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Synthesis of spiro 3-bromo-4,5-dihydroisoxazoles via [1,3]dipolar cycloaddition reactions

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Abstract: A group of novel 4-bromo-7,9-dimethyl-1-aryl-2-oxa-3,7,9-triaza-spiro[4.5]dec-3-ene-6,8,10-trione derivatives is prepared through 1,3-dipolar cycloadditions between benzylidenes and bromonitrile oxide. This reaction is shown to have high atom economy.

Keywords: 1,3-dipolar cycloaddition, bromonitrile, 4,5-dihydroisoxazoles, dibromoformaldoxime.

The synthetic utility of the 1,3-dipolar cycloaddition reaction is evident from the number and scope of targets that can be prepared by this chemistry.[1-4] As one of the most thoroughly investigated 1,3-dipoles, nitrile oxides are arguably the most useful due to their ability to generate nitrogen- and oxygen-based functionalities from the cycloadducts, as well as the potential to install multiple stereogenic centers through high degrees of regio- and stereoselectively.[5-9]

Several simple and convenient methods for the preparation of nitrile oxides have been developed over the years. One of the important procedures for the easy access and preparative use of nitrile oxides is the in situ technique with hydroximoyl halides.[10-12]

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