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Two-Photon Active *o*-Carborane Branched Initiators for 3D-Microfabrication of Thermo-Switchable Fluorescent Materials devoted to Optical Data Storage

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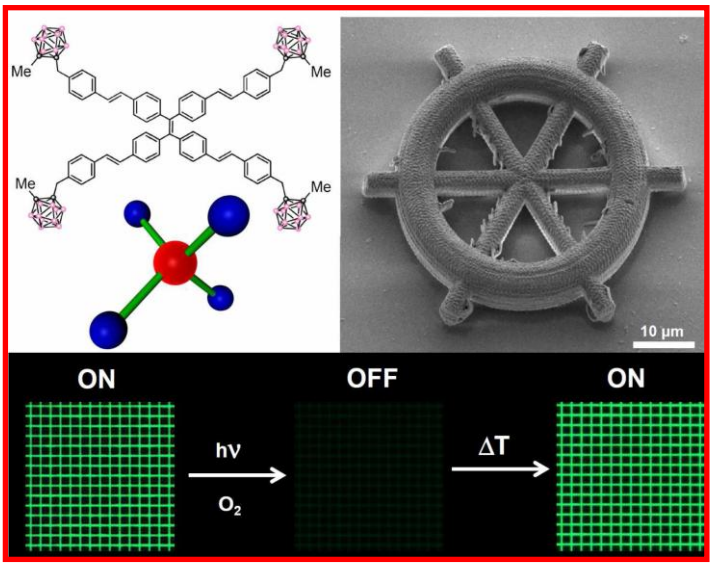
Two-photon polymerization (2PP) has emerged as one of the most efficient maskless stereolithography[1]. Such a direct laser writing method allows the fabrication of intricate 3D-structures with a spatial resolution down to the sub-µm scale. The unique capability of 2PP relies on its diffraction unlimited spatial confinement due to the non-linear absorption of the initiator component which is photoactivated at the focus point of a tightly focalized *fs*-pulse laser[2]. 2PP technology which is now commercially available has been largely dedicated to the photopatterning of advanced functional materials with plethora applications such as photonic metamaterials[3], stimuli responsive devices[4], microelectromechanical systems or micromedicine[5, 6]. In this context, the two-photon initiator clearly has a pivotal role and should both exhibit significant two-photon absorption (2PA) cross-sections as well as an efficient quantum yield for the generation of reactive species that promote monomers cross-linking. With this respect, we present herein a series of *o*-carborane-based derivatives with quadrupolar or octupolar geometries with significant two-photon activation ability. Such a non linear absorption property has been oriented for 2PP fabrications of emissive microstructures whose fluorescent can be alternatively 'switched off' and 'switched on' through light and thermal stimuli. This strategy proposes thereby a two-photon patternable materials for reversible data storage applications.



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