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## Electronegative guests in CoSb<sub>3</sub>

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Introducing guests into a host framework to form a so called inclusion compound can be used to design materials with new and fascinating functionalities. The vast majority of inclusion compounds have electropositive guests with neutral or negatively charged frameworks. Here, we show a series of electronegative guest filled skutterudites with inverse polarity. The strong covalent guest-host interactions observed for the electronegative group VIA guests, i.e., S and Se, feature a unique localized “cluster vibration” which significantly influences the lattice dynamics, resulting in very low lattice thermal conductivity values. The findings of electronegative guests provide a new perspective for guest-filling in skutterudites, and the covalent filler/lattice interactions lead to an unusual lattice dynamics phenomenon which can be used for designing high-efficiency thermoelectric materials and novel functional inclusion compounds with open structures.

### Biography

Jihui Yang has completed his PhD in 2000 from University of Michigan. He is currently the Kyocera Associate Professor at Materials Science and Engineering Department of the University of Washington, Seattle, Washington. Prior to joining the University of Washington in the Fall of 2011, he was a Technical Fellow and Lab Group Manager at GM Research and Development Center, responsible for leading GM's research on Li-ion battery materials and systems; as well as advanced thermoelectric materials and technology development.

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