

Advances in Printed Organic Photonics and Photovoltaics

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Abstract

There is an ever-increasing demand for smaller and lighter weight electronic and optoelectronic devices that consume less power, have greater functionality, and can be fabricated using environmentally benign processes. Recent advances in organic light-emitting devices enforce the notion that organic and hybrid based materials, and devices, are indeed key enablers for novel electronic and optoelectronic devices. The ability of these molecular and/or polymeric organic materials to be processed and fabricated on plastic substrates will be a key factor in the development, for example, of roll-up-displays, and disposable plastic electronics. Currently, processing and fabrication of organic-based electronic, optical, and optoelectronic materials and devices is carried, by-in- large, using traditional techniques such as spin coating [SC], dip coating, and vacuum thermal deposition. However, these techniques are either limited to certain substrate geometry, or costly and time consuming. A tremendous advantage can be gained by incorporating printing techniques in the processing and fabrication of organic materials and devices. Printing methods such as ink jet and screen printing (SP) can be useful in the fabrication of certain types of devices based on organic materials. We will discuss the use of SP and ink jet printing techniques in the rapidly growing area of organic optoelectronics.

Biography

Dr. Ghassan E. Jabbour is a leading industry consultant and faculty member at the Optical Sciences Center at the University of Arizona. He has made significant contributions to the organic optoelectronics area; including novel aluminum based cathodes, screen- and ink jet printing of OLEDs, electrode modification for electroluminescence applications, plastic solar cells, and many others. He attended Northern Arizona University, Massachusetts Institute of Technology, and the University of Arizona. He earned a Ph.D in Materials Science and Engineering in 1994.

Dr. Jabbour specializes in the development of materials for optical and electronic applications; and the fabrication, characterization, and testing of organic (polymeric and molecular) light-emitting devices for rigid and flexible display applications. Recent research projects include work on photovoltaic materials and devices; printed optical, electronic and optoelectronic materials and devices; optics and materials science of thin films and nanostructures; combinatorial techniques in photonic and electronic materials discovery; data storage, photosensitive materials for optoelectronic applications; and quantum simulations of condensed matter.

Ghassan E. Jabbour is the Associate Editor of the Journal of the Society of Information Displays (JSID), the SPIE Annual Meeting Nanotechnology Track Chair, chaired and co-chaired numerous symposia in related areas, and has lectured and published widely in the field of electroluminescence and photonics.