

Electronic Supplementary Information

**Highly dispersed graphene ribbons produced from ZnO/C core-shell nanorods and their use as a filler in polyimide composites**

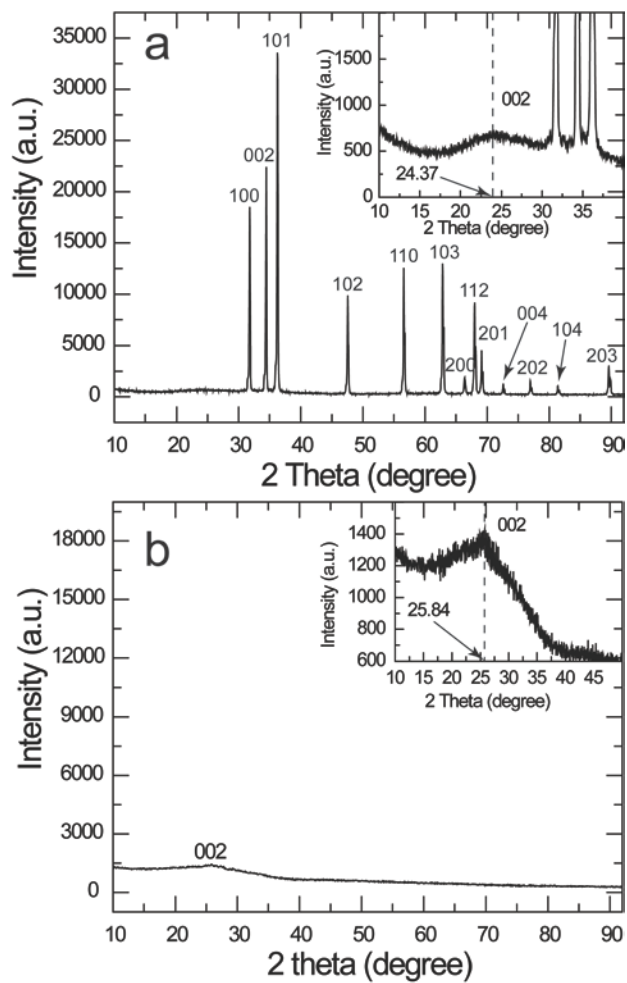
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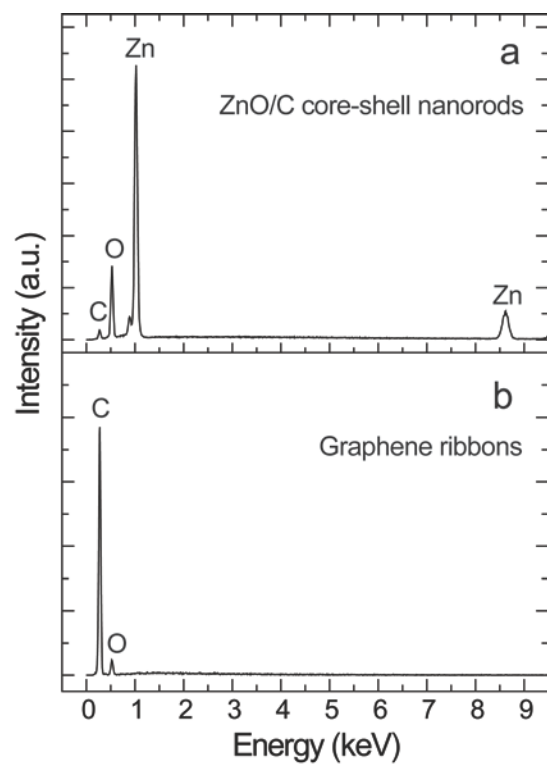
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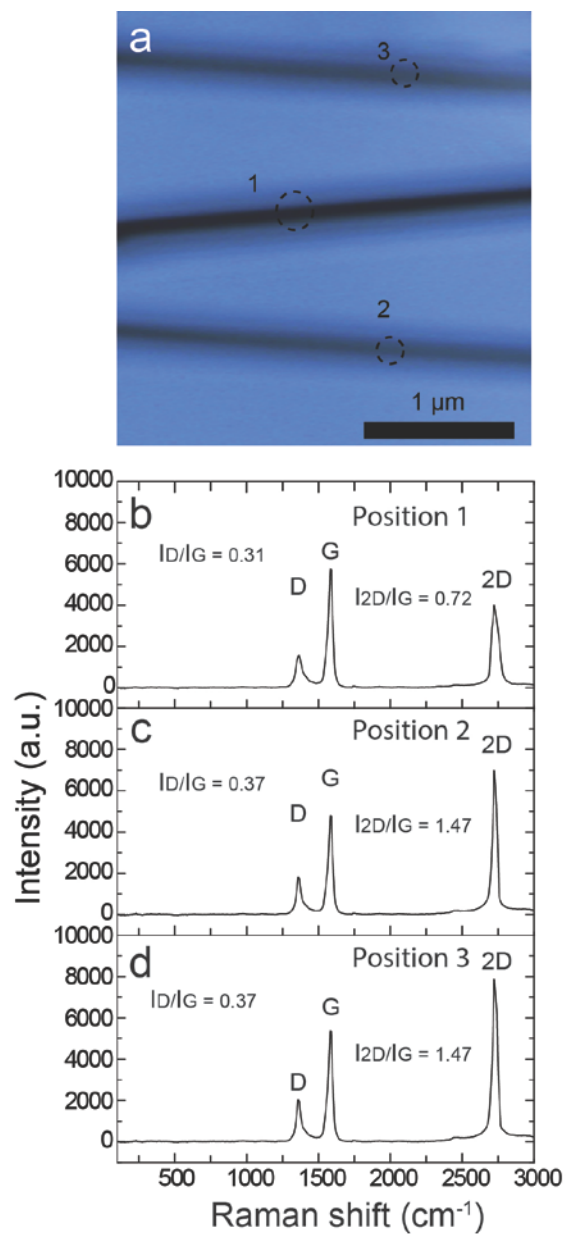
## Supplementary Figures and Tables



**Figure S1.** X-ray diffraction (XRD) patterns of the ZnO/C core-shell hexagonal nanorods (a) and a few layer graphene ribbons (b).



**Figure S2.** EDX spectra of (a) the ZnO/C core-shell nanorods and (b) a few layer GRs.



**Figure S3.** (a) Optical image of GRs on a silicon wafer. Raman spectra taken at (b) the position 1, (c) position 2, and (d) position 3 marked in the optical image.

**Table S1.** Electrical conductivities of various metal/metal oxide-carbon materials.

Materials	Electrical conductivity (S/m)
Few layers of graphene/Al <sub>2</sub> O <sub>3</sub> <sup>34</sup>	1,000
CNT-Fe/Co-MgAl <sub>2</sub> O <sub>3</sub> <sup>35</sup>	150–180
CNT-Fe-Al <sub>2</sub> O <sub>3</sub> <sup>35</sup>	40–80
CNT-Co-MgO <sup>35</sup>	20
SCS microtowers <sup>36</sup>	1.6–63
<b>ZnO/C core-shell (our work)</b>	<b>55</b>

**Table S2.** Electrical conductivities of various carbon materials.

Carbon Materials	Conductivity (S/m)
Graphene <sup>39</sup>	45
Graphene aero gel <sup>40</sup>	100
Graphene powder <sup>41</sup>	~200
Graphene film <sup>42</sup>	1250
Graphene film <sup>28</sup>	1500
Graphene <sup>43</sup>	2300
Carbon nanotube <sup>36</sup>	4520
Graphene film <sup>44</sup>	5880
Graphene film <sup>27</sup>	6500
Graphene film <sup>31</sup>	7200
<b>GRs disk (our work)</b>	<b>5107</b>