

Title : Transmission Surface Plasmon Resonance Spectroscopy for Chemical Sensor Application

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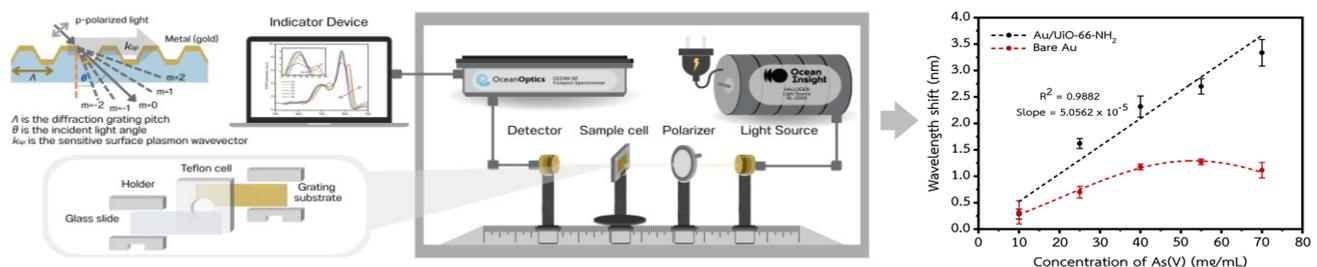
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ABSTRACT

Transmission surface plasmon resonance spectroscopy (TSPR) has been developed as an advancement over conventional surface plasmon resonance spectroscopy (SPR), addressing the limitations and complexity of conventional SPR setups. In this study, a grating substrate obtained from a DVD-R was coated with gold, enabling a simpler and more accessible experimental TSPR configuration. To enhance the sensitivity and selectivity for arsenate or As(V) detection, UiO-66-NH₂ metal-organic frameworks (MOFs) with high surface area and abundant amine (-NH₂) functional groups were incorporated as the sensing material. UiO-66-NH₂ was deposited onto the gold-coated DVD-R grating substrate by the drop-dry method, enabling effective adsorption and detection of As(V). TSPR signal exhibited a response to the adsorption of As(V) ions on the UiO-66-NH₂ layer with effective detection range of 10-70 mg/mL. This study demonstrates the potential of MOFs-TSPR integration as an efficient and sensitive approach for heavy metal detection in environmental monitoring.



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