

33482

S/195/61/002/005/007/027
EO40/E485

Mobility of catalyst ...

reactions were present on the surface of the catalyst pellets only. The tests were made in a stream of nitrogen, air and a 3% ethylene/air mixture, the reaction time being up to 5 hours. The results showed that the catalyst additives are progressively reduced during the reaction and removed from the silver catalyst surface which, in the authors' opinion, may be responsible for the low selectivity of the catalyst in the synthesis of ethylene oxide. Similar results were obtained in tests with iodide and sulphate tracers. An increase of the reaction temperature and the use of higher concentrations of the reactant were found to favour the process of additive reduction and thereby diminish the catalyst selectivity. In order to check the correctness of previously reported observations that the synthesis of ethylene oxide can be made much more selective by introducing a small quantity of organic halides into the reaction in the presence of silver catalyst, an investigation was made of the oxidation of CH_2Cl_2 , CHCl_3 , CCl_4 , $\text{C}_6\text{H}_5\text{I}$, $\text{C}_6\text{H}_5\text{Br}$, C_2Cl_6 and $\text{C}_2\text{H}_5\text{I}$ heated in the presence of oxygen at 250°C on silver catalyst and $(\text{CH}_3)_2\text{CHCl}$, C_2HCl_5 , $(\text{CH}_2\text{Cl})_2$ and $\text{C}_6\text{H}_5\text{Cl}$ also heated to the same temperature but in the absence of oxygen. It was found that the organic halides introduced into the

Card 2/4

STEPANOV, Yu.N.; MARGOLIS, L.Ya.; ROGINSKIY, S.Z.

Modification of a silver catalyst by organohalogen compounds.
Dokl. AN SSSR 135 no.2:369-372 N '60. (MIRA 13:11)

1. Institut fizicheskoy khimii AN SSSR. 2. Chlen-korrespondent
AN SSSR (for Roginskiy).
(Catalysts) (Silver)

0513R00103232000

33482
S/195/61/002/005/007/027
E040/E485

11.1330
AUTHORS:
TITLE:

Stepanov, Yu.N., Margolis, L.Ya.
Mobility of catalyst modifying additives introduced
into silver catalyst

PERIODICAL: Kinetika i kataliz, v.2, no.5, 1961, 684-689
TEXT: The activity of many catalysts can be profoundly modified by the presence of even minute quantities of various elements or compounds and especially of halides. Because the selectivity of the catalytic action of pure silver in the synthesis of ethylene oxide is usually very low, it was thought desirable to investigate the effect of various catalyst-modifying additives on the selectivity of silver in the above reaction. Pellets of the modified based on the use of tracer technique, in which the radio-^{110m}Ag, ^{113m}In and ^{113m}Sb were introduced as chloride, iodide or into pure silver catalyst. The investigation of the activity of these substances were determined from changes in Preliminary tests showed that silver silver sulphate formed during the

X

84706

The Mobility of Modifying Admixtures
in Silver

S/O20/60/133/006/014/016
B004/B064

= initial rate of the decrease of radioactivity) as a function of the time of treatment, and Table 2 the decrease of the radioactivity of silver tagged with $S^{35}O_4^{2-}$, I^{131} or Cl^{36} in ethylene. To keep constant the activity of the silver catalyst, the authors recommend to add the metalloids concerned to the gases introduced. There are 3 figures, 2 tables, and 13 references: 12 Soviet and 1 US. 4

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR (Institute of Physical Chemistry of the Academy of Sciences USSR)

SUBMITTED: May 18, 1960

Card 3/3

84706

The Mobility of Modifying Admixtures
in SilverS/020/60/133/006/014/016
B004/B064

air with 3% ethylene reduced the radioactivity under the same conditions. The authors assumed that a reduction of chlorine to HCl takes place, and that all reducing agents containing hydrogen are bound to cause the same effect. The experimental data of Table 1 (reaction with H_2 , C_2H_4 , $N_2 + 5.3\%$ i- C_3H_7OH , $N_2 + 2\%$ C_2H_4O , CO) confirm this. Only CO proved not to reduce radioactivity. Further experiments were conducted to determine HCl in the reaction products. Silver tablets containing Cl^{36} were heated with C_2H_4 to $300^\circ C$. A silver tablet cooled to $40^\circ C$ stood at a distance of 15 cm. After five hours of experimenting the silver plate had become radioactive. The same effect was obtained with $S^{35}O_4^{2-}$. Absorbing the reaction products in water, containing methyl red, proved their acidity. HCl was nephelometrically determined with $AgNO_3$. Measurement of radioactivity in sections through the silver tablets proved that radioactivity decreased in the entire volume of tablets, i.e. that no surface reaction was concerned. The diffusion of chlorine ions by silver was proven on a silver single crystal with Cl^{36} . Fig. 2 shows the change of the radioactivity of Ag in various $N_2 + C_2H_4$ mixtures at $300^\circ C$, Fig. 3 log C (C

Card 2/3

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S/O20/60/133/006/014/016
B004/B064

11 1325
AUTHORS:

Stepanov, Yu. N., Margolis, L. Ya. and Roginskiy, S. Z.,
Corresponding Member AS USSR

TITLE:

The Mobility of Modifying Admixtures in Silver

PERIODICAL:

Doklady Akademii nauk SSSR, 1960, Vol. 133, No. 6,
pp. 1374-1387

TEXT: In the introduction the authors discuss papers on the modification of the catalytic activity of metals with admixture of small quantities of metalloids (Refs. 1-13). In the present paper, they investigate the behavior of admixtures, the change in their concentration, and their escaping from the metal. Silver powder was tagged with Cl^{36} , I^{131} , or S^{35} by adsorption of NaCl, KI, or Na_2SO_4 , and then pressed to tablets. The regularity of distribution of the admixture was examined with an end window counter. The silver tablets were then heated with gas mixtures. Fig. 1 shows that the heating of the tablets with air or nitrogen to $1000^\circ C$ did not bring about a change of the specific radioactivity, whereas

The Relationship Between Electric Conductivity and the Work Function of Modified Zinc Oxide

68993
S/020/60/131/02/037/071
B004/B007

of the sample. ZnO was saturated with Na and Li, whereas ZnSO₄ and ThO₂ were precipitated only on the surface. Measurement of the change in electric conductivity alone is therefore not sufficient in order to carry out a unique determination of the position of the Fermi level on the surface of modified catalysts. For the purpose of recognizing the true relationship between catalytic activity and electric conductivity, it is necessary to investigate admixture distribution on the surface and in the interior of the semiconductor. There are 1 table and 13 references, 7 of which are Soviet.

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

PRESENTED: November 4, 1959, by M. M. Dubinin, Academician

SUBMITTED: October 30, 1959

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The Relationship Between Electric Conductivity and the
Work Function of Modified Zinc Oxide

68993

S/O20/60/131/02/037/071
B004/B007

subjected to X-ray- and electron diffraction studies. Table 1 shows the measurements of activation energy and the change in the work function as a result of admixtures. The activation energy of pure ZnO was very low (0.08 ev). The admixtures led to an increase of the activation energy as well as to a decrease of electric conductivity. The electric resistance of the samples at 350° decreased in the following order: $ZnO+Li_2O > ZnO+Na_2O > ZnO+ZnSO_4 > ZnO+ThO_2 > ZnO$. From measurement of electric conductivity alone

the conclusion might have been drawn that all admixtures used are acceptors and reduce the Fermi level to the level of the valence band. Measurement of the work function, on the other hand, shows that Li and Na decrease the work function, and that $ZnSO_4$ and ThO_2 increase it. The X-ray measurement carried out by

N. A. Shishakov et al. and M. Ya. Kushnerev revealed no changes in the lattice constant of the modified zinc oxide, so that no conclusions could be drawn as to the formation of solid solutions. The different influence exerted by admixtures was explained by their different distribution on the surface and in the interior

Card 2/3

24.7700
AUTHORS:

Vladimirova, V. I., Yanikev, E. Kh.,
Zhabrova, G. M., Margolis, L. Ya.

68993
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B004/B007

TITLE:

The Relationship Between Electric Conductivity and the Work
Function of Modified Zinc Oxide

PERIODICAL:

Doklady Akademii nauk SSSR, 1960, Vol 131, Nr 2, pp 342 - 345
(USSR)

ABSTRACT:

In many cases, the experimental data on the electric conductivity of semiconductors contradict the conceptions of the position of the Fermi level. The present paper is intended to characterize the position of the Fermi level by the amount of the work function of the electron. For this purpose, the activation energy E_a of electric conductivity and the change in the work function ϕ of an electron after introduction of the admixtures Li, Na, Th, and $ZnSO_4$ into ZnO are measured. For the purpose of introducing Na and Li, the ZnO was saturated with the oxalates of these metals and heated up to 450 - 500°. Thorium was precipitated from thorium hydrate onto the surface of ZnO, $ZnSO_4$ was adsorbed as a basic salt from a solution of this salt. Also with Th and $ZnSO_4$, the sample was heated to 450°. The ZnO with the admixtures was

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Isotope Exchange of Oxygen on
Oxidation Catalysts

68618
S/020/60/130/05/032/061
B004/B014

lysts can be regulated by additions. There are 4 figures, 2
tables, and 4 Soviet references. *

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

PRESENTED: July 9, 1959, by V.I. Spitsyn, Academician

SUBMITTED: July 6, 1959

Card 3/3

68618

Isotope Exchange of Oxygen on
Oxidation CatalystsS/020/60/130/05/032/061
B004/B014

trates the kinetic curves of the isotope exchange of oxygen on silver with different content of Cl ions. Figure 2 shows curves for the homolytic isotope exchange on the same sample at 232°. Table 1 lists constants of the isotope-exchange rate. The reaction proceeds in a monomolecular way. The rate constant is monotonely reduced by chlorine additions. Addition of iodine increases the constant of the homolytic exchange, whereas the rate of the molecular isotope exchange remains unchanged. Addition of halides thus changes the ratio between molecular and atomic O and its mobility. Table 2 and figures 3 and 4 contain values for the isotope exchange of oxygen on CuO at 412°. The reaction is not monomolecular but follows the equation set up by Roginskiy-Zel'dovich. This deviation results from the inhomogeneity of the surface as confirmed by L.A. Kasatkin and G.K. Boreskov (Ref 1). Cr₂O₃ has no effect upon the rate of isotope exchange, Bi₂O₃ reduces it, LiO₂ increases it, and SO₄²⁻ slows it down rapidly. It is noted that the rate of isotope exchange of O on oxidizing metallic and oxide cata-

Card 2/3

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AUTHORS:

Margolis, L.Ya., Kiselev, V.A.

S/O20/60/130/05/032/061

B004/B014

TITLE:

Isotope Exchange of Oxygen on Oxidation/Catalysts

PERIODICAL:

Doklady Akademii nauk SSSR, 1960, Vol 130, Nr 5, pp 1071-1073
(USSR)

ABSTRACT:

The authors refer to the publications dealing with the aforementioned problem and quote G.K. Boreskov et al. (Ref 1). It is noted that the effect of additions upon the isotope exchange of oxygen on catalysts has not yet been studied. The present paper is intended to close this gap. Silver and copper oxide were chosen as typically oxidizing catalysts. The silver powder was doped with AgCl or AgJ, whose even distribution over the surface was radiometrically checked by means of Cl^{34} and J^{131} . CuO was doped with Cr_2O_3 , Bi_2O_3 , Li_2O , or $CuSO_4$. The experiments were made at 1 torr. The content of O^{18} was recorded by a mass spectrometer. On the basis of the variation in concentration of O_2^{18} and $O^{16}O^{18}$ it was possible to check the rate of the homolytic exchange reaction $O_2^{18} + O_2^{16} \rightleftharpoons 2O^{16}O^{18}$. Figure 1 illus-

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S/081/60/000/021/011/018
A005/A001

11.6200 also 2209

Translation from: Referativnyy zhurnal, Khimiya, 1960, No. 21, p. 50, # 22989

AUTHOR: Margolis, L. Ya.

TITLE: Intermediate Active Forms of the Catalytic Oxidation of Hydrocarbons

PERIODICAL: Probl. kinetiki i kataliza, 1960, Vol. 10, pp. 410-414

TEXT: The study of the main stages of the catalytic oxidation of hydrocarbons showed that the ion-radicals of oxygen and $[C_nH_{2n}]^+$, $[C_nH_{2n+1}]^+$ are intermediate active forms. The data on the homolytic isotopic oxygen exchange indicate the partial dissociation of oxygen on the surface of the oxidizing catalysts. Different types of ion-radicals are formed at the adsorption, depending on the catalyst's electronic properties, the structure, and the type of the hydrocarbon molecule. The deep-oxidation reaction of hydrocarbons is specified by the stability of bonding the peroxide radicals with the catalyst surface.

Author's summary

Translator's note: This is the full translation of the original Russian abstract.

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S/195/60/001/003/010/013
B013/B058

- (II)
1. $O_3 + e \rightarrow (O_3)^-$
 - 2a. $O_3 \rightleftharpoons 2O$
 - 2б. $O + e \rightarrow (O)^-$
 3. $C_2H_4 - e \rightarrow (C_2H_4)^+$
 4. $(O_3) + C_2H_4 \pm ne \rightarrow (C_2H_4O_3)$ (заряженный комплекс 1)
 5. $(O)^- + C_2H_4 \pm ne \rightarrow (C_2H_4 \cdot O)$ (заряженный комплекс 2)
 - 5а. $(C_2H_4)^+ + (O_3)^- \pm ne \rightarrow (C_2H_4O_3)$ (заряженный комплекс 3)
 6. $(C_2H_4 \cdot O_2) \xrightarrow{+ne} (C_2H_4O)^+ + (O)^-$
 7. $(C_2H_4O_2) + O_3 \xrightarrow{\pm ne} (CH_2O)^+ + (CO_2)^- + (H_2O)^+$
 8. $(C_2H_4 \cdot O) + 2O_2 \xrightarrow{\pm ne} 2CO_2 + 2H_2O$

Legend to the Schemes; a) charged complex; b) gas; c) etc.

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B013/B058

(I)

- 1a. $O_2 \rightleftharpoons 2O.$
16. $O + e \longrightarrow (O)^-,$
2. $O_2 + e \longrightarrow (O_2)^-,$
3. $C_3H_6 + (O_2)^- \pm ne \longrightarrow (C_3H_6OOH) \text{ (заряженный комплекс 1)}$ ^{u)}
4. $(C_3H_6OOH) \xrightarrow{\pm ne} (C_3H_6O)^+ + (H_2O)^+,$
5. $(C_3H_6O)^+ + e \longrightarrow C_3H_6O_{\text{раств.}}$ _{b)}

- (I) 6. $(C_3H_6O)^+ \pm ne + O_2 \longrightarrow (C_3H_6O \cdot O_2)^+ \text{ (заряженный комплекс 2),}$ ^{a)}
7. $(C_3H_6O \cdot O_2)^+ \xrightarrow{\pm ne} CO_2 + H_2O + (R_1H)^+,$
8. $(R_1H)^+ + O_2 \longrightarrow CO_2 + H_2O + (R_2H)^+ \text{ и т. д., c)}$
9. $C_3H_6 - e \longrightarrow (C_3H_6)^+,$
10. $(C_3H_6)^+ \pm ne + (O_2)^- \longrightarrow (C_3H_6 \cdot OO) \text{ (заряженный комплекс 3),}$ ^{a)}
11. $(C_3H_6 \cdot OO) \xrightarrow{\pm ne} (CH_2OO) + (R'H),$
12. $(R'H) + O_2 \longrightarrow CO_2 + H_2O + (R''H) \text{ и т. д. z)}$

Card 5/6

Modifying Catalysts for the Oxidation
of Hydrocarbons

S/195/60/001/003/010/013
B013/B058

This can be explained by the similarity of the reaction mechanism. To all appearance chain reactions also play an important role in the formation of CO₂. S. M. Vilenkina, Laboratory Assistant, participated in the work ✓
S. Z. Roginskiy, Zel'dovich, M. I. Temkin, P. V. Zimakov, and G. D. Lyubarskiy are mentioned. There are 5 figures, 1 table, and 23 references. 19 Soviet, 4 US, 1 British, and 1 Canadian.

ASSOCIATION Institut fizicheskoy khimii AN SSSR (Institute of Physical Chemistry AS USSR)

SUBMITTED: April 6, 1960

Card 1/6

Modifying Catalysts for the Oxidation
of Hydrocarbons

S/195/60/001/003/010/013
B013/B058

the signs of charges determined: (II). Data with regard to the kinetics of the oxidation process, available from publications and often paradox, can probably be traced back to the dependence of the partial surface concentrations of O_2 and C_2H_4 on the change of the work function. The activation energy of the oxidation of ethylene to ethylene oxide ought to change only little in the modification of silver, since the surface concentration of donor molecules is increased through an increase of ψ . These in turn level the change of ψ under the effect of metalloids additions. It was shown that an increase of the work function reduces the activity of silver and raises the selectivity of the process. Conclusively, the studies showed the following: There is an interrelation between the work function of the electron and the activity of the catalysts and the selectivity of the oxidation processes of unsaturated hydrocarbons. The oxidation of hydrocarbons proceeds over a number of parallel and successive stages and, according to the reaction mechanism, is differentially controlled by the work function of the electron. The inhibition of a total oxidation with an increase of the work function is characteristic of the reactions studied.

Card 3/6

Modifying Catalysts for the Oxidation
of Hydrocarbons

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B013/B058

the activation energy and k_0 (factor of the exponential functions for the reactions of the formation of acrolein and CO_2) depend on the work function. For greater values of the work function, the activation energy of the formation of acrolein is reduced and that of CO_2 increased. From the dependence of the isotopic exchange on the work function ψ , the rate of which increases for smaller values of ψ , the controlling effect of the work function on the surface concentration of O_2 may be inferred. The selectivity of the acrolein synthesis is increased through the introduction of acceptor additions (SO_4^{2-} , Cl^-) in CuO and reduced by that of donors (Cr, Fe, Li). The oxidation of ethylene to ethylene oxide is a typical process proceeding according to a parallel scheme (Ref. 10). The following signs of the charges of the components of the studied reaction were ascertained: ethylene and ethylene oxide are donors, oxygen and CO_2 are acceptors. ψ is only slightly reduced by water. The step-by-step oxidation scheme proposed in Ref. 4 could be explained on the basis of

Card 2/6

S/195/60/001/003/010/013
B013/B058

AUTHORS: Yenikeev, E. Kh., Isayev, O. V., Margolis, L. Ya.

TITLE: Modifying Catalysts for the Oxidation of Hydrocarbons

PERIODICAL: Kinetika i kataliz, 1960, Vol. 1, No 3, pp. 431 - 439

TEXT: In this paper the authors studied the oxidation of propylene on cuprous oxide (Cu_2O) and of ethylene on silver. The oxidation of propylene to acrolein on Cu_2O proceeds according to a parallel-successive scheme. A step-by-step scheme is presumed: (I). On the basis of the change of the work function of the electron during adsorption of reaction components on Cu_2O , the sign of their charges could be established: Like most organic substances, propylene and acrolein are the donors and oxygen is the acceptor. The water reduces the work function only slightly and is also a donor. It was shown that the oxidation rate of propylene to acrolein and carbon dioxide is proportional to the oxygen concentration in the gas phase (Ref 6). This is also valid for modified catalysts. It was established that

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Kinetics of the Oxidation of Propylene to
Acrolein on a Copper Catalyst

S/195/60/001/002/004/010
B004/B067

increasing copper concentration in the catalyst. 3) The activation energy for the formation of CO_2 on a copper - sillite catalyst was

28 - 30 kcal/mole, and on a copper - pumice catalyst, 23 - 25 kcal/mole.

4) The major part of CO_2 was formed by oxidation of acrolein. Therefore,

the kinetics of acrolein oxidation was compared with that of propylene, and the following was found: a) The oxidation rate is proportional to the oxygen concentration and independent of the acrolein concentration; b) the activation energy for the formation of CO_2 is 22 - 24 kcal/mole, and for

the formation of CO , 38 kcal/mole; c) the presence of propylene inhibits the oxidation of acrolein. The authors intend to perform experiments with tagged atoms to study this effect more thoroughly. The results will be published in the next paper. There are 6 figures, 2 tables, and 4 Soviet references.

ASSOCIATION: Institut fizicheskoy khimii AN SSSR (Institute of Physical Chemistry of the AS USSR)

SUBMITTED: December 19, 1959

Card 3/3

S/195/60/001/002/004/010
B004/B067

AUTHORS: Isayev, O. V., Margolis, I. Ya.

TITLE: Kinetics of the Oxidation of Propylene to Acrolein on a Copper Catalyst

PERIODICAL: Kinetika i kataliz, 1960, Vol. 1, No. 2, pp. 237 - 241

TEXT: The authors attempted to determine the rules governing the oxidation of propylene to acrolein and CO₂ on a copper catalyst. The experiments were made in a continuous apparatus under atmospheric pressure. Temperature was kept constant by means of a photoelectric thermoregulator in which a portable ПП(PP) potentiometer was used. The gases were analyzed for CO and CO₂ on the basis of their infrared absorption spectra and by means of ПИП-5 (GIP-5) gas analyzers. CuO produced by impregnating sillite or pumice with Cu(NO₃)₂ and by heating to 600 - 700°C served as catalyst. Experimental data are given in Table 1:

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Kinetics of the Oxidation of Propylene to Acrolein on a Copper Catalyst

S/195/60/001/002/004/010
B004/B067

%Cu	°C	Change of propylene concentration				Change of O ₂ concentration				First-order constants, sec ⁻¹	
		Initial mixture		Result		Initial mixture		Result, %		k _{CO₂}	k _{acr}
		%C ₃ H ₆	%O ₂	%CO ₂	%Acrolein	%O ₂	%C ₃ H ₆	%N ₂	%CO ₂		
0.5373	15	1075	1.2	0.26	3.0	30	67	0.55	0.077	0.62	0.052
	20	1070	1.25	0.30	5.0	30	65	0.85	0.13	0.58	0.053
	30	1060	1.1	0.31	10.0	30	60	1.8	0.27	0.61	0.054
	40	1050	1.2	0.36	15.0	30	55	2.7	0.39	0.61	0.052
	60	1030	1.2	0.25	-	-	-	-	-	0.605	0.053
	mean										
1.0362	15	1075	1.8	-	3.0	30	67	0.50	0.056	0.56	0.038
	20	1070	1.6	0.30	5.0	30	65	0.75	0.11	0.50	0.045
	30	1060	1.55	0.26	10.0	30	60	1.6	0.22	0.57	0.044
	40	1050	1.6	0.29	15.0	30	55	2.4	0.32	0.57	0.042
	60	1030	1.7	0.30	-	-	-	-	-	0.54	0.042
	mean										

Summing up: 1) The rate of propylene oxidation is independent of the propylene concentration, and is proportional to the oxygen concentration. 2) The constants of the reaction rate linearly increase with

66492

SOV/20-129-1-39/64

The Mechanism of Propylene Oxidation to Acrolein on a Cuprous Oxide Catalyst

activities of the barium carbonate and the acrolein 2,4-dinitrophenylhydrazone precipitates, respectively. The experimental results are represented graphically in the figures 1-3 (CO₂ and acrolein concentrations as functions of the time of contact, the catalyst, and composition of the initial gas mixture). Table 1 gives the data obtained and the oxidation rate calculated for the transformation of propylene to acrolein. An organic film of acrolein was found to form on the catalyst. The stability of this film was greater in the case of the catalyst containing less copper. The parallel-consecutive reaction scheme suggested in reference 2 was confirmed by the experiments. There are 4 figures, 1 table, and 5 Soviet references.

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

PRESENTED: June 19, 1959, by P. A. Rebinder, Academician

SUBMITTED: June 15, 1959
Card 2/2

66492

SOV/20-129-1-39/64

~~5(4)~~ 5.3300(A)

AUTHORS: Isayev, O. V., Margolis, L. Ia., Gazonova, I. S.

TITLE: The Mechanism of Propylene Oxidation to Acrolein on a Cuprous Oxide Catalyst

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol. 129, Nr 1, pp 141-144 (USSR)

ABSTRACT: On the basis of kinetic measurements the authors gave a scheme for the oxidation of propylene to acrolein (Ref 2). In the present investigation this scheme is revised by means of tagged atoms. Propylene tagged with radioactive carbon was prepared by dehydrogenating isopropyl alcohol at 400° over Al₂O₃. After mixing with acrolein and oxygen the propylene thus prepared was oxidized on catalysts at atmospheric pressure. The catalysts contained 0.1 and 1% copper, respectively. Carborundum was used as carrier. The acrolein content in the reaction product was determined by the bromide-bromate method, and the propylene content and CO₂ by means of the gas analyzer type VTI. The radioactivities of CO₂ and acrolein were determined by measuring the

Card 1/2

The Charge of the Surface of Oxide Semiconductors
as a Result of the Adsorption of Gases and Vapors

SOV/20-124-3. 32/67

function considerably. In the adsorption of vapors of isopropyl-alcohol on ZnO at 20° the contact potential passes through a maximum (and the work function passes through a minimum), if the surface of the adsorbent is filled with alcohol up to 10%. Measurement of the potential difference at the places of contact is a promising method of investigating the character of the binding of the molecule adsorbed on the surface of the semiconductor. There are 4 figures, 1 table, and 5 references. 3 of which are Soviet.

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

SUBMITTED: August 14, 1958

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The Charge of the Surface of Oxide Semiconductors
as a Result of the Adsorption of Gases and Vapors

SOV/20-124-1-32/67

semiconductor	adsorbed gas				
	O ₂	H ₂	CO	CO ₂	C ₃ H ₆
CuO	-	not adsorbed	+	not changed	+
NiO	-	not adsorbed	+	not changed	+
V ₂ O ₅	-	+	+	not changed	+
ZnO	-	not adsorbed	not ads.	not changed	not changed

All adsorbed gases (with the exception of oxygen) diminish either the work function (i. e. they occur as electron donors irrespective of the type of semiconductor), or they do not vary the work function. In this case adsorption is very rapid, and at 80° these gases are nearly completely desorbed; in this case physical adsorption probably occurs. This conclusion is confirmed in the case of the adsorption of C₃H₆ on CuO, and in

this case a rapid irreversible adsorption is observed. The work function decreases considerably. Oxygen is adsorbed firmly and irreversibly on NiO (20°), in which case it increases the work

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The Charge of the Surface of Oxide Semiconductors
as a Result of the Adsorption of Gases and Vapors

SOV/20-124-3-32/67

in a continuously maintained vacuum up to $\sim 10^{-6}$ mm to temperatures 250-400°. A diagram shows the dependence of the contact potential V_k of NiO on the length of time used for treating the sample which was later in an oxygen atmosphere. The considerable reduction of the work function is apparently due to the desorption of the oxygen from the surface of the catalyst. The semiconductors, which had formerly been subjected to the influence of an O_2 atmosphere, can be compared with one another with respect to the work function only if the samples are treated in a fully homogeneous manner. After an approximately constant value of the contact potential has been attained, the adsorption of various gases and vapors was investigated at room temperature and at increased temperatures. The table given below contains data concerning the surface charge of oxide semiconductors in the case of the adsorption of gases (at 20°):

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Catalytic Oxidation of Propylene in Acrolein. 1

SOV/79-29-5-26/75

oxidation of propylene on other catalysts was investigated: V_2O_5 , MoO_3 , WO_3 , Cr_2O_3 , $CdTe$, $CuSe$, $CuTe$, Cu_3As . Selenide, telluride, arsenide and cuprous oxide were found to have the highest selectivity with respect to the formation of acrolein. On the formation of the mixture of saturated aldehydes and acrolein, oxides of transition metals (MoO_3 , V_2O_5 etc.) are especially active. There are 7 figures and 6 references, 5 of which are Soviet.

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

SUBMITTED: April 22, 1958

Card 3/3

5(4)
AUTHORS:

Yenikeyev, E. Kh., ~~Margolis, L. Ya.~~ SOV/25-124-3-32/57
Roginskiy, S. Z., Corresponding Member, AS USSR

TITLE:

The Charge of the Surface of Oxide Semiconductors as a Result of the Adsorption of Gases and Vapors (Zaryazneniye poverkhnosti okisnykh poluprovodnikov pri adsorbtsii gazov i parov)

PERIODICAL:

Doklady Akademii nauk SSSR, 1959, Vol 124, Nr 3, pp 606-608 (USSR)

ABSTRACT:

A sensitive method of determining a surface charge is that by measuring the work function. For the purpose of investigating the connection between surface charge and adsorption, the authors used a vibrating condenser. The immobile condenser plate consisted of the pulverulent semiconductor to be investigated, and the vibrating condenser plate was a gold plate. The adsorption of O_2 , H_2 , CO , CO_2 , C_3H_6 and of isopropyl-alcohol vapors on ZnO , V_2O_5 , CuO and NiO were investigated. ZnO and V_2O_5 are electron semiconductors, CuO and NiO are hole-semiconductors. These samples were heated

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Catalytic Oxidation of Propylene in Acrolein. 1

SOV/79-29-5-26/75

same time and independently of one another several parallel reactions take place, in which connection unstable intermediates of the peroxide type are formed. Further some experiments were carried out in which the effect of the contact time upon the oxidation process of propylene was investigated (Fig 3). The acrolein yield first increases on prolonged contact time but later remains constant whereas the yield of carbon dioxide continuously increases. During the oxidation of propylene on the copper catalyst the acrolein is not completely destroyed. Probably at the same time and independently two reactions take place: The formation of acrolein and its oxidation up to the carbon dioxide. The rate ratio of this process is determined by the composition of the gas mixture. In order to clarify the dependence of the acrolein yield on the concentration of the catalyst on the carrier, several samples of the catalyst on pumice and carborundum were investigated (Figs 4-7). The investigation indicated that the selectivity of the process can be obtained by shortening of the contact time, by increase of the linear velocity of current as well as by a decrease of the copper concentration on the carrier which determines the course of the process in the kinetic range. Under certain conditions the length of the catalyst layer can be of decisive importance: Further the

Card 2/3

Catalytic Oxidation of Hydrocarbons - a Way of
Monomeric Synthesis

SOV/74-28-5-6/7

these processes are carried out in practice. A further development of the investigation work under application of new experimental methods will facilitate the production of oxidation catalysts with certain properties within the near future. This will render possible the carrying out of highly productive syntheses of monomers by means of the catalytic oxidation of hydrocarbons. There are 6 figures, 8 tables, and 127 references, 72 of which are Soviet.

Card 7/7

00513R001032320003

5(4)
AUTHORS:Isayev, O. V., Margolis, L. Ya.,
Roginskiy, S. Z.

TITLE:

Catalytic Oxidation of Propylene in Acrolein. 1
(Kataliticheskoye okisleniye propilena v akrolein. 1)

PERIODICAL:

Zhurnal obshchey khimii, 1959, Vol 29, Nr 5, pp 1522-1527 (USSR)

ABSTRACT:

In the present paper the properties of the cuprous oxide catalyst which was used in the catalytic oxidation of propylene in acrolein were investigated. Further its activity was compared with other oxidizing contacts. In order to clarify the part acetaldehyde plays in the oxidation of propylene the method of the marked atoms was used. The oxidation of the propylene mixture with oxygen and with acetaldehyde marked with radioactive carbon (1 : 2 : 0.5) on cuprous oxide at 350° permitted the definition of the genetic compounds of these reaction products. The results of a typical experiment are illustrated in figure 1. As can be seen, the carbon dioxide is mainly not formed from acetaldehyde but independently via other intermediates. The data devised according to the kinetic method of M. B. Neyman (Ref 5) are given in figure 2. By the use of radioactive carbon it could be proved that in these processes at the

Catalytic Oxidation of Hydrocarbons - a Way of
Monomeric Synthesis

SOV/74-28-5-6/7

dicals and can only be increased by the change of the chemical composition of the surface of the catalyst. The taking place of the catalytic oxidation is not only due to the selection of an active catalyst but also to the fixation of optimum conditions of the process. The formal kinetics of reaction is only little investigated. The difficulties arising in connection with the determination of kinetic rules are above all connected with the exothermal character of these reactions which entails an overheating of the catalysts and an intensification of the parasitic processes. The data obtained by different authors (Refs 9, 22, 56, 57, 61, 49, 120-124) which are in contradiction indicate a complicated reaction mechanism (Table 7). Table 8 gives the values of the activation energy of various reactions taking place during the oxidation of propylene. The field of physical chemistry that deals with the investigation of the effect of so-called macroscopic factors upon the rate of chemical processes and their kinetics is called macroscopic kinetics (macrokinetics). Figure 6 shows the investigation results of the oxidation of naphthalene on melted vanadium pentoxide (Ref 126). In spite of numerous shortcomings in theory many of

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Catalytic Oxidation of Hydrocarbons - a Way of
Monomeric Synthesis

SOV/74-28-5-6/"

and metals during the adsorption of oxygen; 5) mobility of oxygen on the surface of the catalyst (Refs 64-97). The chemisorption of hydrocarbons on various materials has been investigated by numerous research workers (Refs 56-58, 98-109, 116-119). Table 5 gives experimental results concerning the variation of the electric conductivity and the work function of various metal oxides during the chemisorption of hydrocarbons. Table 6 shows the data on the activation energy and the adsorption heat on various oxidation catalysts. The latter fact indicates a differing mobility of oxygen on the surface of the catalyst. In a homogeneous oxidation of hydrocarbons the peroxide radicals are the active forms which cause the process. In the course of the heterogeneous oxidation it is obviously the peroxide ion radicals that play the decisive part. Oxygen containing compounds of the type of aldehydes, acids etc, which enter coexistence together with the products of complete combustion - carbonic acid gas and water - form in consequence of all types of reaction of oxygen with hydrocarbon. The selectivity of the process is apparently due to the tight connection between the bond and the surface of the forming peroxide ion ra-

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Catalytic Oxidation of Hydrocarbons - a Way of
Monomeric Synthesis

SOV/74-28-5-6/7

those of the exchange and the desorption of oxygen (Table 4). The comparison of these data points to the fact that the concepts concerning the redox mechanism of catalysis are invalid. The inadequate development of the theory of catalytic oxidation and the lacking of experimental data on individual stages of the process have hitherto not permitted to set up a scheme of the stepwise oxidation of hydrocarbons. The character of the primary acts of catalytic oxidation is in close relation to the nature of the active forms causing the process. During the past years comprehensive material was collected concerning the adsorption of oxygen and hydrocarbons on oxidation catalysts. Of great importance for the mechanism of the oxidative catalysis on metals and semiconductors are the adsorption of oxygen and the character of its bond with the catalyst surface. The results of several papers obtained in connection with the investigation of chemical adsorption of oxygen on various solid bodies may be divided into 5 groups: 1) Equilibrium and kinetics of adsorption; 2) heterogeneity of the surface; 3) dissolution of oxygen in the lattice of the solid body; 4) transformation of the properties of the electrons of semiconductors

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Monomeric Synthesis

SOV/74-28-5-6/7

foreign admixtures were the basis of concepts (Ref 16) concerning the impurities and admixtures as the main regulators of the activity of the solid bodies and with respect to the chemical character of surface activity. Essential for redox reactions are the transitions of the electrons between the solid body and the reacting molecules. Figure 1 shows the dependence between the velocity constant of oxidation and the amount of the introduced admixture. The interaction between the solid body - the catalyst - and the reacting medium often entails a variation of the phase composition of the surface (Ref 16). Sometimes it may be the case that such a variation does not only occur at the surface but also inside. The chemical composition of the surface of the catalyst exercises an effect on both activity and selectivity of the process. Isotopic exchange is one of the methods permitting the determination of the mobility of the oxygen atoms- or molecules at the surface and in the lattice. On metal oxides the isotopic exchange proceeds much slower than the catalytic oxidation reaction. According to the results obtained by the author (Ref 42) the rates of the catalytic oxidation reactions are by several orders of magnitude higher than

Card 3/7

Catalytic Oxidation of Hydrocarbons - a Way of
Monomeric Synthesis

SOV/74-28-5-6/7

obtained in the field of heterogeneous oxidative treatment of hydrocarbons would have to be found as well as the factors preventing these processes from developing towards the main direction of organic synthesis. The investigation of the oxidation processes indicates a division of these reactions into solely heterogeneous and homogeneous ones, taking place under certain conditions. All oxidation processes have several important characteristic features of the reaction chemism in common: the role of the peroxide compounds and of the atomic oxygen, the propagation of conjugate reactions, etc, as well as the characteristics of the conditions of the process which are in connection with the exothermal character of the oxidation reactions. The most frequently used oxidation catalysts are platinum, palladium, nickel, copper and silver. Oxides of transition metals are used as oxidative semiconductor contacts (Table 2). The earlier published survey (Ref 9) provided a complete list of the oxidation catalysts. According to the modern physics of solid bodies these groups of catalysts are divided with respect to the properties of their electrons. Theoretical and experimental data on the effect of smaller amounts of

Card 2/7

5 (3)

AUTHOR: Margolis, L. Ya. (Moscow)

SOV/74-28-5-6/7

TITLE: Catalytic Oxidation of Hydrocarbons - a Way of Monomeric Synthesis (Kataliticheskoye okisleniye uglevodorodov kak put' sinteza monomerov)

PERIODICAL: Uspekhi khimii, 1959, Vol 28, Nr 5, pp 615 - 638 (USSR)

ABSTRACT: Catalytic oxidation is the most promising method of producing monomers from natural gases and the gases occurring in the production of petroleum. Until recently - as a result of the complicated course of the process - it was not possible to obtain any satisfactory results from theory as regards the practical application of catalytical organic synthesis. In theory, almost no use was made of the great practical experience in the selection of catalysts. Roginskiy (Ref 1) divides the oxidation reactions of hydrocarbons into 5 main classes. Table 1 gives an incomplete list of the types of reaction of hydrocarbons with oxygen. The types of process mentioned do not provide a complete picture of the variety of possible reactions. Industry has put into practice only part of these reactions. In principle a further development of all mentioned directions would be possible. To begin with the reason for the very inadequate results

Card 1/7

MARGOLIS, L. Ya.: Doc Chem Sci (diss) -- "The basic laws of the catalytic oxidation of the simpler hydrocarbons in the gas phase". Moscow, 1959. 14 pp
(Acad Sci USSR, Inst of Phys Chem), 150 copies (KL, No 13, 1959, 100)

Principal Regularities of Catalytic Oxidation of
Hydrocarbons. Communication 2. Oxygen Adsorption
on Oxidizing Catalysts

SOV/62-59-2-6/40

tion rate and the rate of the catalytic reaction, it can be seen whether the dissociation of oxygen into atoms is the decisive stage (Table 5). The rate of the catalytic reaction is higher by some orders of magnitude than that of the oxygen dissociation. The sorption rate is also higher than that of the homolytic exchange. Only with V_2O_5 the rates of this process at 474° can be compared. Apparently, mainly the molecular oxygen ion O_2^- and at temperature increase probably O_2^- and O^- take part in the catalytic low-temperature oxidation on V_2O_5 , Ag, and Pt. The author expresses his gratitude to V. N. Litvakov for the mass-spectrometric analysis. There are 5 tables and 29 references, 16 of which are Soviet.

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

Card 3/4

Principal Regularities of Catalytic Oxidation of Hydrocarbons. Communication 2. Oxygen Adsorption on Oxidizing Catalysts

SCV/62-59-2-6/40

ture of the catalytic process (Table 2). The rate of the isotopic exchange is considerably smaller than the rate of the catalytic oxidation processes. The isotopic exchange on silver at 200, 220, 232, 288 and 320° and on platinum at 20, 120, 240, 320 and 420° was investigated. Experimental results are given in table 3. It could be found that the oxygen is closely combined with the surface of the metal and that its mobility on these metals is only small. The investigation of oxygen exchange permits the determination of the character of intermediate forms during adsorption. It can be seen from the investigation of the homolytic oxygen exchange on different solid compounds whether a dissociation of oxygen takes place during the adsorption on the surface. The homolytic oxygen exchange was investigated by the author together with V. A. Kiselev on metals - silver, platinum- and on semiconductors - vanadium pentoxide, manganese dioxide (Table 4). If the constants of the reaction rate for $(O_2^{18} + O_2^{16} \rightarrow 2O^{16}O^{18})$ are determined and compared with the constants of the adsorp-

Card 2/4

5(4)

AUTHOR:

Margolis, L. Ya.

SOV/62-59-2-6/4C

TITLE:

Principal Regularities of Catalytic Oxidation of Hydrocarbons
(Osnovnyye zakonomernosti kataliticheskogo okisleniya
uglevodorodov) Communication 2. Oxygen Adsorption on
Oxidizing Catalysts (Soobshcheniye 2. Adsorbtsiya kisloroda
na okislitel'nykh katalizatorakh)

PERIODICAL:

Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk.
1959, Nr 2, pp 225-231 (USSR)

ABSTRACT:

In the present paper the author investigated the adsorption of oxygen on typical oxidizing catalysts - vanadium pentoxide (V_2O_5), magnesium chromite ($MgCr_2O_4$) and silver - in a static vacuum at a pressure less than 2 mm and at different temperatures. In table 1 the principal characteristics of the sorption process of oxygen on these catalysts are presented. The isotopic exchange is one of the methods which permit the determination of the mobility of oxygen atoms or molecules on the surface and in the lattice of a solid compound. Usually, an appreciable isotopic exchange of oxygen takes place on oxidizing catalysts at 100 - 200° above the tempera-

Card 1/4

20-119-1-28/52

On a Copper Catalyst for the Oxidation of Propylene to Acrolein

reaction mixture the reduction of the cuprous oxide can either be suppressed or intensified. The composition of the catalyst is automatically regulated by the existence of the reversible process of the reduction of Cu_2O to Cu and the oxidation of Cu to Cu_2O . There are 2 figures and 8 references, 3 of which are Soviet.

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR
(Institute for Physical Chemistry AS USSR)

PRESENTED: August 6, 1957, by V. N. Kondrat'yev, Member, Academy of Sciences, USSR

SUBMITTED: July 25, 1957

Card 3/3

20-119-1-28/52

AUTHORS: Isayev, O. V., Kushnerev, M. Ya, Margolis, L. Ya.

TITLE: On a Copper Catalyst for the Oxidation of Propylene to Acrolein (O mednom katalizatore okisleniya propilena v akrolein)

PERIODICAL: Doklady Akademii Nauk SSSR, 1958, Vol. 119, Nr 1, pp. 104-106 (USSR)

ABSTRACT: First a short report is given on previous papers dealing with the same subject. Several patents recommended the application of cupric oxide which has to be applied to different carrier materials. The following problems remained unsettled: What is the phase composition of the copper contacts? What happens to the catalyst during the reaction and which oxide is catalytically active? For settling these problems 3 series of experiments were carried out, the following catalysts being used: 1) CuO; 2) Cu₂O; 3) metallic copper applied to pumice stone. The phase composition of the catalysts before and after the experiment was roentgenographically investigated. The roentgenographs were taken by a Debye (Debye)-chamber of a diameter of 57,3 mm with the K_α-radiation of iron. The catalysts were tested for 40 minutes in a dynamic device under atmospheric pressure in a mixture of propylene

Card 1/3

20-119-1-28/52

AUTHORS: Isayev, O. V., Kushnerev, M. Ya, Margclis, L. Ya.

TITLE: On a Copper Catalyst for the Oxidation of Propylene to Acrolein (O mednom katalizatore okisleniya propilena v akrolein)

PERIODICAL: Doklady Akademii Nauk SSSR, 1958, Vol. 119, Nr 1, pp. 104-106 (USSR)

ABSTRACT: First a short report is given on previous papers dealing with the same subject. Several patents recommended the application of cupric oxide which has to be applied to different carrier materials. The following problems remained unsettled: What is the phase composition of the copper contacts? What happens to the catalyst during the reaction and which oxide is catalytically active? For settling these problems 3 series of experiments were carried out, the following catalysts being used: 1) CuO; 2) Cu₂O; 3) metallic copper applied to pumice stone. The phase composition of the catalysts before and after the experiment was roentgenographically investigated. The roentgenographs were taken by a Debye (Debye)-chamber of a diameter of 57,3 mm with the K_α-radiation of iron. The catalysts were tested for 40 minutes in a dynamic device under atmospheric pressure in a mixture of propylene

Card 1/3

Basic Rules Governing the Catalytic Oxidation of Hydrocarbons. Communication 1: Adsorption of Hydrocarbons on Oxidation Catalysts

SOV/62-58-10-3/25

hydrocarbons on different oxide catalysts. The author of the present paper found two types of hydrocarbon sorption on the surface of metal oxides: a weak (and reversible), as well as a steady one blocking the surface of the metal oxides (not reversible). Furthermore the electric conductivity of the metal oxides was investigated. It is assumed that diverse ion radicals are formed on the surface of the oxide catalysts in the adsorption. Furthermore the effect of additions ($MgCr_2O_4$ and Cu_2O) on the sorption of unsaturated hydrocarbons was investigated. The similarity of the character of the ethylene sorption on metal oxides and on (oxygen coated) silver was shown. There are 8 figures, 5 tables, and 21 references, 11 of which are Soviet.

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR
(Institute of Physical Chemistry of the Academy of Sciences USSR)

Card 2/3

AUTHOR: Margolis, L. Ya.

SOV/62-58-10-3/25

TITLE: Basic Rules Governing the Catalytic Oxidation of Hydrocarbons
(Osnovnyye zakonomernosti kataliticheskogo okisleniya
uglevodorodov)
Communication 1: Adsorption of Hydrocarbons on Oxidation
Catalysts
(Soobshcheniye 1. Adsorbtsiya uglevodorodov na okislitel'nykh
katalizatorakh)

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk,
1958, Nr 10, pp 1175-1183 (USSR)

ABSTRACT: The polymorphic and complex character of the process of
catalytic hydrocarbon oxidation has hitherto turned difficult
the explanation of the mechanism of the different stages of
these reactions. The use of the most modern methods makes
possible the definition of the most important rules governing
this process. Some papers dealt with the investigation of the
chemisorption of hydrocarbons (Refs 3-4) which has to be
regarded as a condition for the further investigation of the
rules governing the catalytic hydrocarbon oxidation. The
purpose of the present paper is the investigation of

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MARGOLIS, L. YA.

RADUSHKEVICH, L. V.

24(6) 13 TRAZE I ROZE REKOLITSIYA 30/1408
Sovetskaya po metodam izobrazheniya struktury vysokodispersnykh i poristykh tel.
M., Leningrad, 1976.

Metody izobrazheniya struktury vysokodispersnykh i poristykh tel.; trudy voprosov
i razresheniya (Methods of Investigating the Structure of Highly Disperse
and Porous Bodies) Transactions of the Second Conference) Moscow, Izd-vo AN
USSR, 1976. 234 p. 2,000 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Institut fizicheskoy khimii i
Institut khimii silikatov.

Prep. By: Dubinin, M.K., Academician; Ed. of Publishing House: Ruzayeva, L.L.;
Tech. Ed.: Markovich, S.K.

PURPOSE: This book is intended for scientists, teachers and advanced students
interested in the structural analysis of highly disperse and porous bodies.

CONTENTS: This collection contains reports by members of various Soviet insti-
tutions of higher education: Institute of Physical Chemistry, AN USSR;
Institute of Chemistry, AN Georgian SSR; Far Eastern Branch, AN USSR;
Georgian Scientific Research Institute for Petroles; State Optical Insti-
tute; Leningrad Technological Institute; Moscow and Leningrad State Univer-
sities; Far Eastern Polytechnic Institute; Institute of Agriculture and others.
Introductory remarks were made by Prof. S.A. Turayev, Director of the
Institute of Silicate Chemistry. Apart from reports under the four subject
divisions (see Table of Contents), the collection includes discussions, con-
clusions and proposals adopted at the close of the conference.

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AVAILABLE: Library of Congress

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Tagged Atoms in Catalysis	SOV/1478
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Card 3/4

Tagged Atoms in Catalysis

SOV/1478

COVERAGE: The author gives a survey of tagged atoms in catalysis. The catalytic processes discussed in this book are heterogeneous. Catalysis here means heterogeneous catalysis. The basic concepts of tagged atom methods and of catalysis are given, so that the nonspecialized reader may understand the text without difficulties. The structure and properties of catalysts are described, and several industrial chemical processes are mentioned. No personalities are mentioned. There are 9 Soviet references.

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PHASE I BOOK EXPLOITATION

SOV/1478

Margolis, Liya Yakovlevna

Mechenyye atomy v katalize (Tagged Atoms in Catalysis) Moscow, Izd-vo AN SSSR, 1958. 65 p. (Series: Akademiya nauk SSSR. Nauchno-populyarnaya seriya) 15,000 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Redkollegiya nauchno-populyarnoy literatury.

Resp. Ed.: S. Yu. Yelovich; Ed. of Publishing House: V. I. Vedeneyev;
Tech. Ed.: T. P. Polenova.

PURPOSE: This is a popular presentation of the use of tagged atoms in catalysis intended for readers interested in popular-science literature.

Card 1/4

TITLE:

Study of Gas Adsorption on Manganese Dioxide by the
Elec Conductivity Method (Izucheniye adsorbtsii gazov
na dnuokisi margantsa metodom elektroprovodnosti)

The complete absence of changes in elec conductivity
during a strong adsorption, which occurred with CO
at -78°C , indicated the occurrence of a physical
type of adsorption.

4 graphs are given. The bibliography contains 11
references, of which 8 are Slavic (Russian).

INSTITUTION:

Institute of Physical Chemistry of the USSR
Academy of Sciences

PRESENTED BY:

SUBMITTED:

No date

AVAILABLE:

At the Library of Congress.

Card 2/2

MARGOLIS, L. Ya.
YELOVICH, S. Yu.; MARGOLIS, L. Ya.

Connection between ionic mobility in the oxide screen and the rate of isotope exchange. Probl. kin. i kat. 9:129-132 '57. (MIRA 11:3)
(Chemical reaction, Rate of) (Ions--Migration and velocity)
(Oxides)

SR001032320003-

MARGOLIS, L. YA

AUTHORS: Yelovich, S. Yu. and Margolis, L. Ya.

TITLE: Study of Gas Adsorption on Manganese Dioxide by the Elec Conductivity Method (Izucheniye adsorbtsii gazov na dnuokisi margantsa metodom elektroprovodnosti)

PERIODICAL: Izves. iya Akademii Nauk SSSR, Vol. XXI, #2, pp 206-210 1957, USSR, Seriya fizicheskaya

ABSTRACT: Chemical adsorption leads to the change in the electronic state of a semiconductor, which is reflected in the elec conductivity of the adsorbent. Experiments were carried out in order to study the adsorption of O₂, CO, CO₂, H₂O, C₂H₆ and C₆H₆ on manganese dioxide by the elec conductivity method. The range of temperatures was from -78° to +20° C. The results of experiments made it possible to determine the adsorption character and degree of filling the surface of an adsorbent-catalyzer. The great changes in elec conductivity of samples during adsorption indicated the occurrence of chemical adsorption, leading to the change in the number of charge carriers.

MARGOLIS, L.Ya.; ROZINSKIY, S.Z.

Mechanism of catalytic oxidation of simplest unsaturated hydrocarbons
on metals and semiconductors. Probl. kin. i kat. 9:107-116 '57.
(Oxidation) (Hydrocarbons) (Catalysts) (MIRA 11:3)

YELOVICH, S. Yu., MARGOLIS, L. Ya.

"Connection Between the Ion Mobility in the Oxide Lattice and the Rate of Isotopic Exchange."

Problemy Kinetiki i Katalyza, v. 9. Isotopes in Catalysis Moscow: Izdat. AN SSSR, 1957. 482p.

Most of the papers in this collection were presented at the Conf. on Isotopes in Catalysis which took place in Moscow, U.S.S.R., Apr. 9, 1956.

MARGOLIS, L. Ya. , ROGINSKIY, S. Z.

"Mechanism of the Catalytic Oxidation of the Unsaturated Hydrocarbons on Metals and Semi-Conductors."

Problems Kinetics and Catalysis, v. 9, Isotopes in Catalysis, Moscow, Institute of Chemistry, AN SSSR, 1957, 442p.

Most of the papers in this collection were presented at the Conference on Isotopes in Catalysis which took place in Moscow, Mar 31 - Apr 5, 1956.

YELOVICH, S.Yu.; MARGOLIS, L.Ya.

New method of demarcation of physical and chemical adsorption on
oxide catalysts, semiconductors. Dokl.AN SSSR 107 no.1:112-114
Mr '56. (MLBA 9:7)

1.Institut fizicheskoy khimii Akademii nauk SSSR. Predstavleno
akademikom A.N.Frumkinym.
(Adsorption) (Catalysts)

*MARGOLIS, L. Ya.*USSR/ Physical Chemistry - Kinetics. Combustion. Explosives. Topochemistry.
Catalysis

B-9

Abs Jour : Referat Zhur - Khimiya, No 4, 1957, 11285

Author : Margolis L.Ya., Roginskiy S.Z., Gracheva T.A.

Title : Oxides of Transition Metals as Catalysts of Oxidation of Hydrocarbons

Orig Pub : Zh. obshch. khimii, 1956, 26, No 5, 1368-1371

Abstract : Under dynamic conditions a study was made of catalytic oxidation of propylene in mixtures of C_3H_6 and O_2 , of 1:1 composition, diluted with nitrogen, at 200-400°. The studied catalysts (C) are classified as follows: 1) C of extensive oxidation: MnO_2 , NiO , $MgCr_2O_4$, yielding ~100% CO_2 and H_2O ; 2) C of destructive oxidation: V_2O_{5-x} , MOO_{3-x} , WO_{3-x} , UO_{3-x} , over which are formed, in addition to CO_2 and H_2O , formaldehyde, acetaldehyde, formic and acetic acid; 3) C of selective oxidation to acrolein -- Cu_2O , which produced at 400° a 60% yield of acrolein. It is assumed that active catalysts of extensive oxidation are oxides with incomplete d-shells, while active catalysts of mild oxidation can be catalysts of the type Ag and Cu_2O , in which gaps in the d-shell arise on modification of these C by oxygen.

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MARGOLIS, L. Ya.; ROGINSKIY, S. Z.

Selectivity of the catalytic oxidation of unsaturated hydrocarbons.
Izv. AN SSSR. Otd. khim. nauk no. 3:281-286 Mr '56. (MLBA 9:7)

1. Institut fizicheskoy khimii Akademii nauk SSSR.
(Oxidation) (Hydrocarbons)