

## Mechanically triggered Fluorescence changes in polymers

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The conversion of mechanical stress applied to a polymeric material into a useful outcome is a relative recent approach that has quickly developed into an active field of research. Materials that display such mechanoresponsive behavior are typically accessible through the introduction of a mechanically sensitive motif, known as mechanophore, into the polymeric backbone and the nature of this moiety will dictate the type of achievable response. Among the different functions that can be activated with mechanically responsive materials, the possibility to visualize structural damage in situ through a color change has gathered a lot of attention. In order to achieve such behavior one needs to design a mechanophore which can be cleaved in a non-reversible fashion and which subsequently displays a drastic change of its optical properties.

The main objective of the work presented in this thesis was the development of new mechanophores that meet these criteria. Molecules that display a modification of their fluorescence emission properties associated to the alteration of their covalent structure were of particular interest because they usually result in a better contrast than changes in absorption.

The work presented in this thesis unveils the mechanophore nature of two molecules, which were never studied in this context, through the use of ultrasound. The dithiomaleimide and the benzoxazole motif showed distinct change in their luminescence emission properties and their application as structural stress sensor could be considered.

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