

Chemistry In Emerging Technologies Lectures

Nazareth College - Peckham Hall, Room 10, 4245 East Ave., Pittsford, NY

Monday, November 13, 2017

White Organic Light-emitting Diodes (OLEDs): Materials, Device Architectures and Applications

Dr. Marina Kondakova, Director of Device Formulation
OLEDWorks, LLC (www.oledworks.com)

7 p.m.: Lecture

OLED lighting is unique as it offers a pleasant, uniform, diffused light, minimizing the need for fixtures. In combination with other characteristics, such as ultra-thin shape and glare-free light, OLEDs can be used to realize innovative lighting applications and designs. An OLED is an electronic device that emits light in response to an applied potential and consists of a substrate and several organic layers sandwiched between two electrodes. It operates by charge injection from the electrodes into the adjacent organic layers, transport of injected charge carriers through organic layers, recombination of holes and electrons to generate excited states of molecules, followed by their radiative deactivation, which is taken out of the device as electroluminescence. High efficiency OLEDs require multiple layer device architectures to provide exciton confinement and charge transport balance. OLED devices can be built on a wide variety of rigid, flexible, and transparent substrates. During recent years, white OLED (WOLED) devices have undergone very fast development as they emerge as next generation lighting sources. White light in OLED can be obtained by emission from a monochromatic emitter in combination with down-conversion layer or by simultaneous emission of light from several emitters in the correct proportions. Various device architectures are used to achieve high efficiency that allows OLED technology to compete with other lighting products. Recent progress on WOLED from materials perspective, device performance and future applications will be discussed.

Dr. Marina Kondakova has 15 years' experience in organic light-emitting diodes (OLED) technology with broad knowledge of OLED physics and material science. Before joining OLEDWorks in 2010, Dr. Kondakova worked at the Kodak OLED Business Unit where she was responsible for development of WOLED technology for lighting and displays through device architecture engineering and use of improved materials. Her work has also included detailed studies of OLED degradation mechanisms. At OLEDWorks, Dr. Kondakova leads the R&D team focused on development and optimization of high-performance OLED lighting panels that will be fabricated by a low-cost, innovative manufacturing process. This development is guided by manufacturing challenges and opportunities to improve product reliability. Dr. Kondakova has a doctorate in Physical Chemistry and has authored numerous publications and patents in the OLED field.

8:15 – 9:30 p.m.: Reception – Peckham Hall Lobby

Further information on these lectures and other Rochester ACS Section events is available at www.Rochester.sites.ACS.org