Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

Supporting Information

Impact of Bi doping on nonradiative carrier recombination in $CsPbI_3$

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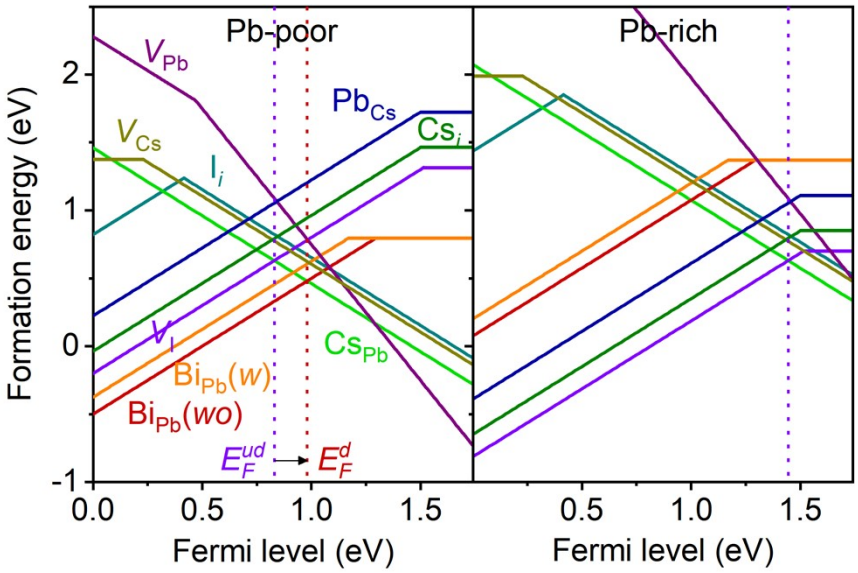

Figure S1. Formation energies of Bi_{Pb}, I_i, V_I, Cs_{Pb}, V_{Pb}, Cs_i, V_{Cs}, and Pb_{Cs} in $CsPbI_3$ under Pb-poor and -rich conditions. $E_F{}^{ud}$ (violet dashed line) and $E_F{}^d$ (red dashed line) mark the equilibrium Fermi levels in undoped and Bi-doped $CsPbI_3$, respectively.

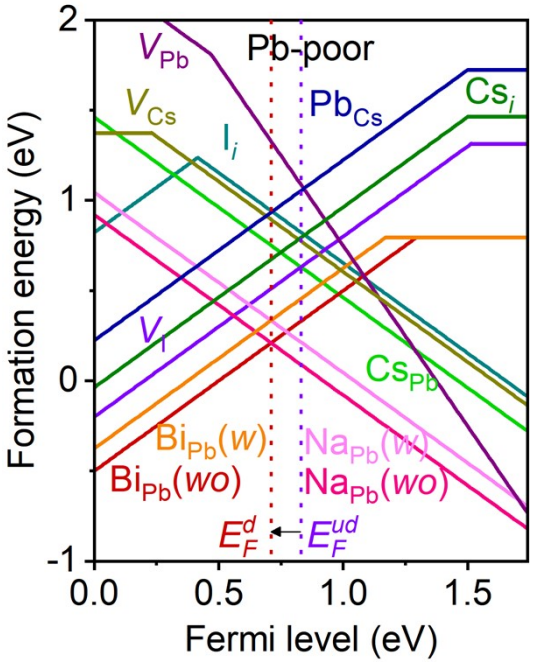

Figure S2. Formation energies of Na_{Pb}, Bi_{Pb}, I_i, V_I, Cs_{Pb}, V_{Pb}, Cs_i, V_{Cs}, and Pb_{Cs} in $CsPbI_3$ under Pb-poor conditions.