

On-Demand Editing of Surface Properties of Microstructures Made by 3D Direct Laser Writing via Photo-Mediated RAFT Polymerization

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Recently, photo-controlled reversible addition-fragmentation chain transfer (RAFT) polymerization has been successfully applied in digital light processing 3D printing. It provides a convenient way to tune the surface properties of the 3D printed object. However, so far, 3D micro- and nanostructures and reconfigurations based on photo-induced RAFT polymerization have not been presented. In this work, one macro photoiniferter, synthesized by photo-controlled RAFT polymerization is applied, to 3D direct laser writing. Thanks to the exquisite spatial control of the photoreaction, 3D microstructures with feature sizes of around 500 nm are successfully obtained. Taking advantage of the presence of dormant polymeric RAFT agents, photo-induced post-modification of the printed microstructures is highlighted via the elaboration of multi-chemistry patterns including thermo-responsive ones. These results open new perspectives in multi-material and 4D micro-printing.^[1]

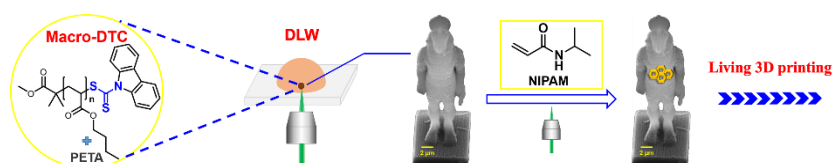


Figure 1. The process to modify the surface of microstructures.

References:

[1] X. Wu, B. Gross, B. Leuschel, K. Mougin, S. Dominici, S. Gree, M. Belqat, V. Tkachenko, B. Cabannes-Boué, A. Chemtob, J. Poly and A. Spangenberg, *Adv. Funct. Mater.*, **2021**, 2109446.

