Resistive switching in mixed conductors : Ag2S as a model system

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STELLINGEN

behorende bij het proefschrift

Resistive Switching in Mixed Conductors.

Ag_2S as a model system

1. The point contact size on mixed conductor materials can be determined with good accuracy using the current-voltage relation derived from the Hebb-Wagner formalism.
   (Chapter 4 and 5 of this thesis)

2. Supersaturation of Ag is a prerequisite for Ag nucleation and switching inside Ag_2S.
   (Chapter 4 of this thesis)

3. An explanation of conductance switching in Ag_2S devices solely in terms of the formation of a metallic filament is over-simplified, considering the possible contribution of structural changes on the conductance.
   (Chapter 3 and 6 of this thesis)

4. In the case of resistive switching devices based on mixed conductors, the observation of conductance steps of $1G_0$ is not sufficient to demonstrate the existence of an atomic switch.
   (Chapter 6 of this thesis)

5. The stoichiometry of the resistive material in resistive switching memories is one of the most important parameters to consider, from the growth of the material to the interpretation of resistance switching.

6. Controllable conductance levels in memory resistive devices open up the possibility for multibit memories or artificial synapses.

7. Phase-change memory is emerging as the direct challenger of flash memory. The commercial success of the contending technologies (phase change memories, resistance change memories based on solid electrolytes and oxides) will hinge on reliability, in view of degradation and data retention issues due to atom migration in the memory cells.
   -*G. I. Meijer, Science **319**, 1625 (2008).*

8. The ultimate efficiency of a solar cell is the ratio between the energy produced during its lifetime and the energy used for production, maintenance and recycling. Therefore nanoparticle based solar cells could beat their silicon counterparts, not necessarily in direct power conversion efficiency, but because they can be produced with low energy manufacturing processes*.
   ** R. Debnath et al., Energy Environ. Sci. DOI: 10.1039/c1ee02279b (2011)*

9. When starting on a new research topic, it is more efficient and motivating to directly learn from a scientist that has experience in the topic than from his articles. In view of this, every PhD student should start his/her research in collaboration with a postdoc or an experienced scientist.

10. In art and science there are trends and fashions. It is undesirable when considerations about trends and fashionable topics take precedence over scientific or artistic merit.

11. Las palabras se intercambian, no los pensamientos. Aquél que sólo piensa permanece solo.
    Words can be exchanged, not thoughts. He who only thinks remains alone.
    Er bestaan woordenwisselingen, geen gedachtenwisselingen. Wie slechts denkt blijft alleen.

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