

Simulation of organic and electrochemical transistor

In recent years, organic electronics (OE) is one of the fastest growing disciplines in material science. In particular, the term OE refers to the study of organic conductive polymers and conductive small molecules as well as their applications in modern electronic devices.

The purpose of this thesis was the simulation of OTFTs and the simulation of organic electrochemical transistors (OECTs) with the device simulation framework “ATLAS”. Simulation is an alternative way of experimenting that provides the researcher with more accurate information, much faster and less expensive.

First of all, we investigated the low-voltage bottom-gate and top-gate organic transistors and we tried to determine their optimal transistor performance by changing the critical region sizes of the device, channel length (L), active layer thickness (t_{act}) and also the gate oxide thickness (t_{ox}).

Moreover, we compared the experimental results of a sprayed organic field effect transistor with these simulation results to extract a realistic theoretical model.

In the end, we mentioned the reasons that we did not manage to complete the simulation of the electrochemical transistor.