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RUBINOWSKI, Zbigniew

Outlines of the metallogenesis of the Paleozoic of the Gory Swietokrzyskie Mountains. Przegl geol 10 no.8:395-399 Ag '62.

1. Swietokrzyska Stacja Terenowa, Instytut Geologiczny, Warszawa.

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ACC NR: AP6019638 SOURCE CODE: UR/0292/66/000/006/0017/0019

AUTHOR: Rubinraut, A. M. (Engineer)

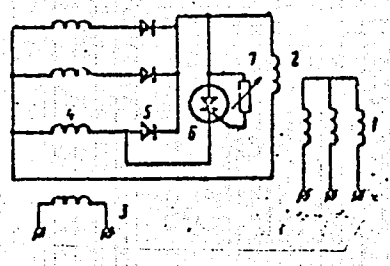
ORG: none

TITLE: Protecting the rectifiers of a contactless synchronous machine

SOURCE: Elektrotekhnika, no. 6, 1966, 17-19

TOPIC TAGS: synchronous machine, semiconductor rectifier, circuit design

ABSTRACT: In the well-known G. M. Rosenberry brushless synchronous motor system, the rotor-mounted rectifiers are protected by three thyristors designed to carry full field current (Appl. and Ind., 1960). The present article suggests a simpler single-thyristor circuit (see figure) in which: 1 - stator winding, 2 - field winding, 3 - exciter field winding, 4 - exciter armature winding, 5 - rectifier, 6 - thyristor, 7 - adjusting resistor. The processes transpiring in the protective circuit are briefly



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ACC NR: AP6019638

described. The circuit was tested in a 4.5-kw 50-cps synchronous machine operated as a motor and as a generator; oscillograms of induction starting and of the current in the generator field winding are shown. "Tests were conducted jointly with Engineer Ye. M. Kirillova." Orig. art. has: 6 figures and 3 formulas.

SUB CODE: 09 / SUBM DATE: none / ORIG REF: 004 / OTH REF: 001

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"APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2

RUBINSKIY, A.M., inzh. (Moskva)

Contactless system for exciting synchronous motors machines with silicon rectifier control. Elektrichestvo no.5:67-70 My '65. (MIRA 18:6)

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"APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2

RUBINSHPAYZER, S.

CA

1

Performance of Lurgi concentrators. S. Rubinshpaizer, P. Zakharov and A. Barmash. *Konservnaya i Plodoovoshchnaya Prom.* 11, No. 3, 33-4(1940).—Optimum conditions for operating concentrators are discussed and examples are cited, with numerical data. J. F. Smith

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2"

"APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2

RUBINSHTEIN, E. [Rubinshteyn, Ye.], doktor po geogr. nauki (Leningrad)

Is the climate of our planet becoming warmer? Priroda Bulg 13 no.3: 72-72 My-Je '64.

APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2"

"APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2

RUBINSHTEYN, A.

More about the new draft program of the Socialist Party of Austria. Vop. ekon. no.3:129-140 Mr '58. (MIRA 11:4)
(Austria--Socialist Party)

APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2"

"APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2

RUBINSHTEYN, A., inzh.; CHERNYAK, G., kand.tekhn.nauk

Using electric capacitors for determining soil moisture. Na stroi. Mosk. 1 no.8:23 Ag '58. (MIRA 11:10)
(Soil moisture) (Electric capacitors)

APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2"

"APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2

RUBINSHTEYN, A.; FURSA, A., inzh.; ROMANOVA, L., inzh

Standardization of the number of workers servicing the same type of equipment. Sots.trud 4 no.3:115-118 Mr '59. (MIRA 12:4)

1. Nachal'nik otdela truda i i zarabotnoy platy "Glavmosprom-stroymaterialy" pri Mosgorispolkome (for Rubinshteyn). 2. Otdel truda i zarabotnoy platy "Glavmospromstroymaterialy pri Mosgori-spolkome (for Fursa, Romanova).
(Production standards)

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"APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2

RUBINSHTEYN, A.

RUBINSHTEYN, A.

What is hidden by reformist "theories" of the second industrial revolution. Vop.ekon. no.12:76-89 D '57. (MIRA 11:1)
(Economics)

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"APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2

RUBINSHTEYN, A., inzhener.

Using paper bags for garbage disposal. Zhil.-kom.khoz. 6 no.8:26 '56. (MIRA 10:2)

(Refuse and refuse disposal)

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"APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2

RUBINSHTEYN, A., inzh.

The "Ural-375" motortruck. Za rul. 18 no.9:18-19 S'60.(MIRA 13:10)
(Motortrucks)

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"APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2

SHUPIK, A.L., okulist; RUBINSHTEYN, A.G., vrach

Report on the work of the Poltava Ophthalmological Society for 1958.
Oft.zhur. 14 no.7:447-448 '59. (MIRA 13:4)

1. Predsedatel' pravleniya Poltavskogo oftal'mologicheskogo obshchestva.
(POLTAVA--OPHTHALMOLOGICAL SOCIETIES)

APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2"

"APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2

RUBINSHTEYN, A.I. (Moskva)

Gap series and class H^{ω}-functions. Mat. sbor. 65 no.2:239-271 O '64. (MIRA 17:11)

APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2"

"APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2

PAUSHKIN, Ya.M.; YUZVYAK, A.G.; RUBINSHTEYN, A.I.

Synthesis of dimethylcyclohexadiene and vinylcyclohexene by the dimerization of butadiene. Dokl.AN SSSR 144 no.3:581-584 My '62. (MIRA 15:5)

1. Institut neftekhimicheskoy i gazovoy promyshlennosti im. I.M.Gubkina. Predstavleno akademikom A.V.Topchiyevym.
(Butadiene) (Cyclohexadiene) (Cyclohexene)

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"APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2

RUBINSHTEYN, A.I.

A-integrals and series in Walsh's system. Usp. mat. nauk 18 no.3: 191-197 My-Je '63. (MIRA 16:10)

APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2"

"APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2

RUBINSHTEYN, A.I. (Moskva)

Gap series. Izv. vys. ucheb. zav.; mat. no.3:137-148 '63. (MIRA 16:4)

(Fourier series)

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"APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2

RUBINSHTEYN, A. L. Dr. Tech. Sci.

Dissertation: "Problems of Geotechnical Investigations of the Rock and SEmi-Rock Carbonate Grounds." Moscow Hydraulic Engineering and Soil Improvement Inst., imeni V. R. Vil'yams, 6 Jun 47.

SO: Vechernyaya Moskva, Jun, 1947 (Project #17836)

APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2"

"APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2

RUBINSHTEYN, A. L.

USSR/Geophysics - Loess Deformations Jun 51

"The Nature of Loess Deformations Under the Influence of Simultaneous Dampening (Wetting) and Pressure," Prof A. L. Rubinshteyn

"Gidrotekh i Meliorat" No 6, pp 39-43

Studies subject deformation in connection with strains in bldgs under which the soil loses its bearing strength through moisture and pressure. Loess-type foundations under these conditions are prone to collapse. Unfortunately the loess type, also called the macroporose type, is the kind of soil most frequently encountered in bldg foundations, canal bldg, power plant constr, dams, etc.

186T33

Describes properties of loess-type grounds: vertical channels called macropores visible to the eye, porousness (40%), powdery character, presence of sol salts like carbonates and sulfates.

186T33

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"APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2

RUBINSHTEYN, A.L., professor; KIRILLOV, A.A., dotsent; ANEF'YEVA, T.I., assistent; MAKSIMOV, S.N., inzhener.

Method of forecasting the deformation of loess soil under hydrotechnical structures. Gidr.i mel. 5 no.9:3-13 S '53. (MLRA 6:9)
(Soil mechanics)

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1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

BC

B-I-2

Rapid determination of ash in coal and coke. B. V. Mangusi and A. L. Rubinstein (Koks i Chim., 1935, No. 10, 67—68).—By moistening finely-ground coal or coke with conc. H_2SO_4 or HNO_3 the time required for ash determination by ignition in a muffle is reduced to 40—60 min. D. R. H.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2"

"APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2

[illegible], A. I.

[illegible], A. I. --"Investigations in the Field of Organic Compounds of Sulfur in Coal, in Connection with Their Enrichment for Coking Purposes." *(Dissertations for Degrees in Science and Engineering Defended at USSR Higher Educational Institutions) Min of Coal Industry USSR, All-Union Scientific Research Inst for the Enrichment and Briquetting of Coal (VNIIUgleobogashcheniye), Moscow, 1955

SO: Vnizhnaya Letopis', No. 25, 18 Jun 55

* For Degree of Doctor of Technical Sciences

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"APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2

RUBINSHTEYN, A. L.

4

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27

Elemental sulfur in coal. A. Z. Yurovskii, V. S. Kovalskii, and A. L. Rubinshtein. *Khim. i Tekhnol. Topliva i Masel* 1957, No. 7, 20-3.—Extn. of S by the standard methods and by the reaction $Na_2SO_3 + S \rightarrow Na_2S_2O_3$ showed that in the coal, in addn. to sulfate, pyrite, and

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modification of the IR references. A.F. Kolloby

MT

SEMENOV, M.P., doktor geologo-mineralogicheskikh nauk, prof., red.; PRIKLONSKIY, V.A., doktor geol.-mineral. nauk, prof., red.; MASLOV, N.N., doktor tekhn.nauk, red.; POKROVSKIY, G.I., red.; MOROZOV, S.S., doktor geol.-mineral.nauk, red.; RUBINSHTEYN, A.L., red.; SOKOLOV, D.S., kand.geol.-mineral. nauk, red.; LYKOSHIN, A.G., red.; YANSHINA, M.S., red.; ORADOVSKAYA, A.Ye., nauchnyy sotrudnik, red.; SAFONOV, P.V., red.izd-va; BUSEVA, S.S., tekhn.red.

[Dissolving and leaching rock] Rastvorenie i vyshchelachivanie gornykh porod. Moskva, Gos. izd-vo lit-ry po stroit. i arkhit., 1957. 264 p. (MIRA 11:2)

1. Moscow. Vsesoyuznyy nauchno-issledovatel'skiy institut vodosnabzheniya, kanalizatsii, gidrotekhnicheskikh sooruzheniy i inzhenernoy gidrogeologii. 2. Zaveduyushchiy laboratoriyey inzhenernoy gidrogeologii Vsesoyuznogo nauchno-issledovatel'skogo instituta vodosnabzheniya, kanalizatsii, gidrotekhnicheskikh sooruzheniy i inzhenernoy gidrogeologii (for Semenov). 3. Laboratoriya gidro-geologicheskikh problem imeni F.P.Savarenskogo (for Priklonskiy). 4. Leningradskiy inzhenerno-stroitel'nyy institut (for Maslov). 5. Moskovskiy gosudarstvennyy universitet imeni Lomonosova (for Morozov). 6. Moskovskiy geologorazvedochnyy institut imeni S.Ordzhonikidze (for Sokolov). 7. Vsesoyuznyy nauchno-issledovatel'skiy institut vodosnabzheniya, kanalizatsii, gidrotekhnicheskikh sooruzheniy i inzhenernoy gidrologii (for Oradovskaya)

(Leaching)

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"APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2

RUBINSHTEYN, A.L

65-7-3/14

AUTHORS: Yurovskiy, A.Z., Kaminsky, V.S. and Rubinshteyn, A.L.

TITLE: An Elemental Sulphur in Coals (Ob elementarnoy sere v kamennykh uglyakh)

PERIODICAL: Khimiya i Tekhnologiya Topliva i Masel, 1957, No.7, pp. 20 - 23 (USSR).

ABSTRACT: One of the authors proposed a hypothesis of the formation of pyrites in coal according to the reaction:

$2FeSO_4 + 5H_2S = 2FeS_2 + 2S + H_2SO_4 + 4H_2O$. Analysis of two samples of Donets coals for elemental sulphur using the sulphite method was carried out (a detailed description of the analytical procedure is given). It was found that both samples contained about 0.15% of elemental sulphur. As this sulphur could not be extracted by carbon tetrachloride, it should be present in coal in amorphous form. It is concluded that the presence of the elemental sulphur can be taken as the confirmation of the above hypothesis on the formation of pyrites and that in addition to sulphate, pyritic and organic sulphur in coal, elemental sulphur should be included into the classification of forms of sulphur in coal. There are 2 tables and 12 references, 8 of which are Russian, 2 English, 1 German and 1 French.

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"APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2

RUBINSHTEYN, A.L., prof.

Forecasting the deformation of structures on loess-type soils. Gidr. i mel. 17 no.4:35-38 Ap '65. (MIRA 18:5)

1. Moskovskiy gidromeliorativnyy institut.

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"APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2

RUBINSHTEYN, F.I.

Second scientific and technical conference of the young specialists of the State Design, Planning and Scientific Research Institute of the Paint Industry. Lakokras.mat. i ikh prim. no.4: 88 '62. (MIRA 16:11)

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"APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2

KOTLOV, F.V., kand. geol.-min. nauk, otv. red.; BEZRUK, V.M., doktor geol.-miner. nauk, red.; BELYY, L.D., doktor geol.-miner. nauk, red.; BYKOVA, V.S., kand. geol.-miner. nauk, red.; GOR'KOVA, I.M., doktor geol.-miner. nauk, red.; GUREYEV, A.M., red.; YEMEL'YANOVA, Ye.P., kand. geol.-miner. nauk, red.; KOLOMENSKIY, N.V., doktor geol.-miner. nauk, prof., red.; MAKEYEV, Z.A., doktor geol.-miner. nauk, red.; POL'SHIN, D.Ye., kand. tekhn. nauk, red.; POPOV, I.V., doktor geol.-miner.-nauk, prof., red.; PRIKLONSKIY, V.A., prof., red. [deceased]; RUBINSHTEYN, A.L., doktor geol.-miner. nauk, prof., red.; SERGEYEV, Ye.M., doktor geol.-miner. nauk, prof., red.; FADEYEV, P.I., kand. geol.-miner. nauk, red.; ZOLOTOV, P.F., red. izd-va; ASTAF'YEVA, G.A., tekhn. red.

[Materials on the engineering and geological properties of rocks and methods for their study] Inzhenerno-geologicheskie svoistva gornykh porod i metody ikh izucheniia; materialy. Moskva, Izd-vo Akad. nauk SSSR, 1962. 362 p. (MIRA 15:5)

1. Soveshchaniye po inzhenerno-geologicheskim svoistvam gornykh porod i metodam ikh izucheniya, Moscow, 1957. 2. Chlen-korrespondent Akademii nauk SSSR (for Priklonskiy). 3. Moskovskiy gosudarstvennyy universitet (for Sergeyev). 4. Laboratoriya gidrogeologicheskikh problem Akademii nauk SSSR (for Kotlov). 5. Kafedra "Osnovaniya i fundamenty" Moskovskogo instituta inzhenerov vodnogo khozyaystva (Rubinshteyn).

(Rocks) (Engineering geology)

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"APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2

RUBINSHTEYN, A.L., prof., doktor tekhn.nauk

Problems involved in the construction of irrigation systems in loess soils. Nauch. zap. MIIVKH 23:3-19. '60. (MIRA 14:8)
(Irrigation research) (Loess)

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"APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2

RUBINSHTEYN, A.L., prof.; ORUSSKIY, V.A., retsenzent; FAYNTSIMMER, V.M., retsenzent; YELIZAVETSKAYA, G.V., red.; GUREVICH, M.M., tekhn. red.

[Soil mechanics research and foundation engineering] Gruntovedenie, osnovaniia i fundamenty. Moskva, Gos. izd-vo sel'khoz. litry, zhurnalov i plakatov, 1961. 311 p. (MIRA 14:8)
(Soil mechanics) (Foundations)

APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2"

"APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2

RUBINSHTEYN, A.L., professor, doktor tekhn.nauk; AREF'YEVA, T.I., kand.tekhn. nauk; KIRILLOV, A.A., dotsent, kand.tekhn.nauk; FROLOV, N.N, inzh.

Problems in the design of hydraulic structures on loess soils. Nauch.zap. MIIVKH 20:262-281 '58. (MIRA 13:6)
(Loess) (Soil mechanics)

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"APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2

KAMINSKIY, V.S., kand. tekhn. nauk; RUBINSHTEYN, A.L., kand.tekhn.nauk; YUROVSKIY, A.Z., doktor tekhn. nauk

Determining the various types of sulfur contained in coal. Obog. i brik. ugl. no.9:53-59 '59. (MIRA 12:9)
(Coal--Analysis) (Sulfur)

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"APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2

AUTHOR: Rubinshteyn, A.L., Professor SOV-99-58-8-4/11

TITLE: The Principles of Engineering Estimates of Loess Soil Deformation Under Irrigation Structures (Osnovy inzhenernykh raschetov deformatsii lessovykh gruntov pod irrigatsionnymi sooruzheniyami)

PERIODICAL: Gidrotekhnika i melioratsiya, 1958, Nr 8, pp 20-27 (USSR)

ABSTRACT: There are no approved norms and technical conditions for the erection of hydrotechnical structures, and for many questions there are no methods of computation available. The fact that data for the erection of buildings and industrial constructions are available does not aid the fixing of norms for irrigation structures. One of the basic problems of constructing irrigation structures on loess soil is to determine the extent of expected deformation of these structures due to the settling of the underlying layers of loess. The conditions and methods of erecting these structures will depend on the extent of this deformation. The author describes 3 kinds of deformations to which loess soils are subjected under the influence of structures and 2 methods according to which the erection of irrigation structures are usually carried out. He deals with the erection of structures without preliminary

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SOV-99-58-8-4/11

The Principles of Engineering Estimates of Loess Soil Deformation Under Irrigation Structures.

wetting of the ground and sets forth, in detail, 3 stages in which the packing of the soil takes place. He quotes formulae for compacting and sagging of the ground, calling attention to the possibility of fluctuations caused by moistening of the loess strata. In conclusion, the author examines various problems in connection with the erection of structures with a preliminary wetting of the ground. This will protect the ground from becoming deformed under certain conditions.

1. Agriculture--USSR 2. Inland waterways 3. Soils--Mechanical properties

Card 2/2

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"APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2

RUBINSHTEYN, A.L., prof.

Principles involved in calculations of the deformation of loess soils under irrigation structures. Gidr. i mel. 10 no. 8:20-27 Ag '58.
(Loess)
(Soil mechanics)

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"APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2

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11(7) PHASE I BOOK EXPLOITATION SOV/2996

Akademiya nauk SSSR. Institut goryuchikh iskopayemykh

Genezis tverdykh goryuchikh iskopayemykh (Genesis Of Solid Fuels) Moscow, AN SSSR, 1959. 358 p. Errata slip inserted. 2,000 copies printed.

Sponsoring Agency: Vsesoyuznoye khimicheskoye obshchestvo im. D. I. Mendeleyeva. Moskovskoye otdeleniye.

Resp. Eds.: N. M. Karavayev, Corresponding Member, USSR Academy of Sciences, and N. G. Titov, Doctor of Chemical Sciences; Ed. of Publishing House: A. L. Bankvitzer; Tech. Ed.: I. F. Kuz'min.

PURPOSE: This collection of articles is intended for geochemists, geologists, and other specialists interested in the genesis of solid mineral fuels.

COVERAGE: The collection of papers on the genesis of solid mineral fuels has been prepared for presentation at the 2nd All-Union Conference on this subject. The formation of humic acids and peat from the decomposition of microorganisms and plants is discussed in connection with studies on the origin of hard coal and brown coal and on the role of certain mineral components in the coal-forming process. The chemical composition of peat and the organic mass of coal are analyzed and shown in a number of tables. Estonian "Kukkersite" oil shales are analyzed as are the brown coals of the Dnepropetrovsk basin. Metamorphism and carbonization of coal found in different parts of the Urals and the Ukrainian SSR are also discussed. The transformation of parent matter into combustible minerals is analyzed. References accompany individual articles.

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RUBINSHTEYN, A.L., doktor tekhn. nauk. prof.; RUBINSHTEYN, V.A., inzh.

New apparatus for testing weak soils for compression. Izv. TSKHA no.5:239-240 '62. (MIRA 16:7)

(Soil mechanics)

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Catalytic oxidation of butyl alcohol to butyraldehyde. A. M. Rubinshtein, A. A. Balandin, B. A. Dolgoplosk, K. A. Morozov and L. I. Vagranskaya. *J. Applied Chem.* (U. S. S. R.) 6, 278-88(1933).—The oxidation was effected with air and with CO_2, the following catalyst being investigated: (1) Cr_2O_3 catalyst in a brass tube, (2) Cr_2O_3 + MnO_2 (35:65) in a brass tube, (3) CuO, (4) Cr_2O_3 + Fe_2O_3 (1:3) in a brass tube, (5) MnO_2 in a brass tube, (6) MnO_2 + Fe_2O_3 (2:3) in a brass tube, (7) Fe_2O_3 in a brass tube, (8) fused V_2O_5, (9) Ag (40%) on asbestos, (10) Ag (50%) on asbestos, (11) Ag (75%) on asbestos, (12) Ag (50%) on asbestos obtained by pptg. Ag on asbestos with HCHO from NH_3-$AgNO_3$, (13) Ag gauze in a glass tube, (14) Cu (7.5%) + Ag(42.5%) on asbestos, and (15) Cu (25%) + Ag (25%) on asbestos (50%) prepd. as in (14). The reaction is accompanied by evolution of heat (with the Ag catalyst); the catalyst, however, retains its activity. With 50-75% of Ag pptd. on asbestos there is no change in the yield of aldehyde and acid. Water improves the process and the best temp. for all Ag catalysts is 350-80°. The most efficient catalyst is Ag (50%) pptd. on asbestos with HCHO. The yields of aldehyde and acid were, resp., as follows, with air as oxidant: with finely pptd. Ag 72 and 4%, finely pptd. mixt. of Ag and Cu on asbestos 68 and 7%, with (8) 49 and 23%, with (7) 40.7 and 6.0%, with (5) 33 and 0.3%. The highest yields were obtained with a Ag catalyst, a furnace temp. of 350-60° and an air velocity of 1-1.5 l. per min. through a tube 15 mm. in diam., the alc.-water mixt. (2:3) being preheated to 85-90°. The temp. is lower for a Ag-Cu catalyst by 25-50°; for V_2O_5 it is about 400° and for Fe_2O_3 400-550°. The Cr_2O_3, Cr_2O_3 + MnO_2 and CuO catalysts in sticks procured from Kahlbaum were useless. Expts. on the oxidation of BuOH with CO_2 in the presence of V_2O_5 were quite successful when made at 500-50° and at an alc. temp. of 80-95°.

A. A. Boehtlingk

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Chemical composition of Fergana benzine. A. M. Rubinsh'tein. *Sci. Repts. Moscow State Univ.* 1934, No. 3, 255-7.—The benzine b. 35-200°, is characterized by absence of S and of unsatd. hydrocarbons and by its low content of aromatic and hydroaromatic hydrocarbons.

B. C. A.

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Comparative dehydrogenation of cyclohexane and methylcyclohexane. A. A. Balandin and A. M. Rubinshtein. *J. Phys. Chem.* (U. S. S. R.) 5, 12-19(1934).—See *C. A.* 28, 2255[1]. F. H. Rathmann

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A study of the parallel reactions of dehydration and dehydrogenation on mixed catalysts. A. A. Balandin and A. M. Rubinshtein. *J. Phys. Chem.* (U. S. S. R.) 6, 576-89(1935).—Mixed Ni-Al oxide catalysts were prepd. from various combinations of the sulfates, nitrates and chlorides with varying amts. of NaOH or Na_2CO_3 as pptg. agents. The final products as catalysts for dehydrogenation and dehydration of isoamyl alc. and the decompn. of AcH ranged from very active to totally inactive and the relative proportions of the products obtained varied widely. For dehydrogenation the energies of activation ranged from 8800 to 22,400 cal.; for dehydration from 15,000 to 33,000 cal. and for aldehyde decompn. from 17,000 to 47,000 cal. A catalyst very active toward one reaction was not necessarily active toward another, and no parallelism exists between the orders of the activation energies of various catalysts for different reactions. No great difference in activity was found as a factor of the anion in the original salt used, but the sulfate catalysts gave higher energies of activation in general. The value of $Q/\lg k_0$ in the Arrhenius equation was 1.83 for dehydrogenation and 3.71 for dehydration with a variation of only 25% for all of the 9 catalysts used. F. H. Rathmann

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Catalytic oxidation of organic compounds by carbon dioxide. I. Oxidation of isoamyl alcohol in presence of acids and salt catalysts. A. M. Rubinshtein, K. P. Preobrazhenskaya and L. S. Chernomorskaya. *Sci. Repts. Moscow State Univ.* 1930, No. 6, 287-97.—The yields of iso-$PrCH_2CHO$ (I) and iso-$PrCH_2CO_2H$ (II) obtained under optimum conditions by passing iso-$C_5H_{11}OH$ (III) in a stream of CO_2 over a number of catalysts are: U_2O_5 at 450°, 72.9 and 12.3, MoO_3-pumice at 450°, 50.3 and 18.2, $Ca(VO_3)_2$ (IV) at 600°, 58.6 and 3.7, $Sn(VO_3)_2$ at 450°, 56 and 30.1 and MoO_3-V_2O_5 pumice at 100°, 40.8 and 37.0%. Except with IV the optimum temps. are the same as for oxidation by air in presence of the same catalysts. The optimum rates of flow of CO_2 are detd. for each catalyst. **II. Oxidation of different alcohols.** A. M. Rubinshtein and N. F. Lukashina. *Ibid.* 299-305.—III-CO_2 mixts. yield chiefly iso-$PrCH:CH_2$ (V) in presence of V_2O_5 at 350° and iso-BuOH-CO_2 mixts. give chiefly $Me_2C:CH_2$ with MoO_3 at 350-500°. CH_3PhOH and CO_2 afford PhCHO 54% and BzOH 32.5% with MoO_3 at 400°. **III. Mechanism of oxidation of alcohols.** A. M. Rubinshtein and N. M. Naglev. *Ibid.* 307-19.—The gaseous products obtained by passing III, III-H_2O, III-CO_2 or III-CO_2-H_2O mixts. over MoO_3-asbestos at 350-500° contain chiefly H_2, together with V, CO and CO_2, the yield of V being greatest and of H_2 least, when III alone is passed over the catalyst. The ratio I/II in the liquid product falls with increasing temp. Under the conditions of the expt., HCO_2H (VI) yields CO and H_2. The reaction of oxidation of alcs. by CO_2 is represented: $CH_3ROH + CO_2 \rightarrow RCHO + VI$; $VI \rightarrow CO + H_2$; $RCHO + H_2O \rightarrow CHR(OH)_2 \rightarrow RCO_2H + H_2$; $CHR(OH)_2 + CO_2 \rightarrow RCO_2H + VI$. B. C. A.

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Simultaneous dehydrogenation and dehydration of alcohol by single and mixed catalysts. A. M. Rubinstein and E. P. Gratscheva (J. Phys. Chem. Russ., 1936, 8, 725—735).—$C_5H_{11}OH$ between 350° and 520° gives chiefly H_2 and smaller amounts of C_5H_{10}, CO, CO_2, and an acid. The relation (rate of dehydrogenation) : (rate of dehydration) is for $Fe_2O_3 > ZnO > Cr_2O_3 > BeO$; it is almost independent of the temp. for Fe_2O_3 and ZnO but decreases with increasing temp. for Cr_2O_3 and BeO. The latter catalysts cause a deposition of C; they consequently become mixed catalysts during the reaction.

J. J. B.

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Decomposition of alcohols by mixed catalysts. A. M. RUBINSTEIN (Bull. Acad. Sci. U.R.S.S., 1937, Sér. Chim., 1417—1431).—Further experiments on the simultaneous dehydrogenation and dehydration of isoamyl alcohol in presence of Al_2O_3–Ni and similar catalysts admixed with other metals (Fe, Co) and oxides (CdO, MnO) confirm the conclusions formerly reached (A., 1937, I, 435). E. S. H.

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Parallel reactions and specific peculiarities of mixed catalysts. A. M. Rubinshtein. *Acta Physicochim. U. R. S. S.* 7, 101-20(1937)(in German); cf. *C. A.* 30, 3300[1]; 31, 2078[1].—Parallel dehydration and dehydrogenation of iso-AmOH in the presence of binary catalysts (NiO and Al_2O_3) confirmed the differences of the activation energies of these reactions and of the consecutive aldehyde decompn. Existence of const. relations between activation energies was confirmed for mixed catalysts. Exponential factors of the Arrhenius equation and the log relations of the activation energies were found. The prepn. of the catalysts is discussed. W. George Parks

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Action of carbon dioxide in the vapor-phase oxidation of an alcohol over a metallic catalyst. A. M. Rubinshtein and A. Ya. Kronrod. *J. Applied Chem.* (U. S. S. R.) 10, 888-98(in German 898-9)(1937).—All expts. were carried out under ordinary pressure in a glass tube 75 cm. long and of 1.15 cm. diam. placed in an elec. furnace and contg. in its middle portion a 20-cm. catalyst layer. Asbestos impregnated with an $AgNO_3$ soln. and reduced at 250-300° with electrolytic H was used as catalyst (Ag 40%). Pure $Me_2CHCH_2CH_2OH$ (I) was used for an oxidation. The systems: (1) I-catalyst; (2) I-H_2O-catalyst; (3) I-CO_2-catalyst; and (4) I-CO_2-H_2O-catalyst were investigated at 375-425°. CO_2 and H_2O (to a lesser degree) act on I in the presence of the Ag catalyst as oxidizing agents. The dehydration of I is insignificant. The main reaction products are H_2 and $Me_2CHCH:CH_2$ in the gas phase, and Me_2CHCH_2CHO (mainly) and $Me_2CHCH_2CO_2H$ in the liquid phase. The authors propose a mechanism of the reaction according to which CO_2 acts as an acceptor for the active H of I with formation of HCO_2H, which decomps. into CO_2 and H_2. The low yield of CO is explained by the decompn. reaction of aldehyde and subsequent decompn. of HCO_2H more extensively into CO_2 and H_2 than into CO and H_2O. Thirty-four literature and 5 patent references. A. A. Podgorny

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X-ray study of mixed nickel catalysts for dehydrogenation-dehydration. A. M. Rubinshtein. *Bull. acad. sci. U. R. S. S., Classe sci. math. nat., Sér. chim.* 1938, 815-39 (in English, 839-40).—A literature review and a Debye-Scherrer x-ray study of 18 mixed Ni-Al_2O_3 catalysts used for dehydrogenation and dehydration of isoamyl alc. show the presence in the catalysts of α-Ni of primary crystal size, 40-122 A.; and γ-Al_2O_3 of crystal size, 58-110 A., together with amorphous Al_2O_3. The activity of the catalyst is greatly affected by the degree of dispersion and deformation of the elementary nucleus of the crystal lattice of the components. Ni shows the highest activity in dehydrogenation when its crystal size is 70-80 A.; the catalytic activity of Al_2O_3 samples studied also suggests a max., but this was not detd. The energy of activation of dehydrogenation on Ni increases with closer packing of the lattice. Evidence was obtained that the sections with highest activity are located on the phase boundaries. 52 references. J. G. Tolpin

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Structure and properties of heterogeneous catalysts. A. M. Rubinshtein. *Uspekhi Khim.* 7, 1144-72(1938).—A review on the x-ray study of polycryst. systems, relation of structure to catalytic properties, polymorphism and catalytic activity, formation of solid solns. and chem. compds. in mixed catalysts, lattice structure and catalytic activity, dispersity, secondary crystn. and surface state of catalysts and effects on catalytic activity. Cf. C. A. 32, 2818[8]. W. H. Rothmann

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Relation of the activity and the selective action of mixed nickel-alumina catalysts to their composition and structure. A. M. Rubinshtein. *J. Phys. Chem.* (U. S. S. R.) 13, 1271-81(1939).—Exptl. data on the dehydration and the dehydrogenation products of Iso-Am alc. on various mixed Ni-Al_2O_3 catalysts at temps. of 200-300° as functions of compn., lattice consts. and disperaity of the catalyst and of the temp. are shown in 10 figures and 5 tables. Although no simple relation between disperaity and compn. exists, the activity-compn. curve for dehydrogenation at all temps. passes through a max. near 30 and a min. near 70% Ni, whereas that for dehydration passes through a max. near 70% Al_2O_3. The 1 to 1 ratio Al_2O_3:Ni gives the best conditions for development of a phase boundary. With increasing grain-size from 50 to 85 A. the activity of the catalysts increases, apparently asymptotically; the effect is more marked at higher temps. Ni acts as a catalyst promoter with respect to Al_2O_3 as a dehydration catalyst; the selective action of the mixed catalysts passes through a min. at 30 to 40% Ni; the curve for selective action with temp. for the 1 to 1 catalyst runs from 0.5 dehydrogenation at 284 to 0.88 at 200° and is much steeper with respect to selectivity for catalysts of all other compns.

F. H. Rathmann

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Dehydrogenation reactions with nickel catalysts of various degrees of dispersion. A. M. Rubinshtein. *Bull. acad. sci. U. R. S. S., Classe sci. chim.* 1940, 135-12 (in German, 142-3); cf. *C. A.* 33, 4116[1].—The relationship between the activity of $Ni-Al_2O_3$ catalysts and the degree of dispersion of the Ni has been investigated in the dehydrogenation of cyclohexane and HCO_2H. X-ray studies of the different catalyst prepns. used show that the primary crystal size of Ni varies in these prepns. from 49-122 A. The activity of the catalyst is greatly affected by the degree of its dispersion. In accordance with results found previously for iso-AmOH, Ni shows the highest activity in dehydrogenation when its crystal size is 70-80 A. Gertrude Berend

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Catalytic hydrogenation in the vapor phase in connection with the degree of dispersion of the catalysts. A. M. Rubinshtein. *Bull. acad. sci. U. R. S. S., Classe sci. chim.* 1940, No. 1, 144-50(in German, 150-1); cf. *C. A.* 33, 4110[8].—The hydrogenation of C_6H_6 and CO in the presence of a Ni-Al_2O_3 catalyst in which the dimensions of the Ni crystals varied from 49 to 102 A. was investigated. C_6H_6 was hydrogenated in an excess of H at 155° and 175°, the velocity of the C_6H_6 stream was 3 cc./hr., yielding 70.2-75.0% and 83.3-85.5%, resp., C_6H_{12}. The highest yield was in the more disperse catalyst; the catalysts with Ni crystals greater than 65 A. had little or no activity. The activation energy also varied within 3100-10,450 cal./mol. with the dispersity of Ni from 49 to 102 A. The mixt. CO + $3H_2$ was hydrogenated at 230-260° at various velocities of the mixt. (4.6-10.0 l./hr.), yielding CH_4; again the most-disperse catalysts (49, 58 A.) promoted best the transformation of CO into CH_4. Other catalysts had little or no activity. Presumably, all catalysts of the same chem. nature (metals, oxides) and having the same crystal system (cube) as the above catalyst should have the same relation between activity and dispersity.

A. A. Podgorny

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RUBINSHTEYN, A. M.

"The Problem of the Structure and Properties of Heterogenous Catalysts."

Zhur. Fiz. Khim., Vol. 14, No. 9-10, 1940.

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Br abo

Catalytic decomposition of Tschugaev's pentammine $[(NH_3)_5ClPt]Cl_3$. A. M. Rubinschtein (*Compt. rend. Acad. Sci. U.R.S.S.*, 1940, 28, 55—58).—Solutions containing $[(NH_3)_5ClPt]Cl_3$ and $(NH_3)_4PtCl_2$ (I) at >100° ppt. a yellow salt having the composition $[(NH_3)_4NH_4ClPt]Cl_2.[(NH_3)_4Cl_2Pt]Cl_2$. The salt shows a single phase under the microscope, with monoaxial positive crystals; $N_m = 1{\cdot}742$, $N_g > 1{\cdot}780$. It is formed by catalytic decomp. of the pentammine at a rate which increases with the amount of (I) present; the latter remains unchanged in the solution, whilst the former is completely decomposed. L. J. J.

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RUBINSHTEYN, A. M.

"Catalysts for the synthesis of gasoline from CO and H_2 which need not be reduced at a high temperature," Iz. Ak. Nauk SSR, Otdel. Khim. Nauk, No. 1, 1941.

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A. I. S. Rubinshtein

X-Ray examination of magnesium oxide catalysts. A. M. Rubinschtein (*Bull. Acad. Sci. U.R.S.S., Cl. Sci. Chim.*, 1943, 427—434).—41 samples of MgO, of crystal size 22—63 A., were examined with respect to their catalytic activity in the dehydration of EtOH, with formation of C_2H_4 (I), butadiene (II) and higher olefines. For the production of (I) and (II) a crystal size of 25 A. is the optimum. Decrease below this size causes a quicker fall in activity than equiv. increase above it. Study of the catalytic activity of crystals of the same size groups (22—24, 28—30, and 36—40 A.) but different lattice const. showed that a val. for this latter of 4·2 A. gave the best results. Expansion of the lattice had a greater effect in reducing activity than an equiv. contraction.

V. B.

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RUBINSHTEYN, A. M.

"A Study of Magnesium Oxyde Catalysts By Means Of X-Rays"

Iz. Ak. Nauk SSR, Otdel. Tekh. Nauk, No. 6, 1943.

Institute of Organic Chemistry, Academy of Sciences

of the USSR, -1943-.

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"On the Role of the Elementary Crystal Formations in Heterogenerous Catalysis, " Iz. Ak. Nauk, Otdel. Khim. Nauk, No. 5, 1945. Inst. Org. Chem., Acad. Sci. USSR, -1945-.

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Primary submicroscopic crystals in heterogeneous catalysis. A. M. Rubinshtein and N. A. Pribitkova (Inst. Org. Chem., Moscow). *Acta Physicochim. U.R.S.S.* 21, 79-100(1946)(in English); cf. *C.A.* 35, 374[8].—The activity, selectivity, and activation energy of MgO catalysts were studied in relation to their phys. structure. Samples were selected by x-ray analysis on the basis of primary crystal size and crystal lattice const. Their activity was detd. for the conversion of butanol at 400-460° to (I) butyraldehyde by dehydrogenation and (II) butylene by dehydration. Catalysts with normal MgO lattice spacing and crystal size of 22-63 A. showed max. activity for both I and II in the size range 25-30 A. Within a fixed size range of 25-30 A., catalysts with lattice spacing of 4.17-4.23 A. showed considerable variation in activity: I was favored by a compressed lattice spacing, whereas II increased directly with enlarged spacing. At the higher temp., II was favored. At 460°, there were produced per cc. alc. per g. of catalyst a max. of 9.5 and 3.0 cc. of gaseous products for reactions I and II, resp. Max. values for the activation energy were obtained for catalysts of normal lattice spacing. The catalytic action of MgO was discussed from the standpoint of Balandin's multiplet theory (cf. *C.A.* 29, 2005[4]). M. L. Nielsen

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General & Physical Chem. - 2

X-ray study of the effect of the lattice parameters and of the dimensions of the primary crystals on the activity and the selectivity of catalysts. A. M. Rubinshtein. *Problemy Kinetiki i Kataliza* 5, 11-24(1948); cf. *Izvest. Akad. Nauk, Otdel. Khim. Nauk* 1945, 500; C.A. 46, 9961d.—Ten MgO catalysts with primary crystallite size (detd. by x-ray diffraction) varying from 21.9 to 63.0 A., and lattice consts. varying from 4.16 to 4.24 A. (tabular value 4.20 A.) were tested in the dehydrogenation-dehydration of BuOH at a space velocity of 1300 ml. BuOH/l. catalyst/hr. The activities *a* are expressed in ml. (S.T.P.) gaseous product (C_4H_8 or PrCHO, resp., for dehydration or dehydrogenation)/ml. BuOH/g. catalyst; the selectivity coeff. *s* represents the ratio of the rate of the dehydrogenation and the sum of the rates of dehydrogenation and dehydration. The following exptl. data give the lattice parameter in A., the crystallite size in A., the activation energies *E* (kcal./mole) for dehydrogenation and for dehydration, *a* for dehydrogenation and dehydration and *s* at 400°, and the same at 460°: (I) 4.18, 21.9, 16.06, 24.03, 4.2, 1.0, 0.81, 5.7, 1.5, 0.78; (II) 4.20, 23.2, 15.65, 43.54, 7.2, 1.27, 0.85, 9.53, 3.03, 0.76; (III) 4.16, 26.1, 10.85, 38.2, 9.5, 1.58, 0.86, 9.8, 2.25, 0.83; (IV), 4.21, 28.2, 15.0, 31.2, 7.7, 1.18, 0.84, 7.9, 2.72, 0.76; (V) 4.24, 30.4, 10.50, 38.95, 7.02, 1.96, 0.81, 8.46, 3.78, 0.70; (VI), 4.23, 33.8, 14.70, 40.18, 4.65, 0.57, 0.88, 5.7, 1.25, 0.74; (VII) 4.22, 36.0, —, 23.29, 3.3, 0.87, 0.84, 4.0, 1.44, 0.84; (VIII) 4.17, 40.0, 15.50, 37.53, 3.7, 0.83, 0.81, 4.5, 2.06, 0.7; (IX) 4.16, 46.0, 17.36, 34.42, 6.2, 1.0, 0.85, 6.5, 2.24, 0.76; (X), 4.24, 63.0, 7.91, 23.89, 6.9, 1.1, 0.86, 7.2, 1.72, 0.75. Activity isotherms at 400 and at 460° at const. lattice parameter show a max. of *a* at a dispersity of the order of 25-30 A., particularly in dehydrogenation. With increasing temp., differences of *a* of prepns. deviating from the optimum dispersity tend to diminish. Prepns. with a less-deformed lattice are somewhat more subject to the effect of the dispersity than are prepns. with a compressed lattice. With increasing lattice parameter, *a* in dehydrogenation decreases, and in dehydration increases. As a function of the lattice parameter, *E* in both dehydrogenation and dehydration passes through a max.; lattice deformations in either direction depress *E*. At const. lattice parameter, *E* of the dehydration falls, almost linearly, with increasing crystallite size, most steeply in the case of an undeformed lattice, more weakly with an expanded lattice, and most weakly with a compressed lattice. In dehydrogenation, *E* increases very slowly with the crystallite size at a lattice parameters of 4.21 and 4.24 A., but quite steeply at a lattice parameter of 4.17 A. These data show the possibility of a competition of the effects of lattice deformation and of dispersity on the catalytic activity. At each one of the temps. 400, 440, and 460°, *s* decreases linearly with increasing lattice parameter, i.e. dehydration prevails increasingly over dehydrogenation. At const. lattice parameter, and varying dispersity, *s* passes through a min., at about 40 and 28 A., resp., with prepns. with lattice parameters of 4.17 and 4.21 A., but for the 4.23-A. prepn. (expanded lattice) *s* either passes through a max. (at 440°) or simply increases slowly (at 460°). The existence of an optimum crystallite size is in accord with findings of Dupont and Piganiol (*C.A.* 33, 3669°) with Ni-Co alloys, which conflict with and deserve preference over Schwal and Zorn (*Z. physik. Chem.* B32, 169(1937)) who failed to observe such an optimum. N. Thon

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RUBINSHTEYN, A. M.

CA

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Effect of thiophene on nickel catalysts for hydrogenation and dehydrogenation of cyclic hydrocarbons. A. M. Rubinshtein and N. A. Pribytkova (Inst. Org. Chem. Acad. Sci. U.S.S.R., Moscow). *Doklady Akad. Nauk S.S.S.R.* 61, 285-8(1948).—Ni-MgO catalysts, prepd. by sintering of NiO + MgO mixts. under strictly controlled conditions of temp. and time, of known grain sizes of the Ni and the MgO crystals, were poisoned by known amts. of C_4H_4S by treating 3-g. portions of the catalyst with 10 mg. C_4H_4S in cyclohexane soln., each treatment resulting in retention of 1.0 mg. S per g. of catalyst. The activity *A* of catalysts thus poisoned, in repeated successive operations, with varying amts. of S up to 7 mg./g., was tested, in batches of 3 g., height of catalyst layer 50 mm., diam. 12 mm., in hydrogenation of C_6H_6 with excess H_2 at 120°, 140°, and 160°, and in dehydrogenation of cyclohexane at 300°, 325°, and 350°, space velocity in both cases 1.2 l. liquid/l. catalyst/hr. With a catalyst sintered at 350°, 6 hrs., Ni crystals 24 A., MgO 32.2 A., *A* in hydrogenation fell rapidly from 90% conversion to 0 at about 3 mg. S/g.; in dehydrogenation, *A* changes little (~63%) up to about 3 mg. S, then decreases with further increasing S, down to about 20% with 7 mg. S. This clearly means that the 1st 3 mg./g. of S poison and eliminate exclusively the centers ("doublets") of activation of H_2; dehydrogenating centers will be occupied only after all the hydrogenating centers have been filled. It also permits a conclusion with respect to the orientation of the adsorbed C_4H_4S; the mol. must be oriented with the S atom toward the surface, the ring pointing away from it. In terms of the size of the Ni crystals, the amt. of S necessary to poison the catalyst for hydrogenation, decreases from 3 to 0.5 mg./g. as the crystal size increases from 24 to 66 A., and the amt. to reduce *A* in dehydrogenation to about 20% (from 63%), decreases from 7 to 0.5 mg./g. This is evidently due to the greater no. of active centers in more highly disperse catalysts. With increasing amt. of S, in dehydrogenation the downward slopes of the log *A* against 1/*T* lines increase, i.e. the activation energy *E* of dehydrogenation increases. This, again, is evidence of the nonhomogeneity of the catalyst surface and shows that poisoning starts on centers of lowest *E*, spreading progressively to those of higher *E*. The frequency factor of the Arrhenius equation increases rapidly with increasing amt. of poison, hence, the no. of active centers increases rapidly with increasing *E*. The regular increase of *E* with progressing poisoning proves that the poison diffuses from the very start through the whole mass of the catalyst and selects points of lowest *E*, rather than being adsorbed in progressively deeper layers of the catalyst.

N. Thon

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PROCESSES AND PROPERTIES INDEX

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Stability of the catalytic properties and of the structure of platinized carbon in heat-treatment. S. S. Novikov, A. M. Rubinshtein, and N. I. Shulkin. *Doklady Akad. Nauk S.S.S.R.* 62, 345-8(1948).—Constancy of the catalytic activity of a 20% Pt catalyst on active C, independently of the length of heat-treatment at 300°, up to 639 hrs., was ascertained by dehydrogenation of cyclohexane to C_6H_6 at 300°, space velocity 0.4 l./l. catalyst/hr. Under the same conditions, both the crystal lattice const. and the grain size of the Pt (~56 A.) remain practically unchanged. Regeneration of a catalyst, heat-treated for 639 hrs., and used at 300° for 120 hrs., at well over 300°, restored the original activity and left the crystal size unchanged, i.e. no recryst. took place even at red glow. Inasmuch as highly disperse Pt without carrier recrystallizes easily even at room temp., it follows that, on the carrier, Pt is not distributed uniformly, but the grains are localized in pores and completely isolated from one another. N. Thon

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RUBINSHTEYN, A. M.

[illegible] platinum content [illegible] M. Rubinshtein [illegible] achev, and N. I. Shulkin [illegible] 62, 107 9(1948) —A series of catalysts made under identical conditions but with the Pt content decreasing, by steps, from 20% (standard catalyst) down to [illegible] showed, in debyograms, systematic disappearance of high index reflections. With increasing diln. of the Pt, the (222) plane reflection disappears first, followed, in that order, by (022), (113), and (002); the reflection on the (111) plane persists throughout, and is only weakened at the lowest Pt content. It proves that the cryst. structure is preserved even at very high diln. of the Pt on an amorphous carrier. The activities of this series of catalysts, expressed in percentage of conversion in hydrogenation of C_6H_6, remain const. = 100% with 4-1% Pt, and decrease only slightly (to about 90%) with 0.5-0.1% Pt. This finding, along with the observed persistence of the (111) plane reflections, indicates that the catalytic activity of Pt on active C resides, primarily, in the (111) plane, with higher-index planes playing only a subordinate role in catalysis. It is consistent with Balandin's location of the hydrogenation-dehydrogenation catalytic activity at octahedral faces of the catalyst, and with his sextet model of plane orientation of ring-shaped mols. on those faces.

N. Thon

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RUBINSHTEYN, A.M.

USSR

Poisoning of catalysts of different physical structures. A. M. Rubinshtein. *Problemy Kinetiki i Katalisa, Akad. Nauk S.S.S.R. 6, Geterogennyi Katalis*, 127-36(1949).—Ni-MgO catalysts with controlled crystallite sizes, 23-60 A. for Ni, and 32-70 A. for MgO, were prepd. by baking the catalyst to various temps. The activities of the prepns. were tested by catalytic hydrogenation of C_6H_6 (I) at 120-60° and dehydrogenation of cyclohexane (II) at 300-350°. Controlled amts. of thiophene were introduced to study the effect of a gradual poisoning of the catalyst. Activity with respect to I decreased rapidly with increase in S content of the catalyst, and disappeared at 3 mg. per g. Activity with respect to II showed little decrease at small amts. of S, faster decrease with S content higher than 1-3 mg. per g., and approached gradually to a residual 30-50% activity at still higher S content. The amt. of S necessary for an efficient poisoning increased with dispersity of the catalyst, but slower than proportionally to the increase in the surface area. The activation energy and the pre-exponential factor for the catalyzed reaction increased with increasing poisoning. The data are interpreted to indicate that the sites of the lowest activation energy, that is of highest activity, are poisoned first, and that I requires sites of much higher activity than does II, presumably because both C_6H_6 and H_2 must be activated.

Andrew Dravnieks

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RUBINSHTEYN, A. M.

PA 28/49T1

USSR/Chemistry - Biography
Chemistry - Catalysts

Jan/Feb 49

"Academician Aleksey Aleksandrovich Balandin (on His 50th Birthday)," A. M. Rubinshteyn, Moscow, 4 pp

"Uspekhi Khimii" No 1

Famous chemist was born on 20 Dec 1898 at Yeniseysk, Siberia. Traces his educational and scientific background and qualifications. He is noted for solution of various problems on physicochemical aspects of catalysts. (CIA Photo Accession No 3426)

[redacted]

28/49T1

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RUBINSTEYN, A. M.

PA 27/49T19

USSR/Chemistry - Societies Jan/Feb 49
Chemistry - Chemical Compounds, Complex

"Fourth All-Union Conference on Chemistry of Complex Compounds," A. M. Rubinsteyn, 5 pp

"Iz Ak Nauk SSSR, Otdel Khim Nauk" No 1

Conference met 21-25 Apr 48 at Leningrad, in honor of L. A. Chugayev. Students attended from Moscow, Kiev, Alma-Ata, Ivanov, Tbilisi, Kishenev, Dnepropetrovsk, Kazan, and other cities. Reports covering almost all branches of the chemistry of complex compounds were submitted.

27/49T19

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Blocking of the active centers of platinized carbon by products of deep decomposition of hydrocarbons. A. M. [illegible] Mipachev and N. I. Shuikin. Doklady Akad. Nauk SSSR [illegible] C.A. 43, 1249g.—In the hydrogenation of C_6H_6 in excess H_2 at 170-2° at the space velocity 0.06 l./l. catalyst/hr., on catalysts contg. from 4.0 down to 0.03% Pt, corresponding to passing velocities from 5.5 to 540.0 ml./hr./g. Pt, some reaction took place even at the smallest Pt content; with 4.0-1.0, 0.5, 0.10, 0.09, 0.06, and 0.03% Pt, the initial degrees of conversion were, resp., 100, 88.5, 88.4, 11.2, 9.0, and 1.0%. The fall of the initial rate during the run is in inverse ratio to the Pt content. Similarly, in the dehydrogenation of cyclohexane, in a weak stream of H_2, at 300-2° and 0.3 l. cyclohexane/l. catalyst/hr., the activity of catalysts with 4.0-0.25% Pt showed no marked differences; from 0.25% Pt down, the activity falls sharply, but even at 0.03% it still is 5% dehydrogenation. The stability of the catalysts falls sharply from Pt < 0.5% down. The curve of relative fall of the activity as a function of the Pt content starts out with an almost vertical fall at lowest Pt contents, bends at about 0.5% and then remains almost horizontal. This curve is taken to render the rate of blocking of the active centers by the decompn. products of the hydrocarbons. It thus would appear that the isolated microcrystallites that predominate at very low Pt contents are more subject to blocking than the aggregates present at high Pt contents. X-ray diagrams show that the cryst. structure of the Pt is preserved down to 0.03%, but that lattice defects, as indicated by blurring of the interference lines and by deviations from the normal value of the lattice const., increase with decreasing Pt content, i.e., with its increasing dispersity. It is possible that active centers of a new type, favorable to splitting of the six-membered ring, are formed at high deformations of the crystal lattice. At high Pt contents, there is no change of the dimensions of the crystals in the course of the reaction; recrystn. consists mainly in a disappearance of crystal defects. This process is less probable at lower Pt contents. Diffusion to the active centers plays only a subordinate role at high Pt contents, but becomes increasingly significant at lower contents. N. Thon

Inst. Org. Chem., AS USSR

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RUBINSHTEYN, A. M.

PROCESSES AND PROPERTIES INDEX

CA

Polymorphism and catalytic properties of titanium dioxide. A. M. Rubinshtein and S. G. Kulikov. *Doklady Akad. Nauk S.S.S.R.* 67, 1053-6(1949).—Catalytic activities a (in ml. gas/ml. EtOH) under identical conditions and selectivities s (ratio of the amt. of H_2, both evolved and spent on hydrogenation of C_2H_4 to C_2H_6, and the sum of $H_2 + C_2H_4 + C_2H_6$) in the decompn. of EtOH at 360, 380, and 400°, were detd. for 12 TiO_2 catalysts prepd. according to Bischoff and Adkins (*C.A.* 19, 1246). By x-ray diffraction, one of the catalysts (I) is pure anatase, one (XII), obtained by heating I 20 hrs. at 900°, pure rutile, the rest mixts. of the 2 forms. I has a higher a than XII (105.7 as against 16 at 400°) but a lower s (0.37 as against 0.85), i.e., anatase is a predominantly dehydrating, rutile a predominantly dehydrogenating, catalyst. All catalysts which are mixts. of anatase and rutile have a higher a than either pure form, which indicates that active centers are preferably located at boundaries between the 2 phases. By detns. of deformations of the lattice consts. in the mixts., c of rutile and a of anatase, the s coeff. of anatase increases with expansion of the lattice, s of rutile increases with increasing compression of the lattice. Possibly, the doublet active [illegible] of anatase (face-centered) consists of 2 atoms at a distance of 2.70 A., which fits the dimensions of the EtOH mol. N. Thon

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Causes of the instability of palladium catalysts in dehydrogenation catalysis. S. S. Novikov, A. M. Rubinshteĭn, N. I. Shuĭkin, and Z. Ya. Mel'nikova. *Doklady Akad. Nauk S.S.S.R.* 69, 1049-51(1949). Identical samples of Pd on C and of Pd on silica gel were (*a*) subjected to prolonged heat-treatment in H_2, (*b*) used in dehydrogenation of cyclohexane at 300-2°, 0.3 l./hr./l., (*c*) used in dehydrogenation of a mixt. of 90% cyclohexane with 10% 1-ethyl-1-cyclopentene, under the same conditions. The Pd-C catalyst has an initial activity by about 35% lower than the corresponding Pt-C catalyst; in *a*, the activity of Pd-C falls faster than that of Pt-C, but becomes stabilized at about 6% of the initial activity. The activity of Pd on silica gel is still lower than that of Pd-C, but it does not change in treatment *a*. In *b*, and even more so in *c*, the activities of Pd-C and Pd-SiO_2 fall rapidly; after *c*, the catalysts can be regenerated to some extent, but lose their activity completely in a very short time. This behavior, again, contrasts with the relative stability of Pt-C in *b*, if not in *c*. An explanation of the difference in stability between Pd and Pt was provided by x-ray patterns. Immediately after deposition on carbon, Pd shows the lattice const. of the hydride, 4.04 A. which does not change on prolonged treatment *a*. Pd on SiO_2 has a normal lattice. New lines appear in the x-ray pattern of Pd-C after operation *b* or *c*; these lines, corresponding to reflections $\sin^2\theta = 0.170$ and 0.281-0.287, belong neither to Pd nor to its hydride, and are absent in the ash of the catalyst. Pd-SiO_2 shows, after *b* or *c*, an extra line $\sin^2\theta = 0.285$, i.e. the same new line as Pd-C. This line, independent of the carrier, can only belong to a new cryst. phase, formed in *b* or *c*, through interaction between Pd and the hydrocarbon. As this new phase is absent in Pt catalysts, it is probable that it is responsible for the rapid fall of the activity of Pd catalysts. It can also be concluded that, at 300°, the conversion of hydrocarbons on Pd is much deeper than on Pt. N. Thon

(BA- A I Ja '53:14)

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Selective action in the catalysis of ethyl alcohol and its relation with the phase transition of titanium dioxide. A. M. Rubinshtein and S. G. Kulikov. *Izvest. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk* 1950, 84-97.—De-hydrogenation and dehydration of EtOH were investigated in flow expts. at 300, 360, and 400°, at a feed rate of 0.3 ml. liquid EtOH/min., over 2.5 g. catalyst in a tube 20 mm. long, 14 mm. in diam., with 12 different prepns. of the TiO_2 catalyst: (I) $TiCl_4$ hydrolyzed with NH_4OH, fine fraction, (II) $TiCl_4$ (15% aq. soln.) hydrolyzed with NH_4OH, fine fraction, (III) $Ti(OMe)_4$ hydrolyzed with humid air, (IV) $Ti(OEt)_4$, in the same way, (V) $Ti(iso\text{-}Pr)_4$, in the same way, (VI) $TiCl_4$, in the same way, coarse fraction, (VII) $Ti(OBu)_4$, in the same way, (VIII) $TiCl_4$, with NH_4OH, coarse fraction, (IX) Na_2TiO_3, with boiling H_2O, (X) $Ti(OMe)_4$, hydrolyzed by humid air in mixt. with NaCl, (XI) $Ti(OMe)_4$, pure ester, isolated by extn., hydrolyzed in humid air, (XII) catalyst I heated 20 hrs. at 900°. All catalysts were dried at 110-20° and heated in an air stream 3 hrs. at 300°. Catalyst III, prepd. according to Bishoff and Adkins (*C.A.* 18, 1980; 19, 1246), was inactive. Selected exptl. data, in the order catalyst no., ml. EtOH passed, ml. gas (S.T.P.) collected, percentage of CO_2, CO, C_2H_4, C_2H_6, H_2 in the gas, ml. (S.T.P.) of total gas, H_2, C_2H_4, C_2H_6 per 1 ml. EtOH, are: at 300°, I, 5.0, 305.3, 1.7, 0.9, 49.0, 28.0, 18.3, 73.0, 13.1, 35.7, 21.0; II, 8.0, 520, 1.9, —, 40.6, 30.7, 26.9, 65.0, 17.5, 26.2, 20.3; IV, 4.0, 464.6, 1.6, 0.8, 57.3, 35.3, 4.3, 116.2, 4.6, 67.8, 46.0; V, 7.0, 518.8, 1.2, 0.6, 41.8, 48.7, 6.2, 74.0, 4.7, 31.8, 33.5; VI, 8.0, 506.4, 1.6, 0.4, 38.5, 49.3, 31.0, 74.8, 23.0, 28.7, 21.3; VII, 5.0, 428.9, 1.3, 0.4, 59.4, 34.0, 4.5, 80.0, 3.9, 51.0, 30.2; VIII, 4.0, 446.3, 1.7, 0.8, 48.9, 32.5, 17.7, 111.5, 19.2, 54.2, 37.0; IX, 10.0, 256.3, 1.9, 0.6, 9.5, 24.7, 64.6, 25.6, 16.5, 2.6, 6.4; X, 4.0, 541.6, 1.7, 0.5, 56.0, 35.1, 4.8, 135.4, 5.4, 69.4, 48.5; XI, 4.0, 414.9, 1.2, —, 57.0, 34.4, 8.7, 103.7, 9.2, 59.2, 36.3; at 400°, I, 5.0, 528.4, 3.4, 0.8, 53.0, 23.8, 21.1, 105.7, 22.5, 53.8, 25.0; II, 6.0, 623.2, 2.9, 1.1, 38.6, 40.0, 19.3, 103.8, 20.5, 40.6, 39.6; V, 5.0, 609.1, 1.4, 0.4, 56.7, 34.0, 7.3, 122.0, 9.4, 68.0, 41.3; VI, 6.0, 676.3, 4.0, 0.4, 37.7, 57.8, 21.4, 112.5, 24.8, 41.2, 41.7; VII, 5.0, 572.5, 1.2, 0.6, 55.2, 39.0, 3.3, 114.5, 3.7, 62.7, 46.1; VIII, 4.0, 553.5, 1.4, 0.2, 54.5, 33.0, 11.6, 138.5, 10.4, 75.5, 45.0; IX, 7.0, 362.6, 2.2, 0.2, 11.1, 47.9, 41.0, 51.8, 21.0, 5.6, 24.7; X, 4.0, 729.4, 1.7, 0.5, 59.3, 32.0, 8.0, 182.0, 14.6, 109.0, 58.4; XI, 4.0, 576.0, 1.2, —, 58.0, 32.7, 9.3, 144.0, 13.4, 84.2, 47.0; XII, 19.0, 302.2, 2.2, —, 11.0, 18.3, 68.0, 16.0, 10.9, 1.8, 2.9. Pyrolysis is insignificant. CO and CO_2 appear only in very small amts., obviously as products of side reactions. That, contrary to B. and A., the C_2H_4 formed is the product of a hydrogenation of the primarily formed C_2H_6, not of a bimol. decompn. of EtOH or of Et_2O, is demonstrated directly by C_2H_4 hydrogenation runs on catalysts I, II, VII, and VIII, which, at 360 and 400°, gave degrees of hydrogenation of, resp., 1.6 and 3.3, 1.0 and 1.3, 1.3 and 2.4,

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0.8 and 0.8%. The total activities of the various catalyst preps., expressed in ml. gas/ml. EtOH (in parentheses, ml. (H_2 + C_2H_4)/ml. EtOH), at 300, 380, 400°, are: I, 73.0 (48.8), 95.0 (66.2), 105.7 (78.3); II, 65.0 (43.7), 77.5 (48.2), 103.8 (61.1); V, 74.0 (30.2), 77.0 (46.0), 122.0 (77.4); VI, 74.5 (51.7), 88.5 (67.9), 112.5 (66.0); VII, 86.0 (54.9), 97.0 (54.7), 114.5 (66.4); VIII, 111.5 (73.4), 126.0 (82.9), 138.5 (91.9); IX, 25.7 (19.1), 32.4 (19.0), 51.8 (26.6); X, 135.4 (74.8), 109.0 (109.2), 182.0 (129.6); XI, 103.7 (68.4), 127.3 (84.5), 144.0 (97.6); XII, —, —, 16.0 (12.7). The *selectivities*, expressed in terms of the vol. ratio H_2/(H_2 + C_2H_4), without and with the hydrogenation of C_2H_4 taken into account, at 300, 380, 400°, are, I, 0.38 and 0.27, 0.36 and 0.25, 0.37 and 0.29; II, 0.45 and 0.40, 0.45 and 0.40, 0.43 and 0.35; IV (at 300°) 0.30 and 0.07; V, 0.37 and 0.13, 0.34 and 0.15, 0.32 and 0.12; VI, 0.47 and 0.45, 0.46 and 0.45, 0.45 and 0.38; VII, 0.30 and 0.07, 0.31 and 0.07, 0.31 and 0.04; VIII, 0.38 and 0.26, 0.37 and 0.23, 0.34 and 0.18; IX, 0.72 and 0.86, 0.64 and 0.82, 0.60 and 0.79; X, 0.32 and 0.07, 0.31 and 0.11, 0.31 and 0.14; XI, 0.32 and 0.14, 0.32 and 0.14, 0.32 and 0.14; XII, at 400°, — and 0.85. By x-ray diffraction patterns, I is pure anatase, XII is pure rutile, whereas all the other prepns. are mixts. of anatase and of rutile. Evidently, anatase is more active than the high-temp. stable rutile; the latter is predominantly a dehydrogenating, anatase a dehydrating, catalyst. The differences of activities and of selectivities of the various catalyst prepns. are detd. by the quant. ratio of the 2 forms of TiO_2. The phase transition appears to take place at as low as 300-400°, not at 900-1000° as is commonly indicated in the literature. The fact that mixed catalysts are more active than either pure anatase or pure rutile, indicates that the catalysis occurs preferentially at the phase boundaries of the 2 phases. The selectivity of a mixed catalyst depends on the defor[illegible] of the lattices of the components and is a linear [illegible] of the lattice const. of rutile along the c axis and of anatase along the a axis; for rutile, the selectivity coeff. decreases linearly with increasing lattice const., for anatase it increases linearly. Allowance for the hydrogenation of C_2H_4 only alters somewhat the slopes of the straight lines, but leaves the trend and the linearity unaffected. In anatase, an increase of a results in an increase of the distance between a corner Ti atom and a Ti atom occupying the center of a face. Evidently, the Ti-Ti distance most favorable for the catalysis of EtOH lies between the a value of anatase, 2.70 A., and the c value of rutile, 2.95 A., the latter distance being particularly favorable for dehydrogenation. Models, built to scale, of the rutile and anatase lattices, are consistent with a picture of catalysis occurring on doublets of a Ti and an O atom. The splitting of a H atom off a CH_2OH group in dehydrogenation, and off a CH_3 group in the dehydration of EtOH occurs through the O atom of a TiO_2, whereas the CO groups or C atoms are oriented towards the Ti atom of the catalyst surface. The activation energies for dehydrogenation and for dehydration, I, 20.0 and 28.0, V, 35.0 and (41.0), VI, 32.4 and 30.5, X, 24.1 and 27.4, XI, 22.5 and 25.2 kcal., are, within the limits of accuracy, the same for both processes on the same catalyst, which indicates that both reactions take place at the same active centers.

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RUBINSHTEYN, A.M.

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Distribution of platinum in a platinized carbon catalyst. A. M. Rubinshtein, Kh. M. Minachev, and N. I. Shulkin (Acad. Sci. U.S.S.R.). *Doklady Akad. Nauk S.S.S.R.* 71, 1073-5(1950).—The Pt content was detd. by transmittance to x-rays of sections, taken at different depths, of cubes of platinized charcoal of 10.2–3.2 mm. side. Although the amt. of Pt is highest in the outermost layer of each grain, it is also found in deeper layers; e.g., in a cube of 10.2 mm. side, the ratio of the amts. of Pt found in layers 0–1.2, 1.2–2.4, 2.4–3.7, and 3.7–4.9 mm. deep, was 6.7:3.0:1.1:1, and in a 4.1 mm. cube, at 0–0.85, 0.85–1.6, and 1.6–2.4 mm. below the surface, the ratio was 2.4:1.2:1. The finer the grain, the more nearly uniform is the depth distribution of the Pt. The distribution is, in a way, analogous to that produced in chromatography. Catalytic reactions can take place not only at the surface of the catalyst grain but also in its deeper layers.

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RUBINSHTEYN, A.M.

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Hydrogenation of benzene and dehydrogenation of cyclohexane on nickel catalysts on activated carbon. A. M. Rubinshtein, S. S. Novikov, Z. Ya. Lapshina, and N. I. Shuikin (Inst. Org. Chem., Acad. Sci. U.S.S.R., Moscow). *Doklady Akad. Nauk S.S.S.R.* 74, 77-9(1950).—Hydrogenation of C_6H_6 at a space velocity of 0.06 l./l. catalyst/hr., at 180°, and dehydrogenation of cyclohexane at 0.3, 300°, were investigated with catalysts prepd. by impregnation of active C with a soln. of 47 g. $(HCO_2)_2Ni$/l., and decompn. at different temps. from 250 to 670°; catalysts heated at 350° were also tested after repeated impregnation with $(HCO_2)_2Ni$, and repeated decompn. at 350°. At low space velocities hydrogenation was practically complete with all catalysts; highest activity was found with catalysts with Ni crystallites of the size of ~ 40 A. In contrast thereto, the activity in dehydrogenation was found to increase with the Ni crystallite size up to 80 A. Since these results are analogous to those observed with Ni catalysts on Al_2O_3, it follows that the optimum grain size of the catalyzing metal does not depend on the nature of the carrier. The activity in dehydrogenation is highest with catalysts decompd. at 450°; higher decompn. temp. lowers the activity, whereas sintering *in vacuo* at 800° increases it considerably owing to a 1.5-fold increase of the Ni grain size. The dehydrogenating activity increases with increasing compression of the Ni lattice. Repeated impregnation results in growth of the existing Ni grains, not in further coverage of new portions of the carrier surface; consequently, the dehydrogenating activity increases with repeated impregnations. The rapidly prepd. Ni catalysts on active C are suitable for both dehydrogenation and, particularly, hydrogenation of six-membered rings, but their activity is inferior to that of catalysts of the Pt group.

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Complex compounds of platinum with diallylamine. A. M. Rubinshtein and G. V. Derbisher. *Doklady Akad. Nauk S.S.S.R.* 74, 283-6(1950).—Action of 2 moles ($CH_2=CHCH_2)_2NH$ (= D) on 1 mole $(NH_4)_2PtCl_4$ produced first a dark-yellow ppt. (I), then, more slowly, a light-yellow ppt. By appropriate timing of the reaction, the 2 ppts. can be ppd. Analysis gives for both the same compn. $PtDCl_2$. The yield of I is not less than 57.6% and may attain 72%. Despite their identical compn., I and II show marked differences; I forms round isotropic grains, with a refractive index $n = 1.68$, and is insol. in H_2O; II has $n = 1.68$, and its soly. in H_2O is 0.040 g./100 g. soln. at 25°. Proof that II is actually a dimer, was obtained by the reaction $PtDCl_2 + D = PtD_2Cl_2$; the product partially was extd. with H_2O, giving a light-brown soln. which reacted according to $PtD_2Cl_2 + (NH_4)_2PtCl_4 = 2\ NH_4Cl + [PtD_2][PtCl_4]$ which was shown to be identical with II by its soly. Consequently, D occupies only 2 coördination places, forming a cycle. Treatment of I with a small amt. of NH_4OH and heating at 100° gives a dark-brown soln., which, on evapn. at not over 50°, gives a 92% yield of a dark-brown salt, analyzing $[Pt(NH_3)_2D]Cl_2$, and reacting with $(NH_4)_2PtCl_4$ to give gray-green $[Pt(NH_3)_2D][PtCl_4]$; the same salt can also be obtained by the action of $(NH_4)_2PtCl_4$ on a neutralized soln. of I in NH_4OH. The dimer II dissolves in NH_4OH and the soln. ppts. the same $[Pt(NH_3)_2D]Cl_2$. Soln. of I in C_5H_5N (py) gives a light-brown soln., which, on evapn. at not above 50° ppts. a bright-orange salt $[Pt(py)_2D]Cl_2$, slightly sol. in H_2O with a yellow color, and giving with $(NH_4)_2PtCl_4$ a pink salt contg. 49.44% Pt. The same salt is obtained if I is dissolved in py, the soln. neutralized with HCl, filtered, and treated with $(NH_4)_2PtCl_4$; analysis gives the compn. $[Pt(py)_2D][PtCl_4]$.

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CA

Structure and properties of titanium dioxide catalysts and their polymorphism. A. M. Rubinshtein and S. G. Kulikov (Acad. Sci. U.S.S.R., Moscow).—*Izvest. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk* 1951, 133–9; cf. *C.A.* 44, 7632f.—Anatase-TiO_2 was prepd. by pptn. from $TiCl_4$ with NH_4OH, and 3 series of catalysts were prepd. by (*a*) 5 hrs. heating at (I) 400°, (II) 500, (III) 600, (IV) 700, (V) 800°; (*b*) heating to 600° for (VI) 5, (VII) 10, (VIII) 25, (IX) 50, (X) 100 hrs.; (*c*) mixing ready-made anatase and rutile in the proportions (% anatase, rutile) (XI) 100, 0, (XII) 90, 10, (XIII) 75, 25, (XIV) 50, 50, (XV) 25, 75, (XVI) 10, 90, (XVII) 0, 100. All prepns. were examd. by x-rays. In series (*a*), some rutile appeared in II, and was predominant in III; in V, there were only traces of anatase. Samples of series (*b*) showed predominantly rutile, but did not differ from one another. The sp. wts. of catalysts formed by extrusion through a 3-mm. opening under the same const. pressure (length of pieces 5–6 mm.), and sp. surface areas, in sq. m./g., detd. by adsorption of methylene blue from aq. soln., were I 0.85, 105, II 1.0, 101, III 1.39, 63.7, IV 1.66, 46.8, V 1.78, 21.3, VI 1.39, 63.7, VII 1.66, 46.1, VIII 1.71, 34.9, IX 1.73, 36.0, X 1.74, ~30, XI 0.85, 105, XII 0.88, 81.5, XIII 0.96, 60.5, XIV 1.18, 31.5, XV 1.38, 24.2, XVI 1.55, 20.8, XVII 1.78, 21.3. In the catalytic decompn. of EtOH at 400°, space velocity 2.1–2.4 l./l. catalyst/hr., the amts. (in ml. S.T.P.) of H_2, C_2H_4, and C_2H_6 evolved per ml. of EtOH, and the selectivity coeffs. (ratio of % dehydrogenation to the sum of % dehydrogenation and % dehydration, i.e. without taking into account the production of C_2H_6), were I 11.9, 110.0, 78.1, 0.09, II 14.1, 107.5, 79.3, 0.116, III 25.0, 71.0, 72.0, 0.26, IV 12.7, 25.7, 43.5, 0.33, V 5.3, 10.5, 32.0, 0.335, VI 25.0, 71.0, 72.0, 0.26, VII 17.2, 46.2, 44.5, 0.27, VIII 12.5, 50.0, 43.7, 0.25, XI 11.9, 110.0, 78.1, 44.5, 0.27, X 13.2, 40.0, 41.7, 0.25, XIII 10.4, 87.6, 75.0, 0.09, XII 11.4, 101.0, 78.5, 0.101, XV 11.8, 82.0, 79.5, 0.106, XIV 11.4, 90.0, 77.6, 0.112, XVII 5.3, 10.5, 32.0, 0.125, XVI 17.8, 52.0, 54.5, 0.197, the dehydrogenating capacity of the catalyst increases, whereas the total activity decreases. This effect is much more outstanding in series (*a*) than in (*c*); i.e., the differences are much more marked in TiO_2 in which the phase transition occurred throughout the whole mass, than in artificial mixts. This evidently is due to the large difference of the sp. surface areas, that of anatase being 5 times as great as that of rutile; with increasing transition, the surface area of anatase, in series (*a*), becomes progressively blocked with rutile, and this does not practically occur in series (*c*). In series (*b*), it would appear that changes of the sp. surface area become stabilized after 25 hrs.; i.e., there is, at that low temp. of 600°, a sort of equil. between anatase and rutile. The observed changes of sp. gr. and of sp. surface area are evidently due to phase transitions, not to sintering, which cannot occur to any appreciable extent at these low temps. The sp. gr. and the sp. surface area (in series *a*) are antibatic, the 1st increasing and the 2nd decreasing with increasing rutile content, along practically sym. curves. In series (*b*), both magnitudes become practically const. after 25 hrs. Series (*c*) shows a behavior similar to, but not identical with (*a*). That the changes of catalytic activity are due solely to phase transition, and not to sintering, is demonstrated by the variation of the selectivity. The fall of the over-all activity with increasing rutile content is clearly linked with its smaller sp. surface area. N. Thon

Inst. Org. Chem., AS USSR

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RUBINSHTEIN, A. M.

Effect of very high pressures on the catalytic properties of aluminum oxide. L. F. Vershchagin, L. Kh. Freidlin, A. M. Rubinshtein, and I. N. Numanov (Inst. Org. Chem., Acad. Sci. U.S.S.R., Moscow). Izvest. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk 1951, 809-18.—Dehydration runs of EtOH to C_2H_4 were made in a flow system on 12 ml. of catalyst (tube diam. 15 mm.) in the temp. range 283-320°, at a feed rate of 0.16 ml./min. (space velocity 0.96 l/l. catalyst). The C_2H_4 content in the gas was at least 97% throughout. Stability of the catalysts was tested by the constancy of the rate of the gas evolution, v (ml. STP/ml. EtOH); the necessary regeneration was done with air, 2 hrs. at 525. Fresh Al_2O_3 pptd. from $Al(NO_3)_3$ with NH_4OH, washed, and dried at 100° (catalyst I) showed a low initial activity, activation energy E = 82.5 kcal./mole; after 2 hrs. activation with air, 2 hrs. at 525°, the activity rose, E falling to 16.0. After runs, without regeneration, E rose to 19.2, and, after 5 days stay with the reaction products, to 43.4. Regeneration restored the activity almost completely, and E to 18.0. Renewed 2-day contact with the reaction products again increased E to 32.0. That this deactivation of the catalyst is due to slow polymerization of the C_2H_4 to a film on the surface, and depends on the length of the contract between the catalyst and the products, was demonstrated directly: there is no deactivation if the products are removed quickly, e.g. by passing N_2 for 10 min. at 300°; after 48-hrs. stay under N_2, the catalyst showed almost the original activity, with E = 17.5. If N_2 is passed at a somewhat lower temp., 200-20°, and the catalyst left overnight under N_2, it has E = 23.6. Passing of N_2 at a still lower temp. is not sufficient to prevent polymerization, and then subsequent treatment with N_2, 40 min. at 300°, lowers E only to 21.6 kcal./mole.

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RUBINSHTEYN, A. M.

PA 174T11

USSR/Chemistry - Catalysts Jan/Feb 51

"Reactions of Hydro- and Dehydrogenation on α- and β-Cobalt," A. M. Rubinshteyn, N. A. Pribytkova, Inst Org Chem, Acad Sci USSR

"Iz Ak Nauk SSSR, Otdel Khim Nauk" No 1, pp 70-80

Investigates effect of phase compn of Co (as affected by temp of reduction of Co oxides) on its activity as catalyst of vapor-phase hydro- and dehydrogenation of aliphatic and cyclic compd (alone or with activated carbon carrier).

LC 174T11

USSR/Chemistry - Catalysts (Contd) Jan/Feb 51

Finds cubic β-Co (reduced at over 600°) much less active than either hexagonal α Co (reduced at 320-360°) or mixt of α- and β-forms.

LC 174T11

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RUBINSHTEYN, A. M.

191T1

USSR/Chemistry - Catalysts
Liquid Fuels Jul/Aug 51

"Contributions of N.D.Zelinskiy to the Science of Catalysis," A.M.Rubinshteyn, Moscow

"Uspekh Khim" Vol XX, No 4, pp 393-409

Reviews in detail Zelinskiy's work in the fld of catalysis, discussing his ideas on the mechanism and nature of catalysis, new catalysts and new flds of the application of catalysts discovered by him, his work on irreversible catalysis, catalytic hydrogenation, alkylation, isomerization, etc.

191T1

(CA 48 no.1:9 '54)

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RUBINSHTEYN A. M.

Akademik Boris Aleksandrovich Kazanskii (K 60-letiiu so dnia roshdeniia). [Boris Aleksandrovich Kazanskii (60th anniversary)] Vest. Akad. nauk SSSR 21:5 May 51 p. 82-90.

1. Survey of his work in organic chemistry.
CIML Vol. 20, No. 10 Oct 1951

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Nicolai Dmitrievich Zelinskii. A. M. Rubinshtein. *Zhur. Fiz. Khim.* 25, 130-5(1951).—A biography and a tribute for N. D. Z's 90th birthday. M. B.

1951

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RUBINSHTEIN, A. M.

Mechanism of the catalytic ketonization of acids. A. M. Rubinshtein and N. A. Pribylova (Inst. Org. Chem. Acad. Sci. U.S.S.R., Moscow). *Doklady Akad. Nauk S.S.S.R.* 78, 917–20(1951); cf. *C.A.* 44, 7032g; 45, 5010b.—The rate of the reaction 2 AcOH → Me_2CO + CO_2 + H_2O was investigated in a flow system over (I) calcite $CaCO_3$ prepd. by pptn. in the cold, with the ppt. kept 24 hrs. in the liquid before filtration, (II) aragonite $CaCO_3$, prepd. by pptn. in a boiling soln., rapid cooling, and immediate filtration, (III) $BaCO_3$ pptd. and dried at 100°, (IV) $BaCO_3$ pptd. and heated 6 hrs. at 800-20°, (V) $BaCO_3$ pptd. and heated 6 hrs. at 1000°. X-ray examn. confirmed the structures of the two $CaCO_3$ prepns. The 3 $BaCO_3$ prepns. were identical, in conformity with the reversibility of the phase transitions in $BaCO_3$. The dispersity of the $BaCO_3$ prepns. IV and V was much smaller than in III; the dispersity of I was about 100 times that of II. With 1.5 g. catalyst, at a space velocity of 1.34 l./l. catalyst/hr., the amts. of CO_2 evolved (ml.) per 1 ml. AcOH vapor passed, on I–V, were: at 350°, 37.5, 41.5, —, —, —; at 400°, 88.2, 87.9, —, —, —; at 420°, 112.3, 112.8, 44.3, —, —; at 440°, 140.5, 141.9, 54.6, —, —; at 470°, 174.4, 178.3, 104.6, 97.9, 97.9. The figures for I and II are practically identical; consequently, the phase transition in $CaCO_3$ is without effect on its catalytic activity. The independence of the yield of the dispersity of $CaCO_3$ contrasts sharply with facts known for numerous other reactions, and can only be attributed to the sp. mechanism of the ketonization of AcOH on carbonates. This particular reaction involves no intermediate complex at the surface, but actual formation of a compd., $(AcO)_2Ca$ or $(AcO)_2Ba$, in the whole mass; decompn. of the acetate regenerates the carbonate. Consequently, the limiting stage is not diffusion of AcOH into the solid, but the rate of decompn. of the solid acetate which has a crystal structure of its own, irrespective of the crystal structure of the carbonate. Only above 470°, when the rate of decompn. of the acetate becomes equal to its rate of formation, will the former cease to be rate-detg., and the reaction take place at the surface only; however, above 470°, the reaction is accompanied by strong deposition of C. Confirmation of the assumption that the reaction is actually due to decompn. of the acetates is supplied by x-ray examn. of $CaCO_3$ after reaction at 330°; there are no lines of either aragonite or calcite, and the reflections belong to $(AcO)_2Ca$. No CO_2 is evolved with HCl. In the temp. range of the phase transition, $(AcO)_2Ca$ decomposes rapidly with formation of only calcite, and that in a much more highly disperse form than is obtained by pptn. N. Thon

[0.8], 8.4; 2-C_4H_{10}, 120°, 110, [0.53], 10.0; 2-C_4H_{10}, 120°, 20, [0.53], 15.6. First-order rate consts. k (sec.$^{-1}$) are

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Causes of the optimum of the catalytic activity as a function of the disperity and effective specific surface area of a catalyst. A. M. Rubinshtein and V. B. Vanserberg (Inst. Org. Chem., Acad. Sci. U.S.S.R., Moscow). *Doklady Akad. Nauk S.S.S.R.* 79, 203-6(1951).—A ppt. of $Al(OH)_3$ obtained from a boiling $Al(NO_3)_3$ soln. with 5% NH_4OH was sepd. into 3 portions of increasing particle size. The 3 portions were converted into γ-Al_2O_3 by heating, and their sp. surface areas *s* and crystal sizes *d* detd. The data (*s*, sq.m./g. by adsorption of MeOH and C_6H_{12}, *d* in A.) are: I, 286 and 182, ≤ 35; II, 286 and 179, 35; III, 286 and 264, 51.4. The striking feature is the strong discrepancy of *s* values detd. by adsorption of MeOH and C_6H_{12} in the case of I and II, as contrasted with their closeness in the case of III. This difference can be due only to the difference of size of the MeOH and C_6H_{12} mols., and to the presence in I and II of very fine pores, accessible to MeOH but not accessible to the larger C_6H_{12} mols. This conclusion is borne out by the above x-ray detns. of *d*; packing of the larger crystal grains of III leaves relatively larger pores, easily accessible even to C_6H_{12}, whereas the pores left by packing of the smaller grains of I and II must be markedly smaller. The sp. catalytic activities (per/g.) relative to the activity of III taken = 1.00, in the dehydration of HCO_2H and of EtOH, are, I, 0.68 and 0.50; II, 0.64 and 0.4 g.; III, 1.00 and 1.00. Thus, the catalytic activity is greater on the catalyst with the larger pores. Since, on the other hand, it is known that considerable increase of *d* is accompanied by a fall of *s* and of the catalytic activity, there must exist an optimum of grain size with a max. of catalytic activity. Detn. of the sp. surface area only by low-temp. adsorption of N_2 is, consequently, insufficient for the characterization of the catalytic activity. An adequate measure of that activity would be an "effective sp. surface area," detd. by adsorption of mols. of a size as close as possible to the size of the reacting mols. The conclusion about the relation between the micropore size and the catalytic activity was further tested by the dehydration of BuOH and AmOH. With BuOH, the ratio of the activities of I and III is about the same as with EtOH, although the abs. activities are about 10% higher. With AmOH, I formed practically no gaseous decompn. products, whereas III showed a weak activity which fell to zero within a few mins., along with the formation of a black C deposit. When this coked catalyst was tested, without regeneration, with $BuOH$, decompn. of BuOH took place at a satisfactory rate. This proves that the difference of behavior of III towards BuOH and AmOH is wholly due to the pore size which permits penetration of BuOH but not of the larger AmOH mols. which, therefore, can react only at the outer geometric surface. The lower catalytic activity of I and II towards EtOH as compared with their activity towards HCO_2H indicates that their pores are partially inaccessible even to EtOH. N. Thon

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RUBINSHTEYN, A. M.

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

3 Chem

Effect of the dimensions of the elementary crystallites on the porosity and the activity of alumina catalysts in the dehydration reaction. A. M. Rubinshtein, V. E. Vasserberg, and N. A. Pribytkova. *Bull. Acad. Sci. U.S.S.R., Div. Chem. Sci.* 1952, 325-32(Engl. translation).—See *C.A.* 46, 9961*d*.
H. L. H.

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RUBINSHTEYN, A.M.

Chemabs v48
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General & Physical
Chemistry

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① Chem

Röntgenography of heterogeneous catalysts. A. M. Rubinshtein. *Uspekhi Khim.* 21, 1287–1338(1952).—Review with 231 references. G. M. Kosolapoff

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"APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2

USSR/Chemistry - Catalysts 1 Jul 52

"Deformation of the Crystal Lattice and the Dehydrogenation Properties of Cr_2O_3," A. M. Rubinshteyn, S. G. Kulikov, N. A. Pribytkova, Inst of Org Chem, Acad Sci SSSR

"Dok Ak Nauk SSSR" Vol LXXXV, No 1, pp 121-124

Cr_2O_3 was tested as a catalyst for the dehydration and dehydrogenation of alc. It was prepd in the compressed crystal form. Expt showed that an increase in the amt of compression of the lattice lowers the activity of the catalyst. Several mixed catalysts, consisting of Cr_2O_3, Al_2O_3, and MgO, were

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prepd and tested. Addn of Al_2O_3 to Cr_2O_3 decreases the selectivity of the catalyst sharply, while a MgO - Cr_2O_3 catalyst is more active than pure MgO. Presented by Acad B. A. Kazanskiy 23 Apr 52.

224T18

RUBINSHTEYN, A.M.

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[illegible], A. [illegible], [illegible], N. A.

Dehydrogenation

Dehydrogenation on copper-chromium catalysts. Dokl. AN SSSR 85 no. 2, 1952.

The results of the expts described show that although the specificity of the action of Cr_2O_3 is not changed by variations in the quantity of Cu added, the dehydrogenation activity of the catalyst shows great differences depending on this quantity. Structural detns show that the effects of added Cu are due to changes in the phase composition of the catalyst and to deformation of the Cr_2O_3 lattice produced by the formation of solid solns with copper oxide and copper chromite. 256T7

Monthly List of Russian Accessions, Library of Congress, November 1952. UNCLASSIFIED.

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RUBINSHTEYN, A.M.; DERBISHER, G.V.

Some reactions of inner-sphere substitution in complex compounds of platinum with diallylamine. Doklady Akad. Nauk S.S.S.R. 86, 961-4 '52. (MLRA 5:11)
(CA 47 no.17:8571 '53)

APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2"

"APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2

An x-ray analysis of heterogeneous catalysts A. M.

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USSR/Chemistry - Catalysts RUBINSHTEYN, A.M. Jan/Feb 53

"The Effect of Compression Pressure of the Activity and Structure of the Alumomlybdenum Catalyst," G.D. Sterligov, M. G. Gonikberg, A. M. Rubinshteyn and B. A. Kazanskiy, Inst of Org Chem, Acad Sci USSR

Iz Ak Nauk SSSR, OKhN, No 1, pp 28-36

The authors studied the effect of the degree of compression pressure (from 2,000 to 20,000 atm) on the structure of the compressed alumomlybdenum catalyst and on its productivity, specific activity, and stability in the reactions involving the dehydrocyclization of n-heptane and the dehydrogenation of cyclohexane. They detd that an increase in the compression pressure leads to an increase in productivity and a decrease in the specific activity of the catalyst (in an equal degree for both reactions studied). They also detd that the stability of the compressed alumomlybdenum catalyst increases with an increase in the compression pressure (also in an equal degree for both reactions studied). An X-ray examination revealed no change in the primary (X-ray) structure of the catalyst after it had been subjected to a high hydrostatic pressure.

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NIKOLAYEV, A. V.; RUBINSHTEYN, A. M.

Bresler, S. Ye.

Radioactive elements. S. Ye. Bresler. Reviewed by A. V. Nikolayev, A. M. Rubinshteyn. Sov. kniga. No. 3, 1953.

9. Monthly List of Russian Accessions, Library of Congress, June 1953, Uncl.

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RUBINSHTEYN, A.M.

ZELINSKIY, Nikolay Dmitriyevich, 1861-1953 [deceased] KAZANSKIY, B.A., akademik; BALANDIN, A.A., akademik; KOCHESHKOV, K.A.; SHUYKIN, N.I.; KAVERZNEVA, Ye.D, doktor khimicheskikh nauk; LEVINA, R.Ya., doktor khimicheskikh nauk; PLATE, A.F., doktor khimicheskikh nauk; RUBINSHTEYN, A.M., doktor khimicheskikh nauk; YUR'YEV, Yu.K., doktor khimicheskikh nauk; KISELEVA, A.A., tekhnicheskiy redaktor.

[Collected works] Sobranie trudov, Moskva, Izd-vo Akademii nauk SSSR. Vol. 2. 1955. 743 p. (MLRA 8:11)

1. Chlen-korrespondent AN SSSR(for Kocheshkov and Shuykin)
(Hydrocarbons) (Petroleum)

APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2"

"APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2

Rubinshteyn, A.M.

BALANDINA,V.A. [translater]; BOGDANOVA,O.K.[translater]; VASSERBERG,V.E., [translater]; KIPERMAN,S.L.,[translater]; BALANDIN,A.A., akademik, redaktor; RUBINSHTEYN,A.M., professor, redaktor; SATAROVA,M.V., redaktor; OGANDZHANOVA,N.A., redaktor; IOVLEVA,N.A., tekhnicheskiy redaktor

[Catalysis, catalysts for organic reactions; translated from the English] Kataliz, katalizatory organicheskikh reaktsii. Perevod s angliiskogo Balandinoi i dr. Moskva, Izd-vo inostrannoi lit-ry, 1955. 336 p. (MLRA 9:2)

(Catalysts)

APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2"

"APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2

RUBINSHTEYN, A. M.

ZELINSKIY, N. D.; KAZANSKIY, B. A., akademik; BALANDIN, A. A., akademik; KOCHESHKOV, K. A.; SHUYKIN, N. I.: KAVERZNEVA, Ye. D., doktor khimicheskikh nauk; LEVINA, R. Ya., doktor; khimicheskikh nauk; PLATE, A. F.; doktor khimicheskikh nauk; RUBINSHTEYN, A. M. doktor khimicheskikh anuak; YUR'YEV, Yu. K., doktor khimicheskikh nauk.

[Collected works] Sobranie trudov, Moskva, Izd-vo Akad. nauk SSSR. Vol. 3, 1955 719 p. (MLRA 8:8)

1. Chlen-korrespondenty AN SSSR (for Kocheshkov, Shuykin)

APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2"

"APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2

RUBINSHTEYN, A.M.

326. CATALYTIC INERTNESS OF AMORPHOUS NICKEL IN REACTIONS OF HYDRO-

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"APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2

RUBINSHTEYN, A.M.; PRIBYTKOVA, N.A.

Effect of the structure on the catalytic decomposition of alcohols of different molecular weight. Izv.AN SSSR. Otd.khim.nauk no.4:770-772 JL-Ag '55. (MLRA 9:1)

1.Institut organicheskoy khimii imeni N.D.Zelinskogo Akademii nauk SSSR.
(Alcohols) (Catalysis)

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"APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2

RUBINSHTEYN, A.M.

Morphological changes of magnesium oxide-phosphate catalysts during use. A. M. Rubinshtein, B. A. Zakharov, N. A. Pribytkova, and V. A. Afanas'ev. *Doklady Akad. Nauk S.S.S.R.* 102, 1135-8(1955).—MgO-phosphate catalysts were found to be the most interesting, and the results obtained with it in the decompn. of alc. the most reproducible, and it was selected for further investigation. It was prepd. by adding $(NH_4)_2HPO_4$ (or Na_2HPO_4) in a little water to a suspension of $Mg(OH)_2$ from which sol. salts were carefully washed out. The sediment, consisting of a mixt. of $Mg(OH)_2$ and Mg phosphate, was filtered, dried at 110–120° without washing, and calcined at 450°. The phosphate content before and after use was found to be unaltered. As standards, one sample of phosphate and one of pyrophosphate were selected, the latter involving addnl. calcining at 900–1000°. The surface was detd. by I adsorption from CCl_4 soln. and from the adsorption isotherm from I vapors, and the results by the 2 methods were in good agreement. The phase compn. of the catalysts was studied with x-rays, and it showed the absence of $Mg(OH)_2$, but whether $Mg_2P_2O_7$ or MgP_2O_6 were present could not be detd. The linear dimensions of MgO were found to be practically the same in the different samples, and varied between 48 and 60 A. The addn. of phosphates resulted in a great increase in the activity of the catalysts, in its selectivity, and in greater steadiness of the activity.

W. M. Sternberg

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RUBINSHTEYN, A.M.

USSR/ Chemistry - Organic chemistry

Card 1/1 Pub. 22 - 22/46

Authors : Rubinshteyn, A. M.; Zakharov, B. A.; Pribytkova, N. A.; and Afanasyev, V. A.

Title : About binary oxide catalysts on the MgO base

Periodical : Dok. AN SSSR 103/1, 83-86, Jul 1, 1955

Abstract : Investigation was conducted to determine the effect of equimolecular amounts of metal oxides, belonging to various groups of the periodical system, on the catalytic properties of MgO during the decomposition of alcohol. X-ray analysis data show that a part of the metal additives introduced into the solution activates the MgO catalyst and the second part either produces no effect (negative effect) or deactivates the catalyst. Results obtained with inert or deactivated CaO, SrO, BaO, PbO and CdO additions are listed. Five references: 1 Eng. and 4 USSR (1945-1954). Table; graph.

Institution : Acad. of Sc., USSR, Inst. of Organ. Chem.

Presented by : Academician A. A. Balandin, February 16, 1955

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"APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2

Category: USSR B-9

Abs Jour: Zh--Kh, No 3, 1957, 7582

at 245-340°. The σ and phase composition of sulfide and selenide catalysts change markedly under the conditions of alcohol decomposition. The accompanying evolution of H_2S and H_2Se leads to a sharp change in the selectivity of action of the catalysts (from dehydrogenating they become dehydrating). On the basis of their activity in the investigated reaction, the catalysts can be arranged in the following series of decreasing activity: NiO, NiS, NiSe; ZnS, ZnO, ZnSe (at 340°); CrS, CrSe, Cr_2O_3. The mixed Ni-Zn catalysts can be arranged in a similar series.

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"APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2

RUBINSHTEYN, A. M.

Category: USSR B-9

Abs Jour: Zh-Kh, No 3, 1957, 7583

Author : Rubinshteyn, A. M., Dulov, A. A., Kulikov, S. G., Pribytkova, N. A.

Inst :

Title : On the Activity of the Oxides, Sulfides, and Selenides of Ni, Cr. and Zn in the Reduction of Nitrobenzene and the Selective Hydrogenation of Diolefins to Olefins

Orig Pub: Izv. AN SSSR, Section on Chemical Sciences, 1956, No 5, 596-603

Abstract: The catalytic action of the oxides, sulfides, and selenides of Ni, Cr, and Zn in the reduction of nitrobenzene to aniline and in the selective hydrogenation of butadiene to butylene has been investigated. The reactions were carried out in a flow system at 220-300 and 200-300°, using space velocities of 0.24 and 10 hrs^{-1}, respectively. In both

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Determination of the surface area of mixed $MgCr_2O_4$ catalysts. A. M. Rubinshtein, V. A. Manasov, Pribytkova. Izvest. Akad. Nauk

[illegible]

[illegible] method of chemisorption [illegible] from [illegible] Rovtar Leach

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"APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R001445820005-2

Distr: 4E4j

Application of dynamic method of measuring vapour-adsorption to determination of the dimensions of catalytic surfaces. [illegible] Rubinstein and V. A. Afanas'ev. (Izv. Akad. Nauk SSSR Otd. Khim. Nauk, 1956, 11, 1294—1303).—The method and apparatus described are suitable for measuring (at room temp. and normal pressure) the adsorption of benzene vapours. A series of isotherms have been obtained, suitable for the analysis of catalytic surfaces. The results obtained, on a sp. surface of 20 $m^2/g.$, have a deviation of $> \pm 10\%$, compared with results from high-vac. apparatus. The same concurrence has been observed on pure-MgO and combined-MgO catalysts. The reliability depends on careful prep. of the samples, by heating and washing.

J. Szebenyi

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