CHALCONE DERIVATIVES DERIVED FROM NATURAL PRODUCTS AS NEAR-UV/VISIBLE LIGHT SENSITIVE PHOTOINITIATORS FOR 3D/4D PRINTING

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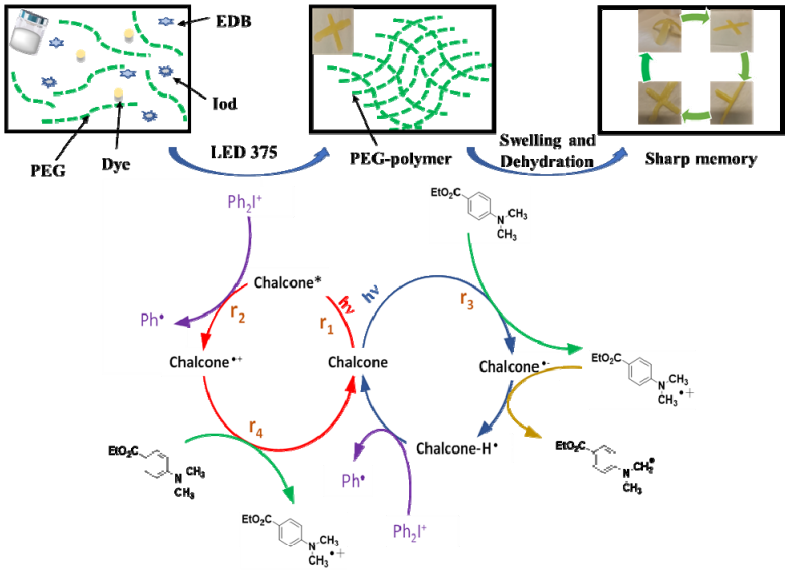
Even with the development of science and technology in the past few decades, photopolymerization technology has been successfully applied in many fields including coatings, adhesives, and some emerging fields like biomedicine or 3D/4D printing, etc [1-2]. However, the photopolymerization process under mild conditions (low light intensity, visible light sources, etc) has always been the focus of many researches, in which the biggest challenge is to develop high-performance photoinitiating system (PIS) that can work effectively under that conditions. Moreover, many studies have shown that some natural dyes can be used as non-toxic photoinitiators, and their good biocompatibility and stability make them to be an ideal choice for the manufacture of biological materials and others. Therefore, we developed a series of chalcones-based dyes, which are used as photoinitiators since their excellent absorption performance over the near UV/visible range. More interestingly, stereoscopic 3D patterns were successfully fabricated by the direct laser write (DLW) technique which exhibited reversible swelling properties and reversible shape-memory effects induced via swelling and dehydration for the access to 4D printing and the design of biocompatible materials.



[1] J.-P. Fouassier, J. Lalevée, Photoinitiators for Polymer Synthesis-Scope, Reactivity, and Efficiency; Wiley-VCH Verlag GmbH & Co. KGaA: Weinheim, Germany, 2012.

[2] E. Blasco, M. Wegener, C. Barner-Kowollik, Photochemically-Driven Polymeric Network Formation: Synthesis and Applications. *Adv. Mater*. 2017, 29, 1604005.