



An experimentally-validated multi-scale materials, process and device modelling & design platform enabling non-expert access to open innovation in the Organic and Large Area Electronics Industry (MUSICODE)

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Publishable summary

This document reports the work carried out in Task 3.1 “Fabrication of test opto-electronic (OE) materials and devices (M1-12)” under the WP3 “Model validation by analytical characterization (M1-M36)”. WP3 conducts experimental tests and characterization to validate the models of WP2. Task 3.1 focuses on the fabrication of these test OE materials and devices. To facilitate a roadmap for this, all partners collaborated during the first months of the project in WP3 Task 3.1 to fabricate the specified OE materials and devices needed, as well as to report problems and mitigation strategies

This report shows the experimental work undertaken during M13 and M18, in Task 3.1, and is a continuation of the experimental work reported in deliverable 3.1. Single carrier devices and small organic photovoltaic devices (OPV) with photoactive areas below 1 cm^2 were fabricated by different partners, using the spin-coating technique in conjunction with vacuum deposition, whereas others were fully solution processed. The single carrier devices were used to measure the charge carrier mobilities of pure donor materials (hole only devices, HOD), leading to additional data from those reported in D3.1. Also, single carrier devices of pure acceptor materials (electron only, EOD) were fabricated, with the aim of collecting the first set of electron carrier mobility data. The fabrication process optimization for both types of single carrier devices was carried out, in order to overcome the difficulties that arose during the first fabrication attempts. Finally, a second batch of opto-electronic (OE) layers were deposited on c-Si by means of organic vapor phase deposition (OVPD). These layers were characterized by several partners by spectroscopic ellipsometry (SE) and atomic force microscopy (AFM), leading to valuable data on the materials’ optical and structural properties, as well as their correlation with the fabrication process parameters.