3-Hydroxy- and 3-alkoxy-2-sulfanylquinazolin-4(3*H*)-ones: synthesis and reactions with alkylating and acylating agents

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Reactions of methyl 2-isothiocyanatobenzoate with hydroxylamine and alkoxyamines afforded earlier unknown 3-hydroxy-2-sulfanylquinazolin-4(3*H*)-one (**1a**) and 3-alkoxy-2-sulfanylquinazolin-4(3*H*)-ones (**1b,c**). Base-catalyzed reactions of compound **1a** with alkyl halides were not regioselective, yielding O,S-dialkylation products. In the presence of acetic acid and sodium acetate, compound **1a** was alkylated only at the S atom to give 2-alkylsulfanyl-3-hydroxyquinazolin-4(3*H*)-ones. Selective O-acylation of compound **1a** at position 3 yielded 3-acyloxy-2-sulfanylquinazolin-4(3*H*)-ones.

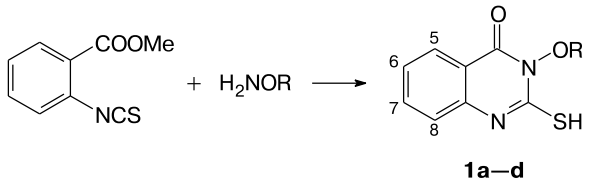
Key words: quinazolinones, 2-isothiocyanatobenzoate, hydroxylamines, cyclocondensation, alkylation, acylation.

Quinazoline fragments are found in many natural alkaloids,[1,2] biologically active compounds, and drugs.[3,4] Among quinazolines, 3-hydroxyquinazolin-4(3*H*)-one derivatives constitute an interesting and promising class of compounds with various types of biological activity,[5—9] which can serve as synthons for the synthesis of novel biologically active compounds through modification of their OH function.

In the present work, we studied the properties of 3-hydroxy-2-sulfanylquinazolin-4(3*H*)-one (**1a**) in search of methods for selective alkylation of two functional (hydroxy and sulfanyl) groups present in this structure.

Using a procedure involving reactions of methyl 2-isothiocyanatobenzoate with hydroxylamine and alkoxyamines,[5] we obtained earlier unknown 3-hydroxy- and 3-alkoxy-2-sulfanylquinazolin-4(3*H*)-ones **1a**—**d**.

Scheme 1



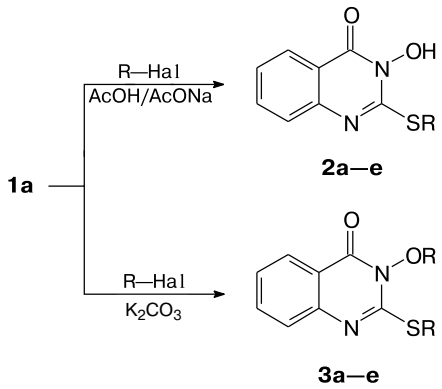
1a—d

1: R = H (**a**), Me (**b**), Pr^i (**c**), Bu^i (**d**)

With the aim of obtaining derivatives both identically and differently substituted at the hydroxy and sulfanyl groups, we alkylated compound **1a** with alkyl halides under different conditions. It is known that base-catalyzed alkylation of 2-thioxoquinazolin-4-one is regioselective (the S atom is alkylated only[10,11]), while its closest analog thiouracil is alkylated randomly at the S, O, and N atoms.[12]

We found that compound **1a** in acetic acid in the presence of sodium acetate is alkylated selectively at the S atom to give 2-alkylsulfanyl-3-hydroxyquinazolin-4(3*H*)-ones **2a**—**e**.

Scheme 2



2a—e

3a—e

2: R = Et (**a**), Allyl (**b**), Pr^i (**c**), $CH_2C(O)NH_2$ (**d**), 2,4-Cl_2-Bn (**e**)
3: R = Me (**a**), Pr^n (**b**), Bu^i (**c**), Bn (**d**), 2,4-Cl_2-Bn (**e**)

Base-catalyzed alkylation of compound **1a** occurs at both the O and S atoms to yield 2,3-dialkylation products,

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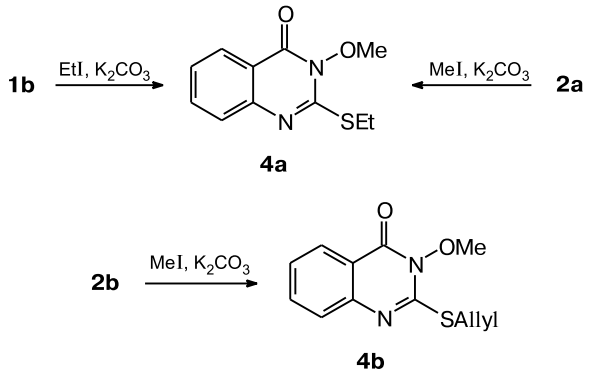
namely, 3-alkoxy-2-alkylsulfanylquinazolin-4(3*H*)-ones **3a**—**e**, regardless of the ratio of the starting reagents or the nature of the alkylating agents. With equal amounts (equivalents) of compound **1a** and alkyl halides, we also obtained products **3a**—**e** (<50% yields) and recovered unreacted compound **1a**; S-monoalkylated derivatives **2a**—**e** were not detected in the reaction mixture.

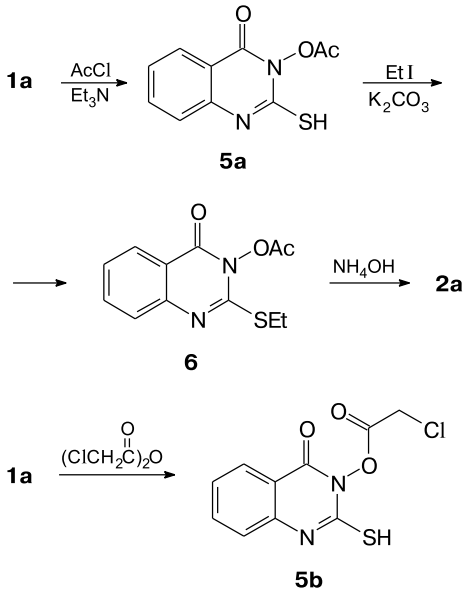
Asymmetric 3-alkoxy-2-alkylsulfanylquinazolin-4(3*H*)-ones **4a,b** were obtained by base-catalyzed alkylation of compounds **1b** and **2a,b**.

Scheme 3



Compound **1a** was selectively acylated at the OH group to give 3-acyloxy-2-sulfanylquinazolin-4(3*H*)-ones **5a,b**.

Scheme 4



Base-catalyzed alkylation of compound **5a** selectively yielded 3-acetoxy-2-ethylsulfanylquinazolin-4(3*H*)-one (**6**), which can be converted into compound **2a** by aminolysis with ammonia in aqueous ethanol.

To sum up, we obtained first representatives of earlier unknown 3-hydroxy- and 3-alkoxy-2-sulfanylquinazolin-4(3*H*)-ones and developed a method for regioselective S-alkylation of 3-hydroxy-2-sulfanylquinazolin-4(3*H*)-one.

Experimental

^{1}H NMR spectra were recorded on Bruker AC-300 and Bruker WM-250 spectrometers (300 and 250 MHz, respectively) in DMSO-d_6. Chemical shifts are given on the δ scale. Mass spectra were measured on a Kratos MS-30 instrument (70 eV).

3-Hydroxy-2-sulfanylquinazolin-4(3*H*)-one (1a). A solution of methyl 2-isothiocyanatobenzoate (19.3 g, 0.1 mol) in chloroform (40 mL) was added at 5—10 °C to a stirred solution of $NH_2OH \cdot HCl$ (6.95 g, 0.1 mol) and NaOH (4.0 g, 0.1 mol) in water (200 mL). The reaction mixture was stirred at room temperature for 2 h. The precipitate that formed was filtered off, washed with water (100 mL) and CH_2Cl_2 (100 mL), and dried at 90 °C. The yield was 17.5 g (90%), white crystals, m.p. 252—254 °C (from ethanol). Found (%): C, 49.56; H, 3.10; N, 14.49; S, 16.49. $C_8H_6N_2O_2S$. Calculated (%): C, 49.48; H, 3.11; N, 14.42; S, 16.51. ^{1}H NMR, δ: 7.22 (m, 1 H, H(6)); 7.40 (d, 1 H, H(8), J = 7.45 Hz); 7.65 (m, 1 H, H(7)); 8.0 (d, 1 H, H(5), J = 7.64 Hz); 10.80 (s, 1 H, SH); 12.75 (s, 1 H, OH). MS, m/z: 194 $[M]^+$.

3-Methoxy-2-sulfanylquinazolin-4(3*H*)-one (1b). Methyl 2-isothiocyanatobenzoate (19.3 g, 0.1 mol) was added to a stirred mixture of methoxyamine hydrochloride (8.35 g, 0.1 mol) and NaOH (4.0 g, 0.1 mol) in dioxane (50 mL) and water (50 mL). The reaction mixture was stirred at 20—25 °C for 2 h and the precipitate that formed was filtered off. Yield 19.0 g (89%), white crystals, m.p. 245—246 °C (from acetone). Found (%): C, 52.05; H, 3.50; N, 14.00; S, 15.24. $C_9H_8N_2O_2S$. Calculated (%): C, 51.91; H, 3.87; N, 13.45; S, 15.40. ^{1}H NMR, δ: 4.0 (s, 3 H, Me); 7.35 (d, 1 H, H(6), J = 8.40 Hz); 7.53 (d, 1 H, H(8), J = 7.86 Hz); 7.71 (t, 1 H, H(7), J = 8.16 Hz); 8.21 (d, 1 H, H(5), J = 7.84 Hz); 13.0 (s, 1 H, SH). MS, m/z: 208 $[M]^+$.

3-Isopropoxy-2-sulfanylquinazolin-4(3*H*)-one (1c) was obtained from isopropoxyamine (7.5 g, 0.1 mol) and methyl 2-isothiocyanatobenzoate (19.3 g, 0.1 mol) as described for compound **1b**. Yield 18.0 g (76.4%), white crystals, m.p. 202—204 °C (from ethanol). Found (%): C, 55.80; H, 5.60; N, 12.20; S, 13.03. $C_{11}H_{12}N_2O_2S$. Calculated (%): C, 55.91; H, 5.12; N, 11.86; S, 13.56. ^{1}H NMR, δ: 1.35 (d, 6 H, Me, J = 5.5 Hz); 4.85 (m, 1 H, CH); 7.40 (d, 1 H, H(6), J = 8.40 Hz); 7.55 (d, 1 H, H(8), J = 7.86 Hz); 7.75 (t, 1 H, H(7), J = 8.16 Hz); 8.10 (d, 1 H, H(5), J = 7.84 Hz). MS, m/z: 236 $[M]^+$.

3-Isobutoxy-2-sulfanylquinazolin-4(3*H*)-one (1d) was obtained from isobutoxyamine (4.5 g, 0.05 mol) and methyl 2-isothiocyanatobenzoate (9.65 g, 0.05 mol) as described for compound **1b**. Yield 10.6 g (85%), m.p. 210—212 °C (from ethanol). Found (%): C, 57.11; H, 5.82; N, 11.10; S, 12.34. $C_{12}H_{14}N_2O_2S$. Calculated (%): C, 57.60; H, 5.60; N, 11.20; S, 12.80. ^{1}H NMR, δ: 1.12 (d, 6 H, Me, J = 6.73 Hz); 2.09 (m, 1 H, CH); 4.10 (d, 2 H, OCH_2, J = 6.42 Hz); 7.40 (m, 1 H, H(6)); 7.55 (d, 1 H, H(8), J = 7.86 Hz); 7.70 (m, 1 H, H(7)); 8.15 (d, 1 H, H(5), J = 7.84 Hz). MS, m/z: 250 $[M]^+$.

2-Ethylsulfanyl-3-hydroxyquinazolin-4(3*H*)-one (2a). Sodium acetate (1.64 g, 0.02 mol) was added to a solution of compound **1a** (3.88 g, 0.02 mol) and ethyl iodide (3.43 g, 0.022 mol)

in acetic acid (20 mL). The reaction mixture was stirred for 1 h and diluted with water (50 mL). The crystals that formed were filtered off and dried in air. The yield was 3.57 g (80.3%), m.p. 169—171 °C (from ethanol). Found (%): C, 54.40; H, 4.32; N, 12.36; S, 14.40. $C_{10}H_{10}N_2,O_2,S$. Calculated (%): C, 54.05; H, 4.53; N, 12.60; S, 14.43. ^{1}H NMR, δ: 1.41 (t, 3 H, Me, J = 7.17 Hz); 2.92 (m, 2 H, SCH_2); 7.31 (t, 1 H, H(6), J = 7.74 Hz); 7.49 (d, 1 H, H(8), J = 8.02 Hz); 7.63 (t, 1 H, H(7), J = 7.95 Hz); 8.00 (d, 1 H, H(5), J = 7.74 Hz); 12.10 (s, 1 H, OH).

Aminolysis of compound 6. Ethanol (5 mL), water (5 mL), and aqueous ammonia (2 mL) were added to compound **6** (0.82 g, 3 mmol). The reaction mixture was heated at 60 °C for 2 h, cooled, diluted with water (10 mL), and acidified with 5% HCl to pH 5. The crystals that formed were filtered off and washed with water on the filter. The yield was 0.58 g (89%), white crystals, m.p. 170—171 °C (from ethanol). The physicochemical and spectroscopic characteristics of the product are identical with those cited above for compound **2a**.

2-Allylsulfanyl-3-hydroxyquinazolin-4(3*H*)-one (2b). Sodium acetate (0.85 g, 10 mmol) and allyl iodide (1.04 g, 6.2 mmol) were added to a suspension of compound **1a** (1 g, 5.2 mmol) in a mixture of ethanol (5 mL) and glacial acetic acid (5 mL). The reaction mixture was refluxed for 3 h. The ethanol was removed and the residue was diluted with water (20 mL). The crystals that formed were filtered off, washed with water, and dried in air. The yield was 0.76 g (63%), m.p. 155—156 °C (from ethyl acetate). Found (%): C, 56.90; H, 4.28; N, 12.50; S, 13.76. $C_{11}H_{10}N_2O_2S$. Calculated (%): C, 56.40; H, 4.30; N, 11.96; S, 13.69. ^{1}H NMR, δ: 3.86 (d, 2 H, SCH_2, J = 6.79 Hz); 5.15 (d, 2 H, CH_2, J = 9.86 Hz); 5.39 (d, 1 H, CH_2, J = 17.94 Hz); 5.98 (m, 1 H, CH); 7.41 (d, 1 H, H(6), J = 7.54 Hz); 7.60 (d, 1 H, H(8), J = 7.90 Hz); 7.79 (t, 1 H, H(7), J = 7.62 Hz); 8.10 (d, 1 H, H(5), J = 7.86 Hz); 11.80 (s, 1 H, OH).

3-Hydroxy-2-isopropylsulfanylquinazolin-4(3*H*)-one (2c) was obtained from compound **1a** (1 g, 5.2 mmol) and isopropyl iodide (1.05 g, 6.2 mmol) as described above for compound **2b**. Yield 1.1 g (90%), white crystals, m.p. 190—191 °C (from ethyl acetate). Found (%): C, 56.34; H, 5.15; N, 12.21; S, 13.18. $C_{11}H_{11}N_2O_2S$. Calculated (%): C, 56.91; H, 5.12; N, 11.86; S, 13.57. ^{1}H NMR, δ: 1.43 (d, 6 H, Me, J = 6.85 Hz); 3.92 (m, 1 H, CH); 7.43 (d, 1 H, H(6), J = 7.83 Hz); 7.58 (d, 1 H, H(8), J = 8.01 Hz); 7.81 (d, 1 H, H(7), J = 6.96 Hz); 8.19 (d, 1 H, H(5), J = 7.83 Hz); 11.21 (s, 1 H, OH).

2-Carbamoylmethylsulfanyl-3-hydroxyquinazolin-4(3*H*)-one (2d) was obtained from compound **1a** (1 g, 5.2 mmol) and chloroacetamide (0.56 g, 6 mmol) as described for compound **2b**. Yield 1.08 g (83%), white crystals, m.p. 218—220 °C (from ethanol). Found (%): C, 47.85; H, 3.48; N, 16.66; S, 12.70. $C_{10}H_9N_3O_3S$. Calculated (%): C, 47.80; H, 3.61; N, 16.72; S, 12.76. ^{1}H NMR, δ: 3.85 (s, 2 H, CH_2); 7.45 (d, 1 H, H(6), J = 7.82 Hz); 7.50 (br.s, 2 H, NH_2); 7.60 (d, 1 H, H(8), J = 8.02 Hz); 7.77 (d, 1 H, H(7), J = 6.98 Hz); 8.10 (d, 1 H, H(5), J = 7.88 Hz); 11.82 (s, 1 H, OH).

2-(2,4-Dichlorobenzyl)sulfanyl-3-hydroxyquinazolin-4(3*H*)-one (2e) was obtained from compound **1a** (1 g, 5.2 mmol) and 2,4-dichlorobenzyl chloride (1.07 g, 5.5 mmol) as described for compound **2b**. Yield 1.69 g (92%), white crystals, m.p. 225—226 °C (from ethanol). Found (%): C, 51.18; Cl, 19.80; H, 2.88; N, 7.75; S, 9.38. $C_{15}H_{10}Cl_2N_2O_2S$. Calculated (%): C, 51.01; Cl, 20.07; H, 2.85; N, 7.93; S, 9.08. ^{1}H NMR, δ: 4.38 (s, 2 H, SCH_2); 7.31 (d, 1 H, H(6), J = 7.83 Hz); 7.40 (d, 1 H, H(8), J = 8.43 Hz); 7.59 (s, 1 H, Ar); 7.65 (d, 2 H, Ar, J = 7.52 Hz); 7.74 (d, 1 H, H(7), J = 8.90 Hz); 8.02 (d, 1 H, H(5), J = 7.92 Hz); 12.14 (s, 1 H, OH).

3-Methoxy-2-methylsulfanylquinazolin-4(3*H*)-one (3a). Method *A*. Potassium carbonate (2.8 g, 0.02 mol) was added to a solution of compound **1a** (1.94 g, 0.01 mol) and methyl iodide (2.52 g, 0.022 mol) in DMSO (15 mL). The reaction mixture was stirred at 35—45 °C for 6 h and diluted with water (30 mL). The precipitate that formed was filtered off. The yield was 1.80 g (80.5%), m.p. 129—130 °C (from hexane). Found (%): C, 54.11; H, 4.58; N, 12.40; S, 14.34. $C_{10}H_{10}N_2O_2S$. Calculated (%): C, 54.05; H, 4.50; N, 12.61; S, 14.41. ^{1}H NMR, δ: 2.62 (s, 3 H, SMe); 4.10 (s, 3 H, OMe); 7.41 (t, 1 H, H(6), J = 8.40 Hz); 7.57 (d, 1 H, H(8), J = 7.80 Hz); 7.75 (t, 1 H, H(7), J = 8.16 Hz); 8.10 (d, 1 H, H(5), J = 7.86 Hz).

Method *B* (with an equivalent amount of an alkyl halide). Potassium carbonate (1.4 g, 0.01 mol) was added to a solution of compound **1a** (1.94 g, 0.01 mol) and methyl iodide (1.42 g, 0.01 mol) in DMSO (15 mL). The reaction mixture was stirred at 35—45 °C for 6 h and diluted with water (30 mL). The precipitate that formed was filtered off and washed with water. The yield was 0.91 g (40.8%). The physicochemical and spectroscopic characteristics of the product are identical with those of compound **3a** obtained according to method ***A***. The filtrate was acidified with 5% HCl to pH 5. The precipitate that formed was filtered off and identified from physicochemical and spectroscopic data as compound **1a**. The yield was 0.88 g (45.3%).

3-Propoxy-2-propylsulfanylquinazolin-4(*H*)-one (3b) was obtained from compound **1a** (1.94 g, 0.01 mol), propyl bromide (2.46 g, 0.02 mol), and K_2CO_3 (3.75 g, 0.02 mol) as described for compound **3a**. Yield 2.4 g (86%), m.p. 73—74 °C (from hexane). Found (%): C, 60.12; H, 6.48; N, 10.03; S 11.50. $C_{14}H_{18}N_2O_2S$. Calculated (%): C, 60.41; H, 6.52; N, 10.06; S, 11.52. ^{1}H NMR, δ: 1.5 (m, 6 H, Me); 1.82 (m, 2 H, $SCH_2\underline{CH_2}$); 2.03 (m, 2 H, $OCH_2\underline{CH_2}$); 4.05 (t, 2 H, SCH_2, J = 7.07 Hz); 4.90 (t, 2 H, OCH_2, J = 6.86 Hz); 7.35 (t, 1 H, H(6), J = 7.82 Hz); 7.48 (d, 1 H, H(8), J = 8.02 Hz); 7.70 (t, 1 H, H(7), J = 6.98 Hz); 8.10 (d, 1 H, H(5), J = 7.83 Hz).

3-Isobutoxy-2-isobutylsulfanylquinazolin-4(3*H*)-one (3c). Potassium carbonate (3.01 g, 0.022 mol) and isobutyl bromide (3.04 g, 0.022 mol) were added to a stirred solution of compound **1a** (1.94 g, 0.01 mol) in DMSO (15 mL). The reaction mixture was kept at room temperature for 24 h and then diluted with water (30 mL). The product was extracted with ethyl acetate. The organic phase was washed with brine (20 mL), dried over Na_2SO_4, and concentrated. The yield was 2.26 g (74%), light yellow oil. Found (%): C, 62.60; H, 7.19; N, 9.40; S, 10.14. $C_{16}H_{22}N_2O_2S$. Calculated (%): C, 62.72; H, 7.24; N, 9.15; S, 10.46. ^{1}H NMR, δ: 1.03 (d, 12 H, Me, J = 6.72 Hz); 1.97 (m, 1 H, CH); 2.09 (m, 1 H, CH); 3.09 (d, 2 H, SCH_2, J = 6.67 Hz); 4.04 (d, 2 H, OCH_2, J = 6.42 Hz); 7.32 (d, 1 H, H(6), J = 7.54 Hz); 7.48 (d, 1 H, H(8), J = 8.11 Hz); 7.53 (d, 1 H, H(7), J = 7.68 Hz); 7.98 (d, 1 H, H(5), J = 7.92 Hz).

3-Benzyloxy-2-benzylsulfanylquinazolin-4(3*H*)-one (3d) was obtained from compound **1a** (0.01 mol), benzyl bromide (0.02 mol), and K_2CO_3 (0.02 mol) as described for compound **3a**. Yield 3.37 g (90.0%), m.p. 161—162 °C (from cyclohexane). Found (%): C, 70.54; H, 4.58; N, 7.40; S, 8.19. $C_{22}H_{18}N_2O_2S$. Calculated (%): C, 70.58; H, 4.81; N, 7.48; S, 8.56. ^{1}H NMR, δ: 4.45 (s, 2 H, SCH_2); 5.40 (s, 2 H, OCH_2); 7.40 (m, 11 H); 7.67 (d, 1 H, H(8), J = 8.02 Hz); 7.75 (t, 1 H, H(7), J = 6.96 Hz); 8.15 (d, 1 H, H(5), J = 7.84 Hz).

3-(2,4-Dichlorobenzyloxy)-2-(2,4-dichlorobenzylsulfanyl)-quinazolin-4(3*H*)-one (3e) was obtained from compound **1a** (1.94 g, 0.01 mol), 2,4-dichlorobenzyl chloride (3.91 g, 0.02 mol), and K_2CO_3 (2.75 g, 0.02 mol) as described for compound **3a**. Yield 4.28 g (84%), white crystals, m.p. 182—183 °C (from cyclohexane). Found (%): C, 51.23; Cl, 27.50; H, 2.70; N, 5.80; S, 6.21. $C_{22}H_{14}Cl_4N_2O_2S$. Calculated (%): C, 51.59; Cl, 27.70; H, 2.75; N, 5.47; S, 6.26. ^{1}H NMR, δ: 4.50 (s, 2 H, SCH_2); 5.38 (s, 2 H, OCH_2); 7.25 (d, 1 H, arom., J = 8.24 Hz); 7.35 (d, 1 H, arom., J = 8.22 Hz); 7.45 (m, 5 H, arom.); 7.65 (s, 1 H, arom.); 7.78 (t, 1 H, H(7), J = 8.11 Hz); 8.13 (d, 1 H, H(5), J = 7.76 Hz).

2-Ethylsulfanyl-3-methoxyquinazolin-4(3*H*)-one (4a). Method *A*. Potassium carbonate (1.4 g, 0.01 mol) was added to a solution of compound **1b** (2.08 g, 0.01 mol) and ethyl iodide (1.56 g, 0.01 mol) in DMSO (15 mL). The reaction mixture was stirred at 45 °C for 6 h, cooled, and diluted with water (30 mL). The precipitate that formed was filtered off. The yield was 1.90 g (80%), beige crystals, m.p. 63—64 °C (from cyclohexane). Found (%): C, 55.40; H, 5.24; N, 12.00; S, 13.44. $C_{11}H_{12}N_2O_2S$. Calculated (%): C, 55.90; H, 5.08; N, 11.86; S, 13.56. ^{1}H NMR, δ: 1.38 (t, 3 H, Me); 3.15 (q, 2 H, S$\underline{CH_2}$); 4.1 (s, 3 H, OMe); 7.12 (d, 1 H, H(6), J = 7.86 Hz); 7.52 (t, 1 H, H(8), J = 8.04 Hz); 7.77 (t, 1 H, H(7), J = 6.98 Hz); 8.12 (d, 1 H, H(5), J = 7.87 Hz).

Method *B*. Potassium carbonate (1.4 g, 0.01 mol) was added to a solution of compound **2a** (2.22 g, 0.01 mol) and methyl iodide (1.56 g, 0.011 mol) in DMSO (15 mL). The reaction mixture was stirred at 45 °C for 6 h, cooled, and diluted with water (30 mL). The precipitate that formed was filtered off. The yield was 1.96 g (82.3%). The physicochemical and spectroscopic characteristics of the product are identical with those of compound **4a** obtained according to method *A*.

2-Allylsulfanyl-3-methoxyquinazolin-4(3*H*)-one (4b). Potassium carbonate (1.4 g, 0.01 mol) was added to a solution of compound **2b** (2.34 g, 0.01 mol) and methyl iodide (1.56 g, 0.011 mol) in DMSO (15 mL). The reaction mixture was stirred at 45 °C for 6 h, cooled, and diluted with water (30 mL). The precipitate that formed was filtered off. The yield was 2.10 g (84.6%), beige crystals, m.p. 134—135 °C (from cyclohexane). Found (%): C, 57.97; H, 4.85; N, 11.14; S, 12.74. $C_{12}H_{12}N_2O_2S$. Calculated (%): C, 58.06; H, 4.87; N, 11.28; S, 12.91. ^{1}H NMR, δ: 3.90 (d, 2 H, SCH_2, J = 6.79 Hz); 4.1 (s, 3 H, OMe); 5.18 (d, 1 H, CH_2, J = 9.88 Hz); 5.38 (d, 1 H, CH_2, J = 17.94 Hz); 6.00 (m, 1 H, CH); 7.40 (t, 1 H, H(6), J = 7.45 Hz); 7.55 (d, 1 H, H(8), J = 8.01 Hz); 7.72 (t, 1 H, H(7), J = 7.62 Hz); 8.12 (d, 1 H, H(5), J = 7.84 Hz).

3-Acetoxy-2-sulfanylquinazolin-4(3*H*)-one (5a). Acetyl chloride (1.6 g, 0.02 mol) was added at 10 °C to a stirred solution of compound **1a** (3.9 g, 0.02 mol) and triethylamine (2.0 g, 0.02 mol) in dioxane (20 mL). The reaction mixture was stirred at room temperature for 12 h and diluted with water (40 mL). The precipitate that formed was filtered off, dried, and crystallized from ethyl acetate. The yield was 4.0 g (90%), m.p. 265—266 °C (from ethyl acetate). Found (%): C, 50.40; H, 3.28; N, 11.60; S, 13.40. $C_{10}H_8N_2O_3S$. Calculated (%): C, 50.84; H, 3.41; N, 11.86; S, 13.56. ^{1}H NMR, δ: 2.45 (s, 3 H, CH_3); 7.42 (t, 1 H, H(6), J = 7.83 Hz); 7.58 (d, 1 H, H(8), J = 8.01 Hz); 7.85 (t, 1 H, H(7), J = 7.94 Hz); 8.10 (d, 1 H, H(5), J = 6.81 Hz); 13.34 (s, 1 H, SH).

3-Chloroacetoxy-2-sulfanylquinazolin-4(3*H*)-one (5b). Chloroacetic anhydride (0.53 g, 3.1 mmol) was added to a suspension of compound **1a** (0.5 g, 2.6 mmol) in chloroform (30 mL). The reaction mixture was refluxed for 3 h and cooled. The crystals that formed were filtered off and washed with ether. The yield was 0.54 g (77%), m.p. 215—216 °C (from ethyl acetate). Found (%): C, 44.40; Cl, 13.30; H, 2.55, N, 10.44; S, 11.80. $C_{10}H_7ClN_2O_3S$. Calculated (%): C, 44.36; Cl, 13.10; H, 2.61; N, 10.35; S, 11.82. ^{1}H NMR, δ: 4.94 (s, 2 H, CH_2); 7.51 (m, 1 H, H(6)); 7.56 (d, 1 H, H(8), J = 8.04 Hz); 7.86 (t, 1 H, H(7), J = 7.94 Hz); 8.02 (d, 1 H, H(5), J = 6.81 Hz); 13.42 (s, 1 H, SH).

3-Acetoxy-2-ethylsulfanylquinazolin-4(3*H*)-one (6). Potassium carbonate (0.65 g, 4.7 mmol) and ethyl bromide (0.51 g, 4.7 mmol) were added to a stirred solution of compound **5a** (1 g, 4.2 mmol) in DMSO (7 mL). The reaction mixture was kept at room temperature for ~8 h and diluted with water (10 mL). The oil that formed was subjected to extraction with ethyl acetate (2×10 mL). The organic layer was washed with water (10 mL) and brine (10 mL), dried over Na_2SO_4, and concentrated. The yield was 0.82 g (74%), light oil. Found (%): C, 54.23; H, 4.52; N, 10.80; S, 11.95. $C_{12}H_{12}N_2O_3S$. Calculated (%): C, 54.53; H, 4.58; N, 10.60; S, 12.13. ^{1}H NMR, δ: 1.38 (t, 3 H, Me, J = 7.82 Hz); 2.45 (s, 3 H, $C(O)CH_3$); 3.20 (m, 2 H, SCH_2); 7.42 (t, 1 H, H(6), J = 7.83 Hz); 7.58 (d, 1 H, H(8), J = 8.01 Hz); 7.85 (t, 1 H, H(7), J = 7.94 Hz); 8.10 (d, 1 H, H(5), J = 7.80 Hz).

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