Abstract

Thermoelectric (TE) materials, which realize direct conversion between thermal energy and electric energy, have attracted great attention recently. Apart from the conventional inorganic thermoelectric materials, organic materials, especially conducting polymers which possess unique properties, attract more and more attention. Due to their decent flexibility, light weight, facile processability and environmental friendly properties, conducting polymers and their composites show great potential in thermoelectric applications.

Among all these conducting polymers for TE applications, polyaniline (PANI) is widely studied because of its stability, simplicity in tuning its electrical conductivity, easy preparation procedures and low cost. In recent years, it is found that inorganic/polymeric composites show promising enhancement in TE performance. Carbon nanotubes is often introduced into the conducting polymer system among many research, such as P3HT, PEDOT:PSS and PANI, because its specific π-π conjugation and interfacial interactions with conjugated conducting polymers. Furthermore, these special interactions may affect the molecular arrangement and polymer chain morphology which may lead to TE improvement. In this work, we introduce a new amine modified carbon nanotubes in the composites, which aims to enhance the interfacial interactions between two components. Furthermore, we also carried out the carrier tuning to achieve the better TE performance.

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Liu Siqi graduated from Sichuan University with a Bachelor Degree in Polymer Materials and Engineering. He got the Master Degree from the department of Materials Science and Engineering, National University of Singapore. He is currently pursuing his Ph.D. degree in the department of Materials Science & Engineering under A/P He Chaobin. His research interests include conducting polymer composites for thermoelectric applications.

ALL ARE WELCOME!

Host: A/P Xue Junmin