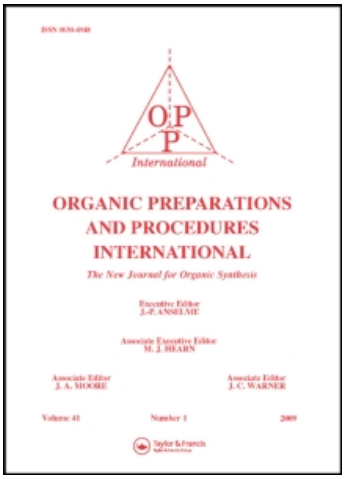


Organic Preparations and Procedures International
Publication details, including instructions for authors and subscription information:
http://www.informaworld.com/smpp/title~content=t902189982

SYNTHESIS OF 3,6-DIHYDROXY-4-PYRIMIDINONES (SYNTHESES OF HETEROCYCLES, 173.)

W. Steiger[a]; A. Argyrides[a]; E. Ziegler[a]
[a] Institut für Organische Chemie Universität, Graz, Austria

To cite this Article Steiger, W. , Argyrides, A. and Ziegler, E.(1972) 'SYNTHESIS OF 3,6-DIHYDROXY-4-PYRIMIDINONES (SYNTHESES OF HETEROCYCLES, 173.)', Organic Preparations and Procedures International, 4: 6, 253 — 256
To link to this Article: DOI: 10.1080/00304947209458272
URL: http://dx.doi.org/10.1080/00304947209458272

ORGANIC PREPARATIONS AND PROCEDURES INT. 4(6), 253-256 (1972)

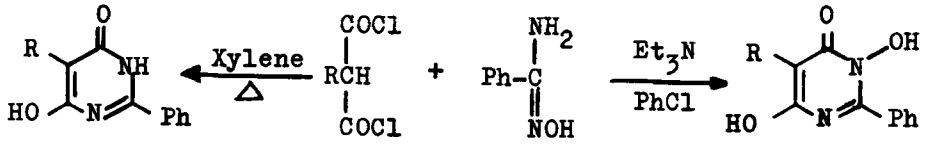
SYNTHESIS OF 3,6-DIHYDROXY-4-PYRIMIDINONES

(SYNTHESES OF HETEROCYCLES, 173.)

W. Steiger, A. Argyrides und E. Ziegler
Institut für Organische Chemie
Universität Graz, Austria

A previous communication[1] described the preparation of 3-alkoxy-6-hydroxy-4-pyrimidinones from the reaction of amidoxime ethers and malonyl chlorides in boiling xylene. The reaction between the free benzamidoxime[2] and benzylmalonyl chloride (Ia) under the same conditions gave, besides benzamide as the major product, benzamidoxime hydrochloride and 3,5-diphenyl-1,2,4-oxadiazole[3], only 6-hydroxy-5-benzyl-2-phenyl-3,4-dihydro-4-pyrimidinone (IIa).[4]

However, in the presence of triethylamine and with chlorobenzene as solvent, reaction takes place between benzamidoxime and Ia to give 5-benzyl-2-phenyl-3,6-dihydroxy-3,4-dihydro-4-pyrimidinone (IIIa). Similarly, from methylmalonyl chloride (Ib) and benzamidoxime, 5-methyl-2-phenyl-3,6-dihydroxy-4-pyrimidinone (IIIb) can be isolated.



IIa: R=$PhCH_2$ Ia: R=$PhCH_2$ IIIa: R=$PhCH_2$

Ib: R=CH_3 IIIb: R=CH_3

When heated with acetic anhydride, compound IIIa gives a diacetate. The high infrared carbonyl absorption of this derivative at 1820 cm^{-1} is characteristic for acetates of hydroxamic acids.[5,6]

Both IIIa and IIIb eliminate oxygen when heated or irradiated (daylight is sufficient), IIIa giving compound IIa and IIIb being converted to 6-hydroxy-5-methyl-2-phenyl-3,4-dihydro-4-pyrimidinone.[4] Both compounds have been prepared by the procedure of Dox and Yoder[4] and found to be identical with our substances in every respect (IR and chromatographic behaviour).

EXPERIMENTAL

5-Benzyl-2-phenyl-3,6-dihydroxy-3,4-dihydro--4-pyrimidinone (IIIa). A solution of 2.3 g (0.01 mole) of benzylmalonyl chloride (Ia), 2 g (0.015 mole) benzamidoxime and 3 ml triethylamine in 70 ml chlorobenzene was refluxed for 30 min. The reaction mixture was concentrated under reduced pressure to an oil, which was treated with water and a few drops of 5% HCl. The mixture was allowed to stand for 24 hrs. and an oil separated. After separation from the aqueous layer, the residue was triturated with a little methanol. Recrystallisation from ethanol afforded 1.0 g (34%) of IIIa, mp. 232° as pale yellow prisms.

Anal. Calcd. for $C_{17}H_{14}N_2O_3$: C, 69.38; H, 4.79; N, 9.52

Found: C, 69.19; H, 4,81; N, 9.60.

Diacetate of IIIa . A solution of 0.5 g (0.0015 mole) of IIIa in 20 ml acetic anhydride was refluxed for 1 hour. Removal of the solvent in vacuo left a residue which was triturated with diethyl ether. The product was recrystallised from methanol to give 0.5 g (72%) of colorless needles, mp. 133°. Anal. Calcd. for $C_{21}H_{18}N_2O_5$: N, 7.40. Found: N, 7.65.

5-Methyl-2-phenyl-3,6-dihydroxy-3,4-dihydro--4-pyrimidinone (IIIb). A solution of 1.6 g (0.01 mole) of methylmalonyl chloride, 2.0 g (0.015 mole) of benzamidoxime and 3 ml triethylamine in 70 ml chlorobenzene was refluxed for 30 min. The solvent was removed and the mixture was worked up as described for IIIa. Recrystallisation from ethanol gave 1.2 g (55%) of pale yellow needles, mp. 260°. Anal. Calcd. for $C_{11}H_{10}N_2O_3$: N, 7.40. Found: N, 7.65.

ACKNOWLEDGEMENT

We are pleased to acknowledge a grant from Ciba-Geigy, Basel, for support of this work.

REFERENCES

1. E. Ziegler, A. Argyrides and W. Steiger, Monatsh. Chem., 102, 301 (1971).
2. F. Tiemann, Ber., 17, 126 (1884).
3. O. Schulz, Ber., 18, 1080 (1885).
4. A. W. Dox and L. Yoder, J. Am. Chem. Soc., 44, 364 (1922).
5. C. Kaneko, Yakugaki Zasshi 79, 428 (1959); CA., 53, 17126 b (1959).

6. A. Ohta and E. Ochiai, Chem. Pharm. Bull. (Tokyo), 10, 1260 (1962); CA., 59, 3888 b (1963).

(Received July 24, 1972; in revised form December 26, 1972)