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Original Paper

Optical properties of multilayered Alq_3/α-NPD structures investigated with spectroscopic ellipsometry

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Abstract

Alternating layers consisting of tris(8-quinolinolato) aluminium (Alq_3) and N,N-Di(naphthalene-1-yl)-N,N′-diphenyl-benzidine (α-NPD) were prepared by organic molecular beam deposition (OMBD) in high vacuum (HV) on hydrogen passivated (111) oriented silicon. The Si(111) substrates were kept at room temperature and the deposition rate was monitored by a quartz microbalance. The typical thickness of the individual layers is in the range of 1-10 nm. The samples were studied by spectroscopic ellipsometry in the range from 0.73 to 5 eV. The evaluation of the ellipsometry measurements shows good agreement between the experimental and simulated data, assuming sharp interfaces and using the optical constants of the single layers. However, small deviations exist in the range where Alq_3 and α-NPD have absorption peaks indicating an electronic interaction at the interfaces. (© 2005 WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim)

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