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SULPHUR EXTRUSION WITH N,N-DIMETHYLFORMAMIDE AND SODIUM ETHOXIDE-A CONVENIENT SYNTHESIS OF 4-(1-ACYL AND ACYLOXYALKYLIDENE)-3,4-DIHYDROQUINAZOLINES

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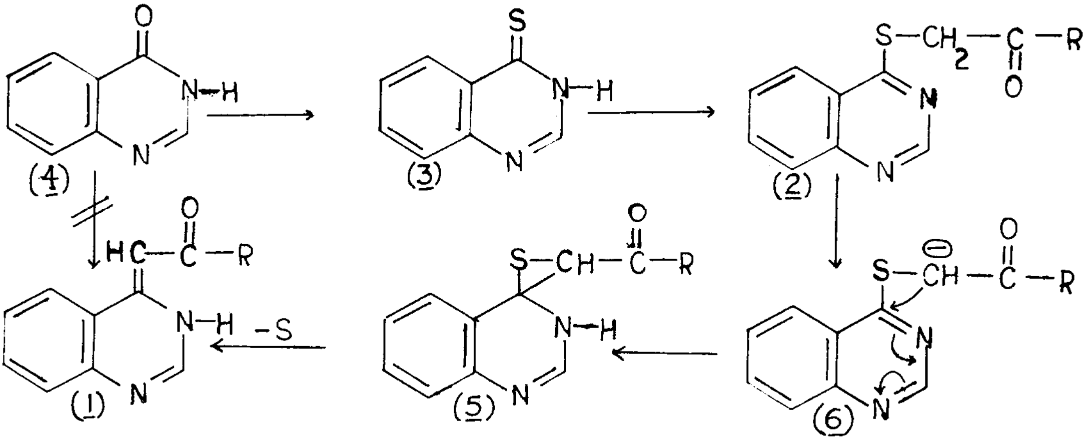
Heterocyclics possessing acyl or acyloxy methylidene group at carbon next to -NH constitute widely used synthetic intermediates[1,2] which have been prepared by using Wittig reaction[3] on corresponding lactams as well as through Bischler Napieralski ring closure reaction.[4] Here is reported an alternate synthesis of such derivatives of quinazoline (1, R=OC_2H_5,alkyl,aryl)[5] through a sequence of reactions involving the desulphurisation of 4-(1-acyl-and acyloxy) alkylthio quinazolines (2) obtained from appropriate α-haloketones and acetates and quinazolinyl 4-thiolate formed from quinazolin-4(3H)-thione (3) which in turn was obtained from the lactam, quinazolin-4(3H)-one (4). We had noticed the desulphurisation of 1-(α-oxocyclohexyl)thio isoquinoline and 4-(α-oxocyclohexyl) thio quinazoline on refluxing their solutions in N,N-dimethylformamide.[6] It was argued that such a carbon carbon bond formation could take place through S extrusion of the episulphide intermediate (5),[7] the formation of which would be facilitated by the generation of carbanion (6). Hence we added excess of sodium ethoxide to the solutions of (2) in DMF and found that reactions proceeded smoothly at ambient temperature. After the completion of the reactions (tlc), the following products[8] were isolated and were purified by crystallisation.

Product (R)	Time (Hrs.)	Yield (%)	m.p. (°C)	$M^{\cdot+}$m/e
1(CH_3)	12	62	109(n-hexane)	186
1(C_6H_5)	0.25	60	149(ethanol)	248
1(C_6H_4Br)	1.5	75	230(benzene)	-
1(OC_2H_5)	12	75	103(pet ether)	172

In the nmr spectra, the most downfield C_2-H signal of (2) shifts upfield in case of (1) and the $-CH_2-$ signal in (2) shifts downfield to a =CH- signal. In 1, the i.r. absorption frequencies for CO are lowered and the u.v. absorptions experience bathochromic shifts as compared with those in (2). These observations have been attributed to the absence of ring current in dihydropyrimidine moiety and the conjugation of the exocyclic double bond in (1) with CO.



Eschenmosher reported analogous desulphurisations of α-(2-pyrolidinylthio) ketones to 2-(1-acylalkylidene) pyrrolidines with triphenylphosphine.[9] For a comparison of the use of (i) triphenylphosphine and (ii) dimethylformamide/ sodium ethoxide, we desulphurised (I,R=C_6H_5) and α-(2-pyrrolidinylthio) propanone under both the conditions. In case of (ii), these reactions proceeded at room temperature and were completed in lesser time and the products were isolated by mere crystallisation. In case of (i), in contrast to the earlier reports,[9] alongwith triphenyl phosphine sulphide, a substantial amount of triphenyl phosphine oxide was formed and the products were invariably isolated by chromatography. Hence the use of dimethyl formamide/sodium ethoxide for such desulphurisations is practically advantageous over the use of triphenylphosphine.

References and Notes

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