DAL', V.I., prof., doktor tekhn.nauk; FOMENKO, O.S., dotsent, kand.tekhn. nauk; MALYROV, B.M., kand.tekhn.nauk; AL'TERMAN, L.S., mladshiy nauchnyy sotrudnik; KEYTEL'GISSER, A.M., mladshiy nauchnyy sotrudnik

Coals from the western part of the Donets Basin as raw materials for complete processing into fuels and other materials. Ugol' Ukr. Vol.3 no.5:15-17 My '59. (MIRA 12:9)

1. Dnepropetrovskiy khimiko-tekhnologicheskiy institut im. F.E. Dzherzhinskogo.
(Donets Basin--Coal) (Coke industry) (Coal-tar products)

DAL', V.I.; FOMENKO, O.S.; KEYTEL'GISSER, A.M.

Studying the coals of Novo-Moskovsk deposit in the Ukraine as a raw material for chemical industries. Ugol' Ukr. 6 no.2:20 F '62. (MIRA 15:2)

1. Dnepropetrovskiy khimiko-tekhnologicheskiy institut.
(Dnieper Basin—Coal)

KEYTEL'GISSER, I. N.

Dissertation: "Investigation of an Intermediate Product From Coal Dressing Plants and the Development of a Flowsheet for Its Dressing." Cand Tech Sci, Moscow Mining Inst, Moscow, 1953. Referativnyy Zhurnal--Khimiya, Moscow, No 13, Jul 54.

SO: SUM No. 356, 25 Jan 1955

KEYTEL'GISSER, I.N., kand.tekhn.nauk; PIGOROV, G.S.; ZHURAVEL', V.A.; RYNDAK, S.A.; PROKUDENKO, N.G.

Improvement of the water-pulp handling operations in the coal preparation section of the Zaporozh'ye Coke and Coal Chemicals Plant. Koks i khim. no.2:13-15 '64. (MIRA 17:4)

1. Ukrainskiy proyektno-konstruktorskiy i nauchno-issledovatel'skiy institut po obogashcheniyu i briketirovaniyu ugley (for Keytel'gisser, Pigorov, Zhuravel'). 2. Zaporozhskiy koksokhimicheskiy zavod (for Prokudenko).

BLAGOV, I.S., inzh.; KEYTEL'GISSER, I.N., kand. tekhn. nauk

Reducing the number of workers employed in coal preparation.
Ugol' Ukr. 2 no.2:23-26 F '58. (MIRA 13:3)
(Coal preparation) (Automatic control)

SHAPIRO, M.D., kand.tekhn.nauk; AL'TERMAN, L.S.; KEYTEL'GISSER, S.R.

Effect of the degree of fineness of crushing on the properties of the plastic mass of coals and charges. Koks i khim. no.9:10-14 '63. (MIRA 16:9)

1. Dnepropetrovskiy khimiko-tekhnologicheskiy institut.
(Coke) (Coal preparation)

S/638/61/001/000/046/056
B116/B138

AUTHORS: Keytlin, L. G., Starodubtsev, S. V.

TITLE: Variation of absorption bands in the spectrum of dyed polymethyl methacrylate under the action of gamma rays

SOURCE: Tashkentskaya konferentsiya po mirnomy ispol zovaniyu atomnoy energii. Tashkent, 1959. Trudy. v. 1. Tashkent, 1961, 279 - 281

TEXT: According to M. I. Day and Stein (Nature, 168, 644, 1951), the color change of dyed polymer during irradiation is due to fixation of the dyestuff of electrons (which are separated out during irradiation). This present paper endeavours to clarify this theory. The color change of thin polymethyl methacrylate plates was studied under the action of gamma rays using benzene-azo-alpha-naphthylamine as the dyestuff. To study the effect of admixtures, both plates without admixtures, and with dichloro ethane or benzene, were used. They were irradiated in vacuo at a dose rate of $3.5 \cdot 10^5$ r/hr. Under irradiation of the dyed polymethyl methacrylate

Card 1/2

STARODUBTSEV, S.V., akademik; ABLYAYEV, Sh.A.; BAKHRAMOV, F.; KEYTLIN, L.G.; YUSOVA, E.N.

Studying the molecular transformations in natural gas provoked by a high-frequency electric discharge. Izv. AN Uz. SSR. Ser. fiz.-mat. nauk no. 2:3-11 '61. (MIRA 14:5)

1. Fiziko-tekhnicheskiy institut AN UzSSR. 2. Akademiya nauk UzSSR (for Starodubtsev).

(Gas, Natural) (Electric discharges through gases)

36768
S/081/62/000/001/066/067
B119/B101

AUTHORS: Keytlin, L. G., Starodubtsev, S. V.

TITLE: Change of absorption bands in the spectrum of colored polymethyl methacrylate under the action of γ rays

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 1, 1962, 567, abstract 1R7 (Tr. Tashkentsk. konferentsii po mirn. ispol'zovaniyu atomn. energii, 1959. v. I. Tashkent, AN UzSSR, 1961, 279-281)

TEXT: The authors studied the effect of γ rays on the absorption spectrum of polymethyl methacrylate foils colored with the indicator benzene azo-α-naphthylamine. The irradiation caused a gradual decrease of the initial maximum at the wavelength λ = 440 mμ and the formation of a new one at λ = 550 mμ. The new maximum attains its highest value at a dose of $1.7 \cdot 10^7$ roentgens, and decreases again on a further dose increase to $4.2 \cdot 10^7$ r. Dichloro ethane admixed to the polymer accelerates the color change on irradiation. Benzene has a protecting effect: in the absorption

Card 1/2

Change of absorption ...

S/081/62/000/001/066/067
B119/B101

spectrum obtained on evaporation of polymer+dyestuff solutions in benzene, the band at 440 mμ disappears on irradiation, but a new maximum is not produced. The change of the absorption spectrum of colored polymer on irradiation reminds of the change of spectrum of an indicator solution with addition of acid. In both cases, the color changes owing to an addition of protons (or electrons) to the dyestuff. [Abstracter's note: Complete translation.]

X

Card 2/2

STARODUBTSEV, S.V.; ABLYAYEV, Sh.A.; KEYTLIN, L.G.

Study of molecular transformations in a natural gas caused by electrodeless high-frequency discharges. Izv. AN Uz. SSR. Ser. fiz.-mat. nauk 6 no.5:50-57 '62. (MIRA 15:11)

1. Fiziko- tekhnicheskiy institut AN UzSSR.
(Gas, Natural) (Electric discharges)

S/166/62/000/006/006/016
B101/B186

AUTHORS: Starodubtsev, S. V., Ablyayev, Sh. A., Bakhramov, F., Ziyatdinov, Sh., Keytlin, L. G.

TITLE: Study of molecular conversions in natural gas under the action of electrodeless high-frequency discharges. III. Effect of the wattage of high-frequency discharges and gas pressure in the discharge tube on electrocracking

PERIODICAL: Akademiya nauk Uzbekskoy SSR. Izvestiya. Seriya fiziko-matematicheskikh nauk, no. 6, 1962, 53 - 60

TEXT: To clarify the basic mechanism of electrocracking, methane was cracked at various wattages (20 - 180 w), pressures (20 - 60 mm Hg), and contact times τ (0.01 - 2.4 sec); total cracking and the yields of ethane, ethylene, acetylene, propane, propylene, butylenes, and hydrogen was determined. Total cracking increased with wattage: the rise was gradual up to ~30 w, τ = 0.05 sec, steep between 30 and 100 w, and then gradual again. The steep section of the curve corresponds to the range where a chain mechanism operates. The threshold limit of the wattage at which the steep rise sets in decreases with increasing τ. The yields of ethane and

Card 1/3

ethylene fall with increasing wattage for τ = const. No C_2H_6 or C_2H_4 is formed at 140 - 150 w. The yield of acetylene increases with the wattage, passes a maximum at a certain wattage depending on τ, and then falls steadily. The maximum C_2H_2 yield is 11% at 50 w and τ = 0.8 sec, and 22.5% at 100 w and τ = 0.3 sec. Diacetylene forms at low wattages. More and more liquids are formed with increasing wattage, and diacetylene disappears due to formation of cyclohydrocarbons. For propane and propylene, there is also a maximum at 50 w and τ = 0.4 sec which vanishes at high wattages, probably being shifted toward very short τ. The yield maxima for C_3H_8 and C_3H_6 lie in the range where intense decomposition of C_2H_6 and C_2H_4 begins. Butylenes form only at low wattages, they are no longer detectable at 140 w. The hydrogen yield, however, rises continuously with w and τ. The specific energy consumption for a tube 2.5 cm in diameter and for τ = 0.3 sec was 70 w·hr per mole of cracked CH_4, and 280 w·hr per mole of resulting C_2H_2. The corresponding values for a diameter of 9.1 cm and τ = 0.3 sec were 65 and 260 w·hr. Increasing pressure has the same effect as increasing wattage on the cracking and the yield of decomposition products. Experiments with tubes of different diameters d showed that total cracking depends linearly

Card 2/3

on the surface/volume ratio. Total cracking in two tubes of different d in proportional to d_2^2/d_1^2, which may be explained by the termination on the walls of the tubes. Furthermore, the yield of the individual products depends on d, and this requires further investigation. There are 7 figures and 1 table.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN UzSSR (Physicotechnical Institute AS UzSSR)

SUBMITTED: July 13, 1962

Card 3/3

STARODUBTSEV, S.V.; ABLYAYEV, Sh.A.; BAKHRAMOV, F.; ZIYATDINOV, Sh.; KEYTLIN, L.G.

Study of molecular transformations in a natural gas caused by electrodeless high-frequency discharges. Part 2. Effect of certain physical factors and impurities on electric cracking. Izv. AN Uz. SSR. Ser. fiz.-mat. nauk 6 no.5:58-65 '62. (MIRA 15:11)

1. Fiziko-tekhnicheskiy institut AN UzSSR.
(Cracking process)

STARODUBTSEV, S.V.; ABLYAYEV, Sh.A.; BAKHRAMOV, F.; KEYTLIN, L.G.; YUSOVA, E.N.

Study of the electrocracking of natural gas by the method of vibrational spectra. Zav. lab. 29 no.6:707-708 '63. (MIRA 16:6)

1. Fiziko-tekhnicheskiy institut AN UzbSSR.
(Gas, Natural—Absorption spectra)
(Cracking process)

KEYVSAN, Z. I.

With Komarov, S. G. "Permeability of Oil Bearing Strata Determined by Specific Resistivities."

p. 171 in book Applied Geophysics; Collection of Articles, No. sp, Moscow Gostoptekhizdat, 1958, 267p.

These articles are concerned with the methodology of interpreting the results of gravimetric, seismic and electrical surveys. Review the collecting properties of rocks on the basis of data obtained from resistometers and the application of charged particle accelerators in well logging.

KEYVSAR, Z. I.

"Relationship Between Relative Resistivity, Porosity, Permeability and Specific Surface."

p. 186 in book Applied Geophysics, Collection of Articles, No. 19 Moscow, Gostoptekhizdat, 1958, 253pp.

The articles are devoted to a discussion of methods of interpreting various types of electrical logs, methods of determining the porosity, permeability, and specific surface characteristics of water bearing rocks, and methods of determining the physical properties of sidements and the characteristics of various physical parameters. A description of piezoelectric pressure recorders used in seismic exploration is also given.

KEY/SAR, Z.I.

Relationship between the relative resistance and the porosity, specific surface, and the permeability of rocks. Prikl. geofiz. no.19:186-194 '58. (MIRA 11:4)
(Petrology) (Logging (Prospecting))

KOMAROV, S.G.; KHYVSAR, Z.I.; KOZINA, Z.K.; SKOBLIKOVA, G.I.; GUZANOVA, I.G.

Determining porosity by spontaneous polarization curves. Prikl. geofiz. no.25:192-215 '60. (MIRA 13:6)
(Electric prospecting)

KEYVISH, A.V.

In the Cold Storage Warehouse No.2 in Riga. Khol. tekh. 42 no.4: 51-52 Jl-Ag '65. (MIRA 18:9)

1. Rizhskiy kholodil'nik No.2 Upravleniya myasnoy i molochnoy promyshlennosti Soveta narodnogo khozyaystva Latviyskoy SSR.

GEDOYAN, P.I.; KOLESNICHENKO, G.D.; KEYYAN, A.P.

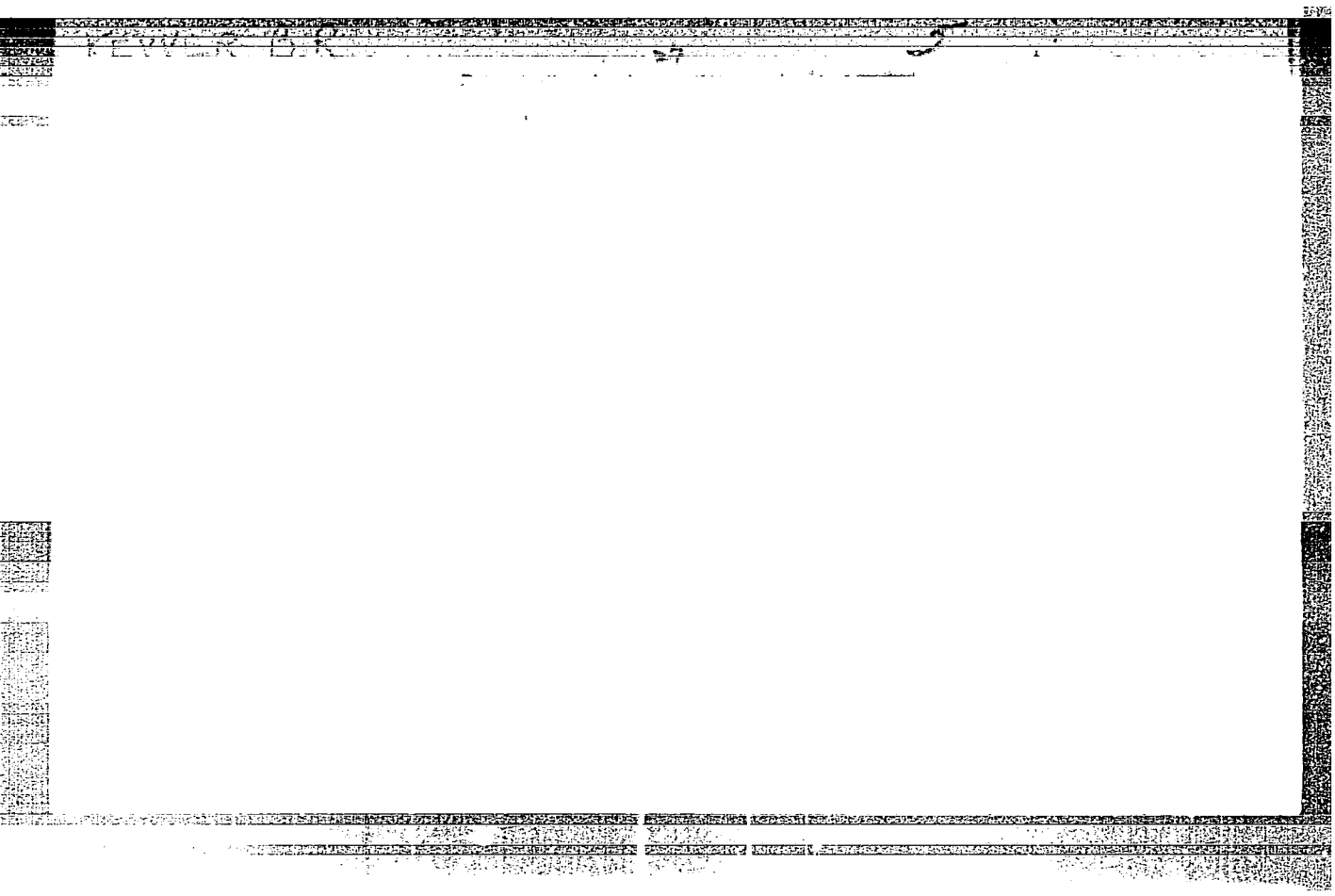
Examination of the protein fractions of the blood serum skin diseases by paper electrophoresis. Vest.derm. i ven. no.9:29-34'62. (MIRA 16:7)
(BLOOD PROTEINS) (SKIN—DISEASES)
(PAPER ELECTROPHORESIS)

[illegible] A.E. (Leningrad, Bol'shoye Moskovskaya ul., [illegible])

Characteristics of a long stump of the arm. Ortop., travm. i protez. 25 no.12:23-27 D '64.

(MIR 18:1)

1. Iz Leningradskogo instituta protezirovaniya (direktor - dotsent M.V. Strukov). Submitted January 7, 1964.



APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000721620008-5"

KEYER, B.R.

KOLESNIKOVA, T.V.; KEYER, B.R.

Softening of water with ammonium zeolite. Gidroliz. i lesokhim.prom. 11 no.8:24-25 '58. (MIRA 11:12)

1. Krasnodarskiy gidrolizuyy zavod (for Kolesnikova). 2. Byuro vodoochistki Orgenergobuma (for Keyyer).
(Feed-water purification)

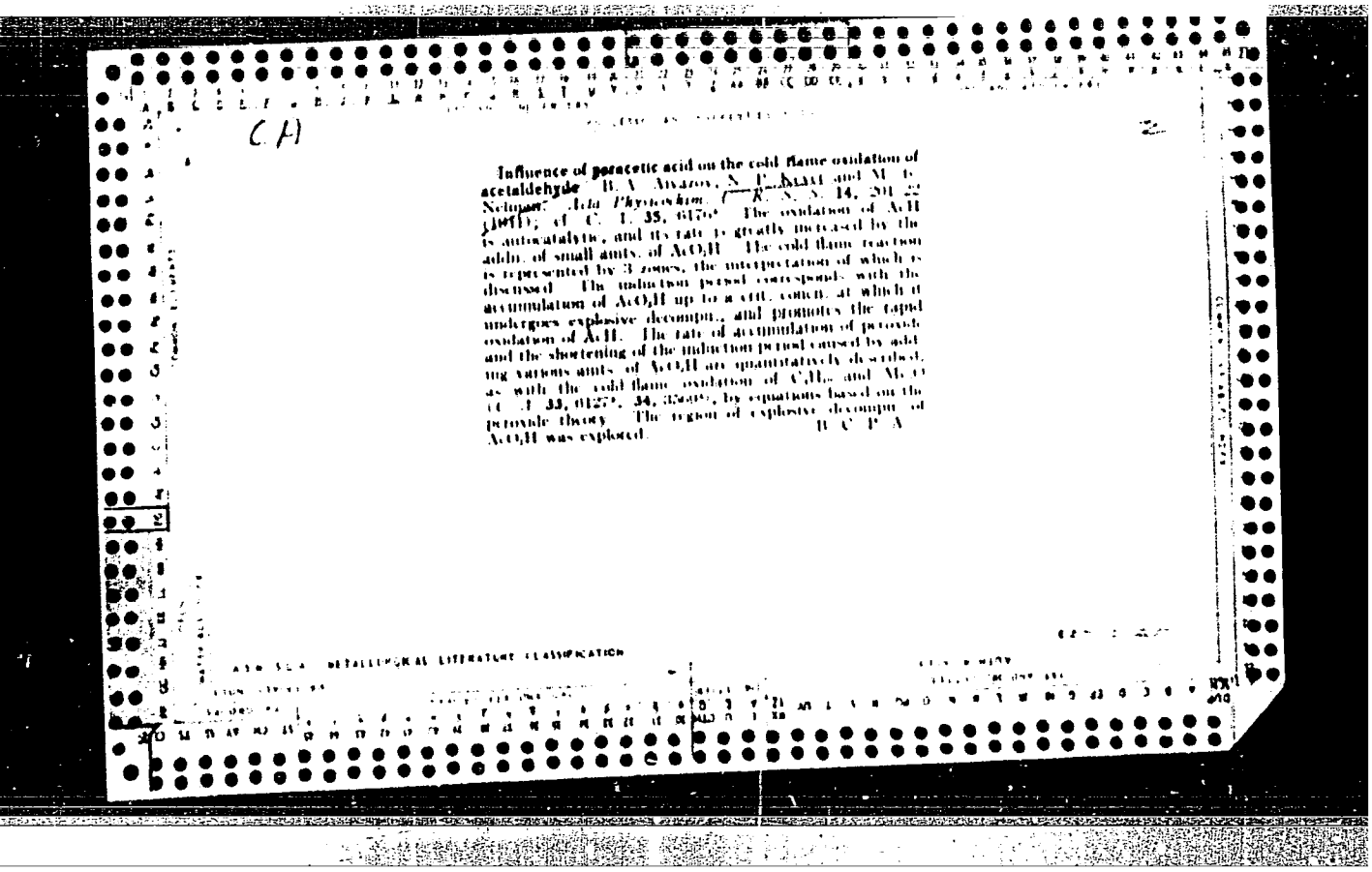
AYVAZOV, B. V.; KEYER, N. I.; NEYMAN, M. B.

Leningrad

Laboratory of Hydrocarbon Reactions, Institute of Chemical Physics, Academy of Sciences USSR, (-1940-).

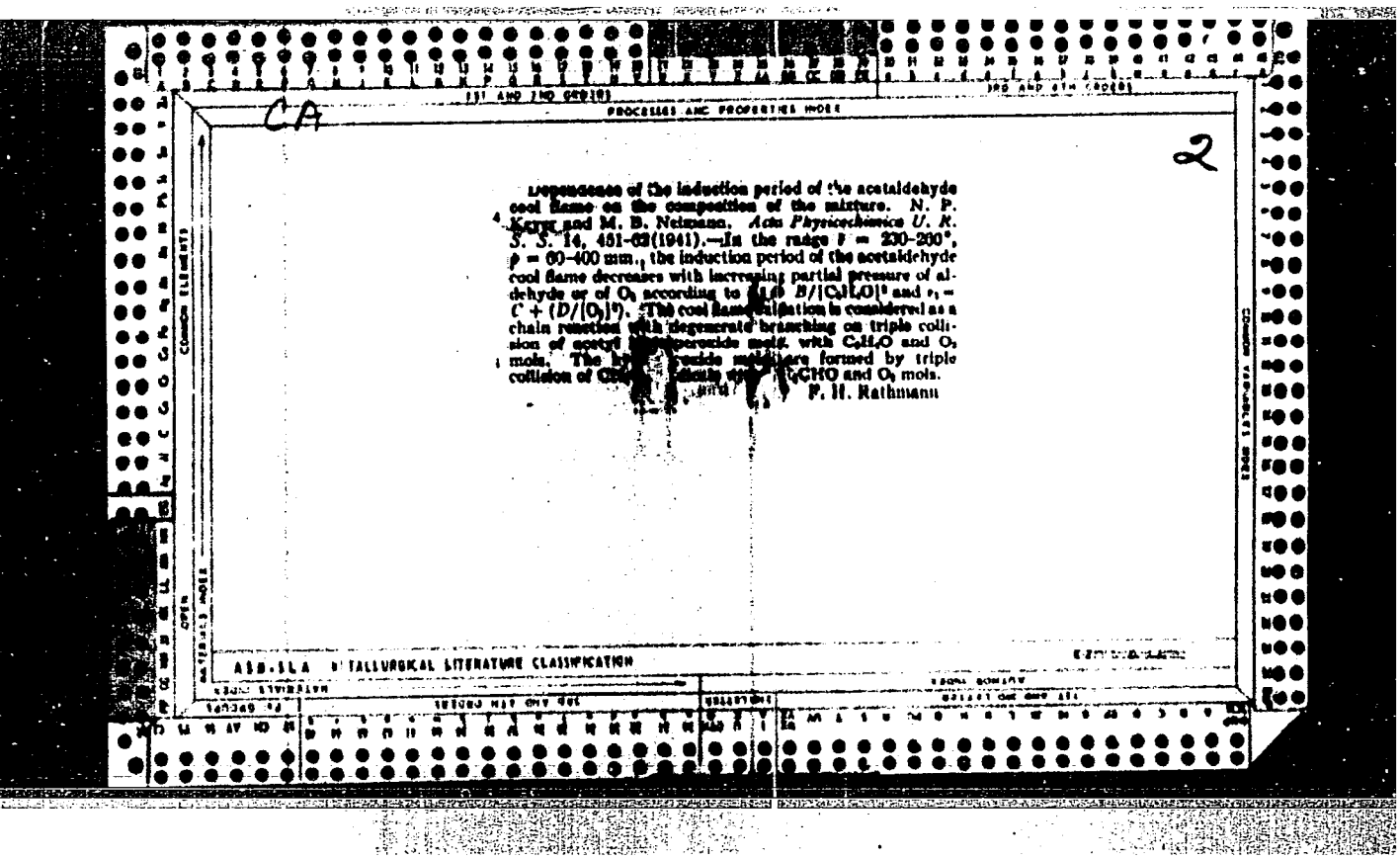
"Examination of the Conditions of Combustion of Gaseous Mixtures." Part XVI. "The Effect of Acetyl Hydrogen Peroxide on the Cold-Flame Oxidation of Acetaldehyde."

Zhur. Fiz. Khim., Vol. 14, No. 12, 1940.



(A)

Influence of peracetic acid on the cold flame oxidation of acetaldehyde. B. A. Arbuzov, N. P. Kazan and M. B. Neiman. *Izdat. Akad. Nauk S.S.S.R.* [Russ.] 14, 201-22 (1951); cf. C. A. 35, 6175⁶. The oxidation of AcH is autocatalytic, and its rate is greatly increased by the addn. of small amts. of AcO$_3$H. The cold flame reaction is represented by 3 zones, the interpretation of which is discussed. The induction period corresponds with the accumulation of AcO$_3$H up to a crit. concn. at which it undergoes explosive decompn., and promotes the rapid oxidation of AcH. The rate of accumulation of peroxide and the shortening of the induction period caused by adding various amts. of AcO$_3$H are quantitatively described, as with the cold flame oxidation of C$_6$H$_{12}$ and MeOH (C. A. 33, 6127⁹, 34, 3300⁵), by equations based on the peroxide theory. The region of explosive decompn. of AcO$_3$H was explored. B. C. P. A.



CA

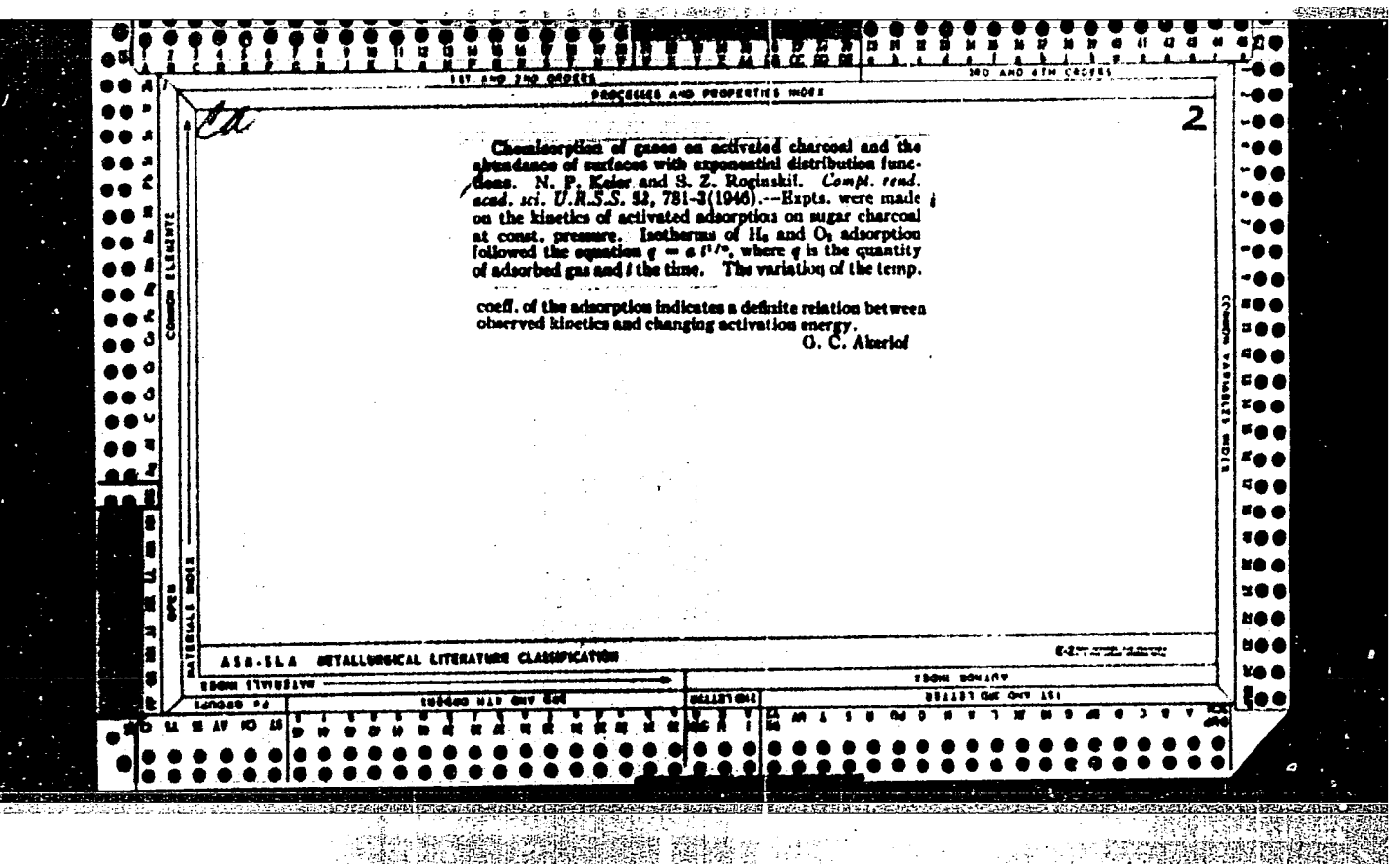
2

PROCESSES AND PROPERTIES INDEX

Dependence of the induction period of the acetaldehyde cool flame on the composition of the mixture. N. P. Keiko and M. B. Neiman. *Acta Physicochimica U. R. S. S.* 14, 451-68(1941).—In the range t = 230-260°, p = 60-400 mm., the induction period of the acetaldehyde cool flame decreases with increasing partial pressure of aldehyde or of O_2 according to $\tau_i = B/[C_2H_4O]^2$ and $\tau_i = C + (D/[O_2])$. The cool flame oxidation is considered as a chain reaction with degenerate branching on triple collision of acetyl peroxide radicals with C_2H_4O and O_2 mols. The [illegible] peroxide radicals are formed by triple collision of CH_3 [illegible] with CH_3CHO and O_2 mols.

P. H. Rathmann

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

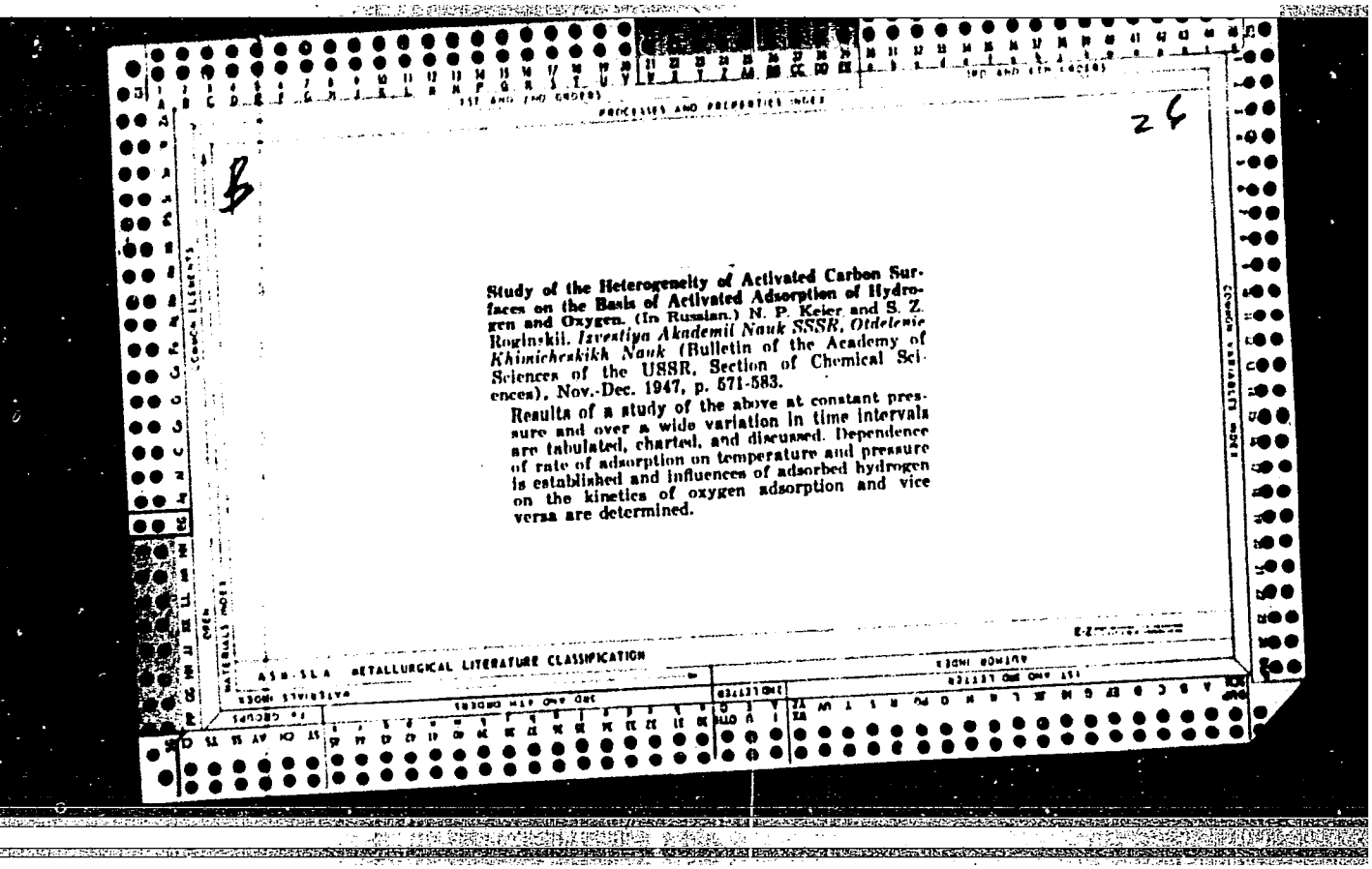


2

Chemisorption of gases on activated charcoal and the abundance of surfaces with exponential distribution functions. N. P. Keier and S. Z. Roginskii. *Compt. rend. acad. sci. U.R.S.S.* 52, 781-3(1946).--Expts. were made on the kinetics of activated adsorption on sugar charcoal at const. pressure. Isotherms of H_2 and O_2 adsorption followed the equation $q = a t^{1/n}$, where q is the quantity of adsorbed gas and t the time. The variation of the temp. coeff. of the adsorption indicates a definite relation between observed kinetics and changing activation energy.

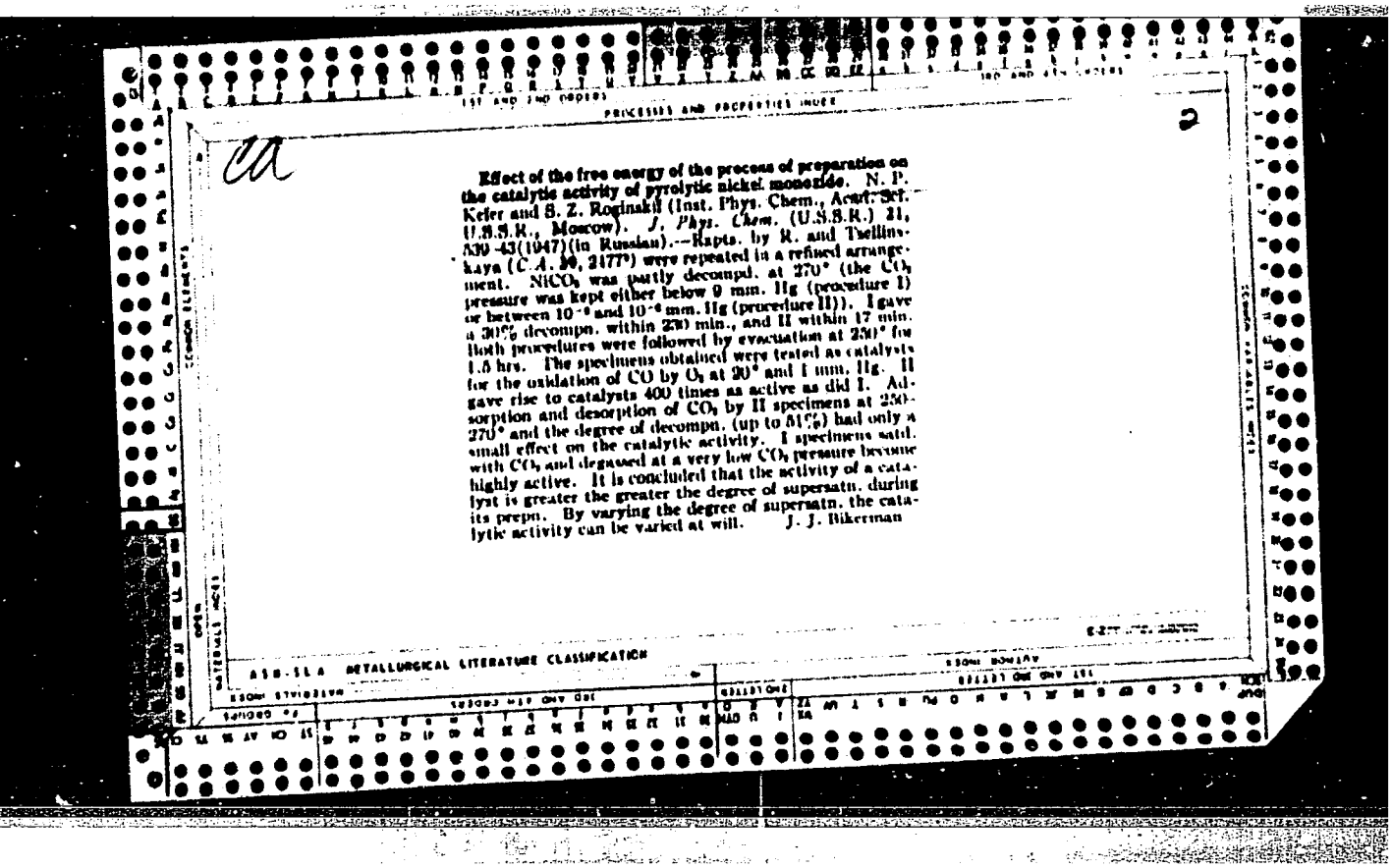
O. C. Akeriof

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

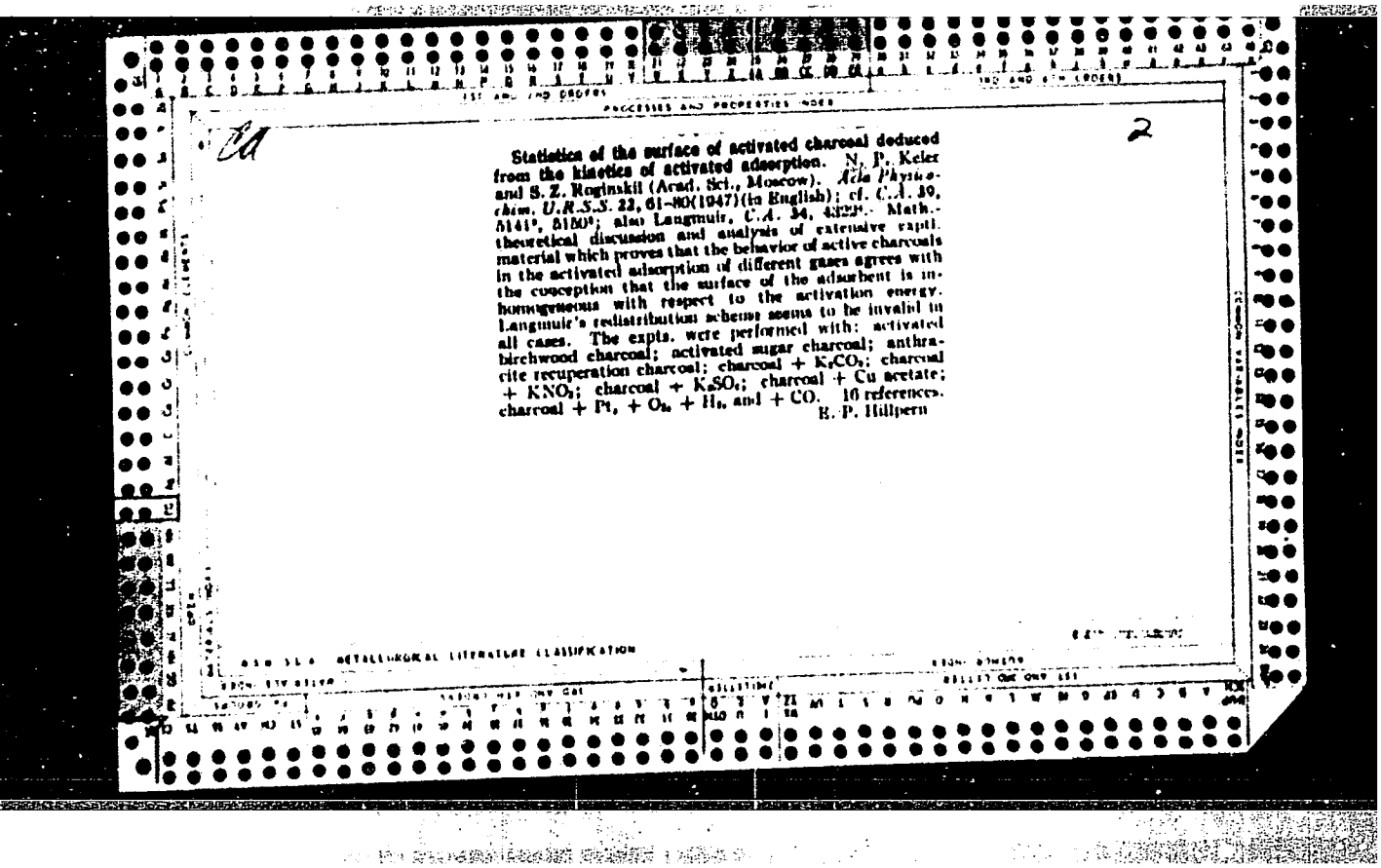


Study of the Heterogeneity of Activated Carbon Surfaces on the Basis of Activated Adsorption of Hydrogen and Oxygen. (In Russian.) N. P. Keier and S. Z. Roginskii. *Izvestiya Akademii Nauk SSSR, Otdelenie Khimicheskikh Nauk* (Bulletin of the Academy of Sciences of the USSR, Section of Chemical Sciences), Nov.-Dec. 1947, p. 571-583.

Results of a study of the above at constant pressure and over a wide variation in time intervals are tabulated, charted, and discussed. Dependence of rate of adsorption on temperature and pressure is established and influences of adsorbed hydrogen on the kinetics of oxygen adsorption and vice versa are determined.



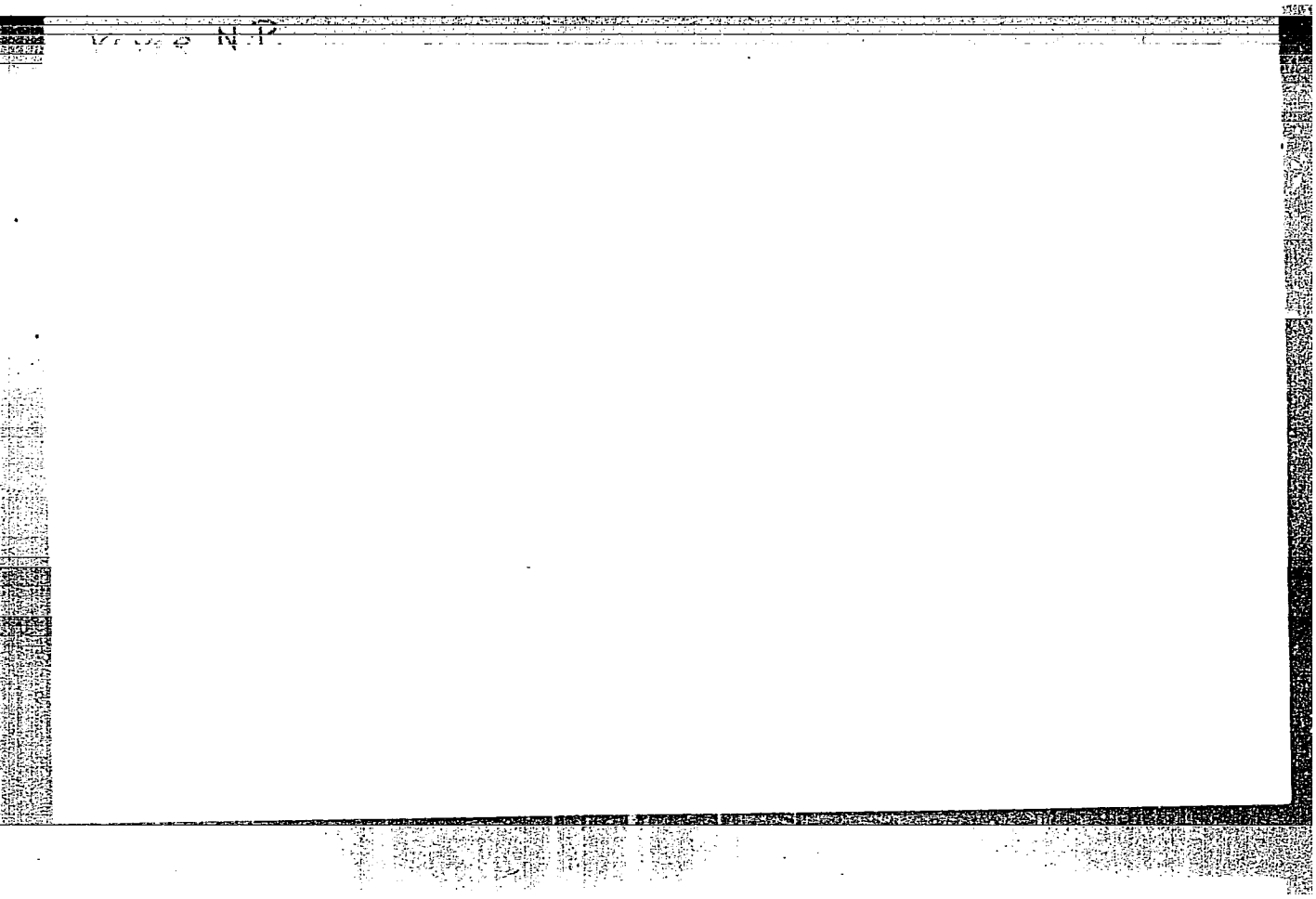
Effect of the free energy of the process of preparation on the catalytic activity of pyrolytic nickel monoxide. N. P. Keier and S. Z. Roginskii (Inst. Phys. Chem., Acad. Sci. (U.S.S.R., Moscow). *J. Phys. Chem.* (U.S.S.R.) 21, 439-43(1947)(in Russian).—Rapts. by R. and Tsellinskaya (*C.A.* 30, 2177⁹) were repeated in a refined arrangement. $NiCO_3$ was partly decompd. at 270° (the CO_2 pressure was kept either below 9 mm. Hg (procedure I) or between 10^{-3} and 10^{-4} mm. Hg (procedure II)). I gave a 30% decompn. within 230 min., and II within 17 min. Both procedures were followed by evacuation at 250° for 1.5 hrs. The specimens obtained were tested as catalysts for the oxidation of CO by O_2 at 20° and 1 mm. Hg. II gave rise to catalysts 400 times as active as did I. Adsorption and desorption of CO_2 by II specimens at 250-270° and the degree of decompn. (up to 81%) had only a small effect on the catalytic activity. I specimens satd. with CO_2 and degassed at a very low CO_2 pressure became highly active. It is concluded that the activity of a catalyst is greater the greater the degree of supersatn. during its prepn. By varying the degree of supersatn. the catalytic activity can be varied at will. J. J. Bikerman



Statistics of the surface of activated charcoal deduced from the kinetics of activated adsorption. N. P. Keier and S. Z. Roginskii (Acad. Sci., Moscow). *Acta Physicochim. U.R.S.S.* 22, 61–80(1947)(in English); cf. *C.A.* 39, 5141⁹, 5180⁹; also Langmuir, *C.A.* 34, 4225⁹. Math.-theoretical discussion and analysis of extensive experimental material which proves that the behavior of active charcoals in the activated adsorption of different gases agrees with the conception that the surface of the adsorbent is inhomogeneous with respect to the activation energy. Langmuir's redistribution scheme seems to be invalid in all cases. The expts. were performed with: activated birchwood charcoal; activated sugar charcoal; anthracite recuperation charcoal; charcoal + K_2CO_3; charcoal + KNO_3; charcoal + K_2SO_4; charcoal + Cu acetate; charcoal + Pt, + O_2 + H_2, and + CO. 16 references.
B. P. Hillpern

CA

A differential isotopic method for the investigation of activated surfaces. N. P. Keier and S. Z. Roginskii. *Doklady Akad. Nauk S.S.S.R.* 57, 157-9(1947); *Chem. Zentr.* (Russian Zone Ed.) 1948, II, 471; cf. *C.A.* 42, 3838c.—All adsorbed gases were removed from activated sugar C by long heating at 1100°. The C was protected against adsorption during subsequent cooling. H_2 and D_2 at the temp. of liquid air were led over the C in order that adsorption might take place. Desorption was accomplished by slowly raising the temp. The compn. of the gases evolved was detd. by measuring the change in the resistance of a Wollaston filament through which a const. current flowed (exactly 3 ma.). This could be done because the thermal cond. of the gases is a function of their compn. The course of the desorption process was independent of the size of the mole. The gas adsorbed last was evolved first; then a mixt. of H_2 and D_2 was evolved; then the gas adsorbed first was evolved. The results indicate that the phenomenon is one of "energetic inhomogeneity" of the surface (different adsorption areas) rather than one involving spaces of varying accessibility. The adsorption isotherm obtained is similar to that of Freundlich; the distribution function ρ follows closely the exponential relation $\rho = He^{-\alpha Q}$, in which Q is the heat of adsorption and α is the coeff. of inhomogeneity. M. G. Moore



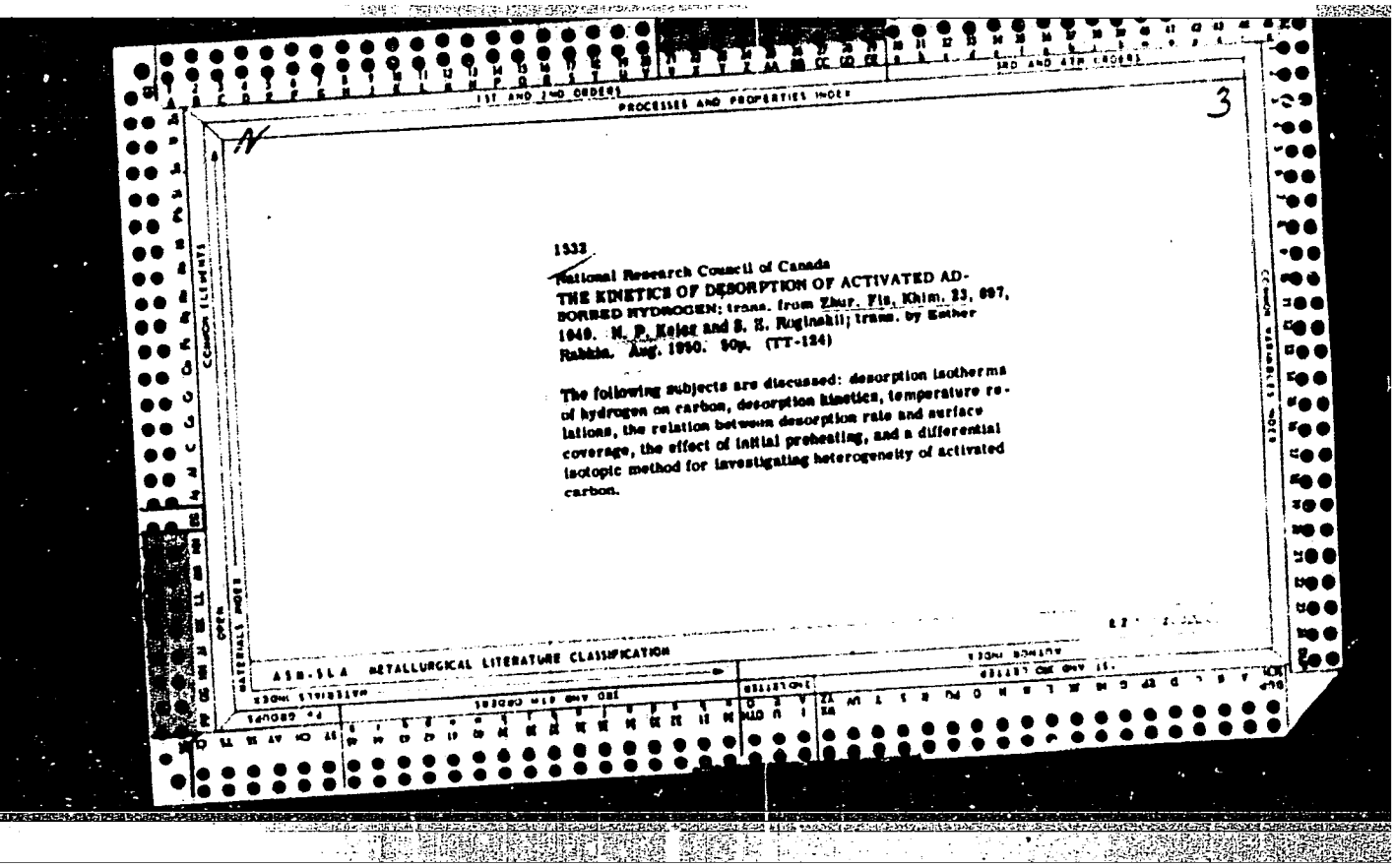
KEIER, N. P.

Keier, N. P., and Roginskiy, S. Z., The kinetics of desorption of activated adsorbed hydrogen. P. 897

Continuing the detailed checking of the conclusions of the statistical theory, the authors decided to study the kinetics of desorption for several systems, the first of which was hydrogen on active charcoal from sugar. This study showed that the surface of charcoal from sugar is highly heterogeneous in the activation energy of hydrogen and therefore the basic conclusions of the statistical theory are applicable.

SO: Journal of Physical Chemistry, (USSR) 23, No. 8, (1949)

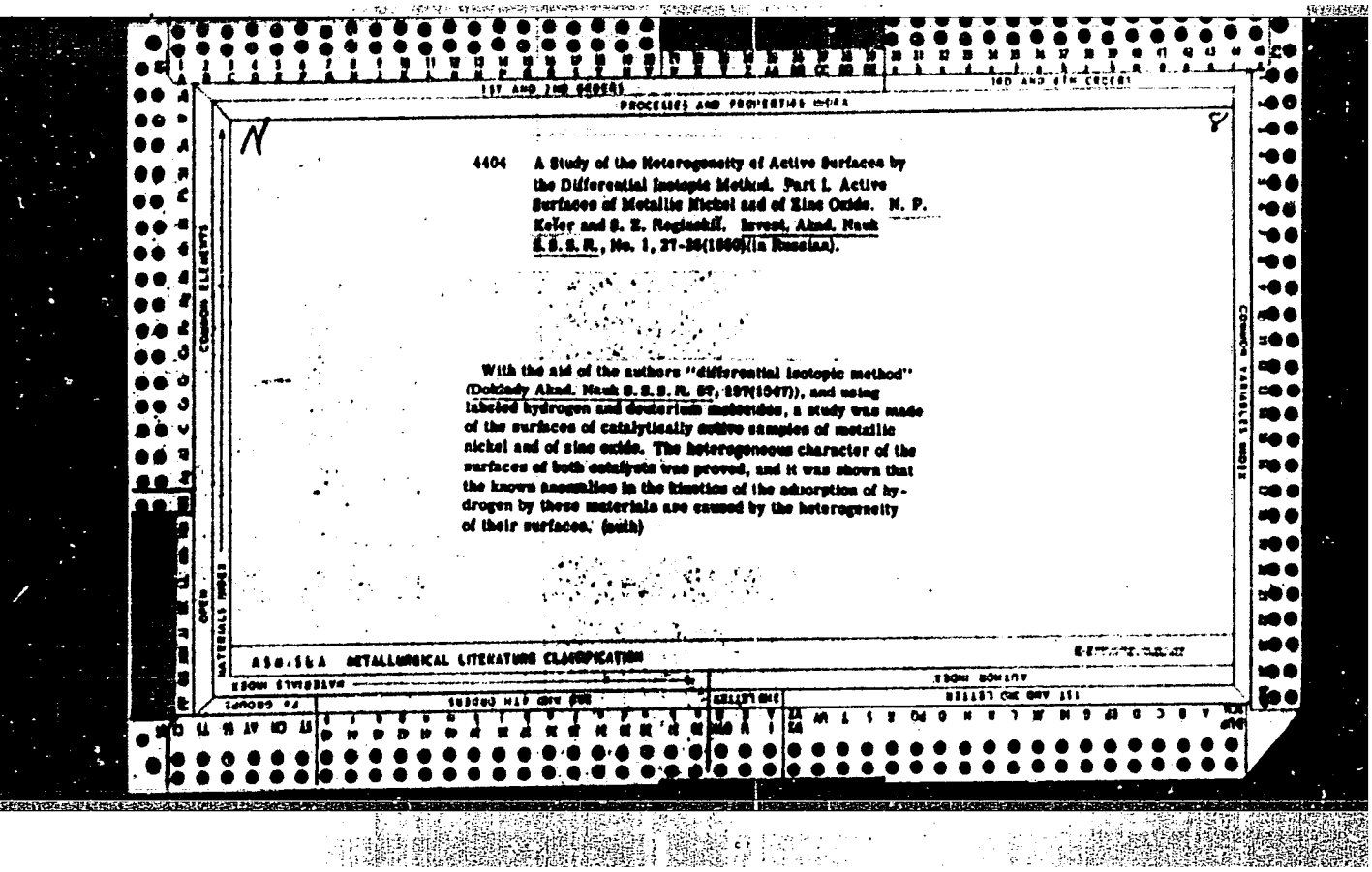
Inst. Phys. Chem, AS USSR



1333

National Research Council of Canada
THE KINETICS OF DESORPTION OF ACTIVATED ADSORBED HYDROGEN; trans. from Zhur. Fiz. Khim. 23, 897, 1949. N. P. Keier and S. Z. Roginskii; trans. by Esther Rabkin. Aug. 1950. 90p. (TT-124)

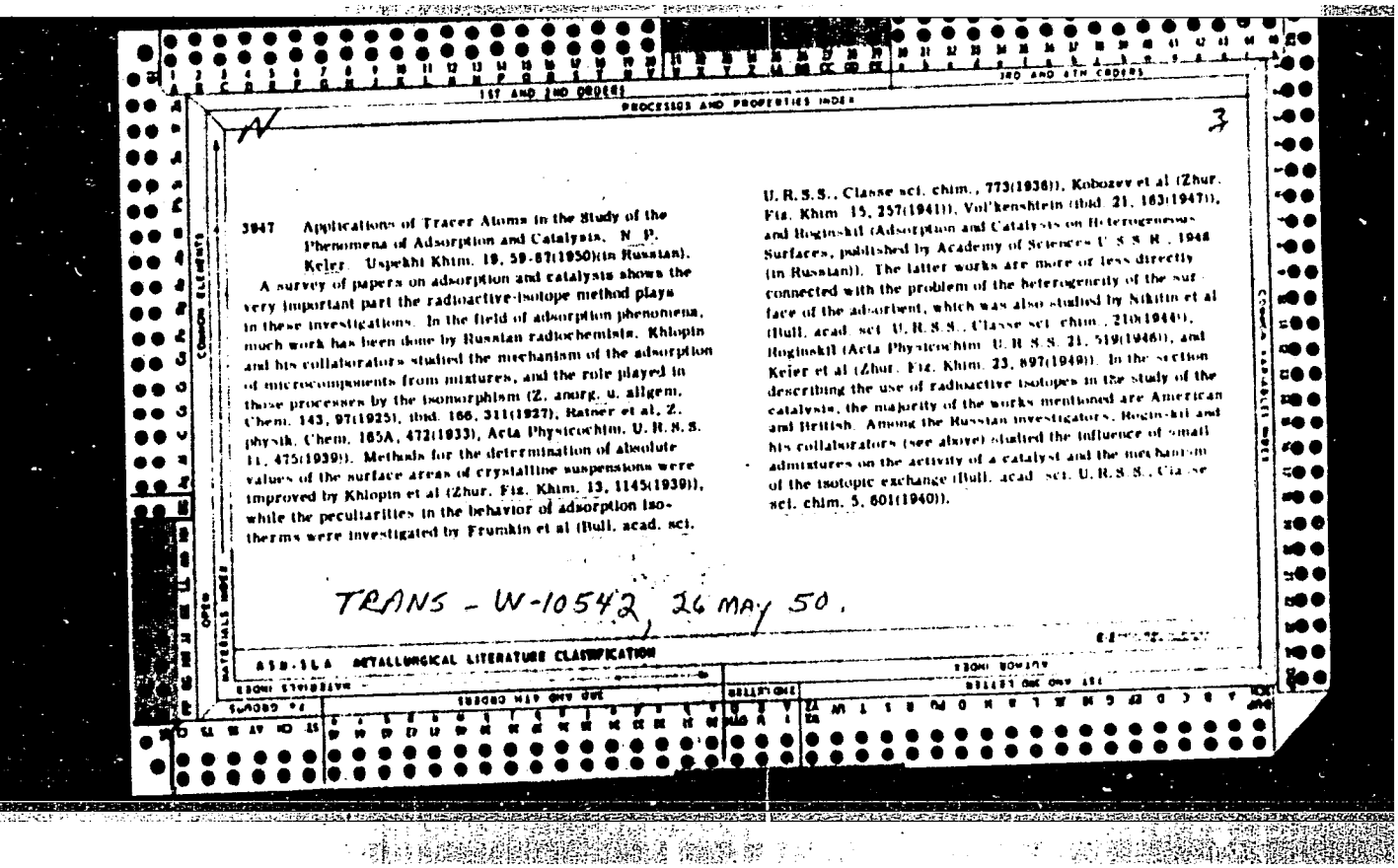
The following subjects are discussed: desorption isotherms of hydrogen on carbon, desorption kinetics, temperature relations, the relation between desorption rate and surface coverage, the effect of initial preheating, and a differential isotopic method for investigating heterogeneity of activated carbon.



4404 A Study of the Heterogeneity of Active Surfaces by the Differential Isotopic Method. Part I. Active Surfaces of Metallic Nickel and of Zinc Oxide. N. P. Keier and S. Z. Roginskiĭ. Izvest. Akad. Nauk S.S.S.R., No. 1, 27-36(1948)(in Russian).

With the aid of the authors "differential isotopic method" (Doklady Akad. Nauk S.S.S.R. 57, 197(1947)), and using labeled hydrogen and deuterium molecules, a study was made of the surfaces of catalytically active samples of metallic nickel and of zinc oxide. The heterogeneous character of the surfaces of both catalysts was proved, and it was shown that the known anomalies in the kinetics of the adsorption of hydrogen by these materials are caused by the heterogeneity of their surfaces. (auth)

ASS.SEA METALLURGICAL LITERATURE CLASSIFICATION



1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3rd AND 4th ORDERS

3

3947 Applications of Tracer Atoms in the Study of the Phenomena of Adsorption and Catalysis. N. P. Keier. Uspekhi Khim. 19, 59-87(1950)(in Russian).

A survey of papers on adsorption and catalysis shows the very important part the radioactive-isotope method plays in these investigations. In the field of adsorption phenomena, much work has been done by Russian radiochemists. Khlopin and his collaborators studied the mechanism of the adsorption of microcomponents from mixtures, and the role played in those processes by the isomorphism (Z. anorg. u. allgem. Chem. 143, 97(1925), ibid. 166, 311(1927), Ratner et al, Z. physik. Chem. 165A, 472(1933), Acta Physicochim. U. R. S. S. 11, 475(1939)). Methods for the determination of absolute values of the surface areas of crystalline suspensions were improved by Khlopin et al (Zhur. Fiz. Khim. 13, 1145(1939)), while the peculiarities in the behavior of adsorption isotherms were investigated by Frumkin et al (Bull. acad. sci. U. R. S. S., Classe sci. chim., 773(1936)), Kobozev et al (Zhur. Fiz. Khim. 15, 257(1941)), Vol'kenshtein (ibid. 21, 163(1947)), and Roginskii (Adsorption and Catalysis on Heterogeneous Surfaces, published by Academy of Sciences U. S. S. R., 1948 (in Russian)). The latter works are more or less directly connected with the problem of the heterogeneity of the surface of the adsorbent, which was also studied by Nikitin et al (Bull. acad. sci. U. R. S. S., Classe sci. chim., 210(1944)), Roginskii (Acta Physicochim. U. R. S. S. 21, 519(1946)), and Keier et al (Zhur. Fiz. Khim. 23, 897(1949)). In the section describing the use of radioactive isotopes in the study of the catalysis, the majority of the works mentioned are American and British. Among the Russian investigators, Roginskii and his collaborators (see above) studied the influence of small admixtures on the activity of a catalyst and the mechanism of the isotopic exchange (Bull. acad. sci. U. R. S. S., Classe sci. chim. 5, 601(1940)).

TRANS - W-10542, 26 MAY 50.

ASD-SLA METALLURGICAL LITERATURE CLASSIFICATION

2

CA

The heterogeneity of the surface of catalytically active nickel oxide. N. P. Keier. *Doklady Akad. Nauk S.S.S.R.* 72, 1071–4(1950).—The kinetics of adsorption of C_2H_4 gas by NiO prepd. by decompn. of $NiCO_3$ at 300° under not over 10^{-4} mm. Hg, and subsequent treatment in vacuo at 400°, are representable by the equation $q = At^{1/n}$, where q = amt. adsorbed in cc. S.T.P. on 0.75 g. NiO, initial C_2H_4 pressure 2.23 mm. Hg, t = time in min. Plots of log q against log t are perfectly linear, with the slopes increasing with rising temp. (−19.6 and 0°). The parameters of the exponential activation-energy distribution function, $\rho(E) = H/\alpha(\epsilon_0)\alpha RT$ and $1/\alpha = \alpha RT$. From the exptl. data of the rates of adsorption of C_2H_4 at −19.6°, $1/n = 0.254$, $\log A = 0.115$, $\alpha = 5 \times 10^{-4}$, and at 0°, 0.273, 0.240, and 5×10^{-4}. From the shift of the kinetic curves along the $RT \log t$ coördinate, at const. q, the magnitude $\log \epsilon_0 = -(\log Ar_0 - \log Ar_1)/[(1/n)r_1 - (1/n)r_0]$ (valid for exponential distribution) is $\log \epsilon_0 = -0.66$; hence, from $\log H = \log A + \log \alpha + (1/n) \log \epsilon_0$, the const. $H = 0.44 \times 10^{-4}$ cc./g. (cal./mole)$^{-1}$, and the distribution function $\rho(E) = 0.44 \times 10^{-4} e^{\alpha \times 10^{-4} E}$ with the adsorption expressed in cc. C_2H_4 (S.T.P.)/g. NiO, and E in cal./mole. In terms of the time t of progressing adsorption, application of Roginskii's relation $E = 2.3 RT \log t/\epsilon_0$ shows that with progressing coverage E increases strongly; q is related to the distribution function by $q = |\rho(E)/\alpha| - |\rho(E_0)/\alpha|$, or, on account of $E_0 < 7$ kcal./mole, approx. $q \sim \rho(E)/\alpha$. Data thus calcd. coincide with the E obtained from Arrhenius' relation. This quant. agreement is strong evidence for the surface-heterogeneity theory, and against attempts at interpretation on the basis of repulsive interactions between adsorbed mols.

N. Thon

KEYER, N.P.

5

catalyst

Chemical Abst.
Vol. 48 No. 9
May 10, 1954
General and Physical Chemistry

Role of different adsorptional centers in the hydrogenation of acetylene on metallic nickel. I. Investigation of the active surface of nickel with the aid of the differential isotopic method. N. P. Keier. *Bull. Acad. Sci. U.S.S.R., Div. Chem. Sci.* 1951, 577-84(Engl. translation).—See *C.A.* 46, 10820g. H. H. L.

9-2-54

CA

General & Physical Chem. - 2

Role of the different adsorption centers in the hydrogenation of acetylene on metallic nickel. I. Investigation of the active surface of nickel with the aid of the differential isotopic method. N. P. Keier (Inst. Phys. Chem. Acad. Sci. U.S.S.R., Moscow). *Izvest. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk* 1952, 616-26.—(1) Desorption and catalytic reactions of C_2H_2 on Ni were investigated by following the C_2H_2 by portions, one of which was tagged with radioactive C^{14}; the desorbed gas or the gaseous reaction products were analyzed for C^{14} by radioactivity measurements. The Ni catalyst, made by leaching of a 50% Ni-Al alloy, had a sp. surface area of 18 ± 1 sq. m./g. (by adsorption of C_2H_2); it was outgassed at 300°, reduced in H_2 at the same temp., and then outgassed at 500° under 10^{-6} mm. Hg. This catalyst did not adsorb C_2H_4 or C_2H_6, but did adsorb C_2H_2 in significant amts. even at room temp. Only part of the C_2H_2 adsorbed at room temp. can be desorbed as such. On a moist catalyst, about 40% of the C_2H_2 are adsorbed irreversibly, whereas on a catalyst preliminarily dried in a stream of N_2, the fraction of irreversibly adsorbed C_2H_2 is only about 10%; the total adsorption is also much less on the dry catalyst, even though the sp. surface areas of the moist and the dry catalyst are apprnt. the same. On desorption at 180° of C_2H_2 adsorbed at room temp. CH_4 and H_2 are found, along with C_2H_6, which are not evolved in the course of the adsorption. At 500°, about 30% of the C_2H_2 adsorbed at room temp. was desorbed unchanged; about 14% of the C of the original C_2H_2 appeared as CH_4, and the balance of the C_2H_2 was decompd. to C and H_2. (2) Two portions of C_2H_2 were admitted at room temp. consecutively: a 1st portion, 1.267 ml./g., of ordinary, and a 2nd portion, 0.148 ml./g., of tagged C_2H_2. After 2 min., evacuation to 10^{-6} mm. Hg, the temp. was raised to 55°, with a vacuum of 10^{-4} mm. maintained. Under these conditions, less than 3% of the C_2H_2 was desorbed, the gas desorbed came overwhelmingly from the portion adsorbed first. If H_2 is admitted at room temp. to C_2H_2 adsorbed at that temp., C_2H_4 and C_2H_6 appear in the gas phase; only part of the H_2 admitted effects hydrogenation, the remainder being simply adsorbed without reaction. With excess H_2, the main product is C_2H_6 (85-90%); the amt. of C_2H_4 increases with subsequently admitted portions of H_2. Hydrogenation of adsorbed C_2H_2 with H_2 gas takes place at room temp.; at 200°, the gas desorbed with H_2 contains no C_2H_4 or C_2H_6, but CH_4 and some unhydrogenated C_2H_2. (3) Ordinary C_2H_2 (2.81 ml.) was adsorbed first, on 0.65 g. catalyst (coverage 46%), and then 1.23 ml. tagged C_2H_2 (coverage 20%). Of the C_2H_6 obtained by admission of H_2, 43% came from the 1st, and 57% from the 2nd portion; this portion of H_2 had hydrogenated 4.6% of the adsorbed C_2H_2. With H_2 admitted at 180°, the gas was all C_2H_6. 94% of the tagged por-

over

tion adsorbed 2nd. At higher temps., without H_2, the gas desorbed was $CH_4 + H_2$, with CH_4 predominating at 150–200°, and the H_2 content increasing with temp.; the CH_4 desorbed at 400° comes almost entirely from the C_4H_8 adsorbed first. From these results, 3 kinds of active centers are inferred: centers from which C_4H_8 is desorbed reversibly, centers of hydrogenation, and centers of decompn. of C_4H_8. (4) With C_4H_8 adsorbed at room temp. in 3 consecutive portions, 0.328 ml tagged, 1.142 ml. ordinary, and 0.619 ml. tagged C_4H_8, evacuation at room temp. for 170 min. resulted in the desorption of 1.6% of the 3rd and 2.4% of the 2nd portion; further prolonged evacuation gave no significant amts. of gas over 15 hrs. With H_2 at room temp., 2.8% of the C_4H_8 was hydrogenated in 288 min., of which 34% was from the 3rd and 66% from the 2nd portion. Above 100°, the CH_4 obtained came mainly from the 2nd adsorbed portion; the C^{14} content in the CH_4 is lower, the higher is the temp. The CH_4 obtained at 500° was completely nonradioactive. Up to 500° no more than 50% of the total C_4H_8 could be removed in all the forms combined. From these facts it is concluded that hydrogenation takes place at active centers corresponding to 42–48% surface coverage; at higher coverages C_4H_8 is adsorbed reversibly, and is not susceptible to hydrogenation, whereas at lower coverages, at the most active centers, the C_4H_8 is cracked to CH_4 or decompd. to carbide and H_2. On a catalyst dried in N_2 the C_4H_8 undergoing hydrogenation was mainly that from the 2nd adsorbed portion, corresponding, on the dry catalyst, to 12–16% surface coverage, with an activation energy of 15–16 kcal./mole. (5) Whereas in the C_4H_8 reversibly desorbed at room temp. the 1st adsorbed portion predominates, the fraction of the 2nd portion increases with increasing temp. of the desorption; at 50–100° it constitutes about 60%. Desorption does not begin at the least active centers with the max. activation energy $E_{adm.}$, but at more active centers, corresponding to a lower coverage. One possible representation of the dependence of the activation energy of desorption, $E_{des.}$, on $E_{adm.}$ is a curve with a min. To the left of the min. lies the range of irreversible, and to its right the range of reversible, adsorption. This representation can account for the above observations.

N. Thon

KEYER, N. P.

USSR/Chemistry - Activated Carbon 11 Apr 52

"Investigation of the Kinetics of Activated Adsorption of Oxygen and Hydrogen on Carbons Containing Different Inorganic Admixtures," N. P. Keyer, N. M. Man'ko, Inst of Phys Chem, Acad Sci USSR

"Dok Ak Nauk SSSR" Vol LXXXIII, No 5, pp 713-716

Activated birch charcoal was treated with NaF in HNO_3, thus lowering the ash content from 3% to 0.4%. One % of K, Ca, Fe, Ni, Ag, or Pt was then introduced into the carbon and the adsorption of O_2 and H_2 measured. The data obtained show that

218T9

USSR/Chemistry - Activated Carbon (Contd) 11 Apr 52

the resulting carbons strongly differ with respect to adsorption, that some additives reduce while others strongly increase adsorption; that the adsorption of O_2 and H_2 is not affected by additives in the same manner. The results were correlated on the basis of S. Z. Roginskiy's theory of processes taking place on inhomogenous surfaces, and the conclusion reached that presence of additives on the surface of carbon increases the deg of its inhomogeneity. The relationships pertaining to the formation of an active surface which have been disclosed must have a bearing on the action of catalyst promoters, modifiers, and poisons.

218T9

KEYYER, N. P.

PA 239T13

USSR/Chemistry - Isotopes

Aug 52

"Preparation of Acetylene and Ethane Tagged With Radioactive C^{14}," N. P. Keyyer, B. V. Klimenok and G. V. Isagulyants, Inst of Phys Chem, Acad Sci USSR

"DAN SSSR" Vol 85, No 5, pp 1029-1031

Radioactive acetylene was prepd from barium carbide contg C^{14} and water. Radioactive ethane was prepd from the tagged acetylene by means of hydrogenation over a Ni catalyst at room temp. Submitted by Acad A. N. Frum 12 Jun 52.

239T13

KEYER, N. P.

Nickel

Elucidation of the role of vatious adsorption centers in the reaction of hydrogenation of acetylene on metallic nickel. Part 2. Kinetics of hydrogenation and activated adsorption of acetylene on a nickel catalyst. Izv. AN SSSR Otd. khim. nauk. no. 1, 1953. p.43-50

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

KEYYER, N. P., LLIENOK, B. V., and ISAGULYANTS, G. V.

"Preparation of Acetylene and Ethane Tagged With C^{14}," Sb. Statey po Obshch. Khimii. Izd-vo AN SSSR, M. -L., Vol 2, pp 1566-1569, 1953

Developed a laboratory method for the preparation of acetylene tagged with C^{14}. Method consists of heating radioactive barium carbonate with magnesium to produce radioactive barium carbide. The barium carbide then yields radioactive acetylene when treated with water, and the acetylene can be hydrogenated over a nickel catalyst to give radioactive ethane. (RZhKhim, No 22, 1954)

Sum. No. 681, 7 Oct 55

AF701597 TREASURE ISLAND BOOK REVIEW AID 833 - S

KEYER, N. P. (Institute of Physical Chemistry, Academy of Sciences, USSR) ISSLEDOVANIYE AKTIVNOY POVERKHNOSTI NEKOTORYKH POLUPROVODNIKOV IZOTOPNYMI METODAMI (Study of the active surface of some semiconductors by isotopic methods). In Problemy kinetiki i kataliza (Problems of Kinetics and Catalysis), vol. 8. Izdatel'stvo Akademii Nauk SSSR, 1955. Section IV: Nature of the active surface. p. 224-232.

Attempts were made to develope a theory of adsorption covering all deviations from Langmuir's theory. The concept of the nonuniformity surface led to the development of the theory of processes taking place on nonuniform surfaces (S. Z. Roginskiy, Ya. B. Zel'dovich, O. M. Todes, M. I. Temkin, Taylor). Except for the uniformity of surface, the theory retained all other points of the Langmuir theory. Another concept ascribed the deviations from the Langmuir theory to the interaction of adsorbed molecules (M. I. Temkin, N. I. Kabozev, Roberts). The latest development was F. F. Vol'kenshteyn's assumption that the number of adsorption centers changes with the change in temperature and that two types of bonds may be formed on the same adsorption center: mono-and di-electron bonds. Several catalysts were studied with the aid of the differential isotopic method and the data compiled in Table 1 (p. 226).

1/2

AF701597 TREASURE ISLAND BOOK REVIEW AID 839 - S

KEYER, N. P. (Institute of Physical Chemistry, Academy of Sciences, USSR).
DISKUSSIYA (Discussion). In Problemy kinetiki i kataliza (Problems of Kinetics and Catalysis), vol. 8. Izdatel'stvo Akademii Nauk SSSR, 1955. Section IV: Nature of the active surface, p. 238-239.

Reply to S. Z. Roginskiy (p. 237-238). The kinetic anomalies can be explained only by electronic processes which are associated with adsorption or by repelling forces between the adsorbed molecules of ethyl alcohol. The experimental data obtained in studying the chemisorption of ethyl alcohol on zinc oxide lead to the conclusion that anomalies are caused by electronic processes. The processes were discussed by F. F. Vol'kenshteyn. Since the calculations are essentially quantum-mechanical in nature, they were applied to simplified and schematized models. One reference (Russian) (1949).

1/1

~~M. KEYER~~ KEYER N, L P J

USSR/Kinetics. Combustion. Explosions. Topochemistry B-9

Abs Jour : Ref Zhur - Khimiya, No 8, 1957, 26234

Author : N. Keyer
Inst : Academy of Sciences of USSR.
Title : All-Union Conference on Application of Isotopes in Catalysis

Orig Pub : Izv. AN SSSR, Otd. khim. n., 1956, No 10, 1279-1284

Abstract : No abstract

Card : 1/1

KEYYER, N.P.

Chemistry

Electronic phenomena in semiconductor catalysis. Investigation of the effect of admixtures dissolved in the NiO lattice upon the catalytic activity. N. P. Keier, S. Z. Roginskiĭ, and T. S. Sazonova. *Zhurnal Fizicheskoĭ Khimii*, U.S.S.R. 1960, 34, 2581–2588. — The effects of electronic factors of metals in the bivalent state (Mg, Zn), univalent state (Li, Ag), and trivalent state (Cr, In) dissolved in NiO on the catalyst activity in the H and CO oxidation were studied in previous contributions (C.A. 44, 6801d; 42, 2581). The NiO binary solid solns. with MgO, Li_2O, and Cr_2O_3, and of the ternary system with Li_2O + Fe_2O_3 were prepd. by the decompn. of the carbonates of the mixts. X-ray analysis showed that solid solns. of Li_2O and MgO were formed with NiO, and the lattice parameters of NiO were increased by MgO and reduced by Li_2O. The catalytic activity was studied under static conditions and at reduced pressures. MgO was added in proportions up to 50 mol. % with very little effect on the [illegible]

KHYYER, N.P.

Effect of the interaction between acetylene molecules adsorbed on nikcelous oxide on the characteristics of adsorption. Dokl. AN SSSR 111 no.6:1274-1277 D '56. (MLRA 10:3)

1. Predstavleno akademikom A.N. Frumkinym.
(Adsorption) (Nickel oxides) (Acetylene)

VINOGRADOV, O. M., KEYYER, N. P., ROGINSKIY, S. Z.

"Study of the Mechanism of Divinyl Synthesis by the Method of S. V. LEbedev With the Use of Radioactive Carbon."

KEYYER, N. P. (without co-authors), "Isotopic Data on Active Surfaces of Catalysts."

Problems Kinetics and Catalysis, v. 9. Isotopes in Catalysis, Moscow, Izd-vo AN SSSR, 1957. 442p.

[illegible] of the papers in this coll. [illegible] presented at the Conf. on [illegible] held [illegible] 5 1956

KEYER, N. P.

VINOGRADOVA, O.M.; KEYER, N.P.; ROGINSKIY, S.Z.

Using S.V. Lebedeva's method and radioactive carbon in the study of the mechanism of divinyl synthesis. Probl. kin. i kat. 9:175-186 '57. (Butadiene) (Catalysis) (Carbon--Isotope) (MIRA 11:3)

KHYKR, N.P.

Active surfaces of catalysts according to isotope data. Probl. kin. i kat. 9:283-293 '57. (MIRA 11:3)
(Catalysts) (Radioactive tracers)

AUTHORS: Keyer, N.P., Roginskiy, S.Z. and Sazonova, I.S.

TITLE: Investigation of Catalytic Properties of Solid Solutions containing Nickel Oxide (Issledovaniye kataliticheskikh svoystv tverdykh rastvorov na osnove zakisi nikelya)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Vol. XXI, #2, pp 183-191, 1957, USSR, Seriya fizicheskaya

ABSTRACT: The Connection of electric conductivity with the kind of admixture is simple in some systems and when this is the case, conductivity can be regulated within a wide range.

The Institute of Physical Chemistry carried out a series of investigations with the oxidation of carbon monoxide on nickel oxide as a catalyzer. This investigation deals with catalytic properties of various solid solutions with nickel oxide, which differ by their electronic characteristics. Oxides of one-, two- and three-valence metals were dissolved in NiO,

Card 1/4

TITLE: Investigation of Catalytic Properties of Solid Solutions containing Nickel Oxide (Issledovaniye kataliticheskikh svoystv tverdykh rastvorov na osnove zakisi nikelya)

and the correlation between the elec and catalytic properties of the catalyzer was studied. Nickel oxide and its solid solutions were obtained by roasting nickel carbonate or its mixtures with other salts for 2 hrs at a temperature of 900° C.

The change in electronic structure of solid solutions containing nickel oxide was concluded from the changes in specific elec conductivity. When Li_2O was dissolved in the nickel oxide, conductivity increased as a result of the decrease in activation energy of this process. The relation between temperature and conductivity in solid solutions containing nickel oxide with various ratios of lithium oxide is shown in Graph 1. The energy of conductivity activation varies linearly with the logarithm of lithium concentration (Graph 2).

Catalytic activity with respect to reaction of CO oxidation was studied in a vacuum.

Card 2/4

N. P. KEYER

USSR/Physical Chemistry - Kinetics, Combustion, Explosions, Topochemistry, Catalysis. B-9

Abs Jour : Referat Zhur - Khimiya, No 1, 1958, 513

Author : O.M. Vinogradova, N.P. Keyer, S.Z. Roginskiy.

Inst : Academy of Sciences of USSR

Title : Study of Mechanism of Divinyl Synthesis by Method of S.V. Lebedev with Application of Radioactive Carbon.

Orig Pub : Dokl. AN SSSR, 1957, 112, No 6, 1075-1078

Abstract : The distribution of C^{14} in products of the catalytic synthesis according th Lebedev (at the addition of tagged molecules of ethanol, acetaldehide and crotonaldehide) shows that the formation of divinyl from ethyl alcohol proceeds mainly through the condensation of acetaldehide into crotonaldehide, which, in presence of excessive ethanol, transforms into crotyl alcohol in the result of the

Card 1/2

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000721620008-5

USSR/Physical Chemistry - Kinetics, Combustion, Explosions, Topochemistry, Catalysis. B-9

Abs Jour : Ref Zhur - Khimiya, No 1, 1958, 513

redistribution of hydrogen. The dehydration of crotyl alcohol leads to the formation of divinyl. Divinyl is not forming at the ethanol reaction in the layer. A very rapid isotope exchange of C^{14} takes place between ethanol and acetaldehide on the catalyst, which is a result of the intermolecular redistribution of hydrogen. The authors confirmed the fundamental order of stages of the Corin-Kagan scheme.

Card 2/2

SOV/30-58-7-34/49

AUTHOR: Krylov, O. V., Candidate of Chemical Sciences

TITLE: Physics and Physical Chemistry of Catalysis (Fizika i fiziko-khimiya kataliza) Transactions of the All-Union Conference (Vsesoyuznaya konferentsiya)

PERIODICAL: Vestnik Akademii nauk SSSR, 1958, Nr 7, pp. 119 - 122 (USSR)

ABSTRACT: This conference convened in Moscow between March 20th and March 23rd. It was called by the Department of Chemical Sciences and the Institute of Physical Chemistry of the AS USSR (Otdeleniye khimicheskikh nauk i Institut fizicheskoy khimii Akademii nauk SSSR). It was attended by more than 600 persons from different towns of the Soviet Union as well as from countries of the people's democracies. Nearly 100 reports were submitted, 78 of which were given to the participants for discussion. The remainder was read. The following reports were heard:

1) S. Z. Roginskiy, (Institute of Physical Chemistry, AS USSR), spoke about the selective methods concerning semiconductor catalysis.

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2) V. V. Boldyrev, Tomsk University, used electron representations for the explanation of the course of topochemical reactions.
3) N. F. Keyyer, (Institute of Physical Chemistry, AS USSR), used electron representations for the clarification of the characteristics of heterogeneity of the active surface of semiconductor contacts.
4) F. F. Vol'kenshteyn, V. B. Sandomirskiy and Sh. M. Kogen, (Institute of Physical Chemistry, AS USSR), investigated the influence of exposure as well as of an external electric field on the absorptive power of a semiconductor.
5) A. N. Terenin spoke about the investigation of the structure and the behavior of surface formations in the case of adsorption and catalysis.
6) V. F. Kiselev (Moscow University), dealt with problems concerning the elementary act of catalysis.
7) G. K. Boreskov, Physical-Chemical Institute imeni L. Ya. Karpov (Fiziko-khimicheskiy institut im. L. Ya. Karpova), reported on the dependence of the catalytic activity of metals on their position in the periodic system of elements.

8) V. L. Bonch-Bruyevich and V. B. Glasko, (Moscow University), reported on the results of the adsorption computation of metals.
9) A. A. Balandin, Institute of Organic Chemistry AS USSR (Institut organicheskoy khimii Akademii nauk SSSR), reported on new data concerning the rôle played by structure factors in heterogeneous catalysis.
10) V. V. Voyevodskiy disproved his (and N. N. Semenov's) hypothesis of the existence of surface lattices and a heterogeneous catalysis.
11) Ya. T. Eydus and N. I. Yershov, (Institute of Organic Chemistry, AS USSR), O. A. Golovina, M. M. Sakharova, S. Z. Roginskiy and Ye. S. Dokukina, (Institute of Physical Chemistry, AS USSR), proved the existence of polymerization lattices in heterogeneous-catalytic processes of hydrocarbon synthesis.
12) N. N. Tikhomirov, P. N. Bubnov and V. V. Voyevodskiy, (Institute of Chemical Physics, AS USSR), reported on the application of the method of paramagnetic resonance of electrons for the purpose of investigating the interaction

of molecular oxygen with the free carbon valences.

13) Ya. K. Syrkin, (Institute of General and Inorganic Chemistry AS USSR) (Institut obshchey i neorganicheskoy khimii Akademii nauk USSR), reported on problems concerning the molecular mechanism in catalysis.

14) K. V. Topchiyev, Moscow University, gave a survey on the data concerning catalytic activity of aluminum silicates.

15) L. I. Piguzova and M. A. Kaliko, All-Union Scientific Research Institute of Mineral Oil Industry (Vsesoyuznyy nauchno-issledovatel'skiy institut neftyanoy promyshlennosti) reported on problems concerning characteristics of active acid centers in cracking and in catalytic reactions with aluminum silicates.

16) N. M. Chirkov, Institute of Chemical Physics, AS USSR, proved the proton character of the mechanism of homogeneous acid catalysis.

17) O. V. Krylov, Institute of Chemical Physics, AS USSR, spoke about the heterogeneous catalysis of acids.

18) G. M. Zhabrova, V. I. Vladimirova and Ye. I. Yegorov, Institute of Physical Chemistry, AS USSR, spoke about the sorption of ions in the production of a zinc oxide catalyst.

Physics and Physical Chemistry of Catalysis. SOV/ 30-58-7-34/49
Transactions of the All-Union Conference

19) O. M. Poltorak, Moscow University, reported on problems concerning the genesis of catalysts.

Card 5/5

AUTHORS: Keyyer, N. P., Chizhikova, G. I. SOV/2o-12o-4-39/67

TITLE: The Chemical Adsorption and Catalytic Oxidation of CO on ZnO and Its Solid Solutions, Which Differ With Respect to Their Electric Conductivity (Khimicheskaya adsorbtsiya i kataliticheskoye okisleniye CO na ZnO i yeye tverdykh rastvorakh, otlichayushchikhsya po svoyey elektroprovodnosti)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol. 12o, Nr 4, pp. 83o - 833 (USSR)

ABSTRACT: The authors investigated zinc oxide and its solid solutions with lithium oxide and gallium oxide parallel to their catalytic activity and to the chemical adsorption of the reaction components. The production of zinc oxide and of the solid solutions is described in short. The dissolution of lithium oxide decreases the specific surface considerably. The catalytic reaction was investigated in a vacuum device under static conditions at a pressure of not more than 2 torr. CO oxidizes with a measurable velocity only at temperatures above 250°. The kinetics of oxidation in the case of all samples corresponds with the first order. The dissolution of lithium oxide, in the

case of concentrations of up to 0,5 atom per cent Li exercises only little influence on the constant of the velocity; in the case of a further increasing percentage of lithium oxide, the constant of velocity decreases considerably and can then be measured only at higher temperatures. The activation energy and the constant before the exponent in the expression for the velocity constant increase according to the law $E=E_0+\gamma \lg k_0$.

The dissolution of gallium somewhat decreases the activation energy of the oxidation of CO. The adsorption of oxygen decreases the electric conductivity of all samples and this speaks for a iecrease of the concentration of free electrons. The dissolution of lithium oxide accelerates the adsorption of oxygen considerably; this is a consequence of the decrease of the activation energy of adsorption. At room temperature CO is very quickly adsorbed by ZnO. This velocity of adsorption decreases with increasing temperature and at 200° it becomes insignificantly low. The adsorption of CO at room temperature does not change electric conductivity, but at 340° conductivity

The Chemical Adsorption and Catalytic Oxidation of CO SOV/2o-12o-4-39/67
on ZnO and Its Solid Solutions, Which Differ With Respect to Their Electric Conductivity

increases. The dissolution of 0,5 to 1,25 atom per cent completely suppresses the adscrption of CO at room temperature and at higher temperatures. The strong influence of the dissolution of lithium oxide upon the catalytic properties is connected with the alteration of the active surface. The adsorption of oxygen considerably influences the state that marks the velocity of oxydation. There are 3 figures, 3 tables, and 6 references, 2 of which are Soviet.

PRESENTED: February 19, 1958, by A.N.Frumkin, Member, Academy of Sciences, USSR

SUBMITTED: February 18, 1958

Card 3/4

KEYYER, N.P., Doc Chem Sci -- (diss) "Study of the significance and nature of the non-homogeneity of an active surface in chemosorption and catalysis." Mos, 1959, 22 p (Inst of Physical Chemistry of Acad Sci USSR) 150 copies (KL, 26-59, 123)

5(4)
AUTHORS: Keyyer, N. P., Kutseva, L. N. SOV/62-59-5-6/40

TITLE: Investigation of the Chemisorption of Gases on Nickel Oxide and Its Solid Solutions With Lithium Oxide (Issledovaniye khimicheskoy adsorptsii gazov na zakisi nikelya i yeye tverdykh rastvorakh s okislom litiya)

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1959, Nr 5, pp 797 - 805 (USSR)

ABSTRACT: So far, no data have been given in publications on semiconductors consisting of solid solutions of two substances having different electronic properties, as are nickel and lithium oxide mentioned in the title. The electrical conductivity of nickel oxide can be varied within a wide range by a varied quantitative introduction of a metal oxide, having different valence than nickel, into its lattice (Tab 1). Thus, in the present work, the chemisorption of the gases O_2, CO, CO_2, C_2H_2 was investigated on nickel oxide and its solid solutions with lithium oxide at various Ni:Li ratios as well as on ternary nickel oxide, lithium oxide, iron oxide systems. The solution of lithium oxide in nickel oxide reduces the specific surface of the latter from

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Investigation of the Chemisorption of Gases on Nickel Oxide and Its Solid Solutions With Lithium Oxide SOV/62-59-5-6/40

1 m^2/g in NiO to 0.3 m^2/g in NiO + 8 at % Li. The adsorption was measured in a vacuum unit on account of falling pressure. The chemisorption of the various gases was investigated at various temperature ranges. The investigations showed that the solid solution considerably influences the adsorption of the various gases by retarding the adsorption of CO (Fig 3) and acetylene (Fig 4) and accelerating that of the gases O_2 (Figs 1,2) and CO_2. The conductivity of the adsorbents is increased by the adsorption of O_2 and CO_2 (Fig 6) and decreased by the adsorption of CO and acetylene (Fig 7). This depends on whether the gases are electron acceptors or donors, respectively. The Li_2O solution increases the activation energy of the adsorption in the beginning (Fig 5) and reduces it in the further course of adsorption. The process is reversed in the case of iron oxide, i.e. the solution of admixtures changes the type of kinetic dependence of the adsorption. It is found that this change cannot be explained by the change of the level of the

Card 2/3

Investigation of the Chemisorption of Gases on Nickel Oxide and Its Solid Solutions With Lithium Oxide

SOV/62-59-5-6/40

chemical potential. The active contact surface of NiO and its solid solutions is inhomogeneous (Table) as can be seen from isotope investigations. The adsorption mechanism is described as follows: The active adsorption centers of the gases with acceptor electrons, e.g. oxygen, are formed by electrons on the acceptor centers of admixtures. The Ni^{3+} cations which are independent of admixtures proved themselves to be active adsorption centers of the electron donor gases (CO and acetylene). Moreover, it is pointed out that the investigation of the adsorption properties of solid solutions with known structure and of the electron properties permits a thorough study of the rules of chemisorption and its physical and chemical nature. There are 7 figures, 2 tables, and 15 references, 9 of which are Soviet.

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

SUBMITTED: July 23, 1957

Card 3/3

5(4)
AUTHOR: Keyyer, N. P.

SOV/76-33-2-40/45

TITLE: An Investigation of the Nature of the Deviations of the Regularities of Chemical Adsorption From the Langmuir Type Using Isotopic Methods (Issledovaniye prirody otkloneniy zakonomernostey khimicheskoy adsorbtsii ot lengmyurovskikh pri pomoshchi izotopnykh metodov). I. A Study of the Adsorption of Ethanol on ZnO (I. Issledovaniye adsorbtsii etilovogo spirta na ZnO)

PERIODCIAL: Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 2, pp 492-499 (USSR)

ABSTRACT: ZnO is a dehydrogenation catalyst for alcohols, and as it had been observed (Refs 1, 2) that the adsorption of ethanol and methanol upon ZnO deviates from the Langmuir adsorption a study of this system was undertaken. Ethanol tagged with radioactive C^{14} was used. Before each experiment the gas was extracted from ZnO at 500°C and after each experiment it was regenerated with an oxygen treatment. The radioactive carbon content in the combustion gases was measured by measuring the radioactivity with a counter (Ref 7) after conduction through

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potash. The specific surface of ZnO, determined by the BET-method, was found to be 12 ± 1 m^2/g. Since the rate of desorption of ethanol at room temperature does not decrease proportional to the degree of packing of the surface (Fig 1) the catalyst must be heated to drive off the ethanol. Investigations on the heterogeneity of the active catalyst surface were carried out using the differential isotopic method (Ref 5) and it was found that at RT the heterogeneity of the surface exerts no influence on the ethanol adsorption. Experiments to study the exchange between the adsorbed ethanol and that in the gas phase showed that at room temperature there exists a "weak" bond (apparently a hydrogen bond between the OH group of the alcohol and the oxygen ion of the ZnO) between the adsorbed ethanol and the surface. This "weak" bond becomes a "strong" bond (depending on the temperature), which varies from place to place because of the heterogeneity of the surface. The high rate of adsorption of ethanol is

SOV/76-33-2-40/45

An Investigation of the Nature of the Deviations of the Regularities of Chemical Adsorption From the Langmuir Type Using Isotopic Methods. I. A Study of the Adsorption of Ethanol on ZnO

explained in terms of a small activation energy of adsorption. The variation in desorption of the "weakly" bound alcohol (deviation from the Langmuir type) in the case of a variation in the degree of packing of the surface is explained by the strength of repulsion between the adsorbed molecules (with oriented dipoles). The deviations from the "strong" binding is attributed to the total effect of the heterogeneity of the surface and the interaction of the repulsion between the molecules. Measurements on the electrolytic properties carried out by G. I. Chizhikova showed that there is no electron transfer in the"weak" bond, while an electron is transferred from the alcohol to the ZnO in the formation of the "strong" bond. There are 2 figures, 2 tables, and 7 Soviet references.

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

SUBMITTED: July 12, 1957

Card 3/3

S/062/60/000/03/01/007
B008/B006

AUTHOR: Keyer, N. P.

TITLE: Catalytic Activity of Solid Solutions of Zinc Oxide and Nickel Oxide

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1960, No. 3, pp. 389-397

TEXT: The interrelationship between the laws of chemical adsorption and the initial electrical conductivity of nickel oxide and zinc oxide was investigated experimentally. Laws governing the adsorption of gases were studied. The latter can be divided into electron acceptors and electron donors according to their effects on conductivity. On adsorption of the latter, and electron is transferred from the adsorbate to the catalyst, while on adsorption of the former type of gas, the reverse occurs. The adsorbate thus becomes positively or negatively charged, respectively. The adsorptive properties of the contact are considerably modified by solution of mono- and tri-valent metallic oxides, which also affect the

Catalytic Activity of Solid Solutions of Zinc Oxide and Nickel Oxide

S/062/60/000/03/01/007
B008/B006

σ-conductivities of NiO and ZnO. σ-conductivity of the NiO changes inversely to that of ZnO. The solution of lithium oxide in NiO and ZnO increases the initial adsorption of the acceptor-gas oxygen. The initial adsorption rate of oxygen as a function of the lithium concentration according to Refs. 16 and 17 is illustrated in Fig. 1. On the adsorption of donor gases, to which acetylene and CO belong, solution of Li_2O in NiO and ZnO has the inverse effect. Solution of trivalent metal oxides, such as Fe_2O_3, in NiO strongly reduces the adsorption rate of oxygen and slightly that of CO. Solution of Ga_2O_3 in ZnO has no effect on oxygen adsorption. At the same time, no direct relationship has been found between the activity of the contact and the conductivity. By transference of an electron to the acceptor level, an excess negative charge having the size of an electron is formed besides the lithium cation. This disturbs the periodic potential. It is assumed that the change in chemical adsorption is connected with the fact that cations at lattice points having anomalous charges affect the statistics of active centers on the surface. The oxidation of CO, decomposition of N_2O, decomposition of N_2O on NiO and ZnO, and the exchange of hydrogen

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and deuterium were investigated. The dependence of the logarithm of the rate constant versus the reciprocal absolute temperature for CO oxidation on NiO, according to I. S. Sazonova is given in Fig. 2. In Fig. 3, the decomposition rate of nitrous oxide on NiO and its solid solutions is plotted as a function of the molar content of lithium oxide and In_2O_3 according to Ref. 5. The decomposition rate of nitrogen oxide on ZnO and its solid solutions as a function of the lithium oxide- and Ga_2O_3 concentrations in mole %, according to Ref. 3, is shown in Fig. 4. The changes in the factors ϕ_2 and ϕ_3 with the decomposition rate of N_2O on NiO according to the theory by K. Hauffe and E. G. Schlosser are illustrated in Fig. 5. The investigations carried out in the present paper reveal that the catalytic activity of solid solutions of NiO and ZnO is determined by the effect of Li_2O, Ga_2O_3, Fe_2O_3, etc, on chemical adsorption. The following persons are mentioned: S. Z. Roginskiy, F. F. Vol'kenshteyn, L. I. Kutseva, and G. I. Chizhikova. There are 5 figures and 21 references, 7 of which are Soviet.

Catalytic Activity of Solid Solutions of Zinc Oxide and Nickel Oxide

S/062/60/000/03/01/007
B008/B006

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

SUBMITTED: July 19, 1958

Card 4/4

KEYYER, N.P.

Nature of the change in the activation heat and activation energy of adsorption, accompanying an increase in the filling of a surface. Kin. i kat. 1 no.1:83-93 My-Je '60. (MIRA 13:8)

1. Institut fizicheskoy khimii Akademii nauk SSSR.
(Adsorption) (Semiconductors) (Catalysts)

KEYYER, N.P.

Effect of the electronic structure of nickel oxide on oxygen exchange. Kin.i kat. 1 no.2:221-228 Jl-Ag '60. (MIRA 13:8)

1. Institut fizicheskoy khimii AN SSSR.
(Nickel oxide) (Oxygen--Isotopes)

KEYYER, N.P.----

Nature of the heterogeneity of the active surface of semiconductor contacts. Probl. kin. i kat. 10:73-76 '60. (MIRA 14:5)

1. Institut fizicheskoy khimii AN SSSR.
(Semiconductors) (Catalysts)

CHIZHIKOVA, G.I.; KEYYER, N.P.

Mechanisms of the chemical adsorption and catalysis on solid solutions of zinc oxide. Probl. kin. i kat. 10:77-81 '60. (MIRA 14:5)

1. Institut fizicheskoy khimii AN SSSR.
(Zinc oxide) (Lithium oxide) (Carbon monoxide)

KUTSEVA, L.N.; KEYYER, N.P.

Chemical adsorption of gases on nickelous oxide and its solid solutions. Probl. kin. i kat. 10:82-86 '60. (MIRA 14:5)

1. Institut fizicheskoy khimii AN SSSR.
(Nickel oxide) (Adsorption)

KEYER, N.P.

81870
S/020/60/133/02/46/068
B004/B064

11.5000
5.1190

AUTHORS: Khuan Yu-mey, Keyer, N. P., Roginskiy, S. Z., Corresponding Member AS USSR

TITLE: Investigation of the Catalytic Decomposition of Hydrazine on Nickel Sulfide and on Its Solid Solutions

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 133, No. 2, pp. 413 - 416

TEXT: While the relationship between the electrical properties and the catalytic and adsorption properties of metallic oxides has been investigated in many previous papers (Refs. 1-3) no such papers exist as regards metallic sulfides. In their investigations the authors used NiS in order to study the effect of various additions of non-bivalent metal sulfides (Li_2S, In_2S_3) and to compare them with the behavior of NiO (with additions of Li_2O and In_2O_3). The nickel sulfide was obtained from $NiCO_3$ (i.e. $NiCO_3$ + Li_2CO_3, $NiCO_3$ + $In(NO_3)_3$) by passing

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Investigation of the Catalytic Decomposition of Hydrazine on Nickel Sulfide and on Its Solid Solutions

through H_2S at 450°C. The X-ray analysis made by M. Ya. Kushnerev showed that NiS was obtained as β-form with a hexagonal crystal structure. The specific surface was determined with the equilibrium isotherm of the adsorption of krypton at -195°C according to Brunauer, Emmet, and Teller. The tablets formed from the NiS powder at 4000 atm had a resistance of 1.2 ohm.cm which increased in the range of 78-573°K in accordance with a rise in temperature. It can therefore be said that within this sphere NiS possesses metallic conductivity. A measurement of the thermo-emf showed that NiS is a semiconductor of the n-type. The decomposition of hydrazine occurs at 1 torr in accordance with the reaction equation $3N_2H_4 \rightarrow N_2 + 4NH_3$. In nickel oxide it is accelerated by adding Li_2O, while it is retarded by adding In_2O_3 (Fig. 1). In the experiments with NiS palladium was used in order to check whether hydrogen was liberated. Since this was not the case the reaction proceeded according to the above equation. The kinetics of the reaction was investigated by measuring the nascent nitrogen. Fig. 2 shows the kinetic isotherms of the

Investigation of the Catalytic Decomposition of Hydrazine on Nickel Sulfide and on Its Solid Solutions

S/020/60/133/02/46/068
B004/B064

decomposition of N_2H_4 at 60, 75, and 100°C in the coordinates $\log(-\Delta P_{N_2H_4})$, log t. Fig. 3 shows the dependence of the composition of t and $P_{N_2H_4}$. The speed of the reaction increases from 60-150°C and decreases after 150°C. The assumption that this is due to a poisoning of NiS by NH_3 was proved by pre-treating NiS with NH_3. NH_3 retards the reaction. Fig. 4 shows the isotherms of the reaction at 75°C and with additions of 0.2 - 1.0 at% of Li or 0.2 - 1.0 at% of In to NiS. Furthermore, the dependence of the speed of the reaction on these additions is shown. In the case of an addition of 0.2 at% of Li the maximum rate was observed which is the same as the maximum rate of dependence of the work function on Li or In addition as measured by E. Kh. Yenikeyev. In general the effect of these additions on NiS is less than on NiO. A further observation of the authors is that only a single preparation was investigated with 0.2 at% of Li so that the conformity of the result with that obtained by Yenikeyev may well be a matter of coincidence. There are 4 figures and 5 references: 4 Soviet and 2 German.

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81870

Investigation of the Catalytic Decomposition of Hydrazine on Nickel Sulfide and on Its Solid Solutions

S/020/60/133/02/46/068
B004/B064

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

SUBMITTED: April 7, 1960

Card 4/4

S/020/60/133/03/11/013
B004/B056

AUTHORS: Khuan Yu-mey, Keyer, N. P., Roginskiy, S. Z., Corresponding Member AS USSR

TITLE: Chemical Adsorption on Pure NiS and on NiS With Admixtures

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 133, No. 3, pp. 641 - 644

TEXT: The authors investigated the chemical adsorption of oxygen and acetylene on pure NiS and on NiS with admixtures of Li_2S (0.2, 0.5, and 1.0 at% Li) and In_2S_3 (0.2, 0.5, and 1.0 at% In). The production of pure NiS and of NiS with admixtures has been described in an earlier paper. The adsorption was carried out in a vacuum apparatus, and the pressure drop of the gas introduced was measured. The adsorption of O_2 occurred at 25 - 65°C. It exerted no influence on electrical conductivity. Fig. 1a shows the kinetic isothermal lines of oxygen adsorption on pure NiS. They obey equation (1): $q = At^{1/n}$. The values of A and 1/n increase with

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31090
S/195/61/002/004/005/008
E111/E585

5.4400

AUTHORS: Keyyer, N.P., Boreskov, G.K., Rode, V.V., Terent'yev, A.P. and Rukhadze, Ye.G.

TITLE: Catalytic activity of organic semiconductors. I. Polychelates

PERIODICAL: Kinetika i kataliz, v.2, no.4, 1961, 509-518

TEXT: The authors investigated various classes of organic polymers in order to establish the catalytic capacity of organic semiconductors and the relationship between their electrical conductivity and catalytic activity. The present work deals with polychelates of a given structure whose electrical conductivity varies by more than ten orders, depending on chemical composition. As regards chemical composition and structure the polychelates were of two types: 1) the sulphur atoms constitute the electron donor and, together with the metal, form the chelate group, which is connected with the radical by the =N-C group

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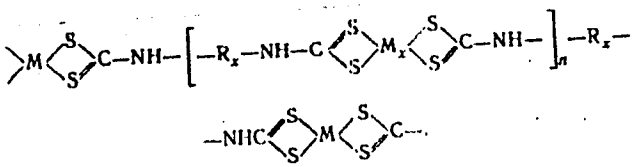
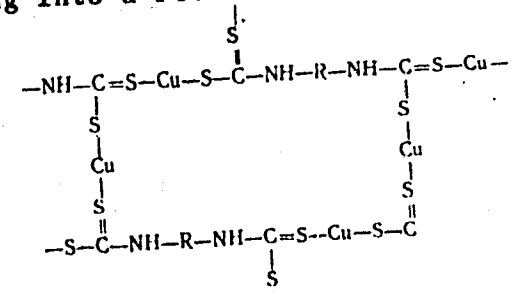
E111/E585

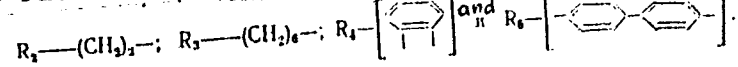
Catalytic activity of ...



2) monovalent copper forms two coordination linear bonds -S-Cu-S- evolving into a reticular structure



The organic radicals of the polychelates were



Card 2/4

39522

S/195/62/003/003/001/002
E075/E436

11.1325

AUTHORS: Kayyer, N.P., Astaf'yev, I.V.

TITLE: Catalytic activity of organic polymers
II. Catalytic properties of the polymer prepared by dehydrochlorination of polyvinylidenechloride

PERIODICAL: Kinetika i kataliz, v.3, no.3, 1962, 364-365

TEXT: Catalytic properties of $(CH_2CCl_2)_n$ were investigated in the reactions of decomposition of formic acid, isopropylalcohol, decomposition of hydrazine and oxidation of CO. Formic acid begins to decompose on the freshly prepared catalyst at 240°C and the reaction proceeds towards dehydrogenation, the hydrogen being absorbed by the catalyst. The decomposition of isopropylalcohol proceeds similarly with the removal of H and begins at 155°C. The catalyst prevented the oxidation of CO under 1 to 2 mm Hg pressure up to 250°C. The decomposition of N_2H_4 proceeded according to the following equations

1) $N_2H_4 \longrightarrow N_2 + 2H_2$

2) $3N_2H_4 \longrightarrow 4NH_3 + N_2$

Card 1/2

KEYYER, N.P.; BORESKOV, G.K.; RUBTSOVA, L.F.; RUKHADZE, Ye.G.

Catalytic activity of organic polymers. Part 3: Some regularities of catalytic activity on the chelate polymers of various chemical composition and structure. Kin.i kat. 3 no.5:680-690 S-O '62. (MIRA 16:1)

1. Institut kataliza Sibirskogo otdeleniya AN SSSR i Moskovskiy gosudarstvennyy universitet imeni Lomonosova.
(Chelates) (Catalysis)

KEYYER, N.P.; TROITSKAYA, M.G.; RUKHADZE, Ye.G.

Catalytic activity of organic polymers. Part 4: Catalytic activity of chelate polymers in the reaction of hydrogen peroxide decomposition. Kin.i kat. 3 no.5:691-697 S-O '62. (MIRA 16:1)

1. Institut kataliza Sibirskogo otdeleniya AN SSSR i Moskovskiy gosudarstvennyy universitet imeni Lomonosova.
(Chelates) (Catalysis) (Hydrogen peroxide)

SAZONOVA, I.S.; KHOKHLOVA, [illegible]; SUSLOPAROVA, [illegible]; KEYYER, N.P.

Catalytic properties of titanium dioxide and its solid solutions. Kin.i kat. 3 no.5:751-760 S-O '62. (MIRA 16:1)

1. Institut kataliza Sibirskogo otdeleniya AN SSSR.
(Titanium oxide) (Solutions, Solid)
(Catalysis)

3086

5.3750
11.1325 11.2205

S/020/62/144/005/011/017
B124/B138

AUTHORS: Boreskov, G. K., Corresponding Member, AS USSR, Keyyer, N. P., Rubtsova, L. F., and Rukhadze, Ye. G.

TITLE: Catalytic properties of chelate (intracomplex) polymers

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 144, no. 5, 1962, 1069-1072

TEXT: The article covers studies of the effect of the following: on the catalytic activity of chelate polymers the decomposition of hydrazine, the metal component, the chemical composition of the atoms of the admixtures in the chelate center, and the organic portion of the polymer in the main or side-chains. Structures and compositions of the polymers are given in Table 1. Hydrazine decomposition is sensitive to the electron state of the contact, and takes place in two ways:

$$N_2H_4 \rightarrow N_2 + 2H_2 \quad (1)$$

$$3N_2H_4 \rightarrow 4NH_3 + N_2 \quad (2)$$

The selectivity of a polymer catalyst can be assessed from the way in which its structure and chemical composition affect the direction of hydrazine

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Catalytic properties of...

S/020/62/144/005/011/017
B124/B138

decomposition. The decomposition of isopropyl alcohol and formic acid by dehydrogenation was also studied. No oxidation of CO took place on the polymers studied until 200°C. Table 2 gives experimental data on the specific decomposition rate of hydrazine at 108°C in the presence of various polychelates. The following decreasing order was found for the catalytic activity of polychelates of copper with chelate centers of different compositions: Cu(N,S) > Cu(S,S) > Cu(N,O) > Cu(O,O). The catalytic activity of chelate polymers is twice as high as that of inorganic copper semiconductors. The same was found for the polychelates of nickel investigated. Fig. 3 shows the dependence of the selectivity of the copper polychelates on their chemical composition and structure. It is concluded that the catalytic activity and selectivity of a polychelate depends on: 1) the metal entering into the polychelate; 2) the nature of admixtures entering into the chelate center; and 3) to a considerable degree, the organic part of the polymer. There is thus an analogy between the rules governing the catalytic properties of these polymers and that of ferments. There are 3 figures and 2 tables. The English-language reference is: E. Leslie, Orgel, An Introduction to Transition-Metal Chemistry. Ligand-Field Theory, London, 1960.

Card 2/8

Catalytic properties of... S/020/62/144/005/011/017
B124/B138

ASSOCIATION: Institut kataliza Sibirskogo otdeleniya Akademii nauk SSSR Novosibirsk (Institute of Catalysis of the Siberian Department of the Academy of Sciences USSR, Novosibirsk). Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University imeni M. V. Lomonosov)

SUBMITTED: December 8, 1961

Table 1. Study of chelate polymers.

Legend: (A) polymer; (B) Organic compound on the basis of which the polychelate was isolated; (D) Chelate center; (E) Composition of polychelate; (F) Sodium bis-di-thiocarbamate; (G) α-thioalkylpyridine amidodiphenyl; (J) 2b Rubianic acid; (K) Poly-(4,4' bis)-α-thio-2,6-lutidine amidodiphenyl; (L) 5,5'-methylene-bis-salicylaldehyde; (M) 3b Diacetyl resorcinol; (P) 4b Dinitrosoresorcinol.

Card 3/[illegible]

AKOPDZHANOV, R.G.; VAYNSHTEYN, E.Ye.; KEYER, N.P.; KOFELI, L.M.; NUKHADZE, Ye.G.

X-ray absorption K-spectra of copper in some catalytically active chelate (inner-complex) polymers. Kin. i kat. 5 no.4:616-623 Jl-Ag. '64. (MIRA 17:11)

1. Institut kataliza Sibirskogo otdeleniya AN SSSR i Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR.

MIKHEYEVA, E.P.; [illegible]

Effect of a superimposed constant [illegible] on properties of ceramics. Fiz. i khim. [illegible]

1. Institut khimii [illegible]

KHYYER, N.P.; MIKHAYLOVA, I.L.; SAZONOVA, I.S.

Chemical adsorption of gases on titanium dioxide and its solid solutions having different electric properties. Kin.i kat. 5 no.6:1086-1094 N-D '64. (MIRA 18:3)

1. Institut kataliza Sibirskogo otdeleniya AN SSSR.

ACCESSION NR: AP5001514 EWT(m)/EPF(c)/EWP(j)/T Pc-4/Pr-4 RM S/0020/64/159/005/1059/1061

AUTHOR: Anufriyenko, V. G.; Mamayeva, Ye. K.; Keyver, N. P.; Kefeli, L. M.; Rukhadze, Ye. G.; Terent'yev, A. P. (Corresponding member AN SSSR)

TITLE: Study of the EPR spectra of Cu(II) α-thiopicolinanilide complex

SOURCE: Doklady, v. 159, no. 5, 1964, 1059-1061

TOPIC TAGS: chemical structure, electron paramagnetic resonance, chelate complex, copper alpha thiopicolinanilide complex

ABSTRACT: It is of great importance to investigate the electronic structure of monomeric links of chelate polymers. This article [illegible] results of the [illegible] of the EPR spectra of CuII α-[illegible] complex (CuII-TPA) [illegible] crystalline state and in solution. The structure of this complex, which [illegible] analog of chelate polymers, is shown in figure 1. This complex was obtained as a brown crystalline precipitate by reacting α-thiopicolinanilide with cupric acetate in a methanolic medium. The EPR spectrum of CuII-TPA is shown in figure 2. It is concluded on the basis of this work that CuII-TPA is a

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ACCESSION NR: AP5001514

coplanar complex in which the Cu-N bond and the Cu-S bond are predominantly covalent. Orig. art. has: 3 figures

ASSOCIATION: Institut kataliza Sibirskogo otdeleniya Akademii nauk SSSR (Institute of Catalysis of the Siberian Branch of the Academy of Sciences SSSR, Moskovskiy gosudarstvennyy universitet ... Moscow State University)

SUBMITTED: 01Aug64 ENCL: 02 SUB CODE: OC, MP

NR REF SOV: 007 OTHER: 013

Card 2/4

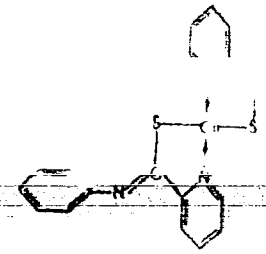
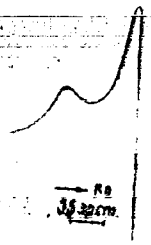


fig 1

Structure of Cu (II) -thiopicolinanilide complex

ACCESSION NR: AP5001514

ENCLOSURE 02



Polycrystalline Cu-II TPA complex

MASTIKHIN, V.M.; KEFELI, L.M.; KEYYER, N.P.

Electron paramagnetic resonance spectra generated in the adsorption of oxygen on rutile. Kin. i kat. 6 no.1:180-181 Ja-F '65. (MIRA 18:6)

1. Institut kataliza Sibirskogo otdeleniya AN SSSR.

SAZONOVA, I.S.; KEYER, N.P.

Work function of an electron of titanium dioxide and its solid solutions in the process of chemisorption and catalysis. Kin.i kat. 6 no.3:448-456 My-Je '65. (MIRA 18:10)

1. Institut kataliza Sibirskogo otdeleniya AN SSSR.

MIKHAYLOVA, I.L.; SAZONOVA, I.S.; KEYYER, N.P.

Oxidation of carbon monoxide on titanium dioxide and its solid solutions with tungsten and iron oxides. Kin. i kat. 6 no.4:704-709 Jl-Ag '65. (MIRA 18:9)

1. Institut kataliza Sibirskogo otdeleniya AN SSSR.

KEYYER, N.P.; MAMAYEVA, Ye.K.; ALIKINA, G.M.; TYULENEVA, L.I.; AFANAS'YEVA, S.M.

Catalytic properties of chelate polymers based on quinaldine bis-thioamides. Kin.i kat. 6 no.5:849-853 S-O '65. (MIRA 18:11)

1. Institut kataliza Sibirskogo otdeleniya AN SSSR.

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Ayrapetyan, E. Ye.; Akopdzhanov

Vysokomolekulyarnyye soyedineniya, v. 7, no. 5, 1965, 847-853

TOPIC TAGS: x ray spectrum, chelate, polymer,

The present investigation is an extension of

studied were

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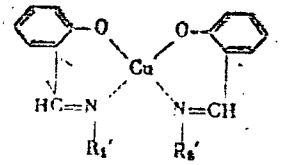

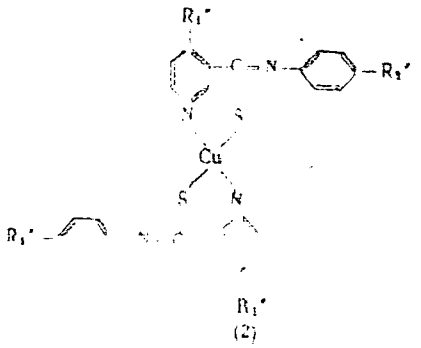

(2)

where R_1', R_2', R_1'', and R_2'' are different aliphatic and aromatic radicals. The experimental results are summarized in Fig. [illegible] Ph_2. It is found that different radicals affect the [illegible] atom to a different extent, and their activity is found to be additive. The effect of polymerization on the x-ray fine structure of the central atom is analogous to the effect of increased chain-branching in the monomer.

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Orig. art. has: 10 graphs and 2 illustrations.

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ENCLOSURE: 01

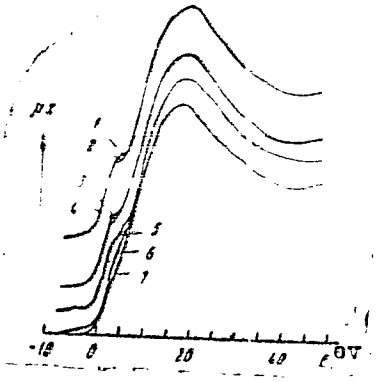

Fig. 1.

Comparison of the fine structure absorption spectra of the K x-rays of copper for chelate molecules of type (I) with different radicals R_1' and R_2'.

1 — $R_1' = R_2' = CH_3$; $R_1 = R_2 =$
— C_6H_5; 3 — $R_1' = OH$; $R_2' = -C_6H_5$;
4 — $R_1' = CH_3$; $R_2' = -CH_2C_6H_5$; 5 — $R_1' =$
— $R_2' = H$; 7 — $R_1' = R_2' = OH$; 7 — $R_1' = R_2' =$
— CH_3

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