Nanoplasmonics and surface enhanced spectroscopy

Silicon nanorods imaging by Surface Plasmon Resonance

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Nanoparticle technology plays a key role in providing opportunities and possibilities for the development of new generation of sensing tools [1]. Surface plasmon resonance (SPR) is the basis of many standard tools for measuring material adsorption onto planar metal (typically gold and silver) surfaces. SPR occurs when polarized light strikes an electrically conducting surface at the interface between two media. This generates electron charge density waves called plasmons, reducing the intensity of reflected light at a specific angle known as the resonance angle, in proportion to the mass on a sensor surface.

The possibility of silicon nanorods detection by SPR imaging in the visible wavelength range was investigated with the help of the Kretchmann-configured optical coupling set-up. The mechanism of detection is based on that the adsorbing particles cause changes in the local index of refraction, changing the resonance conditions of the surface plasmon waves and allowing the electromagnetic waves to be emitted into the outer space. The emitted light was focused by objective lens onto the solid-state imaging device, and the obtained images were stored in the computer. This method provides a high contrast of the images of the adsorbed silicon nanorods 40-60 nm in diameter. The approach employed in this research differs from that utilized in other works on SPR- assisted nanoparticle imaging where the images were collected using the reflected beam [2].

The study was aimed at development of a novel type of SPR-based biosensor relied upon direct count of biological species of interest (bacteria, viruses, large biomolecular complexes), rather then measuring the integral effect of specific binding exploited for current SPR-based biosensors. The obtained results demonstrate the potentiality of direct count of nanoobjects for enhancement of sensitivity of the SPR-based biosensor devices.

1. *Shuwen Zeng, Ken-Tye Yong, Indrajit Roy, Xuan-Quyen Dinh, Xia Yu, Feng Luan.* A Review on Functionalized Gold Nanoparticles for Biosensing Applications // Plasmonics -September 2011.- **6**,N3.- P. 491-506.
2. *Zybin A., Kuritsyn Yu.A., Gurevich E.L., Temchura V.V., Uberla K., Niemax K.* Real-time Detection of Single Immobilized Nanoparticles by Surface Plasmon Resonance Imaging // Plasmonics.- 2010.- **5**, N.1.-P. 31-35.

Предлагаемые изменения, насколько я понял смысл:
adsorption material -> material adsorption (или adsorption of material - Изменен порядок слов; получается «адсорбция материалов», а было, как мне представляется, что-то вроде «материальной адсорбции»)

Silicon -> silicon (не вижу причины писать с большой буквы)