Biocompatible Sensors based on Chromonic Materials

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Smart packaging systems able to incorporate advanced sensors are important for the modern food industry. The ability to monitor the food conditions in real time, helping to prevent spoilage and ensure safety, is of crucial relevance. Also, due to the prolonged proximity to edible goods there is a pressing need for sensors fabricated using biocompatible materials. Soft materials, like thermotropic liquid crystals, which optical properties and sensitivity to external stimuli are well-known, have demonstrated to be excellent candidates for the creation of sensors except for their lack of biocompatibility. In recent years, a new category of liquid crystals, chromonics, started to attract attention due to their spontaneous self-assembly in supramolecular columnar structures that, depending on their concentration in water, align to form a nematic liquid crystalline phase. The optical properties of water-based and biocompatible chromonic liquid crystals resemble the ones of thermotropic liquid crystals. Here, we present a study of the chromonics optical textures as a function of temperature in the perspective to use these materials in optical sensors.