Ring Transformation of 1,2-Disubstituted 4(1*H*)-Quinazolone Oximes to 3,5-Disubstituted 1,2,4-Oxadiazoles

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Received December 12, 1988

Key Words: ANRORC mechanism / 1,2,4-Oxadiazoles / 4(1*H*)-Quinazolone oximes

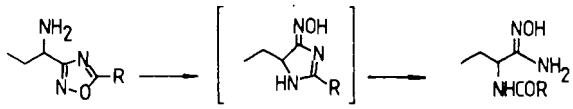
In basic media *O*-Benzoyl- and *O*-acetyl-2-benzylaminobenzamide oxime (**8b,c**) give 5-substituted 3-(2-benzylaminophenyl)-1,2,4-oxadiazoles (**9a,b**), while on heating in pure water 2-amino-1-benzylbenzimidazole (**10**) is formed. Reaction of 2-(*N*-acylbenzylamino)benzonitrile (**12**) with hydroxylamine, or treatment of *O*-acyl-2-(*N*-benzoylbenzylamino)benzamide oximes (**8f,g**) with acid give the novel 1,2-disubstituted 4(1*H*)-quinazolone oximes **13**, which isomerize on heating with alkali by an ANRORC mechanism to the 1,2,4-oxadiazoles **9a,b**.

Ringumwandlung von 1,2-disubstituierten 4(1*H*)-Chinazolonoximen zu 3,5-disubstituierten 1,2,4-Oxadiazolen

O-Benzoyl- und *O*-Acetyl-2-benzylaminobenzamidoxim (**8b,c**) ergeben in basischem Medium 5-substituierte 3-(2-benzylaminophenyl)-1,2,4-oxadiazole (**9a,b**), während Erhitzen in reinem Wasser zu 2-Amino-1-benzylbenzimidazol (**10**) führt. Reaktion von 2-(*N*-Acylbenzylamino)benzonitril (**12**) mit Hydroxylamin, oder Behandlung von *O*-Acyl-2-(*N*-benzoylbenzylamino)benzamidoxim (**8f,g**) mit Säure ergibt die neuen 1,2-disubstituierten 4(1*H*)-Chinazolonoxime **13**, die beim Erwärmen in Gegenwart von Alkali nach einem ANRORC-Mechanismus zu den 1,2,4-Oxadiazolen **9a,b** isomerisieren.

Recently, we reported the transformation of 3-(1-aminopropyl)-1,2,4-oxadiazoles (**1**) to α-acylaminopropionamide oximes (**3**). As an intermediate the cyclic amide oxime **2** was postulated (Scheme 1)[1].

Scheme 1



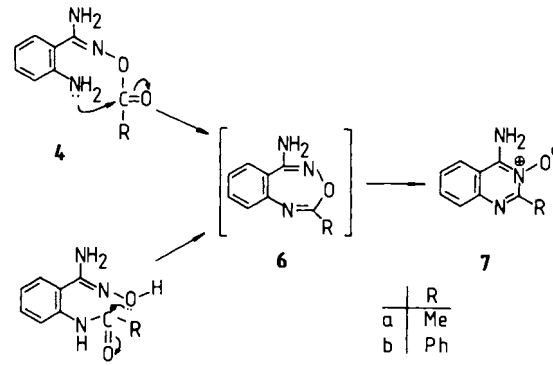
1 **2** **3**

In this paper we report a ring transformation of similar character but of opposite direction, i.e. the conversion of **2** to **1** involving the formation of an aminooxadiazole **9** from a cyclic amide oxime **13**.

It was also recently reported by us that the monoacyl derivatives **4** and **5** of 2-aminobenzamide oxime are transformed, depending on pH, to various heterocycles, among others in acidic media to quinazoline-3-oxides[2]. We assumed that the latter are formed by an electrocyclic reaction from the benzoxdiazepin intermediate **6** which – in turn – are produced from **4** or **5** by loss of water. Regarding the whole process, an important role can be attributed to the possibility that the N(1)=C(2) bond can be formed from the aromatic amino group (Scheme 2).

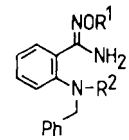
Neither reaction **4** → **7** nor pathways involving **6** as an intermediate are in accord with concepts put forward in the literature concerning the formation of **7** and the related quinazoline-3-oxides[3].

Scheme 2



4 **5** **6** **7**

	R
a	Me
b	Ph



8

	R^1	R^2
a	H	H
b	COPh	H
c	COMe	H
d	H	COPh
e	H	COMe
f	COMe	COPh
g	COPh	COPh

In order to clarify this situation we intended to prepare 2-benzylaminobenzamide oxime (**8a**) and its *O*- and *N*-acyl derivatives **8b–e** and study their ring closure. In these compounds the formation of the C(1)=N(2) bond from the aromatic amino group is precluded and therefore, according

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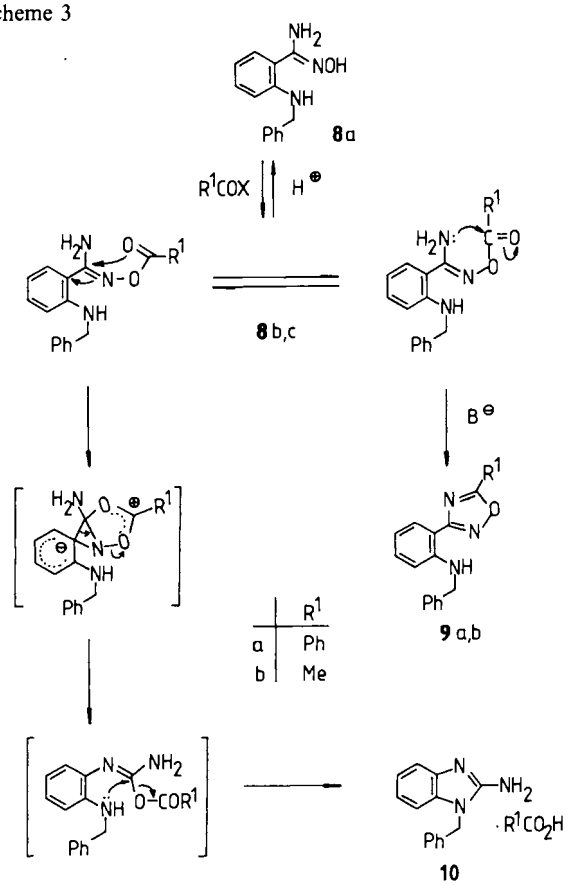
to our hypothesis, formation of an *N*-oxide could not be expected.

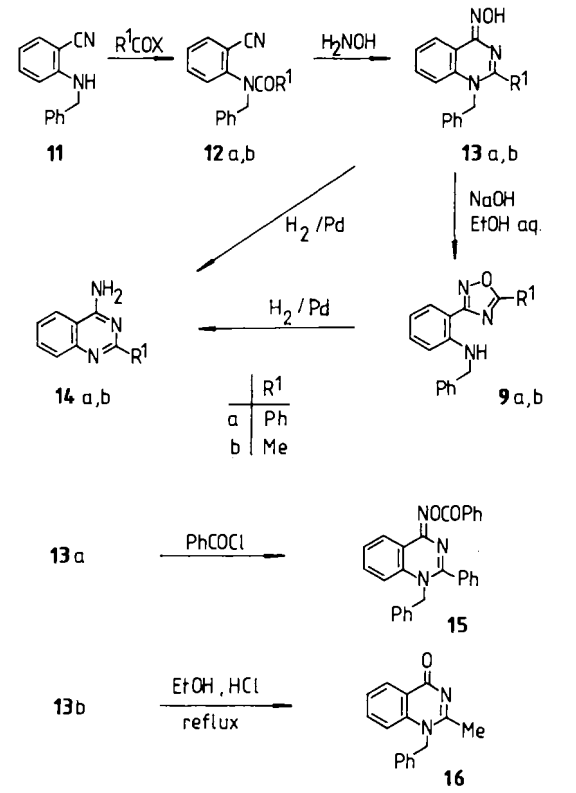
In fact, in contrast to the *O*-acyl compounds of type **4**, on heating the *O*-acyl derivatives **8b,c** with ethanolic hydrogen chloride no quinazoline ring was formed, merely hydrolysis to the parent compound **8a** was observed. In basic media, such as pyridine or ethanolic sodium hydroxide, as main products the 1,2,4-oxadiazoles **9a,b** were obtained, whereas by heating in pure water 2-amino-1-benzylbenzimidazole (**10**) was isolated. This latter reaction is an extension of the recently discovered synthesis of 2-aminobenzimidazole from *O*-benzoyl-2-aminobenzamide oxime (**4**, R = Ph)[2] to 1-substituted analogues. Attention has to be called upon the reaction **8c** → **10**. In compounds **4**, containing a primary aromatic amino group, the electron attraction by the acetyl group and its stability were insufficient (in contrast to the *O*-benzoyl derivative) to permit ring closure combined with Beckmann rearrangement under the given conditions[2]. In the case of **8c**, in turn, enhanced nucleophilicity of the benzylamino group as compared with the primary amino group enables the initiation of the complex transformation (Scheme 3).

Scheme 3



We attempted to prepare the 2-(*N*-acylbenzylamino)benzamide oximes **8d,e** (isomers of **8b,c**) in analogy to the synthesis of **5a,b**[2] by acylation of 2-benzylaminobenzonitrile (**11**)[4] to the amides **12a,b** and subsequent treatment with hydroxylamine. However, in this way the main products were the quinoid 1,2-disubstituted 4(1*H*)-quinazolone oximes **13a,b** accompanied by some 1,2,4-oxadiazole **9a,b** (Scheme 4).

Scheme 4



IR and NMR spectra of compounds **13** are very similar the those of the first representative of this new type of compounds (unsubstituted at C-2)[5]. A very characteristic feature is the strong double band in the IR spectrum at around 950 cm^{-1} assigned to the N–O bond of the quinoid cyclic amide

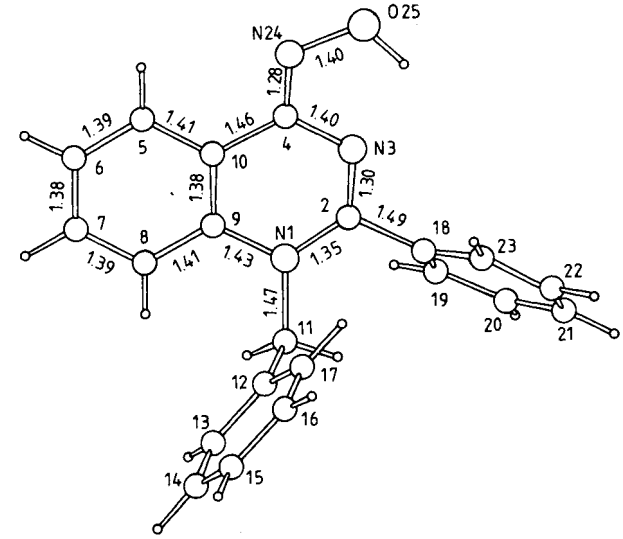


Figure 1. The X-ray molecular diagram of **13a** with crystallographic atomic numbering and selected bond lengths. E.s.d.'s are in the range of 0.01 – 0.02 Å

oxime moiety. The structures of the new compounds were also supported by an X-ray analysis performed on **13a** (Figure 1)[6].

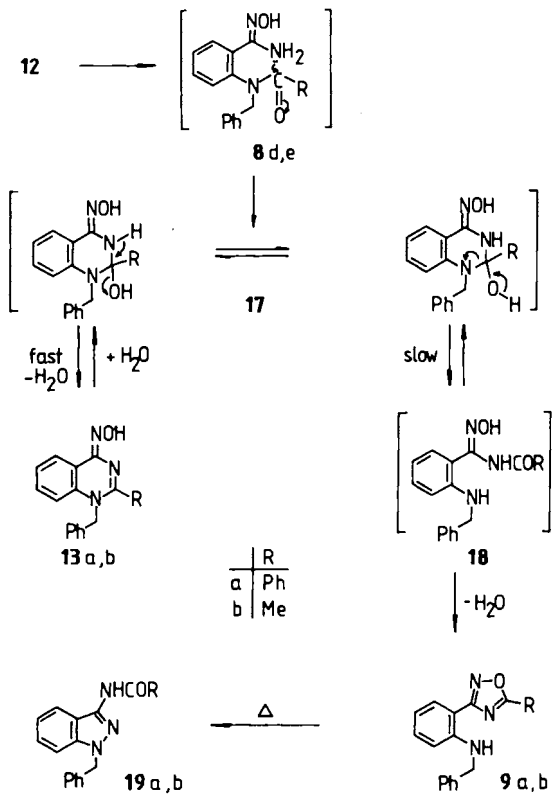
Some chemical transformations of **13a, b** have also been studied. Catalytic hydrogenation resulted in N–O bond fission and debenzylation to give 2-substituted 4-aminoquinazolines **14a, b**[7,8]. Note that reduction of the oxadiazoles **9a, b** also gave **14a, b**. In view of our earlier studies[7a] debenzylation is probably preceded by hydrogenolytic N–O bond cleavage and formation of the quinazoline ring by dehydration.

Benzoylation of **13a** gave the *O*-benzoyl derivative **15**. On boiling with ethanolic hydrogen chloride, **13b** suffers hydrolysis of the oxime function and yields the 4-quinazolone **16**, while **13a** resists hydrolysis. A similar difference in the susceptibility to hydrolysis between phenyl and methyl compounds was observed with the analogous 4-iminoquinazolines, too[7a].

Surprisingly, on heating in aqueous ethanolic alkali the quinazolone oximes **13a, b** are transformed in good yield to the oxadiazoles **9a, b**. In case of **13a** this isomerization can also be performed by prolonged boiling in acidic medium.

For the above novel ring transformation and for the formation of compounds **13** we propose the following mechanism (Scheme 5).

Scheme 5



In the first step the nitrile **12** is converted to the amide oxime **8**, which is transformed to the quinoid oxime **13** via the cyclic form **17** by fast dehydration. Under hydrolytic conditions and heating this latter process is reversed; involving an ANRORC mechanism[9] it is converted slowly to the more stable oxadiazole **9** via **17** and the *N*-acyl compound **18**.

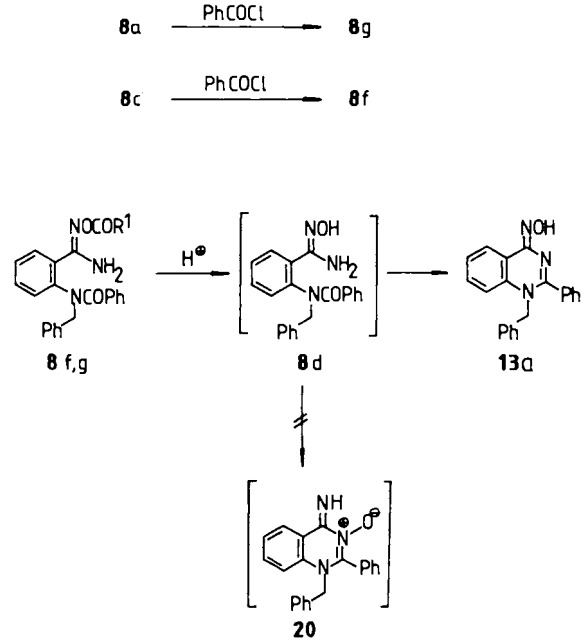
The latter thermodynamically controlled process explains the formation of a small amount of the oxadiazoles **9a, b** besides quinazolone oximes **13** in the reaction of **12** with hydroxylamine (**12** → **8** → **17** → **18** → **9**).

Stability of 1,2,4-oxadiazoles **9** is but relative since, as we have shown earlier[10], they are transformed at higher temperature, e.g. by boiling in dimethyl formamide, to 3-acylaminoindazoles **19a, b**, a third heterocycle, isomeric with both **9** and **13**.

In the course of the above reactions the formation of the hypothetical quinoid compound **20** was not observed. **20** can be derived from the quinazoline 3-oxide **7** and corresponds to the quinazolone oxime **13** (Scheme 6).

Since from both mono- and diacylated 2-aminobenzamide oximes *N*-oxides are most readily formed in acidic media[2,3a], we prepared the *N,O*-diacyl derivatives of **8a**, i.e. **8f, g**, and treated them with hydrochloric acid (Scheme 6). From both amides, obviously via the free oxime **8d**, the oxime **13a** was obtained as the main product, accompanied by some **9a** and **9b**. The fact that not even traces of the *N*-oxide **20** could be detected is in accord with our mechanistic proposal concerning the formation of quinazoline 3-oxides of type **7**[2].

Scheme 6



The above investigations are part of our studies on the chemistry of aminoamide oximes[1,2,5,7,10,11].

Thanks are due to Mrs. *E. Héja* for technical assistance, to *Dr. V. Kovács, Dr. K. Horváth*, and *Dr. T. Erős* for recording the IR and mass spectra and to *Dr. I. Remport* for elemental analyses.

Experimental

IR spectra: Unicam SP-1000 and Spectromom 2000. – ^{1}H- and ^{13}C-NMR spectra: Jeol FX-100 (100 and 25 MHz). Data for aro-

matic protons and NH (if obscured by aromatic protons) were not included. – Mass spectra: Jeol D-300.

O-Benzoyl-2-benzylaminobenzamide Oxime (**8b**): To a solution of **8a**[10] (4.82 g, 20 mmol) and triethylamine (2.02 g, 20 mmol) in chloroform (100 ml) benzoyl chloride (2.80 g, 20 mmol) was added dropwise at 5–10°C. Stirring was continued at room temp. for 2 h, the product filtered off, and washed thoroughly with water: colorless crystals, 4.60 g (67%), m.p. 155°C (from ethanol). – IR (KBr): $\tilde{\nu}$ = 3495 cm^{-1}, 3395, 1740. – ^{1}H-NMR ($CDCl_3$): δ = 4.50 (s, 2H, CH_2), 5.10 (br, 1H, NH).

$C_{21}H_{19}N_3O_2$ (345.4) Calcd. C 73.02 H 5.54 N 12.17
Found C 72.86 H 5.61 N 12.15

O-Acetyl-2-benzylaminobenzamide Oxime (**8c**): To a solution of **8a**[10] (2.41 g, 10 mmol) in diethylether (20 ml) acetic anhydride (1.02 g, 10 mmol) was added dropwise at 5°C. After 1 h the product was filtered off, and washed with ether; 2.64 g (93%), m.p. 132–134°C (from ethanol). – IR (KBr): $\tilde{\nu}$ = 3410 cm^{-1}, 3300, 1740. – ^{1}H-NMR ($CDCl_3$): δ = 2.14 (s, 3H, CH_3), 4.41 (d, J = 3 Hz, 2H, CH_2), 5.06 (br. s, 2H, NH_2).

$C_{16}H_{17}N_3O_2$ (283.3) Calcd. C 67.83 H 6.05 N 14.83
Found C 67.60 H 5.90 N 14.80

O-Acetyl-2-(N-benzoylbenzylamino)benzamide Oxime (**8f**): To a solution of **8c** (2.83 g, 10 mmol) and triethylamine (1.01 g, 10 mmol) in acetone (50 ml) benzoyl chloride (1.40 g, 10 mmol) was added at 5°C. After stirring for 2 h and standing for ca. 12 h the mixture was filtered, the filtrate evaporated, and the residue purified by chromatography on silica gel [eluant benzene/acetone (4:1)] to give **8f** as an oil, 2.70 g (70%). – IR (nujol): $\tilde{\nu}$ = 3375 cm^{-1}, 3280, 1715, 1620. – ^{1}H-NMR ($CDCl_3$): δ = 2.13 (s, 3H, CH_3), 4.50 (d, ^2J = 15 Hz, 1H, CH_2), 4.99 (br. s, 2H, NH_2), 5.64 (d, ^2J = 15 Hz, 1H, CH_2).

$C_{23}H_{21}N_3O_3$ (387.4) Calcd. C 71.30 H 5.46 N 10.85
Found C 71.14 H 5.30 N 10.84

O-Benzoyl-2-(N-benzoylbenzylamino)benzamide Oxime (**8g**): To a solution of **8a**[10] (2.41 g, 10 mmol) and triethylamine (2.02 g, 20 mmol) in acetone (50 ml) benzoyl chloride (2.80 g, 20 mmol) was added dropwise. After standing for 2 d the mixture was filtered, the filtrate evaporated, and the residue crystallized from ethanol; 2.3 g (51%), m.p. 156–157°C. – IR (KBr): $\tilde{\nu}$ = 3380 cm^{-1}, 3290, 1720, 1620. – ^{1}H-NMR ([D$_6$]DMSO): δ = 4.43 (d, ^2J = 15 Hz, 1H, CH_2), 5.62 (d, ^2J = 15 Hz, 1H, CH_2), 6.6 (br. d, 2H, NH_2).

$C_{28}H_{23}N_3O_3$ (449.5) Calcd. C 74.82 H 5.16 N 9.34
Found C 75.02 H 5.10 N 9.12

3-(2-Benzylaminophenyl)-5-phenyl-1,2,4-oxadiazole (**9a**): A solution of **13a** (0.33 g, 1 mmol) and sodium hydroxide (0.40 g, 10 mmol) in 50% aqueous ethanol (60 ml) was heated at reflux for 9 h. After standing for ca. 12 h the product was filtered off and washed thoroughly with water; 0.26 g (79%), m.p. 110°C (from ethanol) (ref.[10] 110°C). Spectroscopic data of the product were identical with those of an authentic sample[10].

b) Boiling of **8b** (0.35 g, 1 mmol) in a solution of sodium hydroxide (0.40 g, 10 mmol) in 50% aqueous ethanol (60 ml) for 2 h gave **9a**, 0.28 g (85%).

3-(2-Benzylaminophenyl)-5-methyl-1,2,4-oxadiazole (**9b**): a) **13b** (0.53 g, 2 mmol) was heated at reflux in a solution of sodium hydroxide (0.80 g, 20 mmol) in a mixture of ethanol (15 ml) and water (40 ml) for 8 h. The product separated on cooling and was recrystallized from benzene; 0.31 g (60%), m.p. 83°C (ref.[10] 83°C). IR and ^{1}H-NMR data of the product were identical with those of an authentic sample[10].

b) **8c** (0.56 g, 2 mmol) was boiled in pyridine (6 ml) for 2 h. Evaporation and crystallization of the residue from methanol gave 0.33 g (62%) of **9b**. Workup of the mother liquor yielded **10**, 80 mg (17%), m.p. 195–196°C.

2-Amino-1-benzylbenzimidazole (**10**): a) **8c** (1.41 g, 5 mmol) was heated at reflux in water (170 ml) for 1 h. The solution was evaporated, the residue (acetate of **10**) was triturated with methanol, and the mixture made alkaline with 5% sodium methoxide. After 1 h the product was precipitated with water (70 ml), filtered off, and washed with water and some diethylether; 0.84 g (84%), m.p. 196–198°C (from ethanol) (ref.[12] 194–195°C).

b) A solution of **8b** (0.69 g, 2 mmol) in water (140 ml) was kept at 150°C for 75 min in a closed vessel. Workup as described above gave **10** as free base in 70% yield. – IR (KBr): $\tilde{\nu}$ = 3460 cm^{-1}, 3320, 1660. – ^{1}H-NMR ([D$_6$]DMSO): δ = 5.27 (s, 2H, CH_2), 6.60 (br. s, 2H, NH_2). – ^{13}C-NMR ([D$_6$]DMSO): δ = 44.91 (CH_2), 107.94 (C-7), 114.88 (C-4), 118.18 (C-5), 120.52 (C-6), 127.02 (C-2′, -6′), 127.27 (C-4′), 128.51 (C-3′,-5′), 134.27 (C-7a), 137.19 (C-3a), 142.96 (C-1′), 155.10 (C-2).

$C_{14}H_{13}N_3$ (223.3) Calcd. C 75.31 H 5.87 N 18.82
Found C 75.59 H 5.83 N 18.68

N-Benzoyl-2-benzylaminobenzonitrile (**12a**): **11**[12] (10.41 g, 50 mmol) and benzoyl chloride (7.00 g, 50 mmol) were heated in pyridine (50 ml) on a water bath for 3 h. Evaporation of most of the solvent and treatment of the residue with water gave the product. This was filtered off and washed with water; 13.42 g (86%), m.p. 174–175°C (from ethanol). – IR (KBr): $\tilde{\nu}$ = 2280 cm^{-1}, 1640. – ^{1}H-NMR ($CDCl_3$): δ = 5.20 (br., 2H, CH_2).

$C_{21}H_{16}N_2O$ (312.4) Calcd. C 80.75 H 5.16 N 8.97
Found C 81.00 H 5.05 N 8.83

N-Acetyl-2-benzylaminobenzonitrile (**12b**): **11**[12] (10.41 g, 50 mmol) was heated at reflux in acetic anhydride (50.10 g, 500 mmol) for 4 h. The mixture was poured onto ice/water, the crystals were filtered off after ca. 12 h, dried, and recrystallized from diisopropyl ether; 10.5 g (84%), m.p. 63–65°C. – IR (KBr): $\tilde{\nu}$ = 2320 cm^{-1}, 1655. – ^{1}H-NMR ($CDCl_3$): δ = 1.90 (s, 3H, CH_3), 4.55 and 5.38 (d each, ^2J = 15 Hz, 1H each, CH_2).

$C_{16}H_{14}N_2O$ (250.3) Calcd. C 76.78 H 5.64 N 11.19
Found C 76.54 H 5.63 N 11.10

1-Benzyl-2-phenyl-4(1H)-quinazolone Oxime (**13a**): a) A mixture of **12a** (1.24 g, 4 mmol), hydroxylamine as base (0.33 g, 10 mmol) and methanol (35 ml) was heated in a closed vessel for 4 h at 95°C. The solution was evaporated, the residue triturated with water, filtered off, and recrystallized from ethanol; yellow crystals, 0.90 g (69%), m.p. 187–189°C. From the ethanolic mother liquor 0.13 g (10%) of pure **9a** could be isolated, which was identified by IR and ^{1}H-NMR spectroscopy and comparison with an authentic sample[10].

b) **8g** (1.12 g, 2.5 mmol) was heated at reflux for 2 h in a mixture of concd. hydrochloric acid (1 ml) and ethanol (6 ml). After evaporation the residue was taken up in water and the solution neutralized with 10% sodium carbonate solution. Crystallization of the precipitate from ethanol gave **13a**, 0.73 g (89%), m.p. 187–188°C. Its IR spectrum was identical with that of a sample obtained by method a). Heating of **8f** with hydrochloric acid gave the same result. – IR (KBr): $\tilde{\nu}$ = 3410 cm^{-1}, 3320, 1660, 1615, 1432, 955, 940. – ^{1}H-NMR ([D$_6$]DMSO): δ = 5.10 (s, 2H, CH_2), 9.72 (s, 1H, =NOH). – ^{13}C-NMR ([D$_6$]DMSO): δ = 50.96 (CH_2), 116.63 (C-8), 118.30 (C-4a), 122.86 (C-5), 128.68 (C-4′, benzyl), 128.04 (C-2′,6′, phenyl), 128.68 (C-3′,5′, phenyl), 128.97 (C-3′,5′, benzyl), 130.06 (C-7 or C-4′, phenyl), 130.47 (C-7, or C-4′, phenyl), 135.61 (C-8a or C-

1′, benzyl), 136.49 (C-8a or C-1′, benzyl), 137.37 (C-1′ phenyl), 146.32 (C-4), 157.64 (C-2).

$C_{21}H_{17}N_3O$ (327.4) Calcd. C 77.04 H 5.23 N 12.83
Found C 76.95 H 5.04 N 12.78

Hydrochloride: Prepared with ethanolic hydrogen chloride, m.p. 207°C.

$C_{21}H_{18}ClN_3O$ (363.9) Calcd. C 69.32 H 4.99 Cl 9.74 N 11.55
Found C 69.58 H 4.88 Cl 9.99 N 11.21

Crystal Data for **13a**: $C_{21}H_{17}N_3O$, M = 327.0. Monoclinic, a = 9.152(2), b = 10.884(3), c = 16.956(3) Å, β = 95.76(5)°, V = 1697.7 Å, D_c = 1.279 g·cm^{-3}, Z = 4, space group $P2_1/c$. Data were collected on a STOE-GÜTTINGER two-circle Weissenberg diffractometer with Ni-filtered Cu-K_α (λ = 1.5418 Å) radiation for $h,0,l-h,11,l$ layers. 3010 out of 3229 reflections were considered observed [$I > 2.5\sigma(I)$]. The structure was solved by routine application of direct methods[13]. All nonhydrogen atoms were found from the E-map with the best Figure of Merit (R = 0.29). Block-diagonal anisotropic least-squares refinement was terminated at R = 0.103 for the 3010 observed reflections and R = 0.106 for all reflections. Hydrogen atom positions were calculated but not refined in the final cycles of refinement. Atomic coordinates for the nonhydrogen atoms with e.s.d.'s in parentheses are given in Table 1.

Table 1. Atomic coordinates with e.s.d.'s in parentheses for **13a**

	x	y	z
N1	0.0490(3)	0.2335(3)	0.1757(2)
C2	-0.0237(4)	0.1305(3)	0.1509(2)
N3	0.0276(3)	0.0193(3)	0.1602(2)
C4	0.1698(4)	0.0020(4)	0.1964(2)
C5	0.3894(5)	0.0945(5)	0.2759(3)
C6	0.4618(5)	0.1982(6)	0.3074(3)
C7	0.3966(5)	0.3117(5)	0.2985(3)
C8	0.2600(4)	0.3256(5)	0.2556(3)
C9	0.1876(4)	0.2216(4)	0.2215(2)
C10	0.2504(4)	0.1069(4)	0.2319(2)
C11	0.0067(4)	0.3560(3)	0.1445(2)
C12	0.1072(4)	0.3990(3)	0.0855(2)
C13	0.1634(5)	0.5155(4)	0.0893(3)
C14	0.2537(5)	0.5572(4)	0.0325(3)
C15	0.2863(5)	0.4794(5)	-0.0278(3)
C16	0.2279(5)	0.3633(5)	-0.0334(3)
C17	0.1383(5)	0.3216(4)	0.0232(3)
C18	-0.1747(4)	0.1417(3)	0.1093(2)
C19	-0.2875(4)	0.1959(4)	0.1455(3)
C20	-0.4278(4)	0.2032(4)	0.1048(3)
C21	-0.4542(4)	0.1577(4)	0.0285(3)
C22	-0.3424(5)	0.1032(4)	-0.0068(3)
C23	-0.2020(4)	0.0932(4)	0.0333(2)
N24	0.2278(5)	-0.1056(4)	0.1995(2)
O25	0.1340(5)	-0.1954(3)	0.1643(2)

1-Benzyl-2-methyl-4(1H)-quinazolone Oxime (**13b**) was prepared from **12b** as described for **13a** in 86% yield, yellow crystals, m.p. 183–185°C. From the mother liquor **9b**, identical with an authentic sample[10] was recovered in 2.5% yield.

13b: IR (KBr): = 3300 cm^{-1}, 3060, 950, 938. – ^{1}H-NMR tic sample[10] was recovered in 2.5% yield.

13b: IR (KBr): $\tilde{\nu}$ = 3300 cm^{-1}, 3060, 950, 938. – ^{1}H-NMR ($CDCl_3$): δ = 2.35 (s, 3H, CH_3), 5.12 (s, 2H, CH_2), 9.28 (s, 1H, =NOH).

$C_{16}H_{15}N_3O$ (265.3) Calcd. C 72.43 H 5.70 N 15.84
Found C 72.53 H 5.62 N 15.86

4-Amino-2-phenylquinazoline (**14a**): a) **13a** (0.40 g, 1.2 mmol) was hydrogenated over 8% palladium on charcoal (0.10 g) as catalyst in dioxane (40 ml) containing concd. hydrochloric acid (1 ml) until hydrogen absorption stopped. After filtration, evaporation of the solvent, and trituration of the residue with 5% aqueous sodium carbonate solution (15 ml) the product was filtered off and washed with water; 0.21 g (78%), m.p. 147°C (from benzene). It was identified with a sample of m.p. 147°C, prepared according to the literature[7], by IR and ^{1}H-NMR spectroscopy.

b) Hydrogenation of **9a** as described under a) gave the same product in 90% yield.

4-Amino-2-methylquinazoline (**14b**): a) **13b** was treated as described for **14a** to give **14b** in 82% yield; m.p. 228°C (from ethyl acetate) (ref.[8] 228–229°C). Its IR spectrum was identical with that of an authentic sample.

b) In a similar way **9b** was converted into **14b** in 88% yield.

O-Benzoyl-1-benzyl-2-phenyl-4(1H)-quinazolone Oxime (**15**): To a solution of **13a** (0.327 g, 1 mmol) and triethylamine (0.100 g, 1 mmol) in acetone (15 ml) benzoyl chloride (0.140 g, 1 mmol) was added dropwise at 5°C. After standing for ca. 12 h the solid was filtered off, the filtrat evaporated, and the residue crystallized from ethanol; 0.270 g (63%), m.p. 210°C. – IR (KBr): $\tilde{\nu}$ = 1750 cm^{-1}, 1620, 1275.

$C_{28}H_{21}N_3O_2$ (431.5) Calcd. C 77.94 H 4.90 N 9.74
Found C 77.73 H 4.82 N 9.50

1-Benzyl-2-methyl-4(1H)-quinazolone (**16**): **13b** (0.132 g, 0.5 mmol) was heated at reflux for 12 h in a mixture of methanol (15 ml) and concd. hydrochloric acid (1.3 ml). The solution was evaporated and the residue taken up in methanol. Neutralization with 5% aqueous sodium hydrogen carbonate solution precipitated the product; 0.080 g (64%), m.p. 186°C (from methanol). – IR (KBr): $\tilde{\nu}$ = 3460 cm^{-1}, 1650. – ^{1}H-NMR ($CDCl_3$): δ = 2.61 (s, 3H, CH_3), 5.42 (s, 2H, CH_2). – ^{13}C-NMR ($CDCl_3$): δ = 23.81 (CH_3), 50.87 (CH_2), 115.25 (C-8), 120.31 (C-4a), 125.40 (C-2′,-6′), 125.69 (C-6), 128.27 (C-5 or C-4′), 129.47 (C-3′,-5′), 133.74 (C-7), 134.20 (C-1′), 141.14 (C-8a), 161.82 (C-2), 168.75 (C-4).

$C_{16}H_{14}N_2O$ (250.3) Calcd. C 76.28 H 5.64 N 11.19
Found C 76.50 H 5.63 N 11.00

CAS Registry Numbers

8a: 82216-22-6 / **8b**: 119392-78-8 / **8c**: 119392-79-9 / **8f**: 119392-80-2 / **8g**: 119392-81-3 / **9a**: 82216-65-7 / **9b**: 82216-70-4 / **10**: 43182-10-1 / **10** · $MeCO_2H$: 119392-84-6 / **11**: 5589-62-8 / **12a**: 119392-85-7 / **12b**: 119392-86-8 / **13a**: 119392-82-4 / **13a** · HCl: 119392-87-9 / **13b**: 119392-83-5 / **14a**: 1022-44-2 / **14b**: 3440-46-8 / **15**: 119392-88-0 / **16**: 119392-89-1

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