

Nanoplasmonic sensor based on surface plasmon coupled emission: review

ABSTRACT

The surface plasmon resonance (SPR) technique is a powerful method to detect chemical molecules. Fluorescent spectroscopy is a subject of great interest in the field of material science and biology. Recently, some optical sensors, based on plasmonic properties of nanomaterial, were introduced to enhance the investigation of the interaction of molecular while detecting the low concentration of molecular. The surface plasmon-coupled emission (SPCE) technique is a merit and accurate method to evaluate the interaction of nanomaterials and molecular. SPCE is based on fluorescence properties of interest molecule, and the surface plasmon enhances the fluorescence signal. According to SPR theory, the condition of excitation of fluorophore could be used in obtaining the SPCE signal. SPCE can be used to detect toxic chemicals and investigate the human molecular. In this review, the theory, experimental setup, condition of SPCE, and role of metal nanoparticles in SPCE were reviewed. In the end, the application of SPCE was presented for detection and monitoring the chemical material, heavy metal, and biologic molecules.

Keyword: Surface plasmon resonance; Surface plasmon-coupled emission; Fluorescence; Plasmonic; Nanomaterial; Metal nanoparticle