

Supporting Information

Flexible ITO films with atomically flat surfaces for high performance flexible perovskite solar cells

Jae-Ho Kim^a, Hae-Jun Seok^b, Hyeong-Jin Seo^b, Tae-Yeon Seong^a, Jin Hyuck Heo^c, Sang-Hyuk Lim^c, Kyung-Jun Ahn^d, and Han-Ki Kim^{b*}

^aDepartment of Materials Science and Engineering, Korea University, Seoul 02841, Republic of Korea

^bSchool of Advanced Materials Science and Engineering, Sungkyunkwan University, Suwon, Gyeonggi-do 16419, Korea

^cDepartment of Chemical and Biological Engineering, Korea University, 145 Anam-ro, Seongbuk-gu, Seoul 136-713, Republic of Korea

^dSNTEK Co., Ltd, 1433-100, Seobu-Ro, Gwonseongu, Suwon-Si, Gyeonggi-do 16648, Republic of Korea

E-mail: hankikim@skku.edu Fax: +82-31-201-2462; Tel: +82-31-205-2462

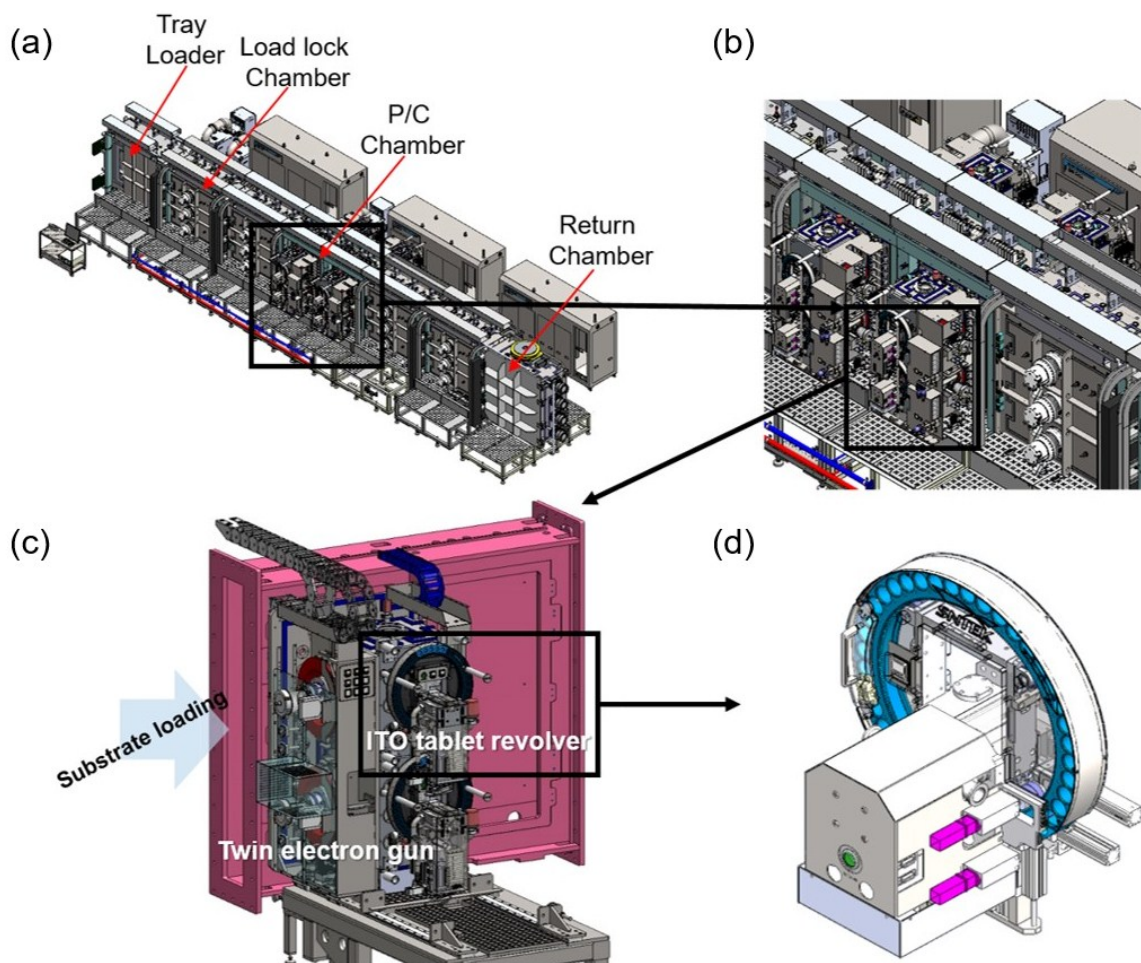


Figure S1. Illustration of the in-line type vertical plasma arc ion plating system. (a) Schematic structure of the in-line type vertical ion plating system (5 generation) consisted of the tray chamber, load lock chamber, process chamber and return chamber and (b) enlarged process chamber of ion plating system. (c) Illustration of the two set of electron guns placed in process chamber and (d) ITO tablet revolver system.

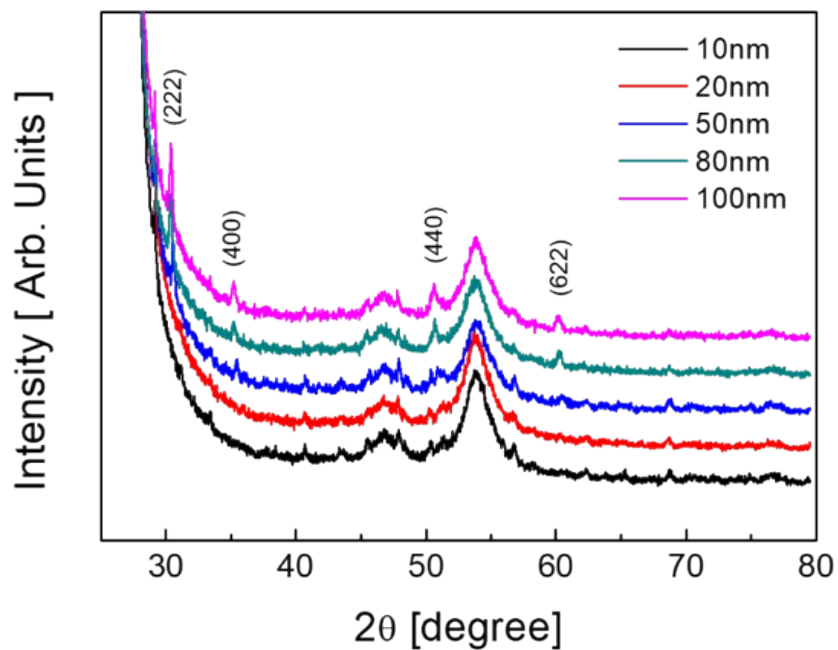


Figure S2. The plot of the XRD patterns obtained from the ion-plated ITO films as a function of the film thickness.

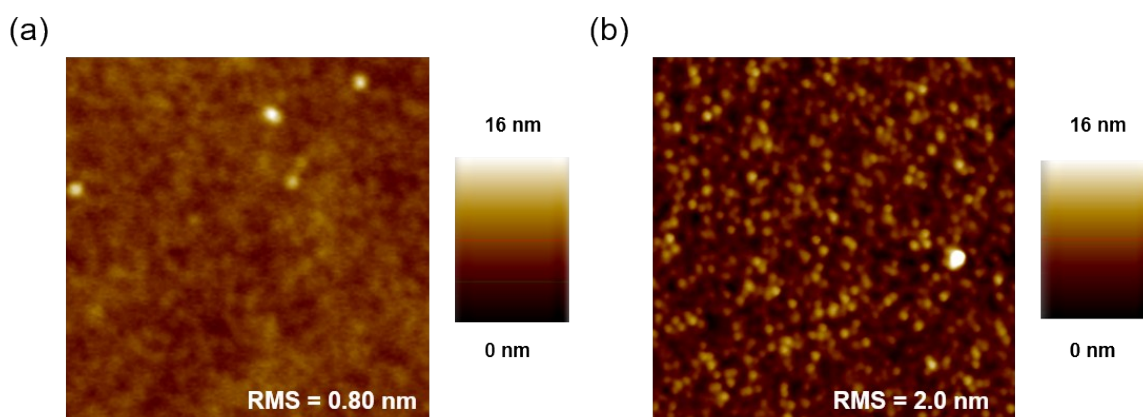


Figure S3. The AFM images of (a) ion-plated ITO films and (b) sputtered ITO films.

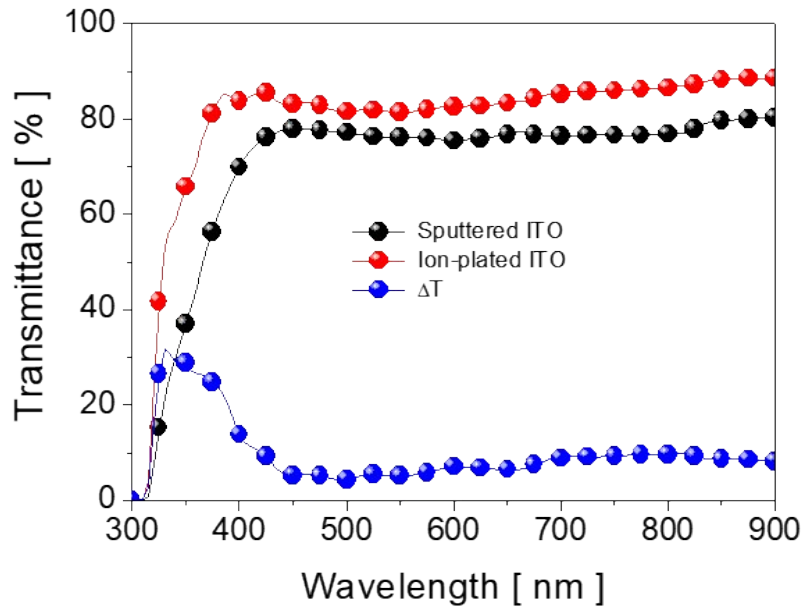


Figure S4. The transmittance spectra of the 100 nm thick sputtered ITO/PET substrate, the 100 nm thick ion-plated ITO/PET substrate and the difference of transmittance between the sputtered ITO/PET substrate and the ion-plated ITO/PET substrate (ΔT).