

Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Reflectivity Calculations on Hybrid-layered CdS/PVK Distributed Bragg Reflectors¹ JAVIER HASBUN, AJITH DESILVA, University of West Georgia — In this study we apply the Born theory [1] of wave propagation on a stratified medium to obtain the reflectivity and transmissivity of a series of distributed Bragg reflectors (DBR). The DBR's are made of pairs of identical alternating layers. Each pair of layers is referred to as a period. Thus, we grow DBR's of one, two, three, and four periods and study their reflectivity properties. Since each layer of a period has a different refractive index, constructive interference from the total reflected portion of light can be investigated to create effective reflectors. The DBR's can be made to act as optical mirrors to enhance certain wavelengths of light to be highly reflected. Due to the high refractive index difference between polyvinyl carbazole (PVK, index 1.683) and cadmium sulfide CdS (index 2.5), a greater reflectivity can be obtained from the structure for fewer periods. The constructed DBR data show theoretically fitted reflectivities with reflectances of about 27%, 51%, 64%, and 80% for the one, two, three, and four period structures, respectively, with a peak wavelength of 614 nm in the four period device.

[1] "Principles of Optics: Electromagnetic theory of propagation, interference and diffraction of light," M. Born and E. Wolf, 7th Ed. (Cambridge UP, UK, 1999.)

¹The authors wish to thank the UWG-UWISE minigrant program for their support.

Javier Hasbun
University of West Georgia

Date submitted: 29 Oct 2014

Electronic form version 1.4