

SUPPORTING INFORMATION

Cu(II) and Zn(II) Phthalocyanine as Hole Transporting Material for Perovskite Solar Cells

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Compound $({}^t\text{OctPhO})_8\text{CuPc } 1$

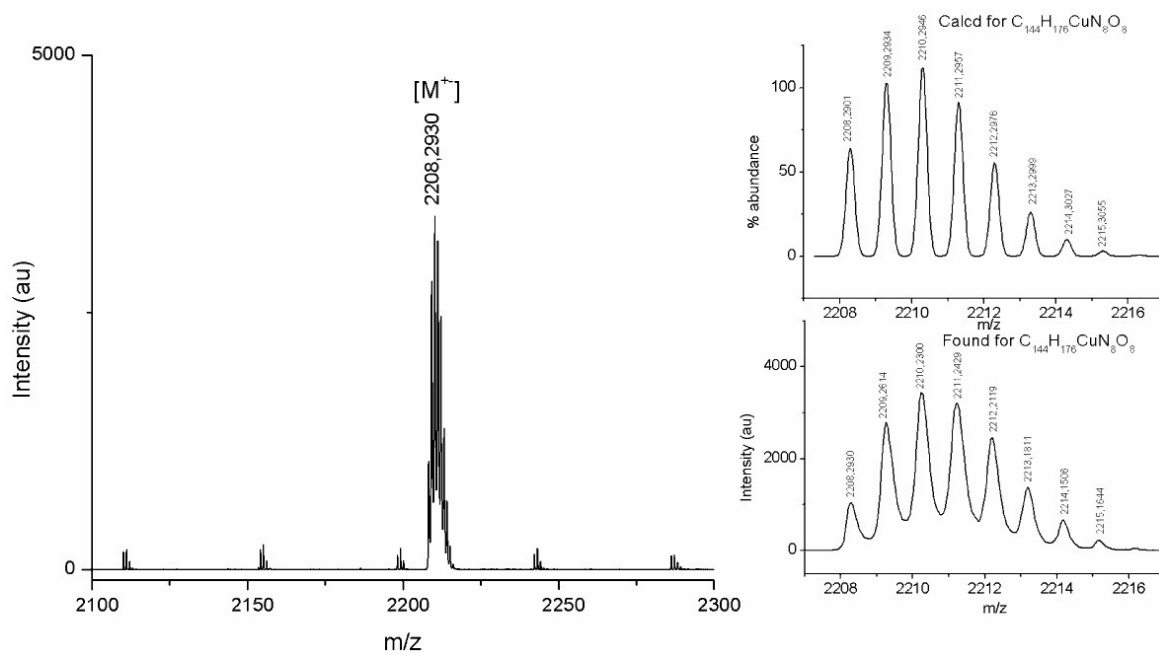


Fig. S1. HR-MALDI-TOF mass spectrum of $({}^t\text{OctPhO})_8\text{CuPc } 1$.

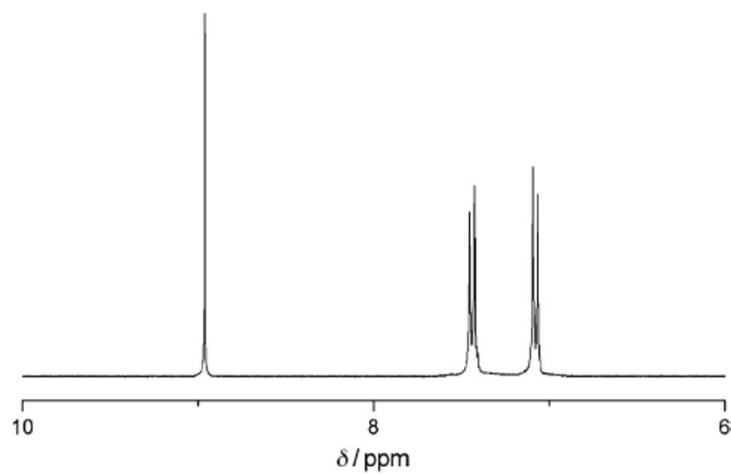


Fig. S2. ${}^1\text{H}$ NMR spectrum of $({}^t\text{OctPhO})_8\text{ZnPc } 2$ in $\text{THF-}d_8$ (enlargement of the aromatic region).

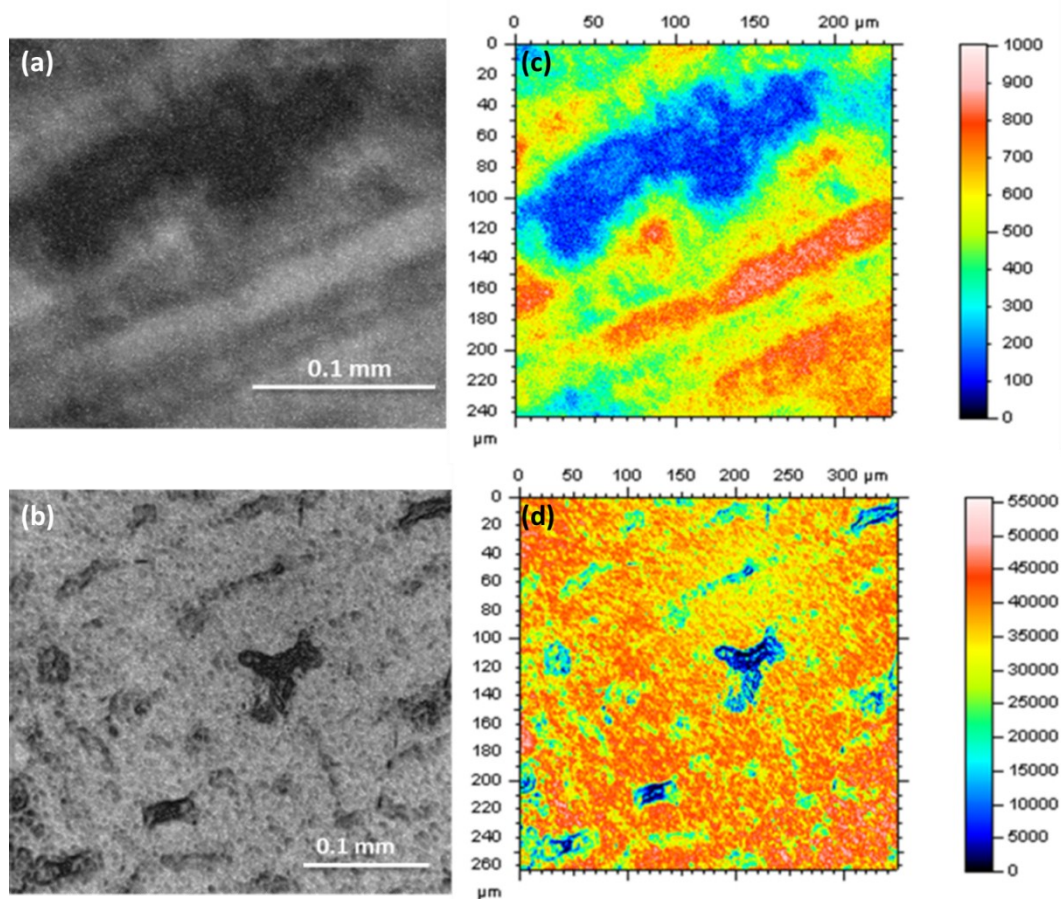


Figure S3. Top-surface morphology recorded by interference microscope of (a-b) $({}^t\text{OctPhO})_8\text{CuPc 1}$ and (c-d) $({}^t\text{OctPhO})_8\text{CuPc 1}$ film on perovskite, respectively.

Table S1: Summary of statistical photovoltaic parameters of PSCs employing $({}^t\text{OctPhO})_8\text{CuPc}$ and $({}^t\text{OctPhO})_8\text{ZnPc}$ as HTMs for 2-4 devices for each configuration

HTM	V_{oc} (V)	J_{sc} (mA/cm ²)	FF (%)	PCE (%)
$({}^t\text{OctPhO})_8\text{CuPc 1 10 mM}$	0.86 ± 0.01	18.76 ± 0.36	48.54 ± 2.86	7.81 ± 0.74
$({}^t\text{OctPhO})_8\text{CuPc 1 20 mM}$	0.71 ± 0.04	16.01 ± 1.06	33.44 ± 2.20	3.82 ± 0.66
$({}^t\text{OctPhO})_8\text{CuPc 1 30 mM}$	0.83 ± 0.01	13.37 ± 0.38	30.61 ± 2.69	3.36 ± 0.34
$({}^t\text{OctPhO})_8\text{ZnPc 2 10 mM}$	0.77 ± 0.01	18.31 ± 0.64	38.30 ± 1.79	5.49 ± 0.37
$({}^t\text{OctPhO})_8\text{ZnPc 2 20 mM}$	0.86 ± 0.02	16.71 ± 1.52	46.73 ± 0.16	6.74 ± 0.36
$({}^t\text{OctPhO})_8\text{ZnPc 2 30 mM}$	0.73 ± 0.01	12.87 ± 0.88	24.62 ± 0.70	2.32 ± 0.13
Spiro-OMeTAD	1.01 ± 0.02	21.51 ± 0.44	69.01 ± 1.01	14.99 ± 0.45