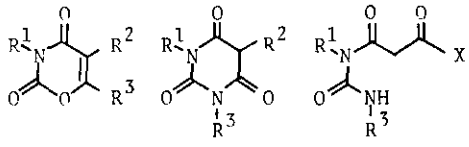
RING TRANSFORMATION REACTION OF 1,3-OXAZINES TO PYRIMIDINES

Motoi Yogo
Fuculty of Pharmacy, Meijo University,
Tempaku-cho, Tempaku-ku, Nagoya 468, Japan
Kosaku Hirota and Shigeo Senda
Gifu College of Pharmacy,
Mitahora-higashi, Gifu 502, Japan

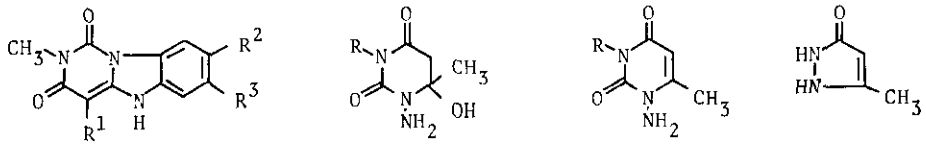
Reactions of 1,3-oxazine-2,4-dione derivatives with nucleophiles such as amines and hydrazine have been investigated.

Treatment of the 6-chloroxazines(Ia:R^1=CH_3, R^2=H,CH_3, R^3=Cl; Ib:R^1=C_2H_5, R^2=CH_3, R^3=Cl) with an aqueous solution of ammonia, methylamine, or ethylamine in THF at 0-5°C caused a ring transformation to pyrimidine ring system giving the corresponding barbituric acids(II:R^1=CH_3, R^2=H, R^3=H,CH_3,C_2H_5; R^1=CH_3,C_2H_5, R^2=R^3=CH_3) along with the open-chain urea(III:X=NHR^3). Further examination of the ring transformation showed that it proceeded *via* formation and recyclization of an intermediate(III:X=Cl). Reaction of Ia with *o*-phenylenediamines also gave the ring transformation products, pyrimido[1,6-*a*]-benzimidazole-1,3(2H,5H)-diones(IV:R^1=H,CH_3, R^2,R^3=H,CH_3,Cl).

The 6-methyloxazines(Ic:R^1=H,CH_3, R^2=H, R^3=CH_3) were treated with hydrazine hydrate in ethanol at room temperature giving the compounds(V:R=H,CH_3) which were considered to be intermediates in the ring transformation* of Ic into the 1-aminouracils(VI:R=H,CH_3) or 5-methylpyrazol-3-one(VII). The best evidence for the structure of V has come from ^{15}N-NMR Fourier transform spectra. Further examination of the ring transformation suggested that dehydration of V affords VI and, on the other hand, VII is formed by the reaction of V with an additional molecule of hydrazine hydrate.



(I) (II) (III)



(IV) (V) (VI) (VII)

* S. Ahmed, R. Lofthouse, and G. Shaw, *J. Chem. Soc., Perkin Trans. I*, 1969(1976); T. Kato, U. Izumi, and N. Katagiri, *J. Heterocycl. Chem.*, 15, 1475(1978).