Applications of graphene in nanotechnology : 1D diffusion, current drag and nanoelectrodes

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Stellingen

Behorend bij het proefschrift

APPLICATIONS OF GRAPHENE IN NANOTECHNOLOGY
1D DIFFUSION, CURRENT DRAG AND NANOELECTRODES

1. Graphene nanoribbons provide a path for one-dimensional diffusion of cobalt adatoms. *Chapter 2 of this thesis.*

2. The observed motion of cobalt adatoms on graphene nanoribbons induced by voltage pulses from an STM tip is consistent with thermal diffusion.
Chapter 2 of this thesis.

3. The voltage signal across a graphene strip that arises when a droplet of ionic liquid is moved over it, is affected by the polarizability of water.
Chapter 3 of this thesis.

4. Contacts formed between graphene edges provide evidence that the conductance of a single carbon atom bridging graphene electrodes is equal to the quantum of conductance, to within 20%.
Chapter 4 of this thesis.

5. The voltage induced by the motion of a droplet of ionic liquid over the surface of graphene depends both on the interaction of ions with the graphene layer and with the substrate supporting the graphene layer.
Yin et al., Nature Nanotech. ***9****, 378 (2014).*
Yang et al., J. Am. Chem. Soc. ***42****, 13746 (2018).*

6. The statistical distribution obtained for electrically driven rotation of butyl methyl sulphide molecules in the work of Tierney *et al.* does not provide enough evidence to support their claim of current-induced directional rotation of the molecular rotor.
Tierney et al., Nature Nanotech. ***6****, 625 (2011).*

7. The use of a graphene nanogap in DNA translocation measurements has no advantageous properties over a graphene nanopore if the measured current is ionic rather than electric.
Patel et al., PLoS One ***12****, e0171505 (2017).*

8. The remote heat dissipation induced by a current through an atomic contact, as reported by Tsutsui *et al.*, does not exist. The maximum of the dissipation is centered at the atomic contact.
Tsutsui et al., Scientific Reports ***8****, 7842 (2018).*

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