Evaluation of 2-Methylacetophenone and its Derivative as Molecular Solar Thermal Systems (MOST).

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Solar energy driven storage compounds have emerged as crucial resources to achieve sustainability. They are based in a photochemical transformation, where an organic molecule is transformed in a high energy photoisomer, that can release the energy in the form of heat when needed. Those compounds are known as molecular solar thermal (MOST) systems and can store the solar energy into the form of chemical bonds upon irradiation. A key feature of these systems is that energy can be released in a controlled way, either in a quick burst or in a slow ramp of heat, when suitable catalytic processes are available.

The work presented herein is based on the synthesis and study of new MOST systems based on 2-methylacetophenone derivatives. As previously studied[1], the 2-methylacetophenone can undergo a cyclization process (Figure 1). The derivatization of this molecule offers a new set of compounds that upon irradiation can also get cyclized. The feasibility of the cyclization of these compounds and the reversibility of this process has been studied and this determines whether or not these derivatives can be used as MOST systems.

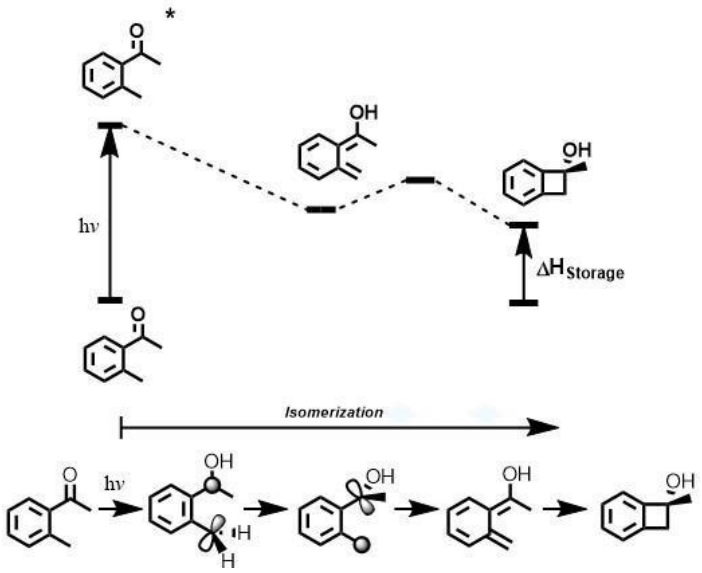

Figure 1. *Proposed cyclization mechanism of 2-methylacetophenone.*

References

[1] P. K. Das, M. V. Encinas, R. D. Small, J. C. Scaiano. *J. Am. Chem. Soc.* **1979**, *101*, 6965-6970.