



September 2015

**ADVENT Technologies at the European PV Solar Energy Conference and Exhibition  
(EUPVSEC 2015) Hambourg, Germany. 14 – 18 September 2015**

Members of the MatHero project were participated in the at the European PV Solar Energy Conference and Exhibition (EUPVSEC 2015) (<https://www.photovoltaic-conference.com/>) with an poster presentation entitled “**Selection of green solvents of the PBDTTPD:PCBM junction based on the study of solubility parameters**”, a joint work between Leitao Technological Center, ADVENT Technologies and Light Technology Institute, Karlsruhe Institute of Technology (KIT).

The aim of this work is to use a new approach to calculate Hansen solubility parameters (HSP) with less experimental effort and considerable high accuracy and to use these results in the selection of green solvents of the PBDTTPD:PCBM blend. In more details, organic photovoltaic is a future technology with great potential since it will facilitate the ever wider use of solar technology in coming years. It is assumed, that the organic electronics industries and organic solar cells in particular, are in the transition stage towards commercialization. A possible insertion of the OPV technology in the market involves a safe and environmentally friendly production process. By today, halogenated solvents, like chlorobenzene, o-dichlorobenzene or chloroform are the standard solvent systems for lab processing due to their excellent solubility for conjugated polymers and molecules. However, the toxicity of these solvents will not allow proceeding to mass production in industrial countries with a strict environmental, health and safety (EHS) legislation. In this work we focus on the binary solvent gradient method to calculate Hansen solubility parameters (HSP) for the design of green ink formulations of PBDTTPD:PCBM solar cells. A list of suitable green solvents was obtained from a computer simulation using the HSP of both polymers and the junction. Thin films devices and solar cells in inverted architecture were fabricated in order to validate experimentally the theoretical results. The efficiencies were compared with the performance of devices fabricated from common halogenated solvents.

*Advent Technologies is a world leader in the development of new materials and systems for energy applications. Advent Technologies is headquartered in Cambridge, MA, USA. The company also occupies research and development space in Patras, Greece where pilot manufacturing is taking place.*

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