OPTICAL SENSOR USING HIGH CONTRAST GRATINGS COUPLED WITH SURFACE PLASMON POLARITON

Tech ID: 24899 / UC Case 2015-131-0

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	10,330,602	06/25/2019	2015-131

BRIEF DESCRIPTION

This invention introduces an optical sensing platform that utilizes high contrast gratings coupled with surface plasmon polaritons for enhanced detection capabilities. The platform comprises an array of sensors, a laser or broadband light source, and an optical detector. The sensor structure includes a low index support layer, a high contrast grating, a low index spacer, and a thin metal film with a target recognition element. The surface plasmon resonance-based sensor employs surface plasmon waves to detect changes on the sensor surface when a target interacts with the recognition element. Binding of the target to the receptor induces changes in the refractive index of the metal layer, altering the resonance wavelength of the plasmon wave, which is then measured or observed.

SUGGESTED USES

- Biological and Chemical Sensing: Detecting biomolecules, pathogens, or chemical compounds with high sensitivity.
- Environmental Monitoring: Monitoring pollutants or hazardous substances in air, water, or soil.
- Medical Diagnostics: Early detection of diseases through biomarker identification.
- Industrial Process Control: Real-time monitoring of chemical reactions and processes.
- Food Safety: Detecting contaminants or spoilage indicators in food products.

ADVANTAGES

- High Sensitivity: Surface plasmon resonance enhances the detection of minute changes in the refractive index.
- Versatile Detection: Capable of detecting a wide range of targets, from biological molecules to chemical compounds.
- Compact Design: The integration of high contrast gratings allows for a compact and efficient sensor structure.
- Real-time Monitoring: Provides immediate feedback on target interactions, useful for dynamic environments.
- Scalable Manufacturing: Suitable for large-scale production using established fabrication techniques.

RELATED MATERIALS

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OTHER INFORMATION

CATEGORIZED AS

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RELATED CASES

2015-131-0

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