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REACTION OF 1,2,3,4-TETRAHYDRO-ISOQUINOLINE ENAMINOAMIDES WITH MALONYL DICHLORIDE

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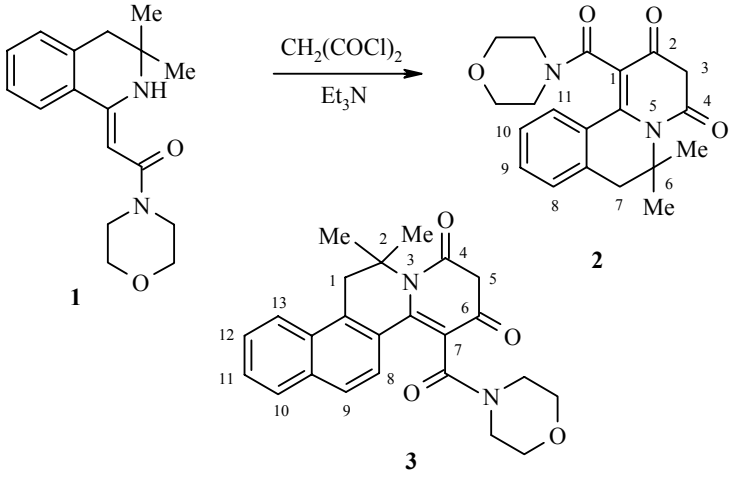
Keywords: 1,2,3,4-tetrahydroisoquinoline enaminoamides, malonyl dichloride, 6,6-dimethyl-1-(N-morpholinocarbonyl)-2,3,4,5,6,7-hexahydrobenzo[*h*]quinolizine-2,4-dione, 2,2-dimethyl-7-(N-morpholinocarbonyl)-1,2,3,4,5,6-hexahydronaphtho[1,2-*h*]quinolizine-4,6-dione.

The possibility of constructing an azachrysene system *via* the reaction of benzo[*f*]isoquinoline enamines with acryloyl chloride has previously been demonstrated [1]. Continuing our studies in this area we decided to use malonyl dichloride as the acylating agent. Up to this time the reactions of this acid chloride with enamines are almost unknown.

Investigations have shown that the enaminoamide **1** [2] forms the tricyclic diketone **2** when refluxed with malonyl dichloride in benzene in the presence of triethylamine. The reaction of malonyl dichloride with similar benzo[*f*]isoquinoline series compounds gives the tetracyclic diketone **3**.



The β-dicarbonyl compounds **2** and **3** can be regarded as novel synthons and as potential medicinal substances.

^{1}H NMR spectra were recorded on a Bruker-300 (300 MHz) instrument using $CDCl_3$ solvent with HMDS as internal standard. IR spectra were recorded on a Specord M-80 spectrometer using vaseline oil and mass spectra on a MAT-311 instrument (70 eV, EI).

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6,6-Dimethyl-1-(N-morpholinocarbonyl)-2,3,4,5,6,7-hexahydrobenzo[*h*]quinolizine-2,4-dione (2). Malonyl dichloride (1.41 g, 10 mmol) was added to a solution of compound **1** (3.4 g, 10 mmol) and triethylamine (1.5 ml, 11 mmol) in benzene (100 ml). The precipitated triethylamine hydrochloride was filtered off. The reaction mixture was refluxed for a further 1 h and the solution turned slightly turbid. After cooling to 20ºC the mixture was diluted with hexane (150 ml) and the precipitate was filtered off, dried, and recrystallized from hexane. Yield 62%; mp 78-80ºC. IR spectrum, ν, cm^{-1}: 1630 (C=O ketone), 1675 (C=O amide), 1700 (C=O lactam). ^{1}H NMR spectrum, δ, ppm: 1.36 (6H, s, $2CH_3$); 2.78 (2H, s, 7-CH_2); 2.95-3.50 (8H, m, $4CH_2$ morpholine); 3.63 (2H, s, 3-CH_2); 7.10-7.57 (4H, m, Ar). Mass spectrum, *m/z* (I_{rel}, %): 354 $[M]^+$ (52); 200 $[M^+$-$C(O)N(CH_2)_4CC(O)]$ (100); 86 $[C(O)N(CH_2)_4]$ (86); 42 $[CH_2C(O)]$ (78%). Found, %: C 67.7; H 6.2; N 8.0. $C_{20}H_{22}N_2O_4$. Calculated, %: C 67.8; H 6.3; N 7.9.

2,2-Dimethyl-7-(N-morpholinocarbonyl)-1,2,3,4,5,6-hexahydronaphtho[1,2-*h*]quinolizine-4,6-dione (3) was prepared similarly from the corresponding benzo[*f*]isoquinoline series morpholide [3] (3.90 g, 10 mmol). Yield 70%; mp 114-116°C. IR spectrum, ν, cm^{-1}: 1630 (C=O ketone), 1670 (C=O amide), 1690 (C=O lactam). ^{1}H NMR spectrum, δ, ppm: 1.32 (6H, s, $2CH_3$); 3.0 (2H, s, 1-CH_2); 3.0-3.64 (8H, m, $4CH_2$ morpholine); 3.70 (2H, s, 5-CH_2); 7.16-7.90 (6H, m, Ar). Mass spectrum, *m/z* (I_{rel}, %): 404.5 $[M]^+$ (43); 250 $[M^+$-$C(O)N(CH_2)CC(O)]$ (100); 86 $[C(O)N(CH_2)_4]$ (75); 42 $[CH_2C(O)]$ (70%). Found, %: C 71.2; H 5.9; N 7.0. $C_{24}H_{24}N_2O_4$. Calculated, %: C 71.3; H 6.0; N 6.9.

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