

Supporting Information

Photo-curing of 4-arm coumarin-functionalised monomers to form highly photoreversible crosslinked epoxy coatings

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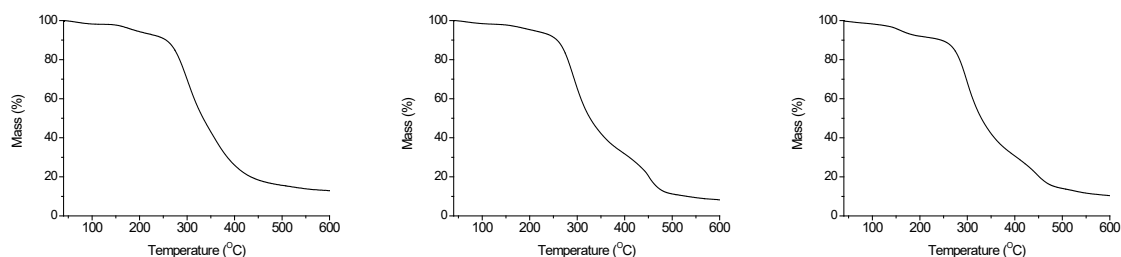


Figure S1: TGA curve for the crosslinked polymers 4ACM-6 (left) and 4ACM-10 (middle) and 4ACM-m (right) using 10 °C/min heating rate.

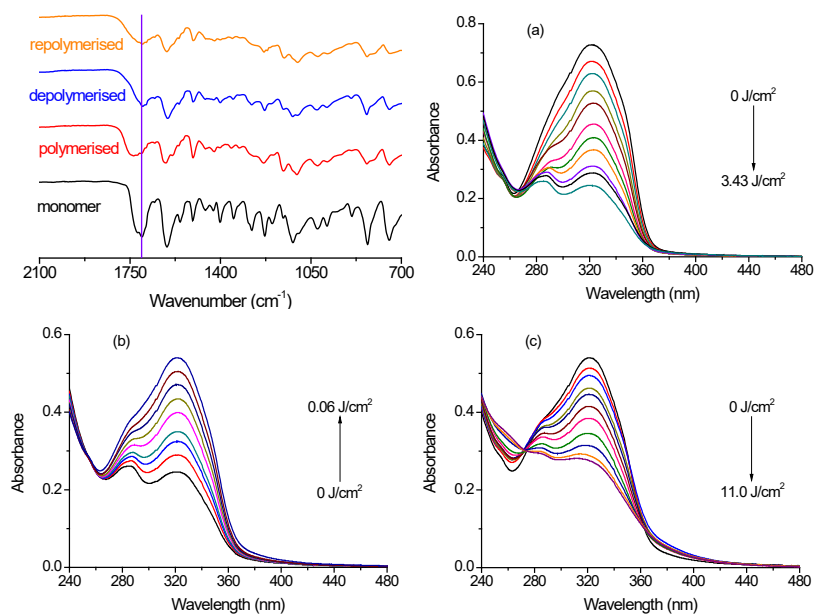


Figure S2: Monitoring of the photoreversibility of the crosslinked polymer 4ACM-10 by IR spectrometry (top left) and by UV-vis spectroscopy through the two stages: (a) polymerisation, (b) depolymerisation and (c) repolymerisation.

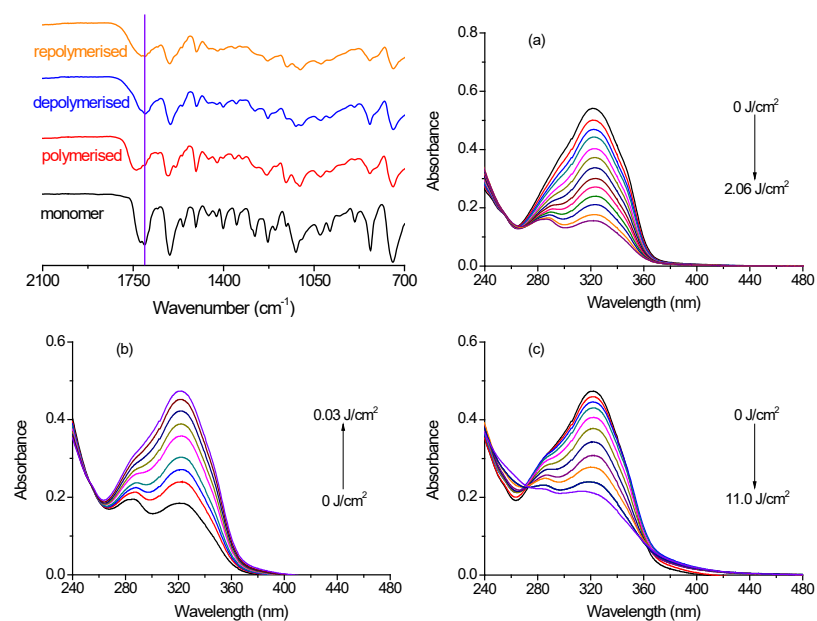


Figure S3: Monitoring of the photoreversibility of the crosslinked polymer 4ACM-m by IR spectrometry (top left) and by UV-vis spectroscopy through the two stages: (a) polymerisation, (b) depolymerisation and (c) repolymerisation.

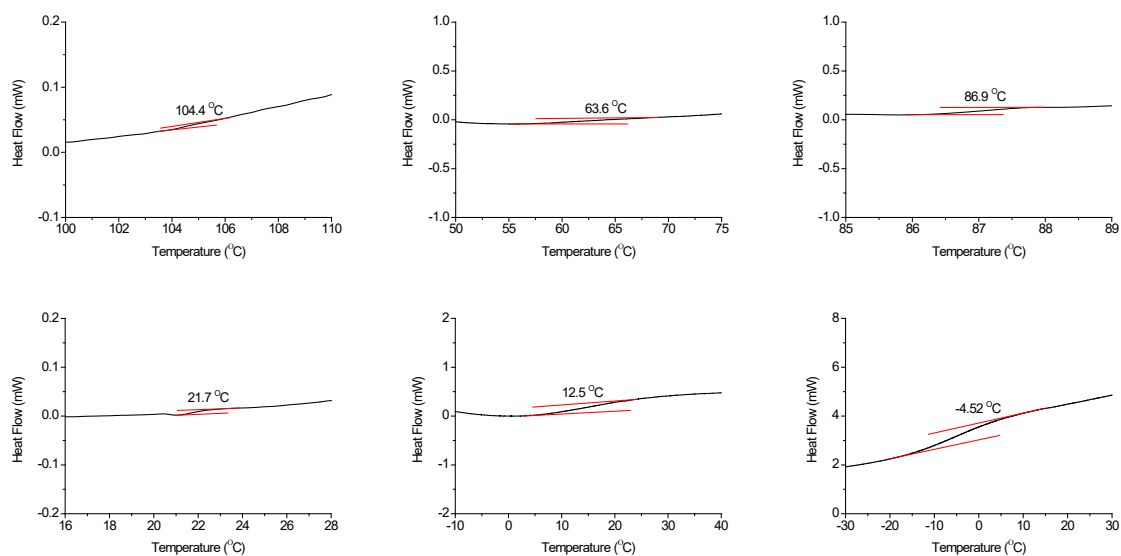


Figure S4: Glass transition temperatures displayed on the DSC curve of the crosslinked polymers (top) and depolymerised state (bottom) for 4ACM-6 (left) and 4ACM-10 (middle) and 4ACM-m (right), using a 10 $^{\circ}\text{C}/\text{min}$ heating rate.

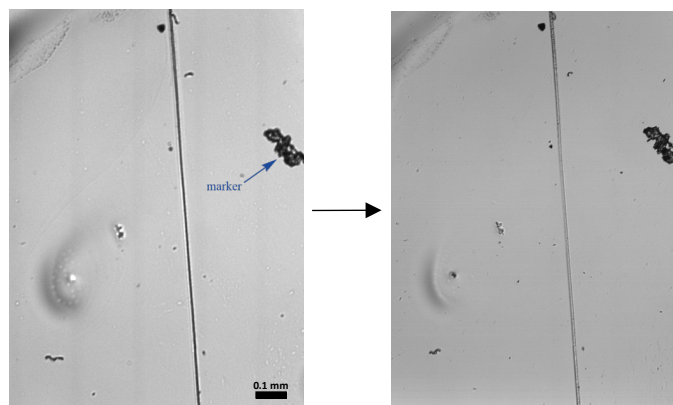


Figure S5: OM images of the incomplete healing of a 10 µm scratch on the surface of polymer 4ACM-6 after irradiation with 254 nm UV light.

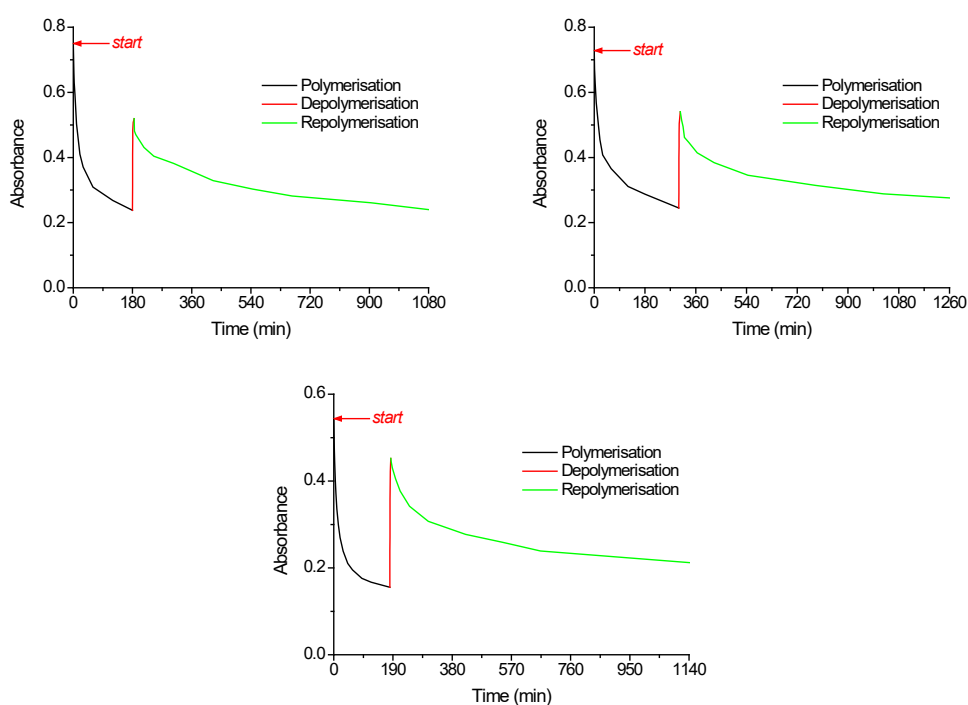


Figure S6: Kinetics of the three photoreversibility process stages for the polymers 4ACM-6 (top left), 4ACM-10 (top right) and 4ACM-m (bottom) based on the absorbance values corresponding to the coumarin double bond peak at 321 nm in the UV-vis spectrometry study.

$$\frac{J}{\text{cm}^2} = 1.142 \times 10^{-2} t \text{ (in mins)}$$

Equation 1: Conversion of irradiation time to irradiation dose for all irradiations conducted in the stated UVP crosslinker.