Design and photoinduced surface relief grating formation of photoresponsive azobenzene based molecular materials with ruthenium acetylides

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Résumé en anglais	Novel photoresponsive materials based on ruthenium(II) σ-acetylides coupled to an azobenzene moiety in the main π-conjugated chain have been synthesized. The introduction of a metal acetylide fragment in the same conjugated chain as the azobenzene induces the trans-cis-trans isomerization of the azo unit, while the rate of the thermal cis → trans back isomerization increases with increasing overall electron richness of these compounds. These azobenzene-containing ruthenium(II) acetylides show satisfactory processability and give rise to spin-coated uniform thin films. Formation of surface-relief gratings on their amorphous thin films and in a PMMA polymer matrix using a picosecond pulsed laser at 532 nm results in instantaneous inscription: saturation of the first order diffraction efficiency and of the modulation amplitude of gratings were obtained in less than 1 s, while the orientation of these azodyes remains unchanged for up to 6 months.
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