Title: Photochemical Reactivity and CO$_2$ Sensing Applications of Organoboron Compounds

**Abstract:** Despite the rapid progress in the field of N,C- and C,C-chelate organoboron photochromic materials over the past more than ten years focused on the impact of different π-conjugated backbones and the effects of different substituents on the chiral boron center have been well developed and explored, limitations still exist such as the need to have at least one bulky mesityl group present on the boron atom.$^{[1]}$ To remedy this deficiency, we investigated a series of N-alkyl substituted benzylideneamine boron compounds and they were found to be more reactive than other chelate systems, to undergo photoisomerization not only for compounds with bulky (Mesityl) group, but also works very well for those with non-bulky (Phenyl, Toly1, Naphthyl, Thieryl) aryl groups (Scheme 1).$^{[2]}$

Different bulky (ethyl, isopropyl, tertbutyl) amino-appended D(donor)-π-A(acceptor) triarylboron have been found with the ability to capture CO$_2$ with the formation of carbamic acid and detect CO$_2$ with obvious fluorescent color change, high sensitivity (60 ppm) and good reversibility.$^{[3,4]}$ In addition, this system is also effective as fluorescence “turn-on” temperature probes due to the dynamic B $\leftarrow$ N bond dissociation/association (Scheme 2).$^{[3]}$

**Scheme 1**

![Scheme 1](image)

**Scheme 2**

![Scheme 2](image)

**References:**