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Stimuli Sensitive Organic Crystalline Materials: Design Strategies and Practical Applications

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Abstract:

Smart organic materials that modify their physical properties in response to different stimuli (mechanical stress, temperature, light...) are of great interest due to their potential applications in multiple fields such as sensors, actuators, optoelectronics, anti-counterfeiting inks... Numerous organic molecules show interesting differences in their color, fluorescence, volume... due to variations in their supramolecular arrangement in response to external stimuli. Single crystal diffraction analysis is probably the most powerful tool to get an accurate understanding of how molecules organize and interact in the bulk. Unfortunately, most of the stimulus-

response behaviors are found in low crystallinity materials (such as gels, liquid crystals or polymers), which prevents us from studying in depth the mechanism underlying this transformation and limits the rational development of new materials with pre-designed properties.

In this talk, I will present new smart crystalline materials developed in my group, discussing our efforts to unravel the mechanism underlying their switchable behavior and the progress we have made towards their practical applications.