



Time-lapse transformation of quinine

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Field strength: 300 MHz

Why is this your favorite spectrum?

This is a time-lapse experiment using ¹H NMR spectroscopy to determine the optimum illumination time required for a photoinitiated thiol-ene “click” reduction of quinine. Spectra were recorded in CDCl₃ (A) before illumination, i.e. at zero minutes, (B) after two minutes’ illumination and (C) after five minutes’ illumination. The proton signals corresponding to the disappearance of the H-19 multiplet (approx. 6 ppm) and the appearance of the H-20 triplet (approx. 2.5 ppm) have been enlarged.

Comments: As you can see, this is a very rapid reaction as full reduction of the substrate occurs within just five minutes. According to the literature, I had initially expected this reaction to take place over the course of many hours – and at first I couldn’t understand why my sample was totally obliterated after 24 hours of (high-energy) UV exposure. It took me a disproportionately long time – and much frustration! – to discover that only a few minutes were required to effect this small molecular transformation.