RING TRANSFORMATION OF URACIL DERIVATIVES WITH NUCLEOPHILES

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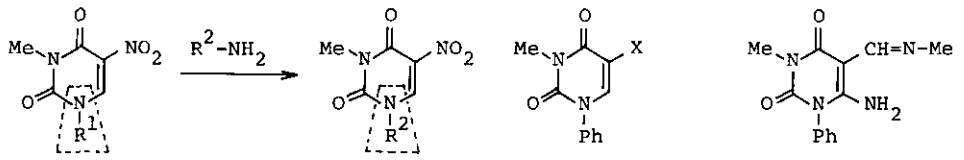
Our previous works have demonstrated that the reaction of uracil derivatives with various 1,3-ambident nucleophiles causes facile intermolecular transfragment reactions to pyrimidines or pyridines. During our investigation on the reactivities of uracil derivatives containing a electron-withdrawing group such as nitro, cyano, and carbamoyl group at the 5-position toward various amines, we have found the new type of pyrimidine-to-pyrimidine ring transformations.

Reaction of 1,3-dimethyl-5-nitrouracil (**1a**;R^1=Me) with butylamine in DMF at 120°C afforded 1-butyl-3-methyl-5-nitrouracil (**2a**;R^2=Bu) in 27% yield. 3-Methyl-5-nitro-1-(p-nitrophenyl)uracil (**1b**;R^1=p-$NO_2C_6H_4$) was smoothly converted into **2a** in 59% yield by treatment with butylamine. Introduction of p-nitrophenyl group at the N_1-position accelerated the conversion of **1b** into **2a**. Analogous treatment of **1b** with primary amines such as methylamine, cyclohexylamine, ethanolamine, glucosamine gave the corresponding products (**2**). These reactions involve a direct displacement of the N_1-portion by amines employed.

Treatment of 5-cyano-3-methyl-1-phenyluracil (**3a**;X=CN) with methylamine led to the formation of 6-amino-1,3-dimethyl-5-methyliminomethyluracil (**4**). Reaction of 5-carbamoyl-3-methyl-1-phenyluracil (**3b**;X=$CONH_2$) with methylamine resulted in the formation of N_1-exchanged 5-carbamoyl-1,3-dimethyluracil. While 5-carbamoyl-1-methyl-3-phenyluracil was converted into 5-(N-phenylcarbamoyl)-1-methyluracil by the treatment with methylamine.



(1) (2) (3) (4)