VORONKOV, M. G.

1 Mar 1943

USSR/Chemistry - Thiophenes, Phenyl
Chemistry - Synthesis

"New Method of Synthesis of Phenylthiophenes and Their Homologs," A. S. Broun, M. G. Voronkov, Chem Faculty, Leningrad State U, 4 pp

"Dok Akad Nauk SSSR, Nova Ser" Vol LIX, No 7

Authors showed in previous article that in heating alpha and beta-dimethylstyrol or alpha, beta, betatrimethylstyrol with three equivalents of sulfur at 190-210°C until complete cessation of precipitation of hydrogen sulfides, smooth formation of betaphenylthiophene and beta-phenyl-beta'-thitolene results. Assuming that this reaction has general significance, they tried to synthesize the remaining two theoretically possible beta-phenylthiotolenes. Consequently, in realization of the reaction of sulfur with alpha-methyl-beta-ethylstyrol and betamethyl-alpha-ethylstyrol, obtained beta-phenylalpha-thiotolene and beta-phenyl-alpha thiolene heretofore unknown. Submitted by Academician A. N. Terenin, 5 Jan 1948.

PA 47T10

PA47T13

VORONKOV, M. G.

USSR/Chemistry - Heterocyclic Compounds Mar 1948
Chemistry - Sulfur, Reaction

"New Trend of Sulfur Reaction in Unsaturated Compounds, and New Heterocyclic Compounds: Phenyl-Substituted 1, 2-Dithiole-3-Thione," M. G. Voronkov, A. S. Braun (Deceased), Chem Faculty Leningrad State U, 3 pp

"Dok Akad Nauk SSSR, Nova Ser" Vol LIX, No 8

Describes various reactions of sulfur phenylophenelins, and how substance with composition of $C_9H_6S_3$ obtained by heating 1-phenylpropene-1 at 190 - 220° C. Submitted by Academician A. N. Terenin, 22 Dec 1947.

47T13

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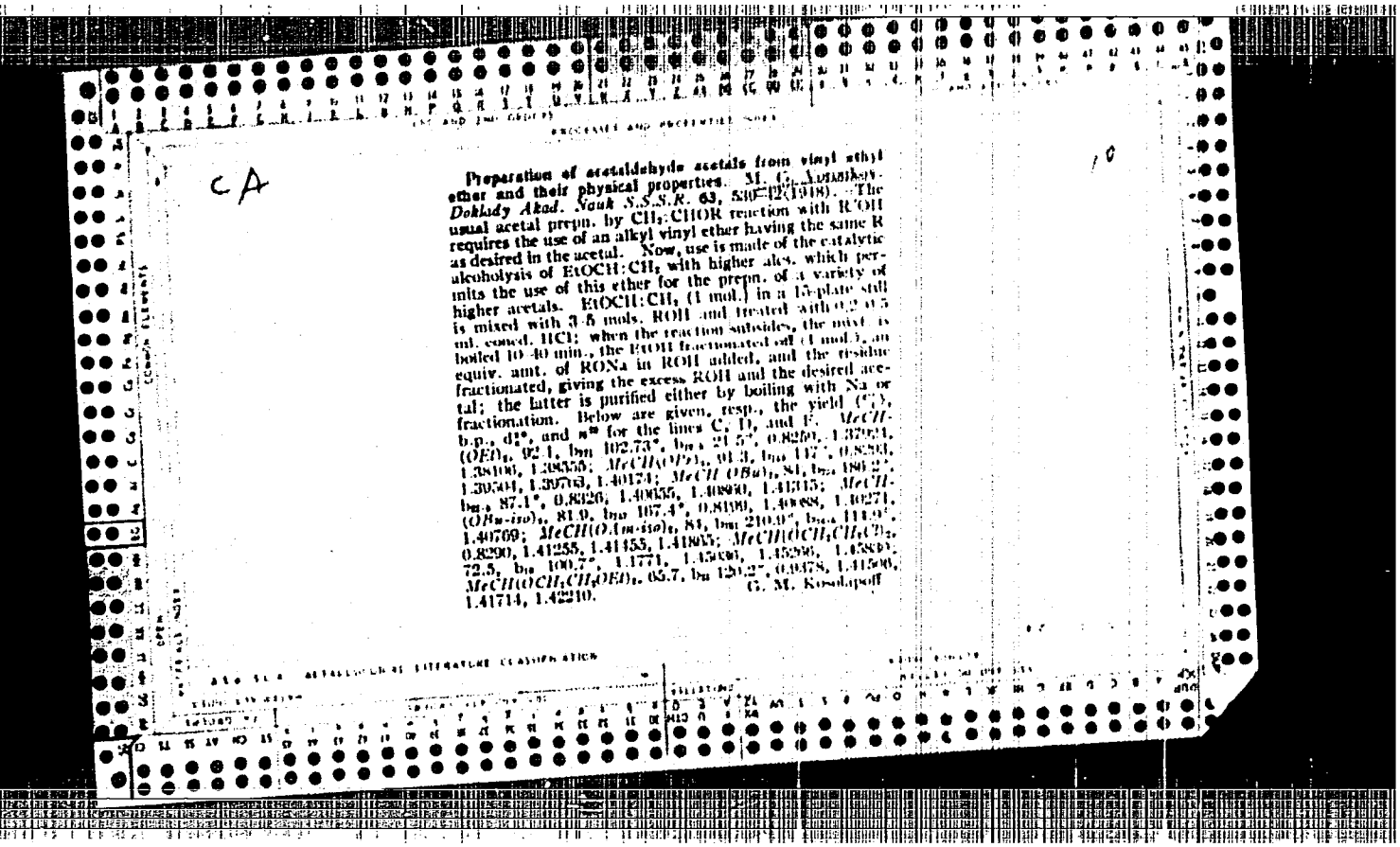

CA

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Preparation of acetaldehyde acetals from vinyl ethyl ether and their physical properties. M. G. Kuzmin. *Doklady Akad. Nauk S.S.S.R.* **63**, 529–32(1948). The usual acetal prepn. by CH_2:CHOR reaction with ROH requires the use of an alkyl vinyl ether having the same R as desired in the acetal. Now, use is made of the catalytic alcoholysis of EtOCH:CH_2 with higher alcs. which permits the use of this ether for the prepn. of a variety of higher acetals. EtOCH:CH_2 (1 mol.) in a 15-plate still is mixed with 3–5 mols. ROH and treated with 0.2–0.5 ml. concd. HCl; when the reaction subsides, the mixt. is boiled 10–40 min., the EtOH fractionated off (1 mol.), an equiv. amt. of RONa in ROH added, and the residue fractionated, giving the excess ROH and the desired acetal; the latter is purified either by boiling with Na or fractionation. Below are given, resp., the yield (%), b.p., d_4^{20}, and n^{20} for the lines C, D, and F. *MeCH*$(OEt)_2$, 92.1, bm 102.73°, bm 21.5°, 0.8260, 1.37954, 1.38100, 1.38355; *MeCH*$(OPr)_2$, 91.3, bm 147°, 0.8393, 1.39504, 1.39763, 1.40174; *MeCH*$(OBu)_2$, 81, bm 189.2°, bm 87.1°, 0.8426, 1.40355, 1.40800, 1.41315; *MeCH*$(OBu\text{-}iso)_2$, 81.9, bm 167.4°, 0.8399, 1.40468, 1.40271, 1.40769; *MeCH*$(OAm\text{-}iso)_2$, 84, bm 210.9°, bm 114.9°, 0.8290, 1.41255, 1.41455, 1.41805; *MeCH*$(OCH_2CH_2Cl)_2$, 72.5, bm 100.7°, 1.1771, 1.45430, 1.45590, 1.45889; *MeCH*$(OCH_2CH_2OEt)_2$, 65.7, bm 120.2°, 0.9378, 1.41500, 1.41714, 1.42210.

G. M. Kosolapoff

VORONKOV, M. G.

USSR/Chemistry -- Acetals Dec 48

"Obtaining Acetaldehyde-Acetals From a Vinylethyl Ester and Their Physical Characteristics," M. G. Voronkov, 3 1/3 pp

"Dok Ak Nauk SSSR" Vol LXIII, No 5

Develops a method to obtain acetaldehyde dialkyl acetals based on catalytic reaction of vinylethyl ester with alcohols of higher boiling point than that of ethyl alcohol. By this method a number of these acetals were synthesized with a good yield (up to 92%). Submitted by Acad A. E. Terenin 7 Oct 48.

55/49T4

VORONKOV, M.G.

PA149T18

USSR/Chemistry - Hydrocarbons, Sep/Oct 49
Structure
Analysis; Refractometric

"Refractometric Determination of the Number of Rings in Hydrocarbons," M. G. Voronkov, Chair of Org Chem, Leningrad State Ord of Lenin U, 3 pp

"Zhur Anal Khim" Vol IV, No 5

Relation between average dispersion ($\Delta \frac{20}{FC}$ and molecular weight is expressed by: $\Delta \frac{20}{FC} = (n_F^{20} - n_C^{20}) \cdot 10^4 = 83 + 0.6m - \frac{800\,(m-2)}{m}$, where m represents number of rings in hydrocarbon. On

149T18

USSR/Chemistry - Hydrocarbons, Sep/Oct 49
Structure (Contd)

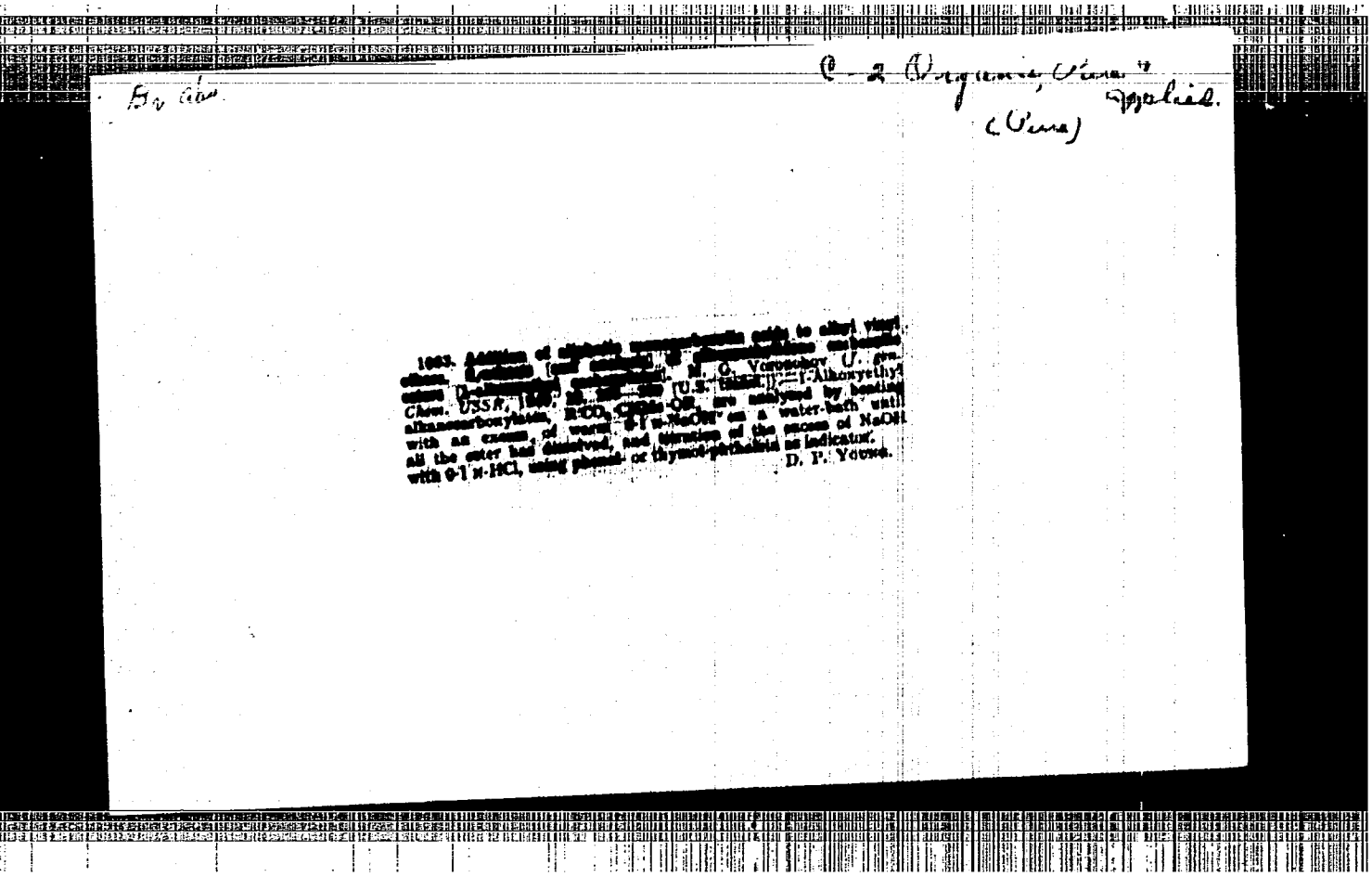
basis of this formula, suggests a method to determine number of rings in a molecule of an individual hydrocarbon or in molecules present in a mixture. Submitted 4 May 48.

149T18

VORONKOV, M. G.

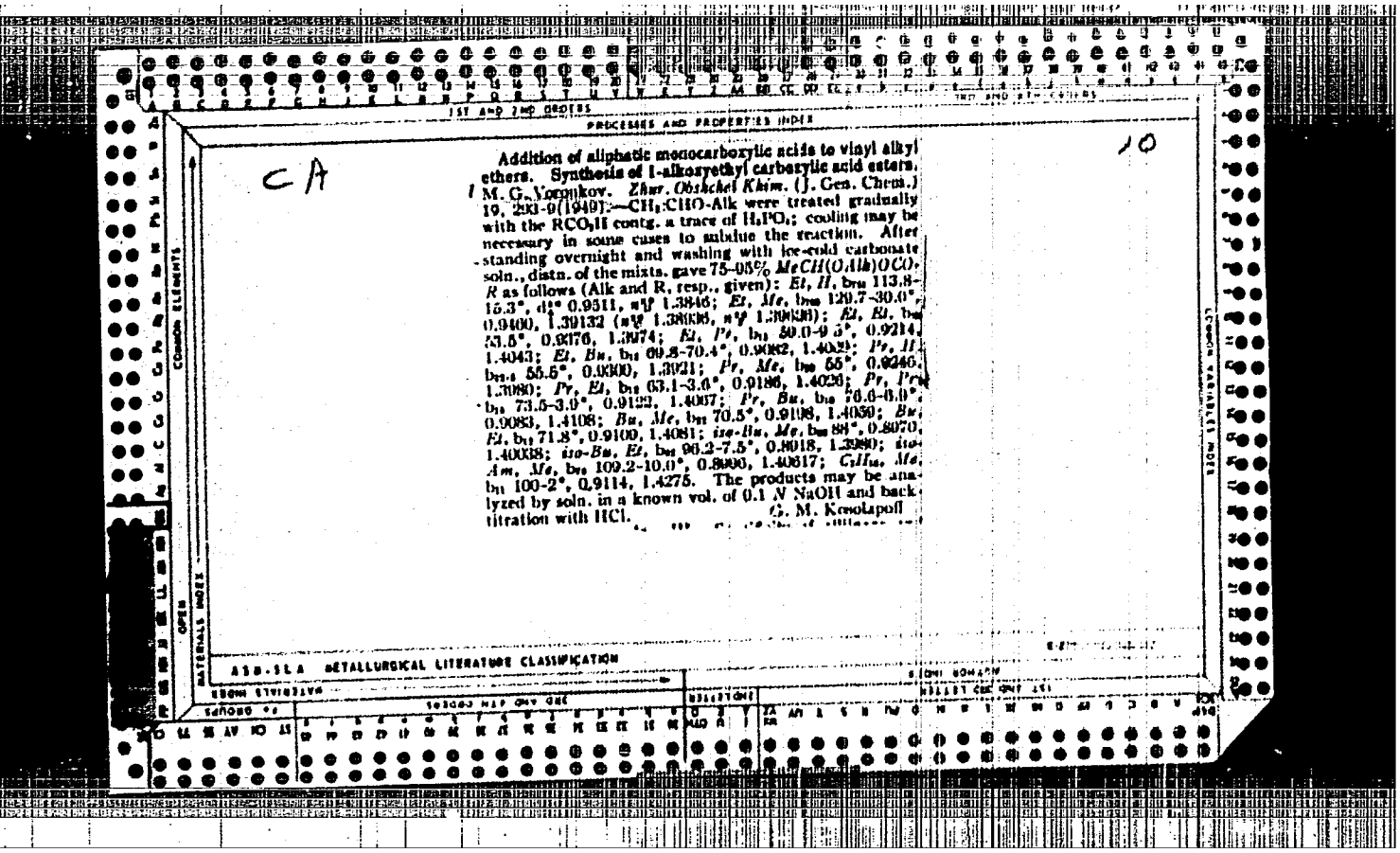
36590. Parakhor i Struktura Organicheskikh Soyedineniy. Zhurnal Fiz. Khimii, 1949, Vyp. 11, c. 1311-21. - Bibliogr: 20 Nazv.

SO: Letopis' Zhurnal'nykh Statey, Vol. 50, Moskva, 1949



Q-2 Organic Chem.
Halid.
(Urea)

1003. Action of alkyl isocyanates with [alkyl] esters of phosphorous and hypophosphorous acids. [and analogues.] M. G. Voronkov, U. Grabans, Doctoral dissertation [U.S. Thesis.] Latvian State Univ., Riga, USSR, 1956. 11 pp. (From Khim. Referat. Zh., Khim., 1957, Abstr. No. 37,000.) (In Russian.)—Diethyl alkanesulphonylphosphonates, $R{:}CO_2{\cdot}CH(R')\cdot OP(OEt)_2$, are analysed by heating with an excess of warm 0·1 N-NaOH on a water-bath until all the ester had dissolved, and titration of the excess of NaOH with 0·1 N-HCl, using phenol- or thymol-phthalein as indicator.
D. P. Young.



CA

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Addition of aliphatic monocarboxylic acids to vinyl alkyl ethers. Synthesis of 1-alkoxyethyl carboxylic acid esters. M. G. Voronkov. *Zhur. Obshchei Khim.* (J. Gen. Chem.) 19, 203-9(1949).—CH_2:CHO-Alk were treated gradually with the RCO_2H contg. a trace of H_3PO_4; cooling may be necessary in some cases to subdue the reaction. After standing overnight and washing with ice-cold carbonate soln., distn. of the mixts. gave 75–95% $MeCH(OAlk)OCOR$ as follows (Alk and R, resp., given): *Et, H*, b_{744} 113.8–15.3°, d_4^{20} 0.9311, n_D^{20} 1.3846; *Et, Me*, b_{760} 120.7–30.0°, 0.9400, 1.39132 (n_D^{20} 1.38939, n_D^{20} 1.39039); *Et, Et*, b_{30} 53.5°, 0.9176, 1.3974; *Et, Pr*, b_{31} 59.0–9.5°, 0.9214, 1.4043; *Et, Bu*, b_{31} 69.8–70.4°, 0.9082, 1.4029; *Pr, H*, b_{744} 55.5°, 0.9300, 1.3921; *Pr, Me*, b_{30} 55°, 0.9246, 1.3980; *Pr, Et*, b_{31} 63.1–3.6°, 0.9186, 1.4020; *Pr, Pr*, b_{31} 73.5–3.0°, 0.9122, 1.4007; *Pr, Bu*, b_{31} 76.0–6.0°, 0.9083, 1.4108; *Bu, Me*, b_{31} 70.5°, 0.9108, 1.4050; *Bu, Et*, b_{31} 71.8°, 0.9100, 1.4081; *iso-Bu, Me*, b_{30} 88°, 0.8970, 1.40038; *iso-Bu, Et*, b_{31} 90.2-7.5°, 0.9018, 1.3980; *iso-Am, Me*, b_{31} 109.2-10.0°, 0.8990, 1.40317; C_6H_{13}, *Me*, b_{31} 100-2°, 0.9114, 1.4275. The products may be analyzed by soln. in a known vol. of 0.1 *N* NaOH and back titration with HCl.

G. M. Kosolapoff

USSR/Chemistry - Sulfur Jul 49
Thiophene, Alpha-Phenyl

"Study of the Interaction of Sulfur With Unsaturated Compounds: III, Synthesis of Alpha-Phenylthiophene," M. G. Voronkov, A. S. Brown (deceased), G. O. Karpenko, B. L. Gol'shteyn, Chair of Org Chem, Leningrad Ord of Lenin State U imeni A. A. Zhdanov, 8½ pp

"Zhur Obshch Khim" Vol XIX, No 7

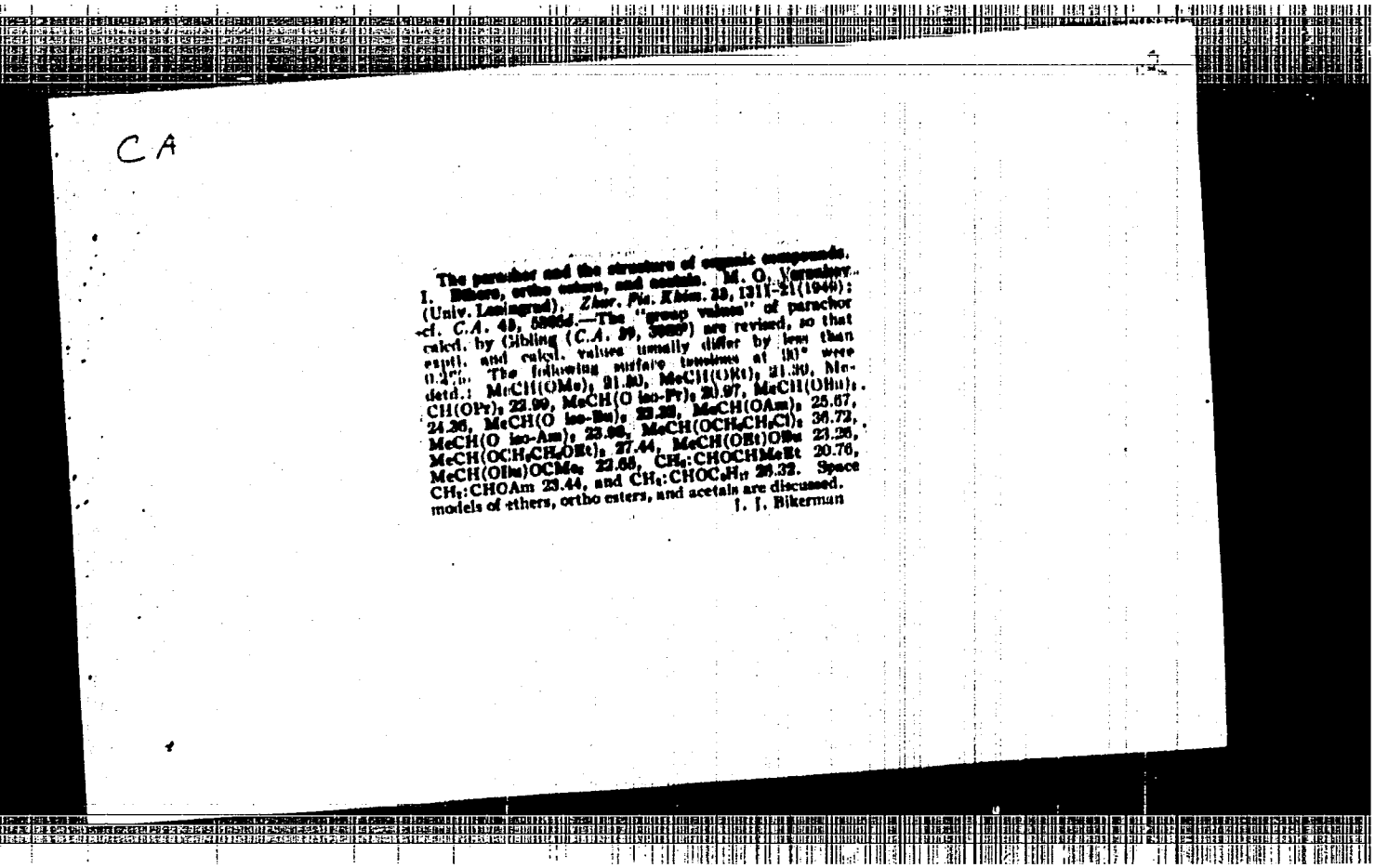
Interaction of sulfur with three isomers of 1-phenylbutene (1-phenylbutene-1, 1-phenylbutene-2, and 1-phenylbutene-3), 1-phenylbutadiene-1,3, and 1-phenylbutane produced alpha-phenylthiophene in all the cases. Then devised a simple method for synthesizing this product, and offered an explanation of the mechanism of its formation from aliphatic-aromatic hydrocarbons. Submitted 28 Apr 48.

2/50X64

CA

10

The reactions of sulfur with unsaturated compounds. IV. Phenyl-substituted 1,2-dithiole-3-thiones. M. G. Voronkov, A. S. Broun, and G. B. Karpenko (Leningrad State Univ.). *J. Gen. Chem.* (U.S.S.R.) 19, No. 10, 1395–411(1949)(English translation).—See *C.A.* 44, 1955e. E. J. C.



CA

The parachor and the structure of organic compounds. I. Ethers, ortho esters, and acetals. M. O. Yarmolinsky (Univ. Leningrad). *Zhur. Fiz. Khim.* 23, 1311-21(1949): cf. *C.A.* 43, 5866d.—The "group values" of parachor calcd. by Gibling (*C.A.* 39, 3999i) are revised, so that calcd. and calcd. values usually differ by less than 0.3%. The following surface tensions at 18° were detd.: MeCH(OMe)$_2$ 21.80, MeCH(OEt)$_2$ 21.30, MeCH(OPr)$_2$ 22.99, MeCH(O iso-Pr)$_2$ 20.97, MeCH(OBu)$_2$ 24.36, MeCH(O iso-Bu)$_2$ 23.38, MeCH(OAm)$_2$ 25.67, MeCH(O iso-Am)$_2$ 23.98, MeCH(OCH$_2$CH$_2$Cl)$_2$ 36.72, MeCH(OCH$_2$CH$_2$OEt)$_2$ 27.44, MeCH(OEt)OBu 23.26, MeCH(OBu)OMe 22.68, CH$_2$:CHOCHMeEt 20.76, CH$_2$:CHOAm 23.44, and CH$_2$:CHOC$_6$H$_{13}$ 26.32. Space models of ethers, ortho esters, and acetals are discussed.
I. J. Bikerman

VORONKOV, M. G.

13C

Reaction of sulphur with unsaturated compounds. V. Action of sulphur on mono-unsaturated aliphatic hydrocarbons. A. S. Brown, M. G. Voronkov, and K. P. Kashkova (*J. gen. Chem. USSR*, 1950, 20, 726—738 [U.S.transl., 765—776]).—Uncatalysed reaction of $CHMe:CMe_2$, $CHMe:CHEt$, and $CMe_2:CMe_2$ with excess of S, at 170° under pressure, proceeds without elimination of H_2S. The products are volatile RS_nR' (where $n = 1$, 2, or 3, and R and R′ are alkyl and alkenyl groups, respectively) and (except in the case of $CMe_2:CMe_2$) solid disulphides [1 : 2-dithiacyclopent-4-ene-3-thione] (cf. A., 1950, II, 1303). A free-radical reaction is postulated, involving intermediate perthiols $R'S_nH$, which add across the olefinic linking of R′H to give $R'S_nR$; n varies with reaction temp., and, at higher temp., compounds where $n = 1$ predominate.

Heating $CHMe:CMe_2$, b.p. 38·3—38·5°/760 mm., d_4^{23} 0·6628, n_D^{23} 1·38700, with S (1·5 or 2 g.-at.) at 170 ± 5° (18—20 hr.) gives a red liquid, steam-distillation of which affords volatile sulphides (68%) and a residue (16%). The residue contains higher sulphides (S_3—S_6), and the distillate on fractionation gives the yellowish *disulphide* [$CMe_2:CH\cdot CH_2\cdot S_2\cdot CH_2Bu^t$], $C_{10}H_{22}S_2$, b.p. 87·5—88·0°/2 mm., d_4^{20} 0·9521, n_D^{20} 1·50518 [oxidised by $KMnO_4$ to $COMe_2$ and (?)AcOH], the corresponding dark orange *trisulphide*, $C_{10}H_{22}S_3$, b.p. 104·5—106·5°/2 mm., d_4^{20} 1·0157, n_D^{20} 1·52851, the *thiol* [(?)2-*methylbut-2-ene-4-thiol*], $C_5H_{10}S$, b.p. 108—107°/740 mm., d_4^{20} 0·8598, n_D^{20} 1·4525, and the *sulphide* [$CMe_2:CH\cdot CH_2\cdot S\cdot CH_2Bu^t$], $C_{10}H_{20}S$, b.p. 80—65°/3·5 mm., d_4^{20} 0·8913, n_D^{20} 1·48615. A red-orange solid deposited from the steam-distillate is probably 4 : 5-*dimethyl*-1 : 2-*dithiacyclopent*-3-*ene*-5-*thione* [3 : 4-*dimethyl*-1 : 2-*dithiol*-3-*thione*], $C_5H_6S_3$, m.p. 95·5°. Analogously, $CHMe:CHEt$ with S (1·5 g.-at.) at 170° (11 hr.) gives the yellowish *disulphide*, $C_{10}H_{22}S_2$, b.p. 88—92°/2 mm., d_4^{20} 0·9508, n_D^{20} 1·50918, the orange *trisulphide*, $C_{10}H_{22}S_3$, b.p. 109·0—102·2°/2 mm., d_4^{20} 1·0301, n_D^{20} 1·54351, and the yellow 5-*ethyl*-1 : 2-*dithiol*-3-*thione* [3-*ethyl*-1 : 2-*dithiacyclopent*-3-*ene*-5-*thione*], $C_5H_6S_3$, m.p. 56·0—56·5°. $CMe_2:CMe_2$ reacts readily with S (2 g.-at.) at 170° (6 hr.) giving principally the orange *trisulphide*, $C_6H_{12}S_3$, b.p. 122·5—120·5°/2·5 mm., d_4^{20} 1·0121, n_D^{20} 1·53550; distillation of the reaction products at atm. pressure, however, yields 2 : 3-*dimethylbut*-1-*ene*-3-*thiol*, $C_6H_{12}S$, b.p. 135·5—136·5°/757·5 mm., d_4^{20} 0·8766, n_D^{20} 1·4802, and much less of the isomeric 2 : 3-*dimethylbut*-2-*ene*-1-*thiol*, b.p. 140—141·5° mm., n_D^{20} 1·5017.

E. S. Sayers.

CA

Reaction of sulfur with unsaturated compounds. VI. Synthesis of isomeric methyl-2-phenylthiophenes. M. G. Voronkov and B. L. Gol'shtein (Zhdanov State Univ., Leningrad). *Zhur. Obshchel Khim.* (J. Gen. Chem.) 20, 1218-24(1950); cf. C.A. 44, 6433i, 7755b.—Dehydration of PhCH(OH)Bu over H_3PO_4 gave *1-phenyl-1-pentene*, b. 72.7–3.7°, b_{760} 211–12°, d_4^{20} 0.9024, n_D^{20} 1.52502, n_D^{25} 1.53050, n_D^{27} 1.54442, γ^{20} 33.23. This (27.8 g.) and 18.3 g. S after 27 hrs. at 210–35°, extn. with hot EtOH, and treatment with Hg gave 15% *2-phenyl-5-methylthiophene*, m. 47.5–8.5°, b_{760} 299–71°, gives a blue-violet color with isatin-H_2SO_4, and yellow-orange with H_2SO_4. Dehydration of iso-BuCH(OH)Ph by $NaHSO_4$ gave *3-methyl-1-phenyl-1-butene*, b_{760} 205.5°, d_4^{20} 0.8807, n_D^{20} 1.52380, n_D^{25} 1.52021, γ^{20} 31.4, which similarly heated with 3 moles S (210–20°, 14 hrs.) gave 20.3% *2-phenyl-4-methylthiophene* (I), m. 17.5°, b_{760} 280°, d_4^{20} 1.1070, n_D^{20} 1.62345, n_D^{25} 1.62216, n_D^{27} 1.62053, γ^{20} 41.79 (red-violet with isatin-H_2SO_4). iso-AmPh (from PhBr, iso-AmBr, and Na in C_6H_6), b_{760} 197.2°, d_4^{20} 0.8542, n_D^{20} 1.48187, n_D^{25} 1.48572, n_D^{27} 1.49509 (35.8 g.), and 30 g. S heated 14 hrs. to 200–45° gave 18% I identical with above. Dehydration of $PhCH_2C(OH)MeEt$ by iodine gave *1-phenyl-2-methyl-1-butene*, b_{760} 202°, d_4^{20} 0.8817, n_D^{20} 1.51724, n_D^{25} 1.52308, n_D^{27} 1.51473, γ^{20} 31.8, which, heated with 3 equivs. S 12 hrs. at 210–20°, gave 11.6% *2-phenyl-3-methylthiophene*, b_{760} 250.8–8.5°, d_4^{20} 1.1067, n_D^{20} 1.60858, n_D^{25} 1.61584, n_D^{27} 1.63519, γ^{20} 39.09 (violet with isatin-H_2SO_4). *tert*-BuPh, b_{760} 167.5–8.2°, d_4^{20} 0.8668, n_D^{20} 1.48838, n_D^{25} 1.48215, n_D^{27} 1.50212, heated 50 hrs. to 180–200° with S gave some tar and unchanged hydrocarbon; *tert*-AmPh, b_{760} 188.5°, d_4^{20} 0.8679, n_D^{20} 1.49090, n_D^{25} 1.49468, n_D^{27} 1.50128, γ^{20} 29.02, gave similar results and almost no H_2S or S dervvs. were isolated.

G. M. Kosolapoff

CA

Synthesis of vinyl alkyl ethers from acetals, and their physical properties. M. G. Voronkov (A. Zhdanov State Univ., Leningrad). *Zhur. Obshchei Khim.* (J. Gen. Chem.) 20, 2060–3(1950).—The prepn. of vinyl alkyl ethers was accomplished by the following procedure: 0.5–1.0 mole of an acetal and 0.2–1.5 g. $NaHSO_4$ (for lower members) or sulfanilic acid or aniline sulfate (for higher members) were heated in an efficient distn. app., best under reduced pressure, with the still head temp. kept as low as possible. Thus, 110 g. $MeCH(OEt)_2$ and 0.7 g. $NaHSO_4$ gave 33 g. *EtOCH:CH*$_2$, bp$_{745}$ 35.8°, bp$_{760}$ 35.72°, d_4° 0.7531, n_D° 1.37390, n_D^{15} 1.37657, n_D° 1.38280, γ° 19.0. The following ethers were similarly prepd. from the corresponding acetals: *iso-PrOCH:CH*$_2$, 66.1%, bp 55.8°, 0.7514, 1.38218, 1.38175, 1.39098, 18.72; *PrOCH:CH*$_2$, 69.5%, bp 65°, 0.7674, 1.38930, 1.39084, 1.39708, 20.62; *BuOCH:CH*$_2$, 85%, bp 93.62°, 0.7792, 1.39910, 1.40166, 1.40787, 21.99; *iso-BuOCH:CH*$_2$, 60%, bp 82.98°, 0.7683, 1.39398, 1.39666, 1.40293, 20.54; *iso-AmOCH:CH*$_2$, 69.5%, bp 112.5°, 0.7825, 1.40471, 1.40721, 1.41330, 22.48; *CH*$_2$*:CHOCH:CH*$_2$, 58%, bp 109.3–9.6°, 0.8021, 1.41948, 1.42299, 1.42808, 25.45; *EtOCH:CHMe*, possibly cis-trans isomer mixt., 53.7%, bp 99.1–9.4°, 0.7764, 1.39504, 1.39862, 1.40520, 21.44; *EtOCH:CHEt*, 68.3%, bp 94.0–5.3°, 0.7761, 1.40350, 1.40627, 1.41299, 22.09; *EtOCH:CMe*$_2$, 71%, bp 94.02°, 0.7757, 1.40126, 1.40528, 1.41277, 21.62.

G. M. Kosolapoff

Organic Chemistry

CA

Synthesis of vinyl alkyl ethers from acetals, and their physical properties. M. G. Voronkov. J. Gen. Chem. U.S.S.R. 20, 2131-4(1950)(Engl. translation).—See C.A. 45, 5007h. B. L. M.

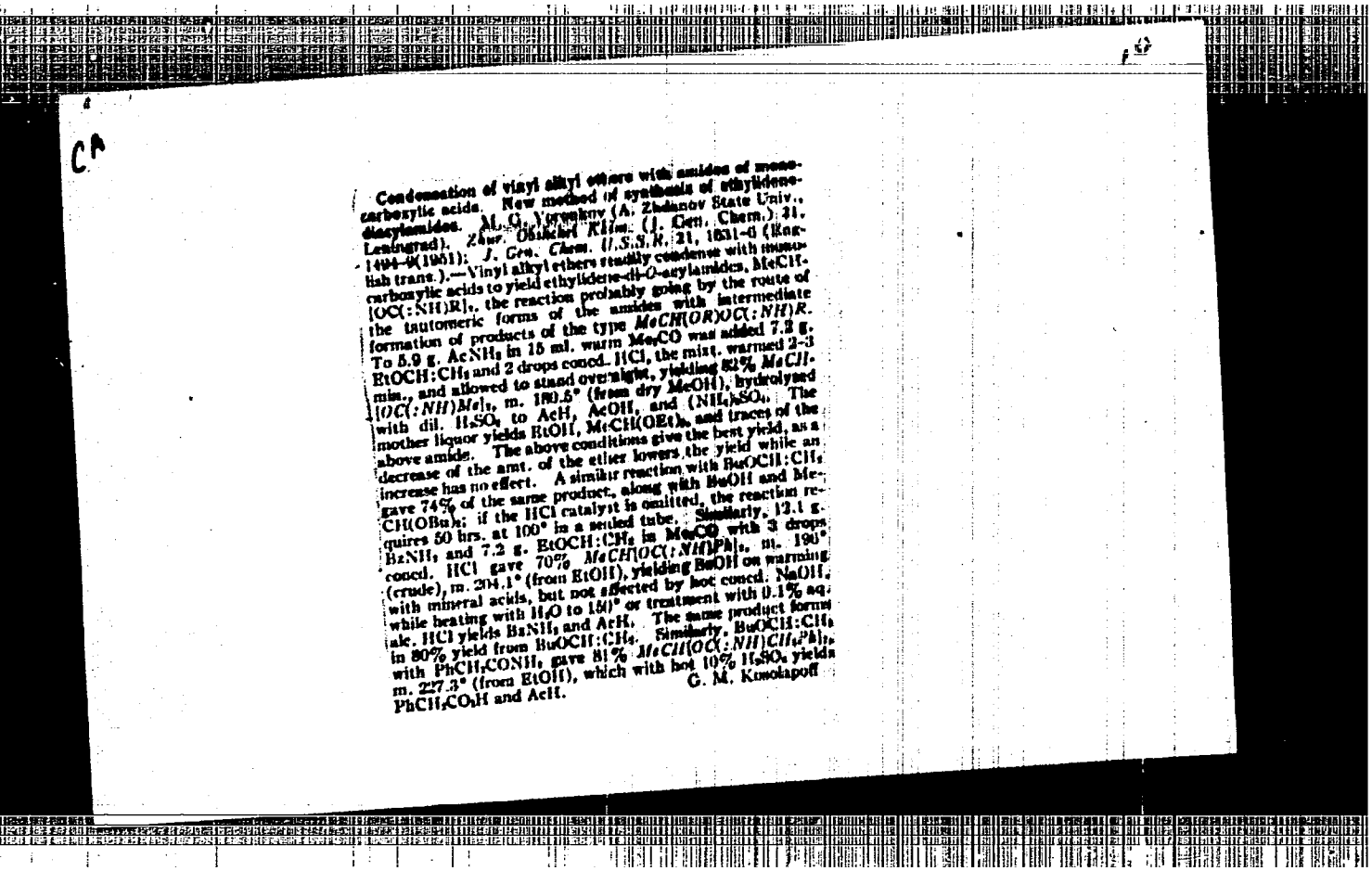
C.A

Refraction and mean optical polarizability of bonds in paraffin hydrocarbons. M. G. Yorunkov (Univ. Leningrad). *Zhur. Fiz. Khim.* 24, 1023-8(1950).—From literature data, mol. refraction at 20° for the *D* line is an additive const. made up of these components: CH_3 group 4.644, CH 1.672, $CH_2.CH_3$, $CH_3.CH_3$, and $CH_2.CH_2$ 1.300, $CH_3.CH$ 1.358, $CH_3.C$ 1.370, $CH_2.CH$ 1.216, $CH_2.C$ 1.132, CH.CH 0.984, CH.C 0.797, and C.C 0.816. The polarizability of these bonds is a linear function of the no. of neighboring bonds (this no., e.g., for $CH_3.C$ is 3) but the coeffs. are not equal for all bond types. J. J. B.

Analytical properties of phenyl-substituted 1,2-dithiole-3-thiones. New organic reagents for copper, mercury, platinum, and palladium. I. M. G. Voronkov and P. P. Tsiper (A.A. Zhdanov State Univ., Leningrad). *Zhur. Anal. Khim.* 6, 331-6(1951).—In these expts. were used 5-phenyl- (I), 4-phenyl- (II), and 4-methyl-5-phenyl-1,2-dithiole-3-thione (III). These reagents were used as 0.3% solns. in CCl_4. To 4 drops of the reagent in a micro test tube was added several drops of a 0.5% aq. soln. of a metal chloride, nitrate, or sulfate. In neutral or dil. acid soln. $AgNO_3$ formed an orange ppt. with all 3 reagents when neutral, but no ppt. when acidified. Au formed colored ppts. with all 3 reagents, both neutral and acidified. $HgCl_2$ formed a ppt. with all 3 reagents when neutral. $SnCl_4$, neutral or acidified, was pptd. only by II. $PtCl_4$ and $PdCl_2$ were pptd. in neutral and acid solns. by I and II and in neutral soln. by III. None of the other tested ions formed ppts. nor did they interfere with the detn. of the cations named. The ppts. were insol. in H_2O. All were sol. in Me_2CO except $PdCl_2$ pptd. by I. None was sol. in CCl_4. In ether only $AuCl_3$ pptd. by I and $HgCl_2$ pptd. by II and III were sol. In CH_3OH only $AgNO_3$ pptd. by III, and $PdCl_2$ pptd. by I and III were sol. In CS_2 only $HgCl_2$ pptd. by I and $AgNO_3$, $AuCl_3$, and $PdCl_2$ pptd. by III were sol. Quantitatively only $HgCl_2$ was pptd. by I in neutral soln. The ppt. was dried at 80-90° and weighed as $2C_9H_8S_3.HgCl_2$. Filter paper moistened with an ether soln. of I or II and dried gives a specific reaction with Cu^{++}. A drop of a soln. contg. Cu^{++} placed on this paper forms a brown or pink (if there is little Cu) spot. The test will detect 0.4 γ per mol.

M Hoseh

1952



CA

Condensation of vinyl alkyl ethers with amides of monocarboxylic acids. New method of synthesis of ethylidenediacylamides. M. G. Voronkov (A. Zhdanov State Univ., Leningrad). *Zhur. Obshchei Khim.* (*J. Gen. Chem.*) 31, 1494–9(1961); *J. Gen. Chem. U.S.S.R.* 31, 1531–6 (English trans.).—Vinyl alkyl ethers readily condense with monocarboxylic acids to yield ethylidene-di-*O*-acylamides, $MeCH[OC(:NH)R]_2$, the reaction probably going by the route of the tautomeric forms of the amides with intermediate formation of products of the type $MeCH(OR)OC(:NH)R$. To 5.9 g. $AcNH_2$ in 15 ml. warm Me_2CO was added 7.2 g. $EtOCH:CH_2$ and 2 drops concd. HCl, the mixt. warmed 2–3 min., and allowed to stand overnight, yielding 82% $MeCH[OC(:NH)Me]_2$, m. 180.5° (from dry MeOH), hydrolyzed with dil. H_2SO_4 to AcH, AcOH, and $(NH_4)_2SO_4$. The mother liquor yields EtOH, $MeCH(OEt)_2$, and traces of the above amide. The above conditions give the best yield, as a decrease of the amt. of the ether lowers the yield while an increase has no effect. A similar reaction with $BuOCH:CH_2$ gave 74% of the same product, along with BuOH and $MeCH(OBu)_2$; if the HCl catalyst is omitted, the reaction requires 50 hrs. at 100° in a sealed tube. Similarly, 12.1 g. $BzNH_2$ and 7.2 g. $EtOCH:CH_2$ in Me_2CO with 3 drops concd. HCl gave 70% $MeCH[OC(:NH)Ph]_2$, m. 190° (crude), m. 204.1° (from EtOH), yielding BzOH on warming with mineral acids, but not affected by hot concd. NaOH, while heating with H_2O to 150° or treatment with 0.1% aq. HCl yields $BzNH_2$ and AcH. The same product forms in 80% yield from $BuOCH:CH_2$. Similarly, $BuOCH:CH_2$ with $PhCH_2CONH_2$ gave 81% $MeCH[OC(:NH)CH_2Ph]_2$, m. 227.3° (from EtOH), which with hot 10% H_2SO_4 yields $PhCH_2CO_2H$ and AcH.

G. M. Kosolapoff

VORONKOV M. G.,

USSR/Chemistry - Organosilicon Compounds Jan 51

"Method for Synthesis of Esters of Orthosilicic Acid," M. G. Voronkov, B. N. Dolgov, Leningrad State U

"Zhur Prik Khim" Vol XXIV, No 1, pp 93, 94

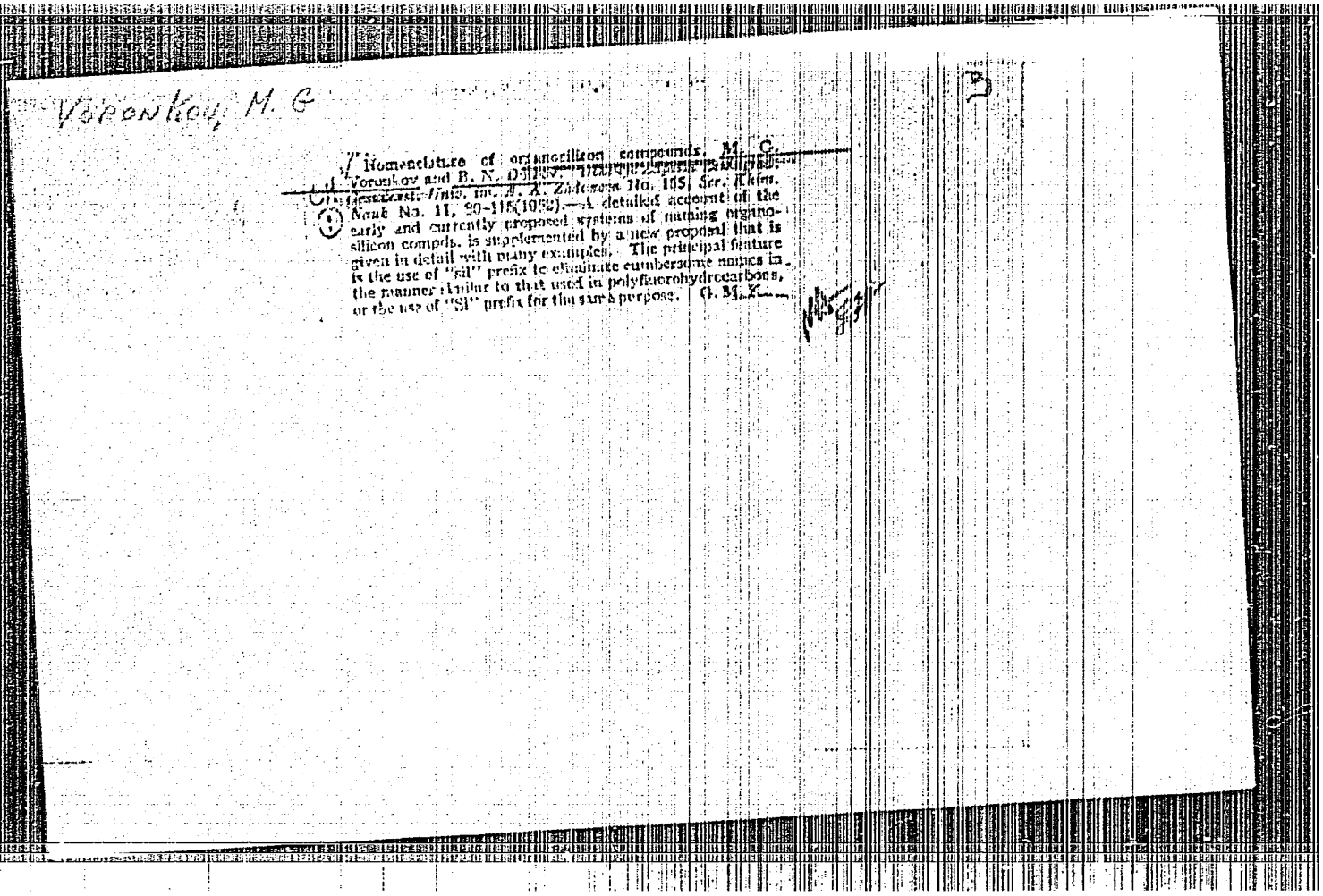
Developed simple, fast method for synthesis of ortho-silicic acid esters from silicon tetrachloride (I) and Et or Me alc under conditions different from usual. Yield exceeds 80%. Alc dehydrated by action of tetra-chloride and distn. Esters formed by rapid addn of excess of tetrachloride to alc, heating rather than cooling (reaction of addn of 1/3 - 1/2 of I strongly endothermic), agitation (these keep HCl content to min).

172T20

VORONKOV, M. G.

Khimiia kremneorganicheskikh soedinenii v rabotakh russkikh i sovetskikh uchenykh /Chemistry of silicon organic compounds in the works of Russian and Soviet scientists/. Leningrad. LGU, 1952. 104 p.

SO: Monthly List of Russian Accessions, Vol. 6, No. 5, August 1953.



Voronkov, M. G.

Nomenclature of organosilicon compounds. M. G. Voronkov and B. N. Dolgov. *Uspekhi Khimii* [Progress in Chemistry], 21, No. 11, 1329–1356(1952).—A detailed account of the early and currently proposed systems of naming organosilicon compds. is supplemented by a new proposal that is given in detail with many examples. The principal feature is the use of "sil" prefix to eliminate cumbersome names in the manner similar to that used in polyfluorohydrocarbons, or the use of "Si" prefix for the same purpose. C. M. K.

VORONKOV, M.G.

Hydrocarbons

Parachor and structure of cyclic hydrocarbons. Zhur.fiz.khim. 26, No.2, 1952

9. Monthly List of Russian Accessions, Library of Congress, September 1952 Uncl.

VORONKOV, M. G.

USSR/Chemistry - Hydrocarbons Jun 52

"Parachors and the Structure of Organic Compounds. III. Monocyclic Aromatic Hydrocarbons," M. G. Voronkov, Leningrad State U imeni A.A. Zhdanov

"Zhur Fiz Khim" Vol XXVI, No 6, pp 813-821

Measured parachors of 34 aromatic hydrocarbons with satd and unsatd side chains. Subjected to scrutiny own and published data on parachors of compds of this class. Calcd new, precise values of group parachors and std corrections for substituents which permit calcn of parachors of aromatic compds of this type by the method of individual group values with a limit of error amounting to 0.1-0.2%. 220128

VORONKOV, M. G.

USSR/Chemistry - Organosilicon Compounds 11 Jun 52

"The Reaction Between Hexaalkyldisiloxanes and Aluminum Halides. A New Synthesis for Trialkylhalogenosilanes," M. G. Voronkov, B. N. Dolgov, N. A. Dmitriyeva, Leningrad State U imeni A. A. Zhdanov

"Dok Ak Nauk SSSR" Vol LXXXIV, No 5, pp 959 - 961

The method consists of reacting hexaalkyldisiloxanes with aluminum halide (chloride, bromide or iodide). The trialkylhalogensilane is distilled off in a relatively pure form with a 75 - 90% yield. Alkyl-substituted polysiloxanes may also be used in this reaction. Presented by Acad I. V. Grebenshchikov 19 Jan 52.

223T11

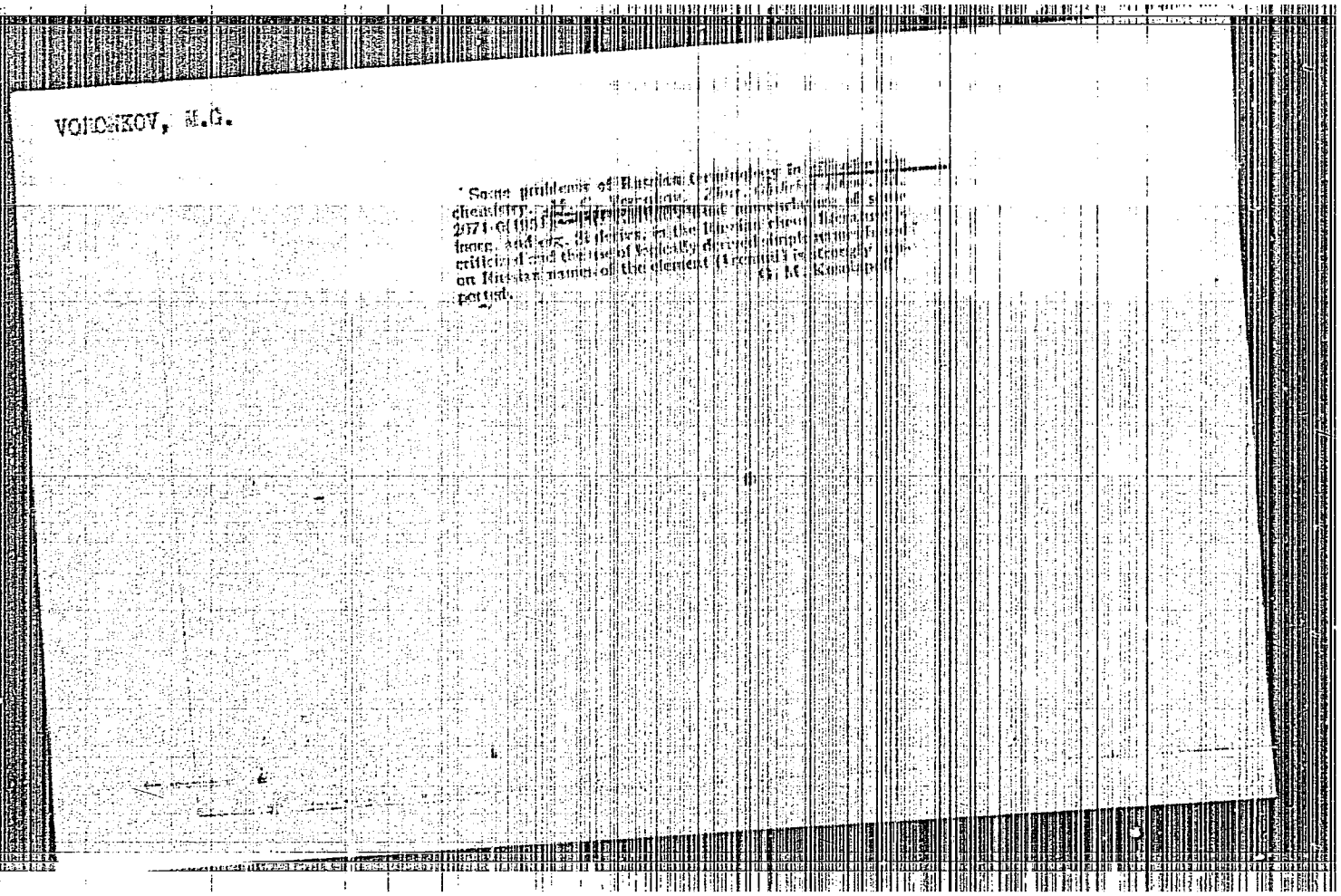
VORONKOV, M.G.; DOLGOV, B.N.

Nomenclature of silicon organic compounds. Uch.zap.Len.un. no.155:80-115 '52. (Silicon organic compounds) (MLRA 9:1)

VORONKOV, M. G.

"The Chemistry of Silico-Organic Compounds," Priroda, No.1, pp 44-52, 1953

Translation D 265331, Jan 1953



VOINOVICH, M.G.

Some problems of Russian terminology in [illegible] chemistry. [illegible] 2671-6(1957) [illegible] Russian chemical terms from Arabic and Persian. In the Russian chemical nomenclature, the use of [illegible] is criticized and the [illegible] on Russian names of the element [illegible] is considered. Bibliography: 45 titles. [illegible] period.

VORONKOV, M. G.

USSR/Chemistry - Silicon Organic Compounds Jan 53

"The Chemistry of Organosilicon Compounds," M. G. Voronkov

"Priroda" Vol 42, No 1, pp 44-52

Reviews the chemistry of organosilicon compds with particular attention to USSR work on the subject. Refers to K. A. Andrianov and N. N. Kotov as pioneers in the synthesis of compds of this type that are of practical value. Says that the synthesis of alkylalkoxysilanes by the reaction of tetraalkoxysilanes (I) with magnesium-organic compds was discovered by Ye. S. Kovtunov and V. Serezhenkov, and that K. A. Andrianov and O. I. Gribanova showed that this reaction can be carried out without ethyl ether, because I (silicic acid esters) catalyze the formation of magnesium-organic compds.

24313

VORONKOV, M. G.

USSR.

Interaction of [illegible] with [illegible] alkyls. Synthesis of alkylethoxysilanes and their physical properties. M. G. Voronkov, B. N. Dolgov, and N. A. Zagrebalova. Doklady [illegible], Leningrad. Gosudarst. Univ. No. 163, Ser. Khim. Nauk No. 13, [illegible] (1953); Referat. Zhur., Khim. 1954, No. [illegible].—The reaction between a Li aliphatic org. compd. [illegible] (I) and $Si(OEt)_4$ (II) was studied in order to find the best method for the synthesis of tetraalkylsilanes. Three methods were investigated: method A wherein an ether soln. of I was filtered and analyzed, combined with II and heated till the end of reaction. Method B was the same as A, except that the soln. of I was not filtered, nor was it analyzed. In method C the production of the I (from Li and an alkyl halide) and its interaction with II was carried out simultaneously. Method A, depending on the molar ratio of the reactants, gave tetraalkylsilanes with a yield over 90% or trialkylsilanes, R_3SiOEt with a yield of 70-80%. Si(OMe)₄ reacted analogously to II. By method B the yield dropped to 10-30%. Tetraalkylsilanes could not be pre-

[illegible]

duced by method *C* because only 3 ethoxy groups were replaced and the product was R_4SiOEt with a yield of 30–50%. Thus were synthesized 9 R_4SiOEt where R was Me to C_4H_9. The yield of R_4SiOEt by method *C* depended on the nature of halogen in the alkyl halide, from the structure of the org. radical, conditions of reaction, and the solvent used. Best results were obtained by carrying out the reaction in petr. ether, at low temp., using alkyl bromides. When the reaction of the I was carried out with a large excess of II, there formed $R_2Si(OEt)_2$ with a yield of 40% by method *A* and 30% by methods *B* and *C*. Simultaneously were also formed $R_4Si(OEt)_2$ with a yield of 40–5% in some instances. II (7.8 g.) added to an ether soln. of hexyllithium (from 0.2 g. Li and 52.5 g. $C_6H_{13}Br$) followed by decompn. in water produced 56.8% $(C_6H_{13})_2Si(OEt)_2$, b$_{10}$ 205°, n^{25}_D 1.4445, d_{25} 0.8292. II (12.49 g.), 4.49 g. Li, 100 ml. petr. ether, and 41.1 g. BuBr heated 2 hrs. gave 80% BuSiOEt, b$_{744}$ 247°, n^{25}_D 1.4340, d_{25} 0.8243, and 7% $BuSi(OEt)_3$, b$_{744}$ 220–2°, n^{25}_D 1.4109, d_{25} 0.8510. Similarly were obtained: Pr_3SiOEt, b$_{744}$ 202.6°, n^{25}_D 1.4265, d_{25} 0.8202; Am_3SiOEt, b$_{744}$ 271.6°, n^{25}_D 1.4393, $(C_6H_{13})_3SiOEt$, b$_{744}$ 262.6°, n^{25}_D 1.4550, d_{25} 0.8455; iso-Pr_3SiOEt, b$_{744}$ 187.2°, iso-Bu_3SiOEt, b$_{744}$ 220.2°, n^{25}_D 1.4170, d_{25} 0.8401; and iso-Am_3SiOEt, b$_{744}$ 138–42°.

M. Hasch

VORONKOV, M. G.

USSR/Chemistry

Card 1/1

Authors : Voronkov, M. G., and Dolgov, B. N.

Title : Water repellent silicon-organic coatings

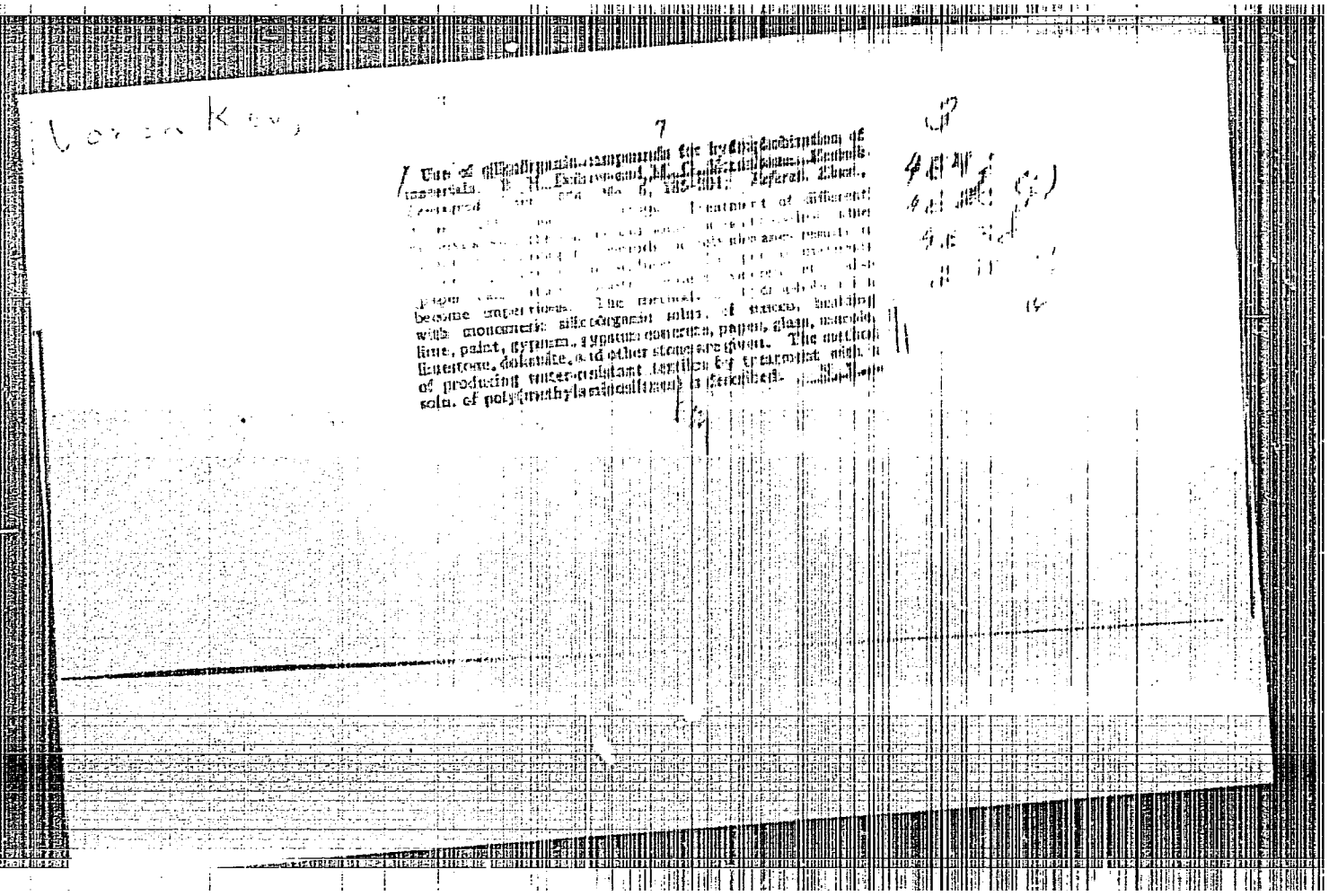
Periodical : Priroda, 5, 22 - 34, May 1954

Abstract : The use of silicon-organic compounds for the hydrophobization of various materials and the properties of materials, treated with water repellent substance, are briefly discussed. Materials, treated with certain easily hydrolysing silicon-organic compounds or their polymers, lose their water absorbability and become hydrophobic. Porous materials (paper, textiles, plaster, cement, gypsum, etc.) when treated with water repellent silicon coating, lose not only their water absorbability, but become water proof. Water falling on hydrophobic surface does not soak into these surfaces, does not spread, but assembles in easy rolling drops. Photos.

Institution : ....

Submitted : ....

Translation M-870, 30 Nov 54



VORONKOV, M.G.

USSR/Chemistry - Destructive hydrogenation

Card 1/1 Pub. 151 - 17/38

Authors : Voronkov, M. G.; Dolgov, B. N.; and Karpenko, G. B.

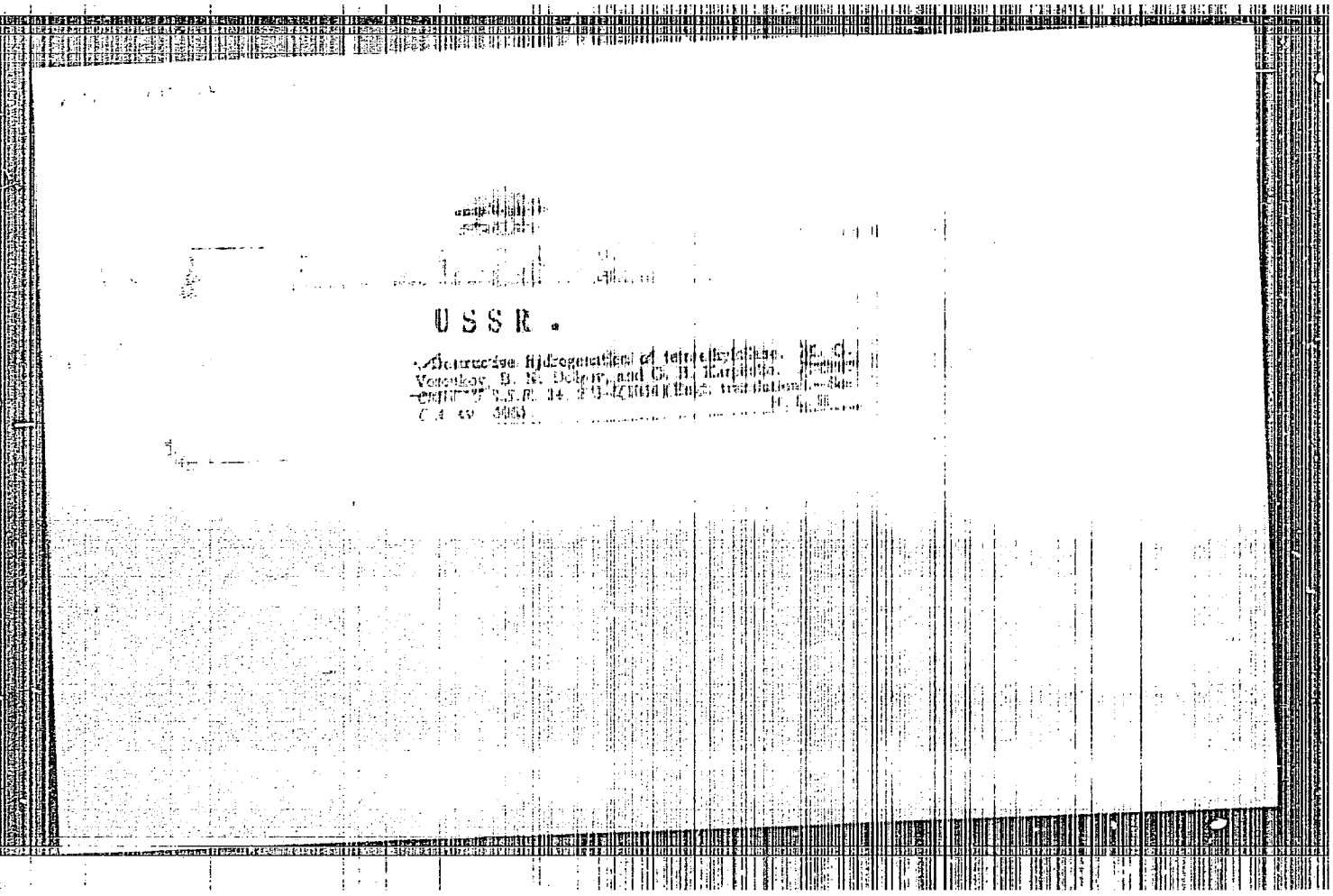
Title : Destructive hydrogenation of tetraethylsilane

Periodical : Zhur. ob. khim. 24/2, 269-272, Feb 1954

Abstract : The reaction of hydrogenation of tetraethylsilane in the vaporous phase was investigated at normal pressures. It was established that the absence of catalysts does in no way change the tetraethylsilane hydrogen even at a temperature of 500°. A temperature much higher than 500° results in the pyrolysis of the tetraethylsilane and the formation of elementary Si and some gaseous products. At a temperature of about 550° the tetraethylsilane is split by the hydrogen over an $Al_2(SiO_3)$ catalyst forming triethylsilane and ethane. The mechanism of destructive hydrogenation of tetraethylsilane is explained. Seven references: 3-USA; 2-German; 1-French and 1-USSR (1904-1950). Tables.

Institution : The A. A. Zhdanov State University, Leningrad

Submitted : October 3, 1953



USSR

VORONKOV, M. G.

USSR/Chemistry

Card 1/1

Authors : Voronkov, M. G.; and Titlinova, E. S.

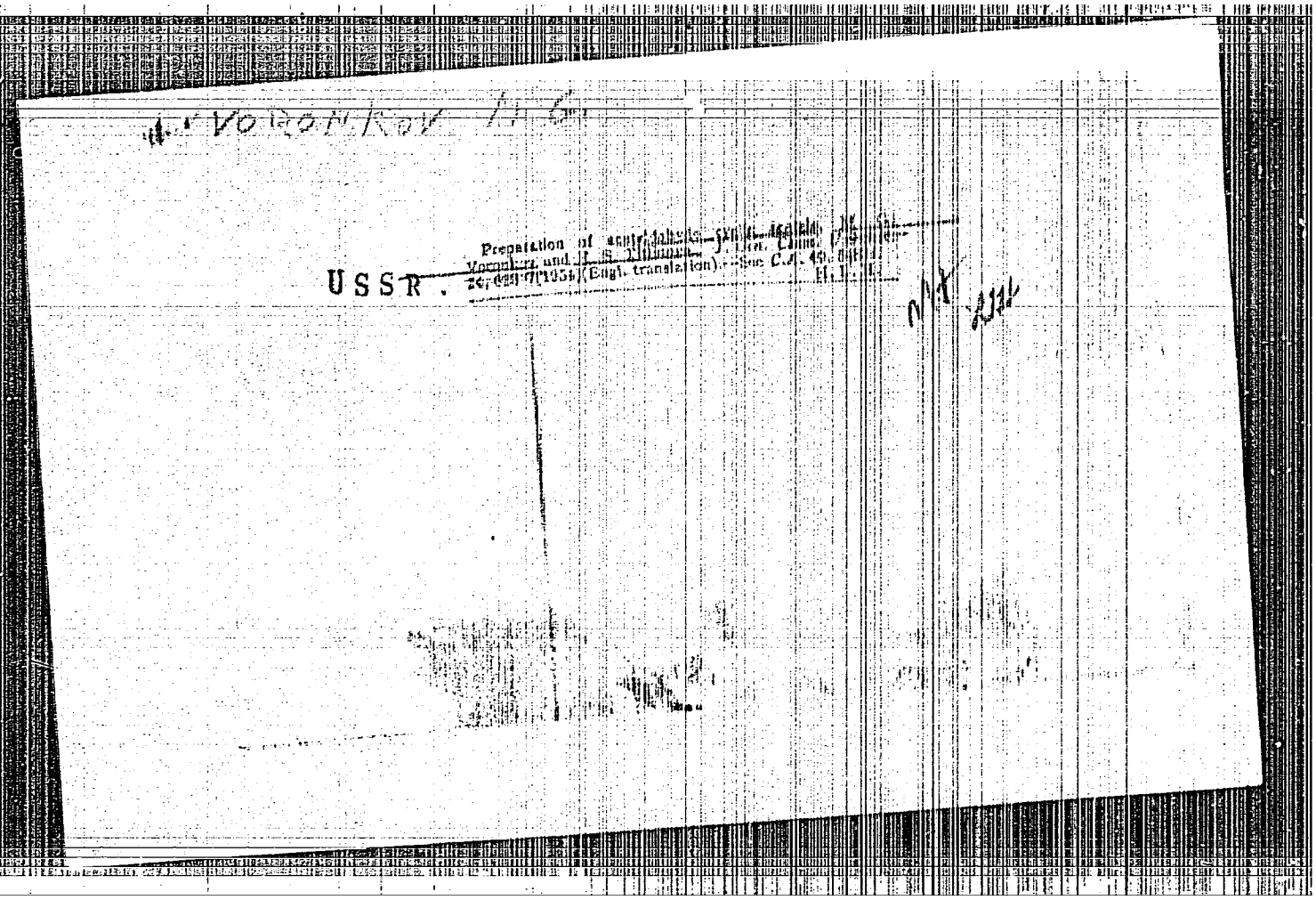
Titles : Method of obtaining cyclic acetaldehydacetals

Periodical : Zhur. Obshchei Khim. 24, Ed. 4, 613 - 618, April 1954

Abstract : A method was developed for the synthesis of cyclic acetaldehydacetals (2-methyl-1, 3-dioxacycloalkanes) from vinyl alkyl esters and glycols. Using this new synthesis method the authors obtained eleven acetaldehydacetals with 5-, 6- and 7 membered cycles. Analysis of the cyclic acetals was made by the method of hydrolytic formation of oximes. Fifteen references; 3 USSR since 1946; 12 English and German dating 1861. Tables, chem. formulas.

Institution : The A. A. Zhdanov State University at Leningrad, USSR.

Submitted : September 3, 1953



USSR.

VORONKOV, M.G.

USSR/Chemistry

Card 1/1

Authors : Dolgov, B. N.; Kharitonov, N. P.; and Voronkov, M. G.

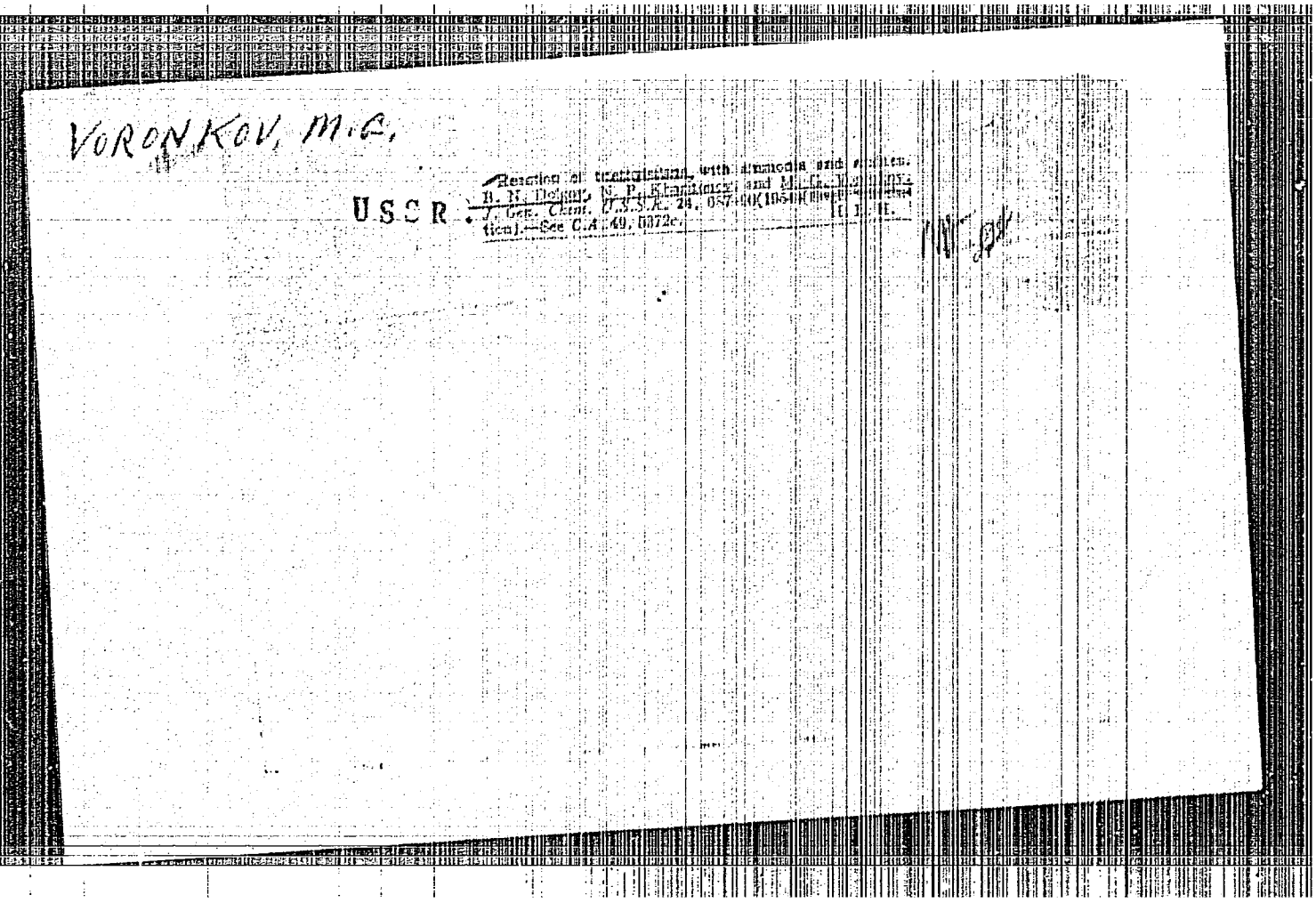
Title : Reaction of triethylsilane with ammonia and amines.

Periodical : Zhur. Ob. Khim. 24, Ed. 4, 678 - 683, April 1954

Abstract : Authors investigated the reaction of triethylsilane with ammonia and amines catalyzed with amides of alkali metals. It was found that the reaction process depends upon the nature of the amine and catalyst. Revealed are the conditions leading to the synthesis of amino-, alkylamino- and dialkylamino derivatives of triethylsilane with high yield. Authors synthesized 12 such compounds, 8 of which were previously unknown, and determined their physical properties. Nine references; 2 USSR since 1948; 7 USA since 1929. Tables.

Institution : Laboratory of Silico-Organic Chemistry at the A. A. Zhdanov University in Leningrad.

Submitted : October 13, 1953



VORONKOV, M.G.

USSR

Reaction of trimethylsilane with ammonia and [illegible]
B. N. Dolgov, N. P. Shapkin[illegible] and M. G. [illegible]
Zhur. Obshch. Khim. 27, 2874-80(1957)
Engl. transl.—See C.A. 49, 5872e.

VORONKOV, M. G.
USSR/Chemistry

Card 1/1

Authors : Dolgov, B. N; Kharitonov, N. P.; and Voronkov, M. G.

Title : Reaction of trialkylsilanes with monocarboxylic acids. New method of synthesizing trialkylacyloxysilanes and their physical properties.

Periodical : Zhur. Ob. Khim. 24, Ed. 5, 861 - 867, May 1954

Abstract : A new method for the synthesis of trialkylacyloxysilanes through the reaction of trialylsilanes with organic acids in the presence of a catalyst is described. This new method enabled the synthesis of 19 such compounds (with yields of 81 - 87%), 16 of which were previously unknown. The physical properties of these compounds were determined. The reaction of trialkylsilane with carboxylic acid depends very little upon the structure of the alkylsilane or acid. Trialkylacyloxysilanes can also be derived from the reaction of trialkylsilanes with mercuric salts of carboxylic acids. Thirty references. Tables.

Institution: The Leningrad State University, Leningrad, USSR

Submitted : October 13, 1953

VORONKOV, M. G.

USSR/Chemistry

Card 1/1

Authors : Voronkov, M. G., and Dolgov, B. N.

Title : Thiocyanogen Substituted Silanes

Periodical : Zhur. Ob. Khim., 24, Ed. 6, 1082 - 1087, June 1954

Abstract : The reaction of ammonium thiocycanate with homologous chlorine substituted silanes, resulted in the synthesis of fourteen isothiocyanate substituted silanes $R_nSi(NCS)_{4-n}$ (n = 0-3), the physical properties of which are described. The isothiocyanate substituted silanes represent heat stable, colorless or slightly yellowish liquids or crystalline bodies, with poignant odor, and are easily hydrolyzed with water. The slightest traces of moisture orginating during hydrolysis, turn these substances colored. Liquid drops of thiocyanogen substituted silanes, or their vapors, turn the color of human skin into dark brown. Nineteen references since 1877, 1906. Tables.

Institution : State University, Leningrad

Submitted : December 30, 1953

VORONKOV, M.G.

The reaction of trialkylsilanes with alcohols. Synthesis of trialkylalkoxysilanes and their physical properties. B. N. Dolgov, N. P. Shirokov, and M. G. Voronkov. *J. Gen. Chem. U.S.S.R.* 14, 1160-77(1944)(Eng. tion).—See *C.A.* 49, 12275b.

Voronkov, M.G.

USSR

The reaction of trialkylsilanes with [illegible] Symbols of trialkylsilanes and their properties. B. N. Dolgov, N. P. Kharitonov, and [illegible] Voronkov, Zhur. Obshchei Khim. 24, 1173–88 (1954); [illegible] 8494.—The reaction of R_3SiH (I) with [illegible] in alcs., $EtOH$, was studied in the presence of Li, Na, [illegible] and Ni alcoholates. The course of the reaction depends on the structure of the R radicals and the nature of the alkali metal; the data indicate that the reaction is an S_N2 reaction of bimol. nucleophilic displacement involving the RO^- ion and the silane, yielding a hydride ion which is rapidly bound by the alc. with evolution of H. The following were prepd. by the Grignard route (R_3, b.p./mm., d_4^{20}, n_D^{20} — n_F^{20}, and n_m given): Et_3, 107.7°/760, 0.7309, 1.4121, 0.0081, 20.65; Pr_3, 178.2°/760, 0.7380, 1.4282, 0.0083, 22.98; Bu_3, 88–9°/5, 0.7705, 1.4380, 0.0083, 24.80. Et[illegible]H (31.9 g.) added to 0.1 g. Na in 10.2 g. MeOH and the mixt. heated 6.5 hrs. gave 92.7% Et_3SiOMe, b$_{18}$ 141.4–3°; similarly, 11.6 g. Et_3SiH and 0.1 g. K in 9.3 g. EtOH gave after 2 hrs. 60.1% Et_3SiOEt, b$_{18}$ 158–8.7°. Et_3SiH (11.6 g.) and 10 g. EtOH heated in an autoclave 20 hrs. at 150° gave 1.2 l. H (both Cu and steel walls were corroded by the alc.) and 87.5% Et_3SiOEt. Refluxing 11.6 g. Et_3SiH, 9.2 g. 96% EtOH, and 1.5 g. NaOH 9 hrs. gave 86% Et_3SiOEt. Et_3SiH re-

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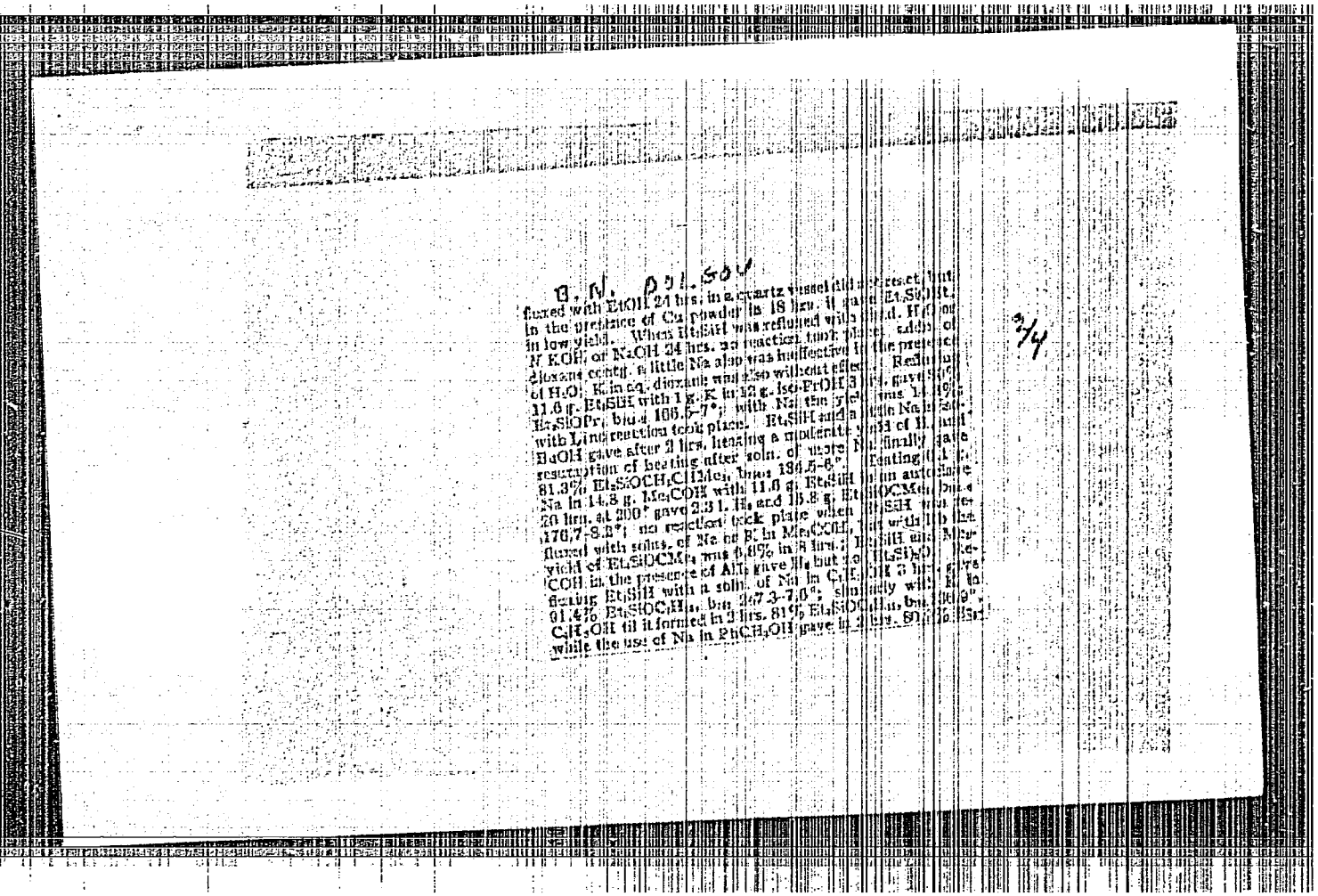
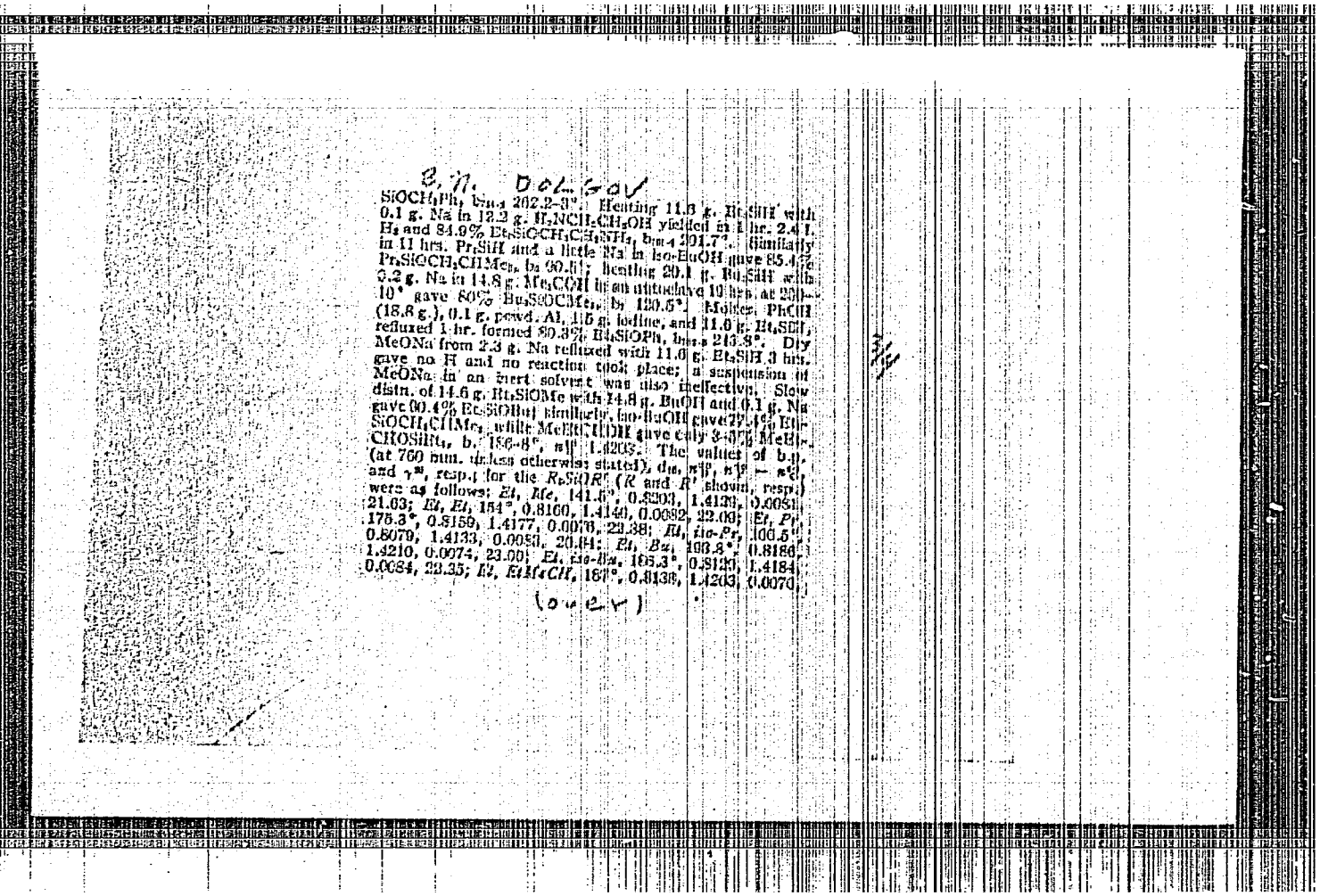


B. N. 911,504

fluxed with EtOH 24 hrs. in a quartz vessel (1) ... reacted, ... in the presence of Cu powder in 18 hrs. it ga... Et3SiH, in low yield. When Et3SiH was refluxed with ... added of N KOH or NaOH 24 hrs. no reaction took pla... the presence dioxane contg. a little Na also was ineffective ... Reflux of of H2O. K in eq. dioxane was also without effect ... gave 11.6 g. Et3SiH with 1 g. K in 12 g. Iso-PrOH 3 ... was 14 Et3SiOPr, b. 164.5-7°; with Na the yield ... with Na Et3SiH and a ... with Lindlar catalyst took place. Et3SiH and a ... of H2 NaOH gave after 2 hrs. heating a mixture ... finally ... resumption of heating after soln. of wate... heating (1 81.3% Et3SiOCH2Cl (Me), b. 136.5-8°. ... in auto... Na in 14.8 g. MeCOH with 11.6 g. Et3SiH ... OCMe) ... 20 hrs. at 200° gave 2.31. H2 and 15.8 g. Et ... SiH ... 176.7-8.2°; no reaction took place when ... with ... fluxed with soln. of Na or K in MeCOH, ... SiH with ... yield of Et3SiOCMe3 was 9.6% in 8 hrs. ... Et3SiO) ... COH in the presence of AlH3 gave H2 but no ... 3 hrs. ... heating Et3SiH with a soln. of Na in C6H6 ... ably with ... 91.4% Et3SiOC6H11, b10 247.3-7.0°; slo... Et3SiOC ... C6H5OH til it formed in 2 hrs. 81% Et3SiOC ... hrs. 80 ... while the use of Na in PhCH2OH gave in 2

3/4



B. M. Dolgov

$SiOCH_2Ph$, $b_{10.5}$ 202.2–3°. Heating 11.8 g. Bu_2SiH_2 with 0.1 g. Na in 12.2 g. $H_2NCH_2CH_2OH$ yielded in 1 hr. 2.4 l. H_2 and 84.9% $Et_2SiOCH_2CH_2NH_2$, b_{744} 201.7°. Similarly in 11 hrs. Pr_2SiH_2 and a little Na in iso-BuOH gave 85.4% $Pr_2SiOCH_2CHMe_2$, b_5 90.5°; heating 20.1 g. Bu_2SiH_2 with 0.2 g. Na in 14.8 g. Me_2COH in an autoclave 10 hrs. at 200–10° gave 80% $Bu_2SiOCMe_2$, b_5 120.5°. Molten PhOH (18.8 g.), 0.1 g. powd. Al, 1.5 g. iodine, and 11.0 g. Et_2SiH_2 refluxed 1 hr. formed 80.3% Et_2SiOPh, b_{744} 215.8°. Dry MeONa from 2.3 g. Na refluxed with 11.6 g. Et_2SiH_2 3 hrs. gave no H and no reaction took place; a suspension of MeONa in an inert solvent was also ineffective. Slow distn. of 14.6 g. Bu_2SiOMe with 14.8 g. BuOH and 0.1 g. Na gave 90.4% Bu_2SiOBu; similarly, iso-BuOH gave 97.4% $Bu_2SiOCH_2CHMe_2$, while $MeEtCHOH$ gave only 3.5% $MeEtCHOSiBu_2$, b. 156–8°, n_D^{20} 1.4203. The values of b.p. (at 760 mm. unless otherwise stated), d_4, n_D^{20}, $n_F^{20} - n_C^{20}$, and γ^{20}, resp., for the $R_2Si(OR')_2$ (R and R' shown, resp.) were as follows: *Et*, *Me*, 141.6°, 0.8203, 1.4120, 0.0051, 21.63; *Et*, *Et*, 154°, 0.8160, 1.4140, 0.0052, 22.03; *Et*, *Pr*, 175.3°, 0.8159, 1.4177, 0.0070, 23.38; *Et*, *iso-Pr*, 166.5°, 0.8079, 1.4133, 0.0050, 20.41; *Et*, *Bu*, 193.8°, 0.8186, 1.4210, 0.0074, 23.00; *Et*, *iso-Bu*, 185.3°, 0.8125, 1.4184, 0.0084, 23.35; *Et*, *EtMeCH*, 187°, 0.8136, 1.4203, 0.0070,

(over)

VORONKOV, M.G.; DOLGOV, B.N.

Water-resistant silicon organic coatings. Priroda 43 no.5:22-34 My '54. (MLRA 7:5)

(Silicon organic compounds) (Waterproofing)

VORONKOV, M. G.

USSR/ Scientists

Card 1/1 Pub. 127 - 10/13

Authors : Voronkov, M. G.

Title : Boris Nikolaevich Dolgov

Periodical : Vest. Len. un. Ser. mat. fiz. khim. 10/2, 149-155, Feb 1955

Abstract : Honoring the 60th birthday and the 30th anniversary of the scientific pedagogical activity of Boris Nikolaevich Dolgov, Dr. of Chem. Sc. and Professor of the Chemical Society of the USSR publishes a list of the major scientific achievements and contributions of Dolgov. The scientific work of Dolgov included among other things the hydrogenation of compounds under pressure, syntheses on CO bases, catalytic conversion of aliphatic oxygen containing compounds, alkylation of aromatic compounds, work in the field of Si-organic chemistry, etc. Illustration.

Institution : .....

Submitted : September 22, 1954

Voronkov, M. G.

4/

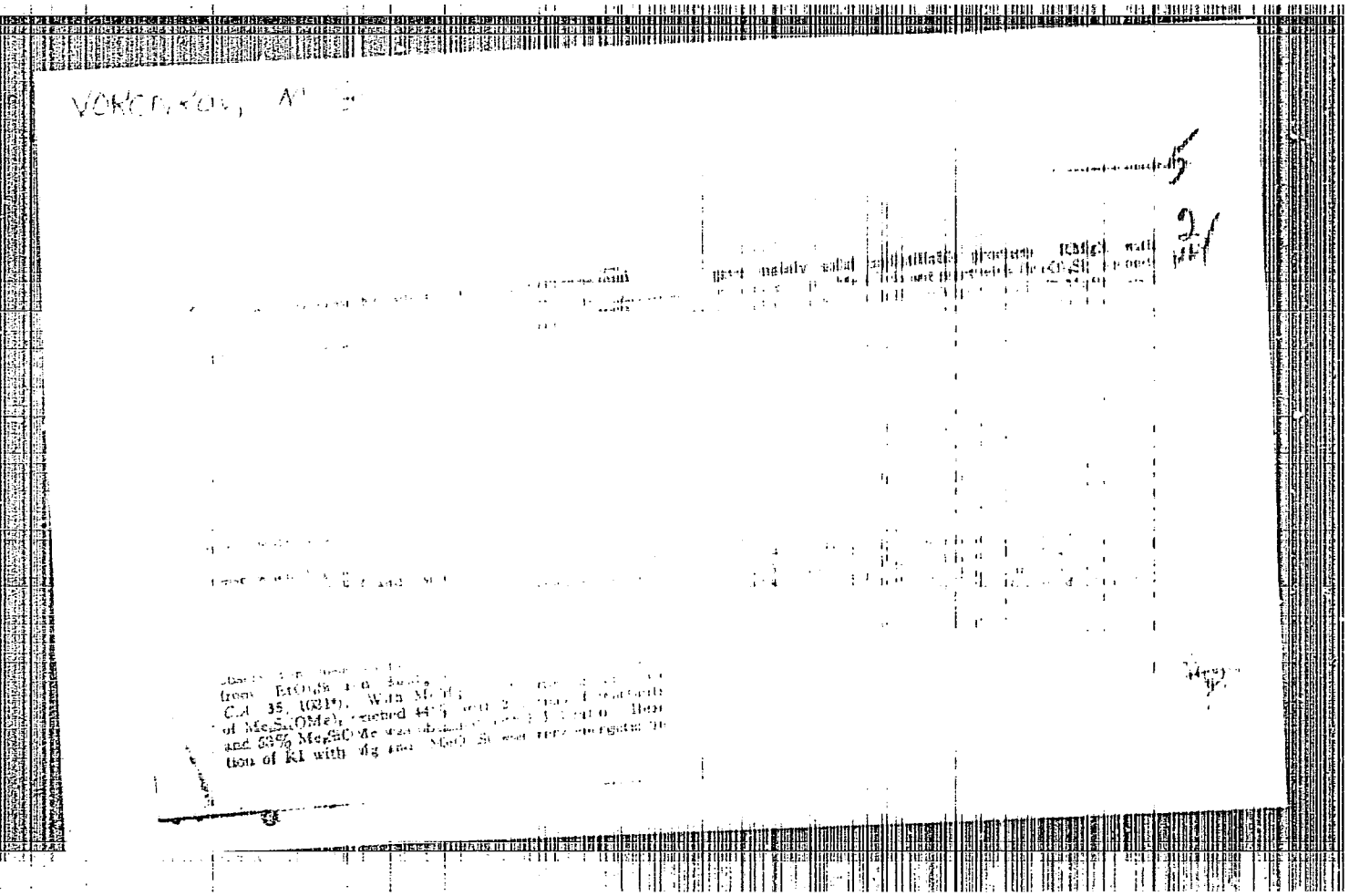
Silicoorganic esters of phosphoric acid—tris(trialkylsilyl) phosphates. [illegible] Voronkov (Leningrad State Univ.) Zhur. Obshchei Khim. 25, 437-8(1955)(Engl. translation).—Heating 16.3 g. $(Me_3Si)_2O$ (b$_{760}$ 103.6°, d_{20} 0.7636, n_D^{20} 1.3774) with 7.1 g. P_2O_5 at reflux 2 hrs. gave 77% $(MeSiO)_3PO$, b$_{10}$ 131.8°, b$_4$ 97°, d_{20} 0.9091, n_D^{20} 1.4088), n_D^{20} — n_D^{20} 0.0070 (cf. Stalle, C.A. 39, 491[1]). Heating 24.7 g. $(Et_3Si)_2O$ (b$_{760}$ 230.3°, d_{20} 0.8443, n_D^{20} 1.4240) and 5.2 g. P_2O_5 gradually to 330° yielded similarly 84% $(Et_3SiO)_3PO$, b$_{10}$ 200.5°, b$_4$ 160.5°, d_{20} 0.9570, n_D^{20} 1.4417 (b. 170)° with some decompn.). Similarly were prepd.: 55% $(Pr_3SiO)_3PO$, b$_4$ 218–25°, and 45% $(Bu_3SiO)_3PO$, b$_4$ 260–70°. These however could not be adequately purified owing to decompn. even on distn. at 1 mm.; this decompn. is notable for luminescent products. All these esters are hydrolyzed by aq. alkalies, such as titration with 0.5N NaOH, with methyl orange indicator. The reaction seems to be $3R_3SiOSiR_3 + P_2O_5 \rightarrow 3(R_3SiO)_3PO$ (cf. Arbuzov and Pudovik, C.A. 47, 4281g; Malatesta, C.A. 46, 4472i).

G. M. Kosolapoff

VORONKOV, M.G.

Silicon organic esters of phosphoric acid, the tris(trialkylsilyl)phosphates. Zhur.ob.khim. 25 no.3:469-470 Mr '55. (MLRA 8:6)

1. Leningradskiy Gosudarstvennyy universitet
(Phosphoric acid)(Silicon organic compounds)



VORONKOV, M. G.

AID P - 3734

Subject : USSR/Chemistry

Card 1/1 Pub. 152 - 14/16

Authors : Belen'kaya, N. G., M. G. Voronkov, and B. N. Dolgov

Title : Rendering paper hydrophobic by means of polymethylaminosilanes

Periodical : Zhur. prikl. khim. 28, 8, 886-898, 1955

Abstract : Polymethyltriaminosilane and polydimethyldiaminosilane do not affect the mechanical strength of paper. They form chemisorption layers on the surface of the paper rendering it hydrophobic. Ten tables, 6 photos, 7 references, 2 Russian (1946-1949).

Institution : Laboratory of Organosilicon Chemistry of Leningrad "Order of Lenin" State University im. A. A. Zhdanov and Laboratory for Restoration and Preservation of Documents of the Academy of Sciences, USSR.

Submitted : N 21, 1953

VORONKOV, M. G.

AID P - 3738

Subject : USSR/Chemistry

Card 1/1 Pub. 152 - 2/22

Authors : Khrustalev, S. S., M. G. Voronkov, and B. N. Dolgov

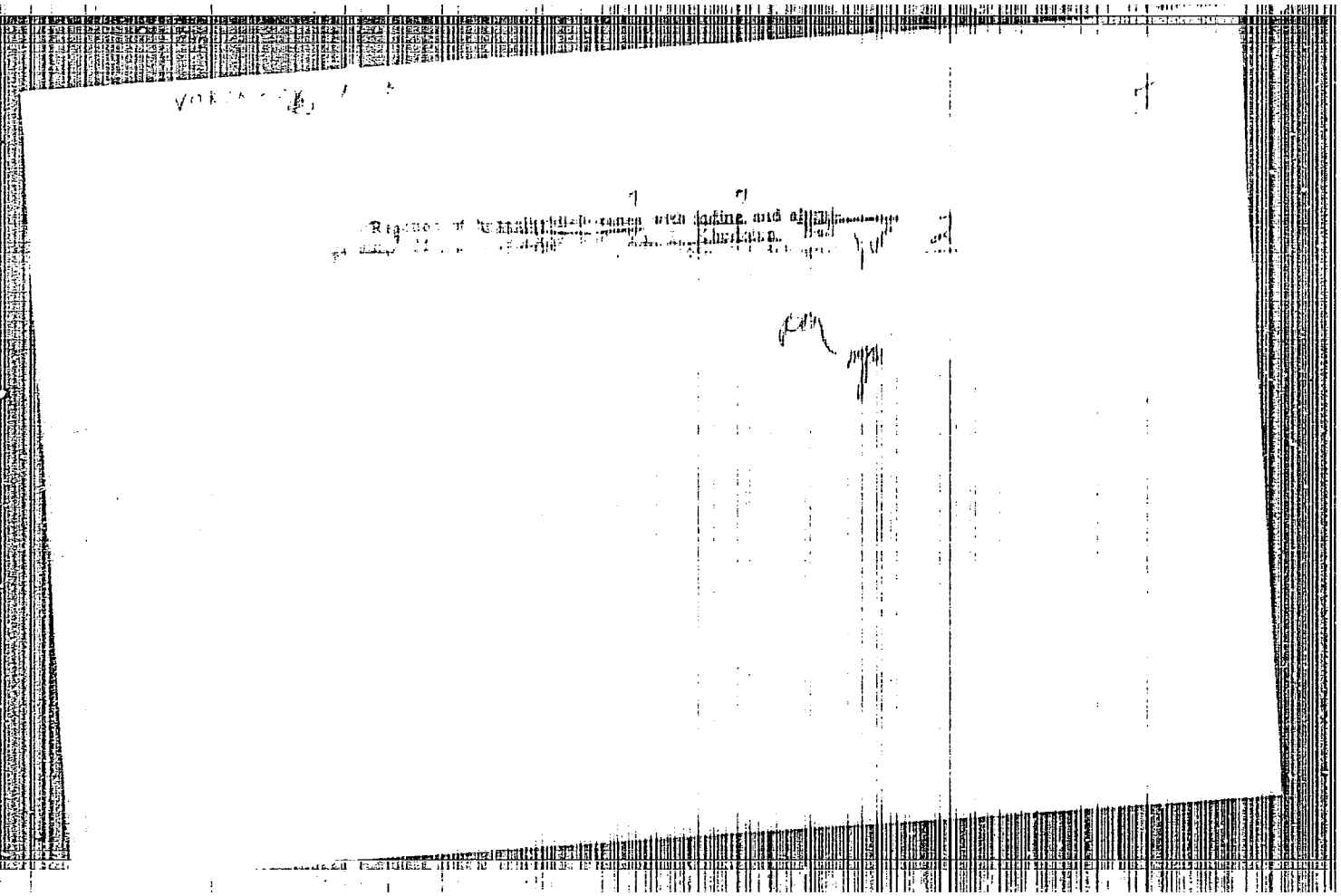
Title : Increase in the water resistance of native gypsum. Part II.

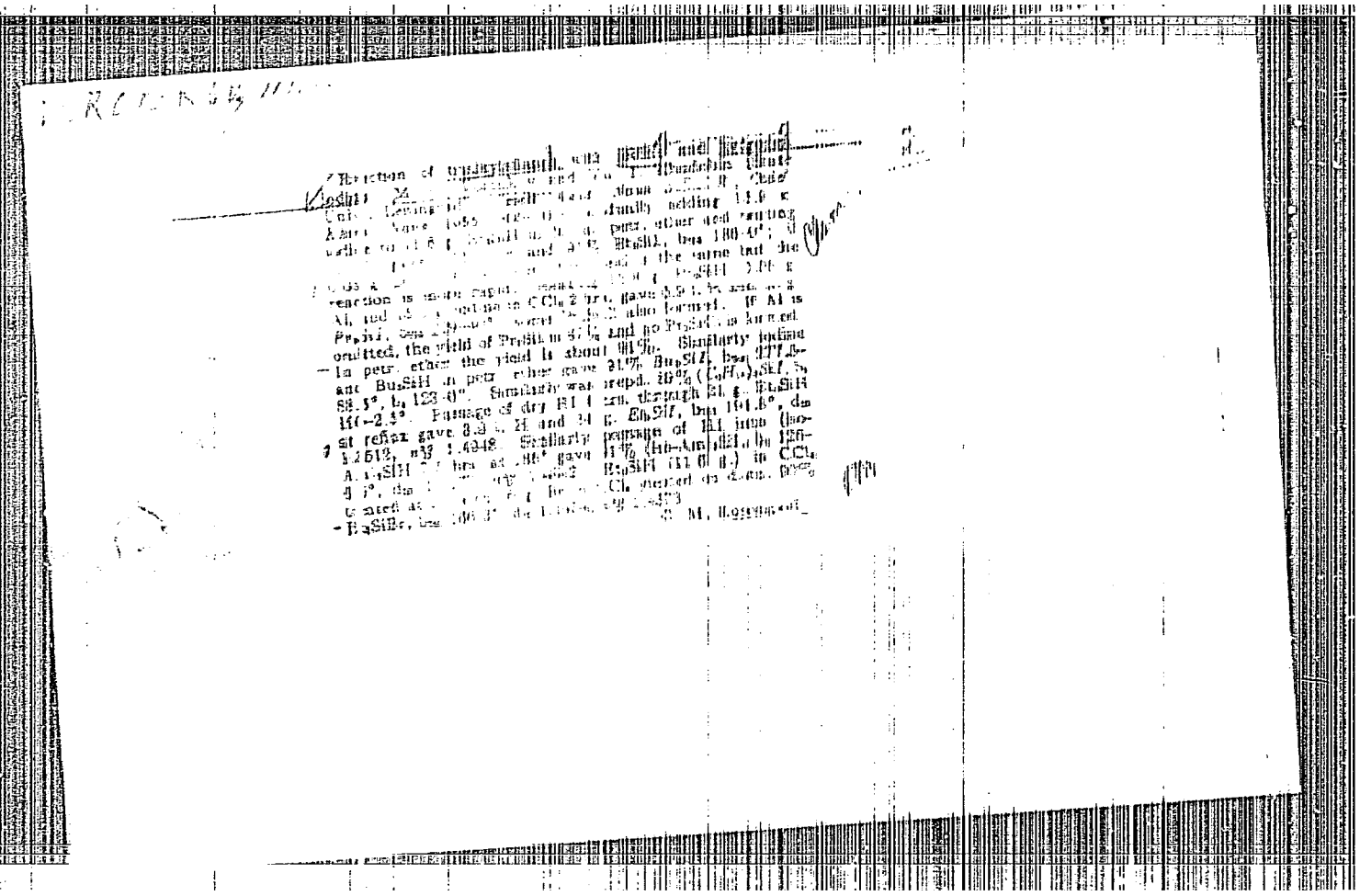
Periodical : Zhur. prikl. khim. 28, 9, 916-921, 1955

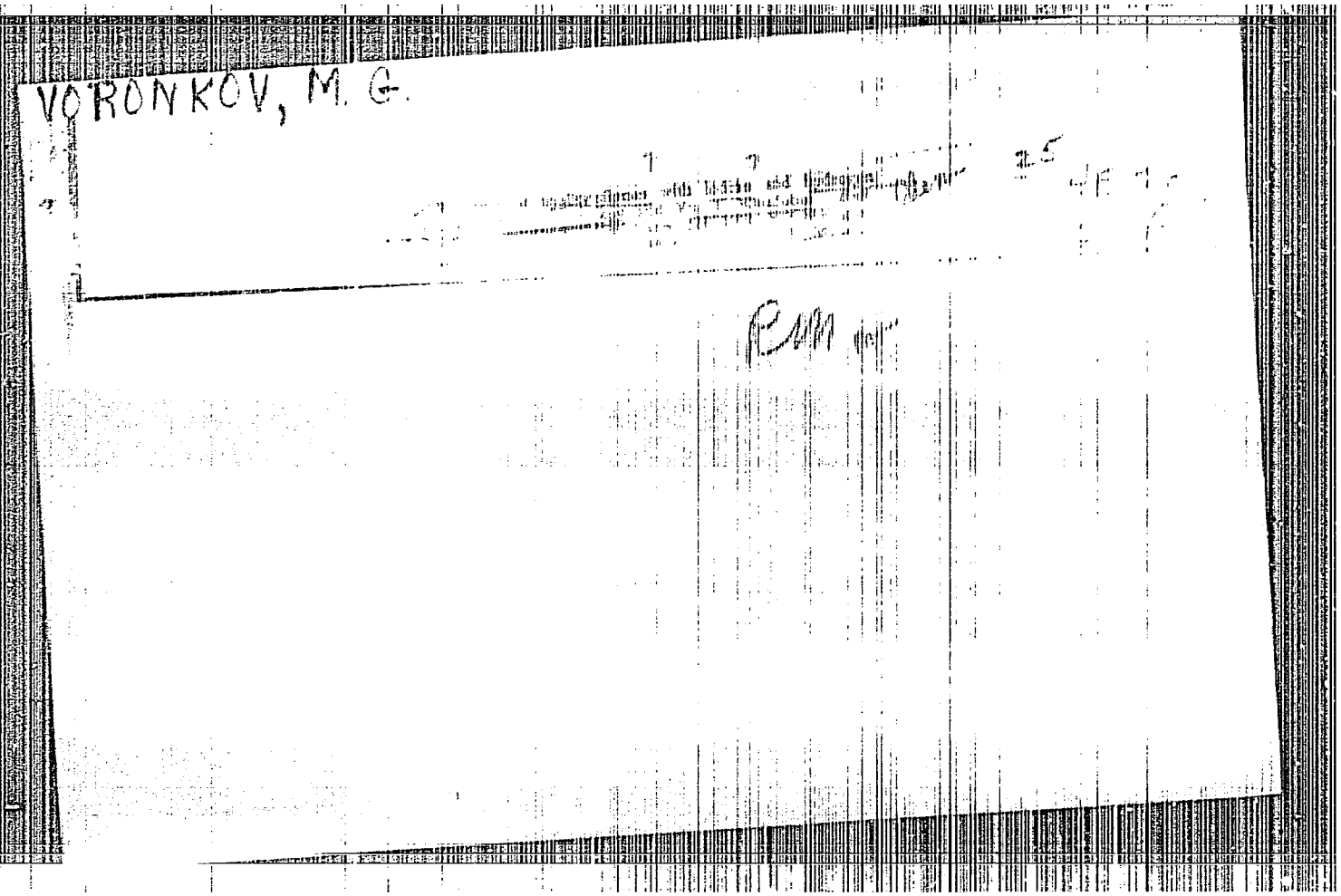
Abstract : By immersing gypsum (3 varieties) in ethyl silicate for several hours, the hydrophobic properties of gypsum were increased, one variety, 7-10 and two varieties 3 times. By treating gypsum with methylchlorosilane, the hydrophobic properties of gypsum were increased 5-10 times. Five tables, 8 references, 4 Russian (1943-1953).

Institution : None

Submitted : O 21, 1953







VORONKOV, M.G.

E-2

USSR/Organic Chemistry - Synthetic Organic Chemistry

Abs Jour : Referat Zhur - Khimiya, No 2, 1957, 4470

Author : Voronkov, M.G., Khudobin, Yu.I.
Inst : Academy of Sciences USSR
Title : Reaction of Hexaalkyl-Disiloxanes with Iodine and Aluminum

Orig Pub : Izv. AN SSSR, Otd. khim. n., 1956, No 6, 713-714

Abstract : Trialkyl-iodosilanes (I) are readily formed on boiling hexaalkyl disiloxanes with Al and iodine, taken at the molar ratios 1:1.1:1.5, until the color of iodine is discharged, and subsequent distillation of the reaction mixture in a current of N_2 in diffused light. Below are listed the alkyl, yield of I in %, BP in °C ± 0.5°/mm, and d_4^{20} 0.001: CH_3, 93, 107.5/760, 1.422; C_2H_5, 89, 191.2/760, 1.351; n-C_3H_7, 88, 238/760, 1.229; n-C_4H_9,

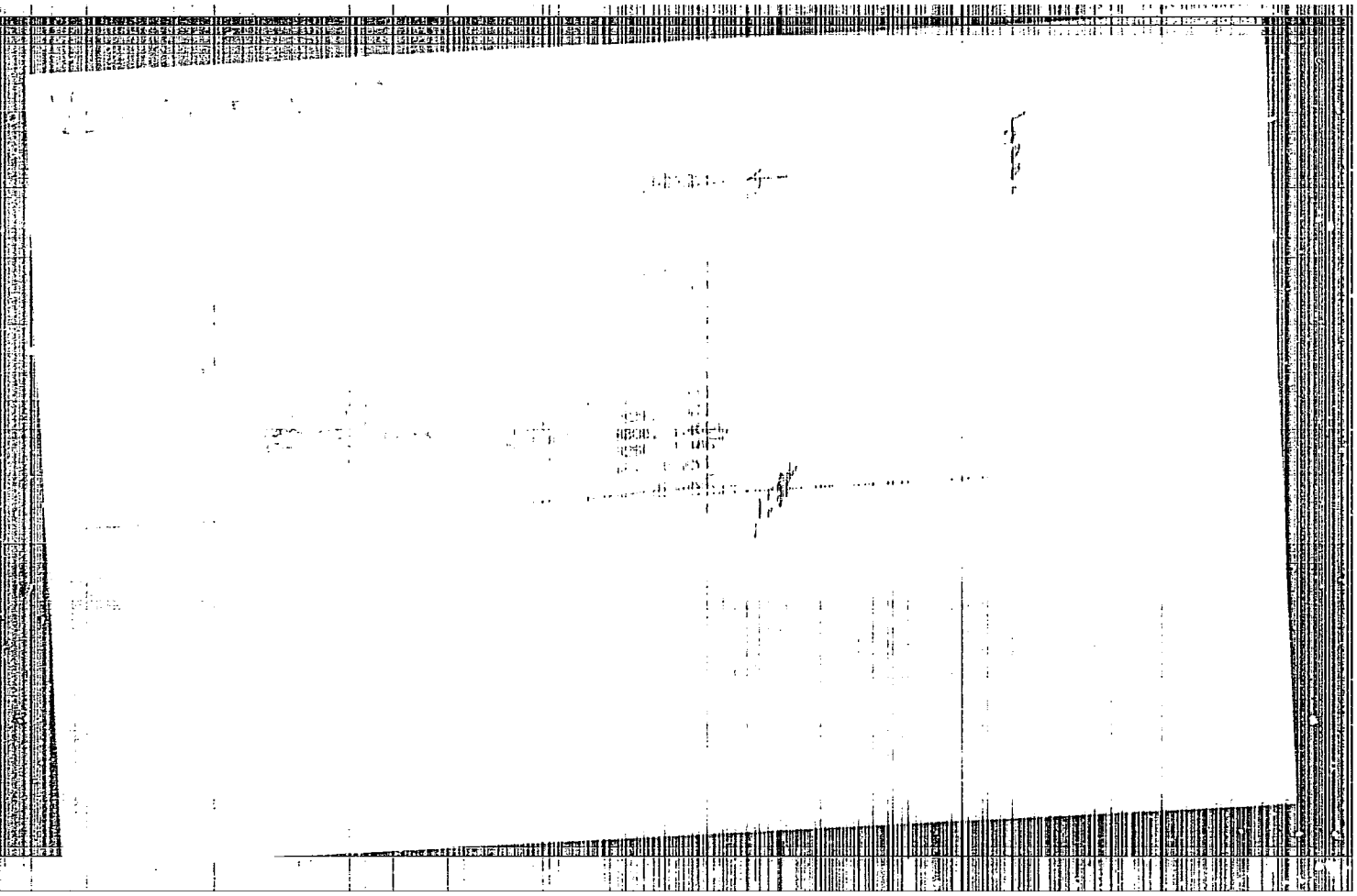
Card 1/2

- 111 -

USSR/Organic Chemistry - Synthetic Organic Chemistry

Abs Jour : Referat Zhur - Khimiya, No 2, 1957, 4470

85, 124.5-125.5/4, 1.225; iso-C_5H_{11}, 82, 151-152/5, 1.115. There was also obtained hexaisoamyl-disiloxane, BP 210-211°/8 mm, d_4^{20} 0.8398, $n^{20}D$ 1.4467, $n_F^{20} - n_C^{20}$ 0.0083.



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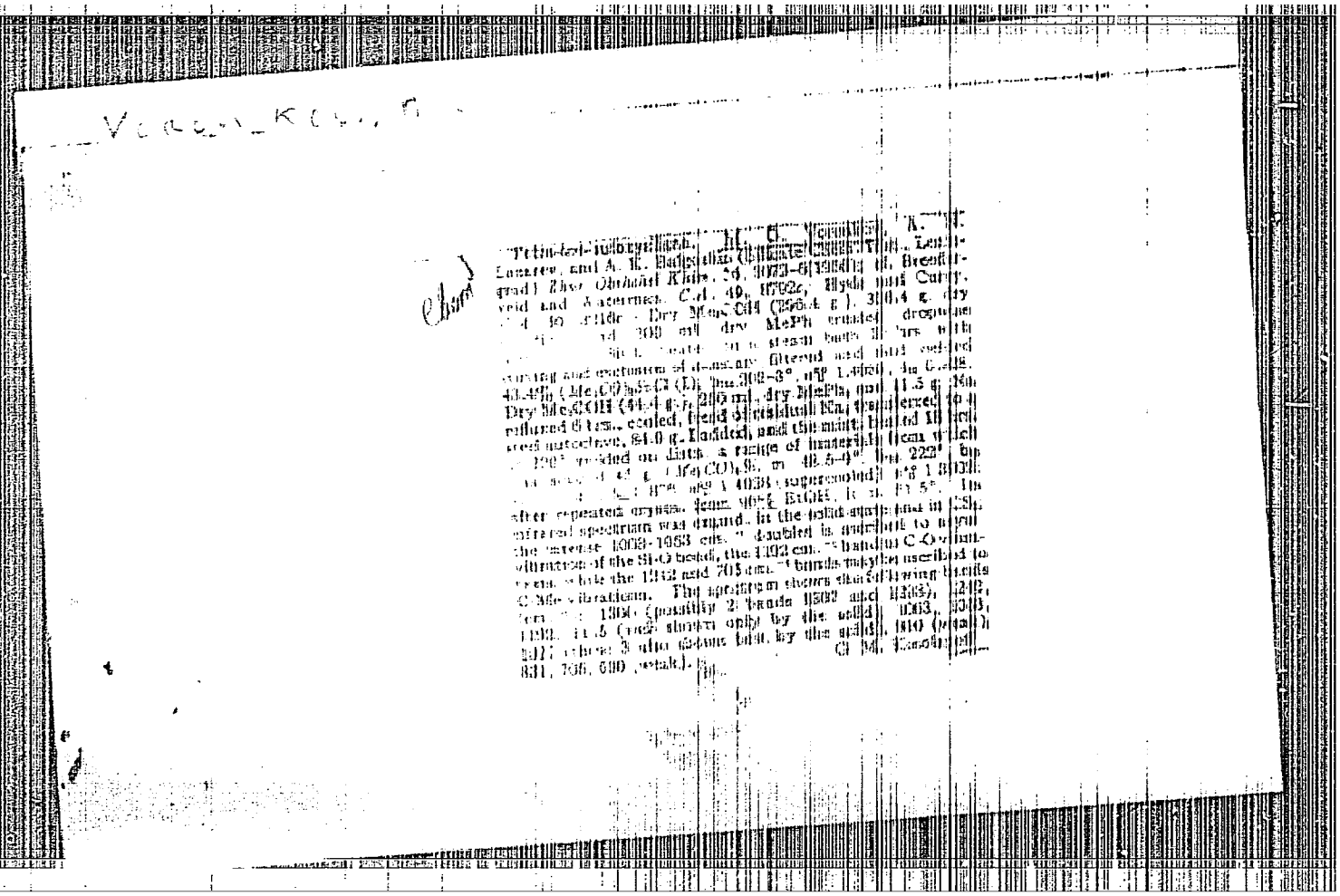
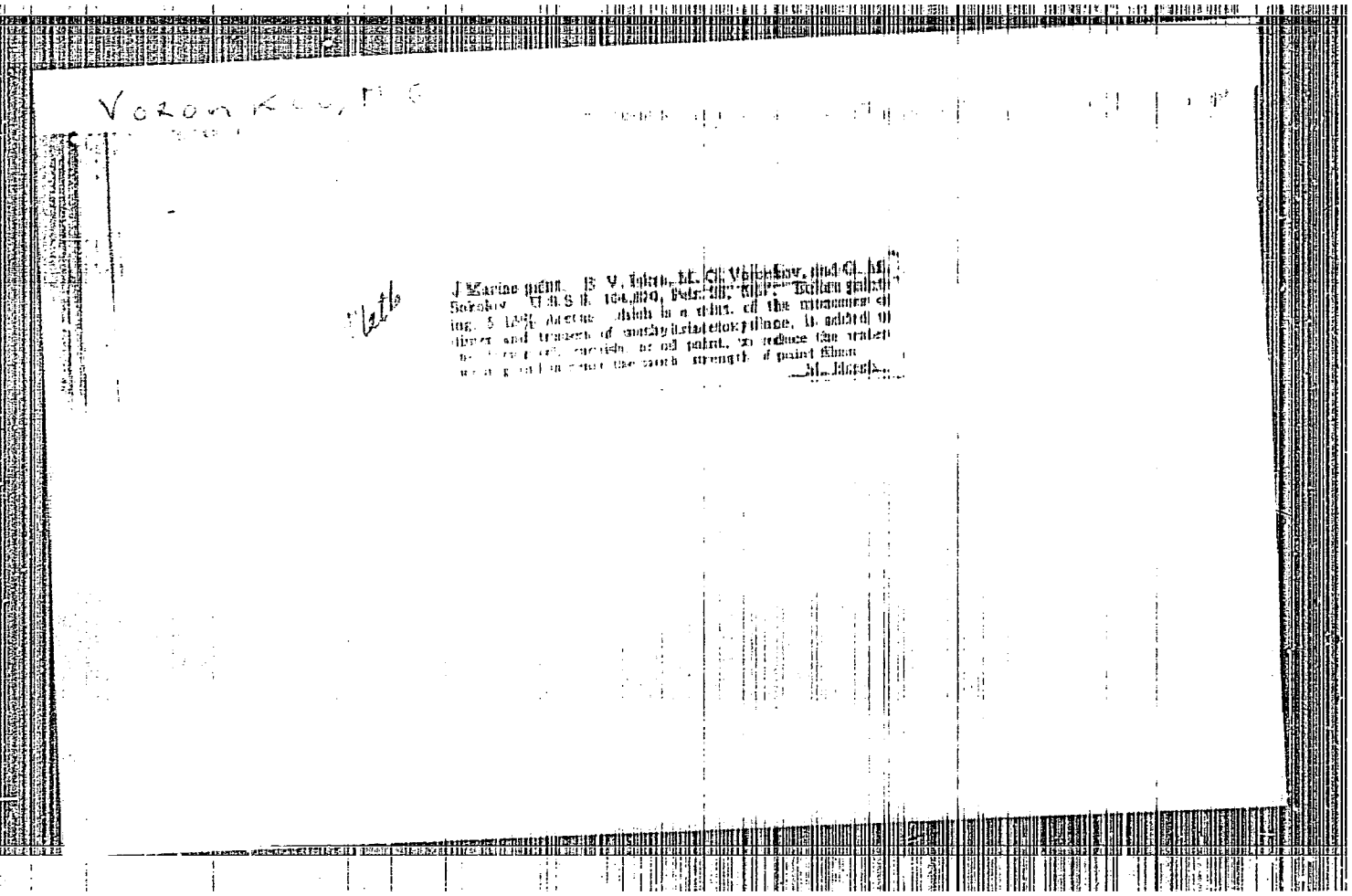


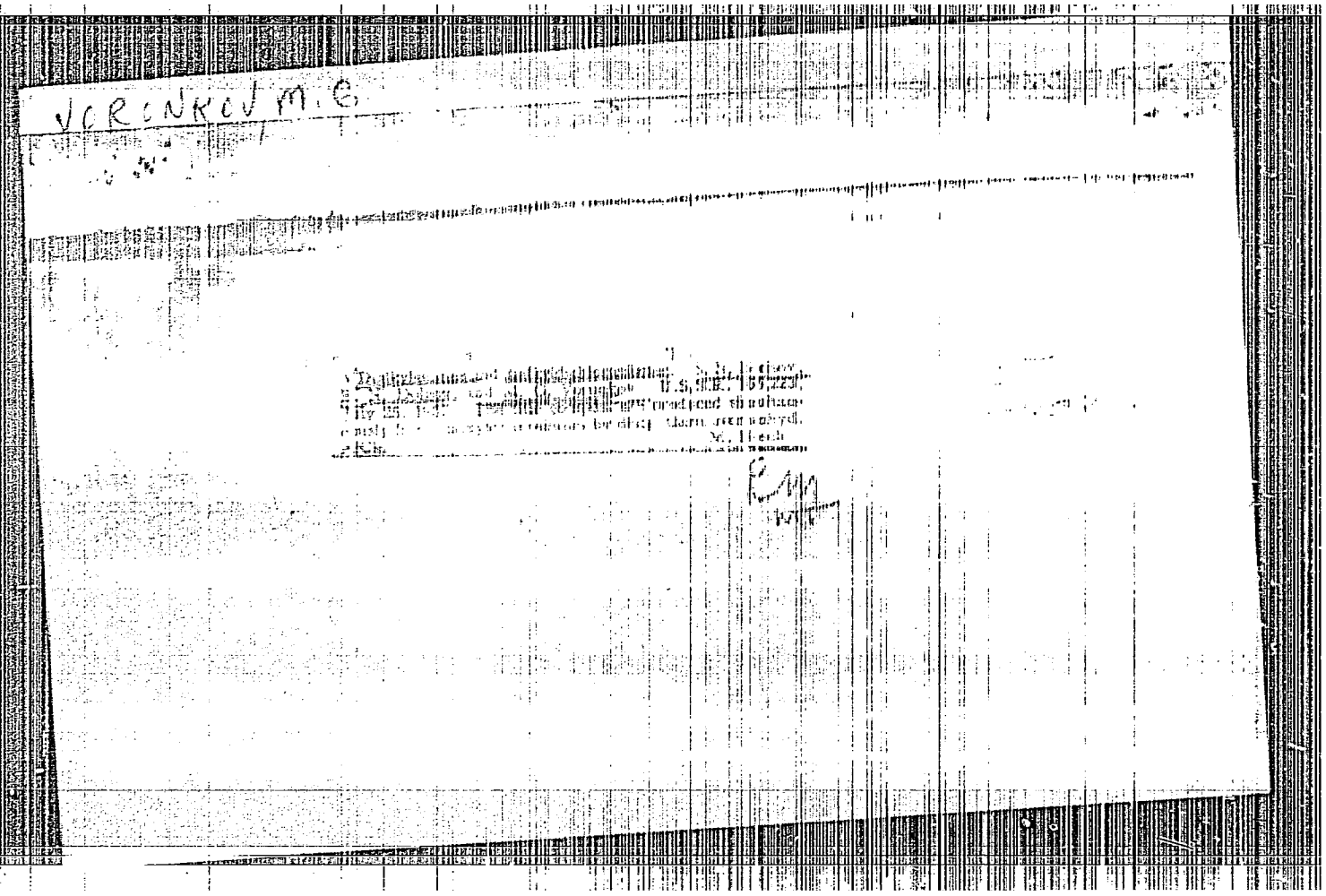
VORONKOV, M.G.

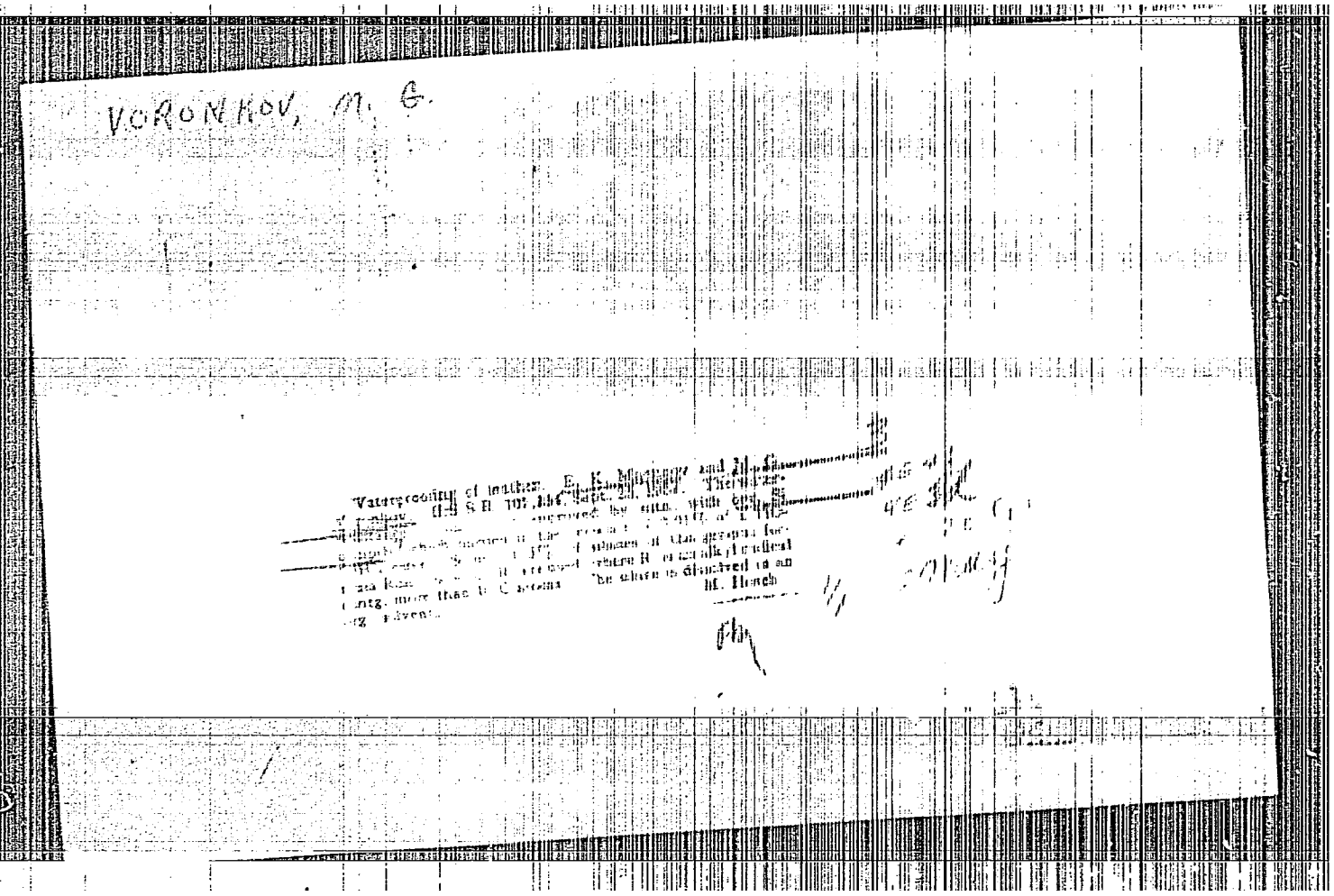
RYSKIN, Ya.I.; VORONKOV, M.G.

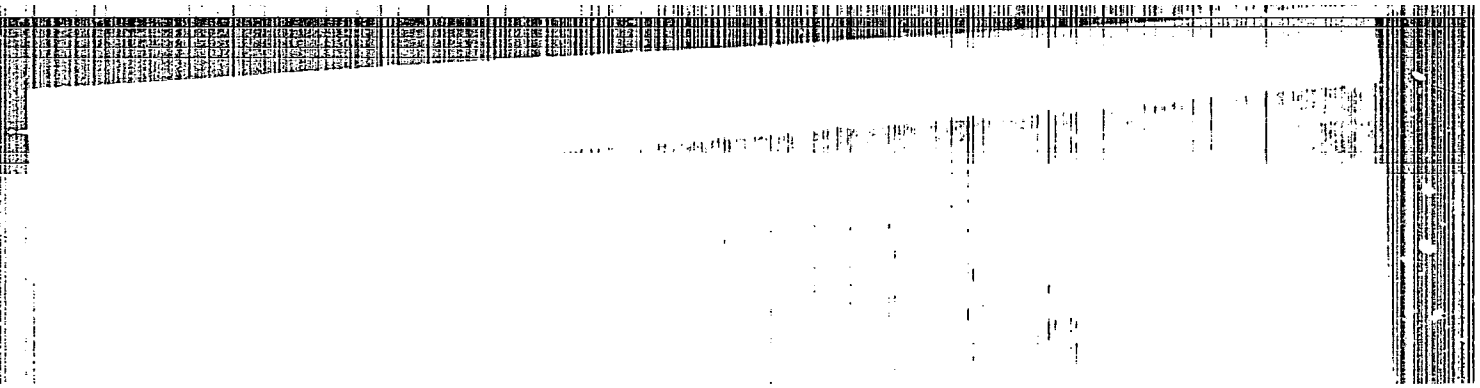
Molecular association and vibration spectra of silanols. Zhur. fiz. khim. 30 no.10:2275-2281 O '56. (MLRA 10:4)

1. Akademiya nauk SSSR, Institut khimii silikatov, Leningrad.
(Silanols--Spectra) (Molecular association)









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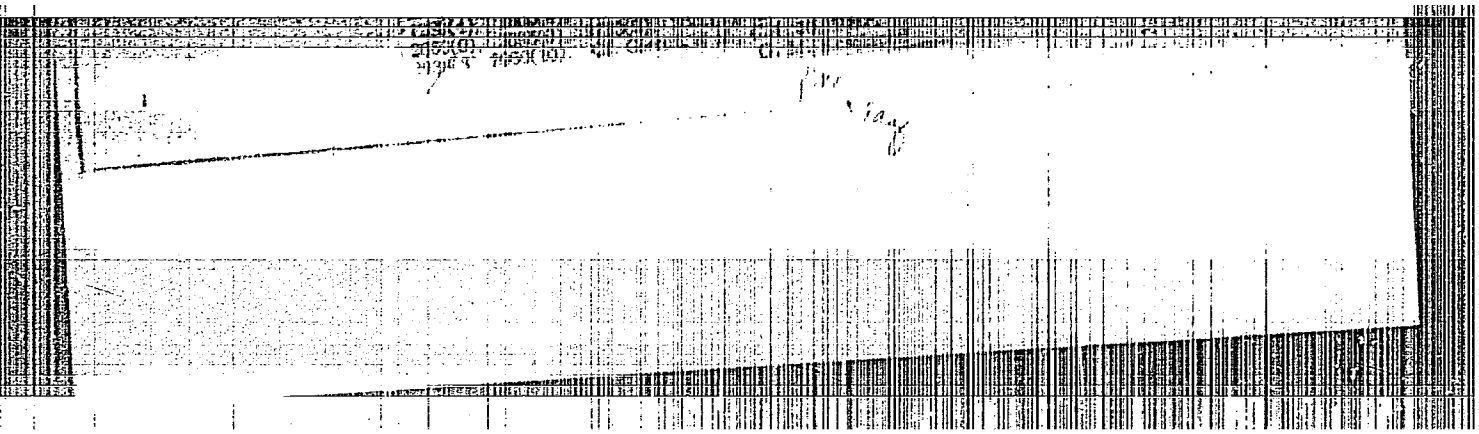

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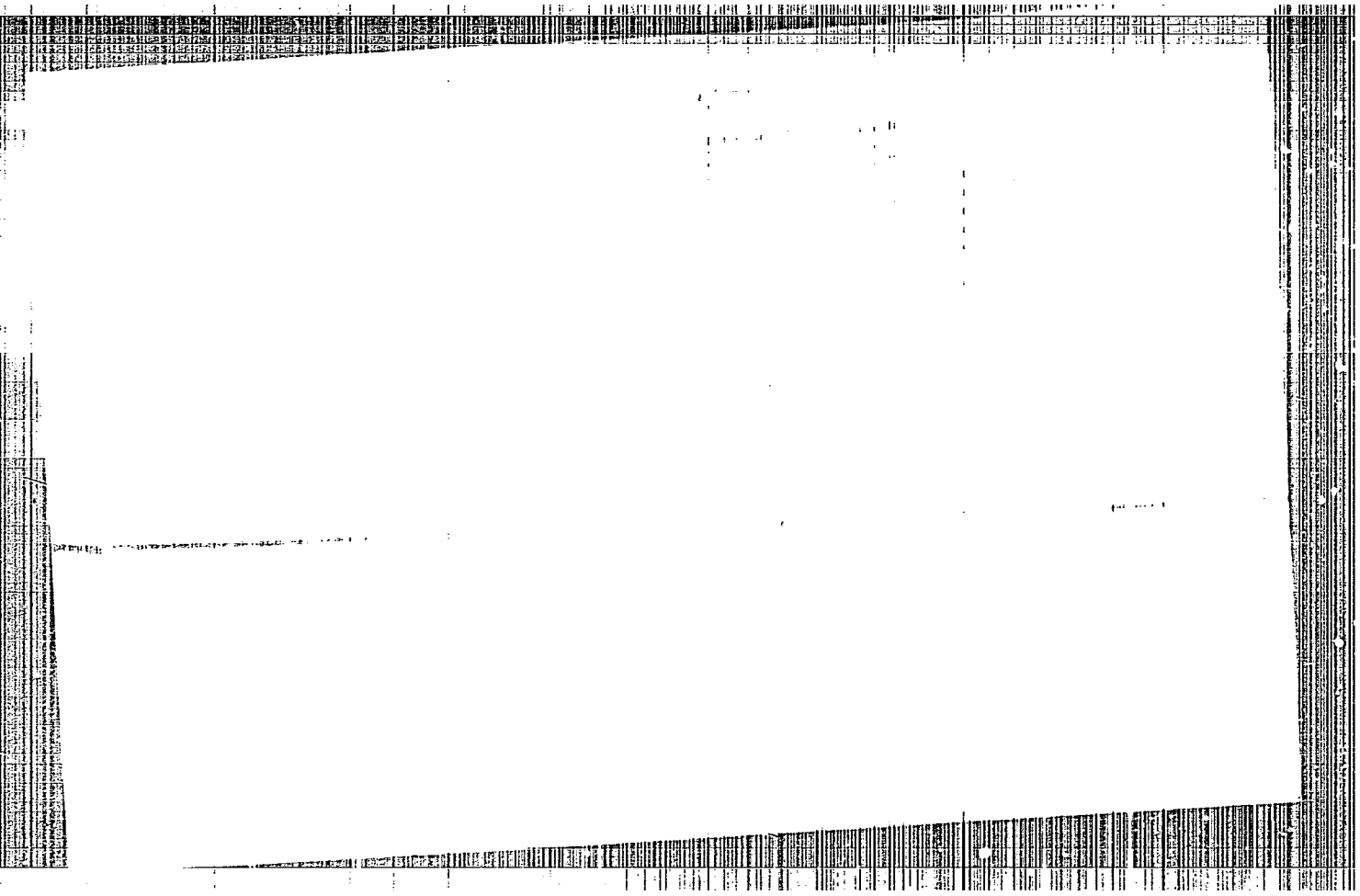


APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R001860920004-1"

VORONKOV, M.G.

VORONKOV, M.G.; DOLGOV, B.N.

Studies in the field of alkoxysilanes. Report No.9: β-fluoro-ethoxysilanes. Izv. AN SSSR. Otd. khim. nauk no.9:1128-1129 S '57. (MIRA 10:12)

1. Leningradskiy ordena Lenina gosudarstvennyy universitet im. A.A. Zhdanova i Institut khimii silikatov AN SSSR.
(Silane)

VORONKOV, M. G.

62-11-10/29

AUTHORS: Voronkov, M. G., Kolesova, V. A., Zgonnik, V. N.

TITLE: Bis- (Trialkylsilyl) Phosphinates (Bis-(trialkilsilil) fosfinaty).

PERIODICAL: Izvestiya AN SSSR, Otdelenie Khimicheskikh Nauk, 1957, Nr 11, pp. 1363-1367 (USSR)

ABSTRACT: Methods for the synthesis of bis-(trialkylsilyl)-phosphinates previously unknown by means of reaction of the phosphorous acid with trialkylchlorosilanes or trialkyl-koxysilanes were elaborated here and the spectra of their combination dispersion were investigated. In the spectrum of the bis-(trialkylsilyl)-ether of the phosphorous acid a series of frequencies in the area of 850 - 1050 cm^{-1}, in which occur deformation oscillations H - P - O (reference 6-10), was ascertained. But in this area are also the valence-oscillations C-C. The frequency of about 850 cm^{-1}, which is characteristical for trimethylphosphate $(CH_3O)_3P = O$ but lacking in the triethylphosphate spectrum (reference 10), was here only observed in the spectra of

Card 1/2

62-11-10/29

, Bis- (Trialkylsilyl) Phosphinates

$[(CH_3)_3SiO]_3P = O$ and $[(CH_3)_3SiO]_2 P{=}^{O}_{H}$. The frequencies of the symmetrical and antisymmetrical oscillations of the P - O -compounds lie in the area of 700 - 760 cm^{-1}, or 1090 - 1200 cm^{-1} respectively (reference 6-10,12). The presumable interpretation of the frequencies in the spectra of trialkylsilyl-ether of the phosphorous and the phosphoric acid is here given in a table. There are 2 tables, and 16 references, 8 of which are Slavic.

ASSOCIATION: Institute for Silicate Chemistry of the AN USSR (Institut khimii silikatov Akademii nauk SSSR).

SUBMITTED: June 19, 1956.

AVAILABLE: Library of Congress

Card 2/2

VORONKOV, M.G.

AUTHORS: Borisov, S.N., Voronkov, M.G., Dolgov, B.N. 62-11-19/29

TITLE: Disproportionation of the Trialkylsilanes (Disproportsionirovaniye trialkilsilanov).

PERIODICAL: Izvestiya AN SSSR, Otdelenie Khimicheskikh Nauk, 1957, Nr 11, pp. 1396-1398 (USSR)

ABSTRACT: It is shown here that the trialkylsilanes disproportion under the influence of $AlCl_3$.

The character of the rearrangement is determined by the structure of the trialkylsilane as well as by the reaction condition and the quantity of $AlCl_3$. There are 1 figure, and 4 references, 2 of which are Slavic.

ASSOCIATION: Institute for Silicate Chemistry of the AN USSR and Leningrad State University (Institut khimii silikatov Akademii nauk SSSR i Leningradskiy gosudarstvennyy universitet).

SUBMITTED: June 20, 1957.

Card 1/2

62-11-19/29

Disproportionation of the Trialkylsilanes

AVAILABLE: Library of Congress

Card 2/2

Fission of Organosiloxanes by Halogensilanes.

62-11-28/29

SUBMITTED: June 24, 1957

AVAILABLE: Library of Congress

Card 2/2

VORONKOV, M. G.

B-4

CZECHOSLOVAKIA/Physical Chemistry. Molecule. Chemical Bond.

Abs Jour: Ref Zhur-Khim., No 13, 1958, 42294.

Author : Kolesova V. A., Voronkov M. G.
Insta :
Title : Raman Spectra of Alkyl-Trichlorosilanes and Alpha-Omega-Bis-(Trichlorosilyl)-Alkanes.

Orig Pub: Sb. chekhosl. khim. rabot, 1957, 22, No 3, 851-861; Chem. listy, 1957, 51, 686.

Abstract: Investigation of Raman spectra of 14 alkyl-, cyclo-alkyl-, phenyl-trichlorosilanes and alpha-omega-bis-(trichlorosilyl)-alkanes (I). Frequencies in the region of 162-180 cm^{-1} and 225 cm^{-1} are attributed to degenerated deformation vibration of $SiCl_3$, at 450 and 565 cm^{-1} -- to symmetrical and degene-

Card : 1/2

Abs Jour: Ref Zhur-Khim., No 13, 1958, 42294.

rated valency vibration of Si-Cl bond. The last mentioned frequency is split into two in the higher alkyl-derivatives. Frequency of valency vibration of Si-C bond is within the region of 700-760 cm^{-1}. Spectra of n-alkyl trichlorosilanes (II) differ little from one another, since on change of the n-alkyl radical the symmetry of the molecule undergoes no substantial alteration. Spectra of I are similar to those of II. Absent are frequencies that are characteristic of vibrations of CH_3 group. Spectra of alkyl-trichlorosilanes with branched substituents differ greatly from those of n-alkyl derivatives. The paper includes tabulation of frequencies of the obtained spectra and their assignment to vibrations of angles and bonds.

VORONKOV, M.G.

AUTHORS: Borisov, S. N., Voronkov, M. G., Dolgov, B. N. 74-12-3/4
(Leningrad).

TITLE: Halides of Aluminum and Silico-Organic Compounds (Galogenidy alyuminiya i organicheskiye soyedineniya kremniya).

PERIODICAL: Uspekhi Khimii, 1957, Vol. 26, Nr 12, pp. 1388-1433 (USSR).

ABSTRACT: Aluminum chloride, which contains no water, is frequently used as a catalyzer in organic chemistry. The chemistry of silico-organic compounds has developed considerably in the course of recent years. In their chemical behavior they are often similar to the corresponding organic compounds, but there are also decisive differences. The present article deals with the reactions in the individual classes of the silico-organic compounds with aluminum halides, mainly with aluminum chloride. This survey comprises periodicals and patents published until October 1956. The following chapters are dealt with:
1.) Alkylation- and arylation reactions of silicon halides in the presence of aluminum chloride.
2.) Reactions of aluminum halides with ethers in orthosilicic acid, alkylalkoxysilanes and alkoxyhalide silanes.
3.) Reactions of aluminum chloride with acyloxysilanes.

Card 1/2

Halides of Aluminum and Silico-Organic Compounds. 74-12-3/4

4.) Reactions of aluminum halides with siloxanes abd silanoles.
5.) Reactions of aluminum halides with alkyl-halide-silanes. Here the reactions of silicon hydrogens are not taken into account.
6.) Reactions of aluminum halides with tetraalkyl- and tetrarylsilanes.
7.) Reactions of aluminum halides alkyl- and aryl halides silanes of the type R_nSiX_{4-n} ($n = 1 - 3$).
8.) Reactions of aluminum chloride with silicon-hydrocarbons and alkylchloride silanes which contain the halide atom in the alkyl rest.

There are 5 tables, and 246 references, 79 of which are Slavic.

AVAILABLE: Library of Congress.

1. Aluminum halides 2. Silico-Organic compounds-Halides

Card 2/2

VORONKOV, M.G.

79-2-10/58

AUTHORS: Voronkov, M. G., and Karpenko, G. B.

TITLE: Investigation of Alkoxysilanes Part 6. Synthesis of Tetraaroxysilanes by the Re-esterification of Ethyl Silicic Ether with Phenols (Issledovaniya v oblasti alkoksisilanov peresterifikatsiyey kremneetilovogo efira fenolami)

PERIODICAL: Zhurnal Obshchey Khimii, 1957, vol 27, No 2, pp. 325-327 (U.S.S.R.)

ABSTRACT: Experiments showed that ethyl silicic ether in the presence of a homologous sodium phenolate reacts easily with phenols of different structures. This reaction was considered to be very simple and also suitable for the synthesis of tetrasroxysilanes with yields of about 70 - 85%. By employing this reaction method, the authors synthesized eleven tetraaroxysilanes as well as orthosilicic ethers of cyclohexanol, cyclopentanol and benzyl alcohol.

The physico-chemical properties of the tetraaroxysilanes obtained are described in a table. When exposed to ultraviolet light, all tetraaroxysilanes give a light blue or dark blue as well as a violet fluorescence.

Card 1/2

79-2-10/58

Investigation of Alkoxysilanes Part 6. Synthesis of Tetraaroxysilanes by the Re-esterification of Ethyl Silicic Ether with Phenols

The refraction indices of these silanes were established for the first time.

1 table. There are 20 references, of which 8 are Slavic

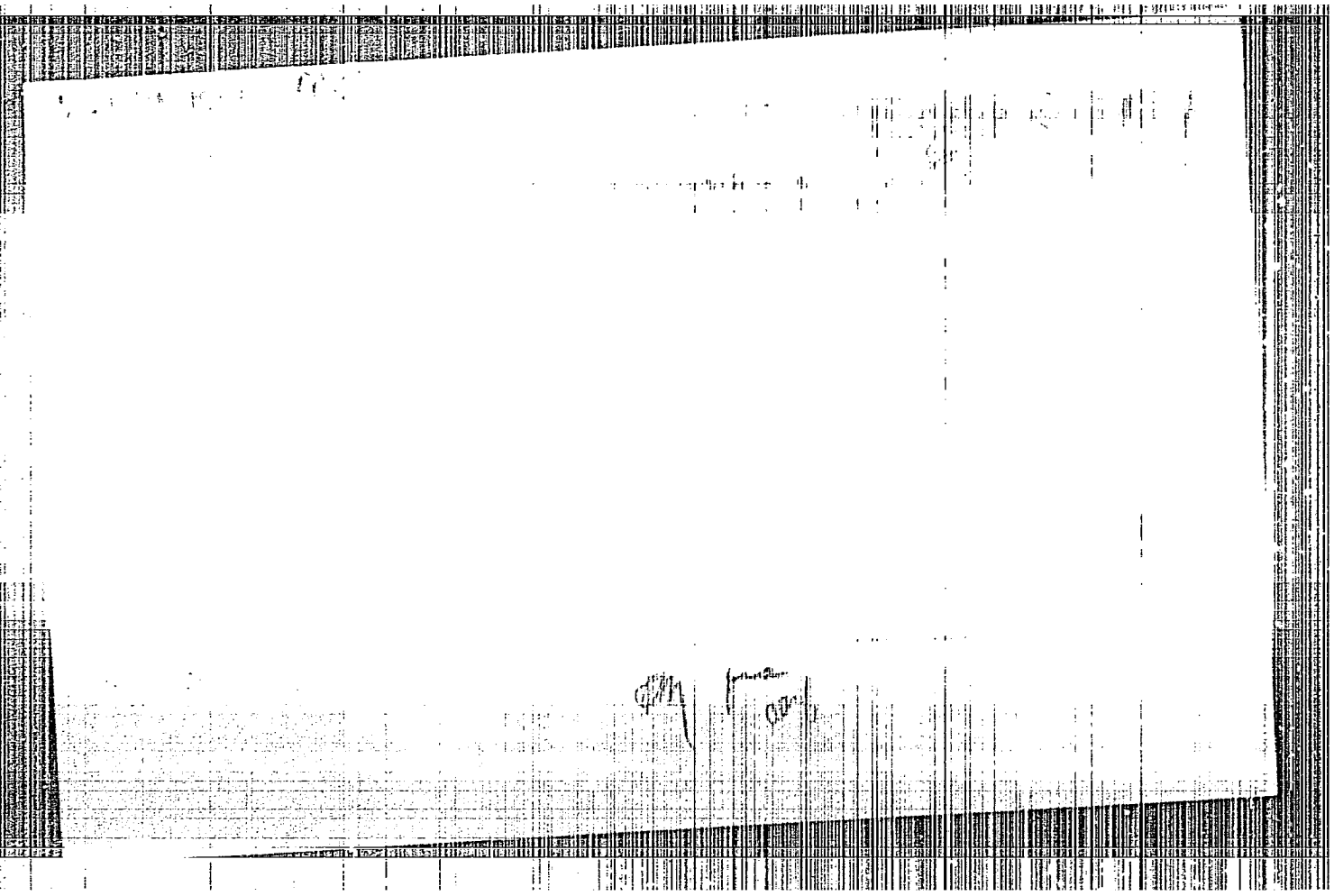
ASSOCIATION: USSR Academy of Sciences, Institute of the Chemistry of Silicates

PRESENTED BY:

SUBMITTED: March 20, 1956

AVAILABLE: Library of Congress

Card 2/2



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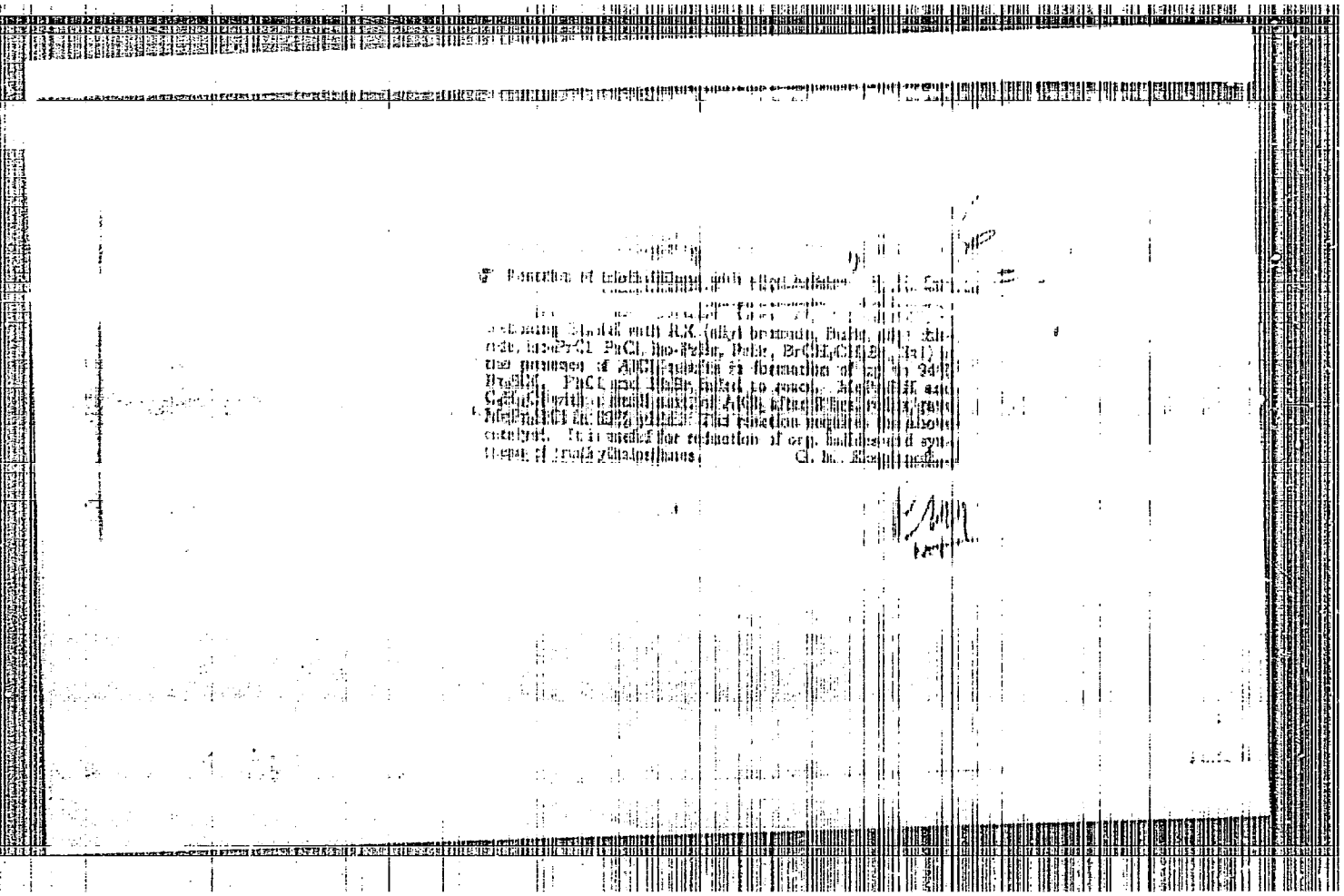

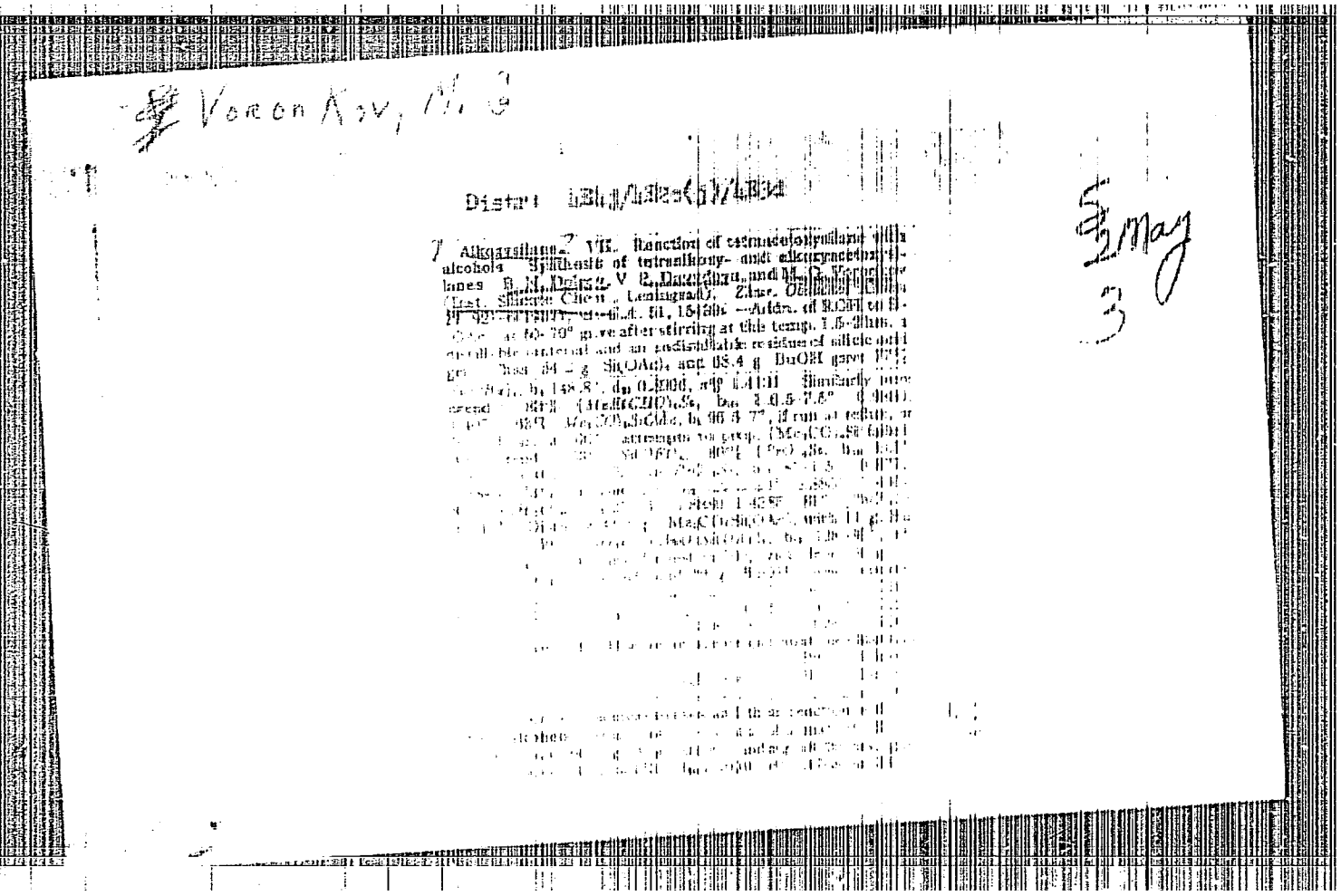

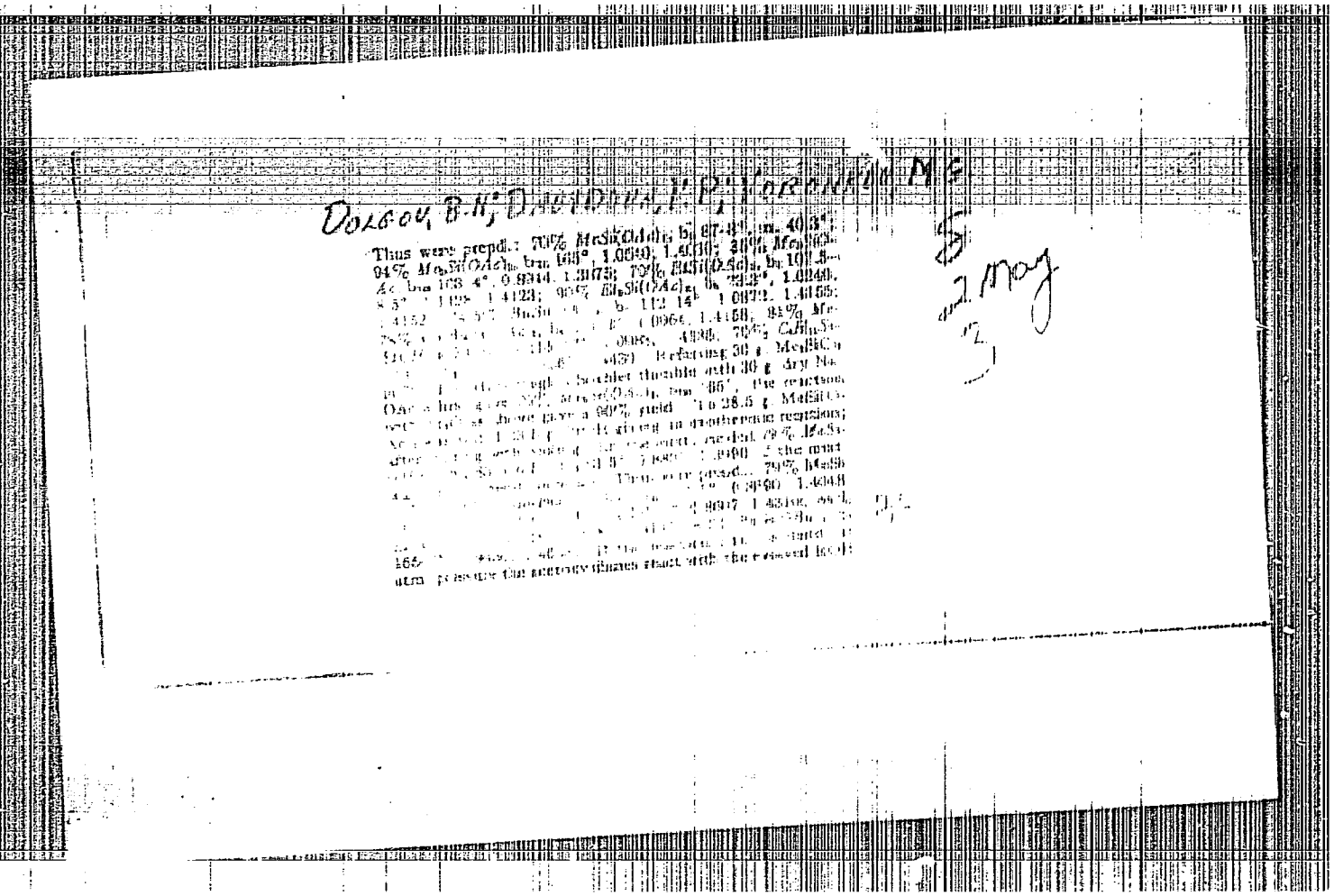

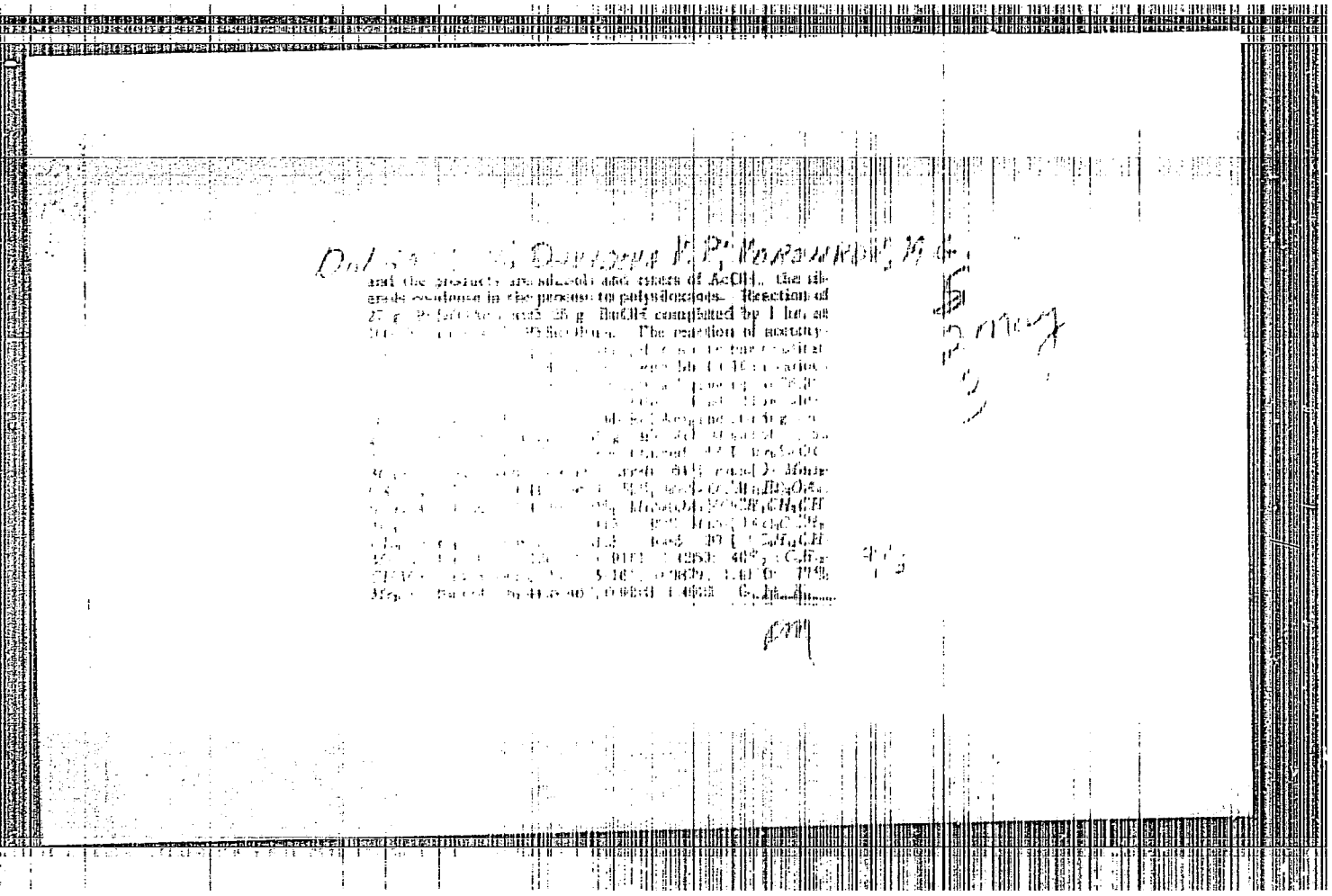

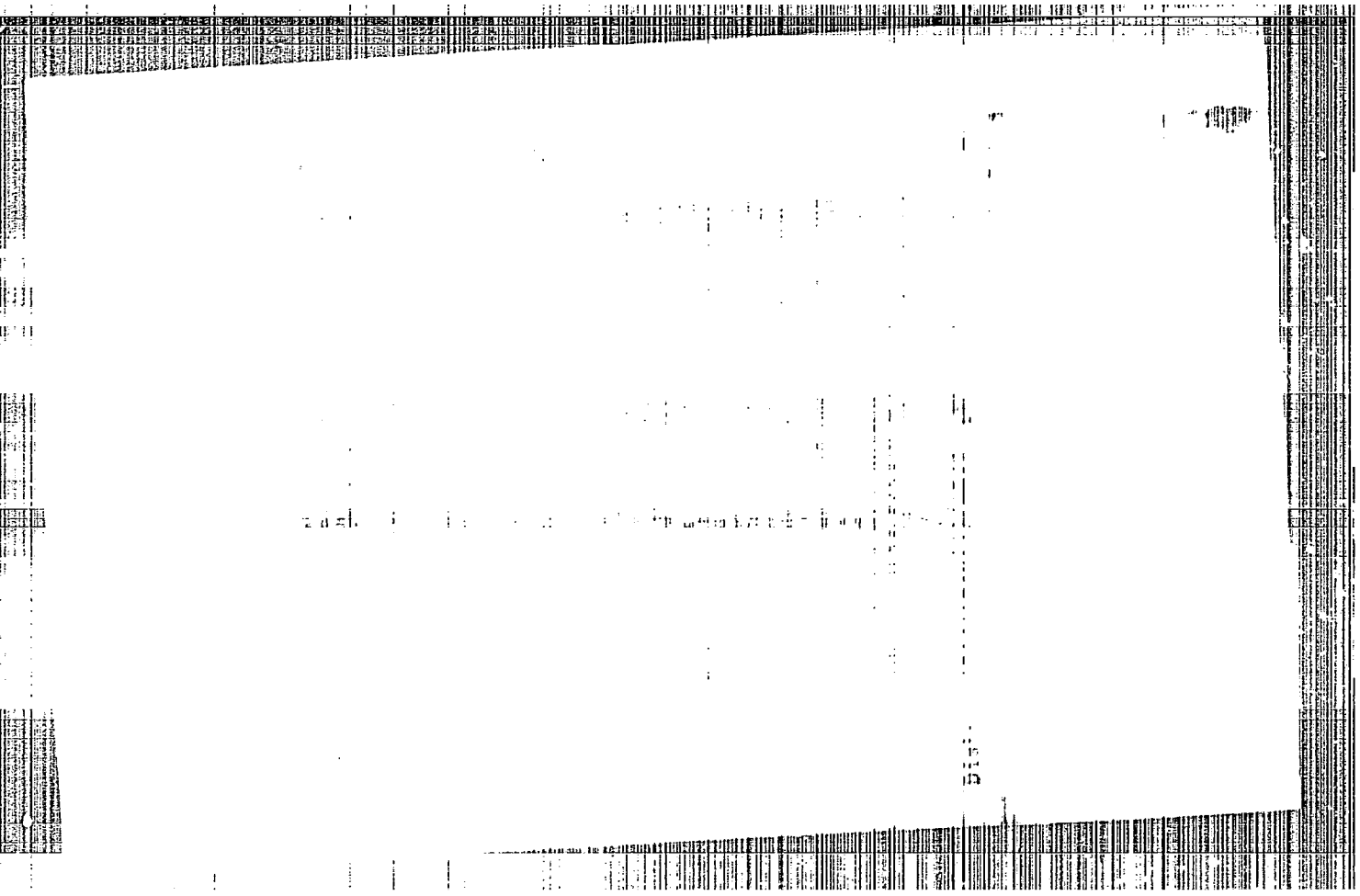

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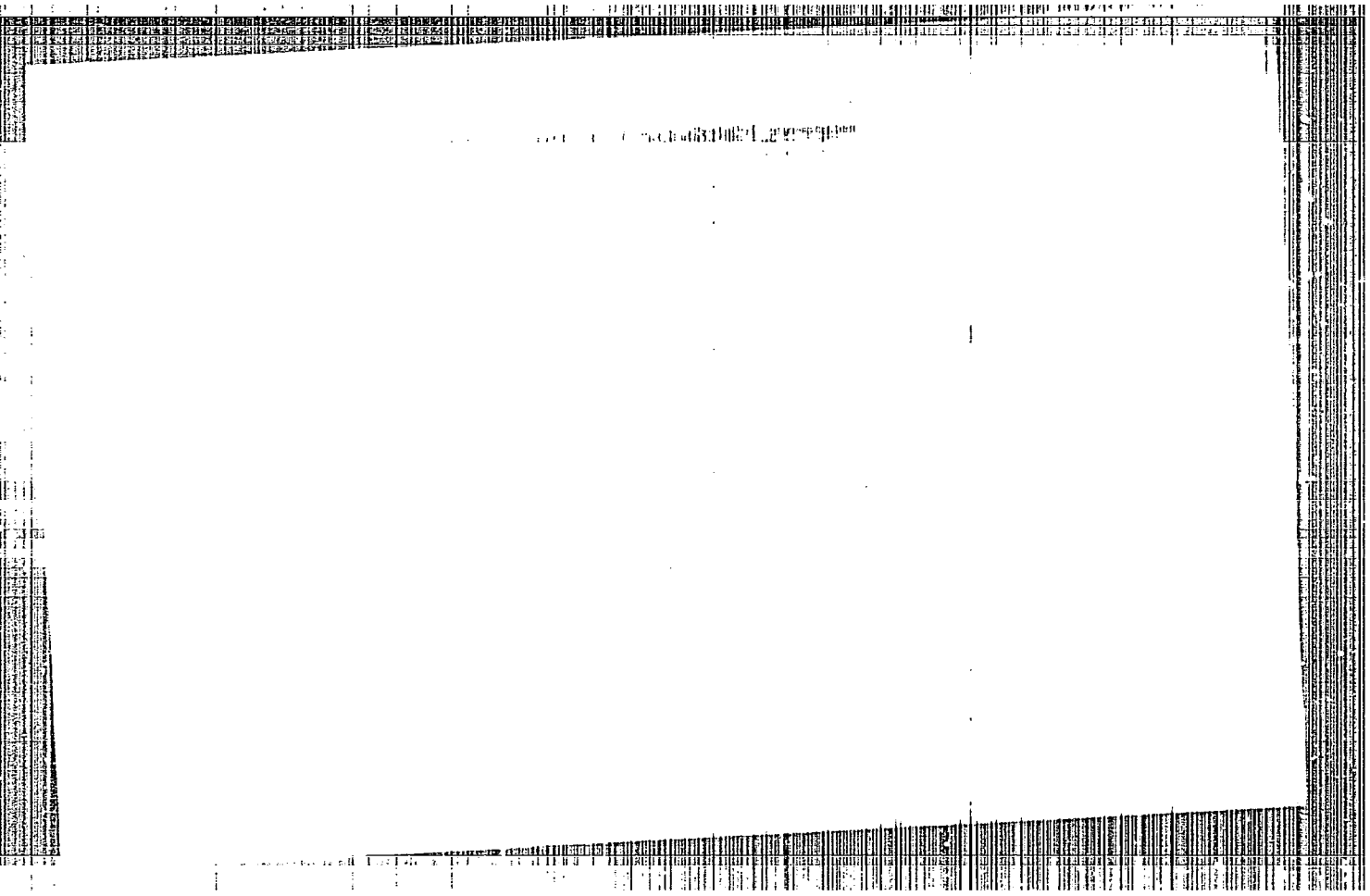

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VORONKOV, M.G.

DOLGOV, B.N.; DAVYDOVA, V.P.; VORONKOV, M.G.

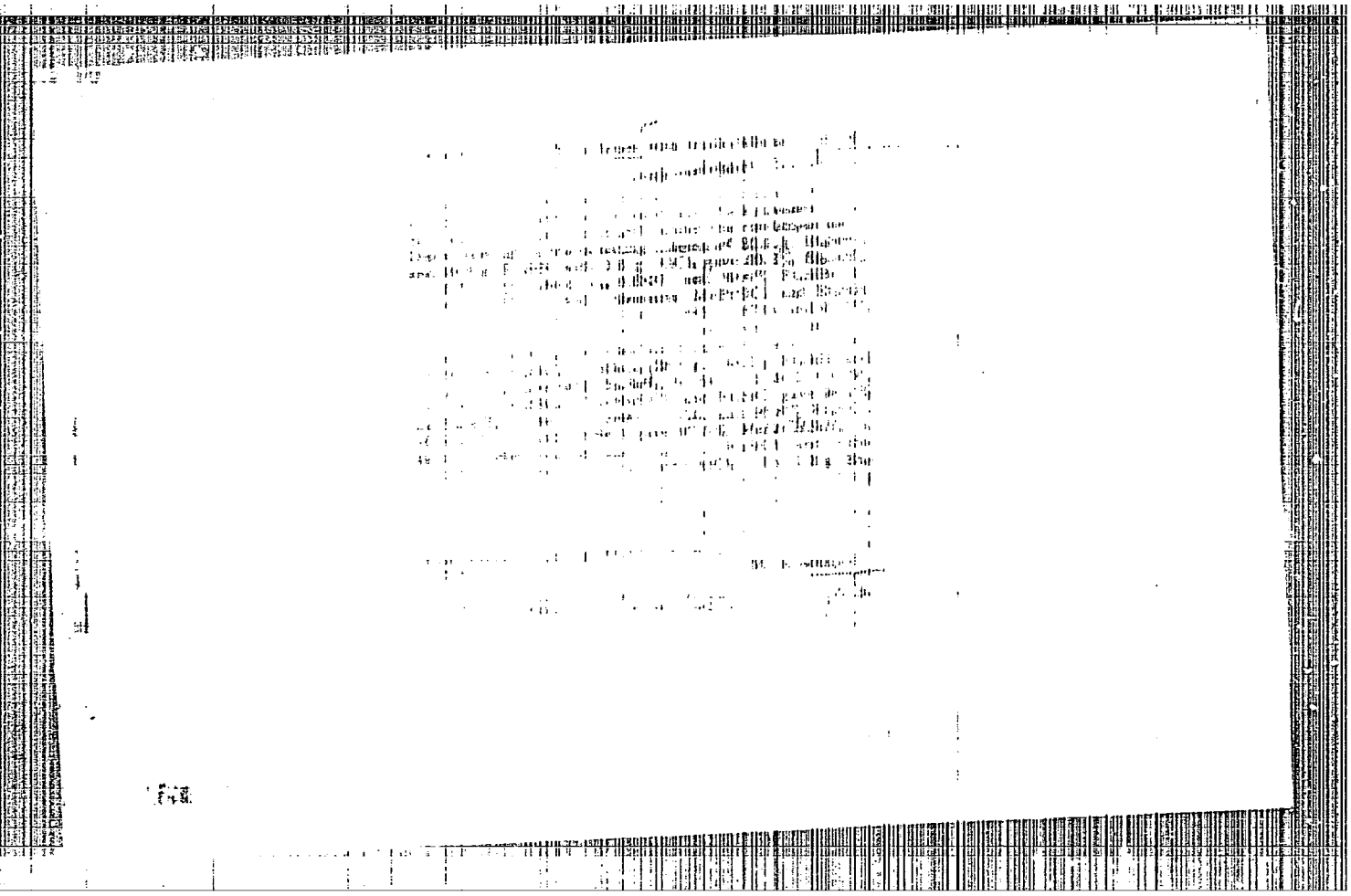
Investigation in the field of alkoxysilanes. Part 8: Alkyl (aryl)acetoxysilanes and their reaction with aliphatic alcohols. Zhur.ob.khim. 27 no.6:1593-1599 Je '57. (MLRA 10:8)
(Silane) (Alcohols)

VORONKOV, M. G.

DOLGOV, B.N.; BORISOV, S.N.; VORONKOV, M.G.

Reaction of dialkylchlorosilanes with aluminum chloride. Zhur. ob. khim. 27 no.8:2062-2066 Ag '57. (MIRA 10:9)

1. Leningradskiy gosudarstvennyy universitet i Institut khimii silikatov Akademii nauk SSSR.
(Silane)



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F-1

USSR / Microbiology. General Microbiology.

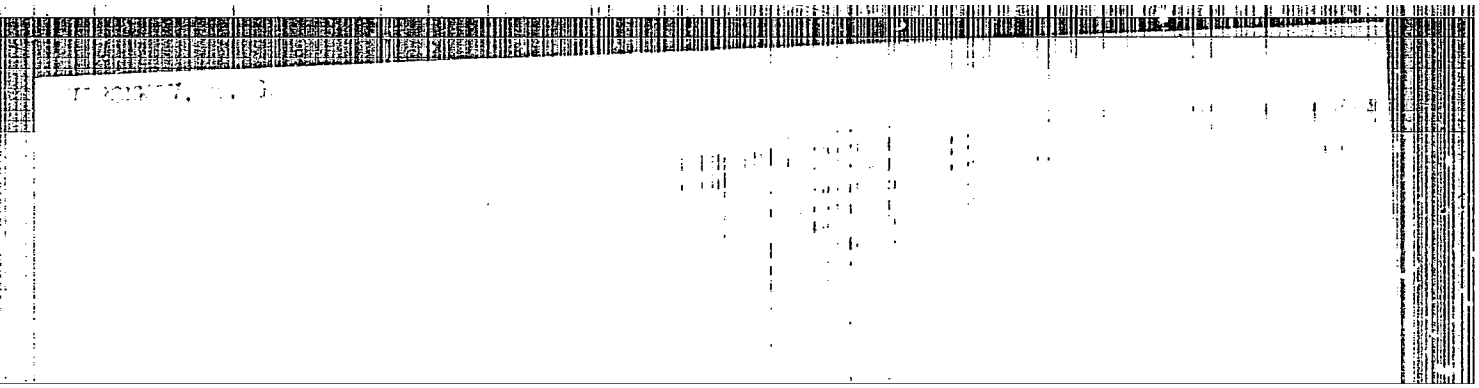
Abs Jour : Ref Zhur - Biol., No 20, 1958, No. 90714

Author : Marova, M. Ya.; Voronkov, M. G.; Dolgov, B. N.
Inst : Not given
Title : Insecticidal and Fungicidal Action of Organic, Silico-Organic, and Inorganic Rhodanides

Orig Pub : Zh. priklad. khimii, 1957, 30, No 4, 650-652

Abstract : Polythiocyanate alkanes (dirhodaninemethane, 1,2-dirhodaninemethane, 1,2,3-trirhodaninepropane) proved to be strong fungicides in a concentration of 0.1% and are recommended by the authors for protection of glues and paints. For the first time it was also observed that certain alkyl isothiocyanate silanes possessed insectean and fungicidal properties, but more weakly than the polythiocyanate alkanes. -- Ye. N. Kondrat'yeva

Card 1/1



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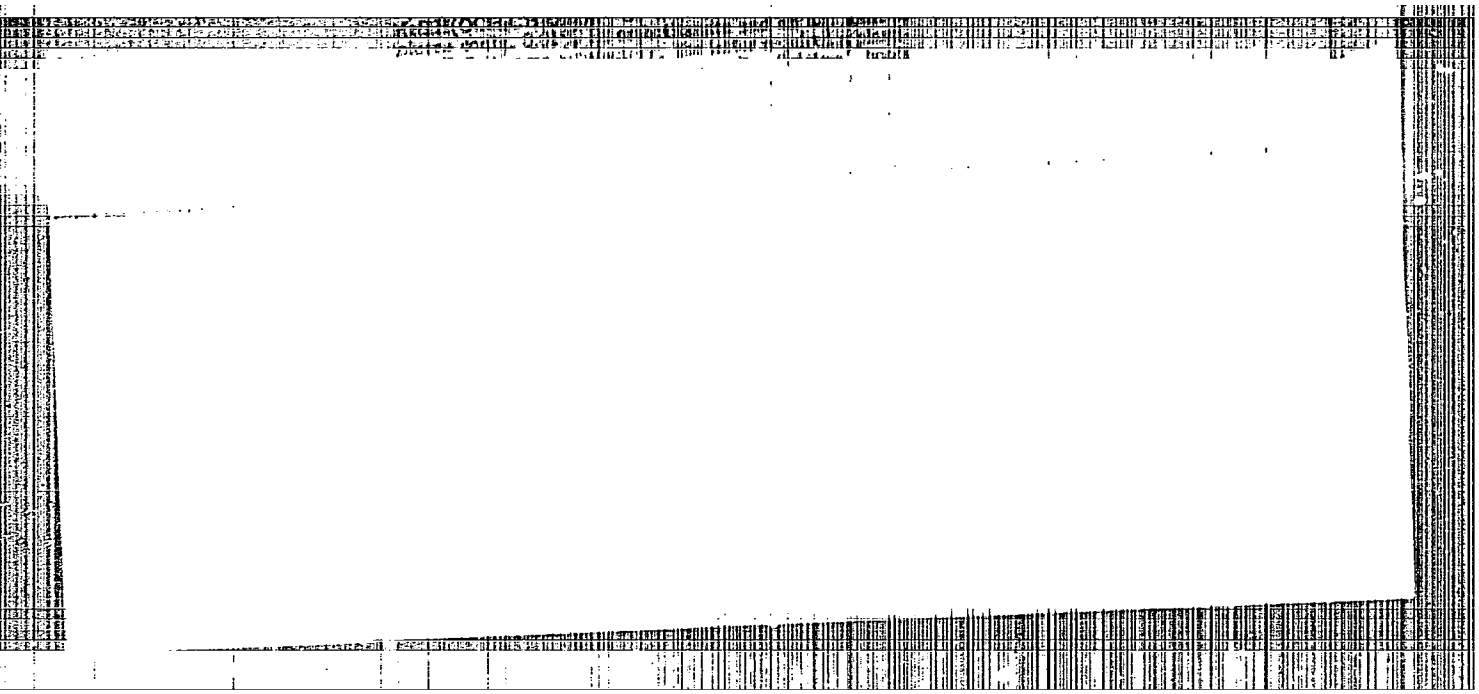

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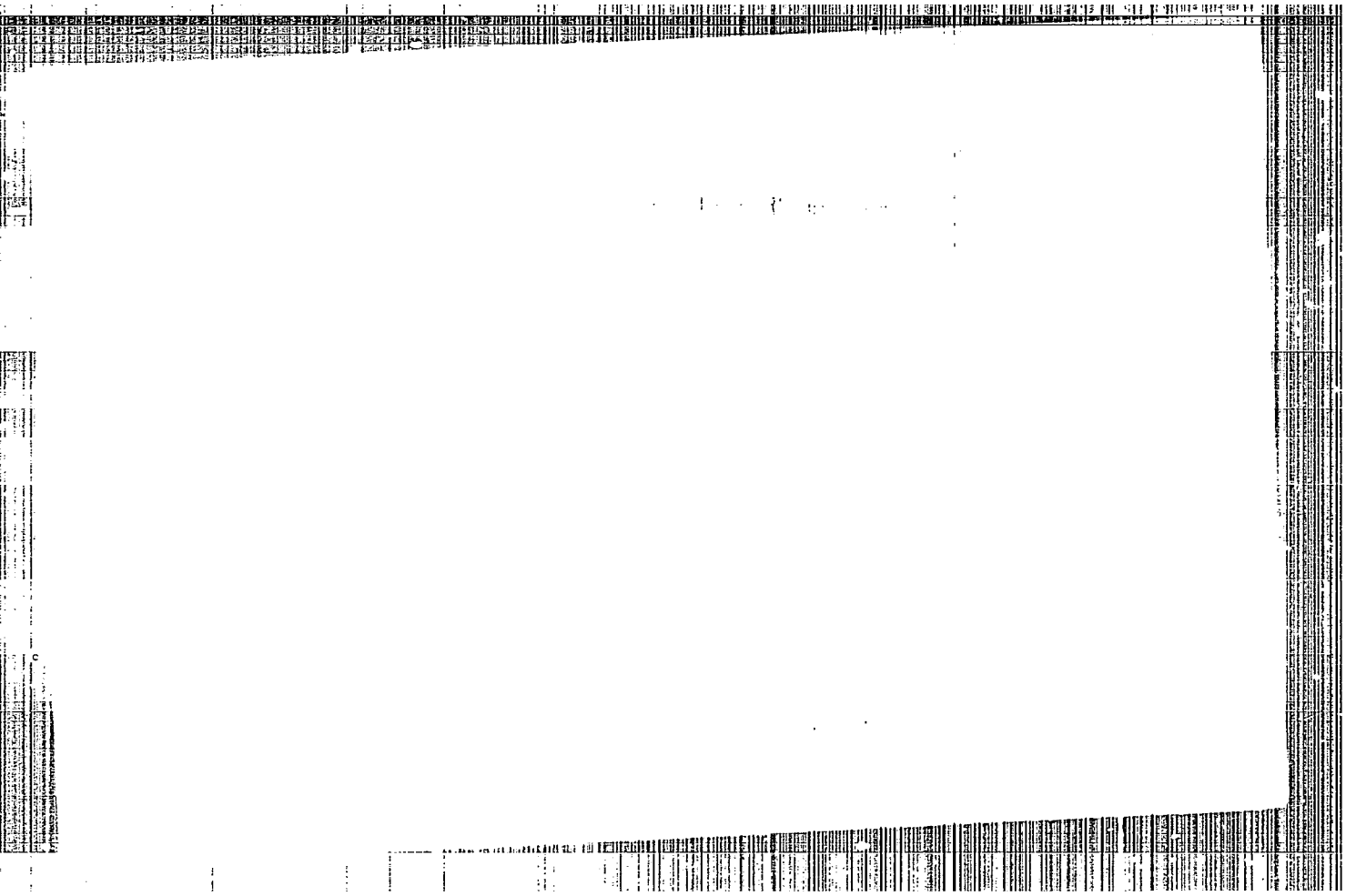

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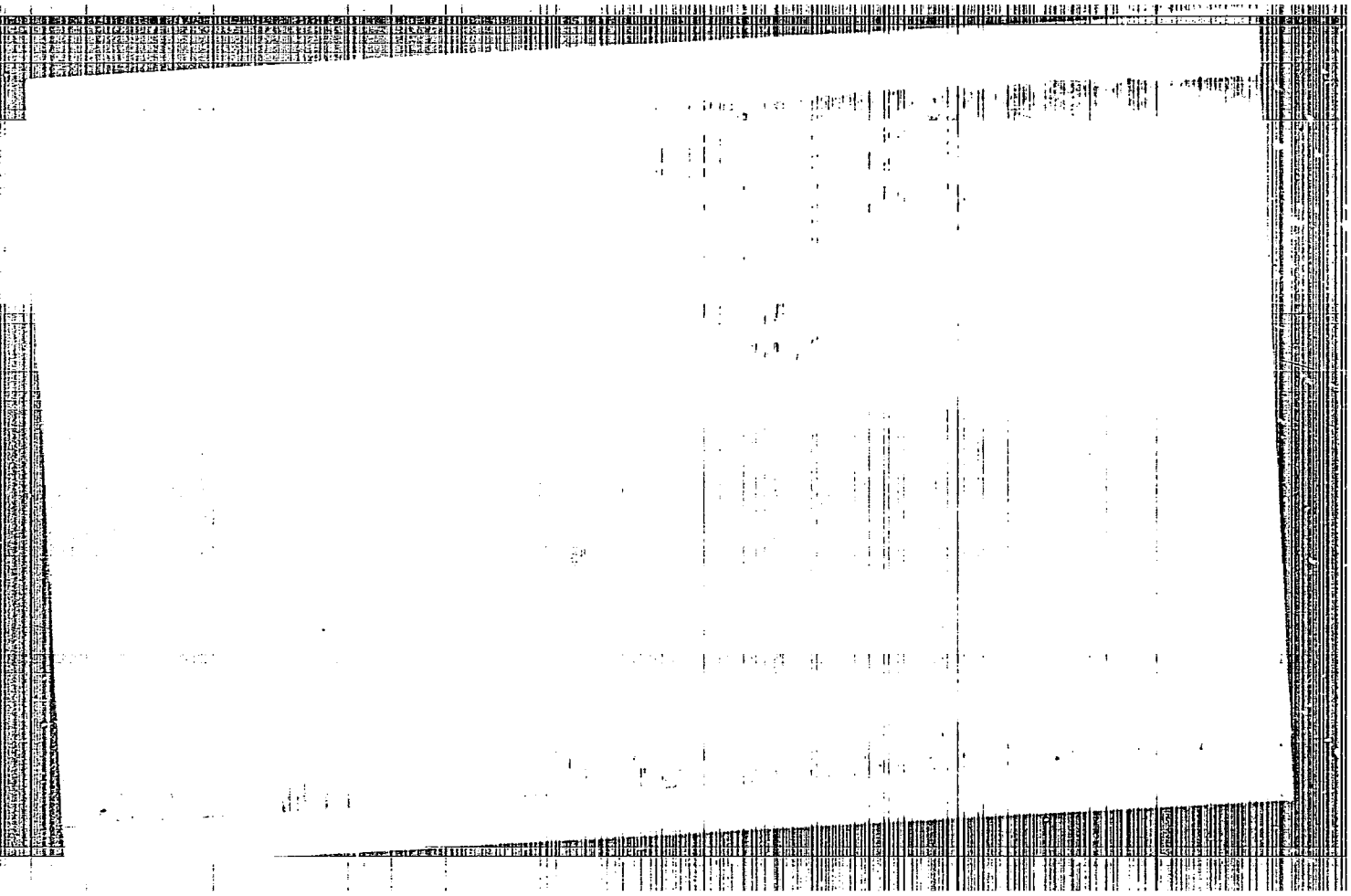

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VORONKOV, M.G.

20-1-25/64

AUTHOR: BORISOV,S.N., VORONKOV,M.G., DOLGOV,B.N.

TITLE: Isomeric Silapentanes and New Ways Leading to their Synthesis. (Izomernyye silapentany i novyye puti ikh sinteza, Russian)

PERIODICAL: Doklady Akademii Nauk SSSR, 1957, Vol 114, Nr 1, pp 93-96 (U.S.S.R.)

ABSTRACT: The properties of the known silicon-hydrocarbons of the type $R_n SiH_4$ have hitherto not been investigated with sufficient thoroughness. The only possible way of determining these properties with any degree of exactitude is that by obtaining the corresponding alkile chlorsilanes by litium-aluminum hydride

$$R_n SiCl_4 + (4-n)\ LiAlH_4 \rightarrow R_n SiH_{4-n} + (4-n)(LiCl+AlCl_3).$$

In order to solve the problem concerning the influence exercised by the position of the silicon atom in the skeleton of silicon carbide upon the properties of the alkile silanes a number of silapentanes C H Si was synthetized which must be described as corresponding pentanes.
In order to be able to obtain the new silapentanes new methods of synthetization were found. (See tables 1 and 2).

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20-1-25/64.

Isomeric Silapentanes and New Ways Leading to their Synthesis.

As expected, the influence exercised by the isomery of the radical upon the process of the modifications of the physical constants of the butyl silanes were of the same kind as e.g. in the case of butyl alcohol. The rapid reaction of the caustic hydrolysis of the silapentanes was reduced from $RSiH_3$ to R_3SiH, as shown by a diagram.

(With 2 Tables, 1 Diagram, and 9 References).

ASSOCIATION: Not given
PRESENTED BY:
SUBMITTED:
AVAILABLE: Library of Congress

Card 2/2

VORONKOV, M. G. (Leningrad)

"The Catalytic Splitting of Organosiloxanes by Alkoxy- and Halogenosilanes."

paper submitted at the Symposium on Organic and Nonsilicate Silicon Chemistry on 12th-14th May 1958, Dresden.

Abst. B,3,108,944 (ENGL.)

VORONKOV, M. G.

AUTHORS: Voronkov, M. G., Skorik, Yu. I. 62-1-27/29

TITLE: Letters to the Editor (Pis'ma redaktoru). Tris (Trialkylsilyl) Phosphites (Tris (trialkilsilil) fosfity)

PERIODICAL: Izvestiya AN SSSR Otdeleniye Khimicheskikh Nauk, 1958, Nr 1, p 119 (USSR)

ABSTRACT: The silicon-organic esters of the oxvacids of the 5-valent phosphor have already been investigated to a great extent. However, the corresponding derivatives of trivalent phosphorus almost not at all. The authors of this letter published two methods of the synthesis of compounds of this kind. The first is based upon the reaction PBr_3 with trialkyloxysilanes: $3\ R_3SiOR' + PB_3 \rightarrow (B_3\ SiO)_3P + 3\ R'Br$. The second is based upon the fission of the hexaalkyldisilyloxanes in presence of the above mentioned catalysts: $3\ R_3\ SioSiR_3 + PX_3 \rightarrow (3R_3SiO)_3 P + 3R_3\ SiX$. In PBr_3 the yield of tris (trialkylsilyl)-phosphites amounts to 25-30%. Both reactions, the physical and chemical properties of the trialkylsilylphosphites as well as their oscillation spectra will soon be discussed in detail in this periodical.

Card 1/1

ASSOCIATION: Institute of Silicate Chemistry, AS USSR (Institut khimii silikatov Akademii nauk SSSR)

SUBMITTED: October 24, 1957

1. Phosphorus-Derivatives 2. Silicon compounds (Organic)-Synthesis 3. Esters-Synthesis

VORONKOV, M. G.

AUTHORS: Voronkov, M. G., Skorik, Yu. I. 62-58-4-20/32

TITLE: Synthesis of Trialkyl Vanadates and Trialkyl Antimonites (Sintez trialkilvanadatov i trialkilantimonitov)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Otdeleniye Khimicheskikh Nauk, 1958, Nr 4, pp. 503-503 (USSR)

ABSTRACT: Remarks in technical literature that $OV(OR)_3$ and $Sb(OR)_3$ can be synthetized with alcohol by interaction with V_2O_5 (Sb_2O_3 respectively) did not furnish satisfactory results in experiments. In boiling V_2O_5 (or Sb_2O_3) with ethyl- or butylalcohols which was to guarantee the removal of the water forming in the reaction, no trialkyl antimonites formed and the yields were very small. In the reaction of $VOCl_3$ ($SbCl_3$ respectively) with alcohols in the presence of ammonia the authors easily managed the synthetization of trialkyl antimonites according to the scheme:

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Synthesis of Trialkyl Vanadates and Trialkyl Antimonites 62-58-4-20/32

$$MCl_3+3ROH+3NH_3 \longrightarrow M(OR)_3+3NH_4Cl; \ (M = Sb, \ OV).$$

Thus the authors synthetized: ethyl- and n.butylorthoesters of vanadic acid, antimonic acid and phosphoric acid.
There are 8 references, 3 of which are Soviet.

ASSOCIATION: Institut khimii silikatov Akademii nauk SSSR (Institute for the Chemistry of Silicates, AS USSR)

SUBMITTED: November 1o, 1957

AVAILABLE: Library of Congress

1. Trialkyl vanadates—Synthesis 2. Trialkyl antimonites —Synthesis

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VORONKOV, M. G.

51-4-2-7/28

AUTHORS: Lazarev, A. N. and Voronkov, M. G.

TITLE: Vibrational Spectra of Alkoxysilanes and Siloxanes. I. Infrared Spectra of Orthosilicic Acid Esters. (Kolebatel'nyye spektry alkoksisilanov i siloksanov.) (I. Infrakrasnyye spektry efirov ortokremnevoy kisloty)

PERIODICAL: Optika i Spektroskopiya, 1958, Vol.IV, Nr.2, pp.180-188. (USSR).

ABSTRACT: The present paper reports measurements of infrared absorption spectra in the 1300-680 cm^{-1} region on 11 orthosilicic acid esters and 1 silicoorganic orthocarbonic acid ester. Methyl and ethyl esters of orthosilicic acid (Nos.1, 2 in Table 1) were obtained by a reaction of silicon chloride with methyl or ethyl alcohol (Ref.10). The higher tetraalkoxysilanes (Nos.3 - 8 in Table 1) were prepared from silico-methyl or silico-ethyl esters by reaction with appropriate alcohols (Ref.11). Tetratributoxysilane (No.9 in Table 1) was described earlier (Ref.12). Tetracis(trimethylsiloxy)silane (No.10 in Table 1) was obtained as in Ref.13. Tetracis(tribenzylsiloxy)silane (No.11) and tetracis(tribenzylsiloxy)methane (No.12) were

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chemical composition of the 12 compounds studied are given in Table 1. The infrared spectra were measured using spectrometers with NaCl prisms. A thermo-element with a photoelectric amplifier (Ref.14) was used as a receiver. Positions of the spectral maxima could be determined to within $\pm$ 0.03 μ in the spectral region 7.5 - 14.5 μ. The majority of the orthosilicic acid esters were studied as solutions in carbon disulphide. Compounds Nos.11 and 12 (in Table 1) were studied as pressed disks made of their powders mixed with KBr. The spectra are given in Figs. 1 - 3, and the frequencies of absorption maxima in Table 2. The authors also discussed identification of bands of valency vibrations of Si-O, C-O and C-C in the 12 compounds studied and in similar substances. There are 3 figures, 2 tables and 27 references, of which 8 are Soviet, 12 English and American, 3 German, 2 French and 2 Dutch.

ASSOCIATION: Institute of Silicate Chemistry, Academy of Sciences of the USSR. (Institut khimii silikatov, AN SSSR.)