

STUDIES ON 1-PHENYL-1H-PYRAZOLO[3,4-d]PYRIMIDINE DERIVATIVES.

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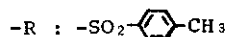
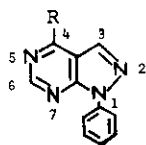
Tajima Odawara-shi, 256, Japan.

In order to synthesize the antitumoral pyrazolo[3,4-d]pyrimidines, 4-(p-tolylsulfonyl)-1-phenyl-1H-pyrazolo[3,4-d]pyrimidine (I), 1-phenyl-1H-pyrazolo[3,4-d]pyrimidine-4-carbonitrile (II) and 1-phenyl-1H-pyrazolo[3,4-d]pyrimidine-4-carboxylic acid (III) were synthesized, and the synthetic methods of their derivatives were investigated.

(I) p-Tolylsulfonyl group at the 4-position of I underwent nucleophilic substitution. Especially, the substitution with carbanion (Nu^- = active methylene compounds or ketones in the presence of NaNH_2 in benzene) introduced the carbon chains, in good yield, to the 4-position of 1-phenyl-1H-pyrazolo[3,4-d]pyrimidine ring.

(2) Application of nucleophile (NuH or Nu^-) to II resulted in two kinds of reaction; the nucleophilic substitution with replacement of the cyano group (A) and the nucleophilic addition to the cyano group (B). The reaction A occurred with hydroxide ion, alkoxide ion, amine, hydrazine and carbanion (active methylene compounds or ketones in the presence of NaNH_2 in DMF). The reaction B gave the derivatives of III. For example, $\text{NH}_2\text{-OH}$ gave amidoxime (V).

(3) III was decarboxylated smoothly in heating and gave 1-phenyl-1H-pyrazolo[3,4-d]pyrimidine. Decarboxylation of III in carbonyl compounds underwent Hammick reaction and gave carbinol derivatives (VI) or 1-phenyl-1H-pyrazolo[3,4-d]pyrimidin-4-yl ketones (VII). III is one of the few carboxylic acids which undergo Hammick reaction.



I

II

III

IV

