

Hydrochromic Polydiacetylene and Its Application to Human Sweat Pore Mapping

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In this study, we developed a sensor system that undergoes a brilliant blue-to-red color transition as well as 'Turn-on' fluorescence upon exposure to water. Introduction of a hygroscopic element into a supramolecularly assembled polydiacetylene results in a hydrochromic conjugated polymer that is rapidly responsive, spin-coatable and inkjet-compatible. Importantly, the hydrochromic PDA is found to be suitable for mapping human sweat pores. The exceedingly small amounts (sub-nanoliter) of water secreted from sweat pores are sufficient to promote an instantaneous colorimetric transition of the polymer. As a result, the hydrochromic sensor can be used to construct a precise map of active sweat pores on a human fingertip. The sensor technology, developed in the study, has the potential of serving as new method for fingerprint analysis and for the clinical diagnosis of malfunctioning sweat pores.