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www.elsevier.com

PII: S2452-2139(18)30143-8
DOI: https://doi.org/10.1016/j.coco.2018.09.002
Reference: COCO131

To appear in: *Composites Communications*

Received date: 22 August 2018
Revised date: 4 September 2018
Accepted date: 5 September 2018

Cite this article as: Xiumin Liang and Qunfeng Cheng, Synergistic reinforcing effect from graphene and carbon nanotubes, *Composites Communications,* https://doi.org/10.1016/j.coco.2018.09.002

Synergistic reinforcing effect from graphene and carbon nanotubes

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Abstract:

Carbon nanomaterials show excellent physicochemical properties, especially for carbon nanotubes (CNTs) and graphene nanosheets. A large amount of bioinspired hybrid materials based on graphene/CNTs have been reported. The mechanical and electrical properties of resultant carbon nanomaterials based hybrid materials have been dramatically improved, indicating the synergistic effect between carbon nanotubes and graphene. In fact, the synergistic effect always plays a key role in the natural materials such as nacre and bone, and bioinspired materials based on carbon nanomaterials. Herein, this mini-review summarizes recent progress in synergistic effect from CNTs and graphene in the bioinspired hybrid materials and also make the perspective of the synergistic reinforcing effect from CNTs and graphene in enhancing the performance of carbon nanomaterials-based nanocomposites.

Abbreviations:

2D, two-dimensional;3D, three-dimensional;CNTs, carbon nanotubes;SACNT, super-aligned carbon nanotubes;SWNTs, single-walled carbon nanotubes;DWNTs, double-walled carbon nanotubes;MWNTs, multi-walled