Title: **Azoheteroarenes, light-induced isomerization in the NIR region and thermal relaxation.**

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This bibliographic TFG will be focused in photoactive chemical compounds. The interest for this kind of compounds has been growing through the years because light is a clean, safe and handy energetic source. The irradiation of photoactive chemical compounds with light allows a fast and precise control of some concrete properties. Photoactive chemical compounds have a lot of interesting applications in fields such as new materials, biomedicine, technology, etc. Azobenzenes are the most famous and studied organic chromophores in the last decades. They have countless applications. This research will focus on azo compounds which incorporate aromatic heterocycles in their molecular structure, denominated azoheteroarenes. The azoheteroarenes whose light-induced *trans*-to-*cis* isomerization occurs in the NIR region will be the main point of interest. Usually, classic azobenzenes present their light-induced *trans*-to-*cis* isomerization in the UV region and the blue-green region of the electromagnetic spectrum, depending on the substitution of their core. For real-time information transmission systems, one of their countless applications, it will be crucial that these azocompounds present a very fast thermal *cis*-to-*trans* isomerization at room temperature. Ionic azo compounds often present a very fast thermal *cis*-to-*trans* isomerization at room temperature although they can present some disadvantages, as for example, their difficult integration to host matrixes. Thus, to find neutral azo compounds with a very fast thermal *cis*-to-*trans* isomerization at room temperature, which are less common, will be particularly worthwhile. Through the comparison between different structures, their absorption maxima and their synthetic routes, one will find azoheteroarenes of interest and determine how the chemical structure affects the shift of the absorption maxima (λ_{max}) to longer wavelengths and, in turn, the thermal isomerization kinetics. New molecular structures will be proposed with the aim of pushing their λ_{max} to longer wavelengths, with a fast thermal isomerization.

Keywords: azoheteroarenes, NIR absorption, photoactive molecules, thermal isomerization.