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## **Molecular and Nano-engineering with iron, ruthenium and carbon: Hybrid structures for sensing**

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Stellingen behorende bij het proefschrift

## **Molecular and Nano-Engineering with Iron, Ruthenium and Carbon: Hybrid Structures for Sensing**

1. To build a graphene field effect transistor is quite straightforward; to gate one, on the other hand, can be a real challenge (this thesis, Chapter 2 & 5).
2. For graphene-based device integrity and reliability, one should keep the transfer polymer intact (this thesis, Chapter 2, 4 & 5).
3. Spin crossover materials are promising candidates for technological devices, but not necessarily for chemical sensors (this thesis, Chapter 2 & 3).
4. Pyrene is a very useful functional group in a metal complex for its abilities to bind to a graphitic surface and to act as a fluorescent tag (this thesis, Chapter 7 and Outlook).
5. Graphene is not the wonder material of the 21<sup>st</sup> century. (A. Geim, *Science*, **2019**, 324, 1530)
6. Homogeneous functionalization of graphene without remaining residues is a major challenge. (L. Wang, et al., *ACS Nano* **2020**, 14, 21)
7. For durable graphene-based sensors, biological materials like enzymes and antibodies are not necessarily the best candidates as functionalizing moieties. (X. Yu et al., *Biosens. Bioelectron.* **2017**, 89, 72)
8. Scaling down the size of SCO materials scales up the complexity of their technological integration. (Molnár et al, *Adv. Mater*, **2018**, 30, 1703862)
9. Synthesis is time-consuming; in the pursuit of results for a PhD thesis, it should be limited as much as possible.
10. A high degree of academic freedom requires a high degree of independence.
11. It is often better to raise one good question than to propose 10 new ideas.
12. Sometimes the best ideas are born in the most informal settings; hence, one should meet regularly with colleagues outside office hours in relaxing environments.

Leiden, 14 januari 2021