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3-Nitro-4-hydroxybenzenearsonic acid from p-chloroaniline [and from 2-nitrodiphenylamino-4-arsonic acid]. V. A. Izmailskii and A. M. Simonov. *Khim. Farm. Prom.* 1933, 317-26.—p-Chloroaniline is the most economical starting material; it is made from p-$ClC_6H_4NO_2$ by neutral reduction with Fe and NaCl (7 hrs. boiling) or with Fe and HCl, steam-distd. and transformed into p-$ClC_6H_4AsO_3H_2$ according to Bart-Schmidt, with about 80% yields. 4,3-$Cl(O_2N)C_6H_3AsO_3H_2$ is made by nitrating p-$ClC_6H_4AsO_3H_2$ with H_2SO_4 and an excess of KNO_3 at 100°. Fourteen g. of the nitro acid is dissolved in 50 g. of 40% NaOH and stirred at 85° for 10 hrs. Thirty cc. of H_2O and 25 cc. of HCl are added, the soln. is filtered with charcoal at 80°, acidified with another 16 cc. of HCl and set to crystallize; the yield of 4,3-$HO(O_2N)C_6H_3AsO_3H_2$ is 64%. These conditions were found best in 14 different expts. In the 2nd method 3,4-$O_2N(PhNH)C_6H_3AsO_3H_2$ is made from the 4-Cl acid by boiling for 10 hrs. with N NaOH and fresh aniline. The excess of aniline is distd. with steam, and the ppt. washed, dried and sapond. for 8 hrs. with 25% NaOH. The aniline is sepd. and 4,3-$HO(O_2N)C_6H_3AsO_3H_2$ is crystd. as before.

L. Nasarevich

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The structure and toxicity of arsinic acids of the diphenylamine series. V. A. Izmail'skii and A. M. Simonov. *J. Gen. Chem.* (U. S. S. R.) 7, 499-507(1937). *Bull. soc. chim.* [5], 3, 1739-53(1936). 4,3-Cl(O$_2$N)-C$_6$H$_3$AsO$_3$H$_2$ condenses with substituted PhNH$_2$ to form RNHC$_6$H$_4$(NO$_2$)AsO$_3$H$_2$. Reduction of the NO$_2$ group gives the corresponding amino acids. Introduction of OH or NHCOMe in the ring which does not contain As lowers the toxicity of these acids. The order of min. lethal dose is *m*-OH > *p*-OH and *m*-NHCOMe > *p*-NHCOMe. Etherification of the OH group raises the toxicity, but all the acids have relatively low toxicities in spite of the presence of the toxic NO$_2$ group. The inductive effect of the same groups on the As is evident, since the *m*- and *p*-compds. have different toxicities. The oxidizability of the compds. is probably also a factor. Attempts to prep. *o*-substituted compds. were unsuccessful. Toxicities are reported for the following diphenylamine-4-arsonic acids: 2-nitro, 3'- and 4'-acetamino-2-nitro, 4'-hydroxy-2-nitro and its Et ether, 3'-hydroxy-2-nitro and its Me ether, 2-amino and its 4'-hydroxy, acetamino and ethoxy and 3'-acetamino derivs., and 4-benzidine-3-nitrophenylarsonic acid. H. M. Leicester

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1ST AND 2ND ORDERS

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BC

Colour of 2-nitrodiphenylamine-4-arsinic acid derivatives containing additional auxo-groups. I. Auxo-oxoid systems separated from the chromophore. V. A. Ismailski and A. M. Simonov (J. Gen. Chem. Russ., 1937, 7, 508—512; cf. preceding abstract).—The influence of substituents on the colour of diphenylamine-4-arsinic acid derivatives is discussed. R. T.

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The structure and properties of the so-called *p*-diazoimines. A. M. Simonov. *J. Gen. Chem.* (U. S. S. R.) 10, 1220-9(1940). Condensation of 2,4-$(O_2N)_2C_6H_3Cl$ (I) with *p*-aminoacetanilide in EtOH in the presence of NaOAc gives 93.6% 4-acetamido-2',4'-dinitrodiphenylamine (II), m. 239.5-40.5°. This is heated with 20% HCl and the product treated with NH_4OH to give 95% 4-amino-2',4'-dinitrodiphenylamine (III), m. 189-9.5° (cor.). From C_6H_6 this crystallizes slowly as plates, and from acid medium on rapid crystn. it gives needles which change to the more stable plates at 130°. With Ac_2O, II is regenerated. When III in H_2SO_4 soln. is treated with $NaNO_2$ at 0° and the temp. is slowly raised to 40°, the corresponding diazonium salt (IV) is formed. IV decomps. slowly on heating in H_2O, but is more stable than the diazoimine, 4-diazo-2',4'-dinitrodiphenylamine (V), formed from it by treatment with soda or NH_4OH, which decomp. on standing, or rather rapidly when heated in H_2O. V undergoes coupling reactions like a diazonium salt, giving with the corresponding phenols cryst. ppts. of *p*-(2',4'-dinitroanilino)phenylazo-2-naphthol-3-carboxanilide, m. 301-2° (decompn.), *p*-(2,4-dinitroanilino)phenylazo-β-naphthol, m. 235-6°, and *p*-(2',4'-dinitroanilino)phenylazo-4-naphthylamine, m. 257-8°. *Et β-oxo-α-[p-(2,4-dinitroanilino)phenylhydrazono]butyrate*, m. 203.5-4°, can be obtained by coupling $AcCH_2CO_2H$ with either IV or V, and *Et α,γ-dioxo-β-[p-(2,4-dinitroanilino)phenylhydrazono]valerate*, m. 180-2.5° (decompn.), is obtained from V and $AcCH_2COCO_2Et$. V and phenylmethylpyrazolone in Me_2CO give 4-[*p*-(2',4'-dinitroanilino)phenylazo]-1-phenyl-1-methyl-5-pyrazolone, m. 283°. IV and V both react with *p*-benzoquinone to give 2-[*p*-(2',4'-dinitroanilino)phenyl]-1,4-benzoquinone, m. 241.5-2.5°. I and *p*-$NH_2C_6H_4NMe_2$ condense to form 4-dimethylamino-2',4'-dinitrodiphenylamine which with MeI gives the *methiodide*, m. about 182° (decompn.). When this is treated with KOH in EtOH, it gives the *methyl betaine of 4-dimethylamino-2',4'-dinitrodiphenylamine* (VI), m. 218.5-20° (decompn.). Thus, diazonium salts and diazoimines undergo the same reactions. The structure of the diazoimines is best explained as a mesomeric mixt. of $R\ N.C_6H_4:N_2$ (VII) and the dipolar ion $R\overset{\bigcirc}{N}C_6H_4\overset{\bullet}{N}_2$ (VIII). If R is weakly neg., the mol. in the mesomeric state will prefer structure VII, but if R is strongly neg. (as in the examples given here), VIII is the preferred form. The formation of VI is cited as support for this structure. H. M. Leicester

Lab. Org. Chem., Moscow State Pedagog. Inst. im Lübnekht

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1ST AND 2ND ORDERS

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3RD AND 4TH ORDERS

10

Ca

Syntheses of proposed antimalarial compounds. I. Relationship of structure and pharmacological properties. V. A. Izmail'skii and A. M. Simonov. *J. Gen. Chem.* (U. S. S. R.) 10, 1580-7(1940).—I. and S. state that pharmacol. properties of mols. are probably due to the "condition" of individual atoms or groups in the mol. creating an external "field of the mol." which governs distribution and conversion of the material in the organism. They believe that the structure of many therapeutically active reagents may be greatly simplified and embark upon the synthesis of antimalarials contg. neither quinoline nor acridine nuclei. 3-Nitro-4-benzamidoanisole was prepd. in a 94% yield by dissolving 25.2 g. of 3-nitro-4-aminoanisole in 280 cc. acetone, adding to it 20.7 g. of KOH powder (ignited) and, while stirring and cooling, 22.5 g. BzCl. The stirring was continued 2-3 hrs., then the mixt. was brought to a boil for a few min. On cooling a yellow orange cryst. product, m. 139-9.5°, sepd. The nitro compd. was reduced to the amino compd. (I) with Fe filings in AcOH. The yield was 82% of white needles, m. 200-200.5°. The amine was heated with BzH for a short time, yielding the benzylidene deriv., m. 96-7° (lemon-yellow needles). 5-Methoxy-1-benzoylbenzotriazole was formed in a 90% yield (m. 116°) when a dil. HCl soln. of I was treated with $NaNO_2$. A 60% yield of 4-benzamido-3-(3-diethylaminopropylamino)anisole was obtained by heating 4.84 g. I and 3.3 g. $Et_2NCH_2CH_2CH_2Cl$ (10% excess) with 2 cc. abs. alc. 2 hrs. at 110-15°, 3 hrs. at 130-5° and 10 hrs. at 150-5°. The product was a thick oil which was dissolved in 200 cc. water at 50-60°. The undissolved part was filtered off and the filtrate was extd. with ether to ext. unreacted chloride. Then it was treated with a soln. of 4 g. KOH and the ppt. was filtered off and dried in a vacuum desiccator. The product was recrystd. 3-4 times from alc. and once from a 1:1 mixt. of C_6H_6 and petr. ether; it m. 146-6.5° (cor.). C and N analyses check. Solns. of the mono-HCl salt in H_2O are quite stable, are weakly acid and are bitter. 3-Nitro-4-phenylsulfonamidoanisole was prepd. by nitrating $PhSO_2NHC_6H_4OMe$ in glacial AcOH. It m. [illegible] reduced with iron filings in dil. AcOH, it yielded [illegible] of a product, m. 116.5-17.5°. II. (γ-Diethylamino-propyl)benzimidazole. A. M. Simonov. *Ibid.* [illegible]—Compds. of the general formula $MeOC_6H_4N:CR.N:CH_2CH_2CH_2NEt_2$ were synthesized. These compds. when tried on birds showed no activity to *Plasmodium relictum*. 4-(p-Tolylsulfonamido)anisole (13.8 g.) in 30 cc. of glacial acetic acid cooled to 15° was added during 40 min. to 5.7 g. HNO_3 (d. 1.36) in 7 cc. glacial AcOH. Mixing at 10-15° was continued for 2 hrs. after which the 3-nitro compd. was filtered out; 81% yield of material m. 103.5-4° (cor.). The nitro compd. (3.000 g.) in 12 cc. concd. H_2SO_4 was allowed to stand overnight, then poured into 100 cc. H_2O and enough NH_4OH was added to be smelled. A 98.8% yield of 3-nitro-4-aminoanisole, m. 122-3° (from alc.), was obtained. 3-Nitro-4-(p-tolylsulfonamido)anisole (48 g.) in 180 cc. abs. alc. was refluxed for 12 hrs. with 26.5 g. $Et_3N(CH_3)_2Cl$ and 21 g. ignited potash. The mineral salts were filtered off

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and the alc. was evapd. The residue was dissolved in ether and the ether soln. was washed with NaOH and H_2O and dried over Na_2SO_4. The ether was evapd. and the residue was recrystd. from alc. More than 84% of 3-nitro-4-[*N*-(3-diethylaminopropyl)-*p*-tolylsulfonamido]-anisole (I), m. 77.5–78°, was obtained. I (13 g.) after standing overnight in 25 cc. 90% H_2SO_4 was poured on 80 cc. H_2O and was neutralized with NH_4OH. The oil formed was extd. with C_6H_6, dried over Na_2SO_4 and filtered. The C_6H_6 was driven off and the residue (8 g.) was fractionated *in vacuo*. An 83% yield of a red oil (II), $b_{1.4}$ 191.5–3.5°, was obtained. It did not solidify at −15°; its picrate has 2 forms, m. 114–15° and 126–7°. A 70% yield of 3-amino-4-(3-diethylaminopropylamino)-anisole (III), b_4 196.8° (cor.), was obtained by reducing II with $SnCl_2$ in 1:1 HCl. III (7.7 g.) was gradually mixed with 6 g. Ac_2O and heated on a water bath for 15 min. The reaction mixt. was dissolved in 30 cc. 4 *N* HCl and refluxed 1.5 hrs. The reaction product sepd. as an oil when a 40% NaOH soln. was added. The oil was extd with ether, dried over potash and filtered. The ether was evapd. and the residue was distd. *in vacuo*. A 95% yield of 2-methyl-5-methoxy-1-(3-diethylaminopropyl)-benzimidazole (IV), b_3 184–5° (dipicrate, m. 236°), was obtained. 3-Nitro-4-acetamidoanisole (63 g.) was added during 1 hr. to a well-agitated mixt. of 180 g. iron filings, 600 cc. H_2O and 13.5 g. NaCl. The agitation was continued for 1.5–2 hrs. at 90°. The hot reaction mixt. was filtered and the solids were twice washed with 300 cc. of boiling H_2O. A 90–2% yield of 3-amino-4-acetamidoanisole (V), m. 150–0.5° (cor.), was obtained. V (18 g.), 16.5 g. $Et_3N(CH_2)_3Cl$ and 3.5 cc. abs. alc. were agitated and heated 2–3 hrs. at 110–15° and 13 hrs. at 135–40°. The cooled reaction mixt. was dissolved in 40 cc. hot H_2O and then extd. with ether, and treated with 160 g. of 50% potash. The dark oil was extd. with 400 cc. C_6H_6. A part of the oil did not dissolve in C_6H_6. It was dissolved in alc. The alc. soln. was filtered and dried. The alc. was driven off and an oily product, sol. in H_2O, was obtained. It was a mixt. of quaternary salts. The C_6H_6 ext. was washed with a small amt. of H_2O, dried over potash and filtered. The C_6H_6 was driven off and the residue was fractionated *in vacuo* 2–3 times. A 60% yield of 2-methyl-6-methoxy-1-(3-diethylaminopropyl)-benzimidazole (VI), b_3 190.5–1.5°, was obtained; dipicrate, m. 218–19°. A mixture of VI (2.4 g.) and 2.3 g. BzH was heated at 200° for several hrs., then 100 cc. H_2O and enough HCl for a weakly acidic reaction was added. The excess BzH was distd. with steam. The hot soln. was filtered and evapd. to dryness. The residue was dissolved in a small amt. of alc. and pptd. with ether. A yield of 2.5 g. of 6-methoxy-2-styryl-1-(3-diethylaminopropyl)benzimidazole-2HCl dihydrate (VII) was obtained. It loses H_2O of crystn. at 100° and m. 234–6°. V (27 g.), 13.5 g. AcOH and 150 cc. 4 *N* HCl were refluxed 1 hr. The HCl salt pptd. in the cold was filtered off and washed with 4 *N* HCl and dissolved in 100–150 cc. H_2O. It was neutralized with NH_4OH, yielding 79% of 2-methyl-5(6)-methoxybenzimidazole (VIII), m. 141.5–2.5° (from petr. ether); picrate, m. [illegible] mixt. of 8.1 g. VIII and 7.55 g. $Et_3N(CH_2)_3C$[illegible] cc. alc. was agitated and heated 3 hrs. at 110–15° [illegible] hrs. at 130–5°. It was treated with 20 cc. hot [illegible], extd. with ether, and the aq. layer was treated with 50 g. of 50% potash. The sepd. oil was extd. with 180 cc. C_6H_6. The C_6H_6 soln. was extd. with NaOH soln. and dried over potash. After evapn. of the C_6H_6 the oil was distd. at 25 mm. The yield was 43.5 g., m. 189–98°; picrate, m. 226–8°.

David Aelony

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Betainelike compounds formed by splitting a proton from the imino group. II. Betaine azeniates of the diphenylamine series. A. M. Simonov. *J. Gen. Chem.* (U. S. S. R.) 13, 51-60 (in English, 61) (1943).—In continuation of the work on *p*-diazoimines (*C. A.* 35, 2868[8]), S. presents further data on the structures of these compds. *m*-O_2N-$C_6H_4NMe_2$, m. 58-9°, was prepd. in 60% yield, from *m*-$O_2NC_6H_4NH_2$, by heating with *p*-$MeC_6H_4SO_2Me$ for 2-3 hrs. at 150°; 8.3 g. in 50 cc. HCl and 50 g. ice was treated with ice cooling and stirring with 15 g. Zn dust, followed by heating to 60-5°, to yield 80% *m*-$H_2NC_6H_4NMe_2$, b. 117°. On treatment with an equimol. amt. of 2,4-$(O_2N)_2$-C_6H_3Cl in EtOH in the presence of NaOAc it yielded *3-dimethylamino-2',6'-dinitrodiphenylamine*, m. 136.5-7° (from benzene-EtOH). This (3 g.) was heated with 3.5 g. MeI in benzene-MeOH to yield after 15 hrs. 3.05 g. of the *methiodide*, decompg. 171-5° (from MeOH); 2.2 g. in 180 cc. MeOH was treated with warming with 1.3 g. KOH in 15 cc. MeOH and on cooling there was obtained 1.4 g. *methyl betaine of 3-dimethylamino-2',6'-dinitrodiphenylamine*, apparently: $Me_2\overset{+}{N}C_6H_4\overset{-}{N}C_6H_2(NO_2)_2 \rightleftarrows Me_2NC_6H_4N\ C_6H_2(NO_2)\ N(:O)\bar{O}$. The material decomps. 220° to 232°, depending on the method of detn.; it is practically insol. in org. solvents, but readily sol. in water contg. mineral acids or AcOH. *4-Dimethylamino-2',4',6'-trinitrodiphenylamine*, prepd. by addn. of picryl chloride to an EtOH soln. of *p*-$H_2NC_6H_4NMe_2$ and NaOAc, m. 183-3.5°; *methiodide*, contains some water of crystn. if crystd. from 90% MeOH, m. 140-5° (decompn.); obtained anhyd., by crystn. from EtOH, it discolors on heating and partially decomps., m. about 181°. *Methyl betaine*, obtained by treating 2 g. of the above methiodide in 90% MeOH with 1.6 g. KOH (30% aq. soln.) in MeOH at 40°, decomps. 243-50° depending on the heating rate, is essentially insol. in org. solvents (slightly sol. in Me_2CO and pyridine, and fairly sol. in $PhNO_2$), and sol. in dil. mineral acids and AcOH. *3-Dimethylamino-2',4',6'-trinitrodiphenylamine*, prepd. by gradual addn. of picryl chloride to equiv. amts. of *m*-$H_2NC_6H_4NMe_2$ and NaOAc in hot alc., m. 195.5-6° (from benzene); *methiodide*, obtained in poor yield by prolonged heating of the base with MeI in benzene, m. 192-4° (from MeOH); *Me p-toluenesulfonate*, obtained by gradual heating of the base and *p*-$MeC_6H_4SO_2Me$ to 130°, m. 229-30° (decompn., from MeOH). The *methyl betaine* is readily formed by the action of NH_4OH, Na_2CO_3 or warm satd. NaOAc soln. on the aq. soln. of either the methiodide or the Me *p*-toluenesulfonate; it is obtained in quant. yield by the action of KOH in MeOH; it decomps. 240°, is rather difficultly sol. in org. solvents, sol. in pyridine and hot $PhNO_2$, sol. in dil. HCl or AcOH. On addn. of dil. NaOH to a dil. soln. of 4(or 3)-dimethylamino-2',4'-dinitrodiphenylamine-MeI there is developed a red coloration but no pptn. occurs. Assuming that this is due to betaine-azeniate formation the depth of color showed approx. equality of the *m*- and *p*-isomers in this respect. Similar results were obtained for the trinitro derivs. G. M. Kosolapoff

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SIMONOV, A. M.

"On betaine - like compounds which are formed through the protone splitting from the imino groups. III. Betaine - azeniates of the series of diphenylaine." Simonov, A. M. (p. 61)

SO: Journal of General Chemistry (Zhurnal Obshchei Khimii) 1943, Volume 13, no. 1-2.

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1ST AND 2ND ORDERS

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Synthesis of proposed antimalarial compounds. III N-Aminoalkyl derivatives of amino azo compounds. A. M. Simonov (Moscow Textile Inst.). *J. Gen. Chem.* (U.S.S.R.) **16**, 621-6(1946); cf. *C.A.* **35**, 2870[2]. —A no. of potential antimalarial agents were synthesized as follows with the idea of using the tertiary N atom as a substitute for a *N*-heterocyclic nucleus. $Et_3N(CH_2)_3Cl.HCl$ (I) (20.7 g.) and 28.6 g. 1-$C_{10}H_7NH_2$ were heated 6 hrs. to 130-40°, after which the mixt. was dissolved in water, made alk., and extd. with Et_2O, yielding 14.5 g. *N-(3-diethylaminopropyl)-1-naphthylamine* (II), b_5 185-90°, b_6 205-6°, m. 25-6°, *picrate* m. 176.5-7.5° (from Me_2CO). *p*-Anisidine (1.23 g.) in 5 cc. concd. HCl and 15 cc. water was diazotized at 5° with 0.7 g. $NaNO_2$, then treated with 4 g. NaOAc, followed by slow addn. to 2.56 g. II in 1 cc. concd. HCl and 20 cc. water; after addn. of 5.5 g. NaOAc the mixt. was made alk. and extd. with Et_2O to yield on evapn. of the latter 3.4 g. (87%) *N-(3-diethylaminopropyl)-4-(p-methoxyphenylazo)-1-naphthylamine*, m. 97-8° (from EtOH), bright red. I (20.7 g.) and 28.6 g. 2-$C_{10}H_7NH_2$ were heated 8 hrs. to 140-50°, then poured while hot into dil. H_2SO_4; the filtrate on treatment with alkali and extn. with Et_2O gave *N-(3-diethylaminopropyl)-2-naphthylamine* (III), b_6 193.5-4.5°; *picrate* m. 116.5-17° (from EtOH). Condensation of III with diazotized *p*-anisidine gave 90% *4-(p-methoxyphenylazo)-N-(3-diethylaminopropyl)-2-naphthylamine*, deep red, m. 38.5-9.5° (from Et_2O), which was purified through the *oxalate*, m. 141-2° (from Me_2CO); *picrate* m. 142-3° (from EtOH-Me_2CO). The diazonium soln. from 0.92 g. benzidine in HCl was added to 2.56 g. II in an equiv. amt. of dil. HCl, and after 1 hr. treated with 1.5 g. NaOAc and allowed to stand overnight; treatment with Na_2CO_3 gave *4,4'-bis[4-(3-diethylaminopropylamino)-1-naphthylazo]biphenyl*, m. 233.5° (from pyridine). Similar reaction with III gave the *corresponding 3-(3-diethylaminopropylamino) deriv.*, m. 156.5-7.5° (from Me_2CO).

G. M. Kosolapoff

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SIMONOV A. M.

"Resonance and Colority of the Diphenylamine Derivatives. (XXIII). On the Conjugated Systems Bound by the Donor N-Atom." by V A. Izmailsky and A. M. Simonov (p. 1 59)

SO: Journal of General Chemistry (Zhurnal Obshchei Khimii) 1946, Volume 16, No. 10

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S[illegible]V, A. M.

"Resonance and Colourity of the Diphenylamine Derivatives. II. (VI). On the Colourity of the 2,4-Dinitrodiphenylamine Derivatives. The Bathochromic Effect of an Additional Group in the Para-Position and Resonance of a Two-Donor System." by A. M. Simonov, and V. A. Izmailsky. (p. 1660)

SO: Journal of General Chemistry (Zhurnal Obshchei Khimii) 1946, Volume 16, No. 10

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SIMONOV, A. M.

(Exercises in organic chemistry) Moskva, Gos. nauchno-tekhn. izd-vO khim. lit-ry, 1949. 492 p. (50-30563)

QD357.I95

1. Chemistry, Organic - Problems, exercises, etc. I. Simonov, A. M.

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Betaine like compounds formed on proton cleavage from an NH group. III. A. M. Simonov (Moscow Textile Inst.). *Zhur. Obshchei Khim.* (J. Gen. Chem.) 19, 2208-12(1949); cf. C. A. 38, 348°. Heating *p*-$MeC_6H_4SO_2Cl$ with *p*-$H_2NC_6H_4NMe_2$ (4% excess) in EtOH in the presence of NaOAc, followed by soln. of the resulting ppt. in dil. HCl and pptn. with $NaHCO_3$, gave 70% *p*-$MeC_6H_4SO_2NHC_6H_4NMe_2$, m. 131.2° (from C_6H_6-EtOH); the same is obtained in 90% yield when pyridine is used as the condensing agent. The *methiodide*, m. 187.93° (decompn.; from 90% EtOH); *metho-p-toluenesulfonate*, m. 220° (from EtOH-Et_2O), was obtained in 70% yield by heating the components to 120° 4 hr. The methiodide was converted by Ag_2SO_4 to the *methosulfate*, and the latter converted by $Ba(OH)_2$ to the *free base* which was dried *in vacuo* at 80°; the *betaine* forms needles, decompg. indefinitely above 220° (from EtOH-Et_2O), and forming alk. solns. in H_2O; its structure is *p*-$MeC_6H_4SO_2NC_6H_4NMe_2$, with a neg. charge on 1 N atom. Direct conversion of the methiodide to the free base by moist Ag_2O is unsatisfactory. 4-Dimethylamino-2',4'-dinitrodiphenylamine-MeI (0.44 g.) with moist Ag_2O (from 1 g. $AgNO_3$) in 150 ml. H_2O at 50° gave, after filtration and concn., 90% of the black-red *methylbetaine* of *4-dimethylamino-2',4'-dinitrodiphenylamine*. The relative difficulty of forming the betaine from the sulfonamide is explained by lesser stabilization probability by mesomeric electronic shift from 2-valent neg. N to the electrophilic groups bound to it. Heating *m*-$H_2NC_6H_4NMe_2$ with *p*-$MeC_6H_4SO_2Cl$ in the presence of NaOAc gave the corresponding *amide*, m. 150.5-51.0° (from C_6H_6-petr.

ether), which forms a colorless *methiodide*, m. 172.5° (from EtOH).

G. M. Kosolapoff

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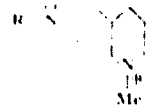
Betaine like compounds formed by cleavage of a proton from an NH group. IV. Betainazeniates of the quinoline series. A. M. Simonov (Moscow Textile Inst.). *Zhur. Obshchei Khim.* (J. Gen. Chem.) **20**, 320-4(1950); cf. *C.A.* **44**, 4437*i*. - Betainazeniates of structure I were prepd. from the quaternary derivs. and it was shown that electrophilic groups bound to NH facilitate the proton detachment in the synthesis. Heating 6-(2,4-dinitroanilino)quinoline and *p*-$MeC_6H_4SO_3Me$ (II) to 140° gave the yellow *metho-p-toluenesulfonate*, decomp. 242-2.5°



(from dil. EtOH), the starting material is obtained in 85%, yield from 2,4-$(O_2N)_2C_6H_3Cl$ and 6-aminoquinoline in the presence of NaOAc only after heating 10 hrs. The quaternary salt (1.24 g.) treated in 50% EtOH with 1.2 g. 40% NaOH in 50% EtOH gave 100% I (R = 2,4-$(O_2N)_2C_6H_3$), plates, decomp. 270-80° on rapid heating, does not m. 300° on slow heating, is but slightly sol. in $PhNO_2$ or pyridine, its yellow solns. in acids turn red on addn. of alkali and the compd. may serve as its own indicator in titrations. *6-Picrylaminoquinoline* (from picryl chloride and 6-aminoquinoline on short heating, decomp. 270°) and II heated to 140° yield the *metho-p-toluenesulfonate*, yellow, m. 256°, which gives the betaine on treatment with aq. pyridine or NaOAc; addn. of alk. NaOH or NH_3 to the quaternary compd. in hot MeOH yields 95% I (R = *picryl*), brown-violet, decomp. 315° (rapid heating), sol. in dil. HCl, poorly sol. in Me_2CO, pyridine, or $PhNO_2$. *6-(p-1-Sulfonamidoquinoline)* m. 190-7° (91%) from RSO_2Cl and 6-aminoquinoline in pyridine) (1 g.), and 2.5 g. II after 1.5 hrs. at 140°, followed by extn. with hot C_6H_6, gave 92% *metho-p-toluenesulfonate*, yellow, m. 271-2° (from EtOH); this (2.4 g.) in 300 ml. H_2O treated at 75° with 4 ml. 15% NH_4OH yields 92% I (R = *p-$MeC_6H_4SO_2$*), orange needles (dihydrate, from 75% EtOH), drying over P_2O_5 gives the anhyd. form, red, very poorly sol. in EtOH, Me_2CO, or $PhNO_2$, addn. of HCl yields a poorly sol. HCl salt, which long standing in H_2O yields the *dihydrate*, and aq. alk. *p-$MeC_6H_4SO_3H$* yields the original quaternary salt, the anhyd. *betaine* decomp. 258-9° on slow heating.

G. M. Kosolapoff

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The betaine-like compounds formed by cleavage of a proton from an NH group. IV. Betaineazeniates of the quinoline series. A. M. Simonov (Moscow Textile Inst.). *J. Gen. Chem. U.S.S.R.* 20, 339-43(1950)(Engl. translation). See C.A. 44 [illegible]. R. M. S.

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Betainelike compounds formed by cleavage of a proton from an NH group. V. Derivatives of 2-anthraquinonesulfonic acid. A. M. Simonov and N. P. Anshukova (Moscow Textile Inst.). *Zhur. Obshchei Khim.* (J. Gen. Chem.) 20, 1802-6(1950); cf. C.A. 44, 6883a. Quaternary salts of the type RNHR'N.X, in which R was the 2-anthraquinonesulfonic acid group, were prepd. Alkalies convert these salts into betaines as a result of the interaction of the R group on the NH linkage. *2-Anthraquinonesulfonyl chloride*, m. 195-5.5° (7 g.), and 3.2 g. *p*-$Me_2NC_6H_4NH_2$ in 25 ml. pyridine heated 30 min. to 50° and let stand overnight gave on diln. with H_2O 8.8 g. *p*-(*2-anthraquinonylsulfonamido*)-*N,N-dimethylaniline* (I), m. 234-5° (from Me_2CO), red-brown needles; the soln. in 1.2% NaOH on cooling gives violet needles of the *Na salt*. Fusing I with a 20% excess of *p*-$MeC_6H_4SO_3Me$ at 130-40° gave the *metho-p-toluenesulfonate*, yellow, decomp. 238° (from dil. EtOH), which (1.18 g.) treated slowly while hot in 15 ml. EtOH and 7 ml. H_2O with 2.4 ml. 5% NaOH yields 97% of the brown-orange *betaine*, $C_{22}H_{20}N_2O_4S$, decomp. 225-30°. *m*-Me_2N-$C_6H_4NH_2$ similarly gave the *m-isomer* of I, red brown, m. 154-4.5° (from EtOH), giving a brown *Na salt*, its *metho-p-toluenesulfonate*, m. 242-4°, pale yellow, gives 96% of the *betaine*, red-brown needles, decomp. above 250°. Similarly was prepd. *6-(2-anthraquinonylsulfonamido)quinoline*, yellow, m. 273-4° (from pyridine), whose *metho-p-toluenesulfonate*, m. 258-9° (from $PhNO_2$), yields with NH_4OH or other weak bases (such as pyridine) the corresponding *betaine*, m. 280° (decompn.), insol. in EtOH, H_2O, $CHCl_3$, poorly sol. in hot pyridine, better in hot $PhNO_2$. *p*-$PhCH_2$-$NHC_6H_4NMe_2$ similarly gave *4'-dimethylamino-N'-benzyl-2-anthraquinonesulfonanilide*, m. 215-16° (from C_6H_6); *metho-p-toluenesulfonate*, decomps. 213-15° (from MeOH), unchanged by alkali; since the substance does not have a free NH group, the result is expected. G. M. Kosolapoff

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The application of the amination reaction by means of sodamide to compounds of the benzimidazole series. A. M. Simonov and P. A. Uglov (Moscow Textile Inst.). *Zhur. Obshchei Khim.* (J. Gen. Chem.) 21, 884-8(1951). 1-Alkylbenzimidazoles can be aminated by means of $NaNH_2$. *3,4-MeO(O₂N)C₆H₄NHSO₂C₆H₄Me-p* (28.8 g.) with 10 g. 46% NaOH in hot EtOH gave the red *Na salt*, $C_{14}H_{12}N_2O_3SNa$, which (22.4 g.) heated with 13 g. *p*-$MeO_2SC_6H_4Me$ 0.5 hr. at 130°, boiled with 65 ml. EtOH 2 hrs., concd., and dild. with hot H_2O, gave *2-nitro-4-methoxy-N-methyl-p-toluenesulfonanilide*, m. 122-3° (from EtOH). This (3 g.) added to 10 ml. concd. H_2SO_4, let stand overnight, heated 0.5 hr. to 60°, and poured into H_2O gave 95% *3-nitro-4-(methylamino)anisole*, m. 97-8° (from EtOH), reduced with Sn-HCl to the *3-amino analog*, m. 78.3-8.8° (from petr. ether), which refluxed 1.5 hrs. with 80% HCO_2H, gave, on dilu., decolorization, and addn. of NaOH, 80% *5-methoxy-1-methylbenzimidazole*, m. 112-13° (from C_6H_6) [*picrate*, m. 256-7° (from AcOH)]. This (3 g.) and 1.6 g. $NaNH_2$ refluxed 2 hrs. in 25 ml. xylene, gave much H and, after cooling, treatment with 10% Na_2CO_3, filtration of the crude product, extn. with hot EtOH, evapn., soln. in 5% HCl, decolorization, and neutralization with Na_2CO_3, gave 60% *2-amino-5-methoxy-1-methylbenzimidazole*, decomp. 222-2.5° (from EtOH-C_6H_6); *picrate*, decomp. 290° (from AcOH). Prolonged heating in EtOH with *o*-O_2N-C_6H_4CHO gave the *N-(o-nitrobenzylidene) deriv.*, orange-red, m. 172-2.5° (from EtOH). G. M. Kosolapoff

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SIMONOV, A.M.

Dipolar ions formed after cleavage of a proton of a proton from the NH group. Zhur. Obshchey Khim. 22, 1865-8 '52. (MLRA 5:11)
(CA 47 no.14:6945 '53)

1. Moscow Textile Inst.

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SIMONOV, A.M.

Chemical Abst.
Vol. 48 No. 8
Apr. 25, 1954
Organic Chemistry

Dipolar ions formed after cleavage of a proton from the NH group. VI. A. M. Simonov. *J. Gen. Chem.* (U.S.S.R.) 22, 1905-7(1952)(Engl. translation).—See *C.A.* 47, 6945g. H. L. H.

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SIMONOV, A.M.

Dipolar ions formed by cleavage of proton from NH group. VII. Reaction with alkyl halides and acyl halides. Zhur. Obshchey Khim. 22, 2006-10 '52. (MLRA 5:12)
(CA 47 no.18:9328 '53)

1. Moscow Taxtile Inst.

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Simonov, A. M.

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Dipolar ions formed on cleavage of a proton from an NH group. VIII. Sulfonium compounds. A. M. Simonov and V. S. Chemagin (Moscow Textile Inst.). Sbornik Statei Obshchei Khim. 2, 1382-6(1953); cf. C.A. 47, 9328g.— Bipolar ions, such as p-$Me_2SC_6H_4NR$ (I) are described. A similar structure is given to previously described derivs. of phenothiazine and 1,2,7,8- and 3,4,5,6-dibenzophenothiazines (cf. Kehrmann and Dardel, C.A. 17, 767). Heating 1.5 g. 4-methylthio-2',4'-dinitrodiphenylamine and 1 g. p-$MeC_6H_4SO_3Me$ 2 hrs. at 140-5° gave after treatment with hot C_6H_6 2.1 g. *dimethyl[4-(2,4-dinitroanilino)phenyl]sulfonium p-toluenesulfonate*, yellow, m. 159.5-60° (from MeOH). Treated with dil. NaOH or 25% NH_4OH, this gives a red ppt. of I (R = *2,4-dinitrophenyl*), decomp. 143-51° (from 70% EtOH). To p-thioanisidine and NaOAc in EtOH was added picryl chloride (equimolar amt.), yielding after 0.25 hr. reflux red *4-methylthio-2',4',6'-trinitrodiphenylamine*, m. 150.5-1° (from EtOH-C_6H_6). This heated with p-$MeC_6H_4SO_3Me$ 2 hrs. at 140° gave *dimethyl[4-(picrylamino)phenyl]sulfonium p-toluenesulfonate*, yellow, m. 167-8.5°, which with 2N KOH yields the deep red I (R = *picryl*), decomp. 193-7°. Treatment of p-thioanisidine in pyridine with β-anthraquinonesulfonyl chloride gave after several days the yellow *p-thiomethoxyanilide* of *β-anthraquinonesulfonic acid*, m. 209-9.5° (from $PhNO_2$), which with p-$MeC_6H_4SO_3Me$ gave *dimethyl[4-(β-anthraquinonesulfamido)phenyl]sulfonium p-toluenesulfonate*, yellowish, decomp. 195° (dihydrate forms from 75% EtOH), which with NaOH, Na_2CO_3 or NH_4OH yields orange I (R = *β-anthraquinonesulfonyl*), m. 175-80°, which with HCl forms a sparingly sol. HCl salt. p-Thioanisidine and p-toluenesulfonyl chloride in pyridine gave *4-(p-toluenesulfamido)thioanisole*,

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m. 111-11.5°, which fused with p-$MeC_6H_4SO_3Me$ at 135° 1 hr. gave colorless *dimethyl[4-(p-toluenesulfamido)phenyl]-sulfonium p-toluenesulfonate*, m. 180-1.5°. IX. Compounds of benzimidazole series. A. M. Simonov and F. A. Mendelevich. *Ibid.* 1387-93.—5-Amino-1-phenylbenzimidazole with p-$MeC_6H_4SO_2Cl$ in pyridine gave *5-(p-toluenesulfonamido)-1-phenylbenzimidazole*, m. 243.5-4.5° (from EtOH). This fused with p-$MeC_6H_4SO_3Me$ 1 hr. at 130-40° gave *5-(p-toluenesulfamido)-1-phenylbenzimidazole Me p-toluenesulfonate*, m. 192-3° (from MeOH-Et_2O). This (1.83 g.) in 50% EtOH treated with 4 ml. 5% NH_4OH gave a ppt. of the *base*, colorless solid, which kept over P_2O_5 changes to the betaine which is sparingly sol. (in the form of the base) in hot H_2O; the product, *5-p-toluenesulfamido-1-phenylbenzimidazole Me betaine* (I), decomp. 250°; it readily adds 2 mols. H_2O in contact with moisture. Heating picryl chloride with 5-amino-1-phenylbenzimidazole in EtOH-NaOAc gave yellow or red form of *5-picrylamino-1-phenylbenzimidazole*, yellow form, m. 239.5-40.5° (decompn.); the red form changes to yellow on heating. This fused with p-$MeC_6H_4SO_3Me$ at 130-5° gave *5-picrylamino-1-phenylbenzimidazole Me p-toluenesulfonate*, yellow, decomp. 229-30°, which treated with aq. NH_4OH or 2*N* NaOH in aq. MeOH gave a red ppt. of *5-picrylamino-1-phenylbenzimidazole Me betaine*, $C_{20}H_{14}O_6N_6$, blackening at 200°, does not m. up to 305°; with dil. HCl, it forms yellow HCl salt. Fusion of *5-(2,4-dinitrophenylamino)-1-phenylbenzimidazole* with p-$MeC_6H_4SO_3Me$ gave the yellow *quaternary salt*, m. 157.5-9.5°, which, in 50% EtOH, treated with a little NH_4OH at 60°, followed by 2*N* NaOH gave a brown-red ppt. which changed to the orange-yellow *pseudobase* II (R = H), m. 164.5-5.5°. Crystn. from C_6H_6 gave a very dark red product contg. 1 mol. C_6H_6, the latter being lost on standing or on heating *in vacuo*. Crystn. from Me_2CO gave a product, m. 166.5-7.5°. Heating this pseudobase with a

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small excess p-$MeC_6H_4SO_3H$ gives the original quaternary salt, m. 157.5–9.5°. The pseudobase reacts very little with dil. $AcOH$, and dissolves slowly in HCl on heating, while a cooled soln. deposits *5-(2,4-dinitrophenylamino-1-phenylbenzimidazole methochloride*, orange-yellow, decomp. 260–70°. The pseudobase does not react with PhNCO nor with BzCl alone; with BzCl in pyridine after 3 days in the cold it gave an orange-yellow product, decomp. 267–70°, which contained ionic Cl and which gave the original pseudobase with Na_2CO_3; the product was identical with the methochloride from the pseudobase. Probably the pseudobase first formed an onium adduct with BzCl, which then was transformed to the methochloride. 2,4-Dinitrochlorobenzene with 5-amino-1-phenyl-2-methylbenzimidazole gave *5-(2,4-dinitrophenylamino)-1-phenyl-2-methylbenzimidazole*, orange crystals (contg. C_6H_6), which after heating *in vacuo* turn yellow and m. 238–8.5°; the *Me p-toluenesulfonate*, yellow, decomp. 231–2° (from MeOH), treated in 50% EtOH with a little NH_4OH followed by 2*N* KOH gave a red ppt. which then turned brown-orange, identified as the pseudobase III (R = Me), which with C_6H_6 gave 20% *betaine*, red solid, m. about 250°, sol. in dil. $AcOH$ and HCl. Evapn. of the C_6H_6 soln. gave an orange-yellow *pseudobase*, decomp. 206–7° (in case of slow heating the product does not m. up to 300°), $C_{21}H_{18}O_2N_4$, insol. in dil. $AcOH$, and sol. in dil. HCl only on heating.

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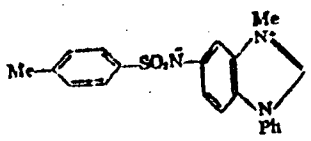

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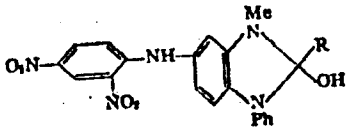

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[illegible], [illegible] and [illegible], [illegible].

On Bipolar Ions Formed on Removal of a Proton from the NH-Group, IV. Compounds of the Benzimidazole Series, page 1377, Zhurnal obshchey khimii (Collection of Papers on General Chemistry), Vol II, Moscow-Leningrad, 1953, pages 1380-1386.

Laboratory of Organic Chemistry, Moscow Textile Inst

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SIMONOV, A. M.

"An Investigation in the Field of Onium Compounds Containing an NH Group and Their Resulting Dipolar Ions." Dr Chem Sci, Inst of Organic Chemistry imeni N. D. Zelinskiy, Acad Sci, USSR, 13 Jan 55. (VM, 4 Jan 55)

Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (13)
SO: Sum. No. 538, 29 Jul 55

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SIMONOV, Andrey Mikhaylovich

Moscow Textile Inst, Academic degree of Doctor of Chemical Sciences, based on his defense, 13 January 1955, in the Council of the Inst of Organic Chemistry imeni Zelinskiy Acad Sci USSR, of his dissertation entitled: "Research in the field of ionic compounds which contain the NH-group and the bi-polar ions formed from them".

Academic degree and/or title: Doctor of Sciences

SO: Decisions of VAK, List no. 9, 16 April 55, Byulleten' MVO SSSR, No. 14, Jul 56, Moscow, pp 4-22, Uncl. JPRS/NY-429

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SIMONOV A. M.

Dipolar ions after cleavage of a proton from the imide group. X. Rearrangement of dipolar ions of the sulfonium series. A. M. Simonov. *J. Gen. Chem. U.S.S.R.* 25, 2245-7(1955 [illegible]).--See *C.A.* 50, 9331*b*.
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Simonov, A. M.

Dipolar ions formed after cleavage of a proton from the NH group. X. Rearrangement of dipolar ions of the sulfonium series. A. M. Simonov (Textile Inst., Moscow). Zhur. Obshchey Khim. 25, 1478-80(1955); cf. C.A. 49, 5449f.—Reaction of p-thioanisidine with p-$O_2NC_6H_4SO_2Cl$ in pyridine gave p-$O_2NC_6H_4SO_2NHC_6H_4SMe$-p (I), m. 165–5.5° (from EtOH). This fused with p-$MeC_6H_4SO_2Me$ at 130–40° gave *dimethyl[4(p-nitrobenzenesulfonamido)phenyl]-sulfonium p-toluenesulfonate*, m. 180°. This (1.6 g.) in H_2O treated at 75° with 2N NaOH or NH_4OH in excess, yielded a brown *betaine*, which melts indefinitely about 185°. I with Me_2SO_4 in aq. NaOH gave p-$O_2NC_6H_4SO_2NMe$-C_6H_4SMe-p, m. 145.5°, also formed from the above betaine on heating to 190–200°. p-Thioanisidine and p-$O_2NC_6H_4$-COCl in aq. $NaHCO_3$ gave p-$O_2NC_6H_4CONHC_6H_4SMe$-p, m. 215–5.5°; this treated as above gave *dimethyl[4-(p-nitrobenzoylamino)phenyl]sulfonium p-toluenesulfonate*, m. 217–19°. This treated with alc. NaOH gave the *betaine*, red, m. about 145°, which at 145–55°, forms p-$O_2NC_6H_4$-$CONMeC_6H_4SMe$-p, m. 107–8°. G. M. Kosolap

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Simonov, A. M.

Dipolar ions formed by cleavage of a proton from the NH group. XI. Rearrangement of dipolar ions of ammonium series. A. M. Simonov and M. N. Okorokova. *Zhur. Obshchei Khim.* 27, 1911-5 (1957); cf. *C.A.* 50, 119635.—4-(*p*-$O_2NC_6H_4CONH$)$C_6H_4NMe_2$ (I) and *p*-$MeC_6H_4SO_2Me$ (II) at 130-40° gave the *metho-p-toluenesulfonate* (III), m. 205-72° (decompn.), depending on the rate of heating. III (1.44 g.) in 10 ml. H_2O and 5 ml. EtOH with 5 ml. 2*N* KOH at 45° yielded 80% red *methylbetaine* (IV) of I, sol. in warm H_2O and repptd. on cooling or treatment with a base. It is not hydrated over 2*N* NaOH in a closed flask; on heating it decomp. about 170°, but with rapid melting it isomerizes to 4-(*p*-$O_2NC_6H_4CONMe$)$C_6H_4NMe_2$ (V); heating IV in an oil bath at 180°, raising the temp. to 190° over 5 min., and maintaining it 5 min. longer gave orange crystals of V, m. 91.5-2.5°, also prepd. by acylating *p*-$MeNHC_6H_4NMe_2$ (VI) with *p*-$O_2NC_6H_4COCl$. V is readily hydrolyzed at the amide group in hot dil. HCl. Methylation of 4-(*p*-$MeC_6H_4SO_2NH$)$C_6H_4NMe_2$ with MeI gave 4-(*p*-$MeC_6H_4SO_2NMe$)$C_6H_4NMe_2$, m. 101-1.5°, also occurring in a *form* m. 93-4°. Fusion of 4-(*p*-$O_2NC_6H_4CONMe$)C_6H_4SH or the betaine 4-(*p*-$O_2NC_6H_4CONMe$)$C_6H_4SMe_2O_2SC_6H_4Me$ gave the same salt as previously described (*loc. cit.*). *p*-$O_2NC_6H_4SO_2Cl$ with *p*-$H_2NC_6H_4NMe_2$ gave orange 4-(*p*-$O_2NC_6H_4SO_2NH$)$C_6H_4NMe_2$, m. between 190° and 200°, depending on the rate of heating. It reacts readily with aq. AcOH and adds $2H_2O$ in a vessel over 2*N* NaOH. I and *p*-$O_2NC_6H_4SO_2Cl$ gave 4-(*p*-$O_2NC_6H_4SO_2NMe$)$C_6H_4NMe_2$, m. 140-1°, formed also from the above methylbetaine on heating to 200°.

G. M. Kosolapoff

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4E4j

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"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

20-3-29/59

AUTHORS Shemyakin, M.M., Corresponding Member, AN (USSR), Mendelevich, F.A., Simonov, A.M., Petrinska, V.B.

TITLE The Tautomerism of Arylazotropolones. (Tautomeriya arilazotropolonov - Russian)

PERIODICAL Doklady Akademii Nauk SSSR, 1957, Vol 115, Nr 3, pp 526-529 (U.S.S.R.)

ABSTRACT It is known that the tropolones which have no substituents in the position 5 easily combine with diazonium salts. Usually arylazotropolones are the products of this reaction to which the here illustrated structure is adscribed. The authors, however, some years ago, found such properties of these compounds as were in contradiction to the formula I. A more careful investigation leads to the conclusion concerning their capacity of tautomeric transformations in the tropochinonhydrazones. This discovered tautomerism is similar to that of the 5-nitro-and 5-nitrosotro-polones as well as to that of the aromatic oxyazo compounds. The first results of the investigation of tautomerism are the material of this report. The investigation was carried out with a group of 5-arylazotropolones (IV) which was obtained by the azo-combination of corresponding tropolones (III) with diazo salts. The inclination of these compounds to reaction in the tautomeric model V was discovered in consequence of their capacity of easy interaction with o-phenylendiamine. On this occasion chinoxaline derivates (VI) are formed which as is known, is not the case with tropolones themselves. On the other hand it turned out that arylazotropolones IV g-IV e very easily (already on the occasion of warming in methanol) separate the carboxyl group which is

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The Tautomerism of Arylazotropolones. 20-3-29/59

in position 3.On this occasion they change into corresponding 5-arylazo-4-carboxylmethyl tropolones(VII);this reaction does not take place in the case of the initial tropolon(IIIg),in the case of the tautomeric models V g-V e,however,absolutely natural,where the separatable carboxyl group is in a ß-position with respect to one of the carbonyl groups.Finally it was found that on the occasion of the transformation of the arylazotropolones IVg-IVe into acids(VII) and also directly from the latter,slightly neutral compounds(VIII) are formed as a consequence of closing the heterocycle of the tropochinonhydrazon forms of the arylazotropolones.The knowledge about the tropochinonhydrazon tautomerism of the arylazotropolones I⇄II which were obtained by chemical investigation could be confirmed spectroscopically.The capacity of the arylazotropolones for the above discussed tautomerism was recently noticed by Nozoe who also observed the formation of the chinoxalin-derivates with o-phenylendiamine.In the experimental part the usual data concerning the production methods and the constants of the substances in question are given. There is 1 table and 1 Slavic reference.

Card 2/2

ASSOCIATION Institute for Biological and Medical Chemistry of the Academy of Medical Sciences of the USSR and of the Moscow Textile Institute. (Institut biologicheskoy i meditsinskoy khimii Akademii meditsinskikh nauk SSSR,Moskovskiy tekstil'nyy institut).

SUBMITTED June 17, 1957

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"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

79-28-4-34/60

AUTHOR: Simonov, A. M.

TITLE: On Bipolar Ions Forming During the Splitting of Protons off the NH-Group (O bipolyarnykh ionakh, obrazuyushchikhsya pri otshcheplenii protona on NH-gruppy) XII. Derivatives of the 6-Quinoline-Sulfo-Acid (XII. Proizvodnyye 6-khinolinsul'fokisloty)

PERIODICAL: Zhurnal Obshchey Khimii, 1958, Vol.28, Nr 4, pp.1003-1007 (USSR)

ABSTRACT: In the present paper the author has investigated the properties of the quinoline salts with a substituted sulfamide group in the quinoline nucleus and the bipolar ions forming in them. In previous papers (Ref 1) it was shown that the quinoline salts which contain an aryl-sulfamide group can be changed into bipolar ions (betaines) by means of splitting the proton off the NH-group. The facility of changing quinoline salt (I) into betaine is caused by the effect of two systems on the NH-group - aryl-sulfonyl-radical and N-alkyl-quinolinium-group. These systems have intense electron accepting properties.

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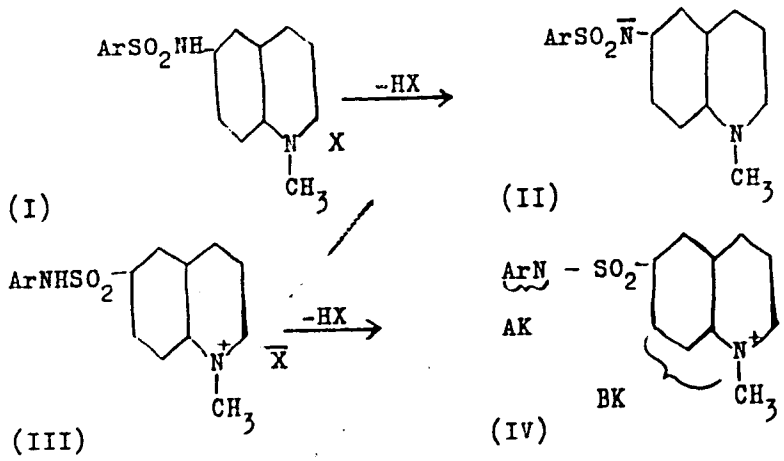
79-28-4-34:60

On Bipolar Ions Forming During the Splitting of Protons off the NH--Group. XII. Derivatives of the 6-Quinoline-Sulfo-Acid



For (I - IV): a. Ar = n-$CH_3C_6H_4$
b. Ar = n-$NO_2C_6H_4$
X = n-$CH_3C_6H_4SO_3$

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"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

79-28-4-34/60

On Bipolar Ions [illegible] During the Splitting of Protons off the NH-Group. XII. Derivatives of the 6 Quinoline Sulfo-Acid

In the investigation of the effect of the onium N-atom on the mobility of the hydrogen in the NH-group the properties of the quinoline salts (Ia, b) were compared with the properties of the isomeric compounds III (a, b), which develop during the fusion of methyl ether of the p-toluene-sulfo-acid with anilidene of the 6-quinoline-sulfo-acid. In the salts of the (III) structure the quinoline nucleus is connected with the NH-group by the SO_2-group. Consequently the onium N-atom can have an effect on the increase of the mobility of the hydrogen in the NH-group only by means of intensifying the electron accepting properties of the acyl. The isomeric salts of the (I) and (III) structure react with weak alkaline agents in the same way. However, under influence of caustic alkali their reaction process is different. The salts (I) change into bipolar ions. The salts (III) change into betaines. The properties of the bipolar ions (II) and (IV) are hardly noticeably depending on the bonding order of the group $-SO_2\overline{N}-$ with the benzene and quinoline ring: the

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79-28-4-34/60

On Bipolar Ions [illegible] During the Splitting of Protons off the NH-Group. XII. Derivatives of the 6-Quinoline-Sulfo-Acid

betaines (IV) as well as the compounds (II) dissolve in diluted acetic acid, do not hydrate in the presence of water in vapors and are of intense coloring. There are 6 references, 5 of which are Soviet.

ASSOCIATION: Vsesoyuznyy zaochnyy institut tekstil'noy i legkoy promyshlennosti (All-Union Institute for Correspondence Education in Textile and Light Industry)

SUBMITTED: March [illegible] 1957

Card 4/4

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"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

5 (3) SOV/79-29-7-67/83

AUTHORS: Simonov, A. M., Vitkevich, N. D.

TITLE: Investigations in the Field of Benzimidazole Derivatives (Issledovaniya v oblasti proizvodnykh benzimidazola). II. 1-(2',4'-Dinitro-phenyl)-benzimidazole and the Salts of 1-Methyl-3-(2',4'-dinitro-phenyl)-benzimidazolium (II. 1-(2',4'-Dinitrofenil)-benzimidazol i soli 1-metil-3-(2',4'-dinitrofenil)-benzimidazoliya)

PERIODICAL: Zhurnal obshchey khimii, 1959, Vol 29, Nr 7, pp 2404 - 2409 (USSR)

ABSTRACT: The N-2,4-dinitro-phenyl derivatives of the compounds of the benzimidazole series have so far been unknown, apart from the 1-(2',4'-dinitro-phenyl)-2-methyl benzimidazole recently described (Ref 2), which induced the authors to synthesize and transform some representatives of this class and the resultant benzimidazolium salts. The 1-(2',4'-dinitro-phenyl)-benzimidazole was obtained by melting benzimidazole and 2,4-dinitro-chloro-benzene or by heating these components in alcohol solution in the presence of sodium acetate. Benzimidazole and its 2-methyl-substituted compounds easily yield the N-dinitro-phenyl derivatives when treated with 2,4-dinitro-chloro-benzene.

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"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

Investigations in the Field of Benzimidazole Derivatives. SOV/79-29-7-67/03
II. 1-(2',4'-Dinitro-phenyl)-benzimidazole and the Salts
of 1-Methyl-3-(2',4'-dinitro-phenyl)-benzimidazolium

The 1-methyl-benzimidazoles react with 2,4-dinitro-chloro-benzene under the formation of the salts of 1-methyl-3-(2',4'-dinitro-phenyl)-benzimidazolium. Salts with the same cation can also be obtained on the basis of N-dinitro-phenyl-benzimidazole and its derivatives. The salts of 1-methyl-3-(2',4'-dinitro-phenyl)-benzimidazolium yield diphenyl-amine derivatives by separation of the dinitro-phenyl radical with aromatic amines. By treating these salts with alkaline reagents the imidazole ring opens and one of the isomeric acyclic amido-forms of the pseudo-base 2-(N-formyl-methyl-amino)-2',4'-dinitro-phenyl-amine is formed. The structure of the deformylation product was confirmed by the synthesis of compound (V) in another way. Thus, new evidence is presented for the existence of so-called pseudo-bases of benzimidazole salts in the acyclic form. There are 16 references, 6 of which are Soviet.

ASSOCIATION: Rostovskiy gosudarstvennyy universitet (Rostov State University)

SUBMITTED: June 6, 1958

Card 2/2

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"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

SOV/79-29-8-35/81

AUTHORS: Vitkevich, N. D., Simonov, A. M.

TITLE: Investigations in the Field of Benzimidazole Derivatives. III. Reaction of Compounds of the Benzimidazole Series With Nucleophilic Reactive Compounds

PERIODICAL: Zhurnal obshchey khimii, 1959, Vol 29, Nr 8, pp 2614-2617 (USSR)

ABSTRACT: The nucleophilic substitution in the benzimidazole series has so far been hardly investigated. A. M. Simonov and Uglov (Ref 1) found that the 5-methoxy-1-ethyl-benzimidazole (I), like the 5-methoxy-1-methyl derivative, is readily aminated when heated with sodium amide, and is converted into compound (II). The reaction takes place in dimethyl aniline with a 60% yield. The end product may also occur in the tautomeric form (III) which is of special interest. In contrast with the 1-alkyl derivatives of benzimidazole the latter cannot be aminated with sodium amide; the benzimidazole is first transformed into the salt-like compound (Ref 2), while an anion charge develops in the imidazole ring, so that the carbon atom in position 2 loses the capability of reacting with the second molecule of the compound. As is known, the N-alkyl- and N-phenyl-benzimidazole derivatives cannot be aminated by means of hydroxyl amine (Ref 4), as the latter is less nucleophilic than the sodium amide. On the assumption that

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Investigations in the Field of Benzimidazole Derivatives. SOV/79-29-8-35/81
III. Reaction of Compounds of the Benzimidazole Series With Nucleophilic Reactive Compounds

the introduction of the aryl-sulfonyl group into the NH-group of the benzimidazole could increase the capability of the derivative obtained of nucleophilic substitution, the authors tried to aminate the 1-benzene-sulfonyl benzimidazole with hydroxyl amine. But it was possible to separate from the reaction mass only the benzene sulfonate of benzimidazole (Ref 5). The formation of the benzimidazole salt is a product of hydrolysis under the given conditions. Thus, the benzimidazole compounds cannot be aminated with an unsubstituted NH-group when treated with sodium amide. There are 1o references, 7 of which are Soviet.

ASSOCIATION: Rostovskiy gosudarstvennyy universitet (Rostov State University)

SUBMITTED: July 1o, 1958

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"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

SOV/79-29-9-40/76

5(3)

AUTHORS: Chab, N. K., Simonov, A. M.

TITLE: On Bipolar Ions Forming in the Separation of a Proton From the NH-Group. XIII. Compounds of the Stilbene Series

PERIODICAL: Zhurnal obshchey khimii, 1959, Vol 29, Nr 9, pp 2988 - 2992 (USSR)

ABSTRACT: A. M. Simonov and M. N. Okorokova (Refs 1 and 2) showed that the onium salts of the structure (I), where R denotes an electrophilic group, are transformed into bipolar ions of structure (II) under the action of alkalies by separation of a proton from the NH-group (Scheme 1). The formation of such bipolar ions proceeds easily only if the electrophilic character of the radical R is sufficiently high. If it is weak, the effect of the other electrophilic radical, of the benzene ring to which the onium atom is bound and which is connected with the NH-group, is not sufficient for a "beta-inization". To investigate the rules, onium salts of structure (III) were synthesized in which the onium-N-atom and the imine group are linked to the stilbene cycle (Table 1) and the conditions of transformation of these salts into bipolar ions

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On Bipolar Ions Forming in the Separation of a Proton From the NH-Group XIII. Compounds of the Stilbene Series SOV/79-29-9-40/76

were determined (IV). In contrast to theoretical considerations, the introduction of the stilbene group into the molecule instead of the benzene ring has a rather weak effect upon the "betainization" of these salts. Just like the similar onium salts of the benzene series the salts of the stilbene series (III) with one acetyl- or benzoyl radical are not transformed into betaine compounds under the action of alkalies upon their aqueous-alcoholic solutions. It was also not possible to transform the onium salts (III), in which R denotes a benzene sulfonyl group, into bipolar ions by means of this method. The synthesized bipolar ions of the stilbene series (Table 2) are strongly red, crystalline compounds which are soluble in diluted mineral acids and acetic acid, and insoluble in apolar solvents. Thus, quaternary ammonium salts of the stilbene series containing an RNH-group (R=acyl or aryl) were synthesized on the basis of 4-amino-4'-dimethylamino stilbene. There are 3 tables, and 7 references, 5 of which are Soviet.

ASSOCIATION: Rostovskiy-na-Donu gosudarstvennyy universitet(Rostov-na-Donu State University)

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On Bipolar Ions Forming in the Separation of a Proton From the NH-Group .XLII.Compounds of the Stilbene Series SOV/79-29-9-40/76

SUBMITTED: July 31, 1958

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"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

KOVALENKO, Petr Nikitich; SIMONOV, A.M., prof., red.; ZARKHINA, I.Ya., red. izd-va; PAVLICHENKO, M.I., tekhn. red.

[Combined electrochemical analysis of nonferrous metals] Kombinirovannyi elektrokhimicheskii analiz tsvetnykh metallov. Rostov-na-Donu. Izd-vo Rostovskogo univ., 1960. 204 p. (MIRA 14:9)
(Nonferrous metals--Analysis) (Electrochemical analysis)

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"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

5.2630

77392
SOV/79-30-1-53/78

AUTHORS: Okorokova, M. N., Simonov, A. M.

TITLE: Concerning Zwitterions Formed by the Elimination of a Proton From the NH-Groups. XIV. m-Aminodimethylaniline Derivatives

PERIODICAL: Zhurnal obshchey khimii, 1960, Vol 30, Nr 1, pp 239-241 (USSR)

ABSTRACT: The article discusses preparation of zwitterions by the action of alkali on the onium salts containing an N atom in meta-position to the NH-group, and isomerism of zwitterions. This is a continuation of the author's previous work (ZhOKh, 27, 1941, 1957). It was shown that the quaternary salt, containing p-nitrobenzolsulfonyl group (I, R = p-$NO_2C_6H_4SO_2$), is easily converted (by the action of aqueous ammonia) into zwitterion (II).

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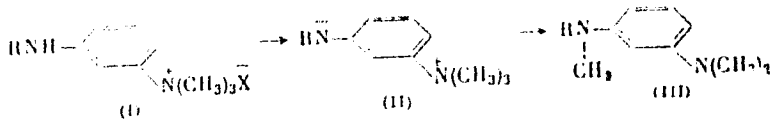
Concerning Zwitterions Formed by the Elimination of a Proton From the NH-Groups. XIV. m-Aminodimethylaniline Derivatives

77392
SOV/79-30-1-53/78



The quaternary salt, containing p-nitrobenzoylamino group in meta-position to the onium N atom (I, R = p-$NO_2C_6H_4CO$), can not be converted into zwitterion by the action of alkali in aqueous media. The zwitterion (II) on melting is converted into N-methylanilide (III). Structure of the latter was proved by a parallel analysis. There are 4 references, 1 U.S., 1 U.K. 2 Soviet. The U.S. and U.K. references are: J. Roberts, R. Clement, J. Drysdale, J. Am. Chem. Soc., 73, 2181 (1951); F. King, K. Acheson, A. Yorke, J. Chem. Soc., 1948, 1926.

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"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

Concerning Zwitterions Formed by the Elimination of a Proton From the NH-Groups. XIV. m-Aminodimethylaniline Derivatives

77392
SOV/79-30-1-53/78

ASSOCIATION: All-Union Correspondence Institute of Textile and Light Industry (Vsesoyuznyy zaochnyy institut tekstil'noy i legkoy promyshlennosti)

SUBMITTED: October 6, 1958

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"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

5.3610

77896
SOV/79-30-2-47/78

AUTHORS: Simonov, A. M., Vitkevich, N. D.

TITLE: Investigation of Benzimidazole Derivatives. IV. Compounds of 2-Aminobenzimidazole Series

PERIODICAL: Zhurnal obshchey khimii, 1960, Vol 30, Nr 2, pp 590-592 (USSR)

ABSTRACT: This article deals with direct amination of benzimidazole nitro-derivatives and with properties of the resulting amino compounds. 1-Methyl- and 5-methoxy-1-γ-diethylaminopropyl)-benzimidazoles were treated with sodium amide and yielded 2-amino derivatives. Age of the sodium amide evidently does not affect the process. In the amino compounds of the benzimidazole series, the amino group has the same properties as in other heterocycles, where it is in α-position to the nitrogen hetero-atom. These properties result from sharp lowering of the electron density at the amino-group nitrogen atom caused by the nitrogen heteroatom. For this reason,

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Investigation of Benzimidazole Derivatives. 77896
IV. Compounds of 2-Aminobenzimidazole Series SOV/79-30-2-47/78

2-aminobenzimidazole and 2-amino derivatives of 1-alkylbenzimidazole, when treated with hydrochloric acid, form only monohydrochlorides and cannot be diazotized even when treated with nitrosylsulfuric acid. They do not react with 2,4-dinitrochlorobenzene in boiling alcoholic solution of sodium acetate. When they are treated with picryl chloride under these conditions, they yield picrates of the starting base and not the corresponding picryl derivatives, i.e., picryl chloride is hydrolyzed instead of reacting with the amino group. Strong acylating agents -- acid chloride of β-antraquinonesulfonic acid (in pyridine), p-nitrobenzoyl chloride (with sodium bicarbonate) and acetic anhydride easily convert amino compounds into acyl derivatives. Experiments conducted at N. F. Vaniyeva Rostov State Medical Institute, under the supervision of N. A. Gubareva, showed that 2-amino-1-methylbenzimidazole hydrochloride and the hydrochloride of its 5-methoxy derivative lower the

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"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

Investigation of Benzimidazole Derivatives 77896
IV. Compounds of 2-Aminobenzimidazole Series SOV/79-30-2-47/78

blood pressure of animals. There are 8 references, 5 Soviet, 2 U.K., and 1 French. The U.K. references are: S. Angyal, C. Angyal, J. Chem. Soc., 1461 (1952); R. Feitelson, R. Rothstein, J. Chem. Soc., 2426 (1958).

ASSOCIATION: Rostov on-Don State University (Rostovskiy na-Donu gosudarstvennyy universitet)

SUBMITTED: February 23, 1959

Card 3/3

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

SIMONOV, A.M.; CHUB, N.K.; MAGAK'YAN, N.V.

Bipolar ions forming when a proton splits off an NH-group. Part 15: Sulfonium compounds containing an acylamino group in the ortho position with respect to the onium atom. Zhur.ob.khim. 30 no.8: 2680-2684 Ag '60. (MIRA 13:8)

1. Rostovskiy gosudarstvennyy universitet.
(Sulfonium compounds)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

SIMONOV, A.M.; VITKEVICH, N.D.; ZHELTONOZHKO, S.Ya.

Derivatives of benzimidazole. Part 5:Action of bases on N-arylbenzimidazolium salts. Zhur.ob.khim. 30 no.8:2684-2688 Ag '60. (MIRA 13:8)

1. Rostovskiy gosudarstvennyy universitet.
(Benzimidazolium compounds)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

VITKEVICH, N.D.; SIMONOV, A.M.

Benzimidazole derivatives. Part 7: Dual reactivity of 2-amino-1-methyl-benzimidazole. Zhur. ob. khim. 30 no.9:2868-2871 S '60. (MIRA 13:9)

1. Rostovskiy gosudarstvennyy universitet.
(Bensimidazole)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

SIMONOV, A.M.; VITKEVICH, N.D.; MARTSOKHA, B.K.

Bensimidazole deratives. Part 6: Action of sodium amide on 1-phenyl- and 1-benzylbenzimidazole. Zhur. ob. khim. 30 no.9:3062-3064 S '60. (MIRA 13:9)

1. Rostovskiy gosudarstvennyy universitet.
(Benzimidazole) (Sodium amide)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

SIMONOV, A.M.; POZHARSKIY, F.T.; CHEBYSHEVA, L.L.

Substituted amides of furancarboxylic acids. Izv.vys.ucheb.zav; khim.i khim.tekh. 4 no.5:798-800 '61. (MIRA 14:11)

1. Rostovskiy gosudarstvennyy universitet, kafedra organicheskoy khimii.

(Amides) (Furoic acid)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

SIMONOV, A.M.; CHUB, N.K.

Bipolar ions forming when a proton splits off an NH-group.
Part 16: Rearrangement of bipolar ions of the stilbene series.
Zhur.ob.khim. 30 no.10:3386-3389 O '61. (MIRA 14:4)

1. Rostovskiy gosudarstvennyy universitet.
(Stilbene)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

SIMONOV, A.M.; GARNOVSKIY, A.D.

Amination of heterocyclic compounds containing on imidazole ring.
Zhur. ob. khim. 31 no.1:114-117 Ja '61. (MIRA 14:1)

1. Rostovskiy-na-Donu gosudarstvennyy universitet.
(Amination) (Benzimidazole)
(Pehnanthrimidazole) (Imidazole)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

GARNOVSKIY, A.D.; SIMONOV, A.M.

Some transformations of heterocyclic systems containing an imidazole ring. Part 2: Amination of N-alkyl substituted napht (1, 2)imidazole and 6, 7, 8, 9-tetrahydronapht(1, 2)imidazole. Zhur.ob.khim. 31 no.6:1941-1944 Je '61. (MIRA 14:6)

1. Rostovskiy-na-Donu gosudarstvennyy universitet.
(Naphthimidazole) (Amination)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

SIMONOV, A.M.; POZHARSKIY, A.F.

Derivatives of benzimidazole. Part 8: Amination of some 1-substituted benzimidazoles. Zhur.ob.khim. 31 no.12:3970-3974 D '61. (MIRA 15:2)

1. Rostovskiy-na-Donu gosudarstvennyy universitet.
(Benzimidazole)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

OSIPOV, O.A.; SIMONOV, A.M.; MINKIN, V.I.; GARNOVSKIY, A.D.

Dipole moments of imidazole and its derivatives. Dokl.AN SSSR 137 no.6:1374-1376 Ap '61. (MIRA 14:4)

1. Rostovskiy-na-Donu gosudarstvennyy universitet. Predstavleno akademikom M.M.Shemyakinym.
(Imidazole--Dipole moments)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

SIMONOV, A.M.; LOMAKIN, A.N.

Derivatives of bezimidazole. Part 9: Derivatives of 2-amino-1-methyl-5-benzimidazolecarboxylic acid. Zhur.ob.khim. 32 no.7:2228-2230 Jl '62. (MIRA 15:7)

1. Rostovskiy-na-Domu gosudarstvennyy universitet.
(Benzimidazolecarboxylic acid)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

SIMONOV, A.M.; MARTSOKHA, B.K.; POZHARSKIY, F.T.

Pyrazole ring expansion under the effect of sodium amide. Zhur.ob. khim. 32 no.7:2388-2389 Jl '62. (MIRA 15:7)

1. Rostovskiy-na-Donu gosudarstvennyy universitet.
(Benzimidazole) (Sodium amide)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

CHUB, N.K.; SIMONOV, A.M.

Bipole ions formed in the splitting off proton from the NH group. Part 17: Transformations of some benzylbetaines by heating. Zhur.ob.khim. 32 no.3:714-718 Mr '62. (MIRA 15:3)

1. Rostovskiy-na-Donu gosudarstvennyy universitet.
(Betaine)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

MINKIN, V.I.; SIMONOV, A.M.; MEDYANTSEVA, Ye.A.

Mechanism of the electronic effect of the trimethyl ammonium group from data obtained in studying the kinetics of the reaction of benzene and stilbene amino derivatives with picryl chloride. Zhur.ob.khim. 32 no.5:1591-1597 My '62. (MIRA 15:5)

1. Rostovskiy-na-Donu gosudarstvennyy universitet.
(Ammonium compounds, Substituted) (Benzene) (Picryl chloride)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

SIMONOV, A.M.; YUTILOV, Yu.M.

Derivatives of benzimidazole. Part 10: Interaction of 1-alkyl- and 1-benzyl-substituted 2-aminobenzimidazoles with alkyl halides. Zhur.ob.khim. 32 no.8:2670-2673 Ag '62. (MIRA 15:9)

1. Rostovskiy-na-Donu gosudarstvennyy universitet.
(Benzimidazole) (Alkyl halides)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

TERTOV, B.A.; IVANKOVA, N.A.; SIMONOV, A.M.

Derivatives of benzimidazole. Part 11. Interaction of 1-phenylbenzimidazole with n. butyllithium and phenyllithium. Zhur.ob.khim. 32 no.9:2989-2991 S '62. (MIRA 15:9)

1. Rostovskiy gosudarstvennyy universitet.
(Benzimidazole) (Lithium)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

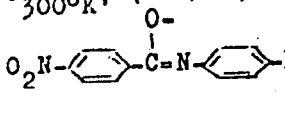
S/062/63/000/003/002/018
B101/B186

AUTHORS: Parini, V. P., Simonov, A. M., Frankevich, Ye. L., and Chub, N. K.

TITLE: Electrophysical properties of some aromatic betaines

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye khimicheskikh nauk, no. 3, 1963, 446 - 450

TEXT: Considering a possible use as organic semiconductors, the electrical conductivity of fine-cristalline betaines which had been pressed to tablets at 10,000 kg/cm^2, was measured between 20 and 160°C, the potential difference being 500 v. The temperature dependence of the conductivity obeyed the law $\sigma = \sigma_0 \exp(-E/kT)$. The following are formulas of the compounds $\sigma_{300°K}$, (mho/cm) with their respective σ_0(mho/cm), E (ev) and ε:



$10^{-13.6}$, $10^{20.5}$, 1.97, 3.6;

Card 1/4

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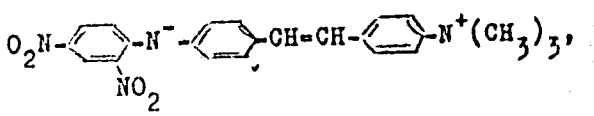
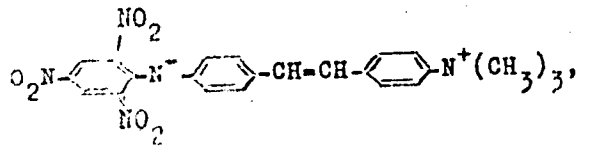
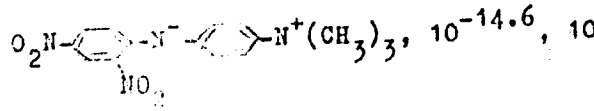
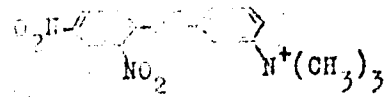
"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7


, $10^{-16.4}$, $10^{4.4}$, 1.20, 2.9;


, $10^{-15.3}$, 10^{-1}, 0.83, 2.9;


, $10^{-14.6}$, $10^{-2.6}$, 0.69, 3.5;


, 10^{-16}, $10^{2.3}$, 1.05, 3.3;

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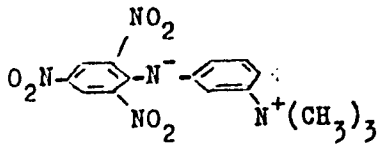
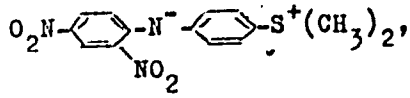
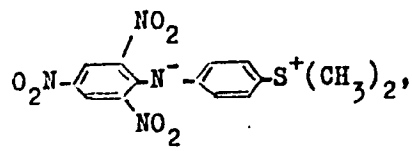
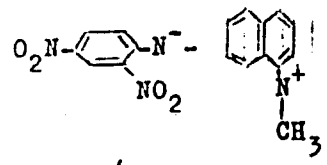
"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

Electrophysical properties of ...


, $10^{-15.2}$, $10^{-1.1}$, 0.82, 3.4;


, $10^{-15.3}$; 10^{13}, 1.63, 3.0;


, $10^{-15.2}$, $10^{2.7}$, 1.00, not measured;


, $10^{-15.8}$, $10^{-0.3}$, 0.90, 3.9.

Card 3/4

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

Owing to the charge localized in the molecules, which is provisionally given in the formulas, ε is higher than in other organic compounds. It may be expected that the electrophysical properties of the betaines will be considerably changed by conjugation between the atoms carrying the charge. There is 1 table.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics of the Academy of Sciences USSR); Rostovskiy-na-Donu gos. universitet (Rostov-na-Donu State University)

SUBMITTED: June 8, 1962

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

SIMONOV, A. M.; POZHARSKIY, A. F.; GARNOVSKIY, A. D.

Results of the proceedings of the conference on five-membered nitrogen heterocycles. Zhur. VKHO 8 no.2:219-221 '63. (MIRA 16:4)

(Heterocyclic compounds--Congresses)
(Nitrogen compounds)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

SIMONOV, A. M.; LOMAKIN, A. N.

Derivatives of 2-amino-1-methylbenzimidazole-5-carboxylic acid. Zhur. VKHO 8 no.2:234-235 '63. (MIRA 16:4)

1. Rostovskiy gosudarstvennyy universitet.

(Benzimidazolecarboxylic acid)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

POZHARSKIY, A. F.; SIMONOV, A. M.

Synthesis of N-alkylbenzimidazoles. Zhur. ob. khim. 33 no.1: 179-182 '63. (MIRA 16:1)

1. Rostovskiy-na-Donu gosudarstvennyy universitet.

(Benzimidazole)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

S/079/63/033/001/011/023
D204/D307

AUTHORS: Lomakin, A. N., Simonov, A. M. and Chirgina, V. A.

TITLE: Studies of benzimidazole derivatives. XII. The action of sodamide on N-alkyl benzimidazoles substituted in position 5

PERIODICAL: Zhurnal obshchey khimii, v. 33, no. 1, 1963, 204-207

TEXT: The action of $NaNH_2$ was studied on the derivatives on benzimidazole containing ethoxy-, benzyloxy-, and hydroxy-groups in position 5, in xylene and dimethylaniline solvents, 5-ethoxy-1-methylbenzimidazole (obtained by the reduction of 3-nitro-4-methylaminophenetole with Sn/HCl and by heating the resulting diamine with HCOOH) was readily aminated at 110 - 120°C, to give 2-amino-5-ethoxy-1-methylbenzimidazole (Ia) in 60% yield. 2-amino-5-ethoxy-1-ethylbenzimidazole (Ib) was similarly prepared by the amination of 5-ethoxy-1-ethylbenzimidazole, in 55% yield, and 2-amino-5-benzyloxy-1-methylbenzimidazole (Ic) by the action of $NaNH_2$ on 5-ben-

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zyloxy-1-methylbenzimidazole, in 25% yield. An attempt at the direct amination of 5-hydroxy-1-ethylbenzimidazole was unsuccessful, but 2-amino-5-hydroxy-1-methyl- and -1-ethylbenzimidazoles were obtained, as hydrobromides, in 70 - 80% yields, by the dealkylation of the 5-ethoxy compounds with HBr.

ASSOCIATION: Rostovskiy-na-donu gosudarstvennyy universitet (Rostov-on-Don State University)

SUBMITTED: February 6, 1962

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

SIMONOV, A.M.; GARNOVSKIY, A.D.; SHEYNKER, Yu.N.; KHRISTICH, B.I.; TROFIMOVA, S.S.

Some transformations of the systems containing an imidazole ring. Part 3: Action of bases of N-methyl-N'-(2,4-dinitrophenyl) imidazolium salts. Zhur.Ob.khim. 33 no.2:571-579 F '63. (MIRA 16:2)

1. Rostovskiy-na-Donu gosudarstvennyy universitet.
(Imidazolium compounds)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

SIMONOV, A.M.; MARTSOKHA, B.K.; POZHARSKIY, F.T.

Derivatives of indazole. Part 1: Reaction of 1-benzylindazole with sodium amide. Zhur.ob.khim. 33 no.3:1001-1005 Mr '63. (MIRA 16:3)

1. Rostovskiy-na-Donu gosudarstvennyy universitet.
(Indazole) (Amides)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

POZHARSKIY, A.F.; MARTSOKHA, B.K.; SIMONOV, A.M.

Direct N-arylation of five-membered nitrogen heterocycles.
Zhur.ob.khim. 33 no.3:1005-1007 Mr '63. (MIRA 16:3)

1. Rostovskiy-na-Donu gosudarstvennyy universitet.
(Heterocyclic compounds)
(Nitrogen compounds) (Arylation)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

DALGATOV, D.D.; SIMONOV, A.M.

Derivatives of benzimidazole. Part 13: Transformations of 2-formyl-1-methylbenzimidazole. Zhur.ob.khim. 33 no.3:1007-1010 Mr '63. (MIRA 16:3)

1. Rostovskiy-na-Donu gosudarstvennyy universitet.
(Benzimidazole)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

SIMONOV, A.M.; POZHARSKIY, A.F.

Derivatives of benzimidazole. Part 14: Amination of 1-cyclohexyl- and 1-phenylbenzimidazole. Zhur.ob.khim. 33 no.7:2350-2354 Jl '63. (MIRA 16:8)

1. Rostovskiy-na-Donu gosudarstvennyy universitet.
(Benzimidazole)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

L 27781-65 EWT(1)/EPA/EWP(f)/EWG(v)/T-2/EPA(bb)-2 Pe-5/Pw-4 WW
ACCESSION NR: AT5003391 S/2563/64/000/232/0059/0070

43
42
B+1

AUTHOR: Anisimov, S. A.; Galerkin, Yu. B.; Rekstin, F. S.; Seleznev, K. P.; Simonov, A. M.

TITLE: The design of centrifugal compressors 23

SOURCE: Leningrad. Politekhnicheskiy institut. Trudy, no. 232, 1964. Turbomashiny (Turbomachines), 59-70

TOPIC TAGS: compressor, centrifugal compressor, compressor design, centrifugal compressor parameter, Reynolds number, Mach number

ABSTRACT: The paper discusses modern methods for the design of centrifugal compressors and proposes a new method based on the utilization of experimentally obtained criterional parameters of the individual stage elements. Certain deliberations concerning the optimum design of the basic elements of a centrifugal stage based on theoretical and experimental work at the authors' Laboratory are included. Further tests are now in progress. They should yield better data concerning the dependence of compressor parameters on the Reynolds and Mach numbers and other significant factors, and the mutual influence of these factors. This, in

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"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

L 27781-65

ACCESSION NR: AT5003391

conjunction with the theory outlined in the paper, will result in detailed recommendations concerning the design of all the elements of a stage and of an entire compressor. Orig. art. has: 11 formulas and 2 figures.

ASSOCIATION: Leningradskiy politekhnicheskiy institut imeni M. I. Kalinina (Leningrad polytechnical institute)

SUBMITTED: 00 ENCL: 00 SUB CODE: PR

NO REF SOV: 029 OTHER: 000

Card 2/2

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

L 27183-65 EWT(1)/EPA/EWP(f)/EWG(v)/T-2/EPA(bb)-2 Pe-5/Pw-4 WW

ACCESSION NR: AT5003393 S/2563/64/000/232/0083/0092

33
31
B+1

AUTHOR: Rekstin, F. S.; Simonov, A. M.

TITLE: Theoretical and experimental study of centrifugal compressor rotors with an exit angle of 90 degrees

SOURCE: Leningrad. Politekhnicheskiy institiut. Trudy, no. 232, 1964. Turbomashiny (Turbomachines), 83-92

TOPIC TAGS: compressor, centrifugal compressor, double deck compressor, compressor efficiency, compressor parameter, vane number, compressor rotor, interblade channel

ABSTRACT: The low efficiency of 90° exit angle compressor rotors is caused by poor flow conditions within the interblade channels as a result of their high diffusiveness. This, in turn, causes break-away effects and high current velocities behind the rotor. Among numerous geometric parameters determining the efficiency of interblade channels, the most important seems to be the opening angle of the equivalent diffusor which is fixed basically by the number of vanes. Tests carried out at the author's laboratory and described in detail in the present article confirmed that the choice of an optimum number of vanes coupled with the use of double

Card 1/2

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"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

L 27783-65

ACCESSION NR: AT5003393

2

-deck lattices leads to significant improvements in the aerodynamics of interblade channels. Experimental results agreed very well with the results of the theoretical analysis of the tested rotors. The optimum number of vanes in the single-deck case is within the range of 24-32. The rotors with radial outflow generate a larger thrust than rotors with inclined (backwards) vanes; at the same time , their efficiencies remain comparable. However, their steady operating region is quite narrow. Double-deck lattice rotors with a 90° exit angle simultaneously exhibit an improved efficiency, thrust, and enlarged stability region. The optimum is found at a 24/12-32/16 vane ration. "The work was supervised by Docent K. P. Seleznev." Orig. art. has: 9 formulas, 5 figures and 2 tables.

ASSOCIATION: Leningradskiy politekhnicheskiy institut imeni M. I. Kalinina (Leningrad polytechnic institute)

SUBMITTED: 00 ENCL: 00 SUB CODE: PR

NO REF SOV: 006 OTHER: 000

Card 2/2

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

SIMONOV, A.P.; SHIGORIN, D.N.

Infrared absorption spectrum and structure of crystalline lithium methylate. Opt. i spektr. 17 no.6:848-858 D '64. (MIRA 18:3)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

POZHARSKIY, A.F.; SIMONOV, A.M.

Nature of interaction between phenyl and imidazole rings in N-aryl imidazoles. Part 1: Dipole moments of N-substituted imidazole and benzimidazole. Zhur.ob.khim. 34 no.1:224-227 Ja '64. (MIRA 17:3)

1. Rostovskiy-na-Donu gosudarstvennyy universitet.

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

GARNOVSKIY, A.D.; SIMONOV, A.M.; MINKIN, V.I.; DIONIS'YEV, V.D.

Transformations of systems containing an imidazole ring. Part 4: Electron absorption spectra of N-alkyl-N'-3,4-dinitrophenyl imidazolium salts. Zhur.obs.khim. 34 no.1:272-276 Ja '64. (MIRA 17:3)

1. Rostovskiy-na-Donu gosudarstvennyy universitet.

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SIMONOV, A.M.; POZHARSKIY, A.F.

Derivatives of benzimidazole. Part 15: Synthesis and amination of N-aralkyl benzimidazoles. Zhur. ob. khim. 34 no. 5:1572-1574 My '64. (MIRA 17:7)

1. Rostovskiy-na-Donu gosudarstvennyy universitet.

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[illegible]

Derivatives of benzimidazole. Part 1: Nitro alcohols and nitrovinyl derivatives of the benzimidazole series. Zhur. Obshch. Khim. 34 no.9:3052-3055 S '64.

(MIRA 17:11)

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L 17823-65 EPA(s)-2/EWT(m)/EPF(c)/EPR/EWP(j)/T Pc-4/Pr-4/Ps-4/Pt-10 RPL/RAEM(a) RM/WW

ACCESSION NR: AP4047650 S/0079/64/034/010/3407/3411

AUTHOR: Garnovskiy, A. D.; Osipov, O. A.; Dalgatov, D. D.; Simonov, A. M.; Minkin, V. I.

TITLE: Complex compounds of metals with certain nitrogen-containing ligands. I. Complexes of the 2-o-hydroxyanilbenzimidazole series

SOURCE: Zhurnal obshchey khimii, v. 34, no. 10, 1964, 3407-3411

TOPIC TAGS: organometallic compound, chelate compound, benzimidazole derivative, organic complex

ABSTRACT: Two new o-hydroxyanils of 1-methyl-2-formylbenzimidazole were synthesized: 1-methylbenzimidazole-2-aldehyde-2'-hydroxyphenylimine and 1-methylbenzimidazole-2-aldehyde-(2'-acetylamino-5'-methoxy)phenylimine. The complex-forming ability of the first compound was investigated; the complexes of the second compound are to be subsequently described. Heating an alcoholic solution of the compound with the acetates or nitrates of Cu, Ni, Pb, Mn, Th or UO_2 gave brightly colored thermally stable rather insoluble crystals. Based

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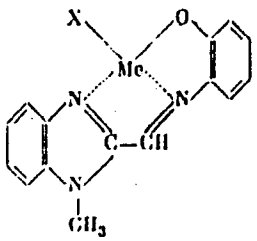
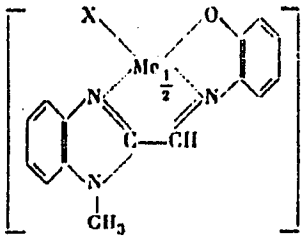
on elementary analysis and IR spectra, the 1:1 complexes formed with Pb and UO_2 and the 2:1 complexes formed with Ni and Th were assigned the following chelate structures:



(III) Me = Pb, X = $OCOCH_3$, NO_3;
(IV) Me = UO_2, X = $OCOCH_3$.



(V) Me = Ni, X = нуль;
(VI) Me = Th, X = NO_3.

1-methylbenzimidazole-2 derivatives containing no hydroxyl group or hydroxyl group in the p-position would not complex. The heteroatom of the imidazole ring

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was also shown necessary for chelate formation, since benzal-o-aminophenol would not form a complex under similar conditions. "Spectra were obtained by V. N. Sheynker on the UR-10 (Zeiss) apparatus in a paste with vaseline oil." Orig. art has: 10 formulae

ASSOCIATION: Rostovskiy-na-Dony gosudarstvenny*y universitet (Rostov-on-Don State University)

SUBMITTED: 01Jul63 ENCL: 00

SUB CODE: OC NO REF SOV: 006 OTHER: 010

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"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

L 11632-66 EPA/EWT(1)/EWT(m)/EWP(w)/EWP(f)/EWP(v)/T-2/EWP(k)/ETC(m) WW/EM

ACC NR: AT6001022 SOURCE CODE: UR/2563/65/000/247/0055/0063

58
B+1

AUTHOR: Simonov, A. M.

ORG: Leningrad Polytechnic Institute (Leningradskiy politekhnicheskiy institut)

TITLE: Effects of different shapes of interblade channels on the characteristics of centrifugal compressor wheels

SOURCE: Leningrad. Politekhnicheskiy institut. Trudy, no. 247, 1965. Turbomashiny (Turbomachines), 55-63

TOPIC TAGS: centrifugal compressor, compressor design, compressor rotor, compressor stage, compressor blade

ABSTRACT: To determine the effects of the shape of interblade channels on the characteristics of centrifugal compressor wheels, three types of compressor wheels (β_{g2} = 20, 49, and 90°) were modified according to a linear channel area-radius law, and were compared with normally shaped wheels (blade is defined by a single radius of curvature). The geometries of the tested wheels and the corresponding area ratios (local area over area at inside diameter) are shown graphically. The characteristics of the three wheels, including the efficiency η_{ad}^*, pressure coefficient ψ_k^*, flow coefficient ϕ_{po}, and coefficients k_α, k_y and k_3 which

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ACC NR: AT6001022

characterize the flow uniformity at the outlet and the range of possible compressor operation respectively, were determined on the apparatus described previously by the author (Eksperimental'noye issledovaniye tsentrobezhnykh kompressornykh koles s uglom vykhoda $\beta_{g2} = 90^{\circ}$. Energomashinostroyeniye. Uchennye zapiski aspirantov i soiskateley. LPI, 1964, 39-44). The results are summarized in Fig. 1 as a function of β_{g2}. It is concluded that the test data obtained so far indicate that a linear area profile may be superior for the case $\beta_{g2} = 90^{\circ}$ (although overall economic consideration must include other factors not considered here). The work will continue in an effort to find desirable channel profile characteristics.

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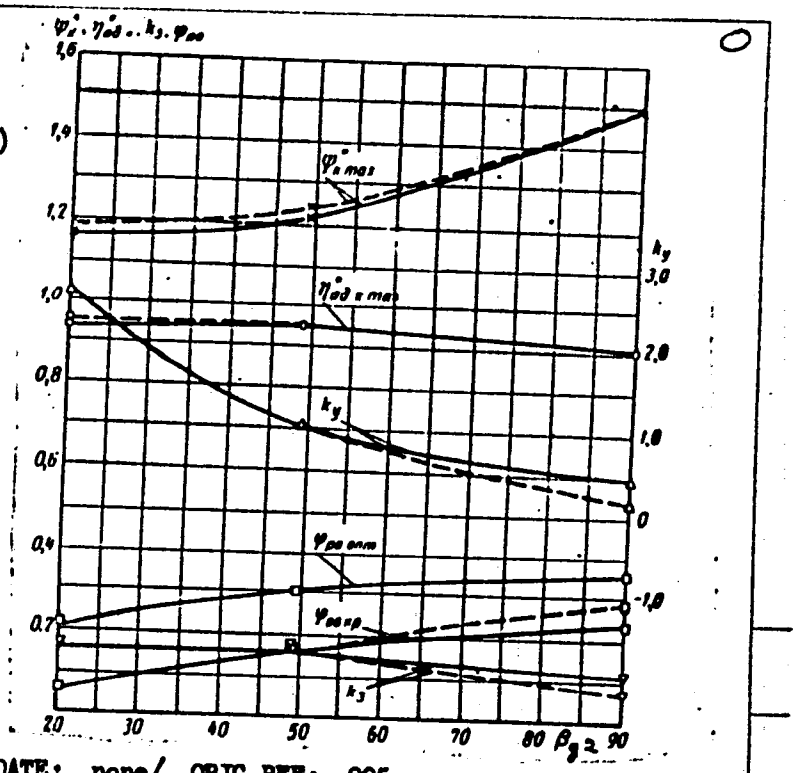
ACC NR: AT6001022

Fig. 1. Wheel characteristics for conventional (dotted lines) and modified (solid lines) wheels.

Orig. art. has: 2 tables, 5 figures, and 2 formulas.



Card 3/3 SUB CODE: 13,20/SUBM DATE: none/ ORIG REF: 005

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"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

L 27965-66 EWT(m)/EWA(d)/EWP(t)/ETI IJP(c) JD

ACC NR: AP6017681 SOURCE CODE: UR/0097/65/000/012/0024/0027

AUTHOR: Simonov, A. M. (Engineer)
ORG: none

TITLE: Short-term creep of reinforcing steel type 35GS

SOURCE: Beton i zhelezobeton, no. 12, 1965, 24-27
TOPIC TAGS: creep, reinforced concrete, mechanical stress, flow stress, steel/35GS steel

ABSTRACT: Type 35GS steel, used in manufacture of prestressed reinforced concrete structures, was tested for creep at various temperatures and under various degrees of mechanical stress, such as might be encountered in the manufacture of prestressed concrete sections. The chemical composition of the alloy tested was: C 0.37%; Mn 1.10%; Si 0.87%; S 0.043%; P 0.035%. The steel was found to be a metal with stable mechanical characteristics, since heating hardly changed its properties. The investigation of the dependence of the change in flow stress on creep at various temperatures indicated that the maximal increase in flow stress is at 300° with large loads and creep times. The strength and deformability change little due to creep. The resistance of the steel to creep decreases sharply beginning at a creep temperature of 400°, whereas up to 300° the creep resistance is relatively high, and with large loads actually increases with increasing temperature. Orig. art. has: 5 figures and 3 tables. [JPRS]

SUB CODE: 11, 20 / SUBM DATE: none / ORIG REF: 010

Card 1/1 UDC: 691.87:539.376

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"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

L 45973-66 EWT(1)/EWT(m)/EWP(k)/T-2/EWP(w)/EWP(f)/EWP(v) IJP(c) WW/EM/GD

ACC NR: AT6026436 (N) SOURCE CODE: UR/0000/66/000/000/0154/0166

AUTHOR: Seleznev, K. P.; Galerkin, Yu. B.; Anisimov, S. A.; Rekstin, F. S.; Patrin, Yu. V.; Simonov, A. M.; Shkarbul', S. N.

ORG: None

TITLE: Results of an investigation of impellers in centrifugal compressors

SOURCE: Leningrad. Nauchno-issledovatel'skiy i konstruktorskiy institut khimicheskogo mashinostroyeniya. Tsentrobezhnyye kompressornyye mashiny (Centrifugal compressors). Moscow, Izd-vo Mashinostroyeniye, 1966, 154-166

TOPIC TAGS: centrifugal compressor, compressor blade, aerodynamic characteristic

ABSTRACT: The authors review the results of experimental and theoretical studies on improving the aerodynamic characteristics of impellers in centrifugal compressors. It is shown that impellers should be designed with a linear change in the cross sectional area with respect to channel length to improve flow characteristics. The number of blades should be selected on the basis of the optimum apex angle for the channels between blades. Experimental investigation of a large number of single-stage impellers with exit angles of 20, 49 and 90° showed that optimum impellers from the standpoint of maximum efficiency have 8-12, 16-18 and 28 or more blades respectively. However, stability is reduced with an increase in the number of blades so that two-

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ACC NR: AT6026436

stage cascades are preferable for high-efficiency impellers with a large number of blades. Recommendations are made for optimalizing the operation parameters of various types of centrifugal compressors on the basis of recent experimental research. Orig. art. has: 6 figures.

SUB CODE: 13/ SUBM DATE: 08Jan66/ ORIG REF: 009/ OTH REF: 003

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"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550710014-7

ACC NR: AP6033307 SOURCE CODE: UR/0409/66/000/004/0611/0613

AUTHOR: Khristich, B. I.; Simonov, A. M.

ORG: Rostov-on-Don State University (Rostovskiy-na-Donu gosudarstvennyy universitet)

TITLE: Some conversions of systems containing the imidazole ring. Part 5: Properties of naphth[1,2-d]imidazole and imidazo[4,5-f] quinoline

SOURCE: Khimiya geterotsiklicheskikh soyedineniy, no. 4, 1966, 611-613

TOPIC TAGS: imidazoquinoline, naphthimidazole, heterocyclic base compound, organic nitrogen compound

ABSTRACT: It was shown earlier that imidazole systems can be directly aminated at the CH group of the imidazole ring, the process being dependent on the nature of the nucleus joined to this ring. In order to study this conversion further, some new derivatives of naphth[1,2-d]imidazole and imidazo[4,5-f] quinoline and their reactions with sodium amide were studied. 3-Benzylnaphth[1,2-d]imidazole (Ia), obtained by benzylating naphth[1,2-d]imidazole, readily reacts with sodium amide in dimethylaniline at 110°, forming 2-amino derivatives (Ic). On the contrary, 3-benzylimidazo[4,5-f]quinoline (IIa) cannot be directly aminated under these conditions; nor does 3-methylimidazo[4,5]quinoline (IIb) form a 2-amino derivative when acted upon by sodium amide, although a similarly structured compound of the naphthimidazole series, (Ib), readily undergoes such a conversion.

Card 1/2 UDC: 547.785.5+547.831.6+542.958.3

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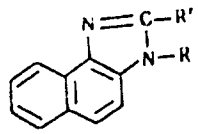
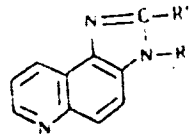


Ia R = $CH_2C_6H_5$; R' = H;
b R = CH_3; R' = H;
c R = $CH_2C_6H_5$; R' = NH_2;



IIa R = $CH_2C_6H_5$; R' = H;
b R = CH_3; R' = H;
c R = $CH_2C_6H_5$; R' = NH_2;
d R = $CH_2C_6H_5$; R' = Cl.

Thus, in contrast to the naphthalene ring, the quinoline ring deactivates the 2-position of the imidazole ring joined to it with respect to sodium amide. 2-Amino-3-benzylimidazo[4,5-f]quinoline (IIc) can be synthesized only by the action of ammonia in the presence of copper salts on 2-chloro-3-benzylimidazo[4,5-f]quinoline (IId), formed by the action of phosphoryl chloride on 3-benzylimidazolono[4,5]quinoline. When sodium amide acts on 3-substituted derivatives of imidazo[4,5]quinoline, the quinoline ring is not aminated either; this is attributed to the influence of the imidazolo ring. The melting points are (°C): (Ia) 170°; (Ic) 256°; (IIb) 189-190°; (IId) 170-171°.

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