STUDY ON THE SYNTHESIS OF HEXAHYDROBENZO[c]PHENANTHRIDINE ALKALOIDS

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In order to challenge to total synthesis of hexahydrobenzo[c]phenanthridine alkaloids, i.e., corynoline and chelidonine, which are representative alkaloids hitherto relatively untouched from attack of synthetic organic chemists, it is required to overcome the following three structural features common in these alkaloids from the synthetic strategy.

This paper describes how we dealt with these problems by employing some basic compounds.

1) Synthesis of the basic structures of 2,3,7,8-tetrasubstituted hexahydrobenzo-[c]phenanthridines. ---------- By applying the enamide photocyclisation, the compounds (II) were prepared.

2) Conversion of the trans-isomer (IV) into the cis-isomer (V).---------- Photo-induced isomerisation of the trans-isomer (IV) into the corresponding cis-isomer (V) was developed by the prolonged irradiation.

3) Stereoselective introduction of the hydroxyl group into 11- and 12-positions. ---------- Peracid oxidation either on the dehydrolactam (VI) or the dehydroamine (X) proceeded stereoselectively to afford a variety of the hydroxylated compounds respectively.

Finally, oxidative conversion of the fully aromatised benzo[c]phenanthridine (IIIa) into the hydroxylated compounds (XIII and XIV) was also studied.