Project Description

The HyperOLED project aims to develop materials and matching device architectures for high-performance, hyper-fluorescence OLEDs for use in display applications and solid state lighting.

The innovative OLEDs will be realised by combining thermally activated delayed fluorescence (TADF) molecular hosts with novel fluorescence emitters, targeting saturated blue emission of very high efficiency, especially at high-brightness levels.

Further efficiency gains will be achieved through molecular alignment to enhance light outcoupling from the hyper-fluorescence OLEDs. Using the hyperfluorescence concept will enable simpler device structures and keep drive voltages low to be compatible with low voltage CMOS back plane electronics. This will enable demonstration of the concept's feasibility for high-brightness, full-colour OLED microdisplays as one application example.

www.hyperoled.eu

HyperOLED

High-performance, hyperfluorescence OLEDs for use in display applications and solid state lighting

January 2017 – December 2019

The HyperOLED project has received funding from the European Union's H2020 research and innovation programme under grant agreement No 732013

Hyper OLED

Objective 1: Develop fluorescence emitters
Development of adapted fluorescence emitters in order to prevent triplet quenching in OLED devices.

Objective 2: Develop TADF hosts
New strucuture of TADF host molecules based on molecular building blocks and strategies to synthesise new green and blue TADF emitters.

Objective 3: Photo-physically characterise the fluorescence emitters and TADF hosts
Full characterisation analysis of the synthesised materials, including the use of fluorescence lifetime measurements.

Objective 4: Anisotropic molecular orientation for enhanced performance
Comprehensive characterisation of the OLED device's anisotropy to optimise the OLED efficiency and brightness.

Objective 5: Design and test prototype hyperfluorescence OLEDs
Test the materials in actual OLEDs to judge their performance, as this is the main guide for the design of new materials or the modification of existing ones.

Objective 6: Fabricate and evaluate demonstration hyperfluorescence microdisplays
Development of a highly efficient white stack based on a TADF blue emitter and conventional phosphorescent RG emitter adapted to OLED microdisplays.

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