第25回　未来化学創造センター セミナー

“OLEDs and Plasmons”

J. Frischeisen, C. Mayr, S. Nowy, W. Brütting
Institute of Physics, University of Augsburg, 86135 Augsburg, Germany
(joerg.frischeisen@physik.uni-augsburg.de,
http://www.physik.uni-augsburg.de/exp4/organic)

An important aspect in the optimization of organic light emitting diodes (OLEDs) is the outcoupling of light. Loss mechanisms like waveguiding in the organic layers and the substrate as well as the excitation of surface plasmons reduce the fraction of light that is leaving the device. We use numerical simulations to identify and quantify different loss mechanisms. Changing various simulation parameters, for example layer thicknesses, enables us to enhance the light output of the OLED stack. The results of the simulations are compared with experimental data on the angular dependent emission spectra.
In the second part of the talk an application of an OLED in a novel surface plasmon resonance (SPR) sensor is presented. We investigated prototype sensors based on silver and gold sensing layers and OLEDs with blue, green and red emission color. Further on we demonstrated the sensor function by measuring the concentration of dissolved sodium chloride in real time. The presented technique offers the advantage that there is no necessity to couple light from external bulky sources such as lasers or halogen lamps into the sensing device which makes it particularly interesting for miniaturization.

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ウエスト4号館　315講義室

連絡先：安達千波矢
adachi@cstf.kyushu-u.ac.jp
TEL: 092-802-3306