



COST

Stable Next-Generation Photovoltaics: Unraveling degradation mechanisms of Organic Solar Cells by complementary characterization techniques (StableNextSol)

MP1307

Start date: 20/03/2014

End date: 19/04/2018

Year: *Starting*

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Scientific context and objectives

(1/2)

Background / Problem statement:

To unravel degradation mechanisms of OPVs by complementary characterization techniques in order to develop more stable devices.

Brief reminder of MoU objectives:

- To take advantage of the different analytical techniques within the consortium to study and understand the degradation of state-of-the-art OPVs.
- To create an interdisciplinary network of laboratories, research groups and industry to promote the development of next-generation OPVs with longer lifetimes.
- The final desired stability of the OPV devices should be comparable to the current Si-based technology: lifetimes above 20 years.



Scientific context and objectives

(2/2)

Research directions:

Approach and methodology

- All objectives and activities for Y1 are working accordingly to plan.
- An on-line survey among partners permitted to distribute members among WGs with well-defined working tasks.
- Two MC/WG Meetings for Y1 are underway. A training school is under organization for Y2 in coordination with an ITN Network on OPV stability.

Innovative work

- We are the first network of the kind to reunite such a large consortium of laboratories working for the same objective.
- A new working group has been established to be aware of the state-of-the-art in other solar cell technologies.



Working Program

A. Networking Program

- To establish a multidisciplinary network of research laboratories.
- To create long-term collaborative teams.
- To train the next generation of research scientist experts on OPV stability.
- To encourage the participation of female researchers.
- To unify protocols on OPVs degradation.
- To apply for Horizon 2020 projects.

B. Science / Technical Program

- To fabricate solar cells and test structures.
- To follow ISOS protocols for the degradation/stability analysis of OPVs.
- To apply characterization techniques to study degradation.
- To elucidate degradation mechanisms in detail.
- To consolidate degradation mechanisms into “families” or “groups”.
- To develop models to simulate the degradation behavior of OPVs.
- To propose alternatives to reduce/eliminate the degradation paths in OPVs.
- To fabricate next-generation OPVs with enhanced lifetime.



Working groups: Networking

- 1. NG: Networking Group.**
- 2. STG: Science and Technology Group.**
- 3. DS: Dissemination Group.**
- 4. IAB: Industry Advisory Board.**
- 5. Ethics Committee.**

Working groups: Science & Tech.

1. **WG 1: Technology Monitoring.**
2. **WG 2: OPV Fabrication.**
3. **WG 3: OPV degradation.**
4. **WG 4: Non-destructive Charact.**
5. **WG 5: Destructive Characterization.**
6. **WG 6: New Device Engineering.**





Future Plans and Challenges

Critical Phases/Topics to Address

- Increase female participation (right now about 40%).
- Invite partners from NNCs and promote ESRs participation.
- Participation in H2020 calls.
- Initiate the scientific program of the Action.

Challenges

- Develop and organize the several degradation mechanisms of OPVs to be employed as reference.
- Involve Industry in the scientific program.
- First publications from member should be released by the end of first year.