

Marek Maciaszek

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Education

2012-2017

Ph. D. in Physics (with distinction)

Faculty of Physics, Warsaw University of Technology

Doctoral thesis: *Modeling of the persistent photoconductivity effect in Cu(In,Ga)Se₂* (supervisors: Prof. Rajmund Bacewicz and Dr. Paweł Zabierowski)

2011-2012

M. Sc. in Applied Physics (with distinction)

Faculty of Physics, Warsaw University of Technology

Master thesis: *Modeling of the influence of metastable defects in the absorber layer on electrical characteristics of Cu(In,Ga)Se₂/CdS/ZnO solar cells* (supervisor: Dr. Paweł Zabierowski)

2007-2011

B. Sc. in Applied Physics (with distinction)

Faculty of Physics, Warsaw University of Technology

Bachelor thesis: *Preparation and characterisation of nanocrystalline V₂O₅ obtained by twin rollers technique* (supervisor: Dr. Tomasz Pietrzak)

Experience

2015-

Research and Teaching Assistant

Semiconductors Division (head: Prof. Małgorzata Igalson), Faculty of Physics, Warsaw University of Technology

2012 (3 months)

Internship

Institut des Materiaux, University of Nantes, France

Topic: Quantum efficiency of Cu(In,Ga)Se₂-based solar cells – experiments and simulations, supervisor: Prof. Nicolas Barreau

2013 (5 months)

Internship

Institut des Materiaux, University of Nantes, France

Topic: Modeling of metastable properties of defects in CuGaSe₂ using ab initio methods, supervisor: Prof. Xavier Rocquefelte

2012 (3 months)

Internship

Pontifical Catholic University of Valparaiso, Chile

Topic: Electrodeposition of CuGaSe₂, supervisor: Prof. Humberto Gomez

Publications

1. T.K. Pietrzak, M. Maciaszek, J.L. Nowiński, W. Ślubowska, S. Ferrari, P. Mustarelli, M. Wasiucionek, M. Wzorek, J. E. Garbarczyk: *Electrical properties of V₂O₅ nanomaterials prepared by twin rollers technique*. Solid State Ionics **225**, 658 (2012)
2. M. Maciaszek, P. Zabierowski, K. Decock: *Modeling of the impact of Se-vacancies on the electrical properties of Cu(In,Ga)Se₂ films and junctions*. Thin Solid Films **535**, 371 (2013)
3. K. Macielak, M. Maciaszek, M. Igalson, P. Zabierowski, N. Barreau: *Persistent Photoconductivity in Polycrystalline Cu(In,Ga)Se₂ Thin Films: Experiment Versus Theoretical Predictions*. IEEE Journal of Photovoltaics **5**, 1206 (2015)
4. M. Maciaszek, P. Zabierowski: *The Influence of the n-Side Doping on Metastable Defect Concentrations in Cu(In,Ga)Se₂ Evaluated from Space Charge Profiles*. IEEE Journal of Photovoltaics **5**, 1454 (2015)
5. M. Maciaszek, P. Zabierowski: *Comment on "Open-circuit and doping transients of Cu(In,Ga)Se₂ solar cells with varying Ga content" [J. Appl. Phys. 117, 055704 (2015)]*. Journal of Applied Physics **118**, 136101 (2015)
6. M. Maciaszek, P. Zabierowski: *Influence of relaxation processes on the evaluation of the metastable defect density in Cu(In,Ga)Se₂*. Journal of Applied Physics **119**, 215103 (2016)
7. M. Maciaszek, P. Zabierowski: *Modeling of the magnitude of the persistent photoconductivity effect in Cu(In,Ga)Se₂*. Thin Solid Films **633**, 45 (2017)
8. M. Maciaszek, P. Zabierowski: *Quantitative analysis of the persistent photoconductivity effect in Cu(In,Ga)Se₂*. Journal of Applied Physics **123**, 161404 (2018)
9. M. Pawłowski, M. Maciaszek, P. Zabierowski, T. Drobiazg, N. Barreau: *Temperature Dependence of the Internal Quantum Efficiency of Cu(In,Ga)Se₂-Based Solar Cells*. IEEE Journal of Photovoltaics **8**, 1868 (2018)

Conferences – oral presentations

1. T.K. Pietrzak, Ł. Pawliszak, M. Maciaszek, J.L. Nowiński, M. Wasiucionek, J.E. Garbarczyk: *Enhanced electronic conductivity in V₂O₅-based nanomaterials*. 10th International Symposium on Systems with Fast Ionic Transport, Chernogolovka, 1-4.07.2012
2. K. Macielak, M. Maciaszek, M. Igalson, N. Barreau: *Persistent photoconductivity in Cu(In,Ga)Se₂ layers*. Photovoltaic Technical Conference, Aix-en-Provence, 22-24.05.2013
3. M. Maciaszek, P. Zabierowski: *Modeling of the influence of deep majority carrier traps on photo-induced current transients in Cu(In,Ga)Se₂ layers*. 39th IEEE Photovoltaic Specialists Conference, Tampa, Florida, 16-21.06.2013

4. M. Maciaszek, P. Zabierowski: *Quantitative analysis of the persistent photoconductivity effect in Cu(In,Ga)Se₂*. 29th International Conference on Defects in Semiconductors, Matsue, 31.07-04.08.2017

5. M. Igalson, M. Maciaszek, K. Macielak, M. Edoff, N. Barreau: *Concentration of defects responsible for persistent photoconductivity in CIGS: dependence on material composition*. E-MRS Spring Meeting Symposium A: Thin film chalcogenide photovoltaic materials, Strasbourg, 18-22.06.2018

Conferences – posters

1. T.K. Pietrzak, M. Maciaszek, J.L. Nowiński, W. Ślubowska, S. Ferrari, P. Mustarelli, M. Wasiucioneck, J.E. Garbarczyk: *Twin rollers technique as a method of obtaining V₂O₅ nanocomposites*. 18th International Conference on Solid State Ionics, Warsaw, 3-8.07.2011

2. M. Maciaszek, P. Zabierowski, K. Decock: *Modelling of the impact of Se vacancies on the electrical properties of CIGS films and junctions*. E-MRS Spring Meeting Symposium B: Thin Film Chalcogenide Photovoltaic Materials, Strasbourg, 14-18.05.2012

3. M. Maciaszek, X. Rocquefelte, P. Zabierowski: *On the metastable properties of Ga_{Cu}-related defect and defect complexes in wide bandgap chalopyrites from first principles*. E-MRS Spring Meeting Symposium A: Thin Film Chalcogenide Photovoltaic Materials, Lille, 26-30.05.2014

4. M. Maciaszek, P. Zabierowski: *Influence of the n-side doping on space charge profiles in CIGS-based solar cells*. E-MRS Spring Meeting Symposium A: Thin Film Chalcogenide Photovoltaic Materials, Lille, 26-30.05.2014

5. M. Igalson, K. Macielak, M. Maciaszek, P. Zabierowski, L. Arzel, N. Barreau: *Dependence of the Persistent Photoconductivity in Cu(In,Ga)Se₂ Thin Films on Deposition Parameters*. 2015 MRS Spring Meeting & Exhibit Symposium B: Thin-Film Compound Semiconductor Photovoltaics, San Francisco, 6-10.04.2015

6. M. Maciaszek, P. Zabierowski: *On the magnitude of the persistent photoconductivity (PPC) effect in CIGS layers with and without sodium*. 42nd IEEE Photovoltaic Specialists Conference, New Orleans, 14-19.06.2015

7. M. Maciaszek, X. Rocquefelte, P. Zabierowski: *Hybrid functional calculations of the metastable properties of Ga_{Cu}-related defects in CuGaSe₂*. 28th International Conference on Defects in Semiconductors, Espoo, 27-31.07.2015

8. M. Maciaszek, P. Zabierowski: *Modeling of the magnitude of the persistent photoconductivity effect in presence of deep defects in CIGS thin films*. E-MRS Spring Meeting Symposium V: Thin film chalcogenide photovoltaic materials, Lille, 2-6.05.2016

9. M. Maciaszek, P. Zabierowski: *Modeling of current-voltage characteristics of Cu(In,Ga)Se₂-based solar cells in the presence of the p⁺ layer*. E-MRS Spring Meeting Symposium A: Thin film chalcogenide photovoltaic materials, Strasbourg, 18-22.06.2018

10. M. Maciaszek, P. Zabierowski: *(V_{Se}-V_{Cu}) as the origin of metastable effects: on the accordance between theory and experiments*. CECAM Workshop: Reliable and quantitative prediction of defect properties in Ga-based semiconductors, Bremen, 8-12.10.2018