Dye Solar Cells (and PV’s) in South Africa

Lukas le Roux
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Various institutions are doing research on photovoltaics in South Africa. Although the CSIR is the only one that does research on DSC's there is significant support from the different universities. In the presentation we will give a short overview of the research on PV's in South Africa such as CuInSe(sub2) but with the emphasis on the DSC. We shall report on the available facilities in South Africa well as the DSC research at the CSIR, which will include specific topics and problems. More information will be give on the "collaboration plan" between the CSIR and Dyesol.
PVs in South Africa

NMMU UJ
Field testing facilities
CuInSe$_2$

CSIR FH
DSC
Real life DSC testing

UWC
nc-Si and a-Si

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CSIR NANO/DSC PROJECT STRUCTURE

CSIR nano technology

CSIR-EaP Dye Solar Cell

University of Port Elizabeth
Field testing

University of the Western Cape
HWCVD & TCVD

Centre for Polymer Technology
Solid electrolytes

National Metrology Lab
Surface and Particle analysis

University of Fort Hare
Real life testing
Energy and Processes DSC related project staff
- PhD x 3
- M dip tech x 2
- MSc interns x 2
- In-service trainee x 1
- Technician x 1

Characterisation equipment
- SEM
- AFM
- TOF SIMS
- XRD
- XPS
- UV/VIS
- Femto-second electron beam diffraction

University support
- NMMU
- UJ
- UWC
- FH
DSC in CSIR

- Why (Nano-ERA)
- Investment (time)
- Research areas
  - Nano particles
  - Cell assembly
  - Polymer type electrolytes
  - Pt deposition
  - Glass thickness
  - Conductivity of glass substrates
  - TiO$_2$ layer thickness
  - Paste stability
Paste stability

- Water based formulation with PEO and PEG
- Daily treated at RT, then 110 °C
- XRD of film
- Photo’s of film
- Results
Photographs of the film @ 20x

Day 1
Day 3
Day 5
Day 8
XRD results

![XRD results graph](image)

Day 1
Day 2
Day 3
Day 4
Day 6
Two half-cells
DSC demonstration and team
THANK YOU FOR YOUR ATTENTION