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Tailoring of Mechanical, thermal and electrical properties of polymers composite: A micro fuel cell perspective

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Fuel cells have been intensively researched for the past few decades for macro applications. However, micro fuel cells have not received so much attention. A micro fuel cell delivers power in the mW-W range, and would be suitable for mobile purposes, e.g. as a charger for cell-phone or other small devices. We consider polymers such as polydimethylsiloxane (PDMS) as a prospective structural material candidate for a Micro Fuel Cell. The introduction of such a polymer as structural material will reduce the mass and the size of the micro fuel cell and therefore optimize the current micro fuel cell models. In this perspective, our work focuses on the tailorability and optimization of thermal, mechanical, and electrical properties of PDMS with different micro/nano fillers such as silver particles, carbon black. The mechanical property is characterized by Dynamic Mechanical Analysis (DMA). The thermal properties are measured using Thermal Gravimetric Analysis (TGA) and Cut-Bar thermal conductivity measurement. Four point probe was used for electrical conductivity measurement. Scanning Electron Microscopy (SEM) was used for surface morphology characterization.

Level (Hons, MSc, PhD, other)?

Hons

Consider for a student award (Yes / No)?

Yes

Would you like to submit a short paper for the Conference Proceedings (Yes / No)?

Yes

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