Preparation of 1,3-Dimethyl-5*H*-tropano[3,4-*e*]pyridazin-4-one

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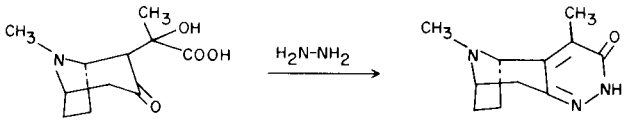
Tropinone has been considered as an extension of our earlier work on the condensation of pyruvic acid with cyclic ketones (3,4,5). The condensation of equimolecular quantities of pyruvic acid and tropinone was effected in alkaline media. On acidification with hydrochloric acid, the product α(2-keto tropanyl) lactic acid (I) crystallized as the hydrochloride salt. This compound is hygroscopic.



I II

Treatment of the crude hydrochloride salt of the acid (I) with hydrazine hydrate in 1-butanol gave 1,3-dimethyl-5*H*-tropano[3,4-*e*]pyridazin-4-one (II) as a crystalline solid. The structure of this compound (II) was confirmed by ultraviolet and infrared spectral studies.

EXPERIMENTAL (6)

α(2-Keto tropanyl)lactic acid (I).

Pyruvic acid (2.64 g., 0.03 mole) was cooled in an ice-bath and neutralized with 20% potassium hydroxide. To this neutralized solution, 4.17 g. (0.03 mole) of tropinone was added and the *p*H was adjusted to 11. After standing at room temperature for 5 days, the solution was extracted with ether to remove unreacted tropinone and the aqueous layer was adjusted to *p*H 7 with 10% hydrochloric acid. The neutral solution was evaporated in a rotatory evaporator to give an orange coloured residue which was redissolved in 30 ml. of water. Acidification to *p*H 2 with 50% hydrochloric acid and evaporation in a rotatory evaporator gave a light brown material. This material was extracted with boiling isopropyl alcohol, filtered through a hot funnel and the filtrate cooled. The hydrochloride salt of the acid α(2-keto tropanyl)lactic acid (I) crystallized as a yellowish powder which was very hygroscopic.

1,3-Dimethyl-5*H*-tropano[3,4-*e*]pyridazin-4-one (II).

To 4.0 g. of the crude hydrochloride salt of the acid (I) dissolved in 30 ml. of 1-butanol, was added 1.0 g. of hydrazine hydrate dissolved in 5 ml. of 1-butanol and the resulting solution was refluxed for 8 hours. The excess 1-butanol was removed by a rotatory evaporator to give a yellowish oily residue which was redissolved in 30 ml. of water. This solution was made alkaline with solid potassium carbonate, extracted with chloroform, dried over anhydrous magnesium sulphate and evaporated to give a semicrystalline residue. The residue was washed with a minimum amount of acetone to give 0.73 g. (12%) of yellowish white shining needles of 1,3-dimethyl-5*H*-tropano[3,4-*e*]pyridazine-4-one (II), m.p. 251-252° (from methanol); UV λ max (ethanol), 290 mμ (ε, 3,162); infrared cm^{-1} (chloroform), 3400 (NH), 1640 (C=O), 1600 and 1550 (double bond).

Anal. Calcd. for $C_{11}H_{15}N_3O$: C, 64.37; H, 7.37; N, 20.47. Found: C, 64.18; H, 7.31; N, 20.19.

REFERENCES

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(6) Melting points were taken in a Gallenkamp capillary melting point apparatus. The infrared spectra was recorded with a Beckman IR 5 spectrophotometer. The ultraviolet spectra were recorded with a Beckman DB spectrophotometer. The microanalysis was done at the Organic Chemistry Laboratory of the Faculty of Pharmacy, Strasbourg, France.

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