

Study on Au-Ni Core-Shell Nanowires for Optical Applications

The optical properties of Au-Ni core-shell nanowire were simulated using the Mie-Lorentz scattering approach. The simulation fixed the core diameter of Au at approximately 20nm and the thickness of the Ni shell at 20nm. The optical absorbance spectrum, optical transmittance spectrum, absorption coefficient and the optical energy gap of Au and Au-Ni coaxial nanowire as a function of wavelength were calculated. The study reveals an excellent enhancement in the values of optical absorbance spectrum and absorption coefficient for Au-Ni core-shell nanowires compared to Au nanowires. The results of energy gap calculations demonstrated that Au-Ni core-shell nanowires have an optical application as ultra-violet photo-detectors.