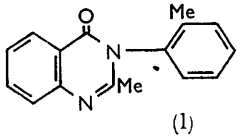
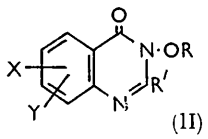
1167. *Amino-oxy-derivatives. Part VI.*[1] *Some Quinazol-4-ones*

By P. Mamalis, M. J. Rix, and A. A. Sarsfield

Two methods for the synthesis of some ethers of substituted 3-hydroxyquinazol-4-ones are described, (*a*) treatment of anthranils with amino-oxy-derivatives, and (*b*) treatment of isatoic anhydride with amino-oxy-derivatives, followed by cyclisation of the intermediate *o*-aminobenzohydroxamates. None of the new compounds showed appreciable antimicrobial activity.

The antimalarial activity of the 3-substituted quinazol-4-one, " febrifugine," has prompted the preparation of many quinazol-4-one derivatives by other workers. Although no therapeutically useful antimalarial has resulted from these investigations, compounds with useful pharmacological activity have been prepared, *e.g.*, 3-*o*-tolyl-2-methylquinazol-4-one (I) is a hypnotic,[2] whilst the corresponding 6-aminoquinazolone is a muscle relaxant and antispasmodic.[3]


(I)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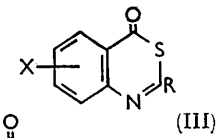
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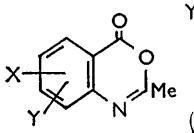
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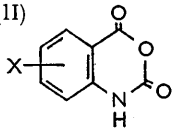

(V)

Whilst a large number of 3-alkyl- and 3-aryl-quinazol-4-ones are known, relatively few derivatives of 3-hydroxy-quinazol-4-one have been prepared. Legrand and Lozac'h[4] prepared the 3-hydroxyquinazol-4-ones (II; R = X = H) by the action of hydroxylamine on the 1,3-benzothiazin-4-ones (III). Similar treatment of the anthranils (IV) gave analogous products, whilst treatment with *O*-benzylhydroxylamine gave the corresponding 3-benzyloxyquinazol-4-ones (II; R = CH_2Ph).[5,6] 3-Hydroxyquinazol-4-ones have also been prepared by treatment of *N*-acylanthranilic esters with hydroxylamine under alkaline conditions.[7a] A number of these derivatives showed slight activity against *M. tuberculosis* $H_{37}Rv$.[5] An extension of the foregoing work is reported in this Communication.

A number of 3-hydroxyquinazol-4-one ethers (II) were prepared in moderate yield by conversion of the substituted anthranilic acids into the anthranils (IV) following the method of Bogert and Seil,[7b] and treatment of these with amino-oxy-derivatives. Reduction of the nitroquinazol-4-one ethers (II; X and/or Y = NO_2) with stannous chloride and hydrochloric acid gave the corresponding amino-derivatives with no cleavage of the N–O or O–C linkages: for example 6,8-diamino-3-benzyloxy-2-methylquinazol-4-one (II; X = Y = NH_2, R = CH_2Ph, R′ = Me) was obtained by reduction of 3-benzyloxy-2-methyl-6,8-dinitroquinazol-4-one. Catalytic hydrogenation of 3-benzyloxy-2-methylquinazol-4-one using palladised charcoal catalyst, however, cleaved the C–O bond with formation of toluene and 3-hydroxy-2-methylquinazol-4-one (II; X = Y = R = H, R′ = Me).

Catalytic reduction of 6-nitro-3-benzyloxy-2-methylquinazol-4-one (II; X = 6-NO_2, Y = H, R = CH_2Ph, R′ = Me) gave 6-amino-3-hydroxy-2-methylquinazol-4-one.

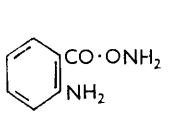
[1] Part V, P. Mamalis, J. Green, D. J. Outred, and M. J. Rix, *J.*, 1965, 1829.
[2] M. L. Gujral, P. N. Saxena, and R. S. Tiwari, *Indian J. Med. Res.*, 1955, **43**, 637; K. Gebler, *Pharmazie*, 1962, **17**, 616.
[3] B.P. 916,139.
[4] L. Legrand and N. Lozac'h, *Bull. Soc. chim. France*, 1961, 618.
[5] H. Taniyama, B. Yasui, H. Uchida, and Y. Okunda, *J. Pharm. Soc. Japan*, 1961, **81**, 431.
[6] R. Anschutz, O. Schmidt, and A. Grieffenberg, *Ber.*, 1902, **35**, 3483.
[7] (*a*) D. Harrison and A. C. B. Smith, *J.*, 1960, 2157; (*b*) M. T. Bogert and H. A. Seil, *J. Amer. Chem. Soc.*, 1905, **27**, 1305.

Attempts to reduce other nitroquinazolones gave tarry products. The 3-hydroxyquinazolone (II; X = 6-NO_2, Y = R = H, R′ = Me) was obtained from the arylmethoxy-precursor by treatment with hydrogen bromide in acetic acid in a sealed vessel.

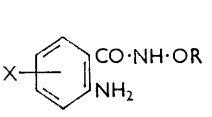
Attempts to react the hydrochloride of (II; X = 6-NH_2, Y = H, R = $C_{10}H_{21}$, R′ = Me) with dicyandiamide in ethanol were unsuccessful.

O-Benzylation of 3-hydroxyquinazol-4-ones proceeded normally under alkaline conditions, as expected for cyclic hydroxamic acids. No reaction took place in the absence of base.

The reaction of isatoic anhydrides (V) with primary amines to give quinazolones has been reported by Wagner *et al.*[8,9] Peterson and his co-workers [10] showed that isatoic anhydrides and hydrazine gave substituted *o*-aminobenzhydrazides which could be cyclised to 3-amino-substituted quinazol-4-ones on treatment with formic acid or formamide. Contrary to the findings of von Meyer and Bellmann,[11a] Scott and Wood [11b] have shown that isatoic anhydride and hydroxylamine reacted to give *O*-(*o*-aminobenzoyl)hydroxylamine (VIa) rather than the hydroxamic acid isomer (VIb; X = R = H).



(VIa)



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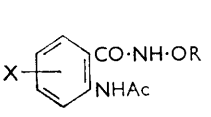

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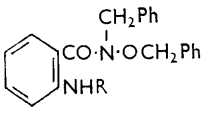


(VIII)

We now find that isatoic anhydrides and *O*-substituted hydroxylamines give good yields of the benzohydroxamates (VIb) when heated together in aqueous ethanolic solution. The benzohydroxamates were soluble in dilute aqueous alkali to a greater or lesser degree, and in the case of (VIb; X = 5-NO_2, R = *p*-$O_2NC_6H_4CH_2$) a sparingly soluble sodium salt was isolated. Heating the benzohydroxamate or the sodium salt with formic acid under reflux readily gave the quinazolones (II; R′ = H). Cyclisations with acetic anhydride were not so straightforward, the nature of the products depending on the reaction conditions. When the benzohydroxamate (VIb; X = H, R = CH_2Ph) was heated under reflux in acetic anhydride for 10—15 sec. and *N*-acetylbenzohydroxamate (VII; X = H, R = CH_2Ph) was obtained; this could be converted into the corresponding quinazolone (II; X = Y = H, R = CH_2Ph, R′ = Me) by heating it above its melting point. The benzohydroxamates (VIb; X = H, R = $C_{10}H_{21}$, 1-$C_{10}H_7CH_2$) yielded the expected quinazolones (II; X = Y = H, R′ = Me, R = $C_{10}H_{21}$, 1-$C_{10}H_7CH_2$, respectively) when heated under reflux with acetic anhydride for 10—15 sec. 1-Naphthylmethyl *o*-aminobenzohydroxamate also gave rise to some of the *N*-acetylbenzohydroxamate (VII; X = H, R = 1-$C_{10}H_7CH_2$). Treatment of the benzohydroxamate (VIb; X = H, R = CH_2Ph) with boiling acetic anhydride for 30 min. gave *NN*-diacetyl-*O*-benzylhydroxylamine (39%) and *N*-acetylanthranilic acid (45%). On another occasion under the same reaction conditions, only *N*-acetylanthranilic acid and 3-benzyloxy-2-methylquinazol-4-one were isolated. When the corresponding *o*-acetamidobenzohydroxamate (VII; X = H, R = CH_2Ph) was treated in the same way, *N*-acetylanthranilic acid (55%) and *N*-acetyl-*O*-benzylhydroxylamine (46%) were isolated, together with a low yield of the quinazolone. The cleavage of *N*-benzyloxy-derivatives by boiling acetic anhydride has been previously noted by Ames and Grey,[12] who observed that, after 5 min., *N*-benzyloxymaleamic acid

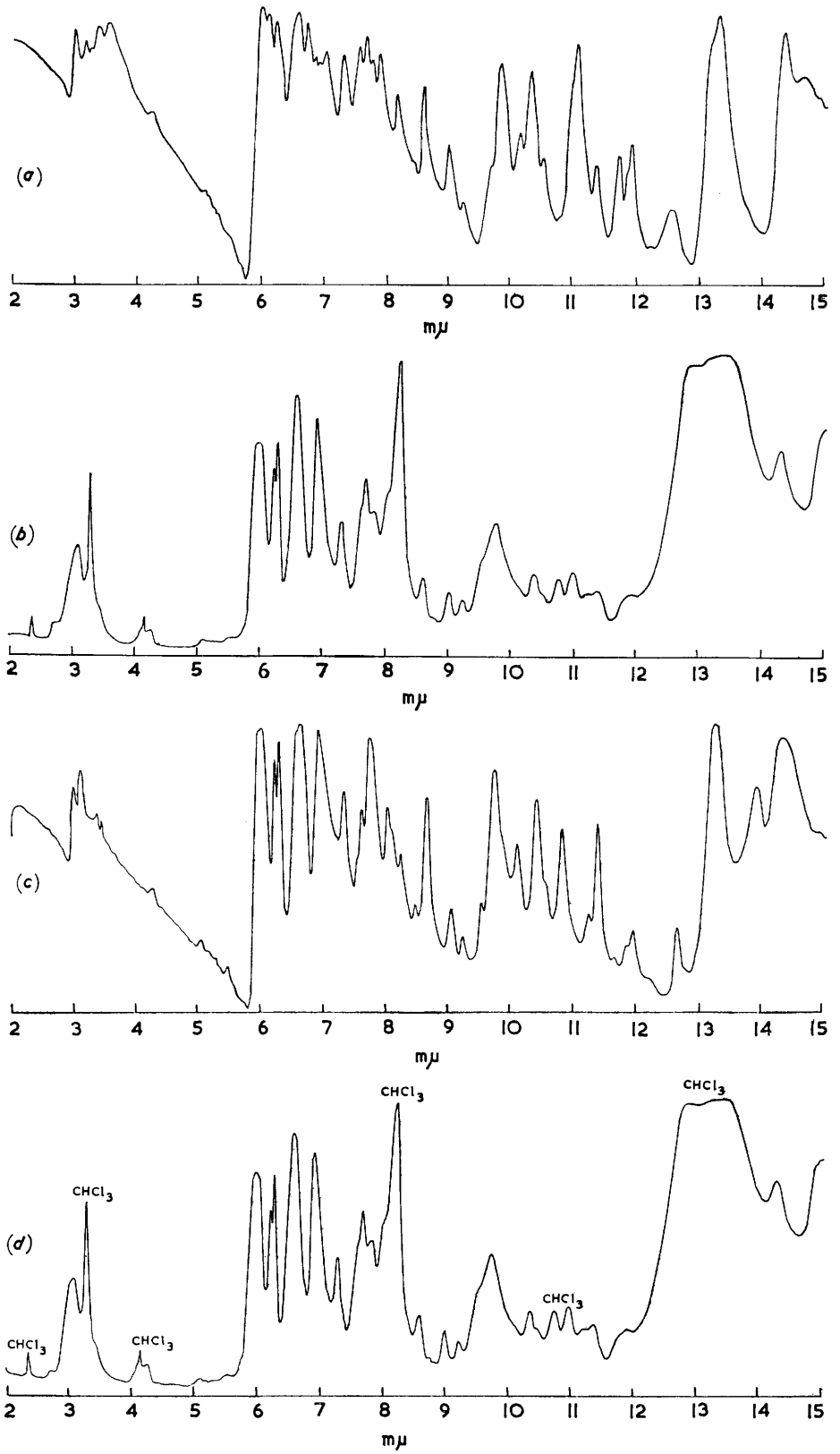
[8] (*a*) R. H. Clarke and E. C. Wagner, *J. Org. Chem.*, 1944, **9**, 55; (*b*) H. Taniyama, B. Yasui, H. Uchida, and Y. Okunda, *J. Pharm. Soc. Japan*, 1961, **81**, 431; (*c*) S. Somasekhara, V. S. Dighe, P. U. Arur, and S. L. Mukharjee, *Current. Sci.*, 1964, **33**, 746.

[9] R. P. Staiger and E. C. Wagner, *J. Org. Chem.*, 1953, **18**, 1427.

[10] S. Petersen, H. Holinger, E. Tietze, and W. Siefken, *Angew. Chem. Internat. Edn.*, 1963, **2**, 24.

[11] (*a*) E. von Meyer and Th. Bellman, *J. prakt. Chem.*, 1886, **33**, 20; (*b*) A. W. Scott and B. L. Wood, *J. Org. Chem.*, 1942, **7**, 508.

[12] D. E. Ames and T. F. Grey, *J.*, 1955, 631. These authors give m. p. 101—102° for *NN*-diacetyl-*O*-benzylhydroxylamine.



Infrared spectra of benzyl-*o*-acetamidobenzohydroxamate

(*a*) Form (A) crystalline; (*b*) Form (A) in chloroform; (*c*) Form (B) crystalline; (*d*) Form (B) in chloroform

gave a good yield of *NN*-diacetyl-*O*-benzylhydroxylamine. No cleavage of 3-benzyloxy-2-methylquinazol-4-one took place on treatment with boiling acetic anhydride for 30 min. The degradation products therefore probably arose from the benzohydroxamate (VI) or (VII).

In the presence of pyridine, benzyl *o*-aminobenzohydroxamate reacted with acetic anhydride both at room temperature and on a steam-bath to give 3-benzyloxy-2-methylquinazol-4-one, and smaller amounts of benzyl *o*-acetamidobenzohydroxamate.

Benzyl *o*-acetamidobenzohydroxamate was best prepared by treating an aqueous solution of benzyl *o*-aminobenzohydroxamate in aqueous hydrochloric acid with acetic anhydride and sodium acetate. It appeared to exist in dimorphic forms. The product obtained from the reaction, m. p. 121—122°, was designated form (B). Crystallisation of (B) from hot ethyl acetate gave a second form, designated (A), m. p. 130·5—132·5°. The infrared (i.r.) spectrum of (A) (KCl disc) was identical with that of the product, m. p. 124—128°, obtained when benzyl *o*-aminobenzohydroxamate was refluxed with acetic anhydride for 15 sec., and differed completely from that of (B). Substance (A) gave a sparingly soluble sodium salt, which, when dissolved in water and acidified with acetic acid, gave (B). Crystallisation of (B) from chloroform–light petroleum at room temperature gave rise to (A), whereas crystallisation from cold aqueous ethanol gave unchanged (B). Both forms gave 3-benzyloxy-2-methylquinazol-4-one on heating above their melting point for a few minutes. In view of the ease of interconversion of the two forms, it seemed unlikely that any chemical change was taking place. Thin-layer chromatography showed that the two forms were free from other materials except for small amounts of 3-benzyloxy-2-methylquinazol-4-one. It was conclusively shown that small amounts of quinazolone were formed during the chromatography. Both forms of benzyl *o*-acetamido-benzohydroxamate ran to the same positions on silica gel G plates and were easily separable from the benzyl *o*-aminobenzohydroxamate and from the quinazolone. Using chloroform as solvent, approximate R_F values were: benzyl *o*-amino- 0·05, benzyl *o*-acetamido-benzohydroxamate 0·11, 3-benzyloxy-2-methylquinazol-4-one 0·31. The corresponding values in ether were 0·38, 0·57, and 0·50.

The i.r. spectra of (A) and (B) in chloroform solution were identical [spectra (*b*) and (*d*)], whereas the spectra of the crystalline solids [(*a*) and (*c*)] showed appreciable differences in the ranges 2·5—4, 6—8·5, 10—12, and 13·5—15 μ. This behaviour was considered to be strong evidence for the existence of dimorphic forms of benzyl *o*-acetamidobenzohydroxamate (cf. Potts [13]). The ultraviolet spectra of (A) and (B) were identical.

Acylation of *o*-aminobenzohydroxamates with acid chlorides gave *N*-acylbenzohydroxamates or quinazolones depending on the conditions used. Thus, treatment of the benzohydroxamate (VIb; X = H, R = CH_2Ph) with 3,5-dinitrobenzoyl chloride and sodium carbonate in acetone gave *O*-benzyl-*N*-[*o*-(3,5-dinitrobenzamido)benzoyl]hydroxylamine, whereas treatment in pyridine gave the cyclised product 3-benzyloxy-2-(3,5-dinitrophenyl)-quinazol-4-one. *p*-Nitrobenzoyl chloride and compound (VIb; X = H, R = C_7H_{15}) in pyridine similarly gave 3-heptyloxy-2-(*p*-nitrophenyl)quinazol-4-one.

Heating together benzyl *o*-aminobenzohydroxamate and chloroacetic anhydride gave the 2-chloromethylquinazolone (II; X = Y = H, R = CH_2Ph, R′ = CH_2Cl) in poor yield. No *N*-chloroacetylbenzohydroxamate was isolated.

Reaction of isatoic anhydride with *ON*-dibenzylhydroxylamine in ethanol and chromatography of the product on alumina gave *O*-benzyl-*N*-benzylidenehydroxylamine, unchanged dibenzylhydroxylamine, and compound (VIII; R = H) as a viscous oil characterised as the crystalline acetyl derivative (VIII; R = Ac). The acetyl derivative was also prepared by reaction of benzyl bromide with benzyl *o*-acetamido-benzohydroxamate.

Oxidation of 3-benzyloxy-6-nitroquinazol-4-one with hydrogen peroxide in acetic acid gave an *N*-oxide in poor yield.

[13] W. J. Potts, jun., " Chemical Infrared Spectroscopy," John Wiley and Sons, New York, 1963.

Alkaline hydrolysis of 3-benzyloxy-6-nitroquinazol-4-one gave benzyl 2-amino-5-nitrobenzohydroxamate.

Antimicrobial screening of the compounds did not detect any useful activity, and limited pharmacological examination revealed no activity of interest.

Experimental

Infrared absorption frequencies for C=O and NH groups were determined using potassium chloride discs on a Grubb–Parsons D.B.-I. S4 instrument having a sodium chloride prism.

3-Benzyloxy-2-methyl-6,8-dinitroquinazol-4-one.—A mixture of 3,5-dinitroanthranilic acid (5·0 g.) and acetic anhydride (15 ml.) was heated under reflux for 30 min. and evaporated at reduced pressure, giving a red gum. To the residual gum in dry benzene (20 ml.) was added *O*-benzylhydroxylamine (3·0 g.) in benzene (10 ml.) whereupon an exothermic reaction took place. After heating on the steam-bath for 45 min., during which time a yellow solid separated, the mixture was cooled and the *product* collected (5·8 g.), m. p. 224—226°, not raised on crystallisation from ethyl methyl ketone (Found: C, 53·55; H, 3·55; N, 15·6. $C_{16}H_{12}N_4O_6$ requires C, 53·9; H, 3·4; N, 15·7%). Other quinazolones similarly prepared are given in Table 1.

Table 1

Quinazol-4-one ethers (II; R′ = Me)

					Found (%)			Required (%)		
X	Y	R	M. p.*	Formula	C	H	N	C	H	N
H	H	$C_6H_5CH_2$	110—112° [a] †	$C_{16}H_{14}N_2O_2$	72·1	5·4	10·8	72·1	5·3	10·5
H	H	3,4-$Cl_2C_6H_3CH_2$	163—165* [b]	$C_{16}H_{12}Cl_2N_2O_2$	56·8	3·45	8·4	57·3	3·6	8·35
H	6-NO_2	$C_6H_5CH_2$	186—188 [c] ‡	$C_{16}H_{13}N_3O_4$	61·4	4·4	13·95	61·7	4·2	13·5
H	6-NO_2	$C_{10}H_{21}$	106—108	$C_{19}H_{27}N_3O_4$	63·3	7·9	11·55	63·1	7·5	11·6
H	5-Cl	3,4-$Cl_2C_6H_3CH_2$	214—216 [b] *	$C_{16}H_{11}Cl_3N_2O_2$	52·15	3·0	7·1	52·0	3·0	7·6
6-Cl	8-Cl	$C_6H_5CH_2$	165—166 [d]	$C_{16}H_{12}Cl_2N_2O_2$	57·9	3·9	7·8	58·0	3·65	7·3
6-Cl	8-Cl	3,4-$Cl_2C_6H_3CH_2$	223—225 [c]	$C_{16}H_{10}Cl_4N_2O_2$	47·8	2·7	6·8	47·5	2·5	6·9
6-NO_2	8-NO_2	$C_{12}H_{25}$	78—80 [d]	$C_{21}H_{30}N_4O_6$	57·8	7·0	12·9	58·0	7·0	12·9
6-NO_2	8-NO_2	4-$NO_2C_6H_4CH_2$	236 [e]	$C_{16}H_{11}N_5O_8$	47·7	2·9	17·6	47·9	2·8	17·5

* Recryst. from [a] propan-2-ol, [b] ethyl acetate, [c] benzene, [d] ethanol, [e] acetic acid. † Taniyama *et al.*[8b] give m. p. 114°. ‡ Somasekhara *et al.*[8c] give m. p. 186—188°.

6,8-Diamino-3-benzyloxy-2-methylquinazol-4-one.—To a stirred solution of stannous chloride dihydrate (20 g.) in concentrated hydrochloric acid (50 ml.) was added 3-benzyloxy-2-methyl-6,8-dinitroquinazol-4-one (2·5 g.); a mild exothermic reaction took place. The mixture was stirred at 60° for 2 hr., cooled, and the complex collected and decomposed with 4N-sodium hydroxide to give the *diamine*, which crystallised from ethanol as needles, m. p. 172—173° (Found: C, 64·5; H, 5·6; N, 18·9. $C_{16}H_{16}N_4O_2$ requires C, 64·9; H, 5·4; N, 18·9%). The *diacetyl derivative* formed plates from nitromethane, m. p. 283—285° (Found: C, 63·0; H, 5·2; N, 14·4. $C_{20}H_{20}N_4O_4$ requires C, 63·1; H, 5·3; N, 14·7%). The aminoquinazolones in Table 2 were similarly prepared.

Table 2

Aminoquinazol-4-one ethers (II)

						Found (%)			Required (%)		
X	Y	R	R′	M. p.	Formula	C	H	N	C	H	N
6-NH_2	H	$C_6H_5CH_2$	H	182—184° [a]	$C_{15}H_{13}N_3O_2$	67·6	5·0	16·0	67·4	4·9	15·7
6-NH_2	H	$C_{10}H_{21}$	CH_3	92 [b]	$C_{19}H_{29}N_3O_2$	68·7	9·1	12·8	68·9	8·8	12·7
6-NH_2	8-NH_2	$C_{12}H_{25}$	CH_3	115—120 [a]	$C_{21}H_{34}N_4O_2$	67·0	9·3	14·7	67·3	9·15	15·0

Recryst. from [a] ethanol, [b] light petroleum (b. p. 60—80°).

6-p-Acetamidobenzenesulphonamido-3-decyloxy-2-methylquinazol-4-one.—A mixture of 6-amino-3-decyloxy-2-methylquinazol-4-one (3·3 g.), *p*-acetamidobenzenesulphonyl chloride (2·2 g.), and pyridine (50 ml.) was heated on the steam-bath for 15 min., then poured into ice-cold hydrochloric acid. The solid was collected and crystallised from methanol to give needles of the *product* (3·1 g.), m. p. 199—201° (Found: C, 61·0; H, 7·2; N, 10·8. $C_{27}H_{36}N_4O_5S$ requires C, 61·3; H, 6·9; N, 10·6%). Hydrolysis with 6N-hydrochloric acid for 1½ hr. under reflux, and crystallisation of the product from ethanol, gave needles of *6-sulphanilamido-3-decyloxy-2-methylquinazol-4-one*, m. p. 158—160° (Found: C, 61·2; H, 7·4; N, 11·4. $C_{25}H_{34}N_4O_4S$ requires C, 61·7; H, 7·0; N, 11·5%).

3-Hydroxy-2-methylquinazol-4-one.—A solution of 3-benzyloxy-2-methylquinazol-4-one (1·3 g.) in ethyl acetate (25 ml.) was shaken with hydrogen and 10% palladised charcoal until uptake ceased (5 min.). Filtration and evaporation gave the *product*, which crystallised from ethanol as needles (0·5 g.), m. p. 223—225° (Found: C, 61·3; H, 4·8; N, 15·9. Calc. for $C_9H_8N_2O_2$; C, 61·4; H, 4·6; N, 15·9%), Anschutz *et al.*[6] give m. p. 214°. The O-*acetyl derivative*, prepared by treatment of the foregoing compound with acetic anhydride, formed needles from ethyl acetate–light petroleum (b. p. 60—80°), m. p. 115—116° (Found: C, 60·4; H, 4·9; N, 13·0. $C_{11}H_{10}N_2O_3$ requires C, 60·5; H, 4·6; N, 12·8%).

6-Amino-3-hydroxy-2-methylquinazol-4-one Hydrochloride.—A suspension of 3-benzyloxy-2-methyl-6-nitro-2-quinazol-4-one (18·3 g.) in methanol (500 ml.) containing concentrated hydrochloric acid (6 ml.) was shaken with hydrogen and 10% palladised charcoal until uptake ceased (1 hr.). Addition of water (50 ml.) rendered the product soluble, and after removal of the catalyst the solution was evaporated. Crystallisation of the residual solid from ethanol–ether gave needles of the *monohydrochloride* (13·4 g.), m. p. 286—290° (Found: C, 47·5; H, 4·5; N, 18·5. $C_9H_{10}ClN_2O_3$ requires C, 47·4; H, 4·4; N, 18·4%).

The ON-*diacetyl derivative* crystallised from ethanol, m. p. 214° (Found: C, 56·5; H, 4·8; N, 15·4. $C_{13}H_{13}N_3O_4$ requires C, 56·7; H, 4·7; N, 15·3%).

3-Hydroxy-2-methyl-6,8-dinitroquinazol-4-one.—(*a*) A mixture of 3-benzyloxy-2-methyl-6,8-dinitroquinazol-4-one (2·4 g.) and 38% w/v hydrogen bromide in acetic acid (4 ml.) was heated in a sealed tube at 110° for 2 hr. After cooling and addition of ether the solid was collected and crystallised twice from aqueous methanol (charcoal) to give the *product* as yellow needles (1·05 g.), m. p. 238—240° (Found: C, 40·4; H, 2·4; N, 21·3. $C_9H_6N_4O_6$ requires C, 40·6; H, 2·3; N, 21·05%).

(*b*) A mixture of 3,5-dinitroanthranilic acid (4·54 g.) and acetic anhydride (20 ml.) was heated under reflux for 1½ hr. and evaporated to give the anthranil as an orange oil. Treatment of the oil with an ethanolic solution containing hydroxylamine hydrochloride (2·8 g.) and sodium hydroxide (1·6 g.) initiated an exothermic reaction. From the clear solution a yellow solid separated on standing. Crystallisation from acetic acid gave 3-hydroxy-2-methyl-6,8-dinitroquinazol-4-one (2·1 g.), m. p. 235—237° not depressed on admixture with the above specimen. The O-*acetyl derivative* had m. p. 194—196° (Found: C, 43·2; H, 2·8; N, 18·5. $C_{11}H_8N_4O_7$ requires C, 42·8; H, 2·6; N, 18·2%).

Benzylation of 3-Hydroxy-2-methylquinazol-4-one.—To a solution of the quinazolone (1·7 g.) and sodium hydroxide (0·4 g.) in ethanol (25 ml.) was added benzyl chloride (1·2 g.), and the mixture was heated under reflux for 1 hr. Concentration of the solution and addition of water gave a solid, which crystallised from ethanol as needles (2·1 g.), m. p. 109—110°, not depressed on admixture with 3-benzyloxy-2-methylquinazol-4-one. Similar benzylation of 6-amino-3-hydroxy-2-methylquinazol-4-one gave *6-amino-3-benzyloxy-2-methylquinazol-4-one*, m. p. 161—163°, needles from ethanol (Found: C, 67·8; H, 5·3; N, 15·0. $C_{16}H_{15}N_3O_2$ requires C, 67·8; H, 5·3; N, 14·9%).

Benzyl o-aminobenzohydroxamate (VI; X = H, R = CH_2Ph).—A mixture of *O*-benzylhydroxylamine (12·3 g.), isatoic anhydride (16·3 g.), and 95% ethanol (100 ml.) was stirred at room temperature for 20 min., then heated under reflux for 20 min. Addition of water gave the *product* (19·4 g.), m. p. 107—108°, which on crystallisation from ethyl acetate–light petroleum (b. p. 80—100°) had m. p. 104—106° (Found: C, 69·2; H, 5·8; N, 11·8. $C_{14}H_{14}NO_2$ requires C, 69·4; H, 5·8; N, 11·5%). A number of similarly prepared derivatives are listed in Table 3.

3-Benzyloxyquinazol-4-one.—Benzyl *o*-aminobenzohydroxamate (2·42 g.) and 99% formic acid (10 ml.) were heated on the steam-bath for 2 hr. After evaporation of excess formic acid

TABLE 3

o-Aminobenzohydroxamates (VIb)

				Found (%)			Required (%)		
X	R	M. p.	Formula	C	H	N	C	H	N
H	Heptyl	50—53° [a]	$C_{14}H_{22}N_2O_2$	67·3	9·0	11·1	67·4	8·8	11·2
H	Decyl	66—68 [b]	$C_{17}H_{28}N_2O_2$	69·7	9·6	9·5	69·8	9·6	9·6
H	1-Naphthylmethyl	150—152 [c]	$C_{18}H_{16}N_2O_2$	74·4	5·65	9·2	74·0	5·5	9·6
5-Nitro	Benzyl	181—184 [b]	$C_{14}H_{13}N_3O_4$	58·4	4·7	14·6	58·5	4·5	14·6
5-Nitro	*p*-Nitrobenzyl	220—221 [d]	$C_{14}H_{12}N_4O_6$	50·6	3·8	17·2	50·5	3·6	16·9
5-Nitro	1-Naphthylmethyl	188—189 [b]	$C_{18}H_{15}N_3O$	64·3	4·6	12·4	64·0	4·5	12·5

Recryst. from [a] light petroleum (b. p. 60—80°), [b] aqueous ethanol, [c] ethyl acetate, [d] acetone.

at reduced pressure, the residual solid was triturated with aqueous sodium hydroxide and the insoluble *quinazolone* (2·4 g.) was crystallised from ethanol, m. p. 116—118° (Found: C, 72·3; H, 5·1; N, 11·1. $C_{15}H_{12}N_2O_2$ requires C, 72·0; H, 4·8; N, 11·1%). Other quinazolones similarly prepared are given in Table 4.

TABLE 4

Quinazol-4-one ethers (II; R′ = Y = H)

				Found (%)			Required (%)		
X	R	M. p.	Formula	C	H	N	C	H	N
H	Hexyl	33—35° [a]	$C_{14}H_{18}N_2O_2$	67·7	7·3	11·1	68·2	7·3	11·4
H	Heptyl	33—34 [a]	$C_{15}H_{20}N_2O_2$	69·1	7·9	10·8	69·5	7·7	10·75
H	Decyl	29—30 [a]	$C_{18}H_{26}N_2O_2$	71·1	8·6	8·8	71·3	8·6	9·25
6-Nitro	Benzyl	190—192 [b]	$C_{15}H_{11}N_3O_4$	60·3	3·8	14·4	60·5	3·7	14·1
6-Nitro	*p*-Nitrobenzyl	241—243 [c]	$C_{15}H_{10}N_4O_6$	52·6	3·2	16·3	52·6	2·95	16·35
H	1-Naphthylmethyl	129—131 [d]	$C_{19}H_{14}N_2O_2$	75·1	4·8	9·5	75·3	4·6	9·3

Recryst. from [a] aqueous ethanol, [b] ethyl acetate–ethanol, [c] dimethylformamide, [d] ethyl acetate–light petroleum (b. p. 60—80°).

Sodium Salt of p-*Nitrobenzyl* 2-*Amino*-5-*nitrobenzohydroxamate* (VIb; X = 5-NO_2, R = *p*-$NO_2C_6H_4CH_2$,Na salt).—*O*-*p*-Nitrobenzylhydroxylamine (19·2 g.) and 5-nitroisatoic anhydride (23·8 g.) were stirred in ethanol (1 l.) and the mixture was heated under reflux for 45 min. Evaporation gave a solid which was stirred with aqueous sodium hydroxide, giving the sparingly soluble *sodium salt* (27 g.) which crystallised from water, m. p. 256° (Found: C, 47·0; H, 3·2; N, 16·05; $C_{14}H_{11}N_4NaO_6$ requires C, 47·4; H, 3·1; N, 15·8%). Heating the foregoing sodium salt (5 g.) with formic acid (20 ml.) on the steam-bath, evaporating, and stirring the residual solid with N-sodium hydroxide gave 6-nitro-3-*p*-nitrobenzyloxyquinazol-4-one (4·43 g.), m. p. 243—246° identical with the product described in Table 4.

Reaction of Benzyl o-*Aminobenzohydroxamate with Acetic Anhydride.*—(*a*) The benzohydroxamate (2·4 g.) and acetic anhydride (10 ml.) were refluxed together for 30 min. then evaporated at reduced pressure. Trituration of the residual oil with a little hot water and cooling gave a solid (2·32 g.), m. p. 80—170°, which after crystallisation from propan-2-ol and then from ethyl acetate gave *NN*-diacetyl-*O*-benzylhydroxylamine (0·8 g., 39%), m. p. 100° (Found: C, 63·7; H, 6·3; N, 7·1. Calc. for $C_{11}H_{13}NO_3$: C, 63·8; H, 6·3; N, 6·8%). The melting point was not depressed on admixture with a sample (2·55 g.) prepared by heating *O*-benzylhydroxylamine (1·86 g.) with acetic anhydride (10 ml.) for 1 hr. on the steam-bath.[12] From the above propan-2-ol mother liquors was isolated *N*-acetylanthranilic acid (0·8 g., 45%), m. p. 184—186°. On a subsequent occasion the product from a similar reaction was triturated with aqueous sodium hydroxide, giving a 30% yield of insoluble 3-benzyloxy-2-methylquinazol-4-one and 23% of *N*-acetylanthranilic acid. No *N*-acetyl- or *NN*-diacetyl-*O*-benzhydroxylamine were isolated. It is probable that some quinazolone was also present in the products of the previous experiment but was not isolated due to the method used for working-up.

(*b*) Benzyl *o*-aminobenzohydroxamate (2 g.) was heated under reflux in acetic anhydride (10 ml.) for 10—15 sec., then cooled and evaporated at reduced pressure. Treatment of the residual solid with 4N-sodium hydroxide left insoluble material (1·8 g.), m. p. 124—128° (A). The i.r. spectrum of this material was identical with that of benzyl *o*-acetamidobenzohydroxamate (m. p. 131°) prepared as in (*c*) below. Although insoluble in 4N-sodium hydroxide, the product (A) passed into solution on dilution.

(*c*) A solution of benzyl *o*-aminobenzohydroxamate (17·7 g.) in aqueous ethanol containing 11·6N-hydrochloric acid (14·8 ml.) was stirred with activated charcoal for 10 min., filtered, and the filtrate treated with acetic anhydride (17·5 ml.) and with sodium acetate (20 g.) in a little water. Initially, a solid separated, which dissolved on stirring, giving a clear solution which soon deposited *benzyl* o-*acetamidobenzohydroxamate* (*form* B) (20·1 g.) as a white solid, m. p. 121—122°. Crystallisation of a portion (10 g.) from ethyl acetate gave the dimorphic *form* (A) (8·5 g.), m. p. 130—131° (Found: C, 67·25; H, 5·6; N, 10·3. $C_{16}H_{16}N_2O_3$ requires C, 67·6; H, 5·7; N, 9·85%).

Interconversions of the (A) *and* (B) *Forms of Benzyl* o-*Acetamidobenzohydroxamate.*—Shaking form (A) (6·8 g.) with N-sodium hydroxide gave a sparingly soluble sodium salt which dissolved on dilution with water. Acidification of the clear solution with acetic acid gave form (B) (6·35 g.), m. p. 117—125° (Found: C, 67·35; H, 5·8; N, 9·75%). It could be recrystallised by dissolving in cold chloroform and adding light petroleum (b. p. 60—80°) to point of turbidity,

when material, m. p. 116—120°, separated (5·7 g.), which from its i.r. spectrum (KCl disc) appeared to be form (A). Further crystallisation from the same solvents gave the same product, m. p. 119—125° (Found: C, 67·4; H, 5·5; N, 10·15%), which after one crystallisation from ethyl acetate gave form (A), m. p. 131—132°, but with the same i.r. spectrum as the material, 119—125°. Crystallisation of form (A) from aqueous ethanol at room temperature gave form (B), m. p. 122—123°.

Reaction of O-*Benzyl* o-*Acetamidobenzohydroxamate with Acetic Anhydride.*—A mixture of the acetamido-derivative (1·25 g.) and acetic anhydride (20 ml.) was heated under reflux for 30 min., and excess of reagent removed under reduced pressure. Trituration of the residual oily solid with N-sodium hydroxide gave an insoluble solid (0·2 g., 17·1%), m. p. 108—110°, not depressed on admixture with authentic 3-benzyloxy-2-methylquinazol-4-one. Acidification of the alkaline solution gave no solid: the solution was therefore concentrated to a small volume and the precipitated solid collected (0·55 g.), m. p. *ca.* 285°. Two crystallisations from water gave a solid, m. p. 188°, identified as *N*-acetylanthranilic acid. The original filtrate was extracted with ethyl acetate, the extracts washed with sodium hydrogen carbonate, dried, and evaporated to yield, after chromatography on alumina, 0·38 g. (53·3%) oily *N*-acetyl-*O*-benzylhydroxylamine, b. p. (bath) 125°/0·005 mm., $n_D^{22.5}$ 1·5380 (Found: C, 65·1; H, 7·1; N, 8·5. Calc. for $C_9H_{11}NO_2$: C, 65·4; H, 6·7; N, 8·5%), having an i.r. spectrum identical with an authentic specimen prepared as below.

N-*Acetyl*-O-*benzylhydroxylamine.*—To a solution of *O*-benzylhydroxylamine (2·5 g.) in water containing concentrated hydrochloric acid (1·75 ml.) was added acetic anhydride (1·9 ml.) followed by sodium acetate (5·0 g., hydrated) in water. The clear solution was extracted with ethyl acetate, the extracts were dried and evaporated, and the residual oil, dissolved in benzene, was chromatographed on alumina (50 g.). Elution with ether–1% methanol gave 1·24 g. of the product as a colourless oil, b. p. 126—128°/0·25 mm., n_D^{22} 1·5384, identical with the foregoing sample.[14]

Reaction of Benzyl o-*Aminobenzohydroxamate with Acetic Anhydride and Pyridine.*—A mixture of the benzohydroxamate (2·42 g.), acetic anhydride (1·5 g.), and pyridine was set aside at room temperature overnight. Evaporation, and extraction of the residual solid with aqueous N-sodium hydroxide gave an insoluble product (0·85 g.), m. p. 108—110°, shown to be 3-benzyloxy-2-methylquinazol-4-one (32% yield). Acidification of the alkaline extracts gave crude benzyl *o*-acetamidobenzohydroxamate (0·62 g.), m. p. 95—111°. Repetition of the reaction with heating on the steam-bath for 35 min. also gave the quinazolone (0·95 g., 37·4%) and the *o*-acetamidobenzohydroxamate (14%).

Action of Hot Ethanol on Benzyl o-*Acetamidobenzohydroxamate.*—Heating an ethanolic solution of the hydroxamate (m. p. 131°) under reflux for 5 hr. gave 3-benzyloxy-2-methylquinazol-4-one, m. p. 109—111°. No reaction occurred at room temperature after 4 days.

3-*Benzyloxy*-2-*methylquinazol*-4-*one.*—Benzyl *o*-acetamidobenzohydroxamate (0·2 g.) was heated above its melting point (*ca.* 135°) for 1 hr. Trituration of the resulting solid with 0·4N-sodium hydroxide left a solid (0·1 g.), m. p. 106°, not depressed on admixture with the quinazolone prepared from the anthranil and *O*-benzylhydroxylamine, and possessing an identical i.r. spectrum.

3-*Decyloxy*-2-*methylquinazol*-4-*one.*—The benzohydroxamate (VIb; X = H, R = $C_{10}H_{21}$) (1·0 g.) was refluxed in acetic anhydride (5 ml.) for 10—15 sec., the solution evaporated under reduced pressure, and the residual solid triturated with aqueous sodium hydroxide to give a solid (0·7 g.), m. p. 240°. On treatment of a solution of this material in aqueous ethanol with dilute hydrochloric acid, the required *quinazolone* separated, m. p. 39—40° (from aqueous ethanol) (Found: C, 72·1; H, 8·9; N, 8·4. $C_{19}H_{28}N_2O_3$ requires C, 72·0; H, 8·85; N, 8·85%).

2-*Methyl*-3-(1-*naphthylmethoxy*)*quinazol*-4-*one.*—The benzohydroxamate (VIb; X = H, R = 1-naphthylmethyl) (2 g.) and acetic anhydride (10 ml.) were heated under reflux for 15 sec., cooled, and evaporated under reduced pressure. Extraction of the residual solid with dilute aqueous sodium hydroxide gave the alkali-insoluble *quinazolone* (0·15 g.), m. p. 170—172° from ethyl acetate–ethanol (Found: C, 76·1; H, 5·15; N, 8·7. $C_{20}H_{16}N_2O_2$ requires C, 76·0;

[14] J. H. Cooley, W. D. Bills, and J. R. Throckmorton (*J. Org. Chem.*, 1960, **25**, 1734) give b. p. 124°/0·07 mm., m. p. 46—48°, n_D^{28} 1·5343 for a sample made from hydroxylamine and ethyl acetate followed by benzylation without isolation of the intermediate. B. J. R. Nicolaus, G. Pagani, and E. Testa (*Helv. Chim. Acta*, 1962, **45**, 1381 and Carter Products, Belg. P. 612,879) describe the material as an oil, b. p. 125—130°/0·2 mm. and b. p. 109°/0·2 mm., n_D^{25} 1·5381, respectively.

H, 5·1; N, 8·7%). Acidification of the alkaline extracts with acetic acid gave 1-*naphthylmethyl* o-*acetamidobenzohydroxamate* (1·66 g.), m. p. 146°, raised to 158—166° after crystallisation from ethanol (Found: C, 72·2; H, 5·3; N, 8·4. $C_{20}H_{18}N_2O_3$ requires C, 71·8; H, 5·4; N, 8·4%). Heating this *N*-acetyl derivative (0·25 g.) above its melting point for a few minutes gave the above quinazolone, m. p. 168—170°.

3-*Benzyloxy*-2-*methyl*-6-*nitroquinazol*-4-*one*.—Made similarly from the benzohydroxamate (VIb; X = 5-NO_2, R = Ph) (1 g.) the quinazolone (0·17 g.) formed needles from aqueous ethanol, m. p. 176—178°, not depressed on admixture with the sample prepared *via* the anthranil (Found: C, 61·4; H, 4·7; N, 13·95. Calc. for $C_{16}H_{13}N_3O_4$: C, 61·7; H, 4·2; N, 13·5%).

2-*Methyl*-6-*nitro*-3-(4-*nitrobenzyloxy*)*quinazol*-4-*one*.—The benzohydroxamate (VIb; X = 5-NO_2; R = 4-$O_2N{\cdot}C_6H_4CH_2$) (2·2 g.) and acetic anhydride (11 ml.) were heated under reflux for 1 min. to give an alkali-insoluble fraction (1·8 g.), m. p. 220°. Two crystallisations from acetone gave the *quinazolone*, m. p. 231—232° (Found: C, 53·9; H, 3·7; N, 15·7. $C_{16}H_{12}N_4O_6$ requires C, 53·8; H, 3·4; N, 15·7%). Similarly was prepared 3-*hexyloxy*-2-*methylquinazol*-4-*one*, needles from aqueous ethanol, m. p. 39—40° (Found: C, 70·3; H, 7·9; N, 10·6. $C_{16}H_{22}N_2O_2$ requires C, 70·0; H, 8·0; N, 10·2%).

1-*Naphthylmethyl* 2-*Acetamido*-5-*nitrobenzohydroxamate*.—A mixture of the benzohydroxamate (VIb; X = 5-nitro, R = 1-naphthylmethyl) (1 g.) and acetic anhydride (10 ml.) was heated under reflux for 15 sec., the excess reagent removed under reduced pressure, and the residual solid triturated with dilute aqueous sodium hydroxide. The solid dissolved completely, and acidification gave the *product* (0·4 g.), m. p. 186—187° unchanged on crystallisation from ethanol (Found: C, 63·4; H, 4·95; N, 11·4. $C_{20}H_{17}N_3O_5$ requires C, 63·4; H, 4·5; N, 11·1%).

3-*Benzyloxy*-2-*chloromethylquinazol*-4-*one*.—The benzohydroxamate (VIb; X = H, R = benzyl) (0·58 g.) and chloroacetic anhydride (1 g.) were heated together at 110° for 10 min., methanol (10 ml.) was added to the cooled solution, and the mixture heated under reflux for 5 min. Evaporation, and treatment of the residual solid with aqueous 2N-sodium hydroxide gave an insoluble fraction (0·16 g.), m. p. 104—110°. Crystallisation from aqueous ethanol gave the *quinazolone*, m. p. 114—115° (Found: C, 64·0; H, 4·5; N, 9·2. $C_{16}H_{30}ClN_2O_2$ requires C, 64·0; H, 4·3; N, 9·3%). Acidification of the alkaline filtrates gave a solid (0·2 g.), m. p. 100—102° not depressed on admixture with the starting material.

Benzyl o-(3,5-*Dinitrobenzamido*)*benzohydroxamate*.—A mixture of benzyl *o*-aminobenzohydroxamate (4·8 g.), 3,5-dinitrobenzoyl chloride (4·6 g.), and sodium carbonate (2·1 g.) in acetone (20 ml.) was heated under reflux for 2 hr., evaporated, and the residual solid treated with aqueous sodium hydroxide to give a crude insoluble material (6·07 g.), m. p. 114—124°. Repeated crystallisation from aqueous ethanol gave the *benzohydroxamate* (2·3 g.), m. p. 207—209° (Found: C, 57·1; H, 3·6; N, 13·1. $C_{21}H_{16}N_4O_7$ requires C, 57·8; H, 3·7; N, 12·8%).

3-*Benzyloxy*-2-(3,5-*dinitrophenyl*)*quinazol*-4-*one*.—The above experiment was repeated substituting pyridine (20 ml.) for the acetone and sodium carbonate. The mixture was heated for 2 hr. on the steam-bath. Evaporation of the solvent and addition of aqueous sodium hydroxide gave the insoluble *quinazolone* (5·1 g.), m. p. 182—186°, raised to 191—192° on crystallisation from aqueous acetone (Found: C, 60·0; H, 3·25; N, 13·3. $C_{24}H_{14}N_4O_6$ requires C, 60·4; H, 3·3; N, 13·4%).

3-*Heptyloxy*-2-(p-*nitrophenyl*)*qinazol*-4-*one* (6·2 g.) was similarly prepared from heptyl *o*-aminobenzohydroxamate (5·0 g.) and *p*-nitrobenzoylchloride (3·7 g.), and formed needles from aqueous ethanol, m. p. 107—108° (Found: C, 66·3; H, 6·0; N, 10·75. $C_{21}H_{26}N_3O_5$ requires C, 66·1; H, 6·4; N, 11·0%).

Reaction between O-*Benzylhydroxylamine, Ethyl Orthoformate, and Isatoic Anhydride*.—A mixture of *O*-benzylhydroxylamine (9·5 g.), ethyl orthoformate (13·2 ml.), and isatoic anhydride (12 g.) was heated on the steam-bath for 20 min. then in an oil-bath at 125—130° for 1 hr. Filtration of the cooled mixture gave a solid (10·35 g.), m. p. 235°, shown to be unchanged isatoic anhydride. The filtrate was evaporated and the residual oil set aside in the cold for several days, when a solid separated (1·9 g.), m. p. 110—112°. Treatment of this with aqueous sodium hydroxide gave insoluble 3-benzyloxyquinazol-4-one, m. p. 113—116° not depressed on admixture with an authentic specimen. Distillation of the mother-liquors gave a fraction (5·0 g.), b. p. 70—80°/0·35 mm., n_D^{21} 1·5099 which appeared to be *O*-benzyl-*N*-ethoxymethylenehydroxylamine (Found: C, 66·8; H, 7·3; N, 7·6. Calc. for $C_{10}H_{13}NO_2$: C, 67·0; H, 7·3; N, 7·8%). Biddle [15] gives b. p. 121—122°/15 mm., n_D^{19} 1·5105.

[15] H. C. Biddle, *Annalen*, 1900, **310**, 20.

N-2-*Aminobenzoyl*-ON-*dibenzylhydroxylamine*.—*ON*-Dibenzylhydroxylamine (15 g.) in 95% ethanol (100 ml.) was stirred with isatoic anhydride (13·2 g.) at room temperature for 15 min., and the mixture heated under reflux for 1 hr. Evaporation of the solvent and addition of 2N-sodium hyroxide (100 ml.) gave a brown oil (17 g.), which was extracted into ethyl acetate. The oil remaining after evaporation of the ethyl acetate was repeatedly extracted with light petroleum at room temperature. A portion (3·9 g.) of the petroleum-soluble material in light petroleum (b. p. 60—80°) containing 20% benzene was applied to a column of alumina. Successive fractions eluted off the column contained (*a*) *O*-benzyl-*N*-benzylidenehydroxylamine (0·2 g.), (*b*) *ON*-dibenzylhydroxylamine (0·2 g.), (*c*) unidentified material (0·75 g.), and (*d*) a viscous oil oil (2·73 g.) which distilled in a short-path still as a colourless syrup, b. p. 190° (bath)/0·03 mm. and was identified as N-2-*aminobenzoyl*-ON-*dibenzylhydroxylamine* (Found: C, 75·9; H, 6·2; N, 8·6. $C_{21}H_{20}N_2O_2$ requires C, 75·9; H, 6·2; N, 8·4%). Treatment of the syrup (0·85 g.) dissolved in aqueous methanol containing 11·6 N-hydrochloric acid (2 ml.) with acetic anhydride (5 ml.) followed by powdered sodium acetate gave the N-*acetyl derivative* (0·85 g.), m. p. 98—99° (Found: C, 73·5; H, 5·9; N, 7·4. $C_{23}H_{22}N_2O_3$ requires C, 73·8; H, 5·9; N, 7·5%).

Benzylation of Benzyl o-*Acetamidobenzohydroxamate*.—A mixture of the benzohydroxamate (1·3 g.), N-sodium hydroxide (13·7 ml.), benzyl bromide (1·65 ml.), and methanol (50 ml.) was heated under reflux for 2 hr., the solvent evaporated, and the mixture processed to give *N-o*-acetamidobenzoyl-*ON*-dibenzylhydroxylamine (0·6 g.), m. p. 98—99° from aqueous ethanol, identical with the sample prepared in the preceding experiment.

3-*Benzyloxy*-6-*nitroquinazol*-4-*one Oxide*.—To a solution of 30% hydrogen peroxide (30 ml.) in acetic acid (100 ml.) heated on the steam-bath for 30 min. was added 3-benzyloxy-6-nitroquinazol-4-one (3·0 g.) and the mixture heated for 8 hr. On cooling, crystals of the *product*

Infrared absorption data

Compound	R	R′	X	Y	(C=O) (cm.$^{-1}$)	(NH) (cm.$^{-1}$)
(VIb)	Benzyl	H	H	H	1658	3413
						3311
						3115
(VIb)	Benzyl	H	5-Nitro	H	1661	3356
						3247
(VIb)	*p*-Nitrobenzyl	H	5-Nitro	H	1634	3367
						3257
(VIb)	1-Naphthylmethyl	H	5-Nitro	H	1631	3413
						3300
					1618sh	3185
(VII)	1-Naphthylmethyl	H	H	H	1664	3175
					1639	
(VII)	1-Naphthylmethyl	H	5-Nitro	H	1650	3448
						3333
						3115
(VII)	Benzyl (A)	H	H	H	1669	3289
					1656	3175
(VII)	Benzyl (B)	H	H	H	1664	3300
						3125
(II)	Hexyl	H	H	H	1686	
(II)	Heptyl	H	H	H	1686	
(II)	Decyl	H	H	H	1681	
(II)	Decyl	CH_3	H	H	1689	
(II)	Decyl	CH_3	6-Nitro	H	1678	
(II)	Benzyl	H	H	H	1675	
(II)	Benzyl	CH_3	H	H	1675	
(II)	Benzyl	H	6-Nitro	H	1686	
(II)	Benzyl	CH_3	6-Nitro	8-Nitro	1701	
(II)	*p*-Nitrobenzyl	H	6-Nitro	H	1701	
(II)	3,4-Dichlorobenzyl	CH_3	5-Chloro	H	1686	
(II)	3,4-Dichlorobenzyl	CH_3	6-Chloro	8-Chloro	1695	
(II)	Benzyl	H	6-Amino	H	1653	3390
						3280
						3155
(II)	Benzyl	CH_3	6-Amino	H	1653	3330
						3280
						3145
(II)	Benzyl	CH_2Cl	H	H	1712	
(II)	1-Naphthylmethyl	CH_3	H	H	1675	
(II)	1-Naphthylmethyl	H	H	H	1689	
					1672	

separated, and after crystallisation from acetic acid had m. p. 272—274° (decomp.) (Found: C, 57·2; H, 3·5; N, 13·0. $C_{15}H_{11}N_3O_5$ requires C, 57·5; H, 3·5; N, 13·4%).

Action of Alkali on 3-Benzyloxy-6-nitroquinazol-4-one.—The quinazolone (3·41 g.) was heated under reflux with 2N-ethanolic sodium hdyroxide for 4 hr. The solvent was evaporated, water was added to the residue, and the mixture was extracted with ethyl acetate to give benzyl 2-amino-5-nitrobenzohydroxamate (1·6 g.), m. p. 185°. The alkaline liquors were acidified and extracted with ethyl acetate to yield more of the benzohydroxamate (1·5 g.), m. p. 175—178°.

In a similar manner 3-benzyloxyquinazol-4-one yielded benzyl *o*-aminobenzohydroxamate (59%), m. p. 100—110°.

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