Supporting information

Simultaneously enhancing efficiency and stability of perovskite solar cells by using P3HT/PEDOT:PSS as double hole transport layer

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Table S1 Summarizes and compares the PCE of hydrophobic polymers in the conventional HTLs of perovskite solar cells.

Device	hydrophobic polymers	PCE	Years
ITO/poly TPD/Perovskite/$PC_{61}BM$/C_{60}/BCP/Au	Poly TPD	15.15 %[1]	2019
ITO/PEDOT:PSS/Perovskite/$PC_{60}BM$/Ag	PTAA	16.94 %[2]	2019
ITO/PEDOT:PSS/PTAA/Perovskite/$PC_{60}BM$/Ag		19.04 %[2]	
ITO/PTAA/Perovskite/$PC_{60}BM$/BCP/Ag	PTAA	6.9 %[3]	2021
ITO/PEDOT:PSS/Perovskite/$PC_{60}BM$/BCP/Ag		10.1 %[3]	
ITO/PTAA/Perovskite/C_{60}/BCP/Ag	PTAA:PASQ-IDT	19.74 %[4]	2022
ITO/PTAA:PASQ-IDT/Perovskite/C_{60}/BCP/Ag		21.33 %[4]	
ITO/PTAA/Perovskite/PCBM/BCP/Ag	PEO-TPAB	18.33 %[5]	2023
ITO/PTAA/PEO/Perovskite/PCBM/BCP/Ag		20.11%[5]	
ITO/PTAA/PEO-TPAB/Perovskite/PCBM/BCP/Ag		21.62 % [5]	
ITO/PTAA(PhMe)/Perovskite/C_{60}/BCP/Ag	PTAA(PhMe) and PTAA(Py)	19.35 %[6]	2023
ITO/PTAA(Py)/Perovskite/C_{60}/BCP/Ag		20.53 %[6]	
ITO/PEDOT:PSS/Perovskite/PCBM/BCP/Ag	P3HT	17.04 %	This work
ITO/PEDOT:PSS/P3HT/Perovskite/PCBM/BCP/Ag		19.78 %	

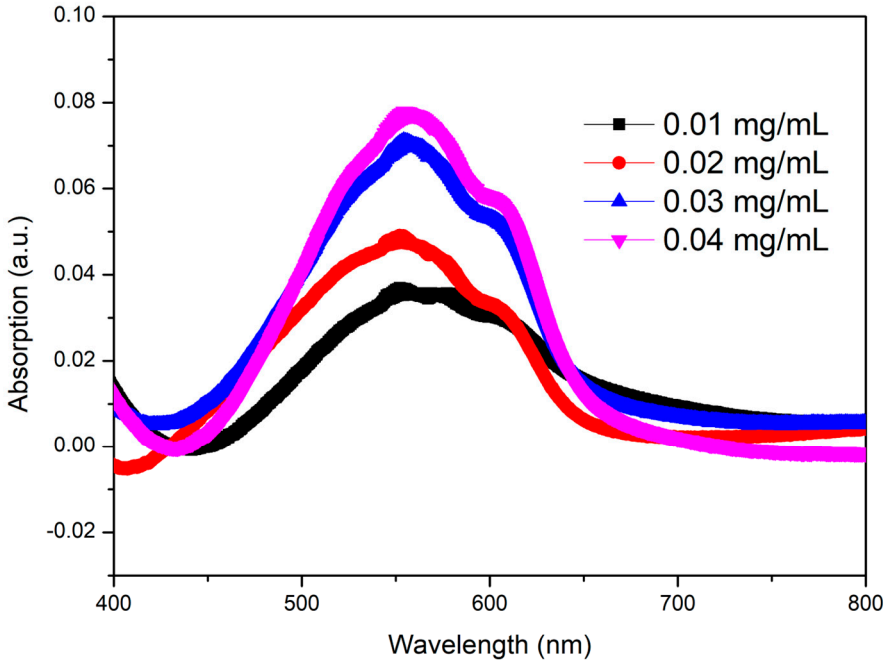


Fig.S1. The absorption of various concentration of P3HT.

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