Supplementary Information

Design of broadband transparent electrodes for flexible organic solar cells**

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Figure S1. Sheet resistances of Ag films of various thickness on dielectrics.

Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A
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Figure S2. Simulated contour plots of average transmittance (400 ~ 700 nm) for D\(_{0}\)/Ag/WO\(_3\) as a function of thickness (a) D\(_{0}\) (n = 1.7, k = 0), (b) D\(_{0}\) (n = 2.3, k = 0), (c) D\(_{0}\) (n = 3.0, k = 0).

Figure S3. Apparent transmittance of D\(_{0}\)/Ag/WO\(_3\) as a function of the refractive index (from 1.5 to 3.0) and extinction coefficient (k = 0, 0.05, and 0.1) of outer dielectrics.
Figure S4. W 4f and O 1s core-level spectra of WO$_{3-x}$ films deposited at different rates.
Figure S5. Changes in PCE of device using Ta$_2$O$_5$/Ag/WO$_{3-x}$ and ITO/WO$_{3-x}$ electrode during exposure to air.