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Modular surface plasmon resonance (SPR) biosensor based on wavelength modulation

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This paper deals with new invention of modular surface plasmon resonance (SPR) biosensor device based on wavelength modulation herein the angle of incidence of the light source is fixed and the shift in wavelength at resonance is monitored. This device is capable of detecting biomolecular binding interactions of different species such as proteins, oligonucleotides and viruses. White light source mounted with a polarizer is used to excite plasmons on the sensor surface which is a thing gold film of ~21 μm thickness coated on BK-7 glass. A variable angle reflection sampling system (VARSS) device was modified to incorporate the transducer components and sampling accessories. SPR was observed at the angle of incidence of the light fixed at 29°. At this point, plasmon-evanescent wave coupling occurred with highest loss of light intensity HR4000-UV-NIR photodetector is used to observe the change in resonance wavelength when the dielectric environment around the surface of the transducer was changed. Two liquid samples; water (n=1.33) and ethylene glycol (n=1.43) was introduced onto the sensor surface to model changes in wavelength at resonance with difference in refractive index of dielectric environment. It was observed that the wavelength at resonance for water and ethylene glycol are 590.10 nm and 594.23 nm respectively when reference to air (n=1.00) indicating the workability of the device.

Biography

Wan Mohd Azwady Wan Ahamad is a PhD student from UiTM, Malaysia. He invented a new modular SPR device for biosensing purposed. It takes almost 2 years to finish the device. For now, he has completed the device and trying to monitor the wavelength shift by introduced two liquid samples which is difference refractive index into the modular SPR device. The next step, he will use the device to monitor biomolecular interaction between anti-BSA and BSA.

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