Improvement in the Lifetime of Planar Organic Photovoltaic Cells through the Introduction of MoO3 into Their Cathode Buffer Layers

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Mots-clés	air contamination [4], cathode buffer layer [5], lifetime [6], Molybdenum oxide [7], planar organic photovoltaic cells [8], work function [9]
Résumé en anglais	Recently, MoO3, which is typically used as an anode buffer layer in organic photovoltaic cells (OPVCs), has also been used as a cathode buffer layer (CBL). Here, we check its efficiency as a CBL using a planar heterojunction based on the CuPc/C60 couple. The CBL is a bi-layer tris-(8-hydroxyquinoline) aluminum (Alq3)/MoO3. We show that the OPVC with MoO3 in its CBL almost immediately exhibits lower efficiency than those using Alq3 alone. Nevertheless, the OPVCs increase their efficiency during the first five to six days of air exposure. We explain this evolution of the efficiency of the OPVCs over time through the variation in the MoO3 work function due to air contamination. By comparison to a classical OPVC using a CBL containing only Alq3, if it is found that the initial efficiency of the latter is higher, this result is no longer the same after one week of exposure to ambient air. Indeed, this result is due to the fact that the lifetime of the cells is significantly increased by the presence of MoO3 in the CBL.
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