

Supplementary material: Lead-free hybrid organic-inorganic perovskites for solar cell applications

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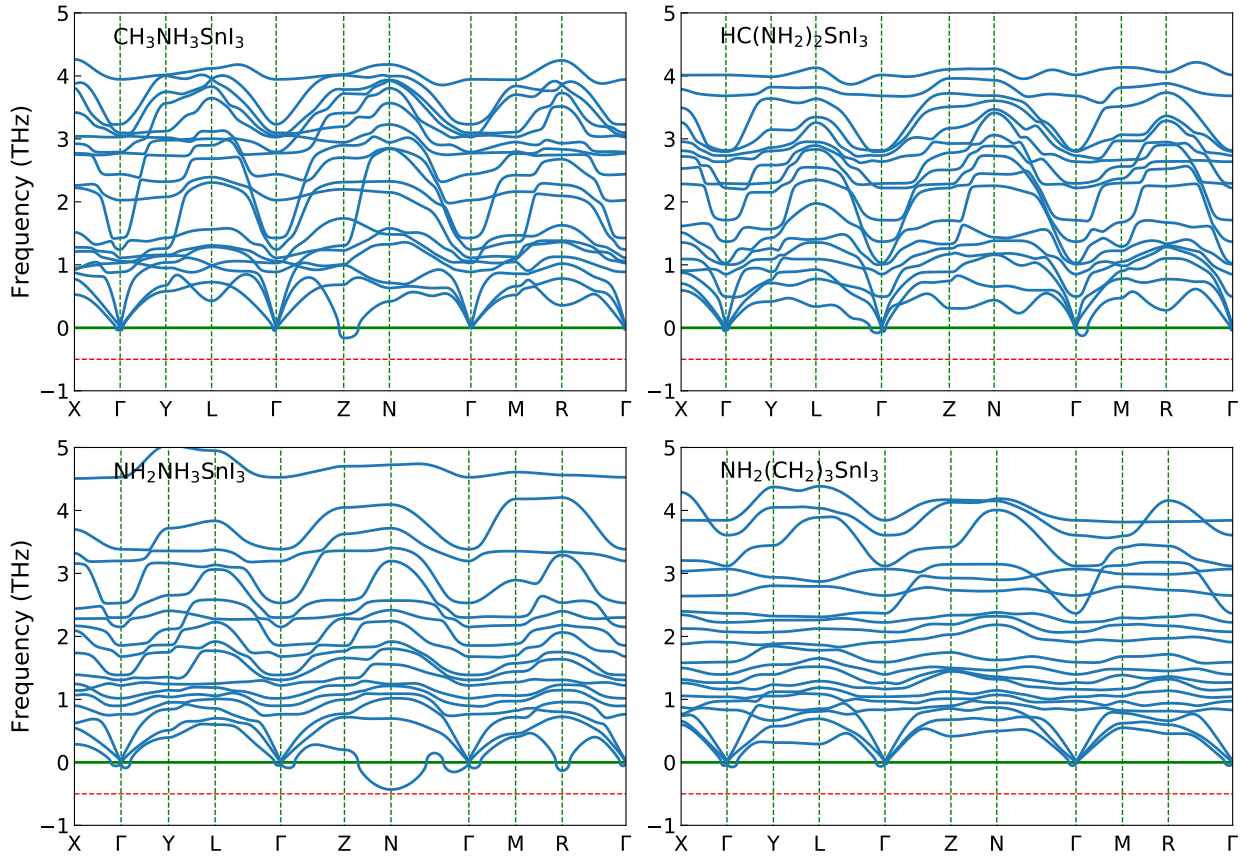


Figure 1: (Color online) Computed phonon band structure of $\text{CH}_3\text{NH}_3\text{SnI}_3$, $\text{HC}(\text{NH}_2)_2\text{SnI}_3$, $\text{NH}_2\text{NH}_3\text{SnI}_3$, and $\text{NH}_2(\text{CH}_2)_3\text{SnI}_3$. Dashed red lines at -0.5 THz are used for the scale of numerical error in phonon calculations of soft materials like polymers and HOIPs.

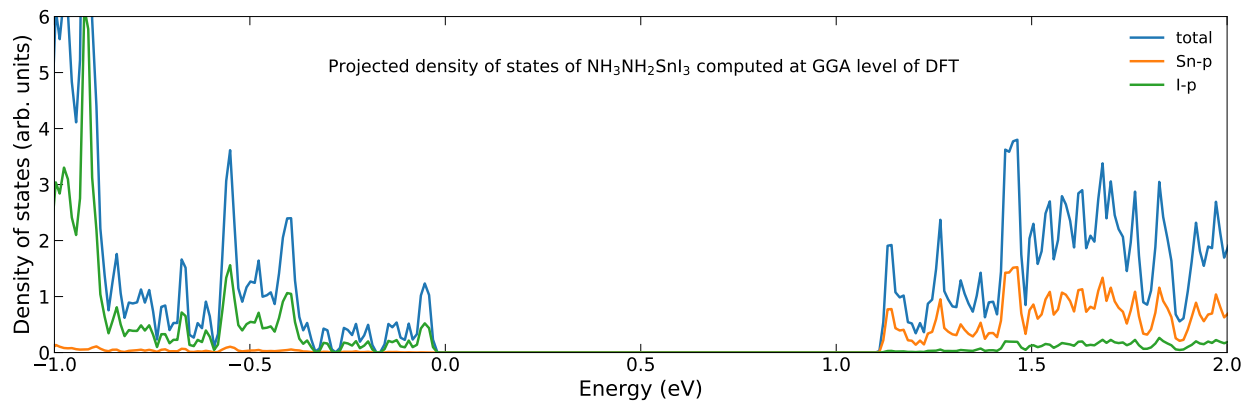


Figure 2: (Color online) Computed electronic density of states $\text{NH}_2\text{NH}_3\text{SnI}_3$.