SYNTHESIS AND RELATED REACTIONS OF 5- AND 10-THIAISOALLOXAZINES

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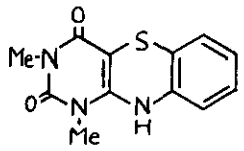
The Smiles-type rearrangement of 1,3-dimethyl-5-bromo-6-(2-aminophenylthio)uracil (1) and 1,3-dimethyl-6-(2-aminophenylthio)uracil (2) was investigated in addition to the previous study on 1,3-dimethyl-5-nitro-6-(2-aminophenylthio)uracil (3).

The thermal rearrangement of (1) followed by cyclization occurred with ease to give dihydro-5-thiaisoalloxazine (4), which is much more convenient for the preparation of (4) than previously reported ones.

When (2) or its acetate was heated in dimethyl sulfoxide, (4) was also obtained in moderate yields. Alkaline treatment of the acetate of (2) at room temperature resulted in the smooth rearrangement leading to a thiolate ion, which was trapped with formaline and subsequently treated with acid to give pyrimidobenzothiazepines (5). Heating of (2) in acetic acid led to the formation of bis(benzothiazolylacetyl)dimethylurea (6). The novel formation of (6) can be explained in terms of the acid-catalyzed cleavage of the uracil ring of the spiro-thiazoline intermediate, which is a key intermediate of the Smiles rearrangement, followed by intermolecular loss of dimethylurea.

Synthesis of dihydro-10-thiaisoalloxazines (8) was achieved by photolysis of 6-(2-azidophenylthio)uracils (7) in 45-75% yields. Some of (8) were easily oxidized to the corresponding 10-thiaisoalloxazines (9). Thermolysis of (7), however, gave a mixture of dihydro-5-thiaisoalloxazines (4) and (8) in the ratio of 2 : 1.

Some chemical natures of the 10-thiaisoalloxazines (9) were examined in comparison with those of isoalloxazines., e.g., It was found that the conjugated azomethine bond of (9) is much more reactive than that of isoalloxazines for the polar addition of alcohol and oxidation of 1,3-propanedithiol.



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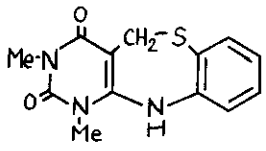

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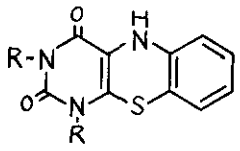

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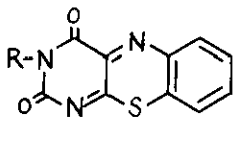

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