

Electronic Supporting Information

## **Design, synthesis and RAFT polymerisation of a quinoline-based monomer for use in metal-binding composite microfibrres**

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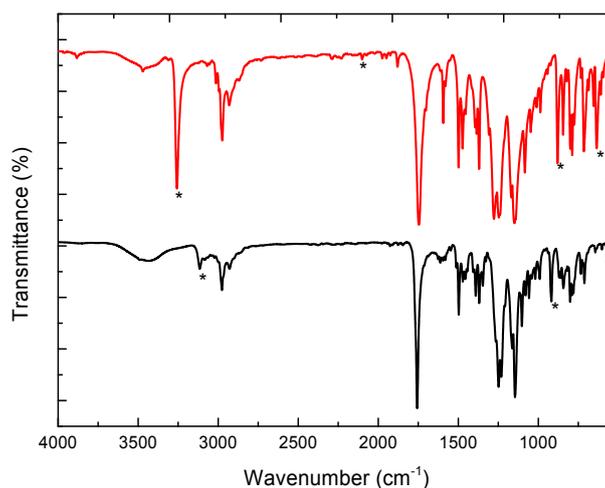
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### **1. FTIR of the monomer**

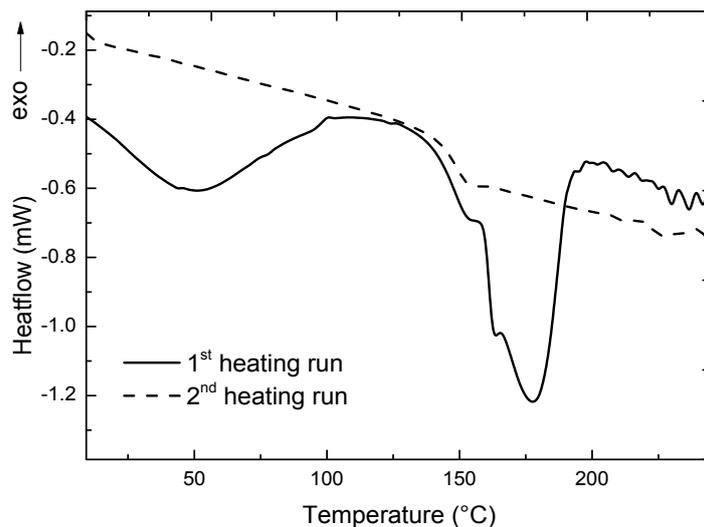
In the FTIR spectrum of QuiBoc monomer (Figure 2 in the main manuscript), characteristic signals of precursor **3** are no longer observed: (i) terminal alkyne stretch at 3255 cm<sup>-1</sup>; (ii) bending of -C≡CH, presented by two bands at 635 cm<sup>-1</sup> and 878 cm<sup>-1</sup>; (iii) weak -C≡C- stretch at 2100 cm<sup>-1</sup> and (iv) the C-H scissoring at 1472 cm<sup>-1</sup>. Instead, a medium band at 1346 cm<sup>-1</sup> indicated alkyl -CH<sub>2</sub>- deformation. The sharp bands at 3112 cm<sup>-1</sup> (stretching vibration) and 917 cm<sup>-1</sup> (bending vibration) indicate the C-H bond of the alkenyl group (-C=C-H) in the triazole ring of the QuiBoc monomer. It is important that the protecting group is preserved throughout the synthetic route (at 1750 cm<sup>-1</sup>).



**Figure S1.** FTIR spectra of the monomer precursor **3** (top red) and monomer QuiBoc **5** (bottom black). Characteristic bands discussed in the text above are indicated with asterisks.

## 2. Deprotection of PQuiBoc

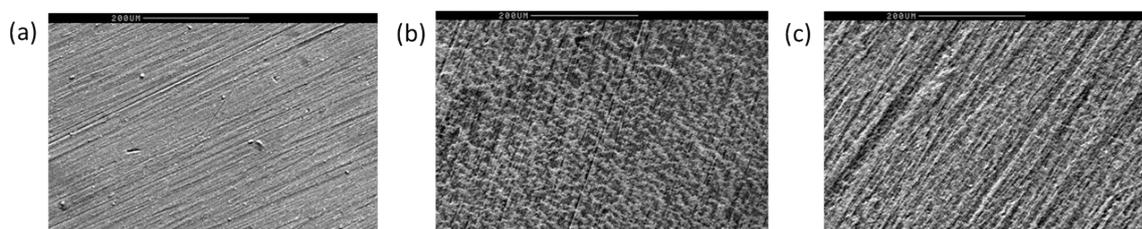
The deprotection temperature of PQuiBoc was determined by DSC in two heating runs (Figure S2). In agreement with previous literature reports, an endothermic peak with an onset at 160 °C and a midpoint at 175 °C is observed.<sup>1,2</sup> This peak originates from cleavage of the BOC group and is no longer present in the second heating run. Furthermore, two other distinct thermal events can be seen. A broad peak at low temperatures is a measuring artefact, due to the presence of moisture in the sample during measuring. The glass transition temperature of PQuiBoc is clearly observed with an onset of 140 °C. Thus, BOC-group cleavage occurs in the bulk just above the glass transition of the polymer and is apparently accompanied by melting of the crystalline regions of the polymer, resulting in a double peak at 160 °C. Interestingly, in the second heating run, the melting peak is no longer observed, but the  $T_g$  of the polymer after BOC group removal remains the same.



**Figure S2.** DSC thermograms of PQuiBoc<sub>28</sub> polymer.

### 3. SEM images of ZnO on the films

The surface binding capacity of PS and PQuiBoc was measured by SEM/EDXA technique, simultaneously allowing to estimate the quality of the formed composite films. As seen in Figure S3, PQuiBoc, annealed at 160 °C, resulted in visibly smoother films than if annealed at 140 °C. This smoothing is associated with the polymer deprotection and more extensive annealing. In terms of smoothing, it is difficult to decouple the effect of prolonged annealing from the deprotection.



**Figure S3.** SEM images of the polymeric films with ZnO nanoparticles on the surface: (a) polystyrene, PS; (b) PQuiBoc annealed at 140 °C and (c) PQuiBoc annealed at deprotection temperature 160 °C to give PQuiOH.

## References

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- 2 V. H. Rawal and M. P. Cava, *Tetrahedron Lett.*, 1985, **26**, 6141–6142.
- 3 B. C. Smith, *Infrared Spectral Interpretation: A Systematic Approach*, CRC Press, 1998.