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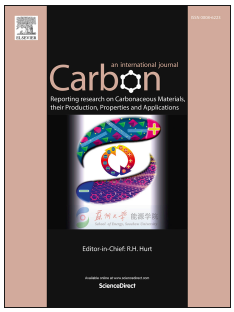

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Hollow microcapsules by stitching together of graphene oxide nanosheets with a di-functional small molecule

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Abstract

Micron-sized hollow capsules composed of graphene oxide and small molecule cross-linker are prepared and isolated. These capsules are thoroughly characterized using various spectroscopic and microscopic techniques. The cross-linked and non-cross-linked microcapsules show distinct release profiles from each other. Moreover, the microcapsules can be loaded with gold nanoparticles, suggesting these structures are useful in encapsulation technologies.

1. Introduction

Graphene oxides (GO) has attracted much interest for its antimicrobial properties,[1–4] mechanical strength,[5],[6] gas barrier properties,[7–10] and as a precursor to conductive materials.[11–14] GO is a sheet-like plane of sp^2 and sp^3 hybridized carbon atoms with oxygen functionalities throughout (i.e., alcohols, epoxides, and carboxylic acids). Due to the coexistence of the hydrophobic carbon frame and hydrophilic oxygen functional groups, GO is amphiphilic and can serve as a surfactant to stabilize Pickering-type emulsions. Such interfacial assembly of GO platelets has been used to prepare polymer particles “armored” with GO nanosheets,[15],[16]

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