

Supporting Information

Interfacial modification between NiO_x and perovskite layers with hexafluorophosphate salts for enhancing device efficiency and stability of perovskite solar cells

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Table S1. Lifetime parameters of TR-PL decay curves of the perovskite on the pristine or modified NiO_x films.

Substrate	A ₁ (%)	τ ₁ (ns)	A ₂ (%)	τ ₂ (ns)	τ _{avg} (ns)
NiO _x	74.99	13.05	25.01	263.24	230.8
NiO _x /NH ₄ PF ₆	38.95	101.98	61.05	11.562	88.3
NiO _x /LiPF ₆	56.6	7.442	43.4	194.07	185.1
NiO _x /NaPF ₆	66	10.15	34	160.5	144

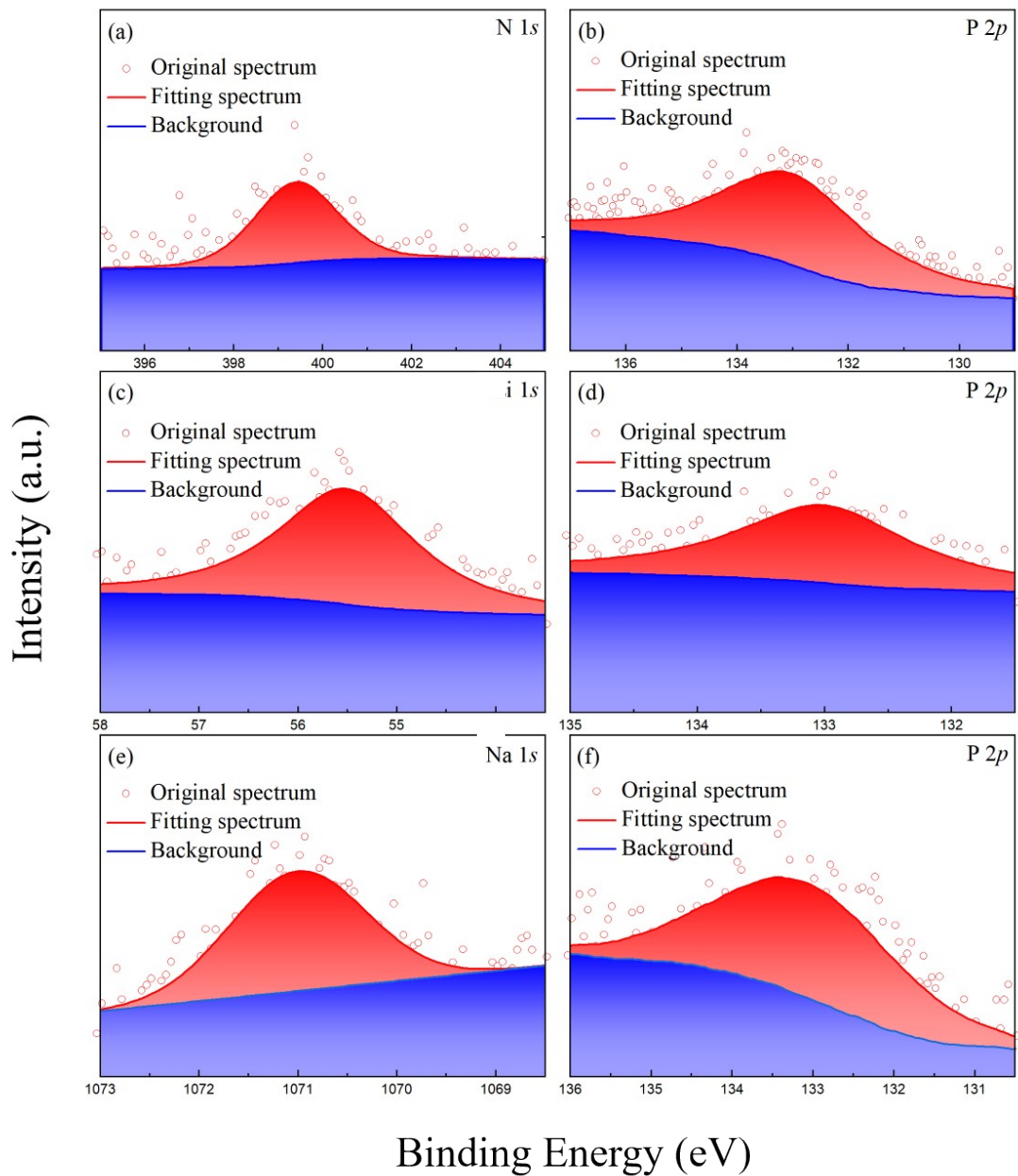


Figure S1. N $1s$, P $2p$, Li $1s$, and Na $1s$ XPS spectra of (a,b) NH_4PF_6^- , (c,d) LiPF_6^- , and (e,f) NaPF_6^- -modified NiO_x films.

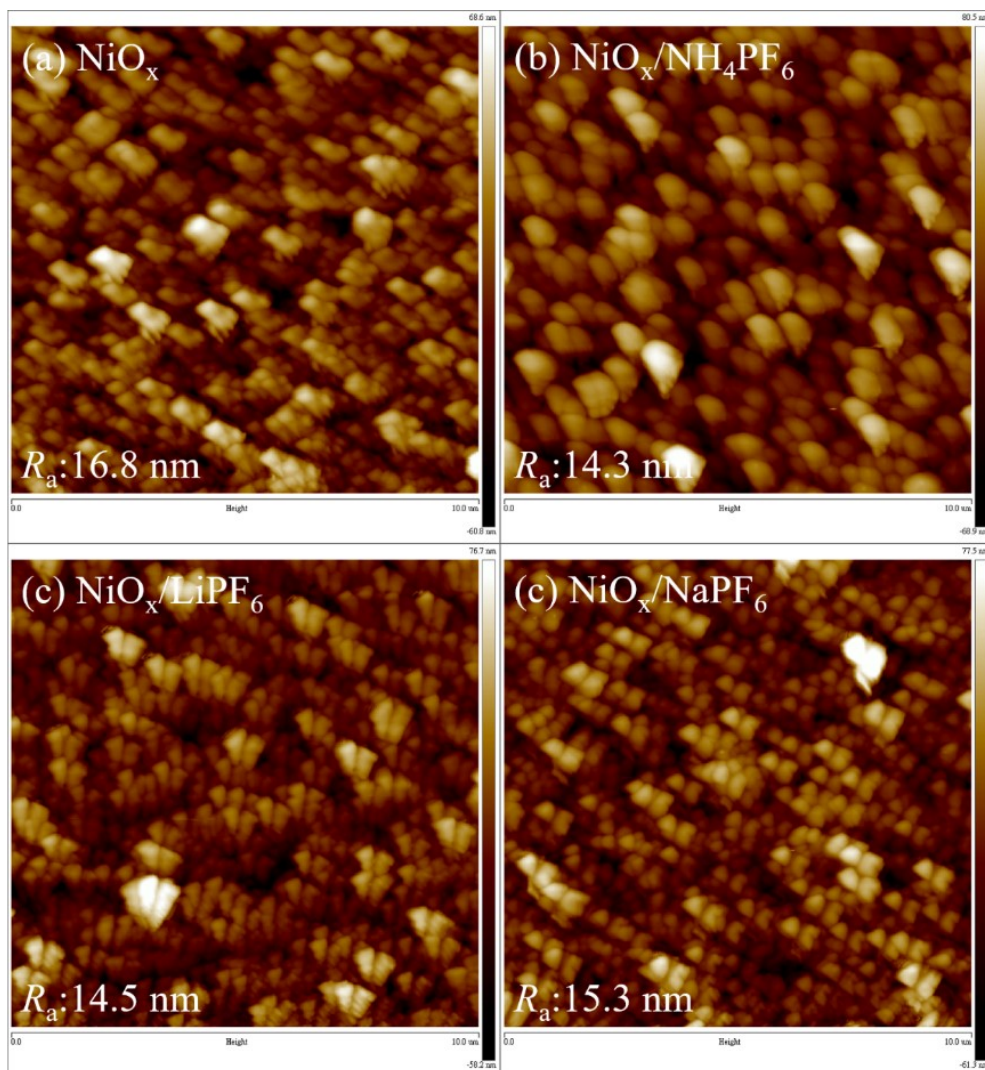


Figure S2. AFM topographic images of the pristine and modified NiO_x films.

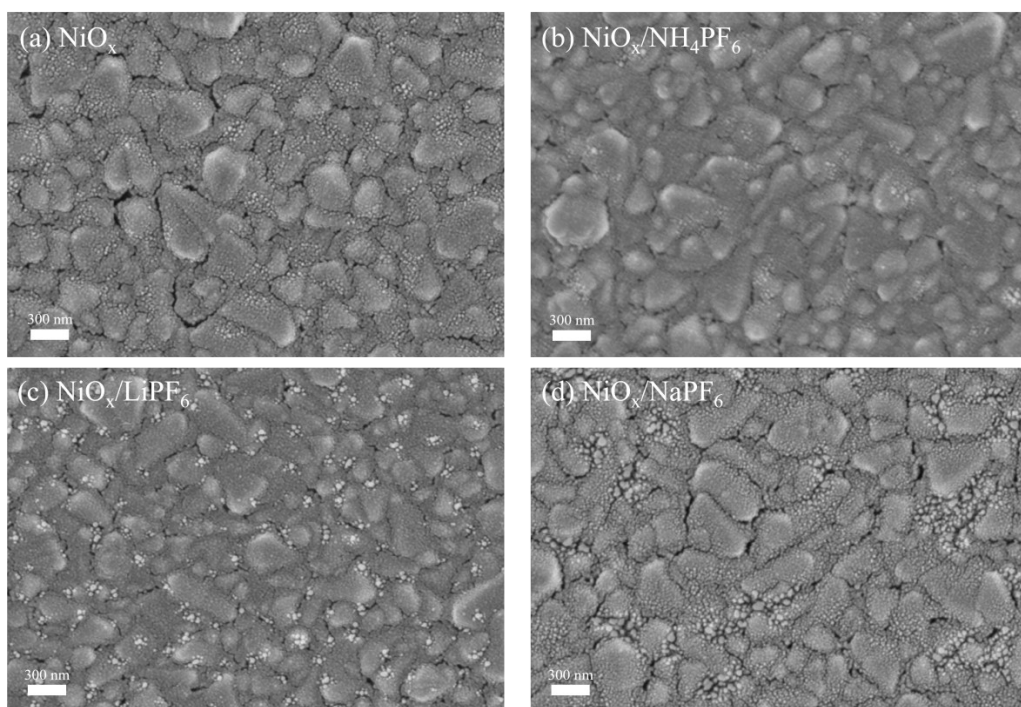


Figure S3. Top-view SEM images of the pristine and modified NiO_x films.

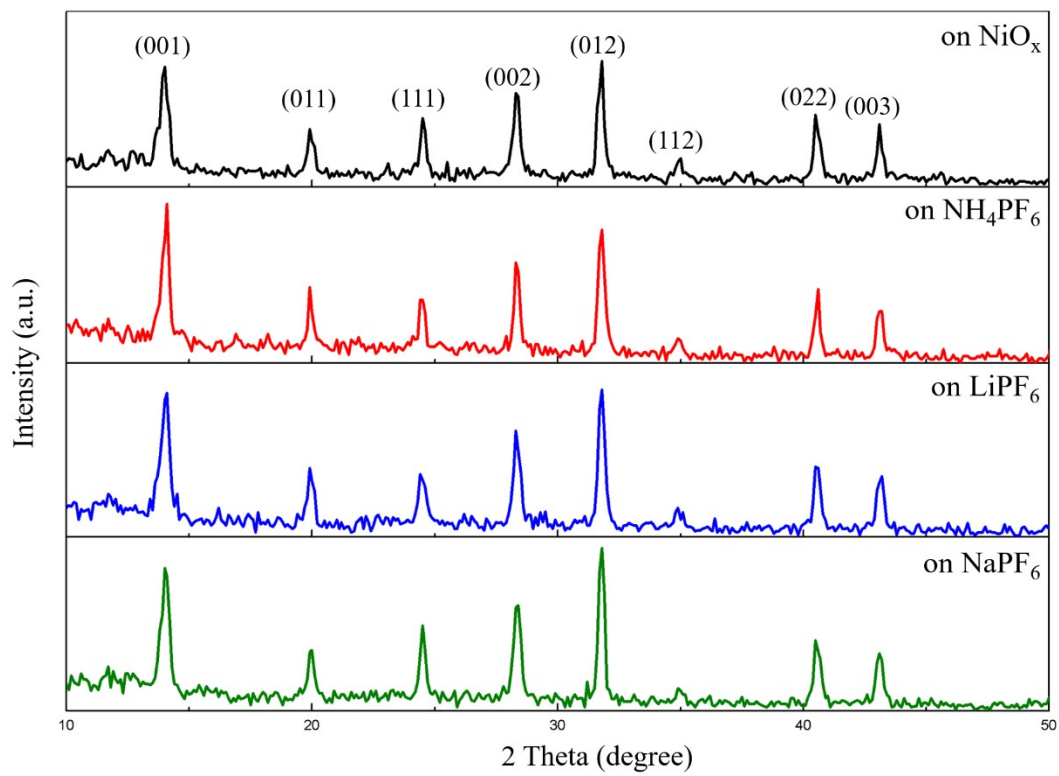


Figure S4. XRD patterns of perovskite layers on the pristine or modified NiO_x films.

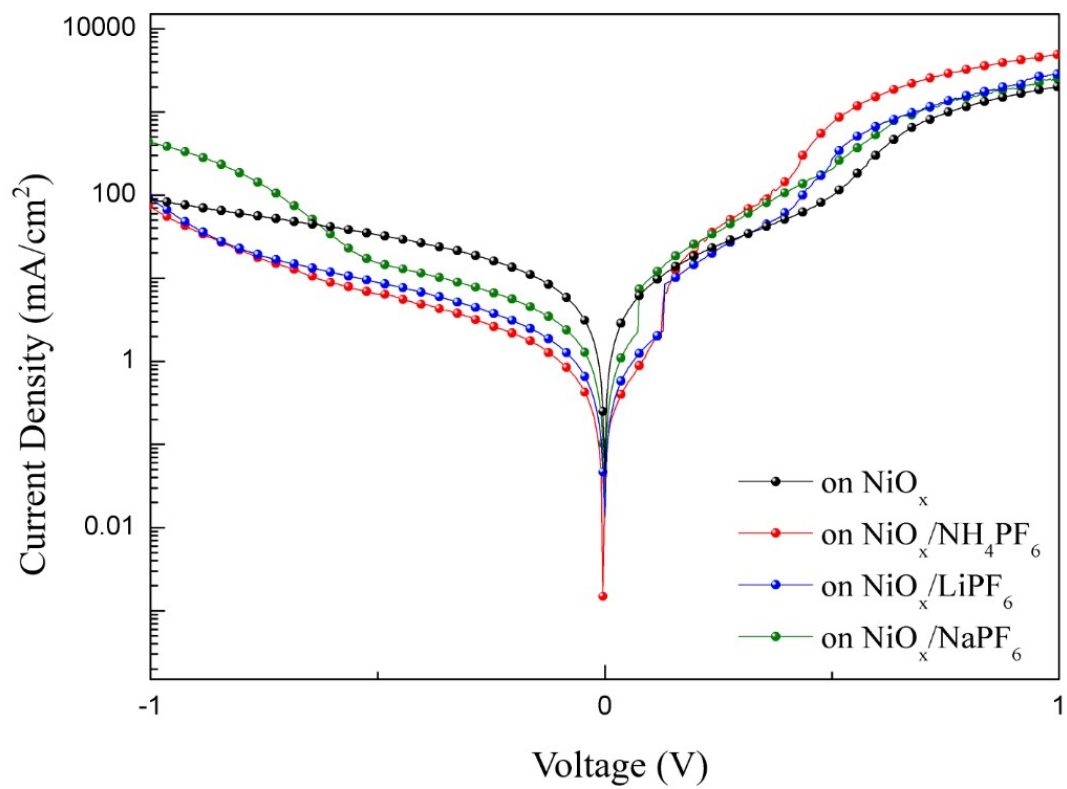


Figure S5. Dark J–V characteristics of PSCs based on the pristine and modified NiO_x HTLs.