ABSTRACT

Fabrication and optical characterization of doubly chiral sculptured thin films

Motivated by the need for reliable optical sensing modalities, we fabricated a doubly chiral sculptured thin film (D-CSTF) of zinc selenide, comprising a structurally left-handed CSTF and a structurally right-handed CSTF deposited consecutively on a glass substrate. Both constituent STFs were sufficiently thick as to exhibit the circular Bragg phenomenon independently and distinctly in the 500–900-nm wavelength range. The fabrication process involved asymmetric serial bideposition through thermal evaporation. All eight circular remittances of the D-CSTF were measured using a variable-angle spectroscopic system. The direction of the incident light was varied so that the azimuthal angle ranged from 0^0 to 70^0 and the polar angle from 0^0 to 180^0. The D-CSTF functions as a bandstop filter for RCP light as well as a bandstop filter for LCP light, regardless of the polar angle and the face that is illuminated, the two stopbands being distinct from each other.