

Photovoltaic-(photo)electrochemical devices for water splitting and water treatment

Perez Rodriguez, Paula

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Propositions accompanying this thesis:

Photovoltaic-(photo)electrochemical devices for water splitting and water treatment

by Paula Perez Rodriguez

1. To achieve high efficiencies, semiconductor devices for water splitting should not rely on the reaction in the electrolyte to ensure charge carrier collection at the semiconductor/electrolyte interface. Instead, a semiconductor device structure with charge carrier collection independent of the reaction in the electrolyte should be used. (This thesis, Chapter 2)
2. Interfaces in photoelectrochemical devices enhance recombination, becoming the limiting factor of the device efficiencies. (This thesis, Chapter 2 & 3)
3. The optimization of textures based purely on maximizing absorption is not enough to improve multijunction solar cells, the absorber material quality also need to be taken into account. (This thesis, Chapter 4)
4. Water treatment methods using solar energy are a promising way to make drinkable water available, especially in more isolated areas. (This thesis, Chapter 6)
5. “Basic research is what I am doing when I don’t know what I am doing.” (Wernher von Braun)
6. Strict regulations regarding measurement standards are needed so that fair comparisons of the performance of devices from different laboratories are enabled, allowing science to progress faster.
7. National borders and strict immigration policies negates the humanity of people and reduces the open-mindedness of a population, only to create the feeling of “us” and “them.”
8. To succeed in academia, knowing how to deal with the politics involved is more important than the technical and basic knowledge of science.
9. Breakfast is the most important meal of the day.
10. Gender equality in science can only be achieved when women are treated as scientists rather than as women scientists. This applies to every aspect, from the positions they get in academia to the clothing regulations in PhD defences.

These propositions are regarded as opposable and defendable, and have been approved as such by the promotor(s) Prof.dr. Miro Zeman and Prof.dr. Arno H.M. Smets