A Novel Algorithm for Lifetime Extrapolation, Prediction, and Estimation of Emerging PV Technologies

Accurate determination of the lifetime of novel hybrid and organic solar cells is often rather challenging due to the very dynamic behavior of such cells over time and ageing curves with shapes of varying nature. Therefore, in order to accurately and reproducibly determine the lifetime of photovoltaic devices with such a behavior, a novel elaboration algorithm is developed, which enables automatic smoothing, filtering, and extrapolation of the real lifetime data and reproducible determination of the lifetime parameters defined in the International Summit on OPV Stability guiding standards. The algorithm is also capable of predicting the lifetime of devices, not tested until the end of sample life, given that there is sufficient number of measured data points to perform reliable extrapolation of ageing curves (to a limited time frame). The algorithm is discussed in detail and a range of examples for different lifetime data are presented.

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