Photo-induced synthesis of fused polyheterocycles

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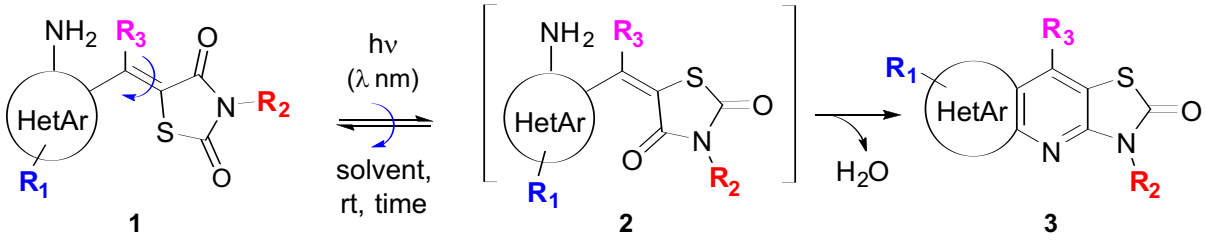
Quinoline derivatives are widely used synthons in organic synthesis and coordination chemistry and have numerous applications (catalysis, photovoltaics, etc.)[1]. In the frame of our work devoted to the preparation of variously substituted arylidenethiazolidine-2,4-diones,[2] we recently developed a new one-pot synthesis pathway towards fused heterocyclic quinoline **3** using light and without any additional reagent,[3] unlike the usual synthesis, which is typically multistep and tedious.[4]



In order to determine the appropriate substituents (R_1 and R_2) and determine the influence of the nature and position of these functional groups on the absorption wavelengths of the molecules, theoretical studies on the absorption maxima of precursors **1** have been explored. The scope of this study was broadened to heterocyclic frameworks, alongside strategic functionalization of the vinylic position to refine system properties. Based on these results, investigations were carried out to define a short and efficient reactional sequence, involving a photo-activated isomerization/cyclisation as a key-step. These optimized conditions afforded a wide range of substituted thiazolo[4,5-*b*]quinoline-2(3*H*)-ones **3** in good to very good yields. In addition, a detailed kinetic study of the isomerization/cyclisation step was conducted by using *in-situ* photo-NMR and UV-vis studies.

References

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[4] I. Tânâsescu et al. *Chem. Ber*. **1957**, *90*, 495–499.