

Abstract Submitted
for the FWS14 Meeting of
The American Physical Society

SiN thin films for fabrication of flexible organic solar cell with enhanced stability HYUNG WOO CHOI, Univ of Nevada - Reno, BARRY O'BRIAN, YONG KYUN LEE, JEAYOUNG CHOI, Arizona State University, GHASSAN JABBOUR¹, Univ of Nevada - Reno — We demonstrate an enhanced stability of organic solar cells (OSC) through the incorporation of a thin silicon nitride (SiN) layer (ca. 300 nm) as a diffusion barrier of oxygen and water. Chemical vapor deposition (CVD) at 150 °C was used to deposit the SiN on flexible substrates of polyethylene naphthalate (PEN) and polyethylene terephthalate (PET). Upon device testing, OSCs with silicon nitride barrier layer showed three orders of magnitude improved performance when exposed to water vapor, as compared to OSCs without SiN. Un-encapsulated devices with SiN film showed only a 20% decrease in power conversion efficiency after exposure to air for more than a month! On the other hand, OSCs without the SiN layer failed upon exposure to air for 15 days. Detailed fabrication, testing and characterization of engineered devices will be given.

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Date submitted: 15 Oct 2014

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