SHUSHUNOV, V. A.

18CT11

USSR/Chemistry - Organomagnesium Compounds **Jan 51**

"Kinetics of the Reaction of Magnesium With Ethyl Bromide Vapors," V. A. Shushunov, A. P. Aurov, Sci Res Inst Chem, Gor'kiy State U

"Zhur Fiz Khim" Vol XXV, No 1, pp 13-19

Developed methods for investigating kinetics of reaction of metals with alkyl halide vapors. Studied in greatest detail reaction of Mg with EtBr, forming MgEtBr, found to proceed autocatalytically with activation energy of 13 kcal/mol (detd from temp coeff of induction period). Induction period decreased in proportion to increase of vapor pressure of alkyl halides.

18OT11

LC

SHUSHUNOV, V. A.

USSR/Chemistry - Organomagnesium Compounds Jan 51

"Catalysis by Ethers of Reaction of Magnesium With Ethyl Bromide Vapors," V. A. Shushunov, A. P. Aurov, V. A. Gorinov, Sci Res Inst of Chem, Gor'kiy State U

"Zhur Fiz Khim" Vol XXV, No 1, pp 20-23

In reaction of Mg with alkyl halides (in this case EtBr) ethers act as catalysts. Low-rate coeff of reaction at significant concn of ether suggests reaction occurs in diffusion region. Catalytic

180T12

LC

USSR/Chemistry - Organomagnesium Compounds Jan 51
(Contd)

ability of ethers depends on their nature, Me_2O being most effective, Et_2O and iso-Pr_2O about equal, though catalysis with Et_2O gives higher yield of organo-Mg compd.

180T12

LC

SHUSHUNOV, V. A.

180T22

USSR/Chemistry - Insecticides **Apr 51**

"Kinetics of the Photochlorination of Benzene," V. A. Shushunov, G. M. Strongin, Yu. I. Gryzin, A. V. Kukanov, Inst Chem, Gor'kiy State U

"Zhur Fiz Khim" Vol XXV, No 4, pp 404-408

Worked out methods for photochlorination of C_6H_6 with Hg-arc light ($\lambda = 4360$ Å). Reaction proceeded autocatalytically, requiring induction period from whose temp coeff calcd γ as 10/kcal/mol. Proposed mech of formation of active centers from which chain reaction starts. Based on reacted C_6H_6 and Cl, product **was** 95% **hexachlorocyclohexane,** 5% oily **sub**stances.

LC 180T22

SHUSHUNOV, V. A.

USSR/Chemistry - Metal Hydrides 21 Jun 51

"Kinetics of the Reaction of Calcium With Hydrogen," V. A. Shushunov, A. I. Shafiyev, Sci Res Inst Chem, Gor'kiy State U

"Dok Ak Nauk SSSR" Vol LXXVIII, No 6, pp 1181-1184

In previous phases of the investigation, which deals with topochem reactions of metals with gases and of alloys with alkyl halide vapors, existence of zone in which temp dependence of reaction rate does not follow Arrhenius' law has been established. When layer of CaH_2 reaches

184T20

USSR/Chemistry - Metal Hydrides (Contd) 21 Jun 51

certain thickness in reaction of Ca with H_2, diffusion of H_2 through the layer becomes slower than chem conversion at Ca surface. At higher temps, rate of reaction is again detd by kinetics of chem process. Arrhenius' law is applicable in entire range investigated, up to decompn t-re of CaH_2.

184T20

SHUSHUNOV, V. A.

8

Potassium carbonyl. V. A. Shushunov (Sci. Research Inst. Chem., State [illegible] ~~Gorki~~). ~~Doklady Akad. Nauk~~ *S.S.S.R.* 79, 617-19([illegible]51); cf. *C.A.* 44, 2833d.—Reaction of K with CO, at 60-80° and 100-700 mm. pressure, produces a nearly black, finely cryst. product, $(KCO)_x$ (I). I is unstable; it is not a K salt of hexahydroxybenzene [cf. Nietzki and Benckiser, *Ber.* 18, 499, 1883(1885)]. I, on heating, began to decompose at 250°, and deflagrated at 275-80°. The decompn. was exothermic. C and metallic K were produced, but no gases were observed. The K, which condensed as a mirror on the cold parts of the reaction vessel, was not metal left unreacted during the formation of I, but was produced during decompn. of I. The I was always pyrophoric; this also was not due to unreacted K. Thermal decompn. under CO at 300-400 mm. pressure led to a violent explosion. Sudden admission of O to 200-300 mm. pressure caused ignition of I, but slow admission of O did not. I with dry HCl at 5-15 mm. pressure, with H_2O vapor at 15-20 mm., or when added in 0.2-0.3 g. portions to liquid H_2O, reacted smoothly. With HCl at 100-150 mm., or H_2O vapor at 50-100 mm., or when larger portions of I were added to liquid H_2O, deflagration occurred. I and anhyd. EtOH reacted slowly, to produce a detectable amt. of the K salt of tetrahydroxyquinone. MeOH reacted similarly. I and Ac_2O at 120° gave tarry products; at 60°, a rapid reaction, which did not produce hexahydroxybenzene hexaacetate; at room temp., a slow reaction during which 2-4% of $C_6(O_2CMe)_6$ was formed. I reacted explosively with AcOH or with Me_2SO_4, slowly with Cl, CCl_4. It did not react with MeI (10 hrs.' boiling). It was insol. in C_6H_6, Et_2O, or liquid NH_3. Lawrence Summers

SHUSHUNOV, V.A.

USSR/Chemistry - Calcium Hydride **May** 52

"Kinetics of the Formation of Calcium Hydride,"
V. A. Shushunov, A. I. Shafiyev, Gor'kiy State U

"Zhur Fiz Khim" Vol XXVI, No 5, pp 672-679

The reaction of Ca with H_2 between 120-530° takes place without spontaneous acceleration. The rate of the reaction under some conditions is detd by the rate of diffusion through the hydride film. The temp coeff of the rate of the chem stage of the process is considerably smaller than that of the diffusion stage. The apparent energy of activation of the chem process is 5,500 cal/mol, while the energy of activation of the diffusion is 15,000

219T6

cal/mol. Admixt of O_2 and water vapor to the H_2 lowers the rate of reaction between calcium and hydrogen.

219T6

SHUSHUNOV, V. A.

"Equipment for Determining Vapor Elasticity of Liquids", Uch. Zap. Gor'kovsk Univ, No 24, 1953, pp 211-212.

The apparatus consists of a glass vessel connected to a pipe, which serves as mercury manometer. The tested liquid is poured into the vessel, sealed, and put into a thermostat. The vapor elasticity is measured from the level differences of Hg in the manometer and the vessel. (RZhFiz, No 1, 1955) SO: Sum. No. 443, 5 Apr. 55

V. A. SHUSHUNOV

USSR.

Self-regulating thermostat for elevated temperatures.
V. A. Shushunov. *Uchenye Zapiski Gor'kov. Univ.* 1953,
No. 24, 213-14; *Referat. Zhur., Khim.* 1954, No. 84000.—
The construction utilizes the const.-boiling temp. of liquids.
For the range 150-218° is used 1,2,3-trichlorobenzene, for
220-300° 1-naphthylamine, for 260-350° Hg, and for 300-
445° S. The device is filled with N or A. M. Hosch

RDW

SHUSHUNOV, V. A.

"Determining the Dissociation Pressure of Chemical Compounds in the Solid State," Uch. Zap. Gor'kovsk. Un-ta, No 24, pp 215-216, 1953

Describes a simple apparatus for determining the dissociation pressure of chemical compounds in the solid state using a static method. (RZhKhim, No 20, 1954)

SO: Sum, No 606, 5 Aug 55

SHUSHUNOV, V. A.

Chemical Abstracts
Vol. 48 No. 5
Mar. 10, 1954
General and Physical Chemistry

Kinetics of the reaction of [redacted] with nitrogen. V. A. Shushunov and Yu. N. B[redacted] (Sci. Research Inst. Chem., Gorki). *Zhur. Fiz. Khim.* 27, 703-12(1953); cf. *C.A.* 45, 8331*h*.—This reaction is autocatalytic at temps. below 430, but not above. The induction period t is equal to $1/(Ap)$, where A is a function of temp. and p is the initial pressure of N. When the area of the Ca-Ca_3N_2 interface is const., the reaction is of the 1st order. The induction period t_i falls rapidly from 180 to 3 or 4 sec. as the temp. rises from 330 to 480°. The rate of reaction r is max. at 500°. The activation energy E calcd. from the equation $t_i = Ce^{E/RT}$, where C is a const., is 31.5 kcal./mole, and the value of E calcd. from r is 23.0 kcal./mole. The difference is attributed to the energy of formation of the nascent phase. The reaction has 2 crit. temps. as a result of the formation of intermediate compds. Exptl. data are presented graphically. J. W. Loweberg, Jr.

MF 7-27-54

SHUSHUNOV, V. A.

Kinetics of reaction of Na + Pb and K + Na + Pb fusions with ethyl chloride vapor. V. A. Shushunov and Yu. N. Baryshnikov (State Univ., Go[illegible]im. 27, 830-9(1953); cf. *C.A.* 44, 2833*d*.—The rate of reaction of EtCl (I) vapor with liquid Na-Pb (II) and K-Na-Pb mixts. was detd. by measurement of the fall of vapor pressure (*p*) at several temps. between 5 and 50° as a function of time in a described and illustrated closed vessel. Exptl. data are shown graphically. When *p* was 200 mm., the temp. of the max. initial reaction rate of I and II was 28°. The self-accelerating character of the reaction becomes less pronounced as the temp. rises, and the kinetic curves cease to be sigmoid. These effects are due to the difference between the temp. coeff. of the topochem. reaction at the clean initial surface and that of the reaction at the interface between the initial liquid phase and the solid phase formed during the reaction. The activation energy of the latter process in the reaction of I and II is 12.5 kcal./mole.

J. W. Loweberg, Jr.

SHUSHUNOV, V. A.

V. A. SHUSHUNOV and A. M. PAVLOV

"Thermal Decomposition of Potassium and Sodium," Doklady Akad Nauk USSR 89: 1033-6, No. 6, 1953.

This paper rates low in originality since extensive prior studies have been made in this special field. The authors may be unaware of this work or have chosen to make no reference to it. The paper rates average in ingenuity, thoroughness and reliability. The senior author is experienced in this field of kinetics of solid-gas systems. We can find only one previous publication by the junior author, which is in the field of organic synthesis.

IX

SHUSHUNOV, V.A.

The retarding influences of light on the velocity of topochemical reactions. V. A. Shushunov and Yu. N. Baryshnikov. *Doklady Akad*[redacted] 91, 331-4(1953).—The expts. consisted of observation of rate of fall of pressure of C_6H_5Cl vapor reacting with alloys of Na plus Pb, and K plus Na plus Pb, whose surface was thoroughly cleaned of oxide films. The retarding influence was not affected by addn. of O to the vapor phase, but it was markedly increased by addn. of H_2O to the vapor phase. The reaction was conducted under quartz Hg-vapor tube. The effect is ascribed to reaction of water with alloys to form K_2O, Na_2O, KCl, NaCl, and metallic Pb, which strongly impedes penetration of light to the reacting surface of the alloy.

V. N. Bednarski

SHUSHUNOV, V.A.; SERDYUK, N.K.

Kinetics of thermal decomposition of potassium cyanate. Dokl.AN SSSR 93 no.3:507-510 N '53. (MLRA 6:11)

1. Gor'kovskiy gosudarstvennyy universitet. Predstavleno akademikom A.A. Balandinym. (Potassium cyanate)

Shishakov, N.A. --"New Type of Topochemical Reactions." Dr Chem Sci, Inst of Physical Chemistry, 21 Jan 54. (VECHERNYAYA MOSKVA, 14 Jan 54)

Source: SUM 168, 22 July 1954

SHUSHUNOV, V. A.

USSR/Chemistry - Physical chemistry

Card 1/1 : Pub. 147 - 15/21

Authors : Shushunov, V. A.; Sadovnikova, G. I.; and Andreev, B. Ya.

Title : Kinetics of barium sulfate reduction

Periodical : Zhur. fiz. khim. 8, 1472-1478, Aug 1954

Abstract : The kinetics of $BaSO_4$ reduction with C, H and CO, was investigated. It was found that the reduction of $BaSO_4$ with C in the absence of gases depends to a large extent upon the composition of the basic mixture. The reduction process becomes highly accelerated by the presence of CO or CO_2. It was established that the thermal decomposition of $BaSO_3$ into $BaSO_4$ and BaS is not the phase which determined the rate of formation of BaS. Five references: 4-USSR and 1-USA (1930-1949). Graphs; drawing.

Institution : State University, Scientific Research Institute of Chemistry, Gorkiy

Submitted : December 15, 1953

AID P - 1584

Subject : USSR/Chemistry

Card 1/1 Pub. 152 - 14/21

Author : Shushunov, V. A. and Pavlov, A. M.

Title : Synthesis of cyanamides of potassium, sodium, and calcium

Periodical : Zhur. prikl. khim., 28, no.1, 98-100, 1955

Abstract : Methods for the preparation of potassium cyanamide (95%) sodium cyanamide (98%), and calcium cyanamide (98%)are described. Eight references (2 Russian: 1934-35)

Institution: None

Submitted : Mr 11, 1953

Shushunov, V.A.

6

✓Effect of sodium chloride on the rate of decomposition of alkali-alkaline earth cyanamides. V. A. Shushunov and A. M. Pavlov (Chem. Sci. Research Inst., Gorki). *Zhur. Priklad. Khim.* 28, 1161–4(1955); cf. *C.A.* 50, 6247*h*.—The effect of NaCl on the decompn. rates of $BaCN_2$ and $CaCN_2$ was detd. The percentages of cyanamide N, k'', and cyanide N, k', formed are reciprocal functions of time. The decrease of k'' and the increase of k' in $BaCN_2$ + 2NaCl at 800° are greater than at 940° without NaCl. Heating $CaCN_2$ for 4 hrs. at 1100° in an atm. of N does not change the compn. With 2NaCl at 1120° the reaction is complete ($k'' = 0$ and $k' = 14\%$) in 5 min.; at 940 and 1030° the reaction is complete (with higher values of k'' and lower values of k') within 8–10 min. The rate of decompn. increases with the proportion of NaCl so that with 16 mol. NaCl it is complete at 940° after 5 min. (k'' and k' about 2 and 16%, resp.).

I. Bencowitz

CH

(1)

PM

Shushunov V. A.

5

USSR.

Synthesis of potassium, sodium, and calcium cyanamides. V. A. Shushunov and A. M. Pavlov. ~~*Zhur. Priklad. Khim.* 28, 99–100(1955);~~ *J. Appl. Chem.* (U.S.S.R.) 28, 87–9 (1955)(Engl. translation).--Dicyanodiamide and Na_2O or K_2O were ground separately in an atm. free of CO_2 and H_2O, mixed in stoichiometric proportions, and heated in a long-neck flask under a few mm. Hg; the H_2O produced by the reaction was continuously evacuated and condensed in liquid-air traps. The temp. of the Na prepn. was raised to 360° (1 hr.) and maintained for 2 hrs. at 360–370°; yield 98%. The temp. of the K prepn. was raised to 190° (1 hr.) and maintained at 185–195° 2 hrs.; yield 95%. $CaCN_2$ was prepd. by passing HCN gas through a column of $CaCO_3$ in a vertical quartz tube at 840–900° for 3–3.5 hrs.; yield 98%, slightly gray; on heating at 1000–1100° for 15–30 min. it became white with a loss of 1–2% N.

I. Bencowitz

AID P - 3741

Subject : USSR/Chemistry

Card 1/1 Pub. 152 - 5/22

Authors : Shushunov, V. A. and A. M. Pavlov

Title : Kinetics of thermal decomposition of cyanamides of alkali metals and alkaline-earth metals

Periodical : Zhur. prikl. khim., 28, 9, 934-938, 1955

Abstract : The decomposition of cyanamides is greatly accelerated in the presence of iron . Decomposition of liquid cyanamides of potassium, sodium, and barium on heating takes place with formation of cyanides.

Institution : Gor'kiy Scientific Research Institute of Chemistry

Submitted : D 15, 1953

SHUSHUNOV, V.A.

USSR/Organic Chemistry. Theoretical and General Questions of Organic Chemistry. E-1

Abs Jour : Ref Zhur - Khimiya, No. 8, 1957, 26660.

Author : Kolpovskaya, G.A.; Moryganov, B.N.; Razuvayev, G.A.; Shushunov, V.A.

Inst :

Title : Chain Reaction of Carbon Tetrachloride with Isopropyl Alcohol Initiated by Acetylized and Benzoylated 1-Oxychclohexanone Hydroperoxides.

Orig Pub : Zh. obshch. khimii, 1956, 26, No. 7, 1981 - 1986.

Abstract : Acetylized (I) and benzoylated 1-oxycyclohexane hydroperoxide (II) starts a reaction between CCl_4 and isopropanol at 40 to 50°. The basic resulting products are HCl, $CHCl_3$ and acetone (III). The influence of the concentration of I and II on the initiation

Card 1/2

SHUSHUNOV, V.A.

Chem

2

8205 .

ISOTOPIC EXCHANGE OF CARBON BETWEEN THE SOLID CARBONATES OF LITHIUM, SODIUM, POTASSIUM, AND BARIUM, AND GASEOUS CARBON DIOXIDES. V. A. Shushunov and B. G. Zateev (Gor'kii State Univ.). Zhur. Fiz. Khim. 30, 321-8(1956) Feb. (In Russian)

Investigations were made of carbon isotope exchange between solid carbonates of Li, Na, K, and Ba and gaseous CO_2 under flow conditions. It was established that the rate of reaction depends on the method of preparing the solid carbonates but does not depend on the air and water vapor impurities in the gas. The reaction is of zero order in respect to carbon dioxide. The reaction proceeds at a noticeable rate at 300° and becomes rapid at 350 to 400°. (tr-auth)

SHUSHUNOV, V.A.

3 4
0

7

Chem

Conversion of cyanides of some metals to their cyanamides. V. A. Shushunov, A. M. Pavlov, and K. G. Fedyakova (Chem.-Sci. Research Inst., Gorkii). Zhur. Priklad. Khim. 29, 1037-44(1956); cf. C.A. 49, 12788g.—The rate of thermal decompn. of Na(K)CN in the temp. range of 600-800° is affected by neither temp. nor NaCl. It is appreciably accelerated by SiO_2, Al_2O_3, and Fe_2O_3. However, in none of these expts. was cyanamide formed. On the other hand, in the presence of MCl_2 (M = Ba, Sr, Ca) MCN_2 is formed. The effect on the rate of MCN_2 formation increased in the order of Ba < Sr < Ca. The effect of Ba is slight so that at 600-700° only a trace of $BaCN_2$ was present. On the basis of these results the processes which occur in a high-temp. cyaniding bath are explained. I. Bencowitz

PM MTT

SHUSHUNOV, V.A.

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

Abst Journal: Referat Zhur - Khimiya, No 19, 1956, 61086

Author: [illegible]unov, V. A., Zateyev, B. G.

Institution: None

Title: Isotope Exchange of Carbon Between Solid Carbonates of Lithium, Sodium, Potassium and Barium and Gaseous Carbon Dioxide

Original Periodical: Zh. fiz. khimii, 1956, 30, No 2, 32[illegible]-328

Abstract: Investigation of isotope exchange of carbon between gaseous CO_2 and solid carbonates of Li, Na, K and Ba tagged with C^{14} at temperatures of 40°-425° and CO_2 pressures of 100-300 mm hg. At low temperatures (40°-160°) the exchange ceases rapidly. At high temperatures the exchange proceeds to a considerable extent of conversion and its velocity is proportional to the amount of the salt used and does not depend on pressure of CO_2 and admixtures of H_2O vapor and air. With a concentration of H_2O vapor close

Card 1/2

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

Abst Journal: Referat Zhur - Khimiya, No 19, 1956, 61086

Abstract: to saturation the exchange is accelerated. Velocity of exchange between CO_2 and the investigated salts is maximum for $BaCO_3$, minimum for Li_2CO_3 and greatly depends upon the method of preparation of the salt. In the opinion of the authors at low temperatures in the exchange take part only several surface layers of crystal lattice while at high temperatures deeper layers of the carbonate. The reactions investigated proceed in accordance with the zero order as concerns CO_2.

Card 2/2

SHUSHUNOV, V.A.; PAVLOVA, L.Z.

Decomposition of nitrogen trichloride in a carbon tetrachloride solution. Zhur.neorg.khim. 2 no.9:2272-2274 S '57. (MIRA 10:12)
(Nitrogen chloride) (Carbon tetrachloride)

Shushunov, V. A.

Reaction kinetics of isopropyl alcohol with carbon tetrachloride initiated with benzoyl peroxide. V. A. Shushunov, G. A. Razuvaev, B. N. Moryganov, and M. K. Salnikova (Inst. Chem., State Univ., Gorki). *Zhur. Fiz. Khim.* 31, 1203-9(1957).—The kinetic laws of Bz_2O_2 decompn. in a mixt. of iso-PrOH and CCl_4, and the reaction between iso-PrOH and CCl_4 initiated by Bz_2O_2 were studied by sealing 15 ml. of the mixts. of the reacting liquids in 20-ml. ampuls. After a predetd. time the mixt. was placed into a separatory funnel contg. H_2O, and the HCl in the water layer, and Bz_2O_2 in the upper layer, which consisted of a mixt. of org. substances, were detd. The reaction rate between iso-PrOH *and CCl_4 was about 20 times as fast in the presence of 2.33 × 10^{-4} to 7 × 10^{-4} mol. Bz_2O_2/l. as in its absence, and the* reaction rate of Bz_2O_2 decompn. was of the 1st order within these concn. limits. Bz_2O_2 in low concns. played no significant *role in the reaction between the alc. and CCl_4.* Me_2O, HCl, BzOH, CO_2, C_2Cl_6, and very small amts. of iso-PrOBz and trichlorotoluic acid were found in the reaction products. The av. chain length of the products formed (φ) was related to the initial Bz_2O_2 concn. (C_0) by the expression $\varphi\sqrt{C_0}$ = const. The initial Bz_2O_2 decompn., when present in a low concn. in the iso-PrOH-CCl_4 mixt., played no significant role in the formation of HCl. W. M. Sternberg

7

2

1/1

Distr: 4E4j/4E3d

80613

SOV/81-59-5-15247

5.3200

Translation from: Referativnyy zhurnal, Khimiya, 1959, Nr 5, p 167 (USSR)

AUTHORS: Shushunov, V.A., Shlyapnikov, Yu.A.

TITLE: The Catalytic Decomposition of Organic Peroxide Compounds. I. The Kinetics of Acidic-Catalytic Decomposition of Cumene α-Hydroperoxide in Glacial Acetic Acid

PERIODICAL: Tr. po khimii i khim. tekhnol., 1958, Nr 1, pp 50 - 54

ABSTRACT: A study is made on the kinetics of cumene α-hydroperoxide (I) decomposition in a 99%-solution of CH_3COOH in the presence of H_2SO_4. The decomposition of I, under these conditions, takes place with the formation of 80 - 90% acetone (II) and 96 - 100% phenol. The reaction rate is proportional to the H_2SO_4 concentration in the first degree and in concentrations of I less than 0.02 M, it obeys an equation of the first order relative to the I concentration. In higher concentrations of I, it is noted that the self-acceleration of the reaction is the greater, the higher the concentration of I, which is explained by the effect of the formed II, the impurities of which speed up the reaction.

4

Card 1/2

80613

SOV/81-59-5-15247

The Catalytic Decomposition of Organic Peroxide Compounds. I. The Kinetics of Acidic-Catalytic Decomposition of Cumene -Hydroperoxide in Glacial Acetic Acid

Acetophenone is a weaker catalyst, benzophenone and phenol do not affect the reaction rate. The reaction rate increases considerably when $(CH_3CO)_2O$ is added to the solution. The initial reaction rate decreases when the water concentration increases to 5 mol.%, and changes little with a further increase in the water concentration. It is assumed that the additions introduced change the conditions of solvation of the molecules and ions, which take part in the reaction. The activation energy at a concentration of I of $7.2 \cdot 10^{-3}$ M in glacial CH_3COOH is 20.0 kcal/mol, in the presence of 0.1 M II is 16.1 kcal/mol.

4

I. Moiseyev

Card 2/2

8C6 14
SOV/81-59-5-15248

5.3200

Translation from: Referativnyy zhurnal, Khimiya, 1959, Nr 5, p 167 (USSR)

AUTHORS: Shushunov, V.A., Shchennikova, M.K., Volkov, I.V.

TITLE: The Catalytic Decomposition of Organic Peroxide Compounds. II. The Kinetics of the Decomposition of Cumene α-Hydroperoxide, Catalyzed by Stearates of Certain Metals

PERIODICAL: Tr. po khimii i khim. tekhnol., 1958, Nr 1, pp 55 - 59

ABSTRACT: The decomposition of cumene α-hydroperoxide (I), in the presence of Co^{2+}, Mn^{2+}, Cu^{2+}, Fe^{2+}, Ni^{2+} and Na^{2+} stearates, in a solution of chlorobenzene, takes place with the formation of acetophenone and dimethylphenylcarbinol, as the main products of the reaction. The reaction rate is proportional to the I concentration and concentration of the catalyst in the first degree. The initial I concentration does not affect the catalytic rate constant which points to the absence of an induced decomposition of I. The catalytic activity decreases in the following series: $Co^{2+} > Mn^{2+} > Cu^{2+} > Fe^{2+} > Ni^{2+} > Na^{2+}$. Zink stearate has no catalytic activity in relation to this reaction.

Card 1/2

SHUSHUNOV, V.A.

Mechanisms of chemical processes conducted in cyaniding baths.
Zhur. prikl. khim. 31 no.91371-1376 S '58. (MIRA 11:10)

1.Gor'kovskiy nauchno-issledovatel'skiy institut.
(Cementation (Metallurgy))

SOV/137-59-5-9620

Translation from: Referativnyy zhurnal, Metallurgiya, 1959, Nr 5, p 20 (USSR)

AUTHORS: Shushunov, V.A., Blagina, M.M.

TITLE: Kinetics of the Reactions of Iron Metal With Its Oxides

PERIODICAL: Uch. zap. Gor'kovsk.un-ta, 1958, Nr 32, pp 9 - 12

ABSTRACT: The author investigated kinetics of the following reactions: $Fe_3O_4 + Fe \rightarrow 4FeO$ (I) and $Fe_2O_3 + Fe \rightarrow 3FeO$ (II), in a mixture of high-dispersed powders of Fe oxides and Fe metal. Batches (2 - 3 g) were placed in a test tube and subjected to vacuum treatment down to 10^{-4} mm Hg with continuous evacuation during the experiments. Temperature changed from 500° to 900°C. After the experiment the mixture was hardened by immersing the tube into cold water. At 900°C (in the case of reaction I) Fe^{2+} concentration reached 95% within 15 minutes; and within 60 minutes in the case of reaction II, it attained 83%. Fe-metal remained in the final product. To ensure full conversion of Fe_2O_3 and FeO a four-fold surplus of Fe is indispensable. In

Card 1/2

SOV/76-32-7-11/45

AUTHORS: Shushunov, V. A., Zateyev, B. G.

TITLE: The Kinetic Method of Physicochemical Analysis (Kineticheskiy metod fiziko-khimicheskogo analiza).VII.Isotopic Carbon Exchange Between Gaseous Carbon Dioxide and Sodium Carbonate With Potassium Carbonate or Sodium Sulfate Melts(VII. Izotopnyy obmen ugleroda mezhdu gazoobraznoy dvuokis'yu ugleroda i splavami karbonata natriya s karbonatom kaliya ili sul'fatom natriya)

PERIODICAL: Zhurnal fizicheskoy khimii, 1958, Vol 32, Nr 7, pp 1517 - 1520 (USSR)

ABSTRACT: Continuing a previous paper the authors investigated two binary systems: K_2CO_3 - Na_2CO_3 and Na_2CO_3 - Na_2SO_4, as both of them form a continuous series of solid solutions and the former forms the chemical compound $K_2CO_3 . Na_2CO_3$ in solid solution. The authors used a powder of the melt of a certain fineness which was thermally after-treated, with the radioactive isotope C^{14} having been used. This isotope from the melt converted to the gaseous phase and the concentration of which in the gaseous phase served as determination value of the isotopic exchange

Card 1/4

The Kinetic Method of Physicochemical Analysis. VII. SOV/76-32-7-11/45
Isotopic Carbon Exchange Between Gaseous Carbon Dioxide and Sodium Carbonate
With Potassium Carbonate or Sodium Sulfate Melts

intensity. The system K_2CO_3 - Na_2CO_3 was very closely investigated by S.Z.Makarov and M.P.Shul'gina (Ref 2), and these scientists also found the mentioned chemical compound. As it was to be expected that the occurrence of the chemical compound will also show in the isotopic exchange a number of experiments was carried out and it was found that the isotopic carbon exchange takes place most easily in salt melts of equimolecular composition. A singular point can be observed in the diagrams mentioned, the occurrence of which is explained by the formation of the chemical compound $K_2CO_3.Na_2CO_3$, which, however, is only stable below 500°C, and in the present case was only metastable. As was already found the velocity of the diffusion processes plays a decisive role in these experiments, hence a promotion of the diffusion by the type of crystal structure must be present in the chemical compound mentioned. The second system Na_2CO_3 - Na_2SO_4 was closely investigated by S.Z.Makarov and S.N.Krasnikov (Ref 4). In this system no singular point was

Card 2/4

The Kinetic Method of Physicochemical Analysis. VII. SOV/76-32-7-11/45
Isotopic Carbon Exchange Between Gaseous Carbon Dioxide and Sodium Carbonate
With Potassium Carbonate or Sodium Sulfate Melts

found in correspondence with the conditions prevailing. It was found that the velocity of the isotopic exchange of the pure Na_2CO_3 amounts to about the threefold of that of the salt mixture; a change of the content of Na_2SO_4 from 20 to 80 molar% in the latter shows almost no change of the reaction velocity displayed. There are 3 figures, 1 table, and 4 references, 3 of which are Soviet.

ASSOCIATION: Gor'kovskiy nauchno-issledovatel'skiy institut khimii
(Gor'kiy Scientific Research Institute of Chemistry)

SUBMITTED: February 27, 1957

Card 3/4

The Kinetic Method of Physicochemical Analysis. VII. SOV/76-32-7-11/45
Isotopic Carbon Exchange Between Gaseous Carbon Dioxide and Sodium Carbonate With Potassium Carbonate or Sodium Sulfate Melts

1. Potassium carbonate-sodium carbonate systems--Chemical analysis
2. Sodium carbonate-sodium sulfate systems--Chemical analysis 3. Exchange reactions 4. Carbon isotopes (Radioactive)--Applications

Card 4/4

AUTHORS: Shushunov, V. A., Sokolov, N. A. SOV/76-32-8-11/37

TITLE: The Kinetics of Benzoyl Peroxide Decomposition in Alcohol-Benzene Solutions (Kinetika razlozheniya perekisi benzoila v spirto-benzol'nykh rastvorakh)

PERIODICAL: Zhurnal fizicheskoy khimii, 1958, Vol. 32, Nr 8, pp. 1796-1803 (USSR)

ABSTRACT: There exist quite a number of publications on the investigation of the above mentioned decomposition, among them are some giving contradicting results. Little attention has been paid to experiments in alcohol solution, however, the publications by G.A. Razuvayev and V.N. Latyayeva (Ref 14) and Kharasch, Rowe and Urry (Karash, Rou, Yuri)(Ref 15) must be mentioned. A.I. Popova took part in the present experiments. The experimental technique is described. In the experiments mostly an equimolecular mixture of alcohol-benzene was used as it was found that at a content of more than 90 molar % of alcohol no satisfactory reproducibility could be reached. It was found that the reaction is of first order and that the rate of decomposition considerably increases with a change from methanol to ethanol, or from butanol to isopropyl- or

The Kinetics of Benzoyl Peroxide Decomposition in Alcohol-Benzene Solutions SOV/76-32-3-11/37

sec-butyl alcohol. This rate, besides being dependent upon the temperature and the nature of the alcohol also depends on its concentration in the solution. The free radicals formed in the decomposition of acyl peroxides mainly enter reaction with alcohol and not with benzene, as could be found. The experiments showed that in the decomposition of one mole of benzoyl peroxide 1,5 moles of benzoic acid and 0,9 moles of acetone are formed. A scheme of the course of the gross-process is given. Contrary to S.R. Rafikov and V.S. Kudinova (Ref 2) the authors found that the molecular transformation of the peroxide takes place at a very low rate, which can not be measured, as compared to that of the chain decomposition. The results show that the constant of the reaction velocity of $(C_6H_5COO)_2 \longrightarrow 2\ C_6H_5COO^{\cdot}$ depends only little on the nature of the solvent.

There are 8 figures, 2 tables, and 19 references, 7 of which are Soviet.

Card 2/3

The Kinetics of Benzoyl Peroxide Decomposition in Alcohol-Benzene Solutions SOV/76-32-8-11/37

ASSOCIATION: Gor'kovskiy nauchno-issledovatel'skiy institut khimii (Gor'kiy Scientific Research Institute of Chemistry)

SUBMITTED: February 27, 1957

Card 3/3

SOV/20-121-4-32/54

5(4)

AUTHORS: Shushunov, V. A., Andreyev, B. Ya.

TITLE: The Kinetic Isotope Effect in the Reaction of Hydrogen and Tritium With the Oxides of Some Metals (Kineticheskiy izotopnyy effekt v reaktsii vodoroda i tritiya s okislami nekotorykh metallov)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 121, Nr 4, pp 689-692 (USSR)

ABSTRACT: This paper reports on the investigation of the influence of the presence of various isotopes on the velocity of the reduction of the oxides of some metals by hydrogen and tritium. The experiments were carried out under dynamic conditions by means of an apparatus described in a previous paper. The carrying out of the experiments is discussed in a few lines. The mixture of hydrogen and tritium was produced by the chemical decomposition of water. The metal oxides were prepared according to several methods, after which they were fractionated by screening. Assuming that the oxides are reduced according to the first order with respect to H_2 and also with respect to HT, and on the basis of some other plausible assumptions,

Card 1/4

SOV/20-121-4-32/54

The Kinetic Isotope Effect in the Reaction of Hydrogen and Tritium With the Oxides of Some Metals

the authors found $\lg A = ((1/\alpha) - 1)\lg p + B$. This equation describes the dependence of the specific activity A of the gas on its pressure p. It is valid if the temperature and the volume of the system are constant. The kinetic isotope effect α is equal to the ratio of the velocity constant k_1 of the reaction of H_2 to the velocity constant k_2 of the reaction of HT with the metal oxides; the constant B characterizes the initial state of the gas. In all the investigated reactions lg A was an exact linear function of lg p and this confirms the correctness of the above-mentioned assumptions. The character of this function does not depend on the initial pressure of the gas, on the batch (naveska) of the oxide (which is to be reduced), and on the temperature. The authors plotted the values of lg A against those of lg p, and from the inclinations of the corresponding straight lines they calculated the values α of the kinetic isotope effect for the various experiments. The results of these calculations are given by a table. α does not depend on the initial pressure of the gas, on the batch of the oxides, and on their degree of dispersion. However, this effect

Card 2/4

The Kinetic Isotope Effect in the Reaction of Hydrogen and Tritium With the Oxides of Some Metals

depends very much on the temperature and on the nature of the oxides which are to be reduced. All the oxides investigated in this paper may be subdivided into 2 groups: The first (second) group consists of those oxides which react faster (more slowly) with hydrogen than with tritium. Ag_2O, Cu_2O, CuO, HgO, PbO_2, MnO_2, and Fe_2O_3 at high temperatures belong to the first group, but Mn_3O_4, Mn_2O_3, NiO, CoO, Fe_3O_4 belong to the second group. Also the possible existence of the reaction $HT + H_2O \rightleftarrows HTO + H_2$ has to be taken into account. This reaction may be catalyzed by the oxides and by the metals produced by their reduction. The oxides of the first group very slightly catalyze the above mentioned reaction. However, the catalysis by this reaction is very characteristic of the second group of oxides. The influence of this reaction on the experiments discussed in this paper can, however, be disregarded. The dependence of α on the temperature satisfies the Arrhenius (Arrenius) law. Finally,

SOV/20-121-4-32/54

The Kinetic Isotope Effect in the Reaction of Hydrogen and Tritium With the Oxides of Some Metals

some anomalies are mentioned. There are 4 figures, 2 tables and 9 references, 3 of which are Soviet.

ASSOCIATION:	Nauchno-issledovatel'skiy institut khimii pri Gor'kovskom gosudarstvennom universitete im. N. I. Lobachevskogo (Scientific Research Institute of Chemistry of the Gor'kiy State University imeni N. I. Lobachevskiy)
PRESENTED:	April 2, 1958, by V. N. Kondrat'yev, Academician
SUBMITTED:	March 27, 1958

Card 4/4

5 (4)

SOV/20-128-2-33/59

AUTHORS: Shushunov, V. A., Shlyapnikov, Yu. A.

TITLE: The Kinetics of the Acid Decomposition of Aralkyl Hydrogen Peroxides

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 128, Nr 2, pp 341-344 (USSR)

ABSTRACT: In the beginning the respective literature is briefly referred to (Refs 1-8). Statements testify that the hydrogen peroxides of cumene, diphenyl methane and tetralin as well as of other aralkyl hydrogen peroxide dissociate when heated with strong acids, forming the adequate phenols, ketons and aldehydes. The present paper investigates the reaction of the hydrogen peroxides of cumene, p-tert.-butyl cumene, 1,1-diphenyl ethane, cyclohexyl benzene, p-diisopropyl benzene, p-oxycumene, sec.butyl benzene and diphenyl methane with sulphuric acid. The reaction is of first order for the hydrogen peroxide as well as for the acid. The initial concentration of the hydrogen peroxide has no effect on the reaction constant. The decomposition products as well as the kind of solvent effect in different ways the reaction rate. The reaction is especially retarded by water addition (Table 1) and is greatly accelerated by addition of acetic anhydride (Fig 1). The accelerating effect

Card 1/2

of acetic anhydride is due to the fact that water resulting from the decomposition process is absorbed by acetic anhydride thus eliminating the retarding effect of the water. An ionic chain reaction in eight stages is constituted for the decomposition of cumene hydrogen peroxide. Table 2 shows the calculated reaction constants and the apparent activation energies of the investigated hydrogen peroxides. There are 1 figure, 2 tables, and 13 references, 2 of which are Soviet.

ASSOCIATION: Nauchno-issledovatel'skiy institut khimii pri Gor'kovskom gosudarstvennom universitete im. N. I. Lobachevskogo (Scientific Research Institute of Chemistry at the Gor'kiy State University imeni N. I. Lobachevskiy)

PRESENTED: May 14, 1959, by V. N. Kondrat'yev, Academician

SUBMITTED: May 12, 1959

24818
S/081/61/000/011/010/040
B105/B203

5.3400

AUTHORS: Redoshkin, B. A., Shushunov, V. A., Kurochkin, N. I.

TITLE: Oxidation kinetics of cyclohexyl benzene by oxygen

PERIODICAL: Referativnyy zhurnal, Khimiya, no. 11, 1961, 62-63, abstract 11B451.(Tr. po khimii i khim. tekhnolog. (Gor'kiy), 1960, vyp. 1, 3-8)

TEXT: The rate of oxidation of cyclohexyl benzene (I) does not depend on the pressure p of O_2 at $p > 200$ mm Hg and on the initial amount of (I); with temperature increasing from 115 to 140°C, it grows rapidly. The apparent activation energy of the gross process is equal to 24 kcal/mole. The yield in hydrogen peroxide of (I) drops during the reaction which, in the authors' opinion, indicates the presence of induced decomposition of the hydrogen peroxide of (I), as well as an acceleration of its thermal decomposition under the action of the decomposition products. [Abstracter's note: Complete translation.]

X

Card 1/1

S/081/61/000/020/016/089
B101/B147

AUTHORS: Shchennikova, M. K., Shushunov, V. A., Milovanov, A. I.

TITLE: Catalytic decomposition of organic peroxide compounds. 9. Influence of the length of the hydrocarbon chain of some salts of fatty acids on their catalytic activity during decomposition of cumene hydroperoxide

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 20, 1961, 58 - 59, abstract 20B442 (Tr. po khimii i khim. tekhnol. (Gor'kiy), no. 2, 1960, 165 - 170)

TEXT: A study has been made of the decomposition of cumene hydroperoxide (I), catalyzed with cobalt salts of fatty acids in an equimolecular mixture of chlorobenzene and acetic acid. In particular, the effect of catalyst, temperature, and concentration of I on the reaction rate was investigated. The increase in reaction rate and the decrease in activation energy with increasing length of the carbon chains of cobalt-salt anions of monobasic fatty acids were found to follow certain rules. No such rule could be established for the cobalt salts of dibasic fatty acids. For Report VIII,

Card 1/2

S/081/61/000/020/016/089
B101/B147

Catalytic decomposition of organic...

see RZhKhim, 1961, abstract 14Zh131. [Abstracter's note: Complete translation.]

✓

Card 2/2

30206

S/081/61/000/019/032/085
B110/B138

53700

AUTHORS: Aleksandrov, Yu. A., Briikina, T. G., Shushunov, V. A.

TITLE: Oxidation of organometallic compounds. 3. Synthesis and some properties of triethyl lead oxide

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 19, 1961, 145, abstract 19Zh44 (Tr. po khimii i khim. tekhnol. (Gor'kiy), no. 3, 1960, 381-387)

TEXT: The oxide of triethyl lead (I) was obtained by reaction of disperse metallic Na with triethyl lead monohydroxide (II) in benzene. I decomposes at ~ 20°C, reacts vigorously with acetone and acetaldehyde, and reacts instantaneously with water to form II quantitatively. When reacting with methyl, ethyl, benzyl, and α,α-dimethyl-benzyl alcohols, as well as with hydroperoxides of tert-butyl and α-cumyl, I gives the corresponding oxy and peroxy derivatives of triethyl lead, which are unstable at ~20°C. The rate of thermal decomposition of I at 70-90°C without solvent was studied. The products obtained consist of an equimolar mixture of C_2H_6 and C_2H_4 (with an impurity of 1-1.5 % of butane), 0.97 mole of

Card 1/2

30206
S/081/61/000/019/032/085
B110/B138

Oxidation of organometallic...

triethyl lead per mole of used I, and a solid substance containing 87.1 % of Pb, which is insoluble in organic solvents. The authors assume that the accelerating effect of I on the oxidation of hexaethyl dilead by O_2 in n-nonane solution is caused by the ability of I to decompose with the formation of ethyl radicals, whereby a degenerate chain reaction is effected. For Report 2 see RZC, 1961, 8Zh231. [Abstracter's note: Complete translation.]

X

Card 2/2

30207

S/081/61/000/019/033/085
B110/B138

5.3700

AUTHORS: Aleksandrov, Yu. A., Radbil', B. A., Shushunov, V. A.

TITLE: Oxidation of organometallic compounds. 4. Oxidation of hexaethyl ditin with oxygen

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 19, 1961, 145, abstract 19Zh45 (Tr. po khimii i khim. tekhnol. (Gor'kiy), no. 3, 1960, 388-393)

X

TEXT: The oxidation of hexaethyl ditin (I) with oxygen (II) in n-nonane solution at concentrations of I ranging from 10 to 100 mole% has been studied. The oxidation rate of I is described by a first-order equation according to the concentration of I, and is independent of the pressure of II within the range of 300-500 mm Hg. In the temperature range of 60-90°C, E(act.) is 19.5 kcal/mole. 0.55 mole of diethyl stannic oxide, 0.62 mole of triethyl stannic oxide, and 0.12 mole of acetaldehyde are formed per mole of oxidized I. Water was found qualitatively. The oxidation of I is not catalyzed by addition of 13.2 mole% of triethyl lead oxide. Addition of 2,6-di-tert-butyl-4-methyl phenol lowers the

Card 1/2

5.3400

77907
SOV/79-30-2-58/78

AUTHORS: Shushunov, V. A., Aleksandrov, Yu. A.

TITLE: Concerning the Decomposition of the Benzoyloxy Radicals in Solutions

PERIODICAL: Zhurnal obshchey khimii, 1960, Vol 30, Nr 2, pp 632-634 (USSR)

ABSTRACT: Benzoyl peroxide on heating dissociates into benzoyloxy radicals which, in turn, decompose into phenyl radicals and CO_2.

$$(C_6H_5COO)_2 \rightleftarrows 2C_6H_5COO\cdot \quad (1)$$

$$C_6H_5COO\cdot \rightleftarrows C_6H_5\cdot + CO_2 \quad (2)$$

If the above reactions are reversible then, in the presence of tagged CO_2, the tracer atoms should pass into the nondecomposed benzoyl peroxide and also into the benzoic acid formed in reaction of the benzoyloxy radicals with the solvent.

Card 1/2

Concerning the Decomposition of the
Benzoyloxy Radicals in Solutions

77907
SOV/79-30-2-58/78

$$C_6H_5COO\cdot + HR \longrightarrow C_6H_5COOH + R\cdot \tag{3}$$

In the present study, benzoyl peroxide was decomposed by heating to 70-80° C in the presence of $C^{14}O_2$ in various solvents (carbon tetrachloride, benzene, mixtures of various alcohols with benzene, etc.). It was established that reaction (2) was irreversible and that, under the conditions of the experiment, there was no exchange of C atoms between CO_2 and the benzoyloxy radicals. There are 2 tables; and 5 references, 3 U.S., 2 Soviet. The 3 U.S. references are: L. Jaffe, E. Prosen, M. Szwarc, J. Chem. Phys., 27, 416 (1957); N. Zwiebel, J. Turkevich, W. Miller, J. Am. Chem. Soc., 71, 376 (1949); A. Seidell, Solubilities of Inorganic and Metallorganic Compounds, Vol 1, N.Y. (1953).

ASSOCIATION: Gor'kiy Scientific Research Institute of Chemistry (Gor'kovskiy nauchno-issledovatel'skiy institut khimii)

SUBMITTED: February 12, 1959

Card 2/2

S/081/61/000/024/011/086
B138/B102

5 3700

AUTHORS: Aleksandrov, Yu. A., Brilkina, T. G., Shushunov, V. A.

TITLE: Oxygen oxidation of distannic ethide, diplumbic ethide and tetraethyl lead

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 24, 1961, 75, abstract 24B541 (Tr. po khimii i khim. tekhnol., [Gor'kiy], no. 1, 1961, 3 - 11)

TEXT: The oxidation of distannic ethide (I), diplumbic ethide (II) and tetraethyl lead (III) by oxygen was studied in solutions of n-C_9H_{20} and $C_6H_3Cl_3$ at 50 - 90°C. Additions of triethyl-tin peroxide cause considerable acceleration of oxidation of I, although the initial increase is not sustained, the reaction rate returning to normal in the course of time. The products of oxidation of I are tin diethyl oxide, tin triethyl oxide, CH_3CHO and H_2O. Activation energy of the process is 19.5 kcal/mol. In oxidation of II lead oxide, III, C_2H_5OH, CH_3CHO, and H_2O are formed.

Card 1/2

42947

S/081/62/000/022/026/088
B144/B101

11.2140

AUTHORS: Aleksandrov, Yu. A., Shushunov, V. A.

TITLE: Organometallic peroxide compounds. 2. Synthesis and some properties of triethyl tin peroxide

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 22, 1962, 227, abstract 22Zh240 (Tr. po khimii i khim. tekhnol. [Gor'kiy], no. 3, 1961, 644-651)

TEXT: $(C_2H_5)_3SnOOSn(C_2H_5)_3$ (II) was synthesized by reacting $(C_2H_5)_3SnOSn(C_2H_5)_3$ (I) with anhydrous H_2O_2. A solution of 2-3 g I and 1 equ. H_2O_2 in 15 ml ether was agitated for 10-15 min (20°C) with 1-1.5 g anhydrous Na_2SO_4 (III); the solvent was evaporated and 10-15 ml of hexane were added in the presence of 1-1.5 g III. Within 5-8 min (of agitation) II was separated after the solvent had been evaporated from the filtrate. In the synthesis a contact between reaction mixture and air moisture was avoided. II hydrolizes readily to give $(C_2H_5)_3SnOH$ and H_2O_2

Card 1/2

88569

S/020/61/136/001/017/037
B016/B055

5 3100

AUTHORS: Aleksandrov, Yu. A., Brilkina, T. G., and Shushunov, V. A.

TITLE: Bistriethyl-lead Oxide

PERIODICAL: Doklady Akademii nauk SSSR, 1961, Vol. 136, No. 1, pp. 89-92

TEXT: Bistriethyl-lead oxide, $((C_2H_5)_3Pb)_2O$, was synthesized with a view to establishing its properties and studying it in detail. In an earlier work the authors had found that bistriethyl-lead oxide has a marked accelerating effect on the oxidation of hexaethyl dilead by oxygen. They assume this effect to be due to free radicals formed by decomposition of bistriethyl-lead oxide. Basing on their own results, they state that this compound has never actually been obtained by other researchers (Refs. 2-4), since bistriethyl-lead oxide hydrolizes in alcoholic and aqueous solutions. The authors therefore applied a different method: They dispersed metallic sodium in n-nonane, removing the n-nonane thereafter by decanting and distilling off, and then poured on dry benzene. To this mixture they added a triethyl lead monohydroxide portion so calculated that sodium was well

Card 1/3

88569

Bistriethyl-lead Oxide

S/020/61/136/001/017/037
B016/B055

in excess. In the course of 2-3 h triethyl lead monohydroxide was transformed into bistriethyl-lead oxide which is readily soluble in benzene. After filtering off the solid residue, and distilling off the benzene, bistriethyl-lead oxide was obtained as mobile, faintly yellowish-green liquid with a sharp specific smell. At room temperature, bistriethyl-lead oxide hydrolizes to triethyl lead monohydroxide (to an extent of 98-99%). Alcohols and tertiary alkyl- and aryl hydroperoxides act similarly to water, transforming the bistriethyl-lead oxide to oxy- or peroxy compounds of triethyl lead, besides triethyl lead monohydroxide. At temperatures of only -10°C, several of these reactions occur at an appreciable rate. The authors studied the effect of methyl-, ethyl- and benzyl alcohol, dimethylphenyl carbinol, tert-butyl- and α-isopropyl phenyl hydroperoxide on bistriethyl-lead oxide. The following compounds were obtained: ethoxy triethyl lead, terto-butoxy triethyl lead, α-isopropyl-phenyl peroxy triethyl lead, methoxy triethyl lead and α-isopropyl-phenoxy triethyl lead. The organic oxy- and peroxy compounds of lead are unstable and decompose gradually at room temperature in sealed ampoules, accompanied by a color-change to redbrown. Bistriethyl-lead oxide reacts vigorously with acetone at room temperature, under formation of triethyl lead monohydroxide. In

Card 2/3

88569

Bistriethyl-lead Oxide

S/020/61/136/001/017/037
B016/B055

the presence of a great excess of acetone, mesityl oxide and a resin which was not further investigated were formed. On heating, bistriethyl-lead oxide decomposes comparatively rapidly with liberation of an equimolecular mixture of ethane and ethylene, and 1% butane. The residue is tetraethyl lead (Ref. 7). There are 2 figures, 1 table, and 7 references: 2 Soviet, 2 German, 2 US, and 1 British.

ASSOCIATION: Nauchno-issledovatel'skiy institut khimii pri Gor'kovskom gosudarstvennom universitete im. N. I. Lobachevskogo (Scientific Research Institute of Chemistry of the Gor'kiy State University imeni N. I. Lobachevskiy)

PRESENTED: July 4, 1960, by M. I. Kabachnik, Academician

SUBMITTED: July 4, 1960

Card 3/3

RAZUVAYEV, G.A.; SHUSHUNOV, V.A.; YABLOKOV, V.A.

Decomposition of cumene hydroperoxide catalyzed by cation exchange resin KU-2. Dokl. AN SSSR 139 no.5:1128-1131 Ag '61.
(MIRA 14:8)

1. Nauchno-issledovatel'skiy institut khimii pri Gor'kovskom gosudarstvennom universitete im. N.I. Lobachevskogo. 2. Chlen-korrespondent AN SSSR (for Razuvayev).
(Cumene peroxide) (Ion exchange resins)

28732
S/020/61/140/003/013/020
B103/B101

5 3700

AUTHORS: Aleksandrov, Yu. A., and Shushunov, V. A.

TITLE: Triethyl tin peroxide

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 140, no. 3, 1961, 595-597

TEXT: Since peroxides of the type R_nMOOMR_n (R = hydrocarbon radical, M = metal) are only known for Cd, Si, and Ge, the authors investigated the triethyl tin peroxide (TETP) synthesized by them, $(C_2H_5)_3SnOOSn(C_2H_5)_3$. The synthesis was carried out by mixing equimolar amounts of triethyl tin oxide and anhydrous H_2O_2, dissolved in absolute ethyl ether, in the presence of anhydrous sodium sulfate. After 10 - 15 min vigorous shaking, the mixture was filtered, and a new portion of sodium sulfate was added to the filtrate. After distilling off the ether at reduced pressure and room temperature, a small amount of hexane was added, and shaken for another 2 - 3 minutes. After filtering off the sodium sulfate, hexane was distilled off. The residue was a viscous, golden-yellow liquid, pure TETP (100-101 % active oxygen). Its synthesis was achieved according to the reaction:

Card 1/4

28732
S/020/61/140/003/013/020
B103/B101

Triethyl tin peroxide

$$(C_2H_5)_3SnOSn(C_2H_5)_3 + H_2O_2 \rightleftarrows (C_2H_5)_3SnOOSn(C_2H_5)_3 + H_2O \quad (1).$$

The resulting water was bound by sodium sulfate. The tin content was 53.6 %, the molecular weight 443.4. TETP is very easily hydrolyzed by water without heating: $(C_2H_5)_3SnOOSn(C_2H_5)_3 + 2H_2O \rightarrow 2(C_2H_5)_3SnOH + H_2O_2$ (2)

This reaction was used to determine the active oxygen by means of permanganatometric titration. TETP is very unstable and decomposes completely within 24 hr at approximately 0°C. At 60°C, decomposition proceeds most vigorously in a sealed glass phial; an explosion occurs after 2-3min. In n-nonane solution, this reaction is much slower. It can be described by a kinetic reaction equation of first order. During the reaction, a white deposit is precipitated from the solution. It is unsoluble in ordinary organic solvents and was identified as diethyl tin oxide. A second product of thermal decomposition, ethoxy triethyl tin (boiling point 190-195°C), remained in the solution. It can be hydrolyzed with water, thus forming triethyl tin monohydroxide. From 1 mole of TETP, 0.93 moles of diethyl tin oxide, and 0.98 moles of ethoxy triethyl tin are formed. The apparent activation energy of TETP decomposition in n-nonane is 14 kcal. Polymerization of methyl methacrylate and acrylonitrile is

Card 2/4

28732
S/020/61/140/003/013/020
B103/B101

Triethyl tin peroxide

initiated by additions of TETP. At room temperature, TETP reacts very fast with hexaethyldi-tin, giving triethyl tin oxide as a result of the reactions:

$$(C_2H_5)_3Sn\dot{O} + (C_2H_5)_3SnSn(C_2H_5)_3 \rightarrow (C_2H_5)_3SnOSn(C_2H_5)_3 + (C_2H_5)_3\dot{Sn} \quad (7)$$

$$(C_2H_5)_3\dot{Sn} + (C_2H_5)_3SnOOSn(C_2H_5)_3 \rightarrow (C_2H_5)_3SnOSn(C_2H_5)_3 + (C_2H_5)_3Sn\dot{O} \quad (8)$$

$$(C_2H_5)_3Sn\dot{O} + (C_2H_5)_3\dot{Sn} \rightarrow (C_2H_5)_3SnOSn(C_2H_5)_3 \quad (9)$$

$$2(C_2H_5)_3\dot{Sn} \rightarrow (C_2H_5)_3SnSn(C_2H_5)_3 \quad (10)$$

During the reaction of hexaethyl di-tin with oxygen, TETP may be formed as an intermediate which, could not be proved because of the high reaction rate. However, oxidation is accelerated by additions of TETP. The methods of these experiments were described before (V. A. Shushunov et al., Tr. po khim. i. khim. tekhnol., Gor'kiy, 1959, p. 329; Yu. A. Aleksandrov et al., ibid., 1960, p. 381). The oxidation of hexaethyl di-tin is accelerated either by TETP, or by the radicals formed during its transformation, but not by diethyl- and triethyl tin oxides which are formed during this process. The reaction of TETP with hexaethyl di-tin is accompanied by a formation of radicals which initiate oxidation of hexaethyl di-tin by oxygen. There are 3 figures and 3 Soviet references.

Card 3/4

28732
S/020/61/140/003/013/020
B103/B101

Triethyl tin peroxide

ASSOCIATION: Gor'kovskiy gosudarstvennyy universitet im. N. I. Lobachevskogo (Gor'kiy State University imeni N. I. Lobachevskiy)

PRESENTED: February 25, 1961, by B. A. Arbuzov, Academician

SUBMITTED: February 22, 1961

Card 4/4

32431

S/020/61/141/006/017/021
B103/B147

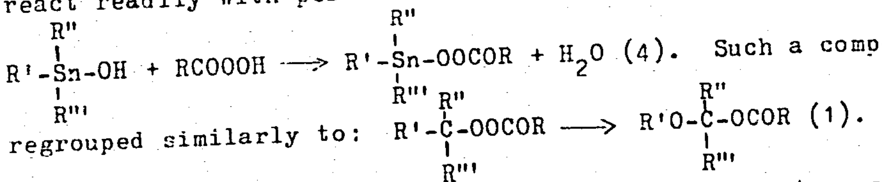
5.3700

AUTHORS: Shushunov, V. A., and Brilkina, T. G.

TITLE: Regrouping of some organotin and organolead peroxide compounds

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 141, no. 6, 1961, 1391-1394

TEXT: The regrouping of Sn and Pb peroxide compounds was studied. Since the monohydroxides of trialkyl and triaryl tin are strong bases, they react readily with peracids to form the relevant organometallic compounds:



$$R'\text{-}\overset{R''}{\underset{R'''}{Sn}}\text{-}OH + RCOOOH \longrightarrow R'\text{-}\overset{R''}{\underset{R'''}{Sn}}\text{-}OOCOR + H_2O \quad (4).$$

Such a compound can be regrouped similarly to:

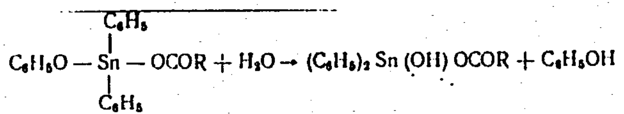
$$R'\text{-}\overset{R''}{\underset{R'''}{C}}\text{-}OOCOR \longrightarrow R'O\text{-}\overset{R''}{\underset{R'''}{C}}\text{-}OCOR \quad (1).$$

The product formed is hydrolyzed with separation of the relevant organometallic oxide and other oxygen-containing compounds. A homogeneous reaction mixture of equimolar quantities of triphenyltin monohydroxide with a) peracetic,

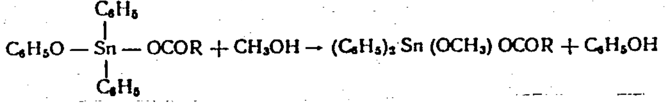
Card 1/5

or b) perpropionic acids at 0°C was kept in the dark at room temperature. Within 40 - 50 hr, the peroxide compounds in the solutions were completely consumed and gradually well-defined needle crystals were precipitated without gas liberation. In cases a) and b) they were insoluble in cold and poorly soluble in hot benzene. In case a) it was a non-meltable product up to 230°C, in case b) the product could be softened at 170°C and formed a non-melting compound on further heating. Acid hydrolysis resulted in the formation of free acetic and propionic acids, respectively. On the basis of their quantities and the amount of $(C_6H_5)_2Sn(OH)Cl$ (melting point 185°C) formed on heating of the precipitations with HCl, the formation of $(C_6H_5)_2Sn(OH)OCOCH_3$ or $(C_6H_5)_2SnO\cdot(C_6H_5)_2Sn(OCOCH_3)_2$ is assumed in the regrouping. The yield was 72% in case a) and 45% in case b). A considerable quantity of finely crystalline substance, insoluble in water but soluble in methanol, (melting point 128 - 130°C) was obtained by alkaline hydrolysis of the alcohol-dissolved compound; under the effect of HCl, this substance is converted to $(C_5H_6)_2Sn(OH)Cl$. In both cases, 90% of phenol (related to the hydroxide) was isolated after separation of the solid products and the unreacted initial hydroxide.

This is explained by



$$C_6H_5O-\underset{C_6H_5}{\overset{C_6H_5}{\underset{|}{\overset{|}{Sn}}}}-OCOR + H_2O \rightarrow (C_6H_5)_2Sn(OH)OCOR + C_6H_5OH \qquad (5)$$



$$C_6H_5O-\underset{C_6H_5}{\overset{C_6H_5}{\underset{|}{\overset{|}{Sn}}}}-OCOR + CH_3OH \rightarrow (C_6H_5)_2Sn(OCH_3)OCOR + C_6H_5OH \qquad (6)$$

The same reaction was performed with (A) triphenyl lead monohydroxide and a) in c) methanol, d) dioxan, and e) sulfuric ether; furthermore with (B) triethyl lead monohydroxide with a) and b). In c) the filtrate resulting from precipitation and filtering of the scanty diphenyl lead oxide precipitate was treated with aqueous alkali. A white precipitate formed from which phenol was isolated (yield 38%, here and later related to initial A or B). By boiling methanol, the water-insoluble precipitate was separated into A and diphenyl lead oxide (C). Total yield in C from the reaction mixture: 35% of the theoretical value. A reacted slowly with a) in d) owing to its poor solubility. Nevertheless, 40% of phenol

32432

S/020/61/141/006/017/021
B103/B147

Regrouping of some organotin and...

was isolated after long standing in the dark at room temperature and subsequent heating for 3 hr at 50°C or for 1 hr at 70°C. A was not completely consumed. The reaction of a) in e) was impeded by the poor solubility. Also in this case, a compound was dissolved after 2 hr of shaking, which yielded phenol (3%) after hydrolysis. A slight quantity of gas escaped in the initial stage of the reactions in d) and e). The results were less clear in case B with a) and with perbenzoic acid. On standing for 36 hr, at - 10°C the peroxide compound was slowly regrouped. Snow white large crystals of triethyl lead acetate were precipitated (melting point 158°C, yield 75%). B reacted with a) in aqueous solution rather rapidly at room temperature with slight gas liberation. After 24 hr standing in the dark, no peroxide oxygen was found, but acetaldehyde (owing to oxidation of ethanol) as well as tetraethyl lead (owing to disproportionation of triethyl lead acetate or diethyl lead diacetate). The reaction of B with perbenzoic acid in e) was similar to that with a). After standing for 1 hr at -20 to -10°C and subsequently for 12 hr at room temperature, no peroxide oxygen was found. Triethyl lead benzoate (melting point 125 - 127°C, yield 35%) was isolated from the solution. Moreover, a readily water-soluble organolead compound formed which was

Card 4/5

BRILKINA, T.G.; SAFONOVA, M.K.; SHUSHUNOV, V.A.

Triphenyl lead oxide. Zhur.ob.khim. 32 no.8:2684-2686 Ag '62. (MIRA 15:9)

(Lead compounds)

YABLOKOV, V.A.; SHUSHUNOV, V.A.; KOLYASKINA, L.V.

Cumyl peracetate. Zhur.ob.khim. 32 no.8:2714-2716 Ag '62.
(MIRA 15:9)

1. Gor'kovskiy gosudarstvennyy universitet.
(Peroxyacetic acid)

LEONOV, M. R.; REDOSHKIN, B. A.; SHUSHUNOV, V. A.

Radiochemical investigation of the reaction of cumene hydroperoxide with cumene. Zhur. ob. khim. 32 no.12:3959-3962 D '62. (MIRA 16:1)

(Cumene) (Hydroperoxide) (Radiochemistry)

SHUSHUNOV, V.A.; REDOSHKIN, B.A.; GOLUBEV, Yu.D.

Effect of certain factors on the rate of oxidation of cumene by oxygen and on its hydroperoxide yield. Zhur.prikl.khim. 35 no.4:832-838 Ap '62. (MIRA 15:3)
(Cumene) (Oxidation)

ACCESSION NR: AT4028346 S/0000/63/000/000/0291/0297

AUTHOR: Aleksandrov, Yu. A.; Brilkina, T. G.; Shushunov, V. A.

TITLE: Some tin and lead organic peroxide compounds

SOURCE: Soveshchaniye po khimii perekisny*kh soyedineniy. Second, Moscow, 1961. Khimiya perekisny*kh soyedineniy (chemistry of peroxide compounds); Doklady* soveshchaniy. Moscow, Izd-vo AN SSSR, 1963, 291-297

TOPIC TAGS: tin, lead, peroxide, tin organic compound, lead organic compound, peroxide compound, metal-organic compound, metal-organic peroxide

ABSTRACT: Results of the investigation of some properties and reactions of triethyl tin peroxide, tert-butal triethyl lead peroxide, α-cumyl triethyl lead peroxide, di-tri-ethyl lead-n-di-isopropobenzene diperoxide, as well as triphenyl-tin-peracetate and triphenyl-tin-perpropenate, triphenyl-lead-peracetate, triethyl-lead peracetate and triethyl-lead perbenzoite are related in this article. The peroxide compounds were easily hydrolyzed by water with the formation of triethyl-tin monohydroxide (or triethyl lead monohydroxide) and hydrogen peroxide (or the corresponding hydroperoxide) at room temperature. The results of the analysis are presented in a table. The above mentioned compounds were produced, precipitated, and characterized for the

Card 1/2

ACCESSION NR: AT4028346

first time. The thermal decay of triethyl tin peroxide and its reaction with hexaethyldi-tin in a n-ionane solution was investigated. Definite results were obtained which indicate the decay of triphenyl tin peracetate and triphenyl tin perproponate, as well as triphenyl lead peracetate by means of regrouping. Orig. art. has: 3 formulas, 6 figures and 1 table.

ASSOCIATION: Gor'kovskiy gosudarstvenny*y universitet im. N.I. Lobachevskogo (Gorky State University)

SUBMITTED: 13Dec63 DATE ACQ: 06Apr64 ENCL: 00

SUB CODE: CH NO REF SOV: 011 OTHER: 011

Card 2/2

GERASIMOV, Yakov Ivanovich, prof.; DREVING, Vladimir Petrovich; YEREMIN, Yevgeniy Nikolayevich; KISELEV, Andrey Vladimirovich; LEBEDEV, Vladimir Petrovich; PANCHENKOV, Georgiy Mitrofanovich; SHLYGIN, Aleksandr Ivanovich; NIKOL'SKIY, B.P., prof., retsenzent; SHUSHUNOV, V.A., prof., retsenzent; LUR'YE, G.Ye., red.; SHPAK, Ye.G., tekhn. red.

[Course in physical chemistry] Kurs fizicheskoi khimii. [By] IA.I.Gerasimov i dr. Moskva, Goskhimizdat, 1963. Vol.1. 624 p. (MIRA 17:1)

1. Chlen-korrespondent AN SSSR (for Gerasimov, Nikol'skiy).
2. Kafedra phizicheskoy khimii Leningradskogo gosudarstvennogo universiteta (for Nikol'skiy, Shushunov).

ALEKSANDROV, Yu.A.; SHUSHUNOV, V.A.

Metallo-organic peroxide compounds. Part 5: Triethyltin hydroperoxide peroxyhydrate. Zhur. ob. khim. 35 no.1:115-117 Ja '65. (MIRA 18:2)

[illegible]

[illegible]. On the preparation of pure calcium cyanamide. Zhur. prikl. khim. 37 no.10:2140-2145 O '64.

(MIRA 17:11)

L 21796-66 EWT(m)/EWP(j)/T WW/JW/WE/RM

ACC NR: AP6012646 SOURCE CODE: UR/0079/65/035/001/0115/0117

43

AUTHOR: Aleksandrov, Yu. A.; Shushunov, V. A.

ORG: none

TITLE: Organometallic peroxide compounds. V. Perhydrate of triethyltin hydroperoxide

SOURCE: Zhurnal obshchey khimii, v. 35, no. 1, 1965, 115-117

TOPIC TAGS: organometallic compound, peroxide, organic synthetic process, chemical decomposition

ABSTRACT: Triethyltin hydroperoxide, one of the least investigated organometallic peroxides, has been synthesized. Triethyltin oxide was reacted with hydrogen peroxide to obtain this compound. It can be assumed that in the synthesis of triethyltin peroxide the hydroxide and hydroperoxide of triethyltin are formed as intermediate products.

$$(C_2H_5)_3SnOSn(C_2H_5)_3 + H_2O_2 \rightarrow (E_2A_5)_3SnOH + (C_2H_5)_3SnOOH$$

$$(C_2H_5)_3SnOH + (C_2H_5)_3SnOOH \rightarrow (C_2H_5)_3SnOOSn(C_2H_5)_3 + H_2O$$

Triethyltin hydroxide must also react with hydrogen peroxide,

UDC: 547.258.11+541.459

Card 1/2

which has acidic properties.

$$(C_2H_5)_3SnOH + H_2O_2 \rightarrow (C_2H_5)_3SnOOH + H_2O$$

The perhydrate of triethyltin hydroperoxide slowly decomposes even at room temperatures. Decomposition of small amounts of this compound occurs at room temperature gradually and is accompanied by the formation of solid, liquid, and gaseous products. Only one of the thermal decomposition products has been investigated -- the oxyhydroperoxide of diethyltin $(C_2H_5)_2Sn(OH)OOH$. This product is a fine-crystalline compound, insoluble in organic solvents and exploding when heated to 150-180°. Orig. art. has: 5 formulas. [JPRS]

SUB CODE: 07 / SUBM DATE: 12Nov63 / ORIG REF: 004 / OTH REF: 001

[illegible]

Catalyt[illegible] [illegible] of alkyl hydroperox[illegible] studied by means of electron paramagnetic resonance [illegible] AN SSSR [illegible] no.4:862-
[illegible] (MIRA 18:10)

1. [illegible] B.[illegible]chadashvili.
[illegible]

L 05318-67 EWP(j)/EWT(m)/EWP(t)/ETI IJP(c) RM/WW/JD

ACC NR: AM6021382 Monograph 38 UR/

Brilkina, Tamara Grigor'yevna; Shushunov, Vasiliy Alekseyevich B+1

Reactions of organometallic compounds with hydrogen and peroxides (Reaktsii metallo-ogranicheskikh soyedineniy s kislorodom i perekisyami) Moscow, Izd-vo "Nauka," 1966. 265 p. biblio. (At head of title: Akademiya nauk SSSR. Otdeleniye obshchey i tekhnicheskoy khimii) Errata slip inserted. 3300 copies printed./

TOPIC TAGS: organometallic compound, group I metal, group II metal, group III metal, group IV metal, organoboron compound, organosilicon compound, reaction with oxygen, reaction with peroxide

PURPOSE AND COVERAGE: This book is a review of studies on the reactions of oxygen and peroxides with organometallic compounds containing metals of groups I, II, III and IV. Reactions of organoboron and organosilicon compounds are included. Chapter 5 reviews the reactions of oxygen and peroxides with organometallic compounds containing different metals Me'-Me" and Me'-C-Me" bonds, designated as compounds of class 1 and class 2, respectively. Chapter 6 reviews the reaction mechanism of oxygen and peroxides with various organometallic compounds. There are 210 Soviet and 609 Western references. The references are given at the end of each chapter.

TABLE OF CONTENTS [abridged]:

Card 1/2 UDC: 547.1'3

L 05318-67

ACC NR: AM6021382

0

SUB CODE: 07/ SUBM DATE: 15Jan66/ ORIG REF: 219/ OTH REF: 600

kh

Card 2/2

L 10803-67 EWT(m)/EWP(j) RM/WW

ACC NR: AP7003493 SOURCE CODE: UR/0074/66/035/008/ 1430/1447

27

AUTHOR: Brilkina, T. G.; Shushnov, V. A.

ORG: State University, Gor'kiy (Gosudarstvennyy universitet)

TITLE: New developments in research on the oxidation of organometallic compounds

SOURCE: Uspekhi khimii, v. 35, no. 8, 1966, 1430-1447

TOPIC TAGS: organometallic compound, peroxide

ABSTRACT: The synthesis, properties, and reactions of organometallic compounds are currently subjects of intense interest, in view of their great theoretical and practical importance. Much of this interest has been centered upon the reaction of such compounds with oxygen, and since it has been demonstrated that such a reaction is accompanied by the formation of organometallic peroxides, attention has also been centered upon the reactions of various peroxides with organometallic compounds. The authors survey the general principles and mechanisms and specific examples of the oxidation of organometallic compounds by oxygen, as well as the reactions of organometallic compounds with organic and inorganic peroxides. [JPRS: 38,970] Orig. art. has: 39 formulas.

SUB CODE: 07 / SUBM DATE: none / ORIG REF: 076 / OTH REF: 092

UDC: 547.24:547.438

Card 1/1

0926 0019

SHUSHUNOVA, A. F.

"The Effect of Heavy Metal Salts on the Adsorption of Certain Primary Alcohols of the Fatty Series." Cand Chem Sci, Gor'kiy State U, Gor'kiy, 1955. (KL, No 10, Mar 55)

So: Sum. No 670, 29 Sept 55 - Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (15)

DEVYATYKH, Grigoriy Grigor'yevich, doktor khim. nauk, prof.;
PAVLOV, Aleksey Mironovich; ODNOSEVTSEV, Aleksandr
Ivanovich; MIRONOV, Nikolay Nikolayevich;
SHUSHUNOVA, Ada Fedorovna; ALAVERDOV, Ya.G., red.

[Manual of laboratory work in inorganic chemistry] Rukovodstvo k prakticheskim zaniatiiam po neorganicheskoi khimii. Izd.2., ispr. i dop. Moskva, Vysshaia shkola, 1964. 282 p. (MIRA 17:6)

31

66824
SOV/155-58-5-32/37

~~24(5)~~ 24.4500

AUTHOR: Shushurin, S.F.

TITLE: On the Existence of Particle-Similar Solutions of the Non-Linear Relativistic Equation of the Scalar Field

PERIODICAL: Nauchnyye doklady vysshey shkoly. Fiziko-matematicheskiye nauki, 1958, Nr 5, pp 192-196 (USSR)

ABSTRACT: The solutions are denoted as similar to particles, if the field function is essentially different from zero only in a small range. Let $m_o = \hbar = c = 1$. The Lagrange function

$$\psi^* = -\frac{1}{2}\left\{\frac{\partial \psi^*}{\partial x_\mu}\cdot\frac{\partial \psi}{\partial x_\mu} + \psi^*\psi + F(\psi^*\psi)\right\}$$

is considered, where for the non-linear function F the simplest form $F'(u^2) = -a^2\vartheta(u-u_o)$ is assumed; $\vartheta(u-u_o) = 0$ for $u < u_o$ and $= 1$ for $u \geqslant u_o$. In the stationary spherically symmetric case the field equation has the form $\nabla^2 u - (1-\varepsilon)^2 u = 0$ for $u < u_o$ and $\nabla^2 u - (1-\varepsilon^2 - a^2)u = 0$ for $u \geqslant u_o$. The solutions are :

Card 1/3

66824

On the Existence of Particle-Similar Solutions of the Non-Linear Relativistic Equation of the Scalar Field SOV/155-58-5-32/37

$$u_1 = A\,\frac{\sin\sqrt{\varepsilon^2 - 1 + a^2}\,r}{r} \text{ for } u < u_0 \text{ and } u_2 = B\,\frac{e^{-\sqrt{1-\varepsilon^2}\,r}}{r}$$

for $u \geqslant u_0$. A particle-similar solution exists, if u_1 and u_2 can be divided up at one point so that the two u-values and the two corresponding u'-values are equal there. Under the assumption that $a^2 \gg 1$ the author investigates by direct calculation the possibilities of such a decomposition and shows 1.) the existence of a mass spectrum depending on a and u_0, as well as the existence of a finite particle radius r_0 2.) the boundedness of the possible number of masses 3.) that the field mass is greater than the mass in the linear equation.
The author thanks Professor Ya.P. Terletskiy for the guidance.

Card 2/3

24 (5)

AUTHORS: Glasko, V. B., Leryust, F., Terletskiy, Ya. P., Shushurin, S. F.

SOV/56-35-2 20/60

TITLE: Investigation of Particle-Like Solutions of a Nonlinear Scalar Field Equation (Issledovaniye chastitsepodobnykh resheniy nelineynogo uravneniya skalyarnogo polya)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol 35, Nr 2, pp 452-457 (USSR)

ABSTRACT:

For the investigation of possibilities offered by the nonlinear field theory of elementary particles (Refs 1 - 9) an investigation of the particle-like solution (Ref 1) of the simplest nonlinear equation of the scalar complex field is of especial importance. Thus it is e. g. possible to find a qualitative solution of the problem of the existence and character of the mass spectrum. The authors proceed from the Lagrangian for a complex scalar field

$$\alpha = - \nabla\Psi^{*}\nabla\Psi + \frac{\partial\Psi^{*}}{\partial x_{o}}\frac{\partial\Psi}{\partial x_{o}} - m^{2}\left[\Psi^{*}\Psi + F(\Psi^{*}\Psi)\right]$$

Card 1/3

(x_0 = ct, F (v) - a determined nonlinear function, m - a parameter with the dimension of a reciprocal length) with the field equations

$$\nabla^2\Psi - \partial^2\Psi/\partial x_0^2 - m^2\left[1 + F'(\Psi^*\Psi)\right]\Psi = 0;$$

$$\nabla^2\Psi^* - \partial\Psi^*/\partial x_0^2 - m^2\left[1 + F'(\Psi^*\Psi)\right]\Psi^* = 0$$

where $F'(v) = dF(v)/dv$
E and Q are then written down as functions of Ψ, Ψ^* and introduced:

$$\Psi = u(r)e^{-i\varepsilon x_0} \qquad \Psi^* = u(r)e^{i\varepsilon x_0}$$

(ε = parameter, proportional to a frequency), and E and Q are given as functions of u and r. With $F(v) = -\lambda v^2/2$, $\eta = \sqrt{\lambda}mru$ and $\rho = r\sqrt{m^2 - \varepsilon^2}$ η and ρ are introduced and with their aid the first three particle-like solutions are derived. (See also figures 1 to 3) The relevant mass spectrum is obtained by numerical integration for the simplest cubic term. Under favorable physical conditions a finite spectrum

Investigation of Particle-Like Solutions of a Nonlinear Scalar Field Equation SOV/56-35-2-20/60

is obtained. There are 3 figures and 10 references, 2 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)

SUBMITTED: March 22, 1958

Card 3/3

SHUSHURIN, S. F. Cand Phys-Math Sci -- "Study of ~~[illegible]~~ particle-like solutions of nonlinear equations of the field." Mos, 1960 (Min of Education RSFSR. Moskovskaya Oblast Ped Inst im N. K. Krupskaya) (KL, 1-61, 181)

41554
S/188/62/000/005/002/008
B102/B108

AUTHOR: Shushurin, S. F.

TITLE: Study of the existence of particle-like solutions to a quasilinear equation of a scalar field

PERIODICAL: Moscow. Universitet. Vestnik. Seriya III. Fizika, astronomiya, no. 5, 1962, 10 - 15

TEXT: The proof that particle-like solutions exist to a quasilinear equation for a complex scalar field with a cubic nonlinearity has been given in a previous paper (Ref. 1. ZhETF, 35, no. 2(8), 452 - 457, 1958). Here those studies are generalized for arbitrary exponential nonlinearities. For this purpose the author considers a differential equation of the type $\hat{L}_r y + \hat{L}_\theta y + f(y) = 0$ having a solution of the form $y = \sum_{k=m}^{\infty} R_k(r) P_k^{(m)}(\cos\theta)$, where $\hat{L}_r$ and $\hat{L}_\theta$ are radial and azimuthal parts of the Laplacian $P_k^{(m)}(\cos\theta)$ are generalized Legendre polynomials. Summation of the polynomials of equal order in these equations leads to the following expression:

S/188/62/000/005/002/008
B102/B108

Study of the existence of...

$\phi(y) = \sum_{k=m}^{\infty} F_k(r) P_k^{(m)}(\cos\theta)$. Since, however, $\hat{L}_\theta P_k^{(m)} = m P_k^{(m)}$, the radial part is subject to $\hat{L}_r R_k + m R_k + F_k = 0$ (4). If the nonlinear term of the Lagrangian for the complex scalar field is chosen to be $F(v) = -\lambda v^{n/2+1}(n/2+1)$ then (4) can be written as $\frac{1}{v}\frac{d^2}{dr^2}(R_k r) + (\varepsilon^2 - m_o^2)R_k + m_o^2 F_k = 0$. If the nonlinearity is assumed cubic ($n = 1$), then this equation reduces to that obtained in Ref. 1. At arbitrary n, after substitution of the variables, $y'' = (1 + y^n/x^n)y$ (7). Existence and type of the solutions of (7) are to be investigated. The problem of the existence of particle-like solutions can be reduced to the problem of the existence of solutions which are near zero if the values of the independent variable are sufficiently high. Such solutions exist for the nonlinear equation if they exist for the linearized, $y'' = (1 - 1/x^n)y$, which is proved. The author confines himself to proving the particle-like solutions of the Cauchy problem for the linearized equation by studying the behavior of the solutions to the steady-state scalar field equation $\nabla^2 u + [\varepsilon^2 - m_o^2\{1 + (u^* u)^n\}]u = 0$. The results obtained analytically are verified by studying the phase trajectories of the equation $y'' = (1-1/x^2)y$ with an MH-7 (MN-7) electric simulator. There are 4 figures.

ASSOCIATION: Kafedra statisticheskoy fiziki i mekhaniki (Department of Statistical Physics and Mechanics)

SUBMITTED: November 22, 1961 (initially),
May 18, 1962 (after revision)

S/055/62/000/006/001/006
D251/D308

AUTHOR: Shushurin, S.F.

TITLE: Approximate solution of ordinary differential equations by linearization

PERIODICAL: Moscow. Universitet. Vestnik. Seriya I, Matematika, mekhanika, no. 6, 1962, 3-8

TEXT: Chaplygin's method has the disadvantage of possessing no rule for finding the zero approximation. The author proposes a method which permits qualitative analysis of the solutions (singular points, behavior at infinity etc). If the right-hand side of

$$y^{(p)} = F(x,y,y',y'',\dots,y^{(p-1)}, \qquad (1)$$

(where F is non-linear, continuous and bounded in finite intervals) contains any linear terms, these should be placed on the left-hand side. F is plotted in a (p + 1)-dimensional space with x as a parameter. The region of approximation M is chosen between (p + 1)-dim-

Card 1/2

SHUSHUYEVA, M.G.

Nature of the humus of principal soils in the taiga subzone and the subzone of southern taiga of the West Siberian Plain. Trudy Biol. inst. Sib. otd. AN SSSR no.12;81-92 '64. (MIRA 18;7)

SHUSSER, I.A., inzh.

Planning the second track under complex topographical conditions.
Transp.stroi. 11 no.4:32-33 Ap '61. (MIRA 14:5)
(Ural Mountains—Railroads—Construction)

SHUST, A.

Toward new boundaries in competition. Avt.transp. 40 no.2:11 F '62. (MIRA 15:2)

(Simferopol--Highway transport workers)

SHUST, I.P., ekskavatorshchik

Two annual norms have been fulfilled. Transp. stroi. 15 no.9:34 S '65. (MIRA 18:11)

1. Baza mekhanizatsii tresta Murmanskmorstroy.

Country : USSR Q-2
Category : Farm Animals.
Cattle.
Abs. Jour : Ref Zhur-Biol., No 16, 1958, 74003

Author : Shust, I. V.
Institut. : Lvov Zooveterinary Institute.
Title : The Arteries of the Dorsal Short Muscles of the Occiput in Cattle.

Orig Pub. : Sb. nauchn. tr. L'vovsk. zoovet. in-t, 1956, 8, 187-193

Abstract : The dorsal short occipital muscles are supplied with blood directly by the vertebral artery and partly also by the occipital artery (A). In the region of the occiput A branch along segments which correspond to intervertebral openings through which they exit. Between A there exist large anastomoses: one of them is situated intervertebrally between the vertebral and condylar A and a number of them are situated extravertebrally between the 1st segment branch of

Card: 1/3

[illegible], A.N., SHUST, I.V.

Function of the adrenal cortex in albino rats in protracted hyperthyroidization. Probl. endok. i gorm. 11 no.4:95-98 Jl-Ag '65. (MIRA 18:11)

1. Ternopol'skiy meditsinskiy institut.