

Organic electronics is becoming an increasingly common element of our lives, until a few years ago devices based on LED matrices (light emitting diode) barely replaced the previous technology, and we are now, where OLED technologies (organic light-emitting diodes) are now successfully competing with old LED technology. Most of us already own organic displays in smartphones (AMOLED, Samsung, iPhone etc.) and we hear more and more about organic lighting and transparent, flexible TVs. Moreover, organic technologies in the case of matrices have shown that we do not have to think schematically about electronic devices as bricks but as thin flexible elements (foils) that can be implemented anywhere from walls, furniture to clothes and skin.

One of the main problems with the organic displays and lighting technology is their stability and processing, and these are the problems we want to solve in our project. To produce stable and high-performance OLED devices using hyperfluorescence process, we plan to investigate the host-guest and the dopant interaction to predict the important parameters needed for highly efficient systems.

We already have experience in researching this type of emitters, but we want to go a step further and define a number of parameters that a molecule must meet in order to have the above-mentioned parameters and we plan to synthesize a wide group of such emitters. The next stage, important for the success of the project, will be the attachment of appropriate groups to improve the solubility and processability of the emitters, which will allow us to use these molecules in the techniques of application from the solution. Thanks to this, it will be possible to use in the future much cheaper technologies in the production of matrices or OLED lighting such as printing or roll to roll (R2R) technology, which is widely used in the mass production of coatings and films. R2R is a coating or printing technology where a roll of flexible material is rolled out, an electronic circuit is applied / printed and the roll is re-wound. Thanks to this, in the future it will be possible to mass-print active lighting on foil / paper, displays that can be implemented around us.