Electronic Supplementary Material (ESI) for Nanoscale.

Supplementary Information

Highly reproducible planar Sb_2S_3-sensitized solar cells based on atomic layer deposition

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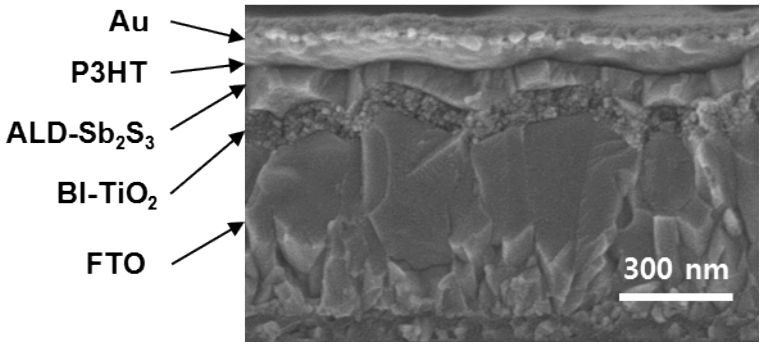

Fig. S1 Cross-sectional high-resolution SEM image of full cell with ALD 1600 layer: FTO/Bl-TiO2/Sb_2S_3-ALD1600/P3HT/Au.

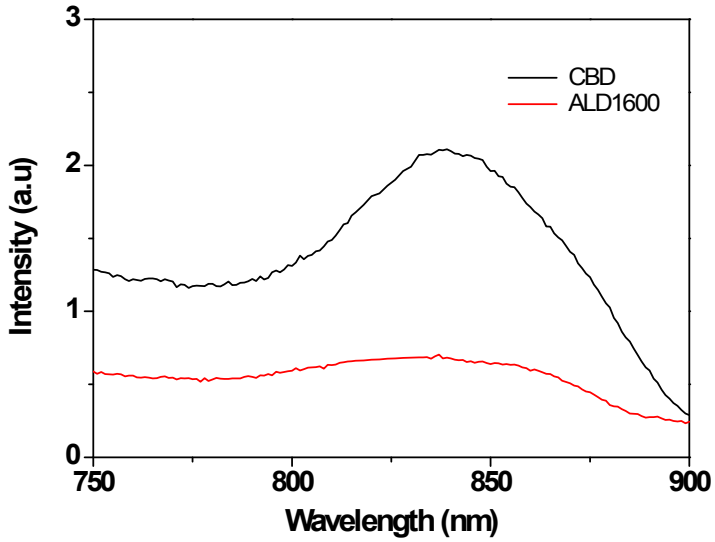

Fig. S2 Photoluminescent (PL) quenching spectra of FTO/bl-TiO_2/Sb_2S_3-CBD/P3HT and FTO/bl-TiO_2/Sb_2S_3-ALD1600/P3HT sample (excitation = 650 nm-wavelength). The PL intensity of FTO/bl-TiO_2/Sb_2S_3-ALD1600/P3HT sample was more severely quenched than the FTO/bl-TiO_2/Sb_2S_3-CBD/P3HT sample. This might be attributed to the better charge injection from Sb_2S_3 into TiO_2 in ALD1600 sample because the pure Sb_2S_3 was formed by the ALD process and as a result, the traps might be significantly removed.

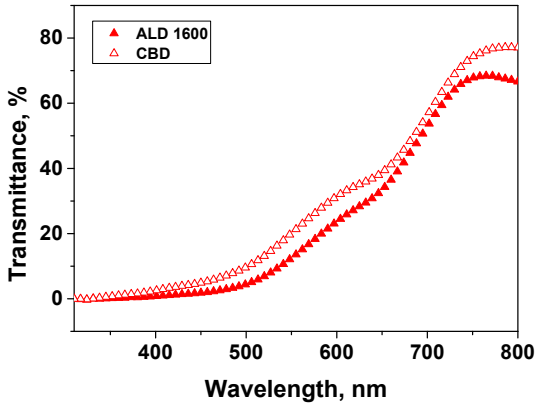

Fig. S3 Transmittance spectra of Sb_2S_3-ALD1600 and Sb_2S_3-CBD. The transmittance of Sb_2S_3-CBD sample was higher than Sb_2S_3-ALD1600 sample. This might be attributed to the low absorption of Sb_2S_3-CBD because the impurities were formed by the CBD process.

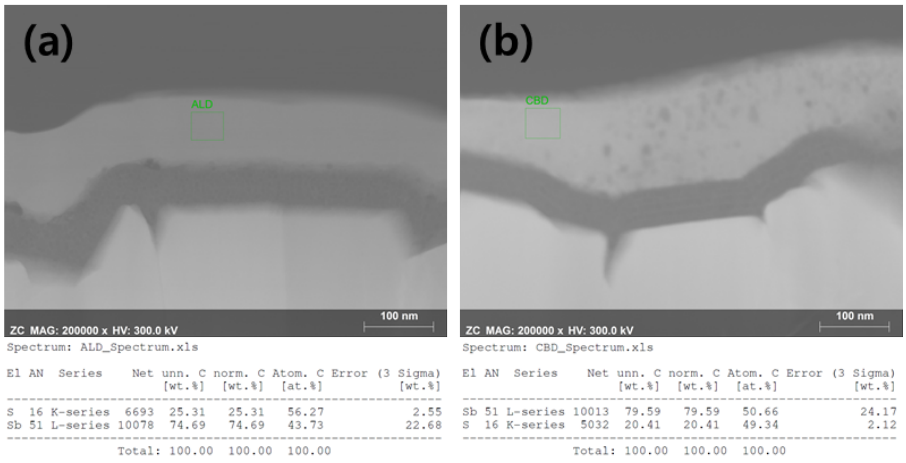

Fig. S4 (a) TEM-EDX of Sb_2S_3-ALD1600 and (b) Sb_2S_3-CBD. The Sb/S ratio of Sb_2S_3-ALD1600 was 0.77 (=43.73/56.27), but Sb_2S_3-CBD was near 1 (=49.34/50.66). Sb_2S_3-CBD sample have higher Sb/S ratio due to impurity.