

N-ALKYLATION OF IMIDAZOLES, PYRIMIDINES, AND PURINES
WITH TRIALKYL PHOSPHATES

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Trialkyl phosphate has been shown to be a convenient alkylating agent for nitrogen heterocycles. Thus, upon heating with a trialkyl phosphate, imidazole, benzimidazole, pyrazole, 1,2,4-triazole, and benzotriazole were converted easily to the corresponding N-alkyl derivatives in 45 - 90 % yields. Predominant alkylation at the 1-position was observed in both triazoles.

Thymine, uracil, and cytosine underwent substitution at the 1- or at both the 1- and 3-positions to give 1-alkyl or 1,3-dialkyl derivatives quantitatively, depending on the quantity and the nature of the phosphate used.

Concerning alkylation of purines, xanthine generated 3,7-dialkyl and 1,3,7-trialkyl derivatives; theobromine underwent only methylation to give caffeine; and theophylline afforded easily 7-alkyl derivatives quantitatively. Preferential alkylation at the 3-position took place in adenine to produce 3-alkyladenine.