

PRIBYTKOVA, N. A.

"Catalysts for the Synthesis of Gasoline from CO and H<sub>2</sub> which Need not be Reduced at a High Temperature," Is. Ak. Nauk SSSR, Otdel. Khim. Nauk, No.1, 1941

PRIBYTKOVA, N[ina Alekseyevna]

"The Role of Primary Submicroscopic Crystals in Heterogeneous Catalysis," Dok 79, No.1, Vol. XXI, 1946. Acad. of Sci., Inst. of Organic Chem., Moscow, c.45

SO: Dok 79, No.1, Vol. XXI, 1946, AS, Inst. of Organ. Chem., Moscow, c. '45

Effect of thiophene on nickel catalysts for hydrogenation and dehydrogenation of cyclic hydrocarbons. A. M. Rubinshtein and S. A. Pilyukhina (Inst. Org. Chem. Acad. Sci. U.S.S.R., Moscow). Doklady Akad. Nauk S.S.S.R. 61, 265-8 (1948). — Ni-MgO catalysts, prep. 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<sub>4</sub>H<sub>4</sub>S by treating 3-g. portions of the catalyst with 10 mg. C<sub>4</sub>H<sub>4</sub>S 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<sub>6</sub>H<sub>6</sub> with excess H<sub>2</sub> 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°, 0 hrs., Ni crystals 24 Å., MgO 32.2 Å. 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<sub>2</sub>; 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<sub>4</sub>H<sub>4</sub>S; 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 60 Å., and the amt. to reduce A in dehydrogenation to about 20% (from 63%), de-

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creases 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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**Hydrogenation and dehydrogenation reactions on  $\alpha$ - and  $\beta$ -cobalt** A. M. Rubinshtein and N. A. Pilykhova (Acad. Sci. U.S.S.R., Moscow). *Izvst. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk* 1951, 70-81. Catalysts without carrier (I) were prepd. by decomn. of purest  $\text{Co}(\text{NO}_3)_2$  at 300°, and reduction of the  $\text{CoO}$  in  $\text{H}_2$ , 10 hrs. at 350, 375, 420, 450, 600, and 800°. Completeness of the reduction was verified analytically and by x-rays; at 325° the reduction was not complete, and there was no reduction at 300°. Catalysts (II) on activated charcoal (washed with  $\text{HCl}$ ) were made by impregnation with  $\text{Co}(\text{NO}_3)_2$ , drying at 200° (accompanied by spontaneous heating-up), and reduction with  $\text{H}_2$ , 8 hrs. at 350, 600, and 800°; catalysts II contained 25% metallic  $\text{Co}$ . X-ray diffraction patterns showed I reduced at 350° to consist only of the hexagonal  $\alpha$ - $\text{Co}$ ; the ductal at 420° showed, along with the predominant  $\alpha$ - $\text{Co}$ , also some face-centered cubic  $\beta$ - $\text{Co}$ ; in I reduced at 600° or 800°  $\alpha$ - $\text{Co}$  was present only in traces, practically all of the  $\text{Co}$  being the  $\beta$  form. II reduced at either 350 or 420° is pure hexagonal  $\alpha$ - $\text{Co}$ ; at 600° it is cubic  $\beta$  with traces of  $\alpha$ , and at 800° pure  $\beta$ . By the line widths, the metal is more highly dispersed in II than in I; in II reduced at 350 and 450°, the crystallite size was 83 and 55 Å., in I, 91 and 108 Å., resp.; in II and I reduced at 600°, 63 and 95 Å., resp. All expts. were made in a flow system with 1 g.  $\text{Co}$ . (1) In the hydrogenation of  $\text{C}_6\text{H}_6$  in excess  $\text{H}_2$ , at space velocity of 4 ml./g.  $\text{Co}/\text{hr}$ ., the catalytic activity, expressed by % conversion, remained const. with time in all expts. at 140° and at 160°, on both  $\alpha$  and  $\beta$ - $\text{Co}$ , I and II, and at 120° on  $\alpha$ -II; only at 120° on  $\alpha$ -I did the activity fall linearly with time. The figures (% conversion) at 120, 140, 160°, are:  $\alpha$ -I, 36 (initial), 9.5, 9.5;  $\beta$ -I, ~1, ~1, ~1;  $\alpha$ -II, 82, 65, 49.5;  $\beta$ -II, ~1, 0, 0. Consequently, only

the hexagonal form is active, the cubic is not. (2) In hydrogenation of cyclohexene at 3.2 ml./g.  $\text{Co}/\text{hr}$ ., on catalysts II, the degrees of conversion in 12 min., at 120, 140, 160°, were:  $\alpha$ , 92, 48, 44.5%;  $\beta$ , 9, 0, 0%. In more prolonged runs (30 min.), the activity of  $\beta$  falls faster than that of  $\alpha$ . Again, higher temp. lowers the conversion. (3) Hydrogenation of  $\text{Me}_2\text{C}=\text{C}=\text{C}=\text{C}=\text{C}=\text{C}$  on II, under the same conditions as above, gave, in 12 min., at 120, 140, 160°,  $\alpha$ , 93, 50, 40%;  $\beta$ , 15, 2.6, 2.6%. Here, however, the activity of  $\beta$  remained the same over 30 min., whereas that of  $\alpha$  fell by about 10%. (4) Hydrogenation of  $\text{C}_6\text{H}_5$  (gas velocity 500) on II, at 10, 30, 30, 50, 80°, gave the conversion:  $\alpha$ , 90.5, 7.9, 0.1, —, 100;  $\beta$ , —, 12.5, 17.26, 34.1%,  $\text{CH}_4$ , 7.8, 2.4, 4%; gaseous space velocity 500) to  $\text{C}_6\text{H}_5$  on II, at 225, 250, 275, 300°:  $\alpha$ , 23, 58, 88, — %;  $\beta$ , —, 20, 25.4%. (5) Dehydrogenation of cyclohexane, space velocity 3.2, at 300, 325, 350°, on I,  $\alpha$ , 5, 4.5, 4.5;  $\beta$ , 1.1, 1.1% on II,  $\alpha$ , 8.5, 8.5, 8.5;  $\beta$ , 0, 0, 0. (7) Dehydrogenation of  $\text{EtOH}$  on II, at space velocity 3.1, at 250, 275, 300°:  $\alpha$ , 30.8, 37.4, 44%;  $\beta$ , 17.6, 30, 30.3%. The differences of the activities of  $\alpha$  and of  $\beta$  tend to diminish with rising temp., but  $\alpha$  remains distinctly more active than  $\beta$ . (8) That the observed differences of activities are not due to changes of the dispersity depending on the temp. of the reduction is clearly proved by the constancy of the crystallite

1967 Inst.-Org. Chem.

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**Mechanism of the catalytic ketonization of acids** A. M. Rubinshtein and N. A. Pribytikova (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, 7632g; 45, 5010b. — The rate of the reaction  $2 \text{AcOH} \rightarrow \text{Me}_2\text{CO} + \text{CO}_2 + \text{H}_2\text{O}$  was investigated in a flow system over (I) calcite  $\text{CaCO}_3$  prepd. by pptn. in the cold, with the ppt. kept 24 hrs. in the liquid before filtration, (II) aragonite  $\text{CaCO}_3$  prepd. by pptn. in a boiling soln., rapid cooling, and immediate filtration, (III)  $\text{BaCO}_3$  pptd. and dried at  $100^\circ$ , (IV)  $\text{BaCO}_3$  pptd. and heated 6 hrs. at  $830-29^\circ$ , (V)  $\text{BaCO}_3$  pptd. and heated 6 hrs. at  $1000^\circ$ . X-ray examn. confirmed the structures of the two  $\text{CaCO}_3$  preps. The 3  $\text{BaCO}_3$  preps. were identical, in conformity with the reversibility of the phase transitions in  $\text{BaCO}_3$ . The dispersity of the  $\text{BaCO}_3$  preps. 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  $\text{CO}_2$  evolved (ml. per 1 ml.  $\text{AcOH}$  vapor passed, on I-V, were: at  $350^\circ$ , 37.5, 41.5, —, —; at  $400^\circ$ , 88.2, 87.9, —, —; at  $420^\circ$ , 112.3, 112.8, 44.3, —, —; at  $440^\circ$ , 140.5, 141.9, 51.6, —, —; at  $470^\circ$ , 174.4, 178.3, 104.6, 97.9, 97.9. The figures for I and II are practically identical; consequently, the

phase transition in  $\text{CaCO}_3$  is without effect on its catalytic activity. The independence of the yield of the dispersity of  $\text{CaCO}_3$  contrasts sharply with facts known for numerous other reactions, and can only be attributed to the sp. mechanism of the ketonization of  $\text{AcOH}$  on carbonates. This particular reaction involves no intermediate complex at the surface, but actual formation of a complex,  $(\text{AcO})_2\text{Ca}$  or  $(\text{AcO})_2\text{Ba}$ , in the whole mass; decompn. of the acetate re-generates the carbonate. Consequently, the limiting stage is not diffusion of  $\text{AcOH}$  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  $470^\circ$ , when the rate of decompn. of the acetate becomes equal to its rate of formation, will the former cease to be rate-detr. and the reaction take place at the surface only; however, above  $470^\circ$ , 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  $\text{CaCO}_3$  after reaction at  $350^\circ$ ; there are no lines of either aragonite or calcite, and the reflections belong to  $(\text{AcO})_2\text{Ca}$ . No  $\text{CO}_2$  is evolved with  $\text{HCl}$ . In the temp. range of the phase transition,  $(\text{AcO})_2\text{Ca}$  decomposes rapidly with formation of only calcite, and that in a much more highly disperse form than is obtained by pptn. N. Thon

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

Effect of  $K_2O$  on the activity, selectivity, and electrical properties of alumina-chromia catalysts. Izv AN SSSR Ser Khim no. 4:604-613 Ap '64. (MIRA 17:5)

1. Institut organicheskoy khimii im. N. D. Zelinskogo AN SSSR.

PribytKova, N.A.

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Changes taking place in magnesium-magnesium phosphate catalysts during their working. A. M. KUBINSKIY, B. A. ZEBERAY, N. F. PribytKova and V. A. Afanas'ev (Dokl. Akad. Nauk SSSR, 1985, 125, 1133-1138). Conc. 2g.  $(NH_4)_2HPO_4$  is added to freshly pptd.  $Mg(OH)_2$ , and the ppt. is collected after 24 hr., dried at 110-120°, and calcined at 450° or at 1000°. The dehydrating activity of the catalysts falls, and the dehydrogenating activity rises, during 48 hr. of working with n-butanol at 450°. The results suggest that the surface of the fresh catalyst consists largely of Mg phosphate or pyrophosphate, which with butanol give  $BaMgPO_4$ ; this in turn gives  $MgHPO_4$ , which reacts with underlying MgO molecules. With time, this process results in diffusion of phosphate into the interior of the catalyst grains and its replacement at the surface by MgO, which acts as a selective dehydrogenation catalyst.

R. TAVARUS

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FRIBYTKOVA N. A.

Mechanism of the catalytic ketonization of acids. A. M. Pribludskiy and N. A. Pribytkova (Inst. Org. Chem. Acad. Sci. U.S.S.R., Moscow). *Doklady Akad. Nauk S.S.S.R.* 76, 917-20 (1951); cf. *C.A.* 44, 7032g; 45, 5019b. The rate of the reaction  $2 \text{AcOH} \rightarrow \text{Me}_2\text{CO} + \text{CO}_2 + \text{H}_2\text{O}$  was investigated in a flow system over (I) calcite  $\text{CaCO}_3$  prep'd. by pptn. in the cold, with the ppt. kept 24 hrs. in the liquid before filtration, (II) aragonite  $\text{CaCO}_3$  prep'd. by pptn. in a boiling soln., rapid cooling, and immediate filtration, (III)  $\text{BaCO}_3$  pptd. and dried at  $100^\circ$ , (IV)  $\text{BaCO}_3$  pptd. and heated 6 hrs. at  $800-20^\circ$ , (V)  $\text{BaCO}_3$  pptd. and heated 6 hrs. at  $1000^\circ$ . X-ray examn. confirmed the structures of the two  $\text{CaCO}_3$  preps. The 3  $\text{BaCO}_3$  preps. were identical, in conformity with the reversibility of the phase transitions in  $\text{BaCO}_3$ . The dispersity of the  $\text{BaCO}_3$  preps. 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  $\text{C}_2$  evolved (ml.) per 1 ml.  $\text{AcOH}$  vapor passed, on I-V, were: at  $350^\circ$ , 37.5, 41.5, —, —, —; at  $400^\circ$ , 88.2, 87.0, —, —, —; at  $420^\circ$ , 112.3, 112.8, 44.3, —, —; at  $440^\circ$ , 140.5, 141.0, 54.0, —, —; at  $470^\circ$ , 174.4, 178.3, 104.0, 97.9, 97.9. The figures for I and II are practically identical; consequently, the

phase transition in  $\text{CaCO}_3$  is without effect on its catalytic activity. The independence of the yield of the dispersity of  $\text{CaCO}_3$ , contrasts sharply with facts known for numerous other reactions, and can only be attributed to the sp. mechanism of the ketonization of  $\text{AcOH}$  on carbonates. This particular reaction involves no intermediate complex at the surface, but actual formation of a compd.,  $(\text{AcO})_2\text{Ca}$  or  $(\text{AcO})_2\text{Ba}$ , in the whole mass; decompn. of the acetate regenerates the carbonate. Consequently, the limiting stage is not diffusion of  $\text{AcOH}$  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  $470^\circ$ , when the rate of decompn. of the acetate becomes equal to its rate of formation, will the former cease to be rate-dctg., and the reaction take place at the surface only; however, above  $470^\circ$ , 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  $\text{CaCO}_3$  after reaction at  $330^\circ$ ; there are no lines of either aragonite or calcite, and the reflections belong to  $(\text{AcO})_2\text{Ca}$ . No  $\text{CO}_2$  is evolved with HCl. In the temp. range of the phase transition,  $(\text{AcO})_2\text{Ca}$  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;  $2\text{-C}_2\text{H}_4$ ,  $120^\circ$ , 110, [0.63], 10.0;  $2\text{-C}_2\text{H}_4$ ,  $120^\circ$ , 120, [0.63], 15.0. First-order rate consts.  $k$  (sec.<sup>-1</sup>) are



RUBINSKIY, R.M., VASSILBERG, Ye., REBYTKOVA, H.A.

Catalysts

"Effect of the dimensions of elementary crystals on the porosity and activity of  $Al_2O_3$ -catalysts in the reaction of the dehydration." Izv. AN SSSR Otd.khim.nauk, no. 2, 1952.

MONTHLY LIST OF RUSSIAN ACQUISITIONS, LIBRARY OF CONGRESS, AUGUST 1952. ENGLISHED.

PRIBYTKOVA, N. A.

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 hydration 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, 9861d.  
H. L. H.

PRIBYTKOVA, N.A.

USSR/Chemistry - Catalysts

1 Jul 52

Deformation of the Crystal Lattice and the Dehydrogenation Properties of  $\text{Cr}_2\text{O}_3$ ,  
A. M. Rubinshteyn, S. G. Kulikov, N. A. Pribytkova, Inst of Org Chem, Sci Acad  
SSSR

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

$\text{Cr}_2\text{O}_3$  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  $\text{Cr}_2\text{O}_3$ ,  $\text{Al}_2\text{O}_3$ , and  $\text{MgO}$ , were prepd and tested. Addn of  $\text{Al}_2\text{O}_3$  to  $\text{Cr}_2\text{O}_3$  decreases the selectivity of the catalyst sharply, while a  $\text{MgO} - \text{Cr}_2\text{O}_3$  catalyst is more active than pure  $\text{MgO}$ . Presented by Acad B. A. Kazanskiy 23 Apr 52.

224T18

PRIBYTKOVA, N. A.

USSR/Chemistry - Catalysts

11 Jul 52

"Dehydrogenation on Copper-Chromium Catalysts,"  
A.M. Rubinshteyn, N. A. Pribytkova, Inst Org Chem,  
Acad Sci USSR

DAN SSSR, Vol 85, No 2, pp 353-355

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 com-

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position 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.

PRIBYTKOVA, N. A.

62 ✓ Morphological changes of magnesium oxide-phosphate catalysts during use. A. M. Rubinshtein, B. A. Zakharov, N. A. Pribytkova, and V. A. Alanas'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 decomn. 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  $Mg_2F_2O_7$  or  $MgP_2O_7$  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 43 and 60 Å. 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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PRIBYTKOVA, N. A.

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

RUBINSHTEYN, A.M.; DULOV, A.A.; KULIKOV, S.G. [deceased]; PRIBYTKOVA, N.A.

Activity of Ni, Cr, and Zn oxides, sulfides, and selenides in the reduction of nitrobenzene and in the preferential hydrogenation of a diolefin into an olefin. Izv. AN SSSR. Otd. khim. nauk no. 5: 596-603 My '56. (MLRA 9:9)

1. Institut organicheskoy khimii imeni N.D. Zelinskogo Akademii nauk SSSR.  
(Catalysts) (Olefins) (Benzene)

RUBINSHTEYN, A.M.; AFANAS'YEV, V.A.; AKIMOV, V.M.; PRIBYTKOVA, N.A.;  
SLOVETSKAYA, K.I.

Effect of composition and heat treatment conditions on the  
structure and catalytic activity of  $Al_2O_3$  -  $ZrO_2$  catalysts.  
Dokl. AN SSSR 124 no.5:1076-1079 F '59. (MIRA 12:3)

1. Institut organicheskoy khimii imeni N.D. Zelinskogo AN  
S.S.S.R. Predstavleno akademikom A.A. Balandinym.  
(Catalysts) (Alumina) (Zirconium oxides)



PRIBYTKOVA, N. A.; AFANASYEV, V. A.; SLINKIN, A. A.; RUBINSHTEYN, A. N.

"The Structure and Texture Of Chromia-Alumina Potassium Oxide Catalysts and Their Activity And Selectivity In Decomposing ISO-C<sub>2</sub>H<sub>7</sub>OH."

report submitted for Catalysis 2nd Intl. Cong., Paris, 4-9 Jul. 60.

The Zelinsk'y Inst. of Organic Chemistry, Moscou, U.R.S.S.

RUBINSHTEYN, A.M.; PRIBYTKOVA, N.A.; AKIMOV, V.M.; KLYACHKO-GURVICH, A.L.;  
SLINKIN, A.A.; MEL'NIKOVA, I.V.

Complex investigation of iron catalysts for ammonia synthesis. Part 2:  
Structure and texture of doubly promoted precipitated catalysts. Kin.  
i kat. 6 no.2:285-293 Mr-Ap '65. (MIRA 18:7)

1. Institut organicheskoy khimii imeni Zelinskogo AN SSSR.

LACHINOV, S.S.; RUBINSHTEYN, A.M.; AKIMOV, V.M.; KLYACHKO-GURVICH, A.L.;  
KONYUKHOVA, I.N.; KUZNETSOV, L.D.; LEVITSKAYA, T.T.; PRIBYTKOVA, N.A.;  
SLINKIN, A.A.; CHESNOKOVA, R.V.

Complex investigation of iron catalysts for ammonia synthesis.  
Kin. i kat. 5 no.3:478-489 My-Je '64.

(MIRA 17:11)

1. Institut organicheskoy khimii AN SSSR i Gosudarstvennyy institut  
azotnoy promyshlennosti.

L 52349-65 EFF(c)/EWF(j)/EWT(m) Pc-4/Pr-4 RM  
ACCESSION NR: AP5011683

UR/0195/65/006/002/0285/0293  
24  
27  
6

AUTHOR: Rubinshteyn, A. M.; Pribytkova, N. A.; Akimov, V. M.; Klyachko-Gurvich,  
A. L.; Slinkin, A. A.; Mel'nikova, I. V.

TITLE: A comprehensive study of ferric catalysts for ammonia synthesis  
II. Structure and grain of twice activated precipitated catalysts

SOURCE: Kinetika i kataliz, v. 6, no. 2, 1965, 285-293

TOPIC TAGS: ammonia, potassium compound, alumina, catalyst

ABSTRACT: The authors studied the effect of potassium oxide on the following properties of iron-alumina catalysts synthesized from coprecipitated hydroxides: specific surface, specific volumes and mean radii of pores (note: these three parameters define the term "grain" as used in this article), phase composition, magnetic susceptibility, saturation magnetization, and ferromagnetic resonance spectra. The addition of  $K_2O$  doubles the activity in comparison to catalysts activated only by  $Al_2O_3$ . The potassium oxide does not change the optimum quantity of  $Al_2O_3$ . The activity of a unit volume of the precipitated catalysts is close to that of fused catalysts of the same composition. The test specimens were made up with 8 different  $Fe_2O_3/Al_2O_3$  ratios (see table 1 of the Enclosure). The samples were prepared in 4

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ACCESSION NR: AP5011683

series: the first was the "control" series activated only by  $Al_2O_3$ ; the other 3 series were activated by  $K_2O$  at various stages of synthesis. It was found that the later the stage at which the potassium oxide activation takes place, the less the grain of the catalyst is changed. X ray analysis indicated that the addition of an alkali has a strong stabilizing effect on the lattice of the maghemite phase, especially if the alkali is introduced at the hydroxide stage. This stabilizing effect on spinel structures depends on the state of the initial iron compounds. "Research conducted jointly with GIAP Laboratory Nr 3." Orig. art. has: 4 tables. 2

ASSOCIATION: Institut organicheskoy khimii im. N. D. Zelinskogo AN SSSR  
(Institute of Organic Chemistry)

SUBMITTED: 01Mar63

ENCL: 01

SUB CORE: GC

NO REF SOV: 004

OTHER: 014

Card 2/3

L 52349-65

ACCESSION NR: AP5011683

ENCLOSURE: 01

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Table 1

Sample No	1	2	3	4	5	6	7	8
Fe <sub>2</sub> O <sub>3</sub> Wt. %	62.5	86.6	92.1	94.6	94.7	97.6	98.85	99.35
Al <sub>2</sub> O <sub>3</sub> Wt. %	37.5	13.4	7.9	5.4	5.3	2.4	1.15	0.65

Card 3/3 MB

RUBINSHTEYN, A.M.; PRIBYTKOVA, N.A.; AKIMOV, V.M.; KRETALOVA, L.D.;  
KLYACHKO-GURVICH, A.L.

Effect of alkali metal oxides on the activity, selectivity, and  
phase composition of binary catalysts based on  $Al_2O_3$ . Izv. AN SSSR.  
Otd.khim.nauk no.9:1552-1558 S '61. (MIRA 14:9)

1. Institut organicheskoy khimii im. N.D.Zelinskogo AN SSSR.  
(Alkali metal oxides) (Catalysts)

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

Decomposition of isopropanol on alumina-chromium oxide catalysts.  
Izv. AN SSSR. *Otd. khim. nauk* no. 6: 996-1005 Je '61. (MIRA 14:6)

1. Institut organicheskoy khimii im. N.D. Zelinskogo  
AN SSSR. (Isopropyl alcohol) (Catalysts)



RUBINSHTEYN, A.M., PRIBYTKOVA, N.A., AFANAS'YEV, V.A., SLINKIN, A.A.

Structure and texture of alumina - chromic oxide - potassium  
monoxide catalysts, and their activity and selectivity of  
action in the decomposition of  $i\text{-C}_3\text{H}_7\text{OH}$ . Kin. i kat. 1 no.1:129-  
143 My-Je '60. (MIRA 13:8)

1. Institut organicheskoy khimii im. N.D.Zelinskogo Akademii  
nauk SSSR.

(Alumina) (Chromium oxide) (Potassium oxide)  
(Butanol)

8.11.60

75100  
597/11-00-1-1-73

AUTHORS: Rubinshteyn, A. M., Slovetzkaya, K. I., Akimov, V. M.,  
Pribylkova, N. A., Kretalova, L. D.

TITLE: Polymorphism and Catalytic Properties of  $Al_2O_3$

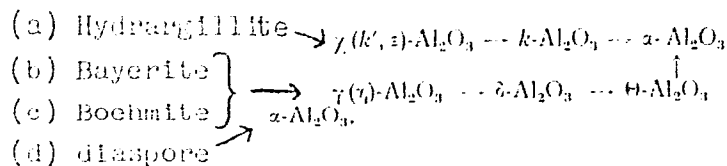
PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh  
nauk, 1960, No 1, pp 31-33 (USSR)

ABSTRACT: Polymorphic modifications of  $Al_2O_3$  and their catalytic  
properties were studied. Preparation of  $\gamma$ -,  $\alpha$ -,  
 $\chi$ -,  $\kappa$ -,  $\theta$ -,  $\delta$ - $Al_2O_3$  modifications is given. It  
was shown that formation of different  $Al_2O_3$  modifications  
depends not only on the thermal conditions of dehydration,  
but also on the structure of the starting aluminum  
hydroxide. The following three series of conversions  
are given:

Card 1/1

Polymorphism and Catalytic Properties  
of  $Al_2O_3$

73065  
SOV/62-60-1-6/77



General and specific catalytic activity of the above modifications was determined by using them in catalytic dehydration of 1-C<sub>2</sub>H<sub>5</sub>OH. The general catalytic

activity of the modifications changes with the change of specific surface. According to their specific catalytic activity the modifications (containing the same amount of residual water per 1 m<sup>2</sup> of surface)

form the following series:  $\theta > \chi > \kappa > \gamma (< \delta) \gg \alpha$ .

Activity of some modifications prepared at high temperatures is higher than that of modifications prepared at lower temperatures. X-ray studies show that in the catalytic experiments the modifications

Card 2/3

Polymorphism and Catalytic Properties  
of  $Al_2O_3$

78060

SOV/62-60-1-6/37

retain their structural characteristics. There are 2 tables; 4 figures; and 17 references, 6 U.S., 1 U.K., 1 French, 5 German, 4 Soviet. The 5 most recent U.S. and U.K. references are: H. C. Stumpf, A. S. Russell, I. W. Newson, C. M. Tucker, *Industr. and Engng. Chem.* 42, 1938 (1950); J. F. Brown, D. Clark, W. Elliot, *J. Chem. Soc.*, 84 (1953); M. K. Day, V. F. Hill, *J. Phys. Chem.* 57, 946 (1953); A. S. Russell, C. N. Cochran, *Industr. and Engng. Chem.* 42, 1336 (1950); W. Brèy, R. Krieger, *J. Am. Chem. Soc.*, 71, 3637 (1949).

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

SUBMITTED: May 5, 1958

Card 3/3

5(2,3)

AUTHORS:

Rubinshteyn, A. M., Afanas'yev, V. A., SOV/20-124-5-32/62  
Akimov, V. M., Pribytkova, N. A., Slovetskaya, K. I.

TITLE:

The Influence of the Composition and of the Conditions of the Thermal Treatment on the Structure and Catalytic Activity of  $Al_2O_3-ZrO_2$  Catalysts (Vliyaniye sostava i usloviy termicheskoy obrabotki na strukturu i kataliticheskuyu aktivnost'  $Al_2O_3-ZrO_2$ -katalizatorov)

PERIODICAL:

Doklady Akademii nauk SSSR, 1959, Vol 124, Nr 5; pp 1076-1079 (USSR)

ABSTRACT:

The authors are not aware of publications on results of systematic changes of the ratio of components or of the conditions of the thermal treatment nor on the determination of the specific activity of the catalysts mentioned in the title. They have investigated the decomposition of absolute isopropyl alcohol on such catalysts which had been produced by precipitation with 10 % ammonia from 10 % solutions of Al- and Zr-nitrate at room temperature and pH 8.7-9.5. During the calcining of samples of the catalysts at 400, 600, and 750° it was found that the dehydration of the hydroxide is already

Card 1/4

The Influence of the Composition and of the Con- SOV/20-124.5-32/62  
ditions of the Thermal Treatment on the Structure and Catalytic Activity of  
Al<sub>2</sub>O<sub>3</sub>-ZrO<sub>2</sub> Catalysts

sufficient at 400°. The catalysts consist of oxides. The additional removal of water at 750° was only as much as 2 % which had still remained adsorbed. The values of the velocity constant K of the reaction were calculated from the equation

$$K = \frac{Nm}{M - m/2} \quad (\text{Ref 5}) \quad \text{and the specific activity } A_{sp} \quad (\text{Table 1})$$

was calculated from K and S (specific surface area). Figure 1 shows the calculated S values (Ref 6). This indicates that the catalysts had a very highly developed surface and a fairly high thermal stability. This expresses the mutual protection afforded by the components before crystallization (sintering). Figure 2 shows the change in the porous structure of the catalysts during calcining. Said catalysts were already active at 230° whereas ZrO<sub>2</sub> alone reaches the same activity only at

300°. Table 1 states the degrees of conversion between 245 and 260°. Only a dehydration of i-C<sub>3</sub>H<sub>7</sub>OH took place on all binary

catalysts. The increase in activity was clearly due in this case to high S values of the binary catalysts compared to

Card 2/4

The Influence of the Composition and of the Con- SOV/20 124-5-32/62  
ditions of the Thermal Treatment on the Structure and Catalytic Activity of  
Al<sub>2</sub>O<sub>3</sub>-ZrO<sub>2</sub> Catalysts

Al<sub>2</sub>O<sub>3</sub>. It can be concluded that the addition of ZrO<sub>2</sub> does not result in an activation of Al<sub>2</sub>O<sub>3</sub> under the conditions given. Figure 3 shows a diagram of the variation of A<sub>sp</sub> with the composition and the calcining temperature of the catalysts (1-750°, 2-600°, 3-400°) for experiments carried out at 260°. The fact that A<sub>sp</sub> is constant throughout a wide range of ZrO<sub>2</sub> concentrations seems to indicate that the reaction is taking place in this case only on Al<sub>2</sub>O<sub>3</sub>, whereas ZrO<sub>2</sub> behaves only as an inert support. All this is in good agreement with the results of the X-ray analysis (made with the assistance of L. D. Kretalova). It has been found that in co-precipitated catalysts ZrO<sub>2</sub> and Al<sub>2</sub>O<sub>3</sub> are present as separate phases rather than solid solutions (in agreement with reference 4). Neither the increase of the temperature at which the experiment was carried out (up to 320°) nor of the volume velocity (up to

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The Influence of the Composition and of the Con- SOV/20-124-5 32/62  
ditions of the Thermal Treatment on the Structure and Catalytic Activity of  
Al<sub>2</sub>O<sub>3</sub>-ZrO<sub>2</sub> Catalysts

12h<sup>-1</sup>) have destroyed. on the whole, the picture of figure 3  
nor affected the conclusions derived therefrom in table 1.  
This relates to the catalysts calcined at 600°. The total  
activity (Table 1) and A<sub>sp</sub> increase with the calcining temper-  
ature between 400 and 600° (Fig 3) probably because the finest  
pores are destroyed, which are difficultly accessible to the  
alcohol molecules. There are 3 figures, 1 table, and 6 referen-  
ces, 4 of which are Soviet.

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

PRESENTED: October 17, 1958, by A. A. Balandin, Academician

SUBMITTED: April 19, 1958

Card 4/4



AUTHORS: Rubinshteyn, A. M., Slinkin, A. A., Pribytkova, N. A. SOV/62-58-7-3/26

TITLE: Properties and Structure of NiO-Al<sub>2</sub>O<sub>3</sub> Catalysts (Svoystva i struktura NiO-Al<sub>2</sub>O<sub>3</sub> katalizatorov) Communication 1: The Influence Exerted by the Structure and the Bindings of the Thermal Treatment on the Activity and Selectivity of the Effect (Soobshcheniye 1. Vliyanie sostava i usloviy termicheskoy obrabotki na aktivnost' i izbiratel'nost' deystviya)

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye khimicheskikh nauk, 1958, Nr 7, pp 814 - 821 (USSR)

ABSTRACT: In the course of the last decade important investigations of the structure of the NiO - Al<sub>2</sub>O<sub>3</sub> catalysts have been carried out and were published (Refs 1,2). No catalytic activity of these catalysts in any reaction has, however, been found. The authors of this paper dealt with the specific activity of the NiO-Al<sub>2</sub>O<sub>3</sub> catalysts and in the reaction of the decomposition of i-C<sub>3</sub>H<sub>7</sub>OH they determined the optimum activity (within the range of the content)(v oblasti sodержaniya) at 5-15 molar %

Card 1/2

Properties and Structure of NiO-Al<sub>2</sub>O<sub>3</sub> Catalysts. SOV/62-58-7-3/26  
Communication 1: The Influence Exerted by the Structure and the Bindings  
of the Thermal Treatment on the Activity and Selectivity of the Effect

of NiO. They furthermore found that the effective selectivity of the catalysts investigated depends on their composition. Within the wide interval of the NiO concentrations only a dehydration takes place (in these concentrations) which tends to show the absence of free NiO. The authors demonstrated that in NiO-Al<sub>2</sub>O<sub>3</sub> catalysts generally used the formation of Ni Al<sub>2</sub>O<sub>4</sub> spinel is possible as early as at 400°, viz. as a result of the intermolecular dehydration of the hydroxides. The changes of the specific surface area of the catalysts used were determined in detail. These changes take place within the temperature interval of from 400 to 900°. There are 1 figure, 4 tables, and 11 references, 5 of which are Soviet.

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

SUBMITTED: February 25, 1957  
Card 2/2.

Pribytkova, N.A.

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

B-9

Abs Jour : Referat Zhur - Khimiya, No 1, 1958, 498

Author : A.M. Rubinshteyn, M.I. Dashevskiy, N.A. Pribytkova.

Inst : Academy of Sciences of USSR.

Title : Application of Method of Ultrathin Sections to Electronic  
Microscopy of Catalysts.

Orig Pub : Izv. AN SSSR. Otd khim. n., 1957, No 4, 431-435

Abstract : The authors polymerize specimens in a mixture of methyl-  
and butylmethacrylates (1 : 3) and make sections less  
than 0.01 $\mu$  thick with a specially constructed micro-  
tome from blocks prepared in the above manner. These  
sections are used for electron-microscopic study of  
highly dispersed catalysts.

Card 1/1

PRIBYTKOVA, N.A.

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

Ultrathin sectioning in electron microscopy of catalysts. Izv. AN  
SSSR Otd.khim.nauk no.4:431-435 Ap '57. (MIRA 10:11)

1. Institut organicheskoy khimii im. N.D.Zelinskogo AN SSSR.  
(Electron microscopy) (Catalysts) (Adsorbents)

PRIBYTKOVA, N.A.

5  
4-4f  
Use of the method of ultrathin cross sections in the electron microscopy of catalysts. V. A. M. Rubinshtein, I. I. Dushanin, and N. A. Pribytkova. Izvest. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk, 1971, 5. — The method of ultrathin cross sections is proposed for the electron-microscopic study of the structure of catalysts and adsorbents. Preliminary results are reported. J. Ruvlar Legsh.

DM 007

PRIBYTKOVA, N. A.

✓ 13314 (Russian) Ultrathin Sectioning in Electron Microscopy of Catalysts / *Prilozhenie metoda ultratolkikh srezov v elektronnoi mikroskopii katalizatorov.* A. M. Rudnikova, M. I. Dashytskiy, and N. A. Pribytkova. *Izvestia Akademii Nauk SSSR, Otdelenie Khimicheskikh Nauk*, no. 4, Apr. 1957, p. 431-435. *5*

Construction of a new microtome for cutting ultrathin sections of catalysts and absorbents.

*up* *pm* *ESL*

PRIBÝTKOVA, N. A.

*Activity of oxides, sulphides and selenides of nickel, chromium and zinc during nitrobenzene reduction and selective hydrogenation of diolefins to olefins. A. M. Rubinstejn, A. A. Dulov, S. G. Kullkov and N. A. Pribýtkova (Izv. Akad. Nauk SSSR, Old. Akim. Nauk, 1959, 336-339). The behaviour of the Ni, Zn and Cr compounds and also of mixed Ni-Zn catalysts was observed during reduction of nitrobenzene to aniline and during selective hydrogenation of olefin double bond of diolefins. Degree of activity decreases during both reactions in the order Ni > Cr > Zn compounds. The catalysts showed activity in the sequence NiS > NiSe > NiO; CrS catalysts were less active than CrSe.*

*PRIBYTKOVA, N.A.*  
RUBINSHTEYN, A.M.; AFANAS'YEV, V.A.; PRIBYTKOVA, N.A.

Determining the surface magnitudes of the components of mixed MgO-  
Cr<sub>2</sub>O<sub>3</sub> catalysts. Izv. AN SSSR Otd. khim. nauk no.12:1505-1507 D '56.

(MIRA 10:4)

1. Institut organicheskoy khimii im. N.D. Zelinskogo Akademii nauk  
SSSR.

(Catalysts)



KISELEVA, N.K.; PRIBYTKOVA, N.N.

Determination of the optical constants of Ge and CdTe by the  
reflection method. Opt. i spektr. 10 no.2:266-268 F '61.

(MIRA 14:2)

(Germanium—Optical properties)  
(Cadmium telluride)

BAKHSHEYEV, N.G.; PRIBYTKOVA, N.N.

Spectroscopic method for determining the density and thickness of films of strongly absorbing substances. Opt. i spektr. 15 no.4:574-576 0 '63. (MIRA 16:11)

PRIBYTKOVA, N.N.; AGROSKIN, L.S.

Investigation of the optic properties of some dyes in a "massive" state by the method of mirror reflection. Opt. i spektr. 2  
no.5:628-632 My '57. (MIRA 10:7)

(Dyes and dyeing)

PRIBYTKOVA, N.N.

PRIBYTKOVA, N.N.

A new method for the determination of optical constants. Opt.1  
spektr. 2 no.5:623-627 My '57. (MIRA 10:7)  
(Selenium--Optical properties)

ПРИКОТ'КО, А.Ф.

24(7) p 3 PHASE I BOOK EXPLOITATION SOV/1365  
L'vov. Universytet

Materialy I Vsesoyuznogo soveshchaniya po spektroskopii. t. 1: Molekulyarnaya spektroskopiya (Papers of the 10th All-Union Conference on Spectroscopy. Vol. 1: Molecular Spectroscopy) [L'vov] Izd-vo L'vovskogo univ-ta, 1957. 499 p. 4,000 copies printed. (Series: Itsi: Fizichnyy zbirnyk, vpp. 3/8/)

Additional Sponsoring Agency: Akademiya nauk SSSR. Komitaya po spektroskopii. Ed.: Jazer, S.L.; Tech. Ed.: Saranyuk, T.V.; Editorial Board: Lavysberg, G.S., Academician (Resp. Ed., Deceased), Neporent, B.S., Doctor of Physical and Mathematical Sciences, Fabelinskiy, I.L., Doctor of Physical and Mathematical Sciences, Fabelinskiy, V.A., Doctor of Physical and Mathematical Sciences, Kornitskiy, V.G., Candidate of Technical Sciences, Rayskiy, S.M., Candidate of Physical and Mathematical Sciences, Klimovskiy, L.K., Candidate of Physical and Mathematical Sciences, Miliyanchuk, V.S., A. Ye., Candidate of Physical and Mathematical Sciences.

Card 1/30

Shatalov, A.A. Spectral Study of the Colloidal Coagulation of F-centers in Alkali Halide Crystals	148
Pialkovskaya, O.V. Infrared Absorption Spectra of Anthracene	151
Vartanyan, A.T. Absorption Spectra of Sublimated Dye Layers	154
Melanikhoin, N.M. Absorption Spectra of Thiazine-dye Crystals	157
Fridytkova, N.M., and L.S. Agroskin. Study of the Optical Properties of Some Dyes in Large Samples by the Method of Mirror Reflection	158
Zhidkova, Z.V., and Yu. M. Suss. Study of the Effect of the Degree of Dispersion and Nature of the Adsorbent on the Spectral Absorption Curve of Absorbed Sensitized Dyes	161

Card 11/30

PRIBYTKOVA, N.N.

4  
4540

Optical properties of some dyes in a "anisotropic" state by the method of mirror reflection. N. N. Pribytkova and L. S. Krasova. *Optika i Spektroskopiya* 7, 605 (1957) in Russian. English transl. in *J. Opt. Soc. Am.* 47, 1031 (1957). The spectra and  $\epsilon$ ,  $n$  curves were complex and peculiar to each dye. In general,  $\epsilon$  plots consisted of 2 max., the relative intensity of which for I and II decreased during actinic illumination, the short-wave max. fading at a faster rate. The use of the K. method for studying the light absorption of dyes and their deterioration on exposure to sun light, heat, humidity, etc., is briefly discussed.

A. P. Kotliarova

Handwritten signature or initials.

PRIBYTKOVA, N. N.

2  
1-4E4e  
21

A new method of determining optical constants. N. N. Pribytkova. *Optika i Spektroskopiya* 2, 624-7 (1967).  
 Optical consts. of amorphous and cryst. Se were obtained by the new method of T. P. Kravets, et al. (cf. CA. 44 4312). The method is based on the determination of the coefficient of mirror reflection ( $R_1$ ,  $R_2$ ) in the layer of a substance on glasses having different refractive indices ( $n_1, n_2$ ) ( $n_1 > n_2$ ) and  $x = [(R_1(n_1 + n_2)^2 - (n_1 - n_2)^2) / (1 - R_1)]^{1/2}$  (where  $n$  and  $x$  are refractive index and absorption coeff. of the substance on glass, resp.). For BK-7 type glass in the spectrum region ( $\lambda$  in  $\mu$ ) 360, 380, 400, 420, 440, 460, 480, 500, 520, 540, 560, 580, 600, and 620, the values of  $R_1$  for amorphous Se were, resp., 0.121, 0.118, 0.116, 0.115, 0.113, 0.112, 0.112, 0.110, 0.110, 0.108, 0.104, 0.099, 0.094, 0.089. For 10 esp. measurements with freshly deposited Se (in vacuo), the av. error of the meas. was  $\leq \pm 0.001$ . The spectral curve of cryst. Se differed from that of the amorphous by a presence of a max. at  $\lambda \sim 600$  m $\mu$  and by the higher abs. values of reflection coeffs. 19 references. A. P. Kotloby

PR  
amb

PRIBYTKOVA, N.N.

51-5-11/26

AUTHOR: Pribytkova, N.N.TITLE: A New Method of Determination of the Optical Constants.  
(Novyy Metod Opredeleniya Opticheskikh Postoyannykh)PERIODICAL: Optika i Spektroskopiya, 1957, Vol.2, Nr 5, pp.623-627  
(USSR)

ABSTRACT: This paper describes the application of the specular reflection method of measurement of the optical constants, put forward by T.P. Kravets (1), to amorphous and crystalline selenium. In this method the coefficients of specular reflection are measured for layers, deposited on glasses with different refractive indices, at the boundary glass-layer and on normal incidence of light. The refractive index  $n$  and the absorption coefficient  $\chi$  are given by the eqs. (3) and (4):

$$n = \frac{1}{2} \left[ \frac{(1-R_1)(1-R_2)}{R_2-R_1} + \frac{1-R_1R_2}{n_2-n_1} + \frac{n_1+n_2}{n_1+n_2} \right] \quad (3)$$

$$\chi = \sqrt{\frac{R_1(n+n_1)^2 - (n-n_1)^2}{1-R_1}} \quad (4)$$

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A New Method of Determination of the Optical Constants. 51-5-11/26

where  $R_1$  and  $R_2$  are the reflection coefficients for two different glasses with refractive indices  $n_1$  and  $n_2$ .

The reflection coefficients were measured with a Beckmann spectrophotometer. To find the absolute value of the reflection coefficients the measured value for reflection at the glass-layer boundary was compared with the coefficient of reflection at the glass-air boundary. The latter coefficient was calculated from the Fresnel formula.

Glasses K8 and  $\Phi$  were used. To exclude the reflections from the front surface of the glass the latter had wedge-shaped form. The glass was cleaned in NaON and by spark discharge. The following conditions were necessary to obtain the best results: a) the layers should be specularly reflecting, b) the layers should have uniform and reproducible structure, c) the layers should be sufficiently thick to avoid multiple reflections inside them. Selenium layers were obtained by vacuum deposition on cold (amorphous layers) or warm (crystalline layers) glass. In each case 10 samples were prepared. The table on p.625 gives the reflection coefficients for amorphous selenium on the K8 glass. The

Card 2/3 reflection coefficients for both amorphous (curves 1) and

A New Method of Determination of the Optical Constants. 51-5-11/26

crystal (curves 2) selenium are given in Fig.1. The refractive index  $n$  and the coefficient of absorption  $\kappa$  for amorphous (curves 1) and crystal (curves 2) selenium are given in Fig.2. T.P.Kravets directed this work. The author thanks M.V.Savost'yanova for advice.

There are 2 figures, 1 table and 19 references, of which 3 are Slavic.

SUBMITTED; August 29, 1956.

AVAILABLE: Library of Congress.

Card 3/3

*Pribytkova, N.N.*

51-5-12/26

AUTHORS: Pribytkova, N.N. and Agroskin, L.S.

TITLE: Study of the Optical Properties of Certain Dyes in "Bulk" State by the Method of Specular Reflection. (Issledovaniye opticheskikh svoystv nekotorykh krasiteley v "massivnom" sostoyanii metodom zerkal'nogo otrazheniya)

PERIODICAL: Optika i Spektroskopiya, 1957, Vol. 2, Nr 5, pp. 628-632 (USSR)

ABSTRACT: The specular reflection method of T.P. Kravets described in the previous article was used. The following dyes were studied: cyanine (quinoline blue), rhodamin B, brilliant green, crystalline violet and malachite green. Cyanine was prepared by melting on a glass plate. The reflection coefficients 15 minutes after preparation are given in Fig. 1. Fig. 2 shows the dependence of a reflection coefficient of cyanine on the duration of illumination. This figure clearly shows that the reflection properties of cyanine layers are light sensitive. Curves ab in Fig. 2 show the effect of illumination by artificial light for 60 days. Then the samples were melted and curves cd show the effect of subsequent illumination in artificial light. Curves dc show the effects of daylight. A control sample of cyanine kept in

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51-5-12/26

Study of the Optical Properties of Certain Dyes in "Bulk" State  
by the Method of Specular Reflection.

darkness did not exhibit such changes. The light-sensitive effects were not due to the action of the glass base since cyanine layers on fluorite behaved similarly. It is suggested that the action of light is photochemical in nature. In Fig.3, curves 1 and 2 represent results for cyanine samples kept in darkness and curves 3 and 4 represent the results for samples illuminated for a long time. The errors for  $n$  in Fig.3 do not exceed 5% and for  $\chi$  about 10%. Rhodamin B was prepared by vacuum sublimation. Dependence of its spectral coefficients on the wavelength is given in Fig.4. Again, the layers were found to be light-sensitive (Fig.5). The optical constants which are means of results for 7 pairs of samples of rhodamin B are shown in Fig.6. Brilliant green layers were obtained by melting. The reflection coefficients of brilliant green in the 360-750  $\mu$  region are shown in Fig.7 and the optical constants in Fig.8. Crystal violet layers were deposited from a warm solution in alcohol. They were not affected by light. Their reflection coefficients are shown in Fig.9 and the optical constants in Fig.10. Malachite green layers were obtained by evaporation of a concentrated alcohol solution. They were strongly light-sensitive. All the measure-

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51-5-12/26

Study of the Optical Properties of Certain Dyes in "Bulk" State  
by the Method of Specular Reflection.

ments were made within 20 minutes from the preparation of the layers. Their reflection coefficients are shown in Fig.11 and the optical constants in Fig.12. All the studied dyes exhibit anomalous dispersion. Their curves for the coefficient of absorption  $\mu$  possess two maxima. The relative intensities of these maxima for cyanine and rhodamin B change on illumination of the layers, which indicates presence of absorption centres of various kinds. This work was directed by T.P.Kravets. The authors thank M.V.Savost'yanova for advice. There are 12 figures and 5 references, 1 of which is Slavic.

SUBMITTED: August 29, 1956.

AVAILABLE: Library of Congress.

Card 3/3

PRIBYTKOVA, N. N.

42051: PRIBYTKOVA, N. N., KRAVETS, I. P., PES'KINA, KH. L. - K. Voprosu o prirode shir-  
chikh polos pogloshcheniya. Doklad i prenie. Izvestiya Akad. nauk SSSR, Seriya  
Fiz., 1948, No 5, s. 504-12

SC: Letopis' Zhurnal'nykh Statey, Vol. 47, 1948

PRIBYTKOVA, V. A.

27 6  
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L 27489-66 FBD/EWT(1)/EWT(1)/EEC(k)-2/T/EWP(t)/EWP(k)/EWA(h) IJP(c) WG/JD

ACC NR: AP6015437

SOURCE CODE: UR/0051/66/020/005/0908/0910

AUTHOR: Skibarko, A. P.; Prichko, Yu. V.

64  
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ORG: none

TITLE: Measurement of the gain of coherent optical radiation in a tube containing a helium-neon mixture.

SOURCE: Optika i spektroskopiya, v. 20, no. 5, 1966, 908-910

TOPIC TAGS: laser, gas laser, helium, neon, noble gas, laser emission coherence

ABSTRACT: An experimental arrangement for direct measurement of the gain per pass G of an He-Ne laser in which there is no feedback is described. The method was used to measure the G of a tube (110 cm long, 8 mm in diameter) filled with He-Ne exposed to a beam from another He-Ne laser. It was shown that the average pump power cannot be used as the criterion for establishing the identity of both the modulated and the unmodulated operating regimes. Orig. art. has: 1 formula and 1 figure. [CS]

SUB CODE: 20/ SUBM DATE: 02Jul65/ ORIG REF: 001/ OTH REF: 003/

Card 1/1 BKG

UDC: 621.375.9:535

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117 AND 120 CARDS

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COMMON ELEMENTS

INTERNAL INDEX

ASB-ILA METALLURGICAL LITERATURE CLASSIFICATION

FROM STABILIS

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117 AND 120 CARDS

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B-I-9

**Catalytic production of chlorine from hydrogen chloride.** M. O. CHANMANDARIAN and G. V. PRATYUSKO (Ukrain. Chem. J., 1953, 8, 66-71).—A catalyst consisting of  $\text{CaO}$ ,  $\text{Co}_2\text{O}_3$ ,  $\text{MnO}$ , and  $\text{Bi}_2\text{O}_3$  gives 97.5% yields of  $\text{Cl}_2$  from  $\text{HCl}$  at  $370^\circ$ . The catalyst is inactivated by  $\text{CO}$  or  $\text{SO}_2$ . R. T.

ASB-35A METALLURGICAL LITERATURE CLASSIFICATION