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Azo-based photoswitches show promise as molecular solar-thermal (MOST) materials due to their ability to store energy in their metastable Z isomeric form. The energy is then released, in the form of heat, upon photoisomerization to the thermodynamically stable E form. However, obtaining a high energy density and recovering the stored energy with high efficiency requires the materials to be employed in the condensed phase and display a high degree of Z to E switching, both of which are challenging to engineer. Here, it is shown that arylazo-pyrazole motifs undergo efficient redox-induced Z to E switching in both the solution and the condensed phase to a higher completeness of switching than achieved photochemically.

