Design of surface plasmon resonance biosensor with one dimensional photonic crystal for detection of cancer

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Abstract
In recent years, development of highly sensitive biosensors is the main purpose of researchers to diagnose and prevent diseases. Accordingly, in this paper, surface plasmon resonance (SPR) biosensor has been designed based on one dimensional layered structures. With regard to the fact that the quality of SPR sensors strongly depends on the reflectance amplitude and full width at half maximum (FWHM) of the SPR curves, a novel structure, TiO₂/(SiO₂TiO₂)ᴺ/Defect/Silver/Gold, is presented using transfer matrix method (TMM), to satisfy these two condition. Besides, the sensitivity of this biosensor has been calculated and it has been employed to diagnose leukemia for Jurkat cells.

Keywords: one-dimensional photonic crystal, surface plasmon resonance biosensor, transfer matrix method

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