2-(3-Acylthioureido)benzonitriles
II. Synthesis of *N*-substituted 2,4-diaminoquinazolines

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Received 9 April 1990

Desulfanation reaction of 2-(3-acylthioureido)benzonitriles (*I*) with mercuric oxide in the presence of aniline, ethyl- and diethylamine in acetonic solution at room temperature led in dependence on the type of starting acyl thioureido derivative and amine to either *N*-phenyl-*N'*-acetyl-*N''*-(2-cyanophenyl)guanidine (*II*) and *N*,*N*-diethyl-*N'*-acyl-*N''*-(2-cyanophenyl)-guanidine (*V*), respectively or the products of their cyclization, *i.e.* 3-substituted 2-acylamino-4-imino-3,4-dihydroquinazoline (*III*) or 3-acyl-2-diethylamino-4-imino-3,4-dihydroquinazoline (*VI*) and the products of their rearrangement, *i.e.* 4-acylamino-2-(diethylamino)quinazolines (*VII*). Compounds *II* and *III* underwent a base-catalyzed rearrangement with simultaneous hydrolysis of the acyl group to 2-amino-4-(R'-amino)quinazolines (*IV*) and compounds *V*, *VI*, and *VII* to 4-amino-2-diethylaminoquinazoline (*VIII*). This gave by acylation with acyl chloride in benzene in the presence of triethylamine compound *VII* only, although its acetylation with acetic anhydride in pyridine gave a mixture of *VI* and *VII*.

The reaction of 3-substituted 1-acylthioureas with desulfanation agents in the presence of primary or secondary amines to *N*-acylguanidines has been already known [1]. Analogously desulfanation of 2-(3-acylthioureido)benzonitriles should lead to *N*-substituted or *N*,*N*-disubstituted *N'*-acyl-*N''*-(2-cyanophenyl)-guanidines. One would expect their cyclization to the quinazoline ring in accordance with the cyclization of 2-(3-acylthioureido)benzonitriles to 4-acylamino-1,2-dihydroquinazoline-2-thiones [2].

The aim of this work was the synthesis of *N*-substituted and *N*,*N*-disubstituted *N'*-acyl-*N''*-(2-cyanophenyl)guanidines by the desulfanation reactions of 2-(3-acylthioureido)benzonitriles *Ia—Ic* with mercuric oxide in the presence of aniline, ethyl- or diethylamine and their following cyclization reactions leading to *N*-substituted 2,4-diaminoquinazolines *III*, *IV*, and *VI—VIII* (Schemes 1 and 2).

Experimental

Melting points were determined on a Kofler hot-stage PHMK 79/2106 (Wägetechnik Rapido). Elemental analyses were performed with an elemental analyzer CHN 1102

(Erba). The found values correspond with the calculated ones. Infrared spectra were taken on a spectrophotometer SP 1000 (Unicam) in KBr pellets, ^{1}H NMR spectra on a BS 567 instrument (Tesla, 100 MHz) in saturated solution of $(CH_3O)_2SO_2$, internal standard HMDSO, resp. in $(CD_3)_2CO$ with TMS as an internal standard. TLC was performed on Silufol UV 254 (Kavalier, Votice), the detection was carried out with Fluotest Universal (Quartzlampen, Hanau). The mobile phase was chloroform, ether or acetonitrile in a chromatographic container saturated by vapours of the used solvent.

Column chromatography was performed on a column with silica gel (grain size 120—160 μm, length 60 cm, diameter 2.5 cm).

Characteristics of synthesized compounds are given in Tables 1 and 2.

Table 1

Characterization and IR spectral data of the synthesized compounds *III*, *V*, *VII*

Compound	Yield	M.p.	$\tilde{\nu}$/cm^{-1}				
	%	°C	ν(C≡N)	ν(C=N)	ν(NCO)	ν(NHCO)	ν(NH)
IIIa	59	142—144		1640		1700, 1575	3220, 3280
IIIb	73	161—164		1630		1690, 1570	3180, 3280
IIIc	85	181—184		1635		1710, 1570	3230, 3280
IIId	90	180—181		1630		1710, 1560	3200, 3300
IIIe	81	143—145		1630		1685, 1565	3200, 3300
IIIf	87	213—214		1620		1715, 1575	3180, 3280
Va	54	117—120	2220, 2230	1620	1670	1710, 1565	3200, 3280
Vb	85	78—80	2220, 2230	1630	1670	1720, 1650	3230, 3260
Vc	61	150—152	2220, 2240	1620	1660	1695, 1575	3240, 3300
VIIa	30*	174—176		1625		1690, 1565	3220
VIIb	—*	126—127		1630		1720, 1570	3240
VIIc	11*	186—188		1630		1685, 1560	3210

* For procedure *A*.

Yield for procedures *B* and *C*, respectively: 87, 88 (*VIIa*), 79, 82 (*VIIb*), 89, 91 (*VIIc*).

N-Acetyl-N'-phenyl-N''-(2-cyanophenyl)guanidine (II)

Into suspension of 2-(3-acetylthioureido)benzonitrile (*Ia*) (5.5 g; 0.025 mol) in acetone (80 cm^3) at room temperature finely ground mercuric oxide (12 g; 0.055 mol) was added. Under vigorous agitation solution of aniline (2.3 g; 0.025 mol) in ethanol (10 cm^3) during 10 min was added. Then the agitation continued for 240 min till the starting compound disappeared. The suspension was filtered with charcoal and the filtrate evaporated at 20 °C on a vacuum evaporator to dryness. The residue was dissolved in acetone (15 cm^3) at room temperature and the solution was left at the temperature of −20 °C for 3 h to crystallize. The formed crystals of 2-acetylamino-4-imino-3-phenyl-3,4-dihydroquinazo-

Table 2

^{1}H NMR characteristics of the synthesized compounds *III, V VII*

Compound	δ
IIIa	13.80 (s, 1H, NH), 7.10—8.27 (m, 10H, H_{arom}, NH), 2.03 (s, 3H, CH_3)
IIIb	12.65 (s, 1H, NH), 7.06—8.29 (m, 10H, H_{arom}, NH), 4.02 (q, 2H, CH_2, J = 6.5 Hz), 1.18 (t, 3H, CH_3, J = 6.5 Hz)
IIIc	13.73 (s, 1H, NH), 7.12—8.40 (m, 16H, H_{arom}, NH)
IIId	13.71 (s, 1H, NH), 6.97—8.18 (m, 5H, H_{arom}, NH), 4.42 (q, 2H, CH_2, J = 7.5 Hz), 2.24 (s, 3H, CH_3), 1.31 (t, 3H, CH_3, J = 7.5 Hz)
IIIe	12.64 (s, 1H, NH), 7.02—8.21 (m, 5H, H_{arom}, NH), 4.41 (q, 2H, CH_2, J = 7.5 Hz), 4.24 (q, 2H, CH_2, J = 6.5 Hz), 1.37 (t, 3H, CH_3, J = 6.5 Hz), 1.30 (t, 3H, CH_3, J = 7.5 Hz)
IIIf	14.12 (s, 1H, NH), 7.11—8.35 (m, 10H, H_{arom}, NH), 4.59 (q, 2H, CH_2, J = 7.5 Hz), 1.44 (t, 3H, CH_3, J = 7.5 Hz)
Va	11.28 (s, 0.7H, NH), 10.45 (s, 0.3H, NH), 6.85—7.54 (m, 4H, H_{arom}), 3.46 (q, 4H, CH_2, J = 7.5 Hz), 2.05 (s, 2.1H, CH_3), 1.98 (s, 0.9H, CH_3), 1.20 (t, 6H, CH_3, J = 7.5 Hz)
Vb	10.66 (s, 0.4H, NH), 10.09 (s, 0.6H, NH), 7.00—7.57 (m, 4H, H_{arom}), 4.03 (q, 2H, CH_3, J = 6.5 Hz), 3.44 (q, 4H, CH_2, J = 7.5 Hz), 1.27 (t, 3H, CH_3, J = 6.5 Hz), 1.23 (t, 6H, CH_3, J = 7.5 Hz)
Vc	11.78 (s, 0.5H, NH), 9.82 (s, 0.5H, NH), 6.80—7.62 (m, 9H, H_{arom}), 3.49 (q, 4H, CH_2, J = 7.5 Hz), 1.26 (t, 6H, CH_3, J = 7.5 Hz)
VIIa	8.40 (s, 1H, NH), 7.12—7.80 (m, 4H, H_{arom}), 3.60 (q, 4H, CH_2, J = 7.5 Hz), 2.63 (s, 3H, CH_3), 1.16 (t, 6H, CH_3, J = 7.5 Hz)
VIIb	8.28 (s, 1H, NH), 7.10—7.75 (m, 4H, H_{arom}), 4.33 (q, 2H, CH_2, J = 6.5 Hz), 3.63 (q, 4H, CH_2, J = 7.5 Hz), 1.34 (t, 3H, CH_3, J = 6.5 Hz), 1.22 (t, 6H, CH_3, J = 7.5 Hz)
VIIc	8.44 (s, 1H, NH), 7.05—7.82 (m, 9H, H_{arom}), 3.61 (q, 4H, CH_2, J = 7.5 Hz), 1.19 (t, 6H, CH_3, J = 7.5 Hz)

line (*IIIa*) (4.1 g, 59 %) were filtered off, washed with ethanol and dried in vacuum. The mother liquor was chromatographed on silica gel (eluent ether). Compound *II* was eluted and after evaporation of the solvent on a vacuum evaporator at 20 °C the crystals of *II* were obtained (1.1 g, 15 %, m.p. = 130—133 °C). IR spectrum (KBr pellet), $\tilde{\nu}$/cm^{-1}: 2230, 2220 ν(C≡N), 1690, 1560 ν(NHCO), 1665 ν(NCO), 1630 ν(C=N), 3295, 3200, 3180, 3140 ν(NH). ^{1}H NMR spectrum, δ: 10.97 (s, 0.8H, NH), 10.45 (s, 0.2H, NH), 6.94—7.75 (m, 10H, H_{arom}, NH), 2.15 (s, 2.4H, CH_3), 2.10 (s, 0.6H, CH_3).

Cyclization of II to IIIa

Procedure A. Compound *II* (2.8 g; 0.01 mol) was refluxed for 1 h in ethanolic solution (50 cm^3). Then water (20 cm^3) was added and all the mixture concentrated on a vacuum evaporator to crystallization. Yield 2.5 g (89 %).

Procedure B. Aqueous solution of sodium hydroxide (5 %, 1 cm^3) was added into solution of *II* (1.4 g; 5 mmol) in ethanol (75 cm^3) at room temperature. After 5 min the reaction was finished (monitored by TLC). Then the pH of the reaction mixture was set

up to 5—7 with aqueous solution of acetic acid (5 %) and the solution concentrated on a vacuum evaporator to crystallization. After 1 h at the temperature 0—5 °C product *IIIa* was separated and crystallized from ethanol. Yield 1.2 g (85 %).

3-Substituted 2-acylamino-4-imino-3,4-dihydroquinazolines IIIa—IIIf

Acetonic suspension (100 cm^3) of compound *Ia—Ic* (0.03 mol) was treated with mercuric oxide (12 g; 0.055 mol) and under vigorous agitation solution of ethylamine or aniline (0.035 mol) in ethanol (20 cm^3) was dropwise added. After 6—8 h of reaction the reaction mixture was heated up with charcoal, hot filtered and the solid portion was washed up with hot acetone (50 cm^3). Then all the fractions of the solvent were evaporated in a vacuum and the remains were recrystallized from ethanol.

2-Amino-4-(R'-amino)quinazolines IVa, IVb

Compound *IIIa—IIIf* and *II* (0.01 mol), respectively, was refluxed for 10 min in the mixture of ethanol (50 cm^3) and aqueous sodium hydroxide (15 %, 10 cm^3). Then the equal amount of water was added and ethanol was evaporated in a vacuum. The product was filtered off and recrystallized from ethanol.

Yield of compound *IVa* was 2.1 g (89 %), m.p. = 261—263 °C. IR spectrum (KBr pellet), $\tilde{\nu}/cm^{-1}$: 1635 ν(C=N), 3450, 3400, 3330, 3180 ν(NH). ^{1}H NMR spectrum, δ: 7.04 —8.06 (m, 10H, H_{arom}, NH), 6.45 (s, 2H, NH_2).

Yield of compound *IVb* was 1.7 g (91 %), m.p. = 273—274 °C. IR spectrum (KBr pellet), $\tilde{\nu}/cm^{-1}$: 1630 ν(C=N), 3420, 3400, 3320, 3200 ν(NH). ^{1}H NMR spectrum, δ: 6.89—7.68 (m, 4H, H_{arom}), 6.75 (s, 3H, NH, NH_2), 4.39 (q, 2H, CH_2, J = 7.5 Hz), 1.35 (t, 3H, CH_3, J = 7.5 Hz).

N,N-Diethyl-N'-acyl-N''-(2-cyanophenyl)guanidines Va—Vc

Compound *Ia—Ic* (0.03 mol) after 5—7 h of the reaction with diethylamine (2.5 g; 0.034 mol) and mercuric oxide (12 g; 0.055 mol) under the same procedure as mentioned above was completely changed. Then into reaction mixture charcoal was added and the liquid part was separated by filtration. The solid portion was washed up with acetone (50 cm^3) and after filtration the filtrates were evaporated to dryness on a vacuum evaporator at room temperature.

The remainder, after reaction of *Ib*, which contains compound *Vb* only, was recrystallized from ethanol. Yield 7.4 g (85 %).

The remains after reaction of *Ia* and *Ic* were dissolved in acetone (50 cm^3) and chromatographed on a column; the eluent was ether—acetone (φ_r = 8 : 1) mixture. The fractions containing compound *Va* and *Vc*, respectively, were under vacuum evaporated

and recrystallized from ethanol with charcoal. Yield of *Va* was 4.2 g (54 %), yield of *Vc* was 5.8 g (61 %).

3-Benzoyl-2-diethylamino-4-imino-3,4-dihydroquinazoline (VIc)

The compound *VIc* was separated after the desulfanation reaction of *Ic* by column chromatography. The eluent was ether—acetone (φ_r = 3 1) mixture. At first compound *Vc* was eluted. The crystallization of *VIc* from ethanol gave 1.4 g (15 %), m.p. = = 178—180 °C. IR spectrum (KBr pellet), $\tilde{\nu}$/cm^{-1}: 3160 ν(NH), 1660 ν(C=O), 1635 ν(C=N). ^{1}H NMR spectrum, δ: 12.59 (s, 1H, NH), 7.10—8.24 (m, 9H, H_{arom}), 3.65 (q, 4H, CH_2, J = 7.5 Hz), 1.16 (t, 6H, CH_3, J = 7.5 Hz).

4-Acylamino-2-(diethylamino)quinazolines VIIa—VIIc

Procedure A. Compounds *VIIa*, *VIIc* were separated from the mixture of products after desulfanation reaction of *Ia*, *Ic* by column chromatography (eluent acetone) after preceding chromatographical separation of compounds *Va*, *Vc*, and *VIc*, respectively. The products were recrystallized from ethanol.

Procedure B. Compounds *Va—Vc* and *VIa*, *VIc* (0.01 mol), respectively, were dissolved at room temperature in ethanol (100 cm^3) and into the solution aqueous solution of sodium hydroxide (5 %, 10 cm^3) was added. The mixture was left at room temperature for 24 h, then acetic acid (10 cm^3) was added, the solvent evaporated on a vacuum evaporator and the product recrystallized from aqueous ethanol.

Procedure C. Compound *VIII* (2.2 g; 0.01 mol) was refluxed for 2—3 h in the presence of triethylamine (10 cm^3) and acyl chloride (acetyl chloride, benzoyl chloride, and ethyl chloroformate; 0.015 mol) in benzene. Then the mixture was cooled down to room temperature, the formed triethylammonium chloride was removed and washed up with benzene (10 cm^3). The combined benzene fractions were evaporated on a vacuum evaporator and products *VIIa—VIIc* recrystallized from ethanol.

4-Amino-2-(diethylamino)quinazoline (VIII)

Procedure A. Compound *Va—Vc*, *VIa*, *VIc*, and *VIIa—VIIc* (0.01 mol), respectively, was refluxed for 10—15 min in ethanolic solution of sodium hydroxide (5 %, 50 cm^3). After cooling down to room temperature water (30 cm^3) was added and ethanol under vacuum distilled off. After separation the product was recrystallized from ethanol. Yield 1.8—2.1 g (82—96 %), m.p. = 129—130 °C. IR spectrum (KBr pellet), $\tilde{\nu}$/cm^{-1}: 3390, 3320, 3200 ν(NH_2), 1620 ν(C=N), δ(NH_2). ^{1}H NMR spectrum, δ: 6.93—7.65 (m, 4H, H_{arom}), 6.88 (s, 2H, NH_2), 3.82 (q, 4H, CH_2, J = 7.5 Hz), 1.20 (t, 6H, CH_3, J = 7.5 Hz).

Procedure B. Compounds *Ia—Ic* (0.05 mol) in ethanol (100 cm^3) under 3 h reflux entered into reaction with diethylamine (7.3 g; 0.1 mol) in the presence of mercuric oxide

(18 g; 0.08 mol). Then the mixture was concentrated to 2/3 of its original volume, solid fractions were hot filtered off with charcoal and sodium hydroxide (4 g; 0.1 mol) was added into solution. Then the mixture was refluxed for 10 min. After cooling down to room temperature the solution was acidulated with hydrochloric acid (5 %, 50 cm^3), ethanol under vacuum distilled off and the separated product filtered off. Yield after recrystallization from aqueous ethanol was 78—85 %, m.p. = 129—129.5 °C [3].

Acetylation of VIII with acetic anhydride in pyridine

Compound *VIII* (2.2 g; 0.01 mol) was dissolved in pyridine (30 cm^3) and acetic anhydride (2.5 g; 0.015 mol) was added. Then the mixture was heated on a steam bath for 90 min. Finally all the liquids were distilled off and the residue dissolved in acetone (25 cm^3). This solution was chromatographed on a column, the eluent was ether—acetone ($\varphi_r = 3:1$) mixture. After removal of the solvent the product was crystallized from ethanol. Yield of compound *VIa* was 0.4 g (15 %), m.p. = 165—167 °C. IR spectrum (KBr pellet), $\tilde{\nu}/cm^{-1}$: 3180 ν(NH), 1660 ν(C=O), 1635 ν(C=N). ^{1}H NMR spectrum, δ: 12.05 (s, 1H, NH), 7.12—8.26 (m, 4H, H_{arom}), 3.63 (q, 4H, CH_2, $J = 7.5$ Hz), 2.60 (s, 3H, CH_3), 1.16 (t, 6H, CH_3, $J = 7.5$ Hz). Yield of the compound *VIIa* was 1.8 g (70 %).

Results and discussion

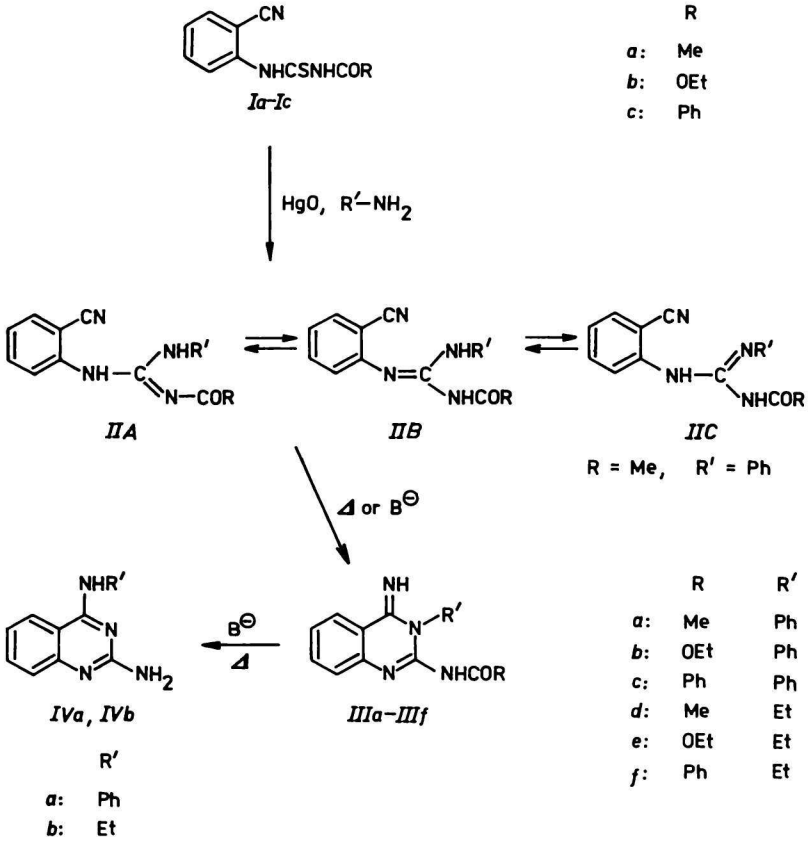
Desulfanation reactions of compounds *Ia—Ic* were carried out in acetonic solution at room temperature. It was found that the reaction proceeds similarly either in benzene, chloroform or ethanolic solution but the low solubility in those solvents appeared as a disadvantage of this procedure. At higher temperature the reactions are accompanied by the cyclization of compounds *Ia—Ic* because of the presence of the amine.

A progress of the reaction of 2-(3-acylthioureido)benzonitrile (*Ia—Ic*) with mercuric oxide was noticeable only after addition of amine. The use of either yellow or red modification of mercuric oxide did not prove any significant influence on the progress or result of the reaction.

As it was proved by TLC in the reaction of compounds *Ia—Ic* with ethylamine and compounds *Ib* and *Ic* with aniline only one product (*IIIb—IIIf*) is formed. In the reaction of compound *Ia* with aniline two products were formed. One of them was compound *II* isolated in the yield of 15 %, the other was compound *IIIa* (yield 59 %; Scheme 1).

In the IR spectrum of compound *II* one can find two bands of vibrations of the cyano group at $\tilde{\nu} = 2230$ and 2220 cm^{-1} and other bands characteristic of a monosubstituted (NHCO) and a disubstituted (NCO) amidic groups as well as vibrations ν(NH) and ν(C=N).

In addition to other signals in the ^{1}H NMR spectrum of product *II* there were found two signals with non whole value of the relative integral intensity in the ratio 4 : 1 (the sum of the relative intensity was equal to 1) and another two signals of hydrogen atoms of methyl group the relative integral intensity of which was also in the ratio 4 : 1 and the whole relative intensity was equal to 3.



Scheme 1

The information so obtained combined with the results of elemental analysis shows that product *II* is *N*-acetyl-*N'*-phenyl-*N''*-(2-cyanophenyl)guanidine that under our conditions of study exists in two tautomeric forms as it is usual at not fully substituted guanidines [4]. The tautomers are 2-acetyl-1-phenyl-3-(2--cyanophenyl)guanidine (*IIA*) and 3-acetyl-1-phenyl-2-(2-cyanophenyl)guanidine (*IIB*). The structure of the form *IIA* is supported by the presence of the band of ν(NCO) at $\tilde{\nu} = 1665\,\mathrm{cm}^{-1}$ and the band of ν(C≡N) at $\tilde{\nu} = 2230\,\mathrm{cm}^{-1}$

characteristic also of other 2-substituted aminobenzonitriles as 2-(3-R-ureido)- or 2-(3-R-thioureido)benzonitriles [1, 5, 6]. The structure of the tautomeric form *IIB* is supported by the presence of amide *I* and amide *II* bands corresponding to acetylamino group and the band of ν(C≡N) at $\tilde{\nu} = 2220\,\mathrm{cm}^{-1}$ This is in comparison with the wavenumber of ν(C≡N) at $2230\,\mathrm{cm}^{-1}$ in the starting compound *Ia* and the tautomer *IIA* shifted to lower values due to conjugation with the group C=N in position 2. The existence of compound *II* in the form of 1-acetyl-2-phenyl-3-(2-cyanophenyl)guanidine (*IIC*) cannot be unambiguously either confirmed or disproved. But the structure of tautomeric forms *IIA* and *IIB* is supported by the existence of a narrow signal of the hydrogen atom in the region of the aromatic multiplet at $\delta = 7.70$ which disappears after addition of deuterium oxide into measured sample and which we consider as the signal NH of phenylamino group (this was observed in both tautomers *IIA* and *IIB*).

We did not succeed to catch the other *N*-acyl-*N'*-phenyl- and *N*-acyl-*N'*-ethyl-*N''*-(2-cyanophenyl)guanidines even by TLC because they probably cyclize to compounds *III* already during the reaction. The same result was obtained at the temperature of 5 °C.

The cyclic products (in their IR spectra a band of vibration of the C≡N group is missing) prepared by the desulfanation reaction of *Ia—Ic* with aniline and ethylamine are 2-acylamino-3-phenyl- and 2-acylamino-3-ethyl-4-imino-3,4-dihydroquinazolines *IIIa—IIIf*, as IR and ^{1}H NMR spectra confirm.

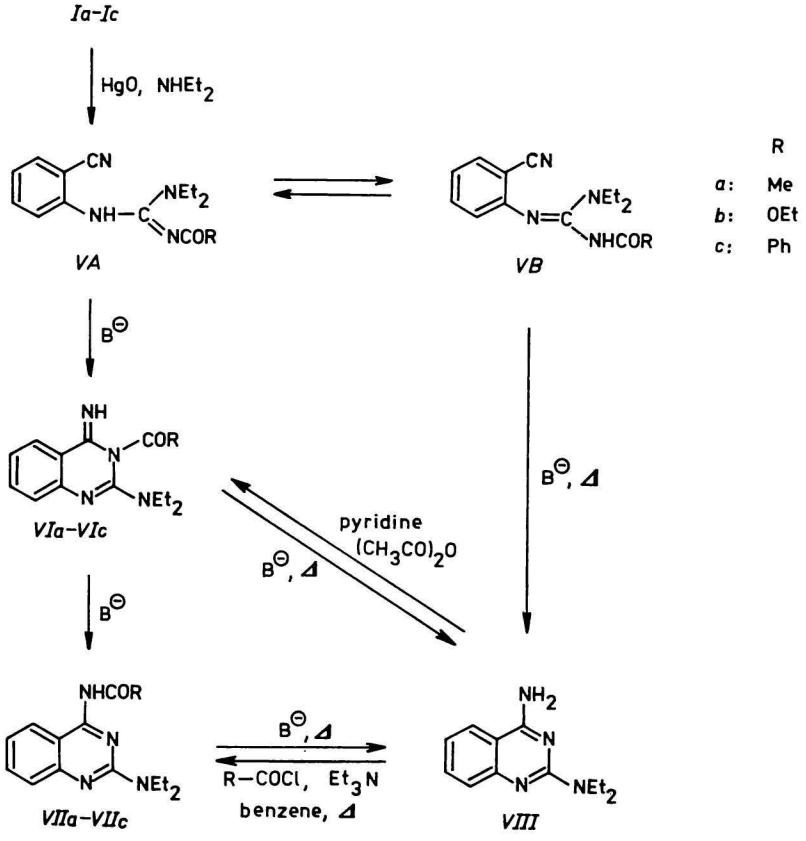
As can be seen from ^{1}H NMR spectra of 4-imino- and 4-oxoquinazoline derivatives, respectively [1, 5—7], the upper limit of the doublet position of the proton, which is situated in position 5 of the quinazoline ring, in the multiplet of aromatic hydrogen atoms is — in comparison with 4-amino- and 4-substituted aminoquinazoline — shifted above the value $\delta = 8.10$ due to an anisotropic effect of the double bond of imino and oxo group, respectively.

Compound *IIIa* is formed by the cyclization of guanidine *II* either after 1 h boiling in ethanolic solution or under a base catalysis of sodium hydroxide in ethanol at room temperature.

Dimroth rearrangement of compounds *IIIa—IIIf* to 2-acylamino-4-(R-amino)quinazolines by the treatment with a base (ammonia, sodium hydroxide or methoxide) at room temperature for several hours was not observed. However, at the higher temperature simultaneously with the splitting off of acyl group the formation of 2-amino-4-(phenylamino)- (*IVa*) and 2-amino-4-(ethylamino)-quinazoline (*IVb*) was observed.

During the desulfanation reaction of compounds *Ia—Ic* in the presence of diethylamine three products were formed. They were *N,N*-diethyl-*N'*-acyl-*N''*-(2-cyanophenyl)guanidines *Va—Vc* (during the reaction of compound *Ib* the only compound *Vb* was formed), 3-benzoyl-2-(diethylamino)-4-imino-3,4-

-dihydroquinazoline (*VIc*) and 4-acetylamino- (*VIIa*) and 4-benzoylamino-2--(diethylamino)quinazoline (*VIIc*), respectively (Scheme 2). The mixtures were separated by column chromatography, their purity was checked by TLC and the structure approved by IR and ^{1}H NMR spectra and elemental analysis.



Scheme 2

The IR and ^{1}H NMR spectra of guanidines *Va*—*Vc* showed that these compounds exist in two tautomeric structures (1,1-diethyl-2-acyl-3-(2-cyanophenyl)guanidines *VA* and 1,1-diethyl-3-acyl-2-(2-cyanophenyl)guanidines *VB*), similarly as compound *II*.

But on the contrary to compound *II* their boiling in ethanol did not lead to any cyclic products. However, the cyclization reaction can be realized at room temperature in ethanol under treatment with aqueous solution of sodium hy-

droxide. The products of the reaction are compounds *VIIa—VIIc* that can also be obtained under the same conditions by Dimroth rearrangement of compounds *VIa*, *VIc*.

If compounds *Va—Vc* as well as compounds *VIa*, *VIc* and *VIIa—VIIc* are treated in ethanolic solution with sodium hydroxide boiling the product obtained after reaction is 4-amino-2-(diethylamino)quinazoline (*VIII*). This after acylation with ethyl chloroformate, acetyl or benzoyl chloride in the presence of triethylamine in benzene boiling gives compounds *VIIa—VIIc* only. Acetylation of compound *VIII* with acetic anhydride in pyridine leads besides compound *VIIa* to *VIa*.

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Translated by M. Potáček