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Investigating Thermoelectric Properties of Yb_3Si_5 in a Wide Temperature Range for Low Temperature Thermoelectric Applications

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In this research we prepared $\text{Yb}_3\text{Co}_x\text{Si}_{5-x}$ where $x=0, 0.1, 0.15, 0.20$ and investigated their thermoelectric properties. Powder X-ray diffraction analysis confirmed all main peaks indexed to Yb_3Si_5 phase. Small amount of Si and Yb were observed as impurity. Thermal conductivity values are quite large for an ideal thermoelectric material, thereby maximum ZT value of 0.07 was measured at 300 K for non-doped Yb_3Si_5 . A very large maximum power factor of $\sim 4.70 \text{ mWm}^{-1}\text{K}^{-2}$ was observed at 72 K and room temperature value $\sim 1.56 \text{ mWm}^{-1}\text{K}^{-2}$ for the pristine sample. These results shows that Yb-Si compounds

have large potential to be used as low temperature TE applications in the future.

Speaker Biography

Fahim Ahmed a Professor at Department of Physics, Division of Science and Technology, University of Education Lahore, Pakistan. His research interests dealt with Thermal conductivity, Power factor, Nanomaterials, Thermoelectricity, particularly the development of Thermoelectric Properties incorporating nanomaterials.

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