

REVIEW

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Cite this: DOI: 10.1039/d6ob00261g

A five-year perspective on DMAP as a cutting-edge reagent in heterocyclic ring formation

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Accepted 27th April 2026

DOI: 10.1039/d6ob00261g

rsc.li/obc

In this review, we have comprehensively and critically evaluated the utility of DMAP in heterocyclic ring formations that lead to the synthesis of various heterocyclic scaffolds, encompassing advancements in this domain from 2021 to the present, and the organization is based on the nature of the ring formed, accompanied by proposed reaction mechanisms. In addition to the advantages, the limitations of the approaches are also examined.

1. Introduction

In 1969, Steglich and Höfle identified 4-(dimethylamino)pyridine (DMAP) (Fig. 1a) as a highly efficient organic base catalyst for acylation reactions.¹ Around the same time, Litvinenko and Kirichenko independently demonstrated that substituting pyridine with DMAP dramatically enhances reaction rates, showing an approximately 10⁴-fold increase in the benzoylation of *m*-chloroaniline.² For the benefit of general readers, in Fig. 1b, DMAP is compared to other well-known organic bases such as DABCO, DBU, and Et₃N in terms of basicity, nucleophilicity, limitations, and role in particular organic transformations.

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