

AUTHORS:

Kazanskiy, V.B., Docent, Rapoport, M.I., Engineer 105-58. 5-22/28

TITLE:

The 25th Anniversary of the Founding of ORGRES (K 25-letiy. so dnya osnovaniya ORGRES)

PERIODICAL:

Elektrichestvo, 1958, Nr 5, pp. 88-89 (USSR)

ABSTRACT:

In May 1958 it will be 25 years since the State Trust for the organization and rationalization of regional electric power plants and networks (ORGRES) of the Ministry for Electric Power Plants has been founded. The basic task to be performed by ORGRES is to render technical aid to plants in putting into operation and introducing new equipments for power engineering in order to increase the safety and economy of these plants. ORGRES has great experience in this field and worked out numerous schemes and constructions. The measures recommended are published by ORGRES as well as by the Ministry for Electric Power Stations. In the course of 25 years more than 200 electric power stations were able to start operating with the aid of ORGRES. The most important achievement during recent years was starting operation of the Kuybyshev hydraulic power station. ORGRES developed a number of measuring devices, published instructions for electrical equipment, and carried out work in connection

Card 1/2

The 25th Anniversary of the Founding of ORGRES

105-58-5-22/26

with safety measures to be undertaken in connection with the automation of systems. Also a number of recommendations for the reduction of losses in networks, securing the necessary voltage, and for the economical distribution of active- and reactive loads were elaborated by ORGRES. Such problems as the reduction of staffs in substations and changing over to operation without the necessity of a permanent control of the steering panel are solved. On the Khot'kov test stand the staff is trained for building- and assembly work in connection with the 400 kV long-distance lines. The work carried out by ORGRES is coordinated with that performed by the Institutes (VEI, ENIN, NIIPT, VNIIE). ORGRES developed telemeters, for which achievement V.I.Ivankin, V.Ye.Kazanskiy, G.P.Minin and N.P.Lapshov were awarded the Stalin Prize. Among the new telemeters the type T40-53 deserves to be mentioned, which was developed on the basis of T40-3. At present an apparatus for automatic frequency- and power control developed according to the ORGRES method is being tested in the Ural power engineering systems and in the electric power stations of the Belonusenergo.

AVAILABLE:

Library of Congress

Card 2/2

- 1. Electric power production--Organization--USSR
- 2. Power plants--Development
- 3. Electrical networks--Development

94.2110

S/109/62/007/001/024/027
D266/D301

AUTHORS: Kazanskiy, V.B., and Stepin, L.D.

TITLE: Calculating the dielectric constant from measurements performed on an axially placed sample in a cylindrical H_{01n} resonator

PERIODICAL: Radiotekhnika i elektronika, v. 7, no. 1, 1962, 173 - 175

TEXT: The dielectric constant ϵ and the loss tangent $\tan \delta$ of liquid dielectrics can be obtained from measurements in a cylindrical H_{01n} resonator as explained in a previous paper of the authors and V.K. Tkach (Ref. 1: Radiotekhnika i elektronika, 1960, no. 12, 2009) The dielectric constant is expressed there in the following form

$$\epsilon = \frac{\beta^2 + k^2}{\beta^2 + k_0^2}$$

(1)

VB

Card 1/2

BORESKOV, G.K.; DZIS'KO, V.A.; YEMEL'YANOVA, V.M.; PECHERSKAYA, Yu.I.;
KAZANSKIY, V.B.

Catalytic activity and electron paramagnetic spectra of
molybdenum oxide catalysts for the polymerization of ethylene.
Dokl. AN SSSR 150 no.4:829-832 Jo '63. (MIRA 16:6)

1. Institut kataliza Sibirskogo otdeleniya AN SSSR i Institut
khimicheskoy fiziki AN SSSR. 2. Chlen-korrespondent AN SSSR
(for Boreskov).

(Molybdenum catalysts--Spectra)
(Polymerization)

KAZANSKIY, V.B.; MARCHENKO, A.I.; STEPIN, L.D.

Circuit for measuring the dielectric constants of substances in the
3-cm. wavelength band. Prib. i tekhn. eksp. 8 no.1:105-108 JA-F
'63. (MIRA 1963)

1. Radiofizicheskiy fakul'tet Khar'kovskogo gosudarstvennogo
universiteta.

(Electric measurements) (Dielectric constant)

... FOR THE FINE ... OF AN EXPRESSION
OF THE ... OF ASSOCIATION OF ... ON THE SURFACE
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~~KAZANSKIY, V. P.~~

~~KAZANSKIY, V. P.~~

APPROVED FOR RELEASE: 06/13/2000 CIA-RDP86-00513R000721320008-8"

~~KAZANSKIY, V. P.~~ ~~Koyevodskiy, V. V.~~ 20-4-29/51
TITLE: Note on the Role of Hydrogen Atoms in the Catalytic Oxidation of Hydrogen on Palladium (O roli atomov vodoroda v reaktsii kataliticheskogo okisleniya vodoroda na palladii).

PERIODICAL: Doklady AN SSSR, 1957, Vol. 116, Nr 4, pp. 633-635 (USSR)

ABSTRACT: Wagner (Vagner) and Hauffe (Khauffe) (reference 2) investigated the mechanism of the catalytic oxidation of hydrogen on metallic palladium by comparing the stationary concentration of hydrogen atoms at the surface of the catalysator with the concentration corresponding to equilibrium. On this occasion the authors established, that a chain-like mechanism of this reaction is possible. The authors of this paper examined the final conclusions by Wagner (Vagner) and Hauffe (Khauffe) by an independent method, using a different experimental procedure. According to modern conceptions a dissociation of the hydrogen molecules at the surface of the metal takes place in the adsorption and dissolution of hydrogen in metallic palladium, resulting in the formation of adsorbed atoms. The solution

Note on the Rôle of Hydrogen Atoms in the Catalytic
Oxydation of Hydrogen on Palladium

20-4-29/51

and diffusion of hydrogen within the metal apparently takes place in the form of ions. The authors compared the stationary concentration of the hydrogen atoms on the surface of the palladium with the concentration corresponding to equilibrium with the help of a diffusion process in a vacuum circulation apparatus. A capillary tube consisting of palladium served as a catalysator. The numerical data of the experimental arrangement are given here, and the occurrence of the experiments is explained. The results from some of the experiments of the authors are compiled in a table. According to these data the stationary concentration of the hydrogen atoms in the reaction zone is considerably smaller than the concentration corresponding to equilibrium. For the purpose of a more precise investigation of the mechanism of the reaction, the authors computed the deviation of the stationary concentration of the hydrogen atoms at the surface of the catalysator from the equilibrium concentration with the assumption of a radical mechanism. The data computed in this way were then compared with the experiment. Oxygen does not modify the mechanism of this reaction. The

Card 2/3

LAZARSHIY, V.B., Cond Chem Sci--(Misc) "Study of the mechanism of
certain catalytic reactions ~~on metallic palladium~~ ⁰⁰¹⁴⁹²⁸⁴⁴ with the participation
of hydrogen on metallic palladium." Dokl, 1957. 10 pp (Inst of Chem Physics of the
Acad Sci USSR), 150 copies (E,25-58, 108)

-30-

KAZANSKY, J.

- The Chemical Society of the USSR held its annual meeting 28 Oct.-1 Nov. 1958 in Leipzig. The following papers were presented by the USSR delegation
- F. Vilesov and A. Terenin - Physics Inst., LCU "Photoelektronische Emission der Oberfläche von Halbleiterkatalysatoren."
 - Ya. Shilov and A. Yarnikov - Inst. Organic Chemistry, AS USSR "Über den Mechanismus der katalytischen Wirkung von Aminosäuren in den Reaktionen der Carbynylverbindungen."
 - A. Shekhter - Inst. Scientific Information, AS USSR "Zur Elektronenmikroskopie heterogener Katalysatoren."
 - N. N. Ananov - Inst. Chemical Physics, AS USSR "Homogene Katalyse auf Chemische Induktion bei komplexen Oxidations-Reaktionen."
 - A. Ye. Brumskhaya - Inst. Biological & Medical Chemistry, ANS USSR "Allgemeine Fragen der biologischen Katalyse im Licht der Wirkungsweise der Pyridoxal-Enzyme."
 - T. Vol'kenshaya - Inst. Physical Chemistry, AS USSR "Zur Elektronentheorie der Chemisorption und Katalyse an Halbleitern."
 - V. Kazanskly and V. Vayvodskly - Inst. Chemical Physics, AS USSR "Über den Mechanismus der katalytischen Reaktionen die an Palladiummetall unter Mitwirkung von Wasserstoff verlaufen."
 - G. K. Borovkov - Karpov Physical-Chemical Inst., Moscow "Mechanismwirkung zwischen Katalysator und Reaktionsystem."
 - A. A. Kalanda - AS USSR "Zur Aufbau einheitstheorie der Katalyse."
- SO: Mitteilungsblatt der Chemische Gesellschaft in der BRD, Sonderheft, 1959, Heft.

11.6200

S/081/60/000/021/006/018

A005/A001

Translation from: Referativnyy zhurnal, Khimiya, 1960, No. 21, p. 50, # 83984

AUTHORS: Kazanskiy, V. B., Voyevodskiy, V. V.

TITLE: On the Problem of the Possibility of Chain Mechanisms at the Catalysis on Metals. An Investigation of the Mechanism of Some Catalytic Reactions on Metallic Palladium.

PERIODICAL: Probl. kinetiki i kataliza, 1960, Vol. 10, pp. 398-403

TEXT: The mechanism is studied of three catalytic reactions on metallic Pd at 150 - 300°C: the hydrogen exchange with deuterium; the oxidation of H₂ and the hydrogenation of C₂H₄. The reaction mechanism is radical in all the three cases.

Summary of the authors:

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

Card 1/1

S/195/60/001/004/005/0:5
B017/B055

AUTHORS: Kazanskiy, V. B., Pariyskiy, G. B., Voyevodskiy, V. V.

TITLE: A Study on the Properties of Hydrogen Atoms Adsorbed on Silica Gel Surfaces by Applying Electron Paramagnetic Resonance

PERIODICAL: Kinetika i kataliz, 1960, Vol. 1, No. 4, pp. 539-541

TEXT: R. Livingston, H. Zeldes, E. H. Taylor (Ref. 1) and N. N. Bubnov, V. V. Voyevodskiy, L. S. Polyak and Yu. D. Tsvetkov found that under the influence of γ -radiation at liquid nitrogen temperature hydrogen atoms, detectable by the EPR method, are formed from adsorbed water molecules or OH groups on the surfaces of glass and silica gel. The properties of the hydrogen atoms adsorbed on the surface of silica gel were studied in the present publication. Co^{60} was used as source of radiation. The EPR spectra were taken at liquid nitrogen temperature on a spectrometer with a high-frequency magnetic field. The spectra of the irradiated silica gel are represented graphically in a figure. The removal of hydrogen atoms from the silica gel surface in presence of ethylene was investigated, and
Card 1/2

A Study on the Properties of Hydrogen Atoms
Adsorbed on Silica Gel Surfaces by Applying
Electron Paramagnetic Resonance

S/195/60/001/004/005/015
B017/B055

it was found that the desorption rate of hydrogen atoms in presence of ethylene exceeds the desorption rate in vacuum by a factor of thirty. Hydrogen atoms adsorbed at -100 to -150°C react with ethylene and oxygen. There are 1 figure and 3 references: 2 Soviet and 1 British.

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

SUBMITTED: August 2, 1960

Card 2/2

KAZANSKIY, V.B.; STRUNIN, V.P.

Nature of the temperature maximum of the reaction rate for the hydrogenation of ethylene on metals. Kin. i kat. 1 no. 4:553-557 N-D '60. (MIRA 13:12)

1. Institut khimicheskoy fiziki AN SSSR.
(Ethylene) (Hydrogenation)

20422

24.2110 (1153, 1160, 1164)

S/109/60/005/012/020/035
E192/E382

AUTHORS: Tkach, V.K., Stepin, L.D. and Kazanskiy, V.B.
TITLE: Resonator Method of Measuring the Permittivity and Loss Tangent of Liquid Dielectrics
PERIODICAL: Radiotekhnika i elektronika, 1960, Vol. 5, No. 12, pp. 2009 - 2014

TEXT: The resonator method provides means of accurate measurement of the permittivity and losses in dielectrics at microwaves. However, the measured sample is usually in the form of a disc and the method cannot be easily employed for measuring the permittivity and losses in liquids. It is proposed, therefore, that the measured sample be cylindrical and situated in the centre of the resonator parallel to its axis. For the purpose of the derivation of the formulae for the measurement, it is assumed that the resonator contains waves of the type H_{0ln} . The solution of the Maxwell equations for the region occupied by the dielectric ($0 < r < b$ where b is the radius of the sample) is given by

Card 1/7

20422
S/109/60/005/012/020/035
E192/E382

Resonator Method of Measuring the Permittivity and Loss Tangent of Liquid Dielectrics

$$H_{r\theta} = -CJ_0(kr) \sin \beta z,$$

$$H_{\theta r} = \frac{j\beta}{k} CJ_1(kr) \cos \beta z,$$

$$E_{\theta z} = \frac{j\omega}{ck} CJ_1(kr) \sin \beta z,$$

where:

$$k^2 = \frac{\omega^2}{c^2} \epsilon - \beta^2 \tag{1}$$

The fields in the region occupied by the air ($b < r < a$ where a is the internal radius of the resonator) are expressed by:

Card 2/7

20422

S/109/60/005/012/020/035
E192/E382

Resonator Method of Measuring the Permittivity and Loss Tangent
of Liquid Dielectrics

where:

$$k_o^2 = \frac{\omega^2}{c^2} - \beta^2 \quad (2).$$

In these expressions, ω is the angular frequency,
 c is the velocity of propagation,
 $\beta = 2\pi/\lambda_{B\Delta}$ is the propagation constant,
 $\lambda_{B\Delta}$ is the wavelength in the resonator.

The unknown k can be determined from the boundary
condition at $r = b$ and $r = a$. These conditions lead
to the following expression:

Card 3/7

20422

S/109/60/005/012/020/035
E192/E382

Resonator Method of Measuring the Permittivity and Loss Tangent
of Liquid Dielectrics

$$kb \frac{J_0(kb)}{J_1(kb)} = k_0 b \frac{J_0(k_0 b)}{J_1(k_0 b)} \frac{1 - \frac{J_1(k_0 a) Y_0(k_0 b)}{Y_1(k_0 a) J_0(k_0 b)}}{1 - \frac{J_1(k_0 a) Y_1(k_0 b)}{Y_1(k_0 a) J_1(k_0 b)}} \quad (3)$$

The quantity kb can be evaluated from Eq. (3). A special table is given for this purpose. The tangent of the loss angle $\text{tg } \delta$ is approximately expressed by:

$$\text{tg } \delta = \frac{W_0}{W_{\Delta}} \left(\frac{1}{Q} - \frac{1}{Q_0} \right) \quad (7)$$

Card 4/7

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E192/E382Resonator Method of Measuring the Permittivity and Loss
Tangent of Liquid Dielectrics

where W is the energy stored in the region $b < r < a$,
 W_{Δ} is the energy stored in the region $0 < r < b$,
 Q is the quality factor of the resonator with the sample,
 Q_0 is the quality factor of the resonator without the
sample.

The final theoretical expression for the loss tangent is in
the form:

$$\operatorname{tg} \delta = \frac{k^2 a^2 J_0^2(kb) F_1(k_0 a)}{k_0^2 c^2 b^2 J_0^2(k_0 b) F_1(kb)} \left[\frac{1}{Q} - \frac{1}{Q_0} \right]. \quad (11)$$

The method proposed above was investigated experimentally.
The resonator used in the experiments was made of brass and
had an internal diameter $2a = 5.908$ cm and a length of
Card 5/7

20422

S/109/60/005/012/020/035
E192/E382

Resonator Method of Measuring the Permittivity and Loss
Tangent of Liquid Dielectrics

14.9 cm. The resonator operated in the H_{011} mode and its quality factor was 3790; the position of the plunger in the resonator could be varied by means of a micrometer screw and could be determined with an error of ± 0.002 mm. The resonant frequency of the system could be accurately measured by means of a cavity wavemeter. The permittivity and the loss tangent of the sample were based on the determination of the resonant wavelength and the magnitude of the quality factors of the resonator itself and the resonator with the sample. Some solid and liquid dielectrics were investigated (organic glass, ebonite, ethyl alcohol, benzole acetone and distilled water). The measured values are indicated in a table. From this it is seen that the results are in good agreement with the data available from literature. The method

Card 6/7

20422

S/109/60/005/012/020/035
E192/E382

Resonator Method of Measuring the Permittivity and Loss Tangent
of Liquid Dielectrics

permits the measurement of permittivity with an average square
error of not more than 3% and that of the loss tangent with
an error of not more than 9%. There are 2 figures, 2 tables
and 9 references: 8 Soviet and 1 non-Soviet.

SUBMITTED: January 16, 1960

Card 7/7

AUTHORS: Kazanskiy, V. B., Pecherskaya, Yu. I. S/076/60/034/02/039/044
B010/B007

TITLE: Paramagnetic Electron Resonance in Irradiated Aluminum Oxide

PERIODICAL: Zhurnal fizicheskoy khimii, 1960, Vol 34, Nr 2, p 477 (USSR)

ABSTRACT: At -196°C gamma aluminum oxide was irradiated¹⁹ with Co^{60} gamma rays in a vacuum and investigated according to the method of paramagnetic electron resonance. A complicated signal with a g-factor of about 2 was observed (Fig a), which did not change also after a prolonged storage at -196°C . Storage for some hours at room temperature led to a change in the signal, in which case the intensity of the left line ($g \approx 2$) decreased considerably, whereas the right line remained unchanged (Fig b). Here intensity decreased by about 10 times its amount. This decrease of the signal and observations made by Taylor and Kohn (Ref 1) are explained by the fact that the signal is in correlation with the centers of aluminum oxide, which are responsible for increased catalytic activity.

ASSOCIATION: Akademiya nauk SSSR Institut khimicheskoy fiziki Moskva (Academy of Sciences of the USSR, Institute of Chemical Physics, Moscow)

Card 1/2

Paramagnetic Electron Resonance in Irradiated Aluminum Oxide

SUBMITTED: July 31, 1959

S/076/60/034/02/039/044

B010/B007



Card 2/2

24-7900 1035 1160
5-1190 1208 1274 1297

21769

S/195/61/002/002/004/004
B101/B208

AUTHORS: Mishchenko, Yu. A., Boreskov, G. K., Kazanskiy, V. B.,
Pariyskiy, G. B.

TITLE: Effect of ionizing radiation on the catalytic and magnetic
properties of titanium dioxide

PERIODICAL: Kinetika i kataliz, v. 2, no. 2, 1961, 296

TEXT: Several papers published in the course of the last years studied the possibility of changing the catalytic properties of solids under the influence of high-energy radiation. Kohn and Taylor (Refs. 1, 2) observed a considerable effect of gamma and neutron radiations on the catalytic properties of Al₂O₃ and of catalysts on SiO₂ basis (Ref. 3) in the isotopic H - D exchange. It was the purpose of the present study to investigate the effect of gamma radiation on catalytic and magnetic properties of TiO₂. The catalytic properties were studied by H - D exchange; the magnetic properties by electron paramagnetic resonance. The TiO₂ samples consisted of anatase with specific surface of the order 130 m²/g. TiO₂ was heated to 500°C for several

Card 1/3

21769

S/195/61/002/002/004/004
B101/B208

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hours at 10^{-5} mm Hg prior to irradiation. The samples thus treated exhibited no marked catalytic properties at 0°C . They were now irradiated with gamma rays of Co^{60} in vacuo at the temperature of liquid nitrogen with 120 r/sec. The integral dose was about $1.7 \cdot 10^7$ r. The irradiated samples showed high catalytic activity at the temperature of liquid nitrogen. The catalytic activity was increased by at least 3-4 orders of magnitude. Heating of the irradiated samples to 0°C considerably decreased the catalytic activity. The constant of the reaction rate at 0°C 1 hr after thawing was by about two orders of magnitudes smaller than at the temperature of liquid nitrogen. The TiO_2 samples heated in vacuo at 500°C showed no signal when the epr spectrum was taken. At the temperature of liquid nitrogen, the samples irradiated gave a signal with well-resolved hyperfine structure, total width 400 oersteds, g factor approximately 2. The signal does not change if the sample is stored at the temperature of liquid nitrogen. Short heating to room temperature reduced intensity and changed the shape of the signal. When the samples were kept for 1 hr at room temperature the signal became stable. This parallelism in the changes of catalytic activity and epr signal was also observable in silica gel (Refs. 3-5) and Al_2O_3 (Refs. 2, 6). It

Card 2/3

KAZANSKIY, V. B., PARIYSKIY, G. B., VOYEVODSKIY, Vladislav V.

"Radiation induced surface reactions in silicagel."

report to be submitted for the Faraday Society, General Discussion
on Radiation Effects in Inorganic Solids, Gif-sur-Yvette (Seine-et-Oise),
France, 11-12 Apr 1961.

Inst. of Chemical Physics, Acad. Sci. USSR, Moscow.

MISHCHENKO, Yu. A.; BORESKOV, G.K.; KAZANSKIY, V.B.; PARIYSKIY, G.B.

Effect of ionizing radiation on the catalytic and magnetic properties
of titanium dioxide. Kin. i kat. 2 no.2:296 Mr-Ap '61.

(MIRA 14:6)

1. Fiziko-khimicheskiy institut imeni L. Ya. Karpova.
(Titanium oxide) (Gamma rays)

S/195/61/002/003/008/009
E071/E412

AUTHORS: Kazanskiy, V.B., Pecherskaya, Yu.I.

TITLE: An investigation of aluminachrome catalysts by the method of electron paramagnetic resonance

PERIODICAL: Kinetika i kataliz, v.2, no.3, 1961, 454-461

TEXT: Since the formation of chromium of an intermediate valency in chromium catalysts may be useful in explaining the nature of their catalytic activity, the authors investigated the process of decomposition of chromic anhydride on alumina by the EPR (EPR) method. Specimens of catalysts were prepared by shaking γ alumina (specific surface area about 180 m²/g) with aqueous solutions of chromic acid of various concentrations. After filtering, the alumina was ignited in a stream of air at 350°C or at 500°C for 8 hours. The reduction of the catalyst was done in a stream of dry hydrogen at 360 or 500°C for 5 hours. After which it was cooled to 30 to 50°C in nitrogen. The content of chromium in the specimens (which varied from 0.2 to 11.4%) was done by chemical analysis. The EPR spectra were taken with an EPR-2 spectrometer operating at 9400 millimegacycles ($\lambda = 3.2$ cm) with a variation of the magnetic field from 0 to 8000 oersted. ✓

Card 1/5

S/195/61/002/003/008/009
E071/E412
An investigation of aluminachrome ...

Occasionally an instrument with $\lambda = 21.8$ cm and $H_p = 500$ oersted was used. The intensity of the signals observed was determined by comparison with the spectrum of a monocrystal of $CuCl_2 \cdot 2H_2O$. The EPR spectra of the specimens, containing up to 9.2% of Cr and ignited in air at 350, contained only one resonance line 44 oersted wide with g-factor = 1.97. At a higher chromium content this line is observed on a background of a wide resonance absorption line. After reduction in hydrogen at 350°C the intensity of the wide line (characterizing microcrystals of reduced Cr_2O_3) increases and the intensity of the narrow line decreases but it is still present at a chromium content of from 0.4 to 2.5%. On reduction at 500°C, the narrow line disappears from the spectra of all specimens. If a so reduced catalyst is heated in air at 300°C, the narrow line reappears. The influence of oxygen on the narrow EPR line was determined at room temperature and at -196°C. At room temperature with increasing oxygen pressure, the amplitude of the signal decreases and its width increases, whereupon the change is reversible. On prolonged retention of the specimens in air, an irreversible decrease in the intensity of the narrow line was observed. This

Card 2/5

An investigation of aluminachrome ... S/195/61/002/003/008/009
E071/E412

is apparently due to the oxidation of all chromium to the six-valent state. At -196°C , a decrease in the intensity of the narrow line without an increase in its width was observed. The influence of temperature was studied within a range of -196 to 300°C . The width of the line is independent of temperature but its intensity obeys the Curie-Weiss law with the value of the Weiss constant $\Delta = 25^{\circ}\text{K}$. The results obtained indicated that the phase giving the narrow line in the EPR spectra of aluminochrome catalysts is bound to the surface of the carrier and that its thickness does not exceed a few atomic layers. A comparison of the EPR spectra at various frequencies indicated that the width of the line and its g-factor remain constant, thus chromium ions, responsible for the narrow line, do not possess a fine structure, i.e. the line corresponds to Cr^{5+} ions. The above conclusion is in line with other results obtained in this work, e.g. the disappearance of the line for catalysts reduced at 500°C can be explained by the reduction of all chromium to the trivalent state. The narrow line was never observed by the authors in the EPR spectra of various chromium oxides without carriers. For chromium

Card 3/5

An investigation of aluminachrome ...

S/195/61/002/003/008/009
E071/E412

catalysts in which aluminosilicates or silicagel were used as carriers, the narrow EPR line is asymmetrical. The above indicates the strong influence of the carrier. In general compounds of pentavalent chromium are unstable and the existence of Cr^{5+} ions in chromium oxide catalysts on carriers is apparently related to the stabilizing effect of the crystal lattice of the base. Acknowledgments are expressed to N.Ya.Buben for measurements. A.V.Topchiyev, V.A.Krentsel', R.Michail, P.Corlateanu and A.Ionesco are mentioned for their contributions in this field. There are 6 figures, 1 table and 17 references: 10 Soviet-bloc, 1 Russian translation from non-Soviet authors and 6 non-Soviet-bloc. The four references to English language publications read as follows:
Ref.4: R.Michail, P.Corlateanu, A.Ionesco, J.Chim.Phys., v.56, 568, 1959; Ref.5: J.Matzunaga, Bull. Chem. Soc. Japan, v.31, 745, 1958; Ref.11: D.E.O'Reilly, D.S.MacIver, Symposium on technique on study of catalysis mechanism, Boston, April 5-10, 1959; Ref.16: P.W.Anderson, P.R.Weiss, Rev. Mod. Phys., v.25, 269, 1953.

Card 4/5

KAZANSKIY, V.B.; PARIYSKIY, G.B.

Electronic paramagnetic resonance spectrum of ethyl radicals
adsorbed on a silica gel surface. *Kin.i kat.* 2 no.4:507-508 *Jl-*
Ag '61. (MIRA 14:10)

1. Institut khimicheskoy fiziki AN SSSR.
(Radicals (Chemistry)—Spectra)

KAZANSKIY, V.B.; YEZHKOVA, Z.I.; LYUBARSKIY, A.G.; VOYEVODSKIY, V.V.;
IOFFE, I.I.

Electron paramagnetic resonance study of the structure of
vanadium-molybdenum oxide catalysts. *Kin.i kat.* 2 no.6:862-866
N-D '61. (MIRA 14:12)

1. Institut khimicheskoy fiziki AN SSSR i Institut organicheskikh
poluproduktov i krasiteley imeni K.Ye. Voroshilova.
(Catalysts--Spectra)

RODE, T.V.; KAZANSKIY, V.B.; PECHERSKAYA, Yu.I. (Moscow)

Electron magnetic resonance study of chromium oxides. Zhur.fiz.-
khim. 35 no.10:2370-2375 0 '61. (MIRA 14:11)

1. Akademiya nauk SSR, Institut obshchey i neorganicheskoy khimii
imeni N.S.Kurnakova.

(Chromium oxide--Spectra)

PECHERSKAYA, Yu.I.; KAZANSKIY, V.B.; VOYEVODSKIY, V.V.

Electron paramagnetic resonance studies of the thermal activation
of chromium gel. Kin.i kat. 3 no.1:111-113 '62. (MIRA 15:3)

1. Institut khimicheskoy fiziki AN SSSR.
(Chromium) (Catalysis)

S/051/62/013/001/005/019
E039/E420

AUTHORS: Kazanskiy, V.B., Pariyskiy, G.B., Burshteyn, A.I.

TITLE: Study of the properties of hydrogen atoms formed during γ -irradiation of silica gel, using the electron paramagnetic resonance method

PERIODICAL: Optika i spektroskopiya, v.13, no.1, 1962, 83-89

TEXT: Measurements are made of the spin-lattice relaxation time T_1 of atoms of hydrogen, formed by γ -irradiation of silica gel, from its surface hydroxyl groups or molecules of adsorbed water on its surface. The silica gel was prepared by the action of sulphuric acid on a solution of sodium silicate. Acid was added until pH = 0; the precipitate was then separated, washed and dried for 4 hours at 500°C. This produced a gel with a surface of $300 \pm 25 \text{ m}^2/\text{g}$. Before exposure, the gel was heated for 10 hours at 400 to 500°C at a pressure of 10^{-5} mm Hg in a glass ampule and then sealed off under vacuum. Irradiation was performed at -196°C using a Co^{60} source (dose ~ 10 Megarad). Electron paramagnetic resonance measurements were then made at -196°C and compared with results obtained for the case where part
Card 1/2

Study of the properties ...

S/051/62/013/001/005/019
E039/E420

of the hydrogen of the surface hydroxyl groups was replaced with deuterium and the effect of radiation defects observed. The dependence of the ratio of the amplitude of the signal for hydrogen atoms to the amplitude of the signal for diphenylpicryl-hydrazyl with microwave power was also investigated. It is shown that the curve for hydrogen in a vacuum falls well below the curve for the case of hydrogen in the presence of adsorbed oxygen. The spin lattice relaxation time T_1 for hydrogen in a vacuum is about 10^{-4} sec. Atoms of hydrogen are stabilized on the surface of the gel in spaces in the crystal lattice which are of sufficient size. There are 5 figures.



SUBMITTED: June 2, 1961

Card 2/2

KAZANSKIY, V.B.; PARIYSKIY, G.B.; BURSHEYN, A.I.

Using the electron paramagnetic resonance method in studying the
properties of hydrogen atoms formed by γ -irradiation of silica
gel. Opt.1 spektr. 13 no.1:83-89 JI '62. (MIRA 15:7)
(Paramagnetic resonance and relaxation) (Silica) (Hydrogen)

S/844/62/000/000/113/129
D207/D307

AUTHORS: Kazanskiy, V. B., Pariskiy, G. B. and Voyevodskiy, V. V.

TITLE: An EPR study of the properties of hydrogen atoms and of defects formed on the irradiation of silica gel

SOURCE: Trudy II Vsesoyuznogo soveshchaniya po radiatsionnoy khimii. Ed. by L. S. Polak. Moscow, Izd-vo AN SSSR, 1962, 656-659

TEXT: Silica gel was investigated because of its special adsorption and catalytic properties. The gel had a specific surface area of 200 m²/g and contained less than 0.1% Fe and Al impurities. It was irradiated with Co⁶⁰ γ rays, in vacuum, at -196°C and at room temperature, with doses of 5 - 10 megarads. After irradiation at -196°C the EPR spectrum (recorded at the same temperature) indicated the presence of radiation defects and free hydrogen atoms, the latter being formed by radiolysis of the surface OH groups; the H-atom concentration increased with the temperature (200 - 500°C) to which the gel was heated before irradiation. On vacuum
Card 1/2

KAZANSKIY, V.B.; STEPIN, L.D.

Concerning the methodology for calculating the dielectric constants of substances measured by a method involving the use of a cylindrical H_{01n} resonator with axial arrangement of the samples. Radiotekhnika i elektronika. 7 no.1:173-175 Ja '62. (MIRA 15:1)

1. Khar'kovskiy gosudarstvennyy universitet im. A.M.Gor'kogo, kafedra radiospektroskopii.

(Dielectrics)

KAZANSKIY, V.B., PARIYSKIY, G.B.

"ESR studies of the reactivity and structure of free radicals stabilized on solid surfaces."

Report submitted to the Sixth Intl. Symp. on Free Radicals,
Cambridge, England 2-5 July 1963

L 19621-65 FWT(m)/EPP(c)/EWP(j)/T/EWP(t)/EWP(b) Pc-L/Pr-L SSD/AFWI/
KAZANSKIY V.B. VAYEVODSKIY V.V. BURELTOVA A.I. (1962)
VIZVESTIYA AKADEMII NAUK SSSR SERIYA KHIMICHESKAYA

SOURCE: Ref. zh. Khimiya, Abs. 9B570

AUTHOR: Kazanskiy V.B. Vayevodskiy V.V. Bureltova A.I.

TITLE: A study of the properties of hydrogen atoms in the
excited state

CITED SOURCE: Zh. Fiz. i khim. spektroskopii, 1, 2, 1962, 55-57

NOTE: This is a translation of the original Russian text.

TRANSLATION: This is a translation of the original Russian text.

... ..

Cord 1/2

L 19421-65

ACCESSION NR: AR4048175

to the H atoms. Addition of O_2 and C_2H_4 increased the rate of recombination of H atoms. Thus, at $-150^\circ C$, the rate of recombination in the presence of C_2H_4 was increased. The authors explain the effect of such additions on their reaction with H atoms confirmed by the appearance of additional components in the EPR spectra. The spectrum appearing in the presence of C_2H_4 which resembled the spectrum of the other components of the mixture. The components of the mixture are slightly positive.

SUB CODE: GC, GP

ENCL: 00

Card 2/2

KAZANSKIY, V.B.; PECHERSKAYA, Yu.I.

Changes in electron paramagnetic resonance spectra of
chromia-aluminosilicate catalysts for ethylene polymerization
induced by reaction components. *Kin.i kat.* 4 no.2:244-251 *Mr-Ap '63.*
(MIRA 16:5)

1. Institut khimicheskoy fiziki AN SSSR.
(Chromium catalysts—Spectra)(Polymerization)(Aluminosilicates)

PARIYSKIY, G.B.; ZHIDOMIROV, G.M.; KAZANSKIY, V.B.

Spectrum of electron paramagnetic resonance of a methyl radical
adsorbed on the silica gel surface. Zhur.strukt.khim. 4 no.3:
364-367 My-Je '63. (MIRA 16:6)

1. Institut khimicheskoy fiziki AN SSSR.
(Methyl group--Spectra)

45354

S/181/63/005/002/043/051

B102/B186

5.4400

AUTHORS: Kazanskiy, V. B., Pariyskiy, G. B., Aleksandrov, I. V., and Zhidomirov, G. M.

TITLE: Investigation of the interaction of free radicals with the surface of a solid (silica gel) by the e.p.r. spectra

PERIODICAL: Fizika tverdogo tela, v. 5, no. 2, 1963, 649 - 659

TEXT: The authors give a detailed analysis of the e.p.r. spectra of atomic hydrogen, methyl, ethyl and polymer radicals adsorbed on several types of silica gels (specific surfaces 290, 300, and 700 m²/g). The studies were made in order to obtain information on the nature and the geometry of binding and the motions in the adsorbed state. The e.p.r. spectra were taken at $\lambda = 3.2$ cm and a hf modulation frequency of 1 Mc. The e.p.r. spectrum of adsorbed hydrogen is characterized by a hyperfine splitting constant of $A = 1411 \pm 0.1$ Mc (for free hydrogen it is $A_0 = 1420.40$ Mc) and a great asymmetry of the components. On the basis of the present authors' earlier results (Kinetika i kataliz I, no. 4, 539, 1960) the hyperfine splitting

Card 1/3

8/181/63/005/002/043/051
B102/B186

Investigation of the ...

constants A_{\perp} and A_{\parallel} for $\vec{H} \perp \vec{E}$ and $\vec{H} \parallel \vec{E}$ are calculated:

$$A_{\perp} = A_{yy} = A_{zz} = A - \frac{47}{60} \frac{\mu_B \mu_n}{a^3} \lambda^2; \quad (4a)$$

$$A_{\parallel} = A_{xx} = A + \frac{47}{30} \frac{\mu_B \mu_n}{a^3} \lambda^2; \quad (4b)$$

$$A = \frac{8}{3} \frac{\mu_B \mu_n}{a^3} (1 - 15.5\lambda^2) = A_0 (1 - 15.5\lambda^2); \quad (4c)$$

$\lambda = a^2 E / e$. The anisotropy of hyperfine splitting is obtained as

$$A_{\parallel} - A_{\perp} = \frac{47}{20} \frac{\mu_B \mu_n}{a^3} = \frac{141}{160} A_0 \lambda^2. \quad (5)$$

$z \parallel E$ and perpendicular to the surface. The anisotropy of the g-factor, $\Delta g = g_{\parallel} - g_{\perp}$, is very weak ($\sim 10^{-6}$) and not to be observed in experiment. The polarization energy of the hydrogen atom in the E field was obtained as ~ 1 kcal/mole. The e.p.r. spectrum of deuterium atoms adsorbed on SiO_2 is considerably narrower and is symmetrical, with smaller amplitudes of the side components. The e.p.r. spectrum of the methyl radicals was measured at -196°C ; it consists of four hyperfine structural lines with a distance of 23.1 ± 0.1 oe and with an amplitude ratio of 1 : 8.5 : 13 : 2.5. instead of 1 : 3 : 3 : 1. This can be explained.

Card 2/3

KAZANSKIY, V.B.; STEPIN, L.D.; TKACH, V.K.

Use of a new variant of the resonator method for measuring dielectric constants for the study of high molecular weight compounds. Biofizika 8 no.1:112-116 '63. (MIRA 17:8)

1. Khar'kovskiy gosudarstvennyy universitet imeni Gor'kogo.

APPROVED FOR RELEASE: 06/13/2000

CIA-RDP86-00513R000721320008-8"

11562
8/020/83/148/001/021/832
B144/B186

11.12.10

AUTHORS:

Vladimirova, V. I., Zhabrova, G. M., Kadenatsi, B. M.,
Kazanskiy, V. B., Pariyskiy, G. B.

TITLE:

Joint action of radiation and oxide catalysts on the
dehydrogenation of cyclohexane

PERIODICAL:

Akademiya nauk SSSR. Doklady, v. 148, no. 1, 1963, 101-104

TEXT: The radiation effect on catalytic systems is studied in the dehydrogenation of cyclohexane activated by SiO₂, Al₂O₃, MgO, ZrO₂, ZnO, or NiO. After a vacuum pretreatment of the catalyst at 400°C, cyclohexane vapors were led over it. The determinations concerned: 1) the catalytic properties after irradiation with 0.8 Mev electrons at room temperature, dose 2.4·10⁶ rad/sec, energy absorption 1.4·10⁹ rad; 2) the paramagnetic properties after gamma irradiation with Co⁶⁰ at -196°C, dose 3200 mcu, energy absorption 5·10⁶ - 1·10⁸ rad. 1) A low-temperature dehydrogenation of cyclohexanone took place. Good results were obtained

Card 1/3

X

9/020/63/148/001/021/032
B144/B186

Joint action of radiation and ...

their different electron properties. In dielectrics and poor semi-conductors the radiation-induced ionization is stronger, since the electrons and holes formed are longer trapped and the paramagnetic centers are resistant at low temperatures, while they vanish so rapidly in ZnO and NiO that no e.p.r. signals could be recorded. There are 2 figures and 1 table.

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

PRESENTED: July 30, 1962, by V. N. Kondrat'yev, Academician

SUBMITTED: July 19, 1962

APPROVED FOR RELEASE: 06/13/2000
Card 3/3

CIA-RDP86-00513R000721320008-8" X

... process, the pressure of oxygen is increased then the amplitude of the "narrow" or initial signal falls, and after 20 mm the signal cannot be observed. Influences of the oxygen on the signal are invertible. The paper was presented by Academician V. N. Kondrat'yev on 3 April 1963. Orig. art. has: 2 figures and 1 table.

Instit. of Chemical Physics

Card 1/2/

KAZANSKIY, V. B.; PARIYSKIY, G. B.

"The e.s.r. study of free radicals adsorbed on catalysts."

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

Inst of Chemical Physics, AS USSR, Moscow.

L 15296-65 EWT(m)/EPP(o)/EWP(j) Po-4/Pr-4/Pa-4 DIAAP RM
ACCESSION NR: 1P4047688 S/0704/64/004/005/0753/0762

AUTHOR: Zhabrova, G. M., Kazanskiy, V.B., Vladimirova, V.I., Kadenatsi, B.M., Partovskiy, S.B.

TITLE: Radiation catalysis in the conversion of cyclohexane

SOURCE: Neftekhimiya, v. 4, no. 5, 1964, 753-762

TOPIC TAGS: cyclohexane, radiation catalysis, dehydrogenation, catalytic dehydrogenation

ABSTRACT: The joint effect of ionizing radiation (γ - rays from Co^{60}) and of catalysts with different electrical properties, such as insulators (SiO_2 , Al_2O_3 , aluminum silicate), semiconductors having low conductivity (MgO , ZrO_2), semiconductors having high conductivity (ZnO , NiO) and some metals (7% Pt on SiO_2 , Ni), was investigated with respect to dehydrogenation and other reactions of cyclohexane in the adsorbed layer at temperatures from 20 to $-196^\circ C$. For comparison, the catalytic activity of non-irradiated samples was also studied. Cyclohexane and benzene were used as adsorbents, and EPR spectra were recorded. The sample with the adsorbed cyclohexane was irradiated at the temperature of liquid nitrogen, the dose varying from 1×10^7 to 1×10^8 rad. The selectivity of the investigated solid compounds in the radiation-excited catalytic process was es-
Cord 1/3

L 15296-65
ACCESSION NR: AP4047688

5

established as compared to the thermal catalytic process and homogeneous radiolysis. The highest radiation-induced catalytic activity was found at 200°C for oxides of the insulator type, which are hardly effective at all in the usual catalytic process even at high temperatures. In these catalysts, the appearance of paramagnetic centers and adsorbed C_6H_7 radicals was established. The semiconductors and metals (NiO, ZnO, Ni) which are active in the ordinary catalytic process had a low radiation-induced catalytic activity. No appearance of paramagnetic centers and adsorbed radicals was found. The relationship between the radiation-chemical yield of hydrogen and the coverage of the SiO_2 surface with adsorbed cyclohexane was established and it was found that the initial parts of surface adsorption were the most radiation-active. It was also established that there is a strong relationship between the electrical properties of solids and their ability to transmit the energy of ionizing radiation. This is due to the electronic mechanism of dehydrogenation and other reactions of cyclohexane. The formation of positive $C_6H_6^+$ ions during radiolysis of benzene adsorbed on silicagel shows the possible donor adsorption of cyclic hydrocarbons to radiation defects; this is additional evidence for the mechanism of radiation catalysis. The authors thank R. Kh. Burshteyn for providing the sample of Ni catalyst, and A. N. Ponomareva and G. L. Karpova for carrying out the mass-

2/3
Cord

L 15296-65

ACCESSION NR: AF4047688

spectrometric analysis." Orig. art. has: 5 figures and 2 tables.

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

SUBMITTED: 12Nov63

ENCL: 00

SUB CODE: 00

NO REF SOV: 007

OTHER: 008

Card 3/3

L 15296-65

ACCESSION NR: AP4047688

spectrometric analysis." Orig. art. has: 5 figures and 2 tables.

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

SUBMITTED: 12Nov63

ENCL: 00

SUB CODE: OC

NO REF SOV: 007

OTHER: 008

Card 3/3

BORESKOV, G.K.; BUKANAYEVA, F.M.; DPIS'KO, V.A.; KAZANSKIY, V.B.; PECHERSKAYA,
Yu.I.

Electron paramagnetic spectra of deposited chromium oxide catalysts
used for ethylene polymerization, and the nature of their activity.
Kin. i kat. 5 no.3:434-440 My-Je '64.

(MIRA 17:11)

1. Institut kataliza Sibirskogo otdeleniya AN SSSR i Institut khimi-
cheskoy fiziki AN SSSR.

L 6716-65

ACCESSION NUMBER

5 COC 04

AUTHOR: Borekov, G. K.; Kazanskiy, V. B., Mishchenko, Yu. A.

TITLE: The nature of active centers in hydrogen isotope exchange reaction on irradiated silica gel.

27

SOURCE: AN SSSR. Doklady*, v. 157, no. 2, 1964, 384-387

TOPIC TAGS: hydrogen, deuterium, silica gel, electron paramagnetic resonance spectrophotometry isotope exchange, irreversible adsorption, hydrogen deuterium exchange reaction

ABSTRACT: The purpose of this work was to study the nature of F-centers on irradiated silica gel by optical methods and by radiospectroscopy and their role in irreversible adsorption of hydrogen and catalysis of the irradiation reaction of hydrogen with deuterium.

11/11/64

11/11/64

11/11/64

L 6716-65

ACCESSION NR: AP4042209

2

centers. Orig. art. has: 2 tables and 3 figures.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics, Academy of Sciences SSSR). Institut kataliza Sibirskogo otdeleniya Akademii nauk SSSR (Institute of Catalysis Siberian Branch, Academy of Sciences SSSR)

SUBMITTED: 29 March

ENCL: 02

SUB CODE: NP, GC

NO REF SOV: 006

OTHER: 011

Card

3/5

L 6716-65
ACCESSION NR: AP4042209

ENCLOSURE: 01

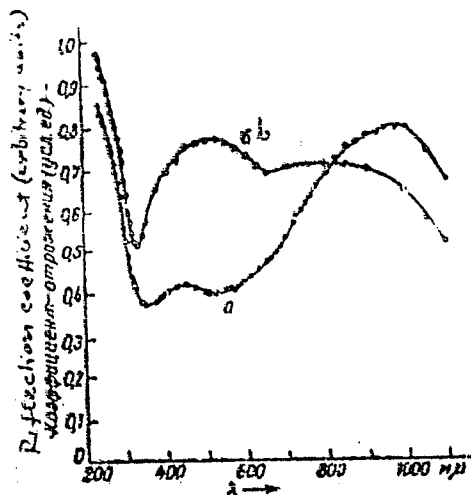


Fig. 1. Optical spectra of silica gel before (a) and after (b) adsorption of hydrogen at room temperature.

Card 5/5

L 6716-65
ACCESSION NR: AP4042209

ENCLOSURE: 02

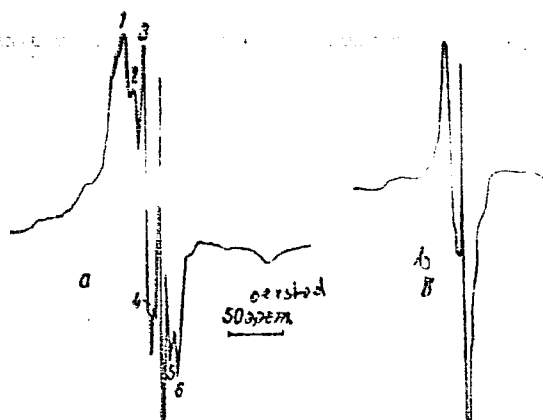


Fig. 2. EPR spectra of irradiated silica gel before (a) and after (b) adsorption of hydrogen.

Card 5/5

1. 5076-50 PW(1)/ED(4)-2/SEC(1) P1-7/P1-4 IJP(1) T
ACCESSION NR: AP5007041 S/0120/65/000/001/0123/0127

AUTHOR: Kazanskiy, V. B.; Stepin, L. D.; Ugrinskiy, L. L.

TITLE: Outfit for measuring the dielectric constant and dielectric-loss angle of
liquids in the 10 cm band

SOURCE: Priory i tekhnika eksperimenta, no. 1, 1965, 123-127

TOPIC TAGS: dielectric constant, dielectric loss, 10 cm band, dielectric liquid

ABSTRACT: The instrument is based on the H_{01n} -resonator method of measurement. The test liquid in a glass or quartz tube is placed along the resonator axis. Variation of the natural frequency and Q-factor of the resonator due to introduced specimen serves as a basis for estimating ϵ' and $\tan \delta$. A simple electron-tube circuit of the outfit is presented. And some data are explained. Data for distilled water, acetone, nitrobenzene, methyl and ethyl alcohols obtained with an error of $\pm 5\%$ and $\pm 17\%$ for ϵ' and $\tan \delta$ respectively is compared with that published by Western researchers. Orig. art. has 5 figures and 1 table.

Card 1/2

L 47076-65

ACCESSION NR: AP007041

ASSOCIATION: Khar'kovskiy universitet (Khar'kov University)

SUBMITTED: 10Jan64

ENCL: 60

SUB CODE: EC

NO REF SOY: 006

OTHER: 001

eye
Card 2/2

MASHCHENKO, A.I., SHUMAYEV, V.P.; KARAYONKIN, V.B.; KISELEV, V.V.

Appearance of electron paramagnetic resonance signals during the low-temperature adsorption of various gases on reduced rutile (TiO₂). Teoret. i eksper. khim. i no. 3: 381-386. My-Je '65.

(MIRA 18-9)

1. Institut Khimicheskoy Fiziki AN SSSR, Moskva.

PECHERSKAYA, Yu.I.; KAZANSKIY, V.B.

Relation between the catalytic activity of chromium oxide catalysts
and the valence state of chromium. *Kin. i kat.* 6 no.2:357-360 Mr-
Ap '65. (MIRA 18:7)

1. Institut khimicheskoy fiziki AN SSSR.

ALEKSANDROV, I.V.; KAZANSKIY, V.B.; MIKHEYKIN, I.D.

Electron paramagnetic resonance studies of the structure of active centers of chromium oxide catalysts for ethylene polymerization.
Kin. i kat. 6 no. 3:439-447 My-Je '65.

(MIRA 18:10)

1. Institut khimicheskoy fiziki AN SSSR.

PARIYSKIY, G.B.; MISHCHENKO, Yu.A.; KAZANSKIY, V.B.

Nature of radiation-induced surface defects in irradiated silica gel.
Part 1: Mechanism of hydrogen adsorption. *Kin. i kat.*, 6 no.4:625-633
Zh.-Ag '65. (MIRA 18:9)

i. Institut Khimicheskoy fiziki AN SSSR.

PECHERSKAYA, Yu.I.; KAZANSKIY, V.B.

Inhibition mechanism of ethylene polymerization on chromium oxide
catalysts. Dokl. AN SSSR 162 no.5:1101-1104 Je '65. (MIRA 18:7)

1. Institut khimicheskoy fiziki AN SSSR. Submitted December 3, 1964.

ACC NR: AN037010 (A, N) SOURCE CODE: UR/0181/66/008/011/3418/3420

AUTHOR: Kazanskiy, V. B.; Korolyuk, A. P.

ORG: Institute of Radiophysics and Electronics, AN UkrSSR, Kharkov (Institut radiofiziki i elektroniki AN UkrSSR)

TITLE: Giant quantum oscillations of the absorption coefficient of ultrasound in antimony

SOURCE: Fizika tverdogo tela, v. 8, no. 11, 1966, 3418-3420

TOPIC TAGS: ultrasound absorption, antimony, quantum oscillation, electron interaction, phonon interaction

ABSTRACT: In view of the increased interest in the characteristics and the Fermi surface of semimetals, the authors measured the amplitudes and periods of giant quantum oscillations in antimony using 350-MHz ultrasound at 1.8K, in magnetic fields up to 110 kOe. The magnetic field was produced by discharging a capacitor bank through a liquid-hydrogen cooled solenoid. The duration of the magnetic field pulse from maximum to 50 kOe was 0.25 sec. The oscillations were recorded with an oscilloscope. The sample was cut from a single crystal in the form of a disc 7 mm in diameter and 2.5 mm thick. The wave vector of the sound was perpendicular to the surface of the sample and parallel to the binary axis. The experimental values of the periods of the giant quantum oscillations were found to be in agreement with a theoretical formula derived by one of the authors earlier (Korolyuk, ZhETF v. 51, 697, 1966). The measured amplitudes are used to calculate the energy of the electron-

Card 1/2

ACC NR: APPROVED FOR RELEASE: 06/13/2000 CIA-RDP86-00513R000721320008-8"

phonon interaction, which is found to decrease from 7.2 to 6.0 eV at 0 and 30° respectively, and then increase to 6.3 eV at 36°. The anisotropy of the electron-phonon interaction energy is found to be small in the plane of the binary axis. The absolute value of the energy of the electron-phonon interaction in antimony is thus found to be close to its value in good metals, in spite of the low carrier density. Orig. art. has: 2 figures, 2 formulas, and 1 table.

SUB CODE: 20/ SUBM DATE: 02Jun66/ ORIG REF: 003/ OTH REF: 003

Card 2/2

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

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

(MIRA 17:12)

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

L 1435-66 EWT(m)/EPF(c)/EPF(n)-2/T GG/RM

ACCESSION NR: AP5020983

UR/0195/65/006/004/0625/0633

541.183;546.11 + 541.15 45

AUTHOR: Pariyskiy, G. B. ^{44.55}; Mishchenko, Yu. A. ^{44.55}; Kazanskiy, V. B. ^{44.55}

TITLE: Nature of surface radiation defects in irradiated silica gel. I. Mechanism of hydrogen adsorption ^{44.55} ^{19.55}

SOURCE: Kinetika i kataliz, v. 6, no. 4, 1965, 625-633

TOPIC TAGS: radiation defect, silica gel, aluminum impurity, radiation damage, hydrogen adsorption, color center, acid center

ABSTRACT: The irradiation of silica gel markedly affects its adsorptional and catalytic properties, since, owing to its highly developed surface, the proportion of surface defects in this substance is particularly large. Thus, irradiated silica gel irreversibly adsorbs hydrogen. The adsorption is accompanied by the disappearance of the color centers that had formed as a result of irradiation. Both effects are attributed by Kohn and Taylor (J. Phys. Chem. v. 63, 966, 1959; v. 66, 1017, 1962; J. of Catalysis v. 2, 208, 1963; Nature v. 184, 630, 1959) to the presence of aluminum impurities in the specimens; they have not, however, been successful in establishing the nature of the attendant radiation defects and the mechanism of hydrogen adsorption. Therefore, to elucidate these questions, the present ar-

Card 1/3

L 1435-66

ACCESSION NR: AP5020983

title describes their investigation by adsorptional, optical, and radiospectroscopic methods. Three varieties of silica gel, each obtained by a different method and having a different content of impurities, were investigated. The first, K-5, was obtained by hydrolysis of a SiCl_4 solution and had a surface area of $700 \pm 50 \text{ m}^2/\text{g}$. The two other specimens were obtained by adding H_2SO_4 to solutions of sodium silicate; the acid was added until a 1N acid solution was obtained, whereupon the precipitate was carefully washed to remove the sulfate ion and dried for 4 hr at 500°C . The surface area of both specimens, which were tagged silica gels I and II, was $300 \pm 50 \text{ m}^2/\text{g}$. The specimens were irradiated with a Co^{60} γ -radiation source (doses: 10^6 to $2.5 \times 10^7 \text{ r}$). Their absorption spectra in reflected light were then measured with an SF-4 spectrophotometer and their EPR spectra, with an EPR-2 radiospectrometer. It was found that ionizing radiation leads to the formation of free electrons and vacancies. Part of these electrons may be trapped by the protons of the acid centers that had formed as a result of the presence of aluminum impurity, thus leading to the formation of hydrogen. At room temperature the stabilization of H atoms does not occur, and they may react with hydroxyl groups, causing dehydration of the surface. Following departure of the H atom, on the Al atom there remains an uncompensated negative charge which may be neutralized when the vacancy on the adjacent O atom gets stabilized. Thus, the color centers forming under the

Card 2/3

L 1435-66

ACCESSION NR: AP5020983

action of irradiation and due to the presence of Al impurity in the specimens re-
present positively charged vacancies stabilized on the oxygen atoms adjacent to
the atoms of Al impurity. These defects are centers of irreversible adsorption of
hydrogen. "The authors wish to express their sincere gratitude to G. K. Borekov
for his interest in this project and discussion of the findings." Orig. art. hrs: 44.55
7 figures, 1 table. [16]

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

SUBMITTED: 17Feb64

ENCL: 00

SUB CODE: SS, NP

NO REF SOV: 006

OTHER: 014

ATD PRESS: 4100

Card 3/3 DP

L 1327-66 EWT(m)/EPF(c)/EPF(n)-2/EWP(j)/EWA(h)/EWA(1) GG/RM

ACCESSION NR: AP5024005

UR/0020/65/164/002/0361/0364

AUTHOR: Vladimirova, V. I.; Zhabrova, G. M.; Kadenatsi, B. M.; Kazanskiy, V. B.;
Pariyskiy, G. B.

TITLE: Radiation-catalytic conversion of methanol

SOURCE: AN SSSR. Doklady, v. 164, no. 2, 1965, 361-364

TOPIC TAGS: methanol, gamma radiation, radiation chemistry, electron paramagnetic resonance, free radical, silica gel, alumina, aluminum silicate, semiconductor, heterogeneous catalysis

ABSTRACT: The authors had established earlier that during the combined action of ionizing radiation and solids of different electronic properties, the dielectric-type oxides SiO₂, Al₂O₃, and aluminum silicate SiO₂·Al₂O₃, in which paramagnetic centers and adsorbed radicals were detected, displayed the greatest activity in the conversion of cyclohexane in the adsorbed layer, whereas semiconductors and metals, which had no paramagnetic centers or radicals, were inactive. In order to determine the scope of these findings, a similar study was made on the radiation-catalytic decomposition of methanol in the adsorbed layer at 20°C, Co⁶⁰ gamma radiation being used (dose rate, 4.3 x 10¹⁶ ev/g·sec; adsorbed radiation dose, 8.2 x 10¹⁹ to

Card 1/2

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7×10^{21} ev/g). It was found that as in the case of the heterogeneous radiolysis of cyclohexane, SiO_2 , Al_2O_3 , and $\text{SiO}_2 \cdot \text{Al}_2\text{O}_3$ were the most effective catalysts for methanol; the radiation-chemical yield and rate of formation of hydrogen, formaldehyde, and ethylene glycol on silica gel were ten times as high as in the case of homogeneous radiolysis. The electron spin resonance spectra of the radicals formed on SiO_2 and Al_2O_3 were recorded. Oxides with semiconducting properties such as ZnO showed a considerably lesser catalytic activity. The results confirm the relationship established earlier between the radiation-catalytic activity of solids and their electronic properties. The high radiation-chemical yields of hydrogen, formaldehyde, and ethylene glycol during decomposition of methanol on silica gel, aluminum oxide, and aluminum silicate are apparently closely related to the processes of transfer of the energy of ionizing radiation absorbed by these solids to the molecules adsorbed on the surface. Orig. art. has: 1 figure, 1 table. [14]

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