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**Tunable water sensitive polymeric composites with synergistic
graphene and carbon nanotubes**

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Abstract

Hybrid nano-carbons of the reduced graphene oxide (rGO) and carbon nanotubes (CNTs) were utilized to fabricate the electrically conductive polymeric composites which exhibited superior flexibility, conductivity and tunable sensitivity to water exposure. Besides the conduction, morphologies and microstructure of the nanocarbon networks, the static and dynamic wetting behaviors as well as the absorption properties of the hybrid nanocarbons and the polymer composites were investigated. The emphasis was put on the influence of the composition on the sensory properties. The synergistic rGO-CNTs were found to magnify the water sensing, which may attribute to the swelling effect on the CNTs entanglement segregated by the rGO sheets. The findings may greatly benefit the exploration of nanocarbons in the field of the flexible sensory materials.

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