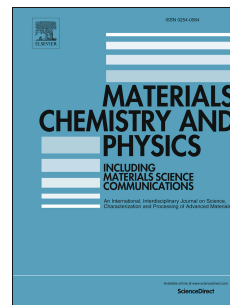


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The thermoelectric performance of bulk three-dimensional graphene

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Abstract

The electronic and thermoelectric properties of a new carbon bulk material, three-dimensional (3D) graphene, are investigated in this study. Our results show that 3D graphene has unique electronic structure, i.e., near the Fermi level there exist Dirac cones. More importantly, the thermoelectric performance of 3D graphene is excellent, at room temperature the thermoelectric figure of merit (ZT) is 0.21, an order of magnitude higher than that of graphene. By introducing line defects, the ZT of 3D graphene could be enhanced to 1.52, indicating 3D graphene is a powerful candidate for constructing novel thermoelectric materials.

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