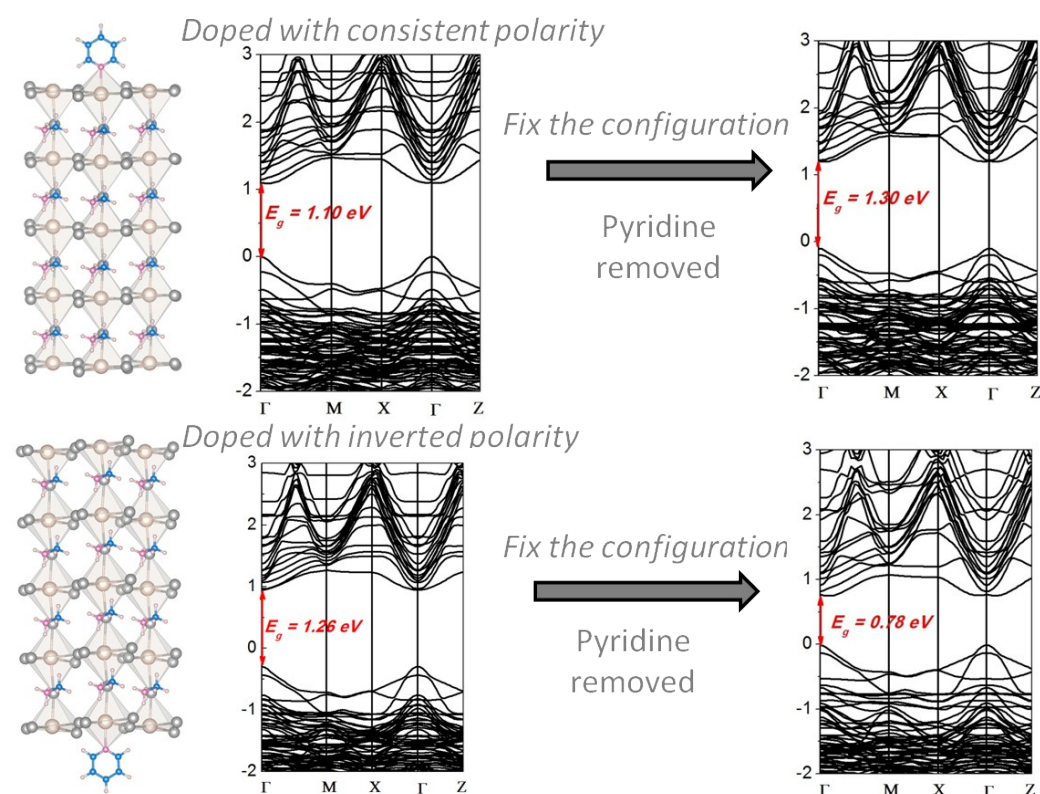
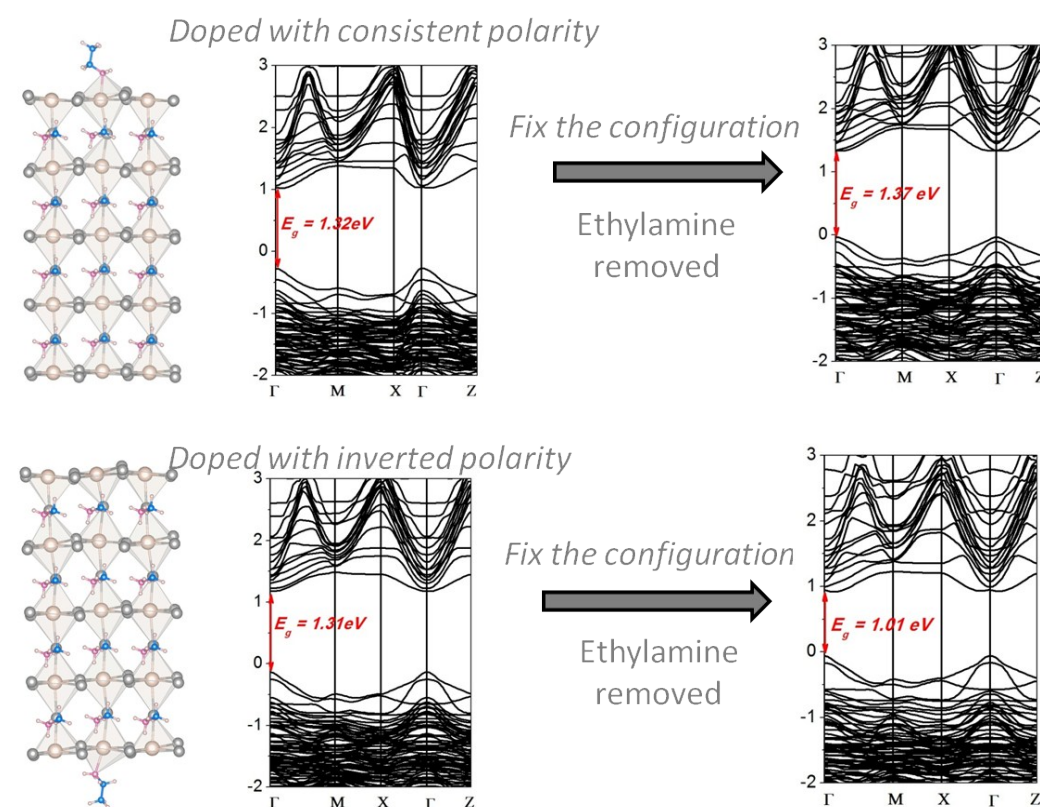


Electronic Supplementary Information



Supplementary Fig. 1. The band structures of two pyridine doped systems and the corresponding ones of the same configurations after removing the pyridine



Supplementary Fig. 2. The band structures of two ethylamine doped systems and the

corresponding ones of the same configurations after removing the ethylamine.

Supplementary Table I. The difference of band gap values before and after removing the dopants, including pyridine and ethylamine on the preovskite surfaces.

Dopant	Band gap (eV)	Removed dopant	Gap influenced by dopant polarities
Pyridine (top)	1.10	1.30	-0.20
(bottom)	1.26	0.78	0.48
Ethylamine (top)	1.32	1.37	-0.05
(bottom)	1.31	1.01	0.30