



Influence of the exciton blocking layer on the stability of layered organic solar cells

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Résumé en anglais	The life-time of multi-layer organic solar cells based on the couple donor acceptor copper phthalocyanine/fullerene is studied as a function of the nature of the exciton blocking layer (EBL). It is shown that organic EBL are more efficient than are the inorganic In ₂ S ₃ EBLs. Moreover among the organic EBL, Alq ₃ is the most efficient EBL protecting layer. An organic solar cell's lifetime depends on oxygen- and water-contamination of the organic materials. The solar cell's degradation may correspond to bulk or interface phenomena. Using equivalent electrical schemes of solar cell diodes, we show that the structure degradation is mainly related to bulk modification. It is proposed that oxygen- and water-diffusion into the C ₆₀ induce a large increase in its resistivity and, therefore an increase in the series resistance, which decreases the solar cell efficiency. In the case of In ₂ S ₃ EBLs, the degradation law predicts that with time two different phenomena will be present. The classical oxygen- and water-diffusion into the organic material, during the first hour of air exposure, leads to a modification in the In ₂ S ₃ EBL/organic interface properties.
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Liens

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