ZIL'BERMAN, V. M.

USSR/Electricity
Heating, Electric
Electrical Equipment

Apr 1948

"Unification of High-Frequency Installations," D. B. Mondrus, S. M. Margolin, V. M. Zil'berman, Engineers, 'ElektroPech'Trust, Ministry of Electrical Industries, USSR, 8 pp

"Elektrichest" No 4

Soviet industry is sorely in need of invention of a series of apparatus for use in high-frequency heating technology. Mentions work done by SevZapPromElektro-Pech in this field of research and successes achieved. Some machines and equipment have already been placed in various industries and authors ask that workers operating equipment send in testimonials or criticisms.

PA 69T27

KUZNETSOV, G.A.; ZIL'BERMAN, Ye.A.; GULENKO, A.I.; VOROTYAGIN, I.V., inzh.

Pay more attention to crop rotations. Zemledelie 8 no.12:25-29 D '60.
(MIRA 13:11)

1. Moskovskiy institut zemleustroystva (for Kuznetsov and Zil'berman).
2. Nachal'nik Pavlodarskoy zemleustroitel'noy ekspeditsii (for Gulenko).
(Rotation of crops)

ACCESSION NR: AP4035099 S/0191/64/000/005/0013/0015

AUTHOR: Smirnova, O. V.; Losev, I. P. (Deceased); Yerofeyeva, S. B.; Zil'berman, Ye. G.

TITLE: Effect of emulsifiers on the course of the interphase polycondensation reaction in preparing polycarbonates based on dichlorodiphenylolpropane.

SOURCE: Plasticheskiye massy*, no. 5, 1964, 13-15

TOPIC TAGS: emulsifier, interphase polycondensation, polycarbonate, dichlorodiphenylolpropane, dichlorodiphenylolpropane polycarbonate, Trilon B, leveling agent A, OP 7, Nekal, Avirol, molecular weight, yield, specific viscosity, polyether, solvent effect

ABSTRACT: The effect of certain emulsifiers on the molecular weight and the yield of polycarbonates based on a chlorinated dihydroxydiphenylalkane were investigated. The following emulsifiers were studied: Trilon B, leveling agent A (quaternary ammonium salt of diethylaminomethyl derivatives of polyethylene glycol esters of isooctylphenols), OP-7 (polyethylene glycol ester of isooctylphenol), Nekal, and Avirol (mixture of neutral esters of butanol, sulfuric and

Card 1/5

ACCESSION NR: AP4035099

oleic acids). CCl_4 and CH_2Cl_2 were selected for the organic phase. Experiments were run at optimum conditions as described by I. P. Losev, S. B. Yerofeyeva, O. V. Smirnova, L. L. D'yachenko (Plast. massy*, no. 11, 1963). The enclosed figures 1-5 summarize the effects of the emulsifiers on the specific viscosity and yields of the polymer. The process of preparing polycarbonates based on 2,2-(3,3'-dichloro-4,4'-dihydroxyphenyl)-propane and phosgene depends on the nature of the organic phase and on the amount and nature of the emulsifier used. All the emulsifiers except Trilon B lower the specific viscosity of the polymer when the reaction was run in CCl_4 in which the polymer is insoluble. Trilon B and the leveling agent A lead to an increase in molecular weight and in yield of the polycarbonate when reaction is run in CH_2Cl_2 which dissolves the polyether formed. Orig. art. has: 5 figures.

ASSOCIATION: None

SUBMITTED: 00 DATE ACQ: 26May64 ENCL: 03

SUB CODE: OC NO REF SOV: 002 OTHER: 001

Card 2/5

ACCESSION NR: AP4035099

ENCLOSURE: 01

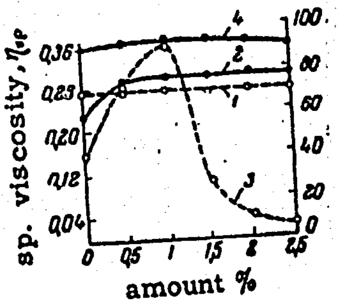


Fig. 1. Relationship between specific viscosity and yield of polyether and amount of Trilon B. ---specific viscosity; ——— yield. 1 and 2- in carbon tetrachloride 3 and 4 - in methylene chloride

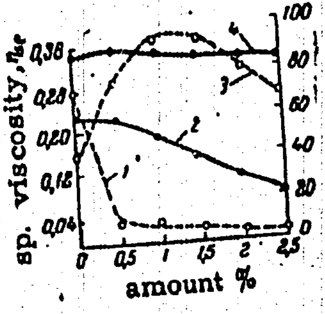


Fig. 2. Relationship between specific viscosity and yield of polyether and amount of leveling agent A. Symbols same as in fig. 1.

ENCLOSURE: 02

ACCESSION NR: AP4035099

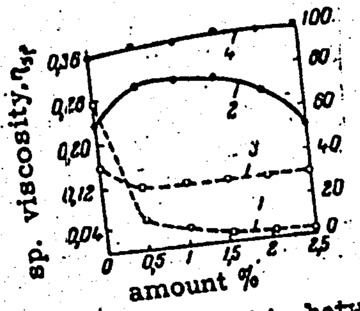


Fig. 3. Relationship between specific viscosity and yield of polyether and amount of OP-7.

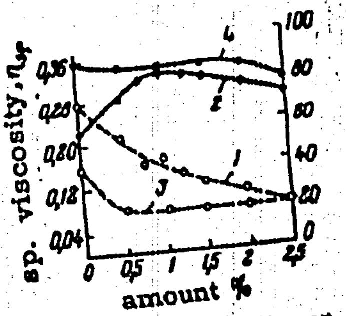


Fig. 4. Relationship between specific viscosity and yield of polyether and amount of Nekal.

ENCLOSURE: 03

ACCESSION NR: AP4035099

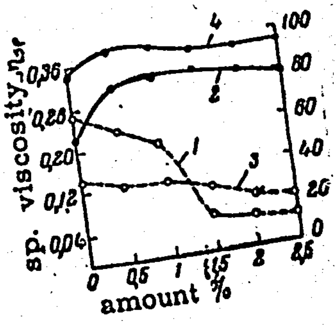
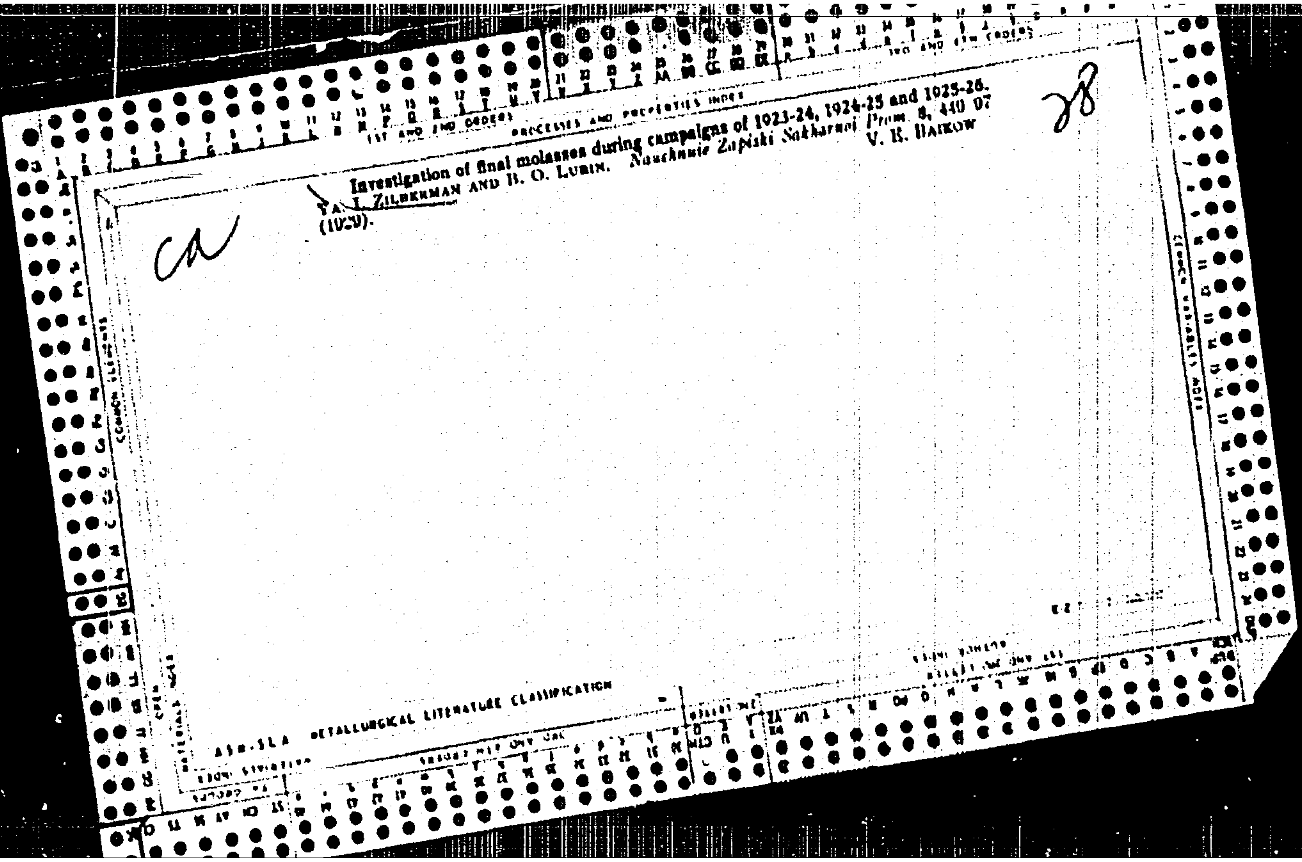


Fig. 5. Relationship between specific viscosity and yield of polyether and amount of Avirol. Symbols same as in fig. 1.



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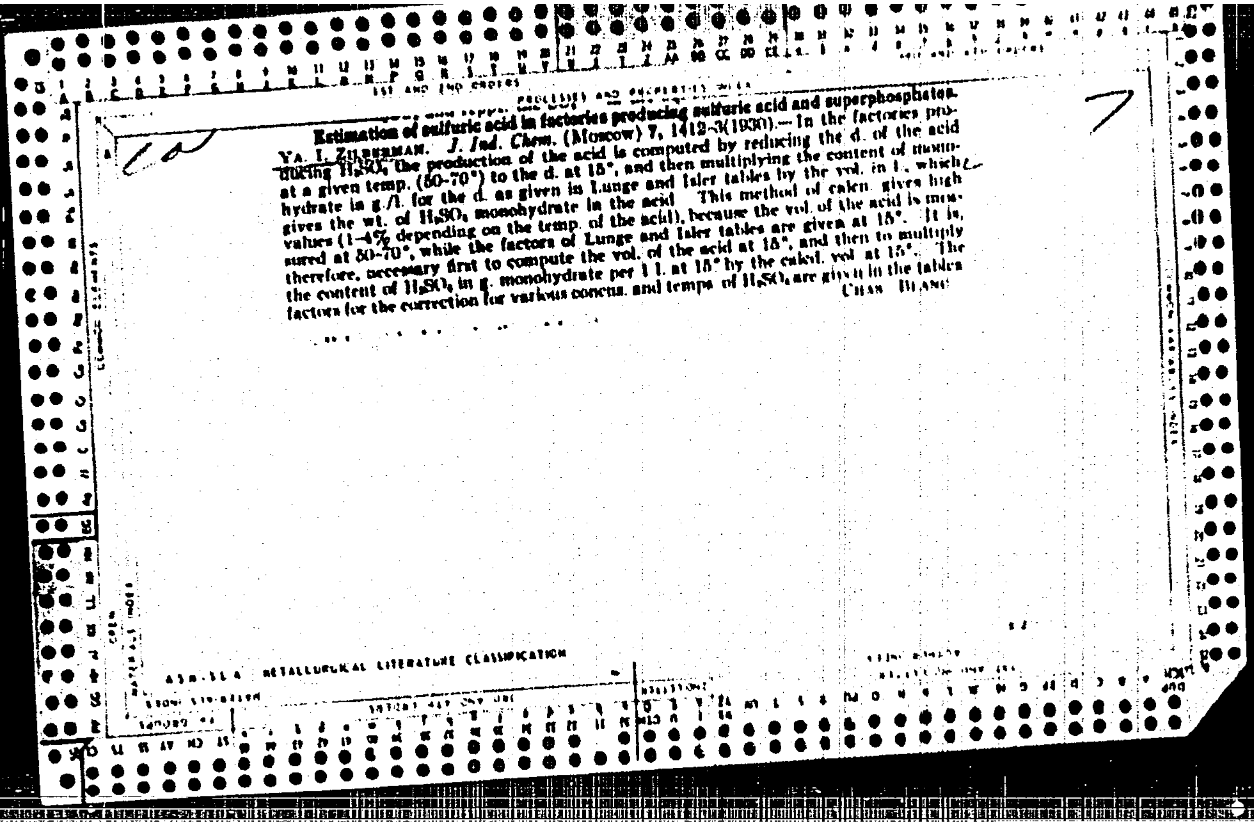
CA

Investigation of final molasses during campaigns of 1923-24, 1924-25 and 1925-26. Ya. I. Zilberman and B. O. Lubin. *Nauchnuie Zapiski Sakharnoi Prom.* 8, 440 97 (1929).

V. R. Baikow

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



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PROCESSES AND PROPERTIES INDEX

Estimation of sulfuric acid in factories producing sulfuric acid and superphosphates. YA. I. ZILBERMAN. *J. Ind. Chem.* (Moscow) 7, 1412-3(1930).—In the factories producing H_2SO_4 the production of the acid is computed by reducing the d. of the acid at a given temp. (50-70°) to the d. at 15°, and then multiplying the content of monohydrate in g./l. for the d. as given in Lunge and Isler tables by the vol. in l., which gives the wt. of H_2SO_4 monohydrate in the acid. This method of calcn. gives high values (1-4% depending on the temp. of the acid), because the vol. of the acid is measured at 50-70°, while the factors of Lunge and Isler tables are given at 15°. It is, therefore, necessary first to compute the vol. of the acid at 15°, and then to multiply the content of H_2SO_4 in g. monohydrate per 1 l. at 15° by the calcd. vol at 15°. The factors for the correction for various concns. and temps of H_2SO_4 are given in the tables. CHAS. BLANC

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

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3RD AND 4TH ORDERS

Cr

18

Sodium carbonate. Ya. I. Zil'berman and A. S. Izotova. Russ. 60,408, Feb. 28, 1947. Na_2S soln. is treated with a soln. of $NaHSO_3$ to decompose the polysulfides and to effect partial sepn. of the basic oxides into the solid phase. The soln. thus purified is subjected to a once-through carbonation and further conversion to Na_2CO_3 in the usual manner.

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

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8C

A-1

Absorption of carbon dioxide by solid sodium carbonate. J. L. ZILBERMAN, P. T. IVANOV, and K. P. MISCHTSCHENKO (J. Appl. Chem. Russ., 1939, 12, 986—995).—Saturated aq. $NaHCO_3$ is added to Na_2CO_3, in amount sufficient to give a ratio of 3—5 mols. of H_2O per mol. of Na_2CO_3, and 13—30% CO_2 is passed through the mass at 18—25°. In these conditions CO_2 is rapidly absorbed, to yield pure $NaHCO_3$. Freshly prepared Na_2CO_3 is a more active absorbent than are samples which have undergone storage.

R. T.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

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C4

B

Absorbing carbon dioxide from gases. Ya. I. Zil'berman and P. T. Ivanov. Russ. 50,550, Feb. 29, 194 To improve its efficiency in the absorption of CO_2, Na_2CO is moistened with $NaHCO_3$ soln.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

PROCESSES AND PROPERTIES INDEX

CA

18

Reaction of hydrogen sulfide with salts of sulfurous acid. I. Formation of sodium dithionate in the reaction of hydrogen sulfide with solutions of sodium sulfite and sodium bisulfite (in the production of sodium thiosulfate). Ya. I. Zil'berman and V. M. Fridman. *J. Gen. Chem.* (U. S. S. R.) 10, 1047-58(1940).—The investigation was begun with a study of the com. production of $Na_2S_2O_3$, according to the summation reaction: $2Na_2SO_3 + 2NaHSO_3 + 2H_2S = 3Na_2S_2O_3 + 3H_2O$. To this end, solns. of Na_2SO_3 and $NaHSO_3$ and their mixts. were treated with a H_2S current at 20-100° until the reaction was completed. The reaction was followed by removing samples at definite intervals and analyzing Na_2SO_3, $NaHSO_3$, $Na_2S_2O_3$, Na_2SO_4 and polythionates in the mixt. by the method of Kurtenacker and Goldbach (*C. A.* 22, 363). The unreacted H_2S was absorbed in 2 flasks contg. KOH and analyzed. Contrary to the literature data, the reaction forms also $Na_2S_2O_6$. Since it is not oxidized by Br in a neutral soln., it was detd. in the filtrate from the $BaSO_4$ by the method of Bassett and Henry (*C. A.* 29, 7208[9]). At the optimum ratio of Na_2SO_3 and $NaHSO_3$ = 1:1, no polythionates ($Na_2S_4O_6$) are formed and max. yields of 79.5% $Na_2S_2O_3$ and 7.2% $Na_2S_2O_6$ are obtained. With increasing and decreasing ratio of the reactants the yields of $Na_2S_2O_6$ decrease and become zero with Na_2SO_3 and $NaHSO_3$ alone. The yields of Na_2SO_4 increase with greater acidity ($NaHSO_3$) of the mixts. With an increase of temp. above 20° the yield of $Na_2S_2O_3$ decreases and that of $Na_2S_2O_6$ increases. Chas. Blanc

State Inst
Applied Chem

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

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Ca

18

Reaction of hydrogen sulfide with salts of sulfurous acid. II. Ya. I. Zil'berman. *J. Gen. Chem.* (U. S. S. R.) 10, 1257-65(1940); cf. *C. A.* 34, 7540ᵃ.—The following hypothesis for the mechanism of the reaction between H_2S and H_2SO_3 is given. H_2S reacts with H_2SO_3 in an aq. soln. in the same way as in the gas phase: $2H_2S + H_2SO_3 \rightarrow 3HSOH \rightarrow 3H_2O + 3S$; however, this autoxidation does not occur in the presence of an excess of H_2SO_3, but the reaction proceeds as follows: $HSOH + H_2SO_3 \rightarrow H_2S_2O_3 + H_2O$, which is accompanied by the reaction: $HSOH + 2H_2SO_3 \rightarrow H_2S_3O_6 + H_2O + 2H^+$. At increased temp. the following reactions take place: $HSOH + H_2SO_3 \rightarrow H_2SO_4 + H_2S$ and $HSOH + 2H_2SO_3 \rightarrow H_2S_2O_6 + H_2O + H_2S$. The formation of $H_2S_5O_6$ is the result of a secondary reaction, which proceeds in the presence of $H_2S_2O_3$ as follows: $HSOH + 2H_2S_2O_3 \rightarrow H_2S_5O_6 + H_2O + 2H^+$. $H_2S_4O_6$ is formed as follows: $HSOH + 2H_2S_2O_3 \rightarrow H_2S_4O_6 + H_2O + H_2S$, and this process proceeds through an intermediate formation of thiomonothionate ion, the dimerization of which forms $H_2S_4O_6$. The Stamm and Goehring theory (cf. *C. A.* 34, 1208ᵃ) for the same process does not present a clear reflection of their exptl. data, but their data support the above presented theory quite well. A. A. Podgorny

State Inst. Applied Chem., Leningrad

ASA-SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

Cf

18

Protection of sodium sulfite and bisulfite against oxidation during their production and storage. Ye. I. Zil'berman and P. T. Ivanov. *J. Applied Chem.* (U. S. S. R.) 13, 541-52(in French, 552)(1940).—Investigation of oxidation of bisulfite during its production by the bubbling and spraying methods with 7, 3.5 and 0.5% SO_2 in the gas mixt. showed that (*a*) the greater the concn. of SO_2 in the gas mixt., the less sulfate formed in bisulfite, (*b*) duration of the production has a direct effect on the degree of oxidation, (*c*) oxidation is max. at pH 7-9 and (*d*) oxidation is less in production by the spraying method than by the bubbling method. Na_2SO_3 was prepd. by neutralizing $NaHSO_3$ with sulfite mother liquor satd. with soda at 35°. The amt. of Na_2SO_4 present in Na_2SO_3 depended mainly on the amt. of sulfate in bisulfite. To retard the oxidation process in the prepn. of bisulfite and sulfite, neg. catalysts were investigated (alc., phenol, hydroquinone, pyrogallol, *p*-phenylenediamine and dimethyl-*p*-phenylenediamine); the best, the last two, were effective even in concn. 1:100,000. During storage, sulfite well sepd. from mother liquor was less susceptible to oxidation. The coarser the crystals of sulfite, the better they were protected from atm. influence; dried surface layers of the crystals afforded good protection against air; and sulfites and bisulfites produced in the presence of neg. catalysts formed much less sulfates than those produced without catalysts.

A. A. Podgorny

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

18

Obtaining crystalline sodium thiosulfate by the polysulfide method without evaporating the dilute alkaline solution. Ya. I. Zil'berman. *J. Chem. Ind.* (U. S. S. R.) 17, No. 11, 21-5(1940).—The mother liquor contg. $Na_2S_2O_3$ prepd. from Na_2S_x and $NaHSO_3$ is treated with 150 g. per l. of soda. This soln. is satd. with SO_2 and treated in the usual way with Na_2S_x. When the soln. is cooled to 18-30°, $Na_2S_2O_3$, more than 90% pure, crystallizes out. The cost is 20% less than when the soln. is evapd. for crystn., and the cycle can be repeated many times. On a factory scale, slight decompn. of $NaHSO_3$, with pptn. of small amts. of S, sometimes occurs.

H. M. Leicester

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

PROCESSES AND PROPERTIES INDEX

BC

A-1

Action of hydrogen sulphide on sulphites. III. Influence of hydrogen-ion concentration on the direction of the reaction. J. I. Zilberman and V. M. Fridman (*J. Gen. Chem. Russ.*, 1941, **11**, 363—370; cf. A., 1941, I, 10, 344).—The variation of the yields of $Na_2S_2O_3$ and Na polythionates formed by interaction of H_2S with Na sulphite–bisulphite solutions is shown graphically for p_H vals. 5·06—7·26. At 80°, the yield of S_2O_3'' is greatest at p_H 6·2, and falls rapidly in more acid or more alkaline media because of side reactions, during which polythionates are produced. At 20°, the yield of S_2O_3'' is greater, and varies much more slowly with p_H, being greatest at p_H 6·28—6·31. A glass electrode was used for p_H measurement.

N. G.

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

5

Preparation and properties of some thiosulfato argentates. I. Sodium salts. Ya. I. Zil'berman and I. I. Khmel'nitskaya. *J. Gen. Chem.* (U.S.S.R.) 11, 1190-4 (1941).—By the method of Baines (*C.A.* 24, 5251) there were prepd. $Na_5Ag_3(S_2O_3)_4.2H_2O$ and $Na_5Ag(S_2O_3)_3.2H_2O$. Stable prepns. of such salts having S_2O_3:Ag ratio over 1.33 can be kept in the dry state for months without decompn.; they are almost immediately decompd. upon soln. in distd. water. The key to the stable prepns. is the rapidity and thoroughness of sepn. of the crystals from the mother liquors and moisture. II. Calcium salts. *Ibid.* 1195-8. —$Ca_2Ag_2(S_2O_3)_3.5H_2O$ and $CaAg_2(S_2O_3)_2.H_2O$ were isolated in the cryst. state by pptn. by means of MeOH of the solns. resulting from interaction of CaS_2O_3 with Ag_2CO_3 and $AgNO_3$, resp. The former salt is fairly stable in dry storage; the latter darkens in several hrs. when exposed to light. O. M. Kosolapoff

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

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Ca

P

Preparation and stabilization of calcium thiosulfate. Ya. I. Zil'berman and L. L. Khmel'nitskaya. *J. Applied Chem.* (U. S. S. R.) 14, 480-491 (in German, 491) (1941). —To 70 g. of $CaCl_2$ in 40 ml. H_2O is added 140 g. fine-ground $Na_2S_2O_3.5H_2O$ in portions at 40-8°. This temp. is maintained for some time, then the fine ppt. of NaCl is filtered off, and $CaS_2O_3.6H_2O$ is crystd. from the filtrate by cooling with water. The yield does not exceed 50-60%. It was impossible to attain complete stabilization of CaS_2O_3 solns. However, on heating to 80° or boiling the slightly decomposed soln., the products of decompn. are pptd. and after filtration the soln. of CaS_2O_3 is stable for months if protected from CO_2 and air. A. A. Bochtlingk

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

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COMMON ELEMENTS

Ca

6

Preparation of magnesium thiosulfate. Ya. I. Zil'-
berman and I. L. Khmel'nitskaya J. ~~Applied Chem.~~
~~(U. S. S. R.)~~ 14, 492-93(1941).—To 45 g. of $Na_2S_2O_3$.-
$5H_2O$ in 15 ml. H_2O at 75-80° is added, with stirring, an
intimate mixt. of 90 g. $Na_2S_2O_3.5H_2O$ and 150 g. $MgCl_2$.
$6H_2O$. The product is filtered, while still hot, through a
heated Büchner funnel. The filtrate is cooled with water.
The double decompn. is thus effected with a minimum of
water (added almost entirely as water of crystn. of the
starting materials). If the temp. exceeds 80°, MgS_2O_3.
$6H_2O$ decomposes with sepn. of S. The yield amounts to
55-70%. The product contains $MgS_2O_3.6H_2O$ 98.2 and
NaCl 0.4%. By recrystn. the content of NaCl can be
lowered to 0.044-0.046%. The final product (transparent
crystals) remained unchanged in storage during a few
months.

A. A. Boehtlingk

MATERIALS INDEX

OPEN

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CA

18

Intensification of the preparation of $Na_2S_2O_4$ by the sulfide method. Ya. I. Zil'berman, K. G. Kruglyakova and N. D. Chertkova. *J. Chem. Ind.* (U. S. S. R.) 18, No. 9, 6-12(1941); *Chem. Zentr.* 1942, II, 2038-9.—When a soln. of Na_2S and Na_2CO_3 is passed down a tower to meet a rising stream of SO_2, the $Na_2S_2O_4$ yield depends on the ratio of gas velocity and rate of flow of the soln. Increasing gas velocity from 0.03 to 0.17 m./sec. raises the yield from 51 to 57%. Decreasing the rate of liquid flow from 6 to 1.5 cu. m./sq. cm./hr. raises the yield from 57 to 65%. If the tower is high enough, a gas contg. 7% SO_2 gives 83-5% $Na_2S_2O_4$ and one contg. 0.5% SO_2 gives 70-5%.

H. M. Leicester

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

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3RD AND 4TH ORDERS

CA

19

Sodium hyposulfite. Ya. I. Zil'berman and N. G. Markova. U.S.S.R. 64,330, Feb. 28, 1945. $NaHSO_3$ is reduced with powd. Fe in a soln. in which the value of pH is regulated at not above 8 during the reaction by passing SO_2.

M. Hosch

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

CA

1

Direct determination of sulfate in the presence of hyposulfite. Ya. I. Zil'berman and N. O. Markova. *Zavodskaya Lab.* 11, 150-2(1945).—A new method for the direct detn. of SO_4^{--} in the presence of $S_2O_4^{--}$ is based on the transformation of all $Na_2S_2O_4$ and Na_2SO_3 into HCHO compds.; these compds. do not interfere with the pptn. of SO_4^{--} by $BaCl_2$ in the cold. To the soln. of sample, after treatment with CH_2O, add 10 ml. of 20% AcOH and 5 ml. of glycerol, dil. to 300-400 ml., and ppt. with 1% $BaCl_2$ soln. The accuracy of the detn. depends to a large extent on the conditions of the soln. of $Na_2S_2O_4$ and on the order of the addn. of the reagents. The mean exptl. error is 9%, the errors ranging from 0.9 to 14%. The initial ratio Na_2SO_4:$Na_2S_2O_4$ has only a slight effect on the accuracy of the detn. Considerably better results were obtained if the sample is dissolved in dil. HCHO instead of water. The mean exptl. error was 2%, with a min. of 0.14 and a max. of approx. 5%. Duplicate detns. by this method gave good results. Add 0.5 g. of sample to 10 ml. of 40% formalin and approx. 100 ml. of water in a beaker, add 10 ml. of 20% AcOH and 5 ml. of glycerol, bring the vol. to 300-400 ml., ppt. SO_4^{--} with 1% $BaCl_2$ in the cold, let stand for 1-2 hrs., filter, wash with water, ignite, and weigh. Four references. W. R. Henn

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

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6

Na

Preparation and properties of some thiosulfatoargentates. III. Magnesium sodium salt. Ya. I. Zil'berman and I. L. Khmel'nitskaya (State Inst. Applied Chem., Leningrad). *J. Gen. Chem.* (U.S.S.R.) 15, 501-3(1945) (English summary); cf. C.A. 39, 1010. The authors showed the possibility of isolation of cryst. Mg thiosulfatoargentates from aq. soln.; the Mg Na salt was synthesized; and the analytical procedure for such compds. was developed. AgCl (from 100 ml. $AgNO_3$ soln. (no concn. given)) was added at 40° to a soln. of 45 g. MgS_2O_3 in 15 ml. water; after the particles of AgCl had disappeared, the mixt. was dild. with PrOH-MeOH mixt. (1:1) and was allowed to stand overnight to yield products which ranged from 43.0% to 43.51% S_2O_3 and contained 21.5% Ag and 4.35% Mg. The initial thiosulfate contained small amts. of Na; the products contained all of this Na in the form of the double salt. Complete analysis of the product indicated a composition close to [illegible]. The salt is readily sol. in water, MeOH, NH_4OH, and H_2SO_4 and is quant. titrated with iodine. The salt is very stable in the dry state, while solns. in water decompose on standing, especially on heating. Ag was detd. by pptg. as AgCl by a stream of Cl passed into aq. soln. of the salt for 30-40 min.

G. M. Kosolapoff

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

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CA 7

The preparation and properties of some thiosulfato argentates. IV. Magnesium salts. I. I. Khmel'nitskaya and Ya. I. Zil'berman (State Inst. Applied Chem. Leningrad). *J. Gen. Chem.* (U.S.S.R.) 15, 718-23 (1945); cf. *C.A.* 40, 5656^4.—Pure AgCl is dissolved in a soln. of MgS_2O_3, contg. not more than 0.05–0.1% Na, and a soln. of MeOH and EtOH (1:2) is added. The ratio of MeOH to vol. of Ag-contg. soln. should be 1:1. An oil ppts. and it is sepd. and redissolved in MeOH. Addn. of twice the vol. of EtOH ppts. cryst. $Mg_3Ag_4(S_2O_3)_5.9H_2O$. Unless the ratios of solvents are exact, an impure product is obtained. The salt is stable in the cold but is decompd. by sulfides, Cl, boiling H_2O, and heat. If it is allowed to stand in MeOH soln., it decomposes to insol. $MgAg_2(S_2O_3)_2.3H_2O$, which is less stable and decomposes to Ag_2S on standing. Both salts lose H_2O of crystn. over $CaCl_2$.

H. M. Leicester

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

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Reaction between hydrogen sulfide and sulfites. IV. Mechanism of the reactions taking place in the preparation of sodium thiosulfate. Ya. I. Zil'berman and V. M. Fridman. *J. Gen. Chem.* (U.S.S.R.) 10, 300-21 (1940); cf. *C.A.* 35, 6307. —The reaction of H_2S with sulfite-bisulfite solns. was studied in a small stirred reaction vessel so that sampling and consequent errors were eliminated, with each charge constituting a sep. expt. The overall reaction of H_2S with Na_2SO_3 is represented by $4Na_2SO_3 + 4H_2S = 3Na_2S_2O_3 + 2NaHS + 3H_2O$. Na trithionate reacts with NaHS in 2 ways: $Na_2S_3O_6 + 2NaHS = 2Na_2S_2O_3 + H_2S$ and $4Na_2S_3O_6 + 6NaHS = 7Na_2S_2O_3 + 4S + 3H_2O$, which condition the formation of H_2S and S at the end of interaction of H_2S with sulfite-bisulfite solns. The formation of thiosulfate is a two-step process: $2Na_2SO_3 + 2H_2S = 2NaHSO_3 + 2NaHS$ and $4NaHSO_3 + 2NaHS = 3Na_2S_2O_3 + 3H_2O$; the 1st step proceeds up to the point of disappearance of bisulfite and is characterized by simultaneous formation of trithionate; the 2nd proceeds after disappearance of bisulfite and is characterized by slow disappearance of trithionate. G. M. Kosolapoff

COMMON ELEMENTS

MATERIALS INDEX

ASD-SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

6

pa

Decomposition and formation of polythionates. I. Dithionate as decomposition product of trithionate. Ya. I. Zil'berman and L. A. Zaputryaeva (State Inst. Appl. Chem., Leningrad). *J. Gen. Chem.* (U.S.S.R.) 10, 1397-1400(1940)(in Russian). —On boiling a soln. of 0.05 mole $K_2S_3O_6$ with KOH, in a total vol. of 80 ml., for 2 hrs. (with reflux condenser), and allowing to cryst. for 18 hrs., the main products were: with a $K_2S_3O_6$:KOH ratio of 2:2, K_2SO_3, $K_2S_2O_3$, $K_2S_4O_6$, and S; with ratios 2:3, 2:4, and 2:5, $K_2S_2O_3$, K_2SO_4, K_2SO_3, and $KHSO_3$; with ratio 2:8, $K_2S_2O_3$ and K_2SO_3. A smaller amt., 0.2-0.3 g., of sparingly sol. crystals was identified, by analysis and chem. reactions (no pptn. with $BaCl_2$ unless heated with HCl) as the dithionate $K_2S_2O_6$. Its yield depends on the $K_2S_3O_6$/KOH ratio; with ratios 2:2, 2:3, 2:4, 2:5, and 2:8, 0.50, 0.03, 0.05, 0.5 g. and traces of $K_2S_2O_6$ were obtained from 13.5 g. $K_2S_3O_6$. That the detg. agent in producing $K_2S_2O_6$ from $K_2S_3O_6$ is K_2SO_3, was verified by 2 hrs.' boiling of 0.05 mole $K_2S_3O_6$, in a total vol. of 80 ml., with K_2SO_3. The crystals pptd. are dissolved in just enough water at 50-60°, and allowed to cryst. By analysis, the yields in $K_2S_2O_6$, from 13.5 g. $K_2S_3O_6$, were 1.8, 2.25, 0.1, resp., for $K_2S_3O_6$:K_2SO_3 = 1:2, 1:4, 1:6. Main products are $K_2S_2O_3$ and K_2SO_4.

N. Thon

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

Solubility in the systems $MgCl_2 + Na_2S_2O_3 \rightleftarrows MgS_2O_3 + 2NaCl$ and $CaCl_2 + Na_2S_2O_3 \rightleftarrows CaS_2O_3 + 2NaCl$. Ya. I. Zil'berman and P. T. Ivanov (State Inst. Applied Chem., Leningrad). *J. Gen. Chem.* (U.S.S.R.) 16, 1589-98(1946)(in Russian).—The soly. in water of $MgS_2O_3.6H_2O$ was detd. as a function of temp.: at 0, 28, 46.5, 61.25°, 30.00, 34.51, 36.64, 38.91%; turbidity (decompn. into S + $MgSO_3$) first appears at 60° and is heavy at 70°; it can be suppressed by the addn. of 0.2-0.3% $MgSO_3$; the soly. then continues to rise with temp.: at 73.75, 86.75°, 41.45, 45.0%. Indication of melting in the cryst. water is found at 92° with some decompn.; solns. contg. up to 32% MgS_2O_3 can be boiled without decompn. For the reciprocal salt system, the compns. of the eutonic solns. $MgCl_2$-MgS_2O_3-H_2O, $Na_2S_2O_3$-MgS_2O_3-H_2O, 2NaCl-MgS_2O_3-$Na_2S_2O_3$-H_2O, 2NaCl-MgS_2O_3-$MgCl_2$-H_2O, at 25° (table) and the contours of the crystn. fields of NaCl, $MgS_2O_3.6H_2O$, and $Na_2S_2O_3.5H_2O$ (graph) are given. No new solid phases are found. The soly. of $CaS_2O_3.6H_2O$ increase linearly with the temp., example, at 0 and 24.5°, 28.04 and 38.48% CaS_2O_3. The turbidity appearing from 30° upwards cannot be suppressed by $CaSO_3$ (because of its very low soly.) nor by addns. of $Na_2S_2O_3$ and $CaCl_2$; satn. with $Ca(OH)_2$ permits reaching 35° but not higher. $CaS_2O_3.6H_2O$ decomp. readily on dissolving and on standing. The ternary system $CaCl_2$-CaS_2O_3-H_2O revealed a new solid phase, identified as $CaS_2O_3.H_2O$ by its CaS_2O_3 content (89.04%, theoretical 89.41%), crystallooptically homogeneous, n_α' 1.645, n_γ' more than 1.760 as against 1.417 for the hexahydrate; after 4 months' standing over H_2SO_4, the latter was converted into the monohydrate which is stable for months, giving always clear solns. The 25° isotherm triangle is given. For the reciprocal salt pair, the compn. of eutonic solns. (table) and the boundaries of the crystn. fields (graph) at 25° are given. The solid phase $CaS_2O_3.H_2O$ + NaCl corresponds to solns. CaS_2O_3 21.35, $CaCl_2$ 18.73, NaCl 20.80, and 30.00, 12.28, 9.45; $CaS_2O_3.H_2O$ + $CaCl_2.6H_2O$ + NaCl is in equil. with CaS_2O_3 8.75, $CaCl_2$ 13.10, NaCl 18.45. The crystn. field of $CaS_2O_3.H_2O$ lies near the $CaCl_2$ apex on the CaS_2O_3 side of the rectangular diagram. N. Thon

1ST AND 2ND ORDERS

3RD AND 4TH ORDERS

PROCESSES AND PROPERTIES INDEX

CA

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Preparation of sodium thiosulfate by the hydrogen sulfide method. Ya. I. Zil'berman and V. M. Fridman (Leningrad State Inst. Applied Chem.). *J. Applied Chem.* (U.S.S.R.) 19, 55-62(1946)(English summary).—In the reaction $2Na_2SO_3 + 2NaHSO_3 + 2H_2S = 3Na_2S_2O_3 + 3H_2O$, optimum temp. is 20-40°. The yield is lowered by higher temps. The initial concn. of the reagents must be equimolar, as the increase of either concn. by more than 10% leads to a serious drop of thiosulfate yield. Under the above conditions the $Na_2S_2O_3$ yield is 95-6%. The mother liquors can be recycled in the process.

G. M. Kosolapoff

COMMON ELEMENTS

COMMON VARIABLES INDEX

MATERIALS INDEX

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

ZIL'BERMAN, Ya.I.; ZAPUTRYAYEVA, L.A.

Purification of gases from hydrogen sulfide in nitrogen processing plants by means of the sulfite-bisulfite method. Sbor.rab.Inst. prikl.khim. no.39:3-46 '47. (MLRA 7:3)
(Thiosulfate)

ZIL'BERMAN, Ya.I.; FRIDMAN, V.M.

Production of anhydrous sodium thiosulfate. Sbor.rab.Inst.prikl. khim. no.39:47-51'47. (MLRA 7:3)

(Sodium thiosulfate)

ZIL'BERMAN, Ya.I.; FRIDMAN, V.M.

Production of sodium pyrosulfite. Sbor.rab.Inst. prikl.khim.
no.39:52-68 '47. (MLRA 7:3)
(Sodium pyrosulfite)

S/186/60/002/006/005/026
A051/A129

AUTHORS: Zil'berman, Ya. I.; Peshchevitskiy, B. I.

TITLE: The production, composition and certain properties of uranyl diethyldithiocarbamate complexes

PERIODICAL: Radiokhimiya, v. 2, no. 6, 1960, 663 - 667

TEXT: The article deals with a description of a method for producing salts of the general formula $M^{n+} (UO_2Car_3)_n$, where M^{n+} is the cation of alkaline or alkaline-earth metals, ammonium or diethylammonium and Car is the diethyldithiocarbamate ion. The properties of these salts are discussed. In addition, the uranyl tri-carbamates with rubidium, cesium calcium, strontium, barium and ammonium were produced for the first time in the external sphere of the complex. The properties of ten different diethyldithiocarbamate derivatives of uranyl have been characterized. During the experiments the electroconductivity was measured on an apparatus consisting of a sound generator, bridge, and electron-beam indicator of equilibrium. The optical density of the solutions was measured on a two-arm ФЭК-М (FEK-M) photocolorimeter. The method of analysis of the metal con-

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S/186/60/002/006/005/026
A051/A129

The production, composition and .....

tent enabled the authors to show that the residue obtained after decomposition and calcination of the complexes is a diuranate of the corresponding metal. In the case of the dicarbamate complex and the ammonium derivatives the expected uranous-uranic oxide is obtained. When heating to 110°C a darkening of color and loss of weight was noted in some compounds. In moist atmosphere the salts regained their initial properties which points to the presence of crystallization water in the complexes. A good coincidence of experimental and theoretical values was observed. The dry, pure complexes are found to have a high thermal stability. All the freshly prepared compounds are soluble in water, the "aging" effect is observed, however, when these are stored. A drop in the solubility is noted at an increase in the ion radius of the one-charge cation of the external sphere (from sodium to cesium) The complexes obtained are soluble in many organic solvents and can be recrystallized from the latter. The organic solvents follow the sequence of solubility: ketones $\simeq$ alcohols $>$ esters $\simeq$ chloroderivatives $>$ ethers $\simeq$ aromatic hydrocarbons, whereby the latter two classes can only dissolve uranyl dicarbamate. Aqueous solutions of uranyl carbamates are decomposed by acids, alkalies and soda solutions. In an acid medium the stability depends to a great extent on the pH of the solution and a noticeable change in

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the stability begins at pH > 4.5. Generally speaking, the stability of the complexes surpasses that of the non-bound dithiocarbamic acid. (Ref. 12: H. Bode Z. Anal. Chem., 142, 6, 414, 1954). The molecular electroconductivity of the sodium uranylcarbamate solutions was found to be equal to about 95 $ohm^{-1} \cdot cm^{-1}$, i.e., corresponding to 1 : 1 of the electrolyte. In conclusion the authors point out that the quantitative results of the analyses on solubility should be regarded with respect to the aging phenomenon, even though these results give a general picture of the solubility properties. There are 3 tables, 1 figure and 12 references: 5 Soviet-bloc and 7 non-Soviet-bloc. The references to the English language publications read as follows: P. J. Lacoste, M.G. Earing, Anal. Chem., 23, 6, 871,, 1951, R. A. Zingaro, J. Am. Chem. Soc., 78, 15, 3568, 1956.

SUBMITTED: December 10, 1959

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Card 3/3

PHASE I BOOK EXPLOITATION SOV/5448

Zil'berman, Ya.I.

Osnovy khimicheskoy tekhnologii iskusstvennykh radioaktivnykh elementov (Chemical Technology Principles of Artificial Radioactive Elements) Moscow, Gosatomizdat, 1961. 331 p. Errata slip inserted. 6,000 copies printed.

Ed.: Ye.I. Panasenkova; Tech. Ed.: N.A. Vlasova.

PURPOSE: This book is intended for radiation chemists and other specialists and scientific workers interested in the production of artificial radioactive elements.

COVERAGE: The book gives a systematic presentation of data on the chemical technology of artificial radioactive elements, especially nuclear fuel processing. Methods for processing irradiated material are discussed, as are the biological and chemical effects of ionizing radiation. Methods for nuclear fuel processing which are still in a stage of development at laboratories and experimental plants are not dealt with. Theoretical principles are treated only to the extent

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L 25485-66 EWT(m)/T/EWP(t) IJP(c) JD/HW
ACC NR: AP6009684 SOURCE CODE: UR/0181/66/008/003/0912/0919
60
B

AUTHOR: Zingerman, Ya. P.; Ishchuk, V. A.

ORG: Institute of Physics, AN UkrSSR, Kiev (Institut fiziki AN UkrSSR)

TITLE: Adsorption of oxygen on the (110) face of single-crystal tungsten

SOURCE: Fizika tverdogo tela, v. 8, no. 3, 1966, 912-919 18 27 27

TOPIC TAGS: tungsten, single crystal, gas adsorption, oxygen, crystal surface, chemisorption

ABSTRACT: This is a continuation of earlier work by the authors (FTT v. 7, 2569, 1965), dealing with the interaction between oxygen and surfaces of different faces of tungsten single crystals. The present investigation was devoted to the (110) face, and the experimental equipment used was the same as in earlier studies. The method consists essentially of adsorbing molecular oxygen from a beam under conditions of very high vacuum ($\sim 10^{-10}$ mm Hg). The single crystal was grown by zone melting. The results show that the interaction with the (110) face consists only of adsorption of oxygen molecules with subsequent dissociation and formation of a final structure of the WO type. It was observed that the (110) face is characterized by the presence of only one type of oxygen chemisorption state with the binding energy between the adsorbed atom and the metal being 4.8 ev, regardless of the degree of coating of the surface θ, with the latter ranging from $\theta \lesssim 0.1$ to $\theta \approx 0.9$. In the region $\theta < 0.5$, the chemisorption is not an activated process, and its probability, equal to 0.1 at

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300K, decreases monotonically with temperature. At $\theta > 0.5$ the chemisorption becomes activated and its probability decreases exponentially with the temperature ($\sigma = \sigma_0 \exp(-E/kT)$, where the activation energy is $E = 4.8 \times 10^{-2}$ ev). Orig. art. has: 5 figures and 9 formulas.

SUB CODE: 20/ SUBM DATE: 26Jun65/ ORIG REF: 004/ OTH REF: 006

Card 2/2 Cl

ZIL'BERMAN, Ye. N.

Solubity Study of the System Water-Adipic Acid Diamide-Ammonia, page 814, Sbornik statey po obshchey khimii (Collection of Papers on General Chemistry), Vol II, Moscow-Leningrad, 1953, pages 1680-1686.

ZIL'BERMAN, E. N.

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

② Chem

System with completely closed solubility curve. Mutual solubility of hexamethylenimine and water. E. N. Zil'berman and Z. D. Skorikova. *Zhur. Obshchei Khim.* 23, 1620-30(1953).—At room temp, hexamethylenimine (I) is completely miscible with water (cf. *Zhur. Fiz. Khim.* 26, 1458(1952)). At higher temp. 2 conjugate solns. are formed and the soly. curve is a completely closed system with a max. and min. consolute points at 30.5 and 22.5% (I) at 228 and 66.9°, resp. Min. soly. of I, 5.7%, is at 100-160°; min. soly. of water in I, 20.7%, is at 140-180°.

I. Bencowitz

ZIL'BERMAN, Ye.N.

Heteroazeotrope of cyclohexanol and water. Zhur.prikl.khim. 26 no.8:886-888
Ag '53. (MLRA 6:8)
(CA 47 no.22:11859 '53) (Azeotropy) (Cyclohexanol)

ZIL'BERMAN, Ye.N.

System: water - adiponitrile - ammonia. Zhur.prikl.khim. 26 no.9:941-948 S '53. (MLRA 6:10)

(Systems (Chemistry)) (Adiponitrile) (Ammonia)

USSR/Chemistry - Production of Cyclohexanone ZIL'BERMAN, Ye. N. FD 169

Card 1/1

Author : Zil'berman, Ye. N.

Title : Thermodynamic investigation of the processes for the production of cyclohexanol and cyclohexanone from phenol.

Periodical : Khim. prom. 3, 24-26 (152-154), April-May 1954

Abstract : On the basis of thermodynamic consideration, arrives at the conclusion that the almost quantitative yield of cyclohexanone which is supposed to result from the interaction of phenol with cyclohexanol according to British Patent 310055 is improbable. States that in the presence of suitable catalysts this dismutation may proceed to the extent of 50% per run, however, so that the process is industrially feasible. 8 USSR references and 11 foreign references are appended.

USSR/Chemistry - Caprolactam [illegible] FD-2726

Card 1/1 Pub. 50 - 7/20

Author : Zil'berman, Ye. N. , Cand. Tech. Sci.

Title : The production of e-caprolactam

Periodical : Khim. prom. No 5, 277-285, Jul-Aug 1955

Abstract : Procedures for the production of e-caprolactam (epsilon-caprolactam) are outlined on the basis of published data, mainly those derived from the foreign literature. One hundred seventy-four references; 7 USSR, 6 of them since 1940.

ZIL'BERMAN, Ye. N.

AID P - 3755

Subject : USSR/Chemistry

Card 1/1 Pub. 152 - 19/22

Authors : Zil'berman, Ye. N. and G. N. Matveyeva

Title : Products resulting from the interaction of hexamethylene diamine with some inorganic acids

Periodical : Zhur. prikl. khim. 28, 9, 1013-1016, 1955

Abstract : Mixtures of basic salts with neutral salts and free hexamethylene diamine were obtained in the reactions of hexamethylene diamine with sulfuric and with nitric acids. Eleven references, 2 Russian (1947-1953).

Institution : None

Submitted : Mr 19, 1954

[illegible]

ZIL'BERMAN, Ye.N.; SMIRNOVA, M.M.

New method for the preparation of imidodisulfonates. Zhur.ob.khim.
26 no.3:672-675 Mr '56. (MLRA 9:8)
(Sulfonic acid)

ZIL'BERMAN, YE. N.

USSR/ Organic Chemistry - Synthetic organic chemistry E-2

Abs Jour : Referat Zhur - Khimiya, No 4, 1957, 11632

Author : Zil'berman Ye. N., Suvorova S.N., Smolyan Z.S.

Title : On Preparation of Adipic Acid by Oxidation of Cyclochexanol with Nitric Acid

Orig Pub : Zh. prikl. khimii, 1956, 29, No 4, 621-627

Abstract : Studied was the effect upon the reaction of oxidation of cyclohexanol (I), by the action of nitric acid, to adipic acid (II), of catalysts (CT), duration of reaction, concentration of HNO_3 and the presence therein of organic acids. Maximum yield of II 81-83%; minimum yield of by-products: glutaric (III) (5.6%), succinic (IV) (3.9%), oxalic (V) (4.2%) acids, is obtained with HNO_3 concentration of 40-50%. With decreasing concentration of HNO_3 yield of II decreases and that of III and IV increases; with 5-10% HNO_3 the main reaction product is III. In presence of CT (NH_4VO_3, $CuCO_3$, $Bi(NO_3)_3 \cdot 6H_2O$ and NH_4VO_3 + $CuCO_3$ (1:3) yield of II increases and that of IV decreases. NH_4VO_3 inhibites formation of V. In the presence of $CuCO_3$ formation of III

Card 1/2

[illegible], E. M.

ZIL'BERMAN, YE. N.

ZIL'BERMAN, Ye.N., kand.tekhn.nauk.

Producing monomers for polyamide resins. Khim.prom. no.5:268-272 Jl-Ag '57. (MIRA 10:12)

(Amides)

Zil' berMAN, Ye .N.

20-5-21/54

AUTHORS: Zil'berman, Ye.N., Smirnova M.M.,

TITLE: The Mechanism Underlying the Oximation of Cyclohexanone by Sodium Hydroxylaminmonosulphonates (Abbrev. HAS) (O mekhanizme oksimirovaniya tsiklogeksanona gidroksilaminmonosul'fonatom natriya)

PERIODICAL: Doklady Akad. Nauk SSSR, 1957, Vol.115, Nr 5, pp.927-930,(USSR)

ABSTRACT: For the oximation of aldehydes and ketons usually salts of hydrosylamin are used. The industry, however, uses sometimes for the purpose described in the title the salt named last in the title. It is and intermediate product of the synthesis of hydroxylaminsulphate(according to Raschig). The mechanism dealt with here has not been described inscientific periodicals. The following characteristics were found in the reciprocal action of the 2 substances, named in the title: 1) Unlike the hydroxylamin the substance HAS, named last, does not react to the alcaline milieu. 2) This substance HAS does not hydrolize at room temperature, which is at the same time the temperature prevailing at the experiment. 3) With the presence of cyclohexanon and an acid HAS reacts easily, forming cyclohesanonoxim and hydroxylamin. For better understanding the reaction should be written down. Here carboniumion is the primary reaction product. In the further course it establishes a binding of coordinations on account of the unseperated electron pair of the nitrogen atom within the nucleophil

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20-5-21/54

The Mechanism Underlying the Oximation of Cyclohexanone by Sodium Hydroxylaminmonosulphonates (Abbrev. HAS)

stant. Description of experiments with the usual information follow. There are 2 figures, 1 table and 1 Slavic reference.

PRESENTED	By Kazanskiy, B.A., Academician, May 15, 1957
SUBMITTED	July 19, 1956
AVAILABLE	Library of Congress.

CARD 3/3

SMIRNOVA, O. V.; LOSEV, I. P.[deceased];YEROFEYEVA, S. B.; ZIL'BERMAN, Ye. G.

Effect of emulsifiers on the course of the interphase polycondensation in the production of polycarbonates based on dichlorodiphenylol propane. Plast. massy no. 5:13-15 '64. (MIRA 17:5)

ZIL'BERMAN, Ye.N.; MICHURIN, A.A.

Interaction of acid sulfate ester of β-hydroxypropionamide with alcohols. Zhur. ob. khim. 33 no.8:2766-2771 Ag '63. (MIRA 16:11)

1. Gor'kovskiy politekhnicheskiy institut.

MICHURIN, A.A.; ZIL'BERMAN, Ye.N.

Synthesis of N,N'-diaryl-β-aminopropionamides. Zhur.ob.khim. 34 no.2:575-579 F '64. (MIRA 17:3)

1. Gor'kovskiy politekhnicheskiy institut.

SOV/64-58-6-13/15

AUTHORS: Zil'berman, Ye. N., Fedoseyeva, G. T.

TITLE: On the Separation of Adiponitrile Obtained From Products of the Reaction Between Adipic Acid and Ammonia (O vydelenii adiponitrila iz produktov vzaimodeystviya adipinovoy kisloty i ammiaka)

PERIODICAL: Khimicheskaya promyshlennost', 1958, Nr 6, pp 377-379 (USSR)

ABSTRACT: One of the methods used for the industrial production of adiponitrile is the synthesis obtained from adipic acid and ammonia producing a heterogeneous mixture (Ref 1). Adiponitrile obtained in such a way is mostly dissolved in water. It is stated that the aromatic carbohydrates are a good extracting agent for adiponitrile since they do not react with it and have a relatively high steam pressure and specific weight. In order to study these possibilities of extraction analyses were, in the present case, carried out with the systems water-adiponitrile-benzene, water-adiponitrile-toluene, and water-adiponitrile-$(NH_4)_2SO_4$. Since good results can also be obtained by salting out the aqueous adiponitrile solutions, the analyses were carried out in the latter system. In a few cases the water content of the oil layer was determined by means of

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On the Separation of Adiponitrile Obtained From Products of the Reaction Between Adipic Acid and Ammonia SOV/64-58-6-13/15

the Fischer reagent (Ref 10). The comparison of the extractability of some carbohydrates is illustrated graphically on the basis of the data of the distribution of adiponitrile between water and the solvent. It appears from this that the introduction of a methyl-substitute into the benzene-ring reduces the concentration ratio of adiponitrile between the oil and the aqueous layer. The extractability decreases in the following order: benzene, toluene, ortho-xylene . On the basis of the observations made it is assumed that an extraction in the presence of inorganic salts would be especially effective. There are 5 figures, 1 table, and 10 references, 4 of which are Soviet.

Card 2/2

AUTHORS: Roginskaya, Ts. N., Svetozarskiy, S. V., Finkel'shteyn, A. I., Zil'berman, Ye. N. SOV/79-28-8-47/66

TITLE: Concerning the Question of the Molecular Structure of the Unsaturated Ketones Which Are the Bimolecular Condensation Product of Cyclohexanone (K voprosu o molekulyarnom stroyenii nenasyshchennykh ketonov-bimolekulyarnykh produktov kondensatsii tsiklogeksanona)

PERIODICAL: Zhurnal obshchey khimii, 1958, Vol. 28, Nr 8, pp. 2229 - 2233 (USSR)

ABSTRACT: On the basis of investigations on the chemical properties of the ketone $C_{12}H_{18}O$(I) the structure (A) (Refs 6,9-11) or structure (B)(Refs 9,10,12-12) may be assigned to it, or it may be considered as a mixture of the two isomers (Refs 15,16). Those supporting structure (B) (Refs 10,14) base their arguments on the chemical reactions of the ketone and cite the rule of Dikman-Kon(Dikman,Kon), according to which the semicyclic double bond in the cyclohexane ring is less stable than the endocyclic double bond. The question of the structure of this ketone was more

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Concerning the Question of the Molecular Structure of the Unsaturated Ketones Which Are the Bimolecular Condensation Product of Cyclohexanone SOV/79-28-8-47/66

disputed by the discovery of a new unsaturated ketone $C_{12}H_{18}O$(II), by Reese (Rize)(Ref 12) in 1942. According to his reactions there could be not doubt that α,β double bonds were present. In contrast to (I) this compound is a solid, relatively less stable, and on warming changes to the liquid ketone (I). The spectra of these two ketones, (I) and (II), had not previously been investigated. The authors investigated the optical properties of (I) and (II) in order to establish their molecular structures. The combined spectra obtained are given in the table, while the infra-red absorption spectra appear in figures 1 and 2 and the ultra-violet spectra appear in figures 3 and 4. It was shown that both compounds are different forms of the α,β-unsaturated ketone 2-cyclohexylide cyclohexane. Figures 1-4 illustrate the spectral analytical results; figure 5 shows the structure of the two stereoisomers of 2-cyclohexylide cyclohexane. There are 5 figures, 1 table, and 20 references, 2 of which are Soviet.

Card 2/3

Concerning the Question of the Molecular Structure of the Unsaturated Ketones Which Are the Bimolecular Condensation Product of Cyclohexanone SOV/79-28-8-47/66

SUBMITTED: May 22, 1957

Card 3/3

SOV/80-59-1-40/44

AUTHORS: Kalikova, A.Ye., Zil'berman, Ye.N., Roginskaya, Ts.N. and Smirnova, M.M.

TITLE: On Purifying Adipo-Nitryl (Ob ochistke adiponitrila)

PERIODICAL: Zhurnal prikladnoy khimii, 1959, Nr 1, pp 227-230 (USSR)

ABSTRACT: Adiponitryl is an intermediate product in the industrial synthesis of the adipic hexamethylenediamine which is used in the production of polyamide resins. The usual methods employed in this synthesis do not ensure the wanted purity of the adiponitryl. In the present notice the authors suggest, on the basis of chemical analyses and studying the ultraviolet spectrum of the adiponitryl, a new method of its purifying. They show that by treating adiponitryl with sulfuric acid and its subsequent flushing with ammonium bisulfite solution it is possible to obtain the pure and stable (in storing) product which practically does not absorb ultraviolet rays in the range from 220 to 400 mμ wavelength.

Card 1/2

On Purifying Adipo-Nitryl. SOV/80-59-1-40/44

There are 4 graphs and 15 references, 4 of which are Soviet, 5 American, 3 German, 2 French and 1 English.

SUBMITTED: May 16, 1957

Card 2/2

ZIL'BERMAN, Ye.N.; TEPLYAKOV, N.M.

[redacted]

New method of polyester synthesis. Vysokom. soed. 1 no.6:934
Je '59. (MIRA 12:10)

(Chemistry, Organic--Synthesis)

5(3)

SOV/63-4-1-26/31

AUTHORS: Zil'berman, Ye.N., Kulikova, A.Ye., Sazanova, N.A.

TITLE: Method for Preparing Amides From Nitriles (Sposob polucheniya amidov iz nitrilov)

PERIODICAL: Khimicheskaya nauka i promyshlennost', 1959, Vol 4, Nr 1, pp 135-136 (USSR)

ABSTRACT: A convenient method for the transformation of nitriles to amides in the cold and in the presence of hydrogen chloride is shown here. The interaction product of 1 mole of benzonitrile and two moles of hydrogen chloride is treated with 1 mole of water which produces the compound $C_6H_5CONH_2 \cdot HCl$. On dissolving it in water it is transformed into benzamide. The hydration reactions of nitriles proceed not only in ether, but also in other organic solvents, like dioxane, benzene, CCl_4, etc. There are 2 references, 1 of which is Soviet and 1 German.

SUBMITTED: July 21, 1958

Card 1/1

5(4)

SOV/79-29-5-10/75

AUTHORS: Svetozarskiy, S. V., Zil'berman, Ye. N., Razuvayev, G. A.

TITLE: Low-Temperature Autocondensation of Cyclohexanone (Nizkotemperaturnaya avtokondensatsiya tsiklogeksanona)

PERIODICAL: Zhurnal obshchey khimii, 1959, Vol 29, Nr 5, pp 1454 - 1457 (USSR)

ABSTRACT: In the present paper a $C_{18}H_{30}O_3$ compound (I) was obtained by means of autocondensation of cyclohexanone at room temperature in the presence of solid sodium hydroxide as catalyst. It represents a tricyclic product with a carbonyl- and two ternary hydroxyl-groups. On heating with solid sodium hydroxide (I) decomposes to give cyclohexanone and 3-cyclohexylidene-cyclohexanone. Owing to the reaction of (I) with concentrated sulfuric acid as well as on short heating 2 water molecules are splitted off and an unsaturated $C_{18}H_{26}O$-ketone (II) is formed. On protracted heating of (I) and (II) the dodecahydro-1,2,3,4,5,6,7,8,9,10,11,12-triphenylene (III) is formed in good yield. Owing to the transformation of (I) into (III) the com-

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pound $C_{18}H_{30}O_3$ must be a dioxy-ketone with the structure of the 2-[2-(1-oxy-cyclohexyl)-1-oxy-cyclohexyl]-cyclohexanone (Fig 1). The easy transformation of (II) into (III) may be due to steric factors. In order to define the structure of the ketone (II) its ultraviolet spectrum in diethyl ester (Fig 2) was taken. It was found that (II) can only have the structure of 2-[2-(Δ^1-cyclohexenyl)-cyclohexylidene]- cyclohexanone. No usual derivatives of carbonyl compounds could be obtained from the ketone (II) and the dioxy-ketone (I) which is due to steric hindrances. It has to be mentioned that (III) is usually obtained in a yield of 6% at the most (Ref 3). The transformations of (I) and (II) into (III) here described are a new and convenient method for the preparation of dodecahydrotriphenylene. The authors express their gratitude to Ts. N. Roginskaya for taking the ultraviolet spectra. There are 3 figures and 9 references, 1 of which is Soviet.

SUBMITTED: April 11, 1958

Card 2/2

5(3)

SOV/79-29-5-61/75

AUTHORS: Zil'berman, Ye. N., Kulikova, A. Ye.

TITLE: Products of the Reaction of Adiponitrile With Hydrogen Chloride and Their Hydrolysis (Produkty vzaimodeystviya adiponitrila s khloristym vodorodom i ikh gidroliz)

PERIODICAL: Zhurnal obshchey khimii, 1959, Vol 29, Nr 5, pp 1694-1699 (USSR)

ABSTRACT: In the hydrochlorination of adiponitrile two molecules of hydrogen chloride first combine selectively with a nitrile group and the hydrochloride of imonium chloride of the δ-cyanovalerianic acid is formed. A further hydrochlorination yields dihydrochloride of diimonium chloride of adipinic acid. Chlorides of imonium hydrin passing over to the amines of the corresponding acids by hydrolysis and neutralization form quantitatively by the reaction of equivalent quantities of hydrochlorides of imonium chlorides and water. A new method is suggested for the hydrolysis of nitriles in the presence of concentrated halogen hydracids. New methods of producing δ-cyanovaleramide, δ-cyanovalerianic acid and adipamide in high yields were introduced. K. K. Ish cooperated in the experimental work. There are 2 tables and 12 references,

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SOV/79-29-5-61/75

Products of the Reaction of Adiponitrile With Hydrogen Chloride and Their Hydrolysis

4 of which are Soviet.

SUBMITTED: March 17, 1958

Card 2/2

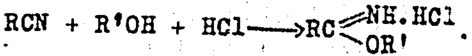
5(3)

SOV/79-29-9-50/76

AUTHORS: Zil'berman, Ye. N., Kulikova, A. Ye.

TITLE: Synthesis of the Imino Esters and the Esters of δ-Cyanovaleric Acid

PERIODICAL: Zhurnal obshchey khimii, 1959, Vol 29, Nr 9, pp 3039-3041 (USSR)



ABSTRACT: At present it is generally assumed (Refs 1-3) that an equivalent amount of nitrile, alcohol, and hydrogen halide is necessary for the formation of imino esters and that the reaction takes place in a stage according to the pattern $RCN + R'OH + HCl \longrightarrow RC\begin{matrix} \nearrow NH.HCl \\ \searrow OR' \end{matrix}$. In this case, however, the yields are low and the final products are rarely obtained in pure state (Refs 4,5). In continuation of a preceding paper of the authors (Ref 6) and on the basis of the publication by I. Guben (Ref 4) on the participation of two molecules of hydrogen chloride in the formation of an imino ester group which is not quite clear it was assumed to be more expedient to carry out the synthesis of the imino esters in two stages, i.e. to add first two molecules HCl to the nitrile group and to conclude the reaction with alcohol. Thus it was possible to obtain

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SOV/79-29-9-50/76

Synthesis of the Imino Esters and the Esters of δ-Cyanovaleric Acid

an almost solid hydrochloric methylimino ester of δ-cyanovaleric acid (I) from adiponitrile, methanol, and HCl in ether-, benzene-, dioxane- or carbon tetrachloride medium in theoretical yields. (Scheme 1). The molecular compound (II) of the hydrochloride of (I) and of adiponitrile resulted from the same components in a molar ratio of 1:1:0.5. Molecular compounds of this type have hitherto not been described. According to the reaction described in publications (Refs 3,5) i.e. in a molar ratio 1:1:1 and in the passing of hydrogen chloride through the ether or benzene solution of adiponitrile and methanol also the molecular compound (II) was formed besides the hydrochloride of (I). By hydrolyzing the reaction product a mixture of methyl ester of δ-cyanovaleric acid (60% yield) and adiponitrile were formed. However, it was not possible to obtain the methyl ester of δ-cyanovaleric acid (III) from this mixture since it becomes unstable in distillation and regroups into adiponitrile and into the dimethyl esters of adipinic acid; this explains the lack of a description of methyl ester (III) in the patents (Ref 5). By hydrolyzing the hydrochloride of (I) synthesized by the authors, methyl ester (III) could be

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SOV/79-29-9-50/76

Synthesis of the Imino Esters and the Esters of δ-Cyanovaleric Acid

obtained which needed no special purification (Table). The ethyl-, n. propyl-, n. butyl, n. amyl-, n. hexylimino esters of δ-cyanovaleric acid were crystallized with difficulty. Therefore they were directly hydrolyzed in the reaction mass under the formation of the corresponding esters of δ-cyanovaleric acid (IV)-(VIII) (Table). There are 1 table and 8 references, 3 of which are Soviet.

SUBMITTED: July 30, 1958

Card 3/3

KULIKOVA, A.Ye.; ZIL'BERMAN, Ye.N.; ROGINSKAYA, TS.N.; SMIRNOVA, M.M.

Purification of adiponitrile. Zhur.prikl.khim. 32 no.1:227-230 Ja '59. (MIRA 12:4)

(Adiponitrile)

5(3), 15(9)

SOV/80-32-4-28/47

AUTHORS: Berlin, A.A., Zil'berman, Ye.N., Rybakova, N.A., Sharetskiy, A.M. and Yanovskiy, D.M.

TITLE: Investigation of Some Epoxide Stabilizers for Polyvinylchloride (Issledovaniye nekotorykh epoksidnykh stabilizatorov polivinilkhlorida)

PERIODICAL: Zhurnal prikladnoy khimii, 1959, Vol 32, Nr 4, pp 863-868 (USSR)

ABSTRACT: One of the real drawbacks of chlorine-containing polymers is their low resistance to the effects of heat and light. Various stabilizers have been proposed for increasing their thermal resistance. The present article furnishes comparative data on the stabilizing effect of some commercial and newly synthesized (by the authors) compounds. The following stabilizers for polyvinylchloride have been synthesized and tested: low-molecular epoxide resins on the base of epichlorohydrin and 2,2-bis-(4-oxy-3-methylphenyl)-propane, 1,1-bis-(4-oxyphenyl)-cyclohexane, 1,1-bis-(4-oxy-3-methylphenyl)-cyclohexane and 2,2-bis-(4-oxy-3-nitrophenyl)-propane; cis-9,10-epoxybutyl stearate, epoxidized castor oil and sperm oil. It has been shown that these compounds, with exception

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SOV/80-32-4-28/47

Investigation of Some Epoxide Stabilizers for Polyvinylchloride

of 2,2-bis-(4-oxy-3-nitrophenyl)-propane are effective thermostabilizers for polyvinylchloride, which improve also physicomechanical properties of the masticated rubber. The application of mixtures of low-molecular epoxide resins or epoxidized triglycerides with lead silicate makes it possible to attain a greater thermal resistance of polyvinylchloride and a better quality of the masticated rubber, than the separate application of those stabilizers.
There are 2 graphs, 2 tables and 10 references, 1 of which is Soviet, 5 English, 2 American and 2 German.

SUBMITTED: September 20, 1957

Card 2/2

5.3610

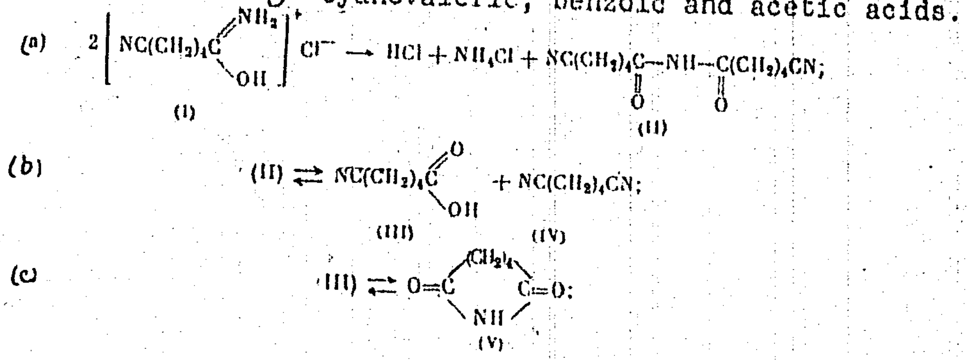
77898
SOV/79-30-2-49/78

AUTHORS: Kulikova, A. Ye., Zil'berman, Ye. N.

TITLE: Pyrolysis of Amide Hydrochlorides

PERIODICAL: Zhurnal obshchey khimii, 1960, Vol 30, Nr 2, pp 596-600 (USSR)

ABSTRACT: The article deals with pyrolysis of imoniumhydrin chlorides of δ-cyanovaleric, benzoic and acetic acids.

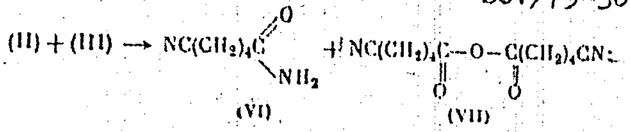


Card 1/3

Pyrolysis of Amide Hydrochlorides

77898
SOV/79-30-2-49/78

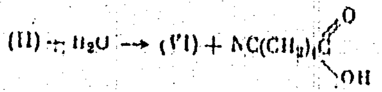
(d)



$$(II) + (III) \rightarrow NC(CH_2)_4C(=O)NH_2 + NC(CH_2)_4C(=O)-O-C(=O)(CH_2)_4CN;$$

(VI) (VII)

(e)



$$(II) + H_2O \rightarrow (VI) + NC(CH_2)_4C(=O)OH$$

(III)

Pyrolysis of (I) gives hydrogen chloride, ammonium chloride, di-(δ -cyanovalero)-amide (II) (described here for the first time) (mp 138-140), δ -cyanovaleric acid (III), adiponitrile (IV), adipimide (V), δ -cyanvaleramide (VI), and, probably, δ -cyanvaleric anhydride (VII). The experiments showed that in the pyrolysis products the amount of secondary amide (II) decreases, and that of adiponitrile (IV) and acid (III) increases with the time of heating. This means that the primary pyrolysis products of (I) are hydrogen chloride, ammonium chloride, and secondary amide (II). On heating, the secondary amide (II) decomposes into nitrile (IV) and acid (III) which partially isomerizes into amide (V). Acylation of the secondary amide (II)

Card 2/3

Pyrolysis of Amide Hydrochlorides

77898
SOV/79-30-2-49/78

with δ-cyanovaleric acid (III) results in an amide (VI) and an anhydride (VII). Pyrolysis of imoniumhydrin chlorides of benzoic and acetic acids was used to confirm the proposed reaction course. The experiments showed that the reactions follow the above rules, but form acid chlorides instead of anhydrides, which can be explained by the hydrogen chloride reaction with either anhydride or secondary amide. It should be noted that thermal decomposition of amide hydrochlorides gives the same products as the pyrolysis of free amides, but the latter occurs at much higher temperatures. There are 2 tables; and 12 references, 2 German, 3 Soviet, 1 Dutch, 4 U.S., 2 U.K. The U.S. and U.K. references are: C. D. Hurd, M. F. Dull, J. Am. Chem. Soc., 54, 2532 (1932); D. Davidson, H. Skovronek, J. Am. Chem. Soc., 80, 376 (1958); D. P. N. Satschell, Chem. and Ind., 1442, (1958); A. W. Ralston, H. J. Harwood, W. O. Pool, J. Am. Chem. Soc., 59, 986 (1937); D. Davidson, M. Karten, J. Am. Chem. Soc., 78, 1066 (1956).

SUBMITTED: February 13, 1959

Card 3/3

5.3610

78302
SOV/79-30-3-56/69

AUTHORS: Svetozarskiy, S. V., Razuvayeva, G. A., Zil'berman, Ye. N.

TITLE: Synthesis of 2-Substituted of 4-Pentamethylene-5,6-Tetramethylene-2,3,4,5-Tetrahydropyrimidines

PERIODICAL: Zhurnal obshchey khimii, 1960, Vol 30, Nr 3, pp 1020-1023 (USSR)

ABSTRACT: It was shown that the previously obtained (by the authors (ZhOKh, 26, 601, 1956)) 2,4-dipentamethylene-5,6-tetramethylene-2,3,4,5-tetrahydropyrimidine (Ia) can also be prepared by condensation of 2-(1-aminocyclohexyl)-cyclohexanone (II) with ammonia.

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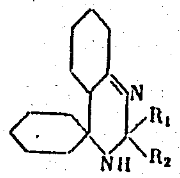
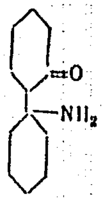
Synthesis of 2-Substituted of 4-Pentamethylene-5,6-Tetramethylene-2,3,4,5-Tetrahydropyrimidines

78302
SOV/79-39-3-56/69


(I)

(Ia) R_1, $R_2 = (CH_2)_5$; (Ib) $R_1 = R_2 = CH_3$; (Ic) $R_1 = CH_3$, $R_2 = C_2H_5$; (Id) $R_1 = H$, $R_2 = CH_3$.


(II)

The following new compounds were obtained by condensation of II and ammonia with different carbonyl compounds. 2,2-Dimethyl-4-pentamethylene-5,6-tetramethylene-2,3,4,5-tetrahydropyrimidine (Ib) was obtained by condensation of II, ammonia, and acetone (91%), d_4^{20} 1.002, n_D^{20} 1.5128; 2-methyl-2-ethyl-4-pentamethylene-5,6-tetramethylene-2,3,4,5-tetrahydropyrimidine (Ic) (90.5%), by condensation of II, ammonia,

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Synthesis of 2-Substituted of 4-Pentamethylene-5,6-Tetramethylene-2,3,4,5-Tetrahydropyrimidines

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SOV/79-39-3-56/69

and methyl ethyl ketone, d_4^{20} 1.001, n_D^{20} 1.5138; 2-methyl-4-pentamethylene-5,6,-tetramethylene-2,3,4,5-tetrahydropyrimidine (Id) (91%), by condensation of II, ammonia, and acetaldehyde, d_4^{20} 1.02, n_D^{20} 1.5202. It was shown that (1) ammonia readily adds to cyclohexanone to form a stable (at low temperatures) compound with a 1:1 molar ratio; (2) this compound is not an intermediate product in the preparation of II and Ia from cyclohexanone and ammonia. There are 7 references, 1 U.K., 4 German, 2 Soviet. The U.K. reference is: R. B. Bradbury, N. C. Hancox, H. H. Hatt, J. Chem. Soc., 1947.

SUBMITTED: January 22, 1959

Card 3/3

AIL'BERMAN, YE. N.

FREYDLIN, L.Kh.; SLADKOVA, T.A.; KUDRYAVTSEV, G.I.; SHEYN, T.I.; AIL'BERMAN, Ye.N.; FEDOROVA, R.G.

Catalytic hydrogenation of aromatic nitriles and the properties of polyamides obtained from p-(β,β'-diaminodiethylbenzene). Izv. AN SSSR. Otd.khim.nauk no.9:1713-1715 S '61. (MIRA 14:9)

1. Institut organicheskoy khimii im. N.D.Zelinskogo AN SSSR i Vsesoyuznyy nauchno-issledovatel'skiy institut iskusstvennogo volokna.
(Nitriles) (Hydrogenation) (Polyamides)

ACCESSION NR: AP4040541 S/0064/64/000/006/0408/0416

AUTHOR: Zil'berman, Ye. N.

TITLE: Production of monomers having a high degree of purity for polyamide resins

SOURCE: Khimicheskaya promy*shlennost', no. 6, 1964, 408-416

TOPIC TAGS: literature survey, polyamide resin, polyamide resin monomer, synthesis, caprolactam, hexamethylenediamine adipate, production, purity, side reactions, Beckmann rearrangement, purification

ABSTRACT: In this survey the domestic and foreign literature on the impurities in monomers for polyamide resins, and the factors causing these impurities, is reviewed. The survey was directed to the synthesis of the two monomers ε-caprolactam (made primarily by forming the oxime of cyclohexanone and subsequent Beckmann rearrangement) and hexamethylenediamine adipate (especially the oxidation of cyclohexane or cyclohexanol to adipic acid, preparation of adiponitrile and hydrogenation to hexamethylenediamine, and subsequent reaction with adipic acid). Three groups of side reactions normally accompanying the basic reactions were studied--those resulting from deviations from established technological conditions, or from

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ACCESSION NR: AP4040541

inadequacies in apparatus design for the processes, or those depending on the presence of impurities in the initial products. The necessary measures for suppressing side reactions and removing impurities from these monomers were sought. It was concluded that all the factors affecting the quality of caprolactam and hexamethylendiamine adipate monomers are not known. To obtain high quality monomers it is necessary to suppress side reactions in all (not just the final) stages of production and to separate impurities from the initial and intermediate products in the synthesis of the monomer. Orig. art. has: 26 equations and 9 formulas.

ASSOCIATION: None

SUBMITTED: 00 ENCL: 00

SUB CODE: OC NO REF SOV: 038 OTHER: 026

Card 2/2

GANINA, V.I.; IVCHER, T.S.; POMERANTSEVA, E.G.; PEREPLETCHIKOVA, Ye.M.;
ZIL'BERMAN, Ye.N.

Polarographic and spectrophotometric determination of α, β-unsaturated ketones in cyclohexanone. Zav. lab. 30 no.5:541-542 '64. (MIRA 17:5)

LAZARIS, A.Ya.; ZIL'BERMAN, Ye.N.; LUNICHEVA, E.V.; VEDIN, A.M.

Study of the formation of by-products during hydrogenation of adiponitrile. Zhur. prikl. khim. 38 no.5:1097-1101 My '65.
(MIRA 18:11)

L 44348-66 EWT(m)/EWP(j)/T IJP(c) WW/RM

ACC NR: AP6023056 (A) SOURCE CODE: UR/0191/66/000/004/0003/0004

AUTHOR: Zegel'man, V. I.; Zil'berman, Ye. N.; Kotlyar, I. B.; Svetozarskiy, S. V.

29

B

ORG: none

TITLE: Low temperature emulsion polymerization of vinyl chloride

SOURCE: Plasticheskiye massy, no. 4, 1966, 3-4

TOPIC TAGS: emulsion polymerization, vinyl chloride, polyvinyl chloride, vinyl plastic

ABSTRACT: Kinetics of vinyl chloride polymerization was studied at -20°C, pH=3-13, duration 0-4 hours, using a mixture of sodium alkylsulfonates with 14-18 carbon atoms as emulsifier and ammonium persulfate- ferrous sulfate (0-2 g/l $(NH_4)_2S_2O_8$) redox system as initiator. A maximum of 80-85% yields of polyvinyl chloride were obtained with an equimolar ratio of the components of the redox system at pH=3, polymerization duration equal to 2-4 hours, and 1-2% emulsifier. The polymer molecular weight was found to increase with increasing amount of emulsifier used. The low temperature polymerization used in this work gave PVC with 95-100°C glass point. Orig. art. has: 4 figures.

15

SUB CODE: 07/ SUBM DATE: none/ ORIG REF: 007/ OTH REF: 001

UDC: 678.743.22 : 66.095.262.3

Card 1/1 blg

ZIL'BERMAN, Ye.N.; STRIZHAKOV, O.D.; PEREPLETCHIKOVA, Ye.M.

Studying the thermal decomposition of the ester plasticizers of polyvinyl chloride. Plast. massy no. 12:29-32 '65 (MIRA 19:1)

PYRYALOVA, P.S.; ZIL'BERMAN, Ye.N.

Reduction of aromatic and branched aliphatic nitriles with stannous chloride. Izv. vys. ucheb. zav.; khim. i khim. tekh. 8 no.1:82-87 '65. (MIRA 18:6)

1. Gor'kovskiy politekhnicheskiy institut imeni Zhdanova, kafedra tekhnologii organicheskogo sinteza.

TOMASHCHUK, V.I.; KOTLYAR, I.B.; SHNAYTSKIY, A.M.; ZIL'BERMAN, Ye.N.

Polymerization of vinyl chloride in the presence of hydrogen chloride acceptors. Plast.massy no.6:6-8 '65. (MIRA 18:8)

IVCHER, T.S.; ZIL'BERMAN, Ye.N.; PEREPLETCHIKOVA, Ye.M.

Kinetic recombination currents in the polarographic reduction of 2-cyclohen-1-one. Zhur. fiz. khim. 39 no.3:749-751 Mr '65. (MIRA 18:7)

Card 1/2

L 62172-65

and 5 tables.

ACCESSION NR: AP5011191

[illegible]