Electronic Supplementary Material (ESI) for RSC Advances.

Electronic Supplementary Information

Photomechanical Photochromism in a Cetyltrimethylammonium Isopolytungstate

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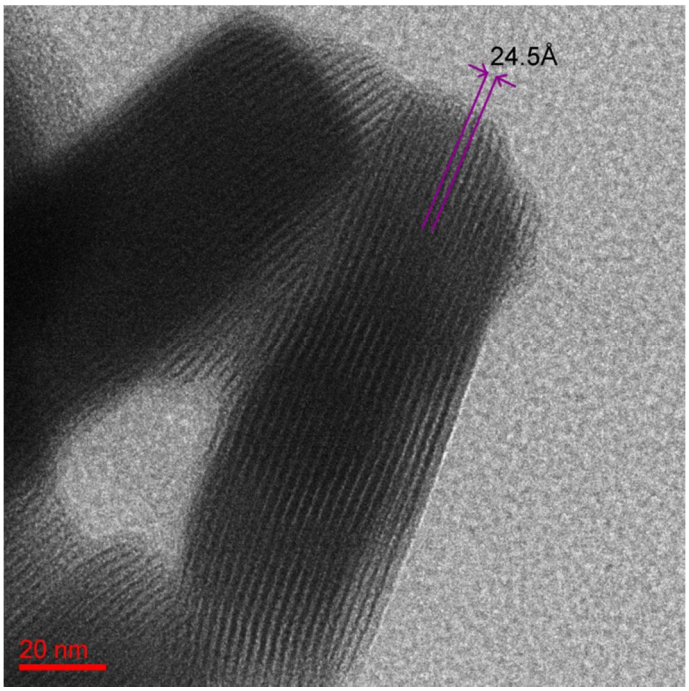

Fig. S1 TEM image of CTA-W_{12} crystals/particles. Courtesy of Dr A. Dowd, University of Technology Sydney.

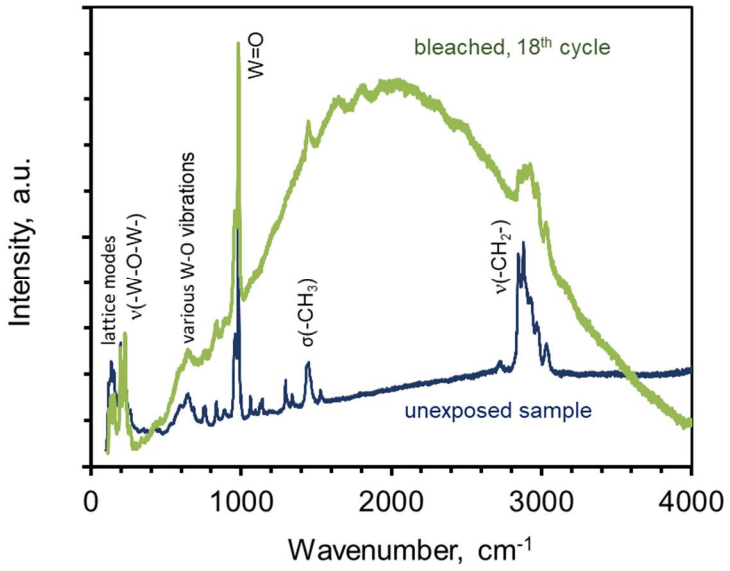

Fig. S2 Raman spectra of bleached (spectrum collected three days after exposure to UV) and as-prepared CTA-W_{12}. The application of repeated cycling generated significant fluorescence in the sample. There is also a marked reduction in CH_2 and CH_3 peak intensity.

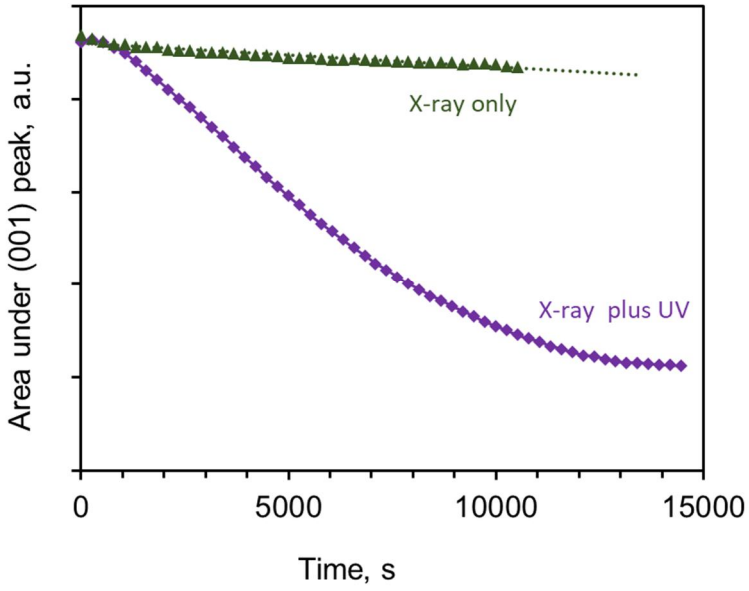

Fig. S3 Changes in area of (001) peak for case of X-ray irradiation only, compared to case with simultaneous UV illumination. The green dotted line is a linear extrapolation.

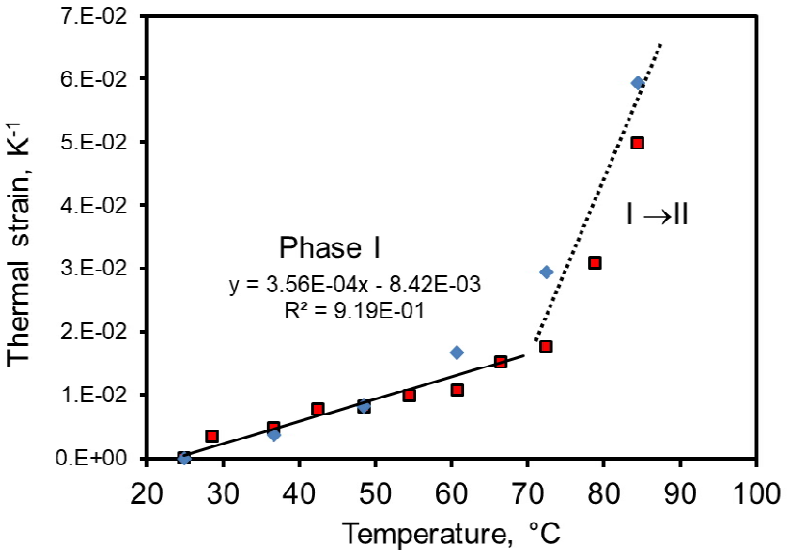

Fig. S4 Thermal expansion of CTA-W_{12} in [001] direction (normal to layers of Keggin ions). When heated, the compound designated as 'Phase I' undergoes a structural transformation at 70°C to form a more loosely packed compound that has been designated as 'Phase II'. See Colusso et al[8] for additional information on these phase transformations

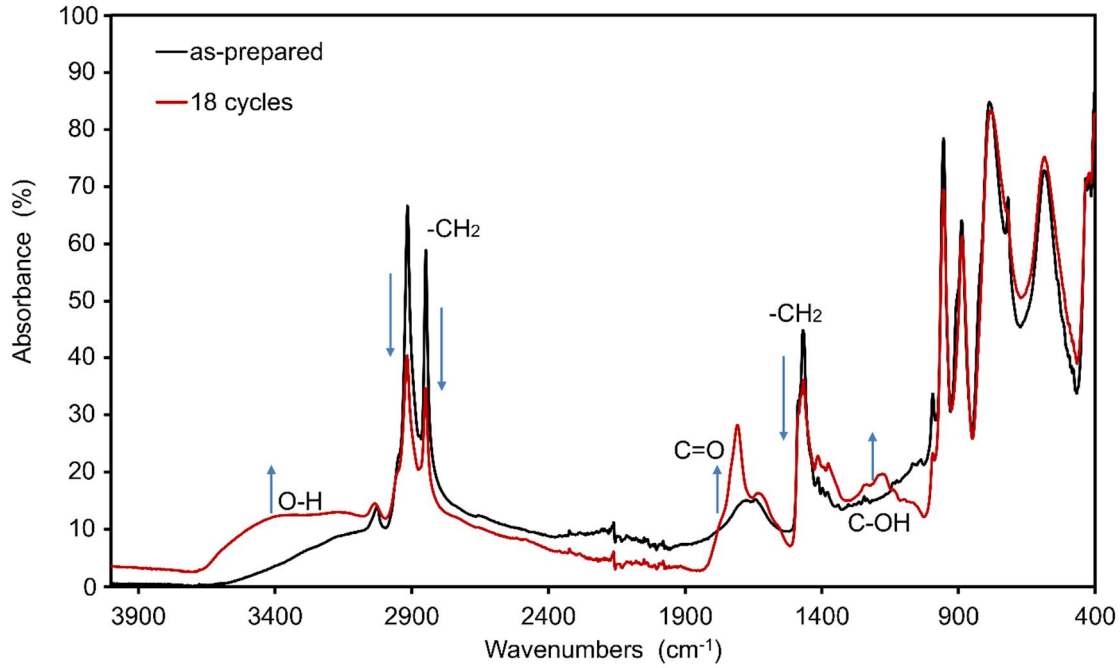

Fig. S5 FTIR spectra of compound, showing as-synthesized spectrum and spectrum after 18 photochromic cycles.

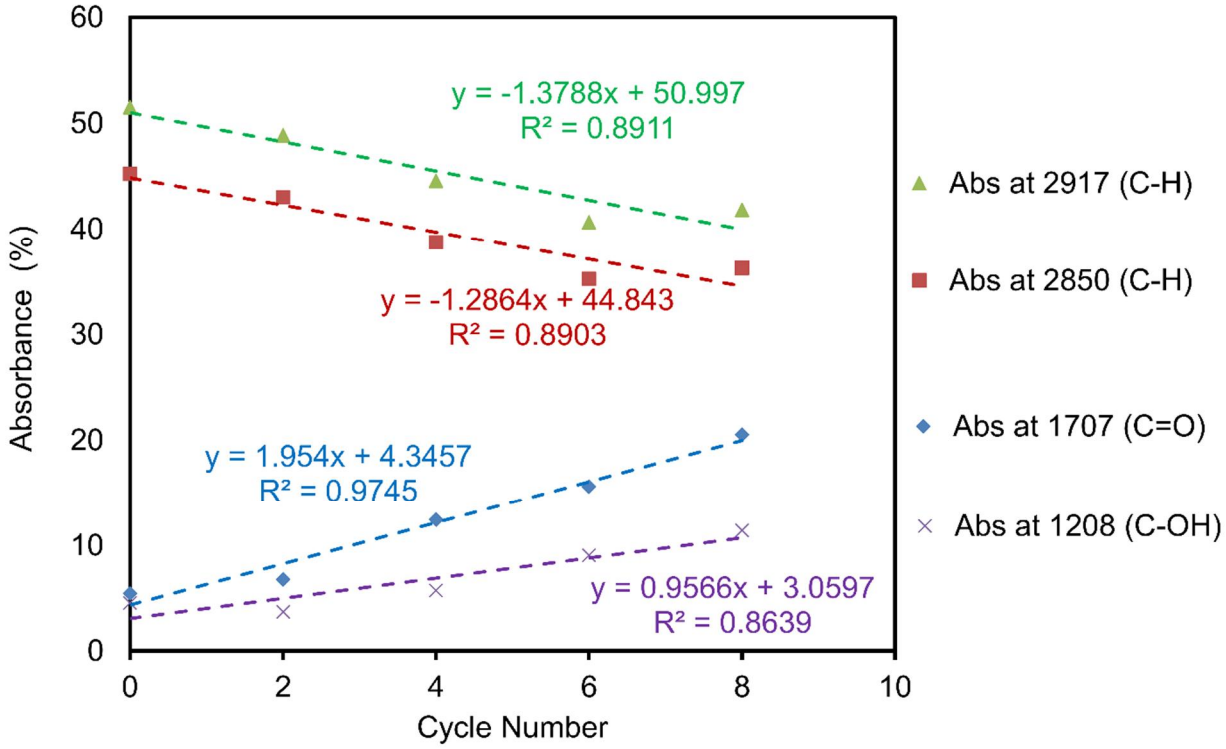

Fig. S6 Changes to FTIR spectra during first 6 cycles of coloring/bleaching. Decrease in -CH_2 vibrations and increase in oxygenated (C=O, C-OH) species.

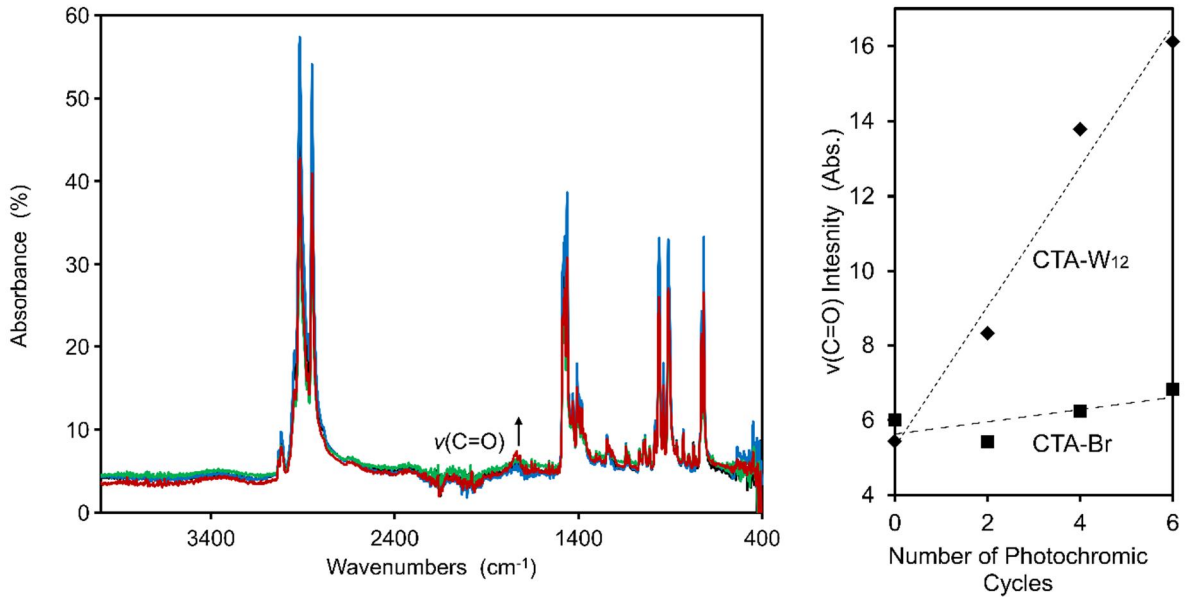

Fig. S7 (a) FT-IR of CTA-Br as-received (-), and after two (-), four (-) and six (-) periods of 1 hr UV irradiation. (b) Growth of *ν*(C=O) intensity in CTA-W_{12} and CTA-Br due to UV irradiation.

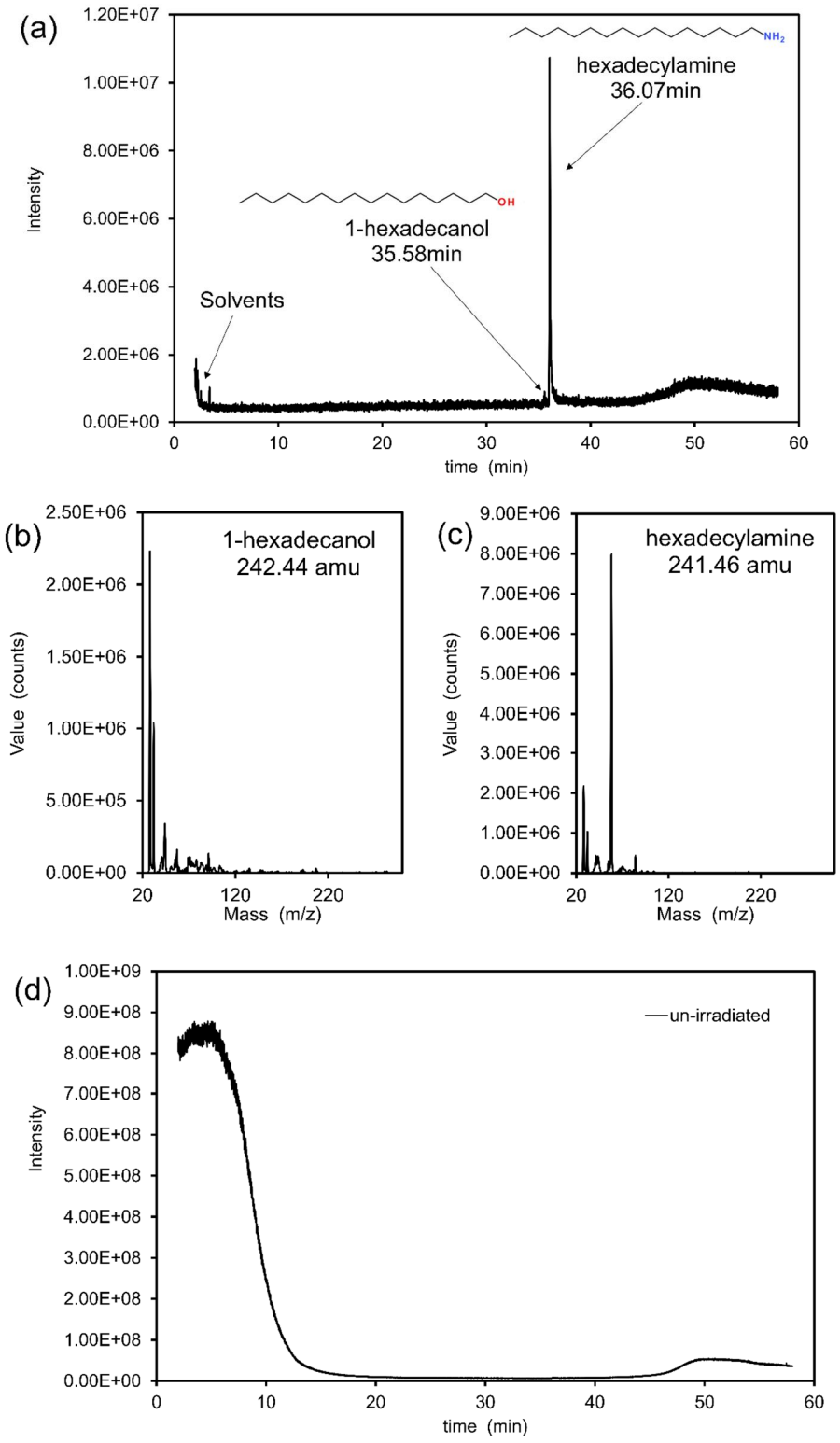

Fig. S8 (a) GC of CTA-W_{12} after 48 hours UV irradiation, extracted in $CHCl_3$ (a) Mass spectrum of minor product 1-hexadecanol (b) Mass spectrum of major product hexadecylamine (d) GC of unirradiated (as-prepared) CTA-W_{12}, extracted in $CHCl_3$.