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Poly(ionic liquid)-Carbon Nanotubes Self-Supported, Highly Electroconductive Composites and their Application in Electroactive Devices

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**Poly(ionic liquid)-Carbon Nanotubes Self-Supported, Highly Electroconductive  
Composites and their Application in Electroactive Devices**

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**Abstract**

*A series of novel poly(ionic liquid)s/carbon nanotubes composites were prepared and studied. The effect of the anion on the thermal, mechanical and electrical properties of the composites was investigated. We obtained electrical conductivities ranged from 20 to 40 S cm<sup>-1</sup> which are amongst the highest reported for a material involving poly(ionic liquid)s and carbon nanotubes only. Dry electrochemical actuators were successfully prepared using poly(ionic liquid)s composites as electrodes, without the use of a polymer support such as polyvinylidene difluoride. It was found that the anion size influences the displacement response of the actuator. A maximum bending displacement of up to 0.5 mm was recorded under a low applied voltage of  $\pm 1$  V.*

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