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# SELENIUM HETEROCYCLES PART II[1]

# A SYNTHESIS OF THE NOVEL DISELENOLO(3,4-b)QUINOLINE SYSTEM

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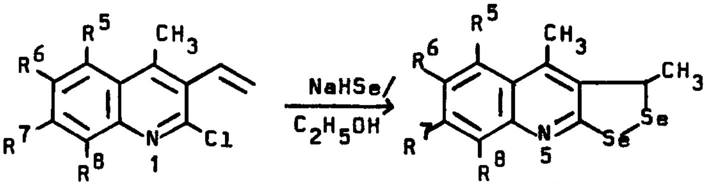
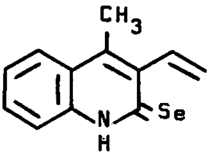
Recently we have demonstrated the utility of 2-oxo-[2] and 2-thioxo-3-vinylquinolines[3] for the synthesis of furo-and thieno(2,3-b)quinolines. Subsequently we were interested in selenolo(2,3-b)quinolines and we hoped to realise their synthesis through 2-chloro-3-vinylquinolines[3]. Expecting to obtain the selenoxoquinoline **2a**, we heated **1a**[3a] with an ethanol solution containing sodium hydroselenide prepared *in situ*[4a,4b] using two-molar (or more) proportions[5] of selenium and sodium borohydride.



**a** $R^5{=}R^6{=}R^7{=}R^8{=}H$;
**b** $R^5{=}R^7{=}R^8{=}H$, $R^6{=}Br$;
**c** $R^5{=}R^8{=}H$, $R^6{=}R^7{=}OCH_3$.



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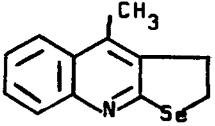

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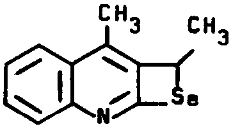

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The product obtained as a red crystalline solid, m.p. 116°, in 62% yield was found to lack the *vinyl*-, the *NH*-, and the selenoxo-groups as shown by its I.R. and N.M.R. spectra. The N.M.R. spectrum (60Mc) exhibited in addition to phenyl (at $\delta$ 7.23-8.13, m, 5H) and $C_4$-methyl protons (at $\delta$ 2.67, s, 3H), a three proton doublet(at $\delta$ 1.97, J=7Hz, 3H) and an one proton quartet (at $\delta$ 4.93, J=7Hz, 1H). The N.M.R. spectrum is in accordance with structure **4a** and rules out the structures **2a** and **3a** for the product. But the mass spectrum (70 e.v.) showed the molecular ion peak at m/e = 327 with characteristic isotopic abundance pattern[6] expected of selenium-containing compounds. This precludes the representation of the product by **4a**(m.wt.=248).

Considering the above spectral data the product can be formulated as 4a with an extra selenium atom incorporated in it and the structure 5a viz., 3,4-dimethyl-3(H)-1,2-diselenolo(3,4-b)quinoline[7] thus assigned, was further corroborated by elemental analysis.

To our best knowledge there is no report in the literature on such a ring system. A similar treatment of the chloroquinolines 1b[3b] and 1c[3a] led respectively to 5b, m.p. 144-146°, yield 71%, $\delta$ 2.00 (d, J=7Hz, 3H, $C_3$-$CH_3$), 2.67 (s, 3H, $C_4$-$CH_3$), 4.95 (q, J=7Hz, 1H, $C_3$-H), 7.82 (bs, 2H, $C_7$-and $C_8$-H), 8.13 (bs, 1H, $C_5$-H), m/e= 406($M^+$) and 5c, m.p. 157-158°, yield 67%, $\delta$ 1.97 (d, J=7Hz, 3H, $C_3$-$CH_3$) 2.63 (s, 3H, $C_4$-$CH_3$), 4.02 (s, 6H, $C_6$-and $C_7$-$OCH_3$), 4.85 (q, J=7Hz, 1H, $C_3$-H), 7.30 (s, 1H, $C_8$-H), 7.35 (s, 1H, $C_5$-H), m/e=387($M^+$). The products 5a to 5c were recrystallised from light petrol (40-60°).

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7. We thank Dr W.H.H. Gunther, Xerox Corporation, New York, U.S.A., for suggesting the nomenclature.