

University of Groningen

Polymer wrapped carbon nanotubes doing it all

Loi, Maria A.; Gao, J.; Kwak, M.; Herrmann, A.

Published in:
Carbon Nanotubes and Nanostructures: Applications and Devices

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version
Publisher's PDF, also known as Version of record

Publication date:
2011

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Loi, M. A., Gao, J., Kwak, M., & Herrmann, A. (2011). Polymer wrapped carbon nanotubes doing it all: from selection to self-assembly of semiconducting devices. In Y. Gogotsi, J. Li, R. Martel, & S. Rotkin (Eds.), *Carbon Nanotubes and Nanostructures: Applications and Devices* (219 ed., Vol. MA2011-01). University of Groningen, The Zernike Institute for Advanced Materials.

Copyright

Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

The publication may also be distributed here under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license. More information can be found on the University of Groningen website: <https://www.rug.nl/library/open-access/self-archiving-pure/taverne-amendment>.

Take-down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.

Polymer wrapped carbon nanotubes doing it all: from
selection to self-assembly of
semiconducting devices

Maria A. Loi*, J.Gao, M. Kwak, A. Herrmann
University of Groningen, Zernike Institute for Advanced
Materials
Nijenborgh 4, 9747AG Groningen, The Netherlands

One of the most promising nano-materials for eventual incorporation into practical technologies is the single-walled carbon nanotube (SWNT). Although several solubilization and isolation methods for individual SWNTs have been recently reported, programmed self assembly of this superb material is a serious limit to further develop their use in technology.

Here I will show a flexible and potentially scalable solution meeting these needs using DNA block copolymers consisting of a single-stranded DNA block covalently connected to a hydrophobic polymer segment. This combination of materials enables each to contribute its full potential to the utilization of SWNTs in electronic devices. While the conjugated portion is able to select few semiconducting species, the DNA portion allows immobilizing the SWNTs in specific pre-determined position. The superiority of this self-assembly method is shown by the high-yield (98%) of working device fabricated.