Surface photovoltage analysis of $CH_3NH_3PbI_3$

Thidarat Supasai[1,2], Nopporn Rujisamphan[1,3], Felix Lang[1], Abdelkrim Chemseddine[1], Kimon Ullrich[1], Thomas Dittrich[1]

[1] Helmholtz Centre Berlin for Materials and Energy, Hahn-Meitner-Platz 1, D-14109 Berlin, Germany
[2] Department of Materials Science, Faculty of Science, Kasetsart University, Bangkok, 10900, Thailand
[3] Department of Materials Science and Engineering, University of Delaware, Newark, Delaware 19716, USA

Layers of $CH_3NH_3PbI_3$ have been prepared from CH_3NH_3I and PbI_2 precursors in different ways by taking into account one-step deposition of $CH_3NH_3PbI_3$ [1] on preheated substrates, sequential deposition by infiltration [2] and sequential deposition by spraying [3]. Surface photovoltage (SPV) measurements were performed in a wide temperature range. Defect related SPV signals were reduced for $CH_3NH_3PbI_3$ layers deposited on preheated substrates. A transfer of $CH_3NH_3PbI_3$ or of PbI_2 onto mica from substrates took place depending on the treatment temperature. It is shown that moderate heating of $CH_3NH_3PbI_3$ leads to improved surface passivation [4] and that the formation of a passivating $CH_3NH_3PbI_3/PbI_2$ interface seems to be a key for high solar energy conversion efficiencies obtained with solar cells based on $CH_3NH_3PbI_3$ absorbers.

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