# Synthesis and photochemical study of a new norbornadiene-derivative with potential as a molecular system for the storage of solar-thermal energy

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Norbornadiene-derivatives (NBD) have recently emerged as a promising alternative in the development of molecular systems for the storage of solar-thermal energy (MOST). In these systems, the energy is stored in the form of chemical bonds by photoisomerization reactions, and the stored energy can be released on demand in the form of heat.

In this contribution, we present results regarding the photochemical behavior of a new NBD, *i.e.*, 2-cyano-3-((4-(diethylamino)phenyl)ethinyl)norbornadiene (NBD1). This compound contains an electron-withdrawing group ($CN^-$), and an electron-donor group (ethinyl-derivative) in one of the double bonds of the bicycle-ring. As a consequence, a conjugated *push-pull* system was obtained, with led to an absorption band peaked at the visible region.

The irradiation of NBD1 in toluene solution promotes the formation of the quadricyclane isomer, for which a maximum at about 310 nm was detected. Photoconversion seems to proceed almost quantitatively after *ca.* 30 minutes of irradiation.

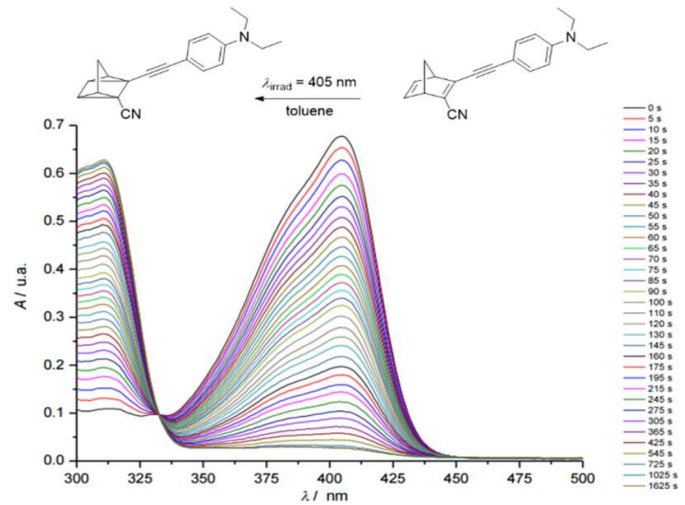


**Figure 1.** UV-Vis spectra of NBD1 (in toluene) upon irradiation ($\lambda_{irrad}$ = 405 nm).

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