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Detection of Mercury and Copper Ions Using Surface Plasmon Resonance Optical Sensor

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Mercury and copper ions, Hg^{2+} and Cu^{2+}, can be detected by measuring surface plasmon resonance signals with a thin chitosan layer deposited on a gold film. An amount of 0.55 ml of chitosan cross-linked glutaraldehyde solution was spin coated onto a glass cover slip at 6000 rev./min for 30 s. Changes in the resonance angle ($\Delta\theta$) are directly proportional to the concentration of heavy metal ions in solution (0.5–100 ppm). The sensitivities to Hg^{2+} and Cu^{2+} are 0.00743 and 0.00654 ppm^{-1}, respectively. The gold/chitosan interface is highly sensitive to Hg^{2+} and Cu^{2+} with detection limits as low as 500 ppb.

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