Supporting Information

**Gold Nanoshell Arrays-Based Visualized Sensors of pH : Facile Fabrication and High Diffraction Intensity**

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**FIG. S1.** Preparation of the 2D PS colloidal crystal/hydrogel composite film: (a) 2D PS microsphere colloidal crystal was fabricated on a cleaned glass slide by an air/water interfacial self-assembly method; (b) Polymerization solution was cast on the 2D PS microsphere colloidal crystal and then photopolymerized into hydrogel by UV light; (c) A free-standing 2D PS colloidal crystal/hydrogel composite film was obtained by peeling it off from the substrates.



**FIG. S2.** Schematic of diffraction spectra measurement.