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## DETECTION OF 5-AMINOPYRIMIDINES

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Bindone is conveniently used for the selective detection of 5-aminopyrimidines. Amino groups in positions 2, 4, and 6 of the pyrimidine ring are not detected by this reaction. 5-Acylaminopyrimidines do not react either.

Anhydrobisindandione (bindone) was long ago recognized as a good reagent for primary aromatic and aliphatic amines [1, 2]. There is also information on the possibility of using bindone for detecting some

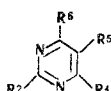
amino groups in aminopyrimidines. We propose to use bindone for the selective detection of the 5-amino group in pyrimidine derivatives in the presence of other substituents, including amino groups in other positions. This presents considerable interest, particularly in the production of 5-aminopyrimidines by the reduction of 5-nitro- or 5-nitrosopyrimidines and also in the acylation of 5-aminopyrimidines.

The reaction was carried out in the usual way [2], i.e., by boiling a small amount of the substance under investigation with bindone in glacial acetic acid for several minutes. Ordinary 98% acetic acid may give negative results even when an amine is present. Amino groups in positions 2, 4, and 6 of the pyrimidine ring and 5-acylaminopyrimidines, adenine, and guanine are not detected. Pyrimidines having amino groups in position 5 give an intense blue-violet or violet color (at low concentrations a violet-red color) even on brief heating, and when such an amino group is absent they give a yellow, red-brown, or brown color. The reaction has been carried out with a series of aminopyrimidines (see table).

The sensitivity of the reaction was determined for some compounds. Compound III is detected at a concentration of not lower than 0.0003 M and compounds XVI and XVII at 0.003 M.

The reaction can be used conveniently for following the starting materials and reaction products in certain syntheses for pyrimidines and purines.

Reactions with Bindone of Compounds  
of the General Formula



Compound	R <sup>2</sup>	R <sup>4</sup>	R <sup>5</sup>	R <sup>6</sup>	Result
I	NH <sub>2</sub>	NH <sub>2</sub>	NH <sub>2</sub>	OH	+
II	OH	NH <sub>2</sub>	NH <sub>2</sub>	OH	+
III	SH	NH <sub>2</sub>	NH <sub>2</sub>	OH	+
IV	NH <sub>2</sub>	NH <sub>2</sub>	NHCOC <sub>6</sub> H <sub>5</sub>	OH	-
V	NH <sub>2</sub>	NH <sub>2</sub>	NHCOCH <sub>2</sub> Cl	OH	-
VI	NH <sub>2</sub>	NH <sub>2</sub>	NHCOCH <sub>3</sub>	OH	-
VII	CH <sub>3</sub>	NH <sub>2</sub>	H	CH <sub>3</sub>	-
VIII	NH <sub>2</sub>	NH <sub>2</sub>	H	OH	-
IX	SH	NH <sub>2</sub>	H	OH	-
X	SH	NH <sub>2</sub>	H	H	-
XI	OH	NH <sub>2</sub>	H	OH	-
XII	SH	NH <sub>2</sub>	NO	OH	-
XIII	NH <sub>2</sub>	NH <sub>2</sub>	NO	OH	-
XIV	Cl	NH <sub>2</sub>	NO <sub>2</sub>	CH <sub>3</sub>	-
XV	OH	NH <sub>2</sub>	NO <sub>2</sub>	CH <sub>3</sub>	-
XVI	H	NH <sub>2</sub>	NH <sub>2</sub>	NH <sub>2</sub>	+
XVII	NH <sub>2</sub>	H	NH <sub>2</sub>	H	+

\* In this case, the reaction takes place without heating. Even under these conditions, the blue-violet color rapidly changes into dark brown.

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heterocyclic primary amines [1]. There is no information in the literature on the selective detection of