DESIGN OF PHOTO-RESPONSIVE POLYMERS BY USING PHOTOSENSITIVE *O*-NITROBENZYL ESTER LINKS

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The study highlights the design of stimuli-responsive polymeric materials by introducing molecular switches into their network structure. In particular, photo-cleavable chromophores such as *o*-nitrobenzyl ester groups (*o*-NBE) are exploited to prepare photo-responsive epoxy based networks and thiol-ene photopolymers, which change specific material properties after exposure to UV-light [1]. In particular, the optically triggered cleavage of covalent links enables a spatially controlled change in solubility properties and in thermo-mechanical performance. Along with bulk properties, the photodegradation also allows a tuning of interfacial properties between glass fibers and the photocleavable polymer matrix [2]. Going from thermally cured epoxy based materials, the present work further demonstrates the preparation of fully photocurable networks with photosensitive links. By combining versatile *o*-NBE chemistry with the unique characteristics of a photo-induced "click" reaction, photopolymers with an inherent photoactivity are synthetized. With the spatially controlled cleavage of the thiol-ene networks, defined relief structures are conveniently inscribed into the photopolymers by UV exposure [3].

[1] Radl, S., Roppolo, I., Pölzl, K., Ast, M., Spreitz, J., Griesser, T., Kern, W., Schlögl, S., & Sangermano, M.. Light triggered formation of photo-responsive epoxy based networks. *Polymer*, **2017**, 109, 349–357.

[2] Radl, S., Kreimer, M., Manhart, J., Griesser, T., Moser, A., Pinter, G., Kalinka, G., Kern, W., & Schlögl, S. Photocleavable epoxy based materials. *Polymer*, **2015**, 69, 159-168.

[3] Radl, S.; Schipfer, C.; Kaiser, S.; Moser, A.; Kaynak, B.; Kern, W.; Schlögl, S. Photo-responsive thiol-ene networks for the design of switchable polymer patterns. *Polymer Chemistry* **2017**, 8, 1562-1572.