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Transmissive Fabry-Perot Spectrum of Liquid Crystal Device for measuring the Surface Plasmon Effect of Silver nano-Particle[1] WEN-CHI HUNG, Inst. of Electro-Optical Engr., Natl. Sun Yat-sen Univ.,Taiwan, YU-SUNG LIN, Dept. of Physics, Natl. Sun Yat-sen Univ., Taiwan, MING-SHAN TSAI, Dept. of Applied Physics, Natl. Chiayi Univ., Taiwan, I-MIN JIANG, Dept. of Physics, Natl. Sun Yat-sen Univ., Taiwan, WOOD-HI CHENG, Inst. of Electro-Optical Engr., Natl. Sun Yat-sen Univ.,Taiwan — A Fabry-Perot scheme for measuring the surface plasmon effect of Ag nano-particles has been presented. As an optical spectrum ananlyzer, the resolution of the Fabry-Perot etalon.is determined by the morphology of reflectors and resonated cavity of the etalon. Ag nano-particles of size 50 nm are deposited on the surfaces of two reflectors. The cavity is filled with liquid crystals which are homogeneous alignment. Because the surface plasmon effect (SPE) of metal nano particles is sensitive to the polarization of incident light (P-wave or S-wave), we apply various polarization lights to explore the spectra of Fabry-Perot etalon filled with liquid crystal to study the SPE of metal nano-particles. In the transmissive spectra, we find the wavelength shift at the peak (603 nm) is about 8 nm when the probed light is changed from P-wave to S-wave. Comparing the measurements of the etalon without filled with the liquid crystal; we discuss the correlation of the wavelength shift and SPE of Ag nano-particles in the liquid crystal etalon device.

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