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Study of the reactivity and the selectivity of the Diels-Alder reactions of furanylboron compounds with maleimides

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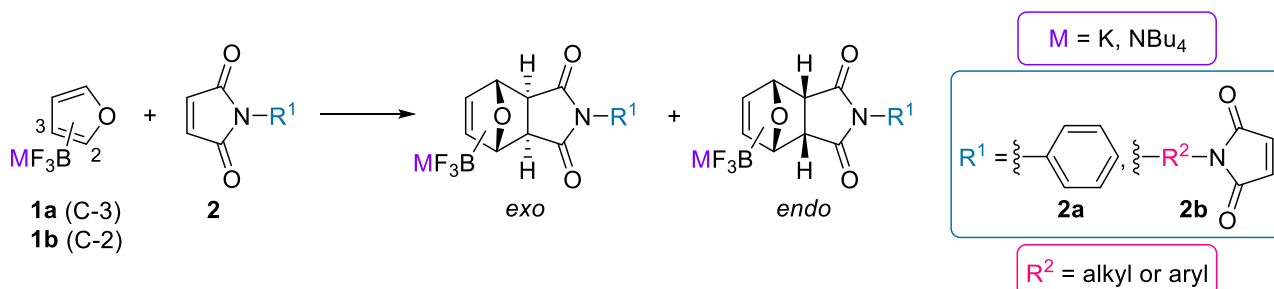
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ABSTRACT

Organoboranes are highly versatile and widely available reagents to carry out carbon-carbon bond-forming reactions and also to prepare a wide variety of functional groups. Although the Diels-Alder reactions using unsaturated organoboron compounds as dienophiles have been widely studied, those in which they participate as dienes are less abundant.¹ Recently, our research group described for the first time the use of furanylboron compounds (**1**) as dienes in Diels-Alder reactions with maleic anhydride.² Next, the reaction of **1** with *N*-phenylmaleimide (**2a**) was investigated. Fortunately, we were able to obtain the *exo* products with excellent diastereoselectivities and yields. In addition, their enhanced stability in solution relative to their maleic anhydride counterparts allowed their subsequent derivatizations. Furthermore, given the reversibility of these cycloadditions, the use of various bismaleimides (**2b**) is being explored and will possibly pave the way to applications in the preparation of cross-linked self-healing polymeric networks.³



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