

# Dye Solar Cells (and PV's) in South Africa

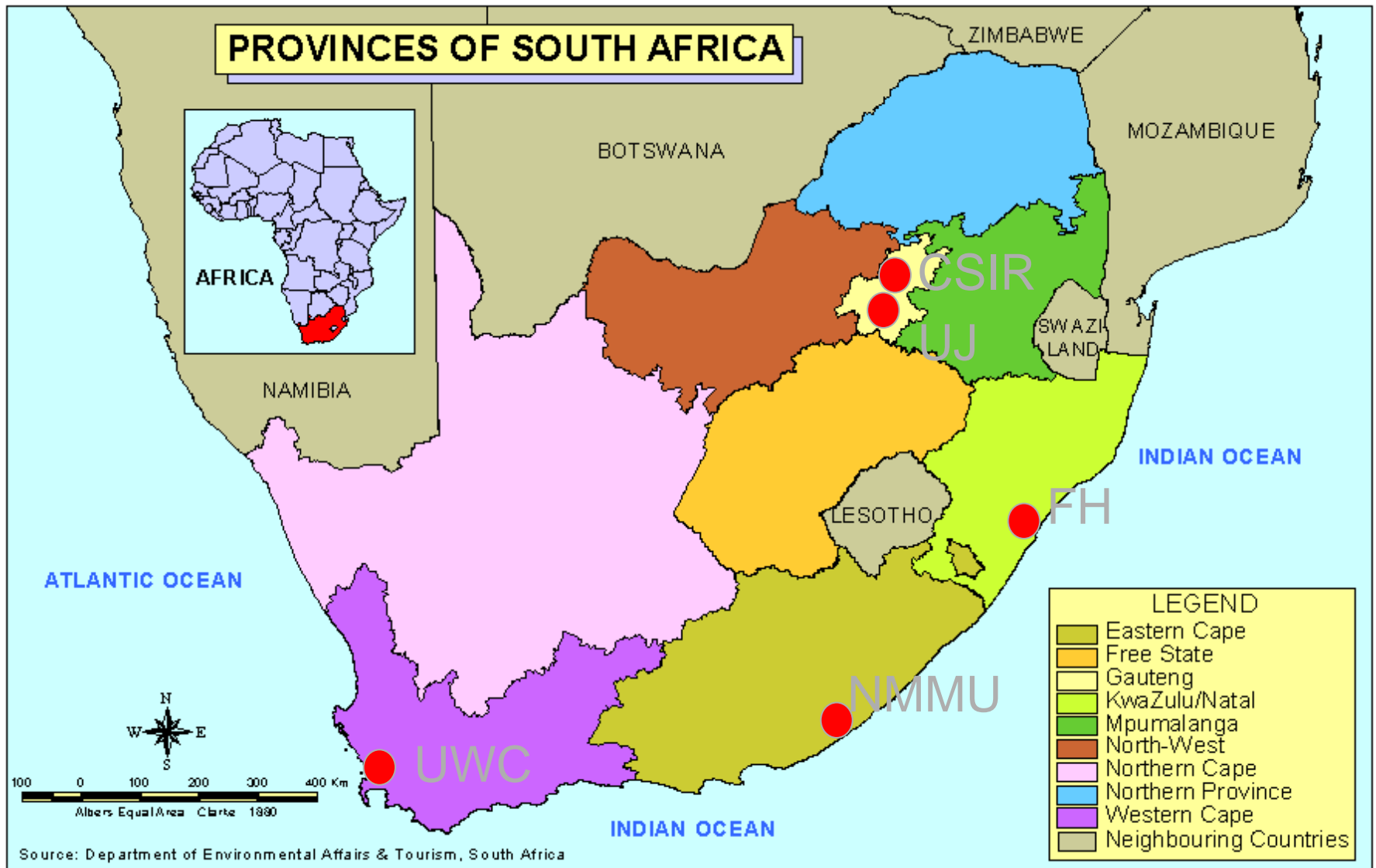
Lukas le Roux  
February 2006



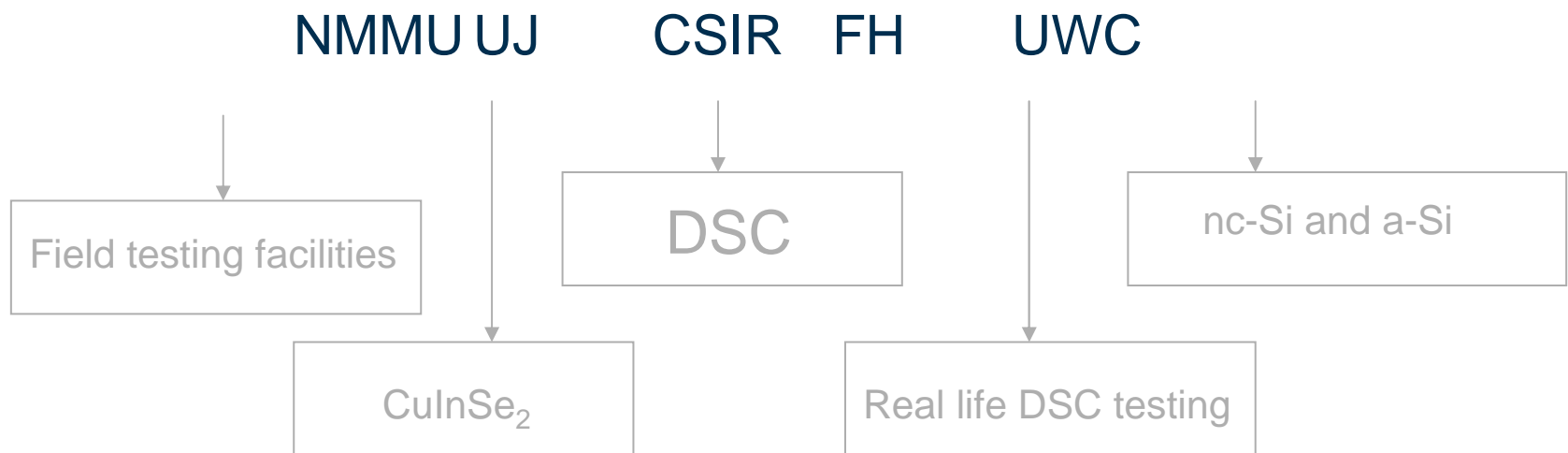
# Abstract

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  $\text{CuInSe}_2$  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.

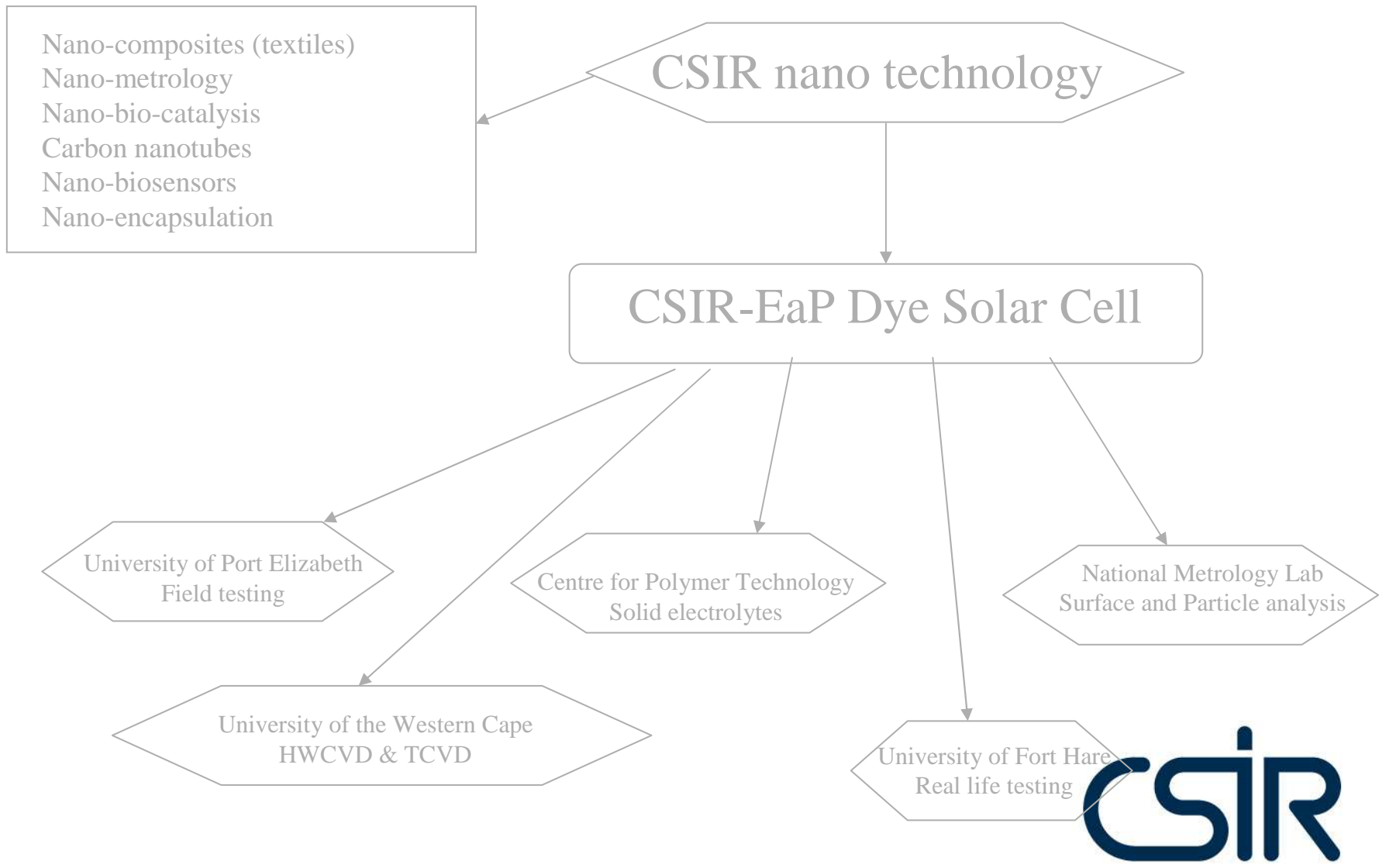
# Geographical Location



# PVs in South Africa



# CSIR NANO/DSC PROJECT STRUCTURE



# CSIR

- 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<sub>2</sub> layer thickness
  - Paste stability

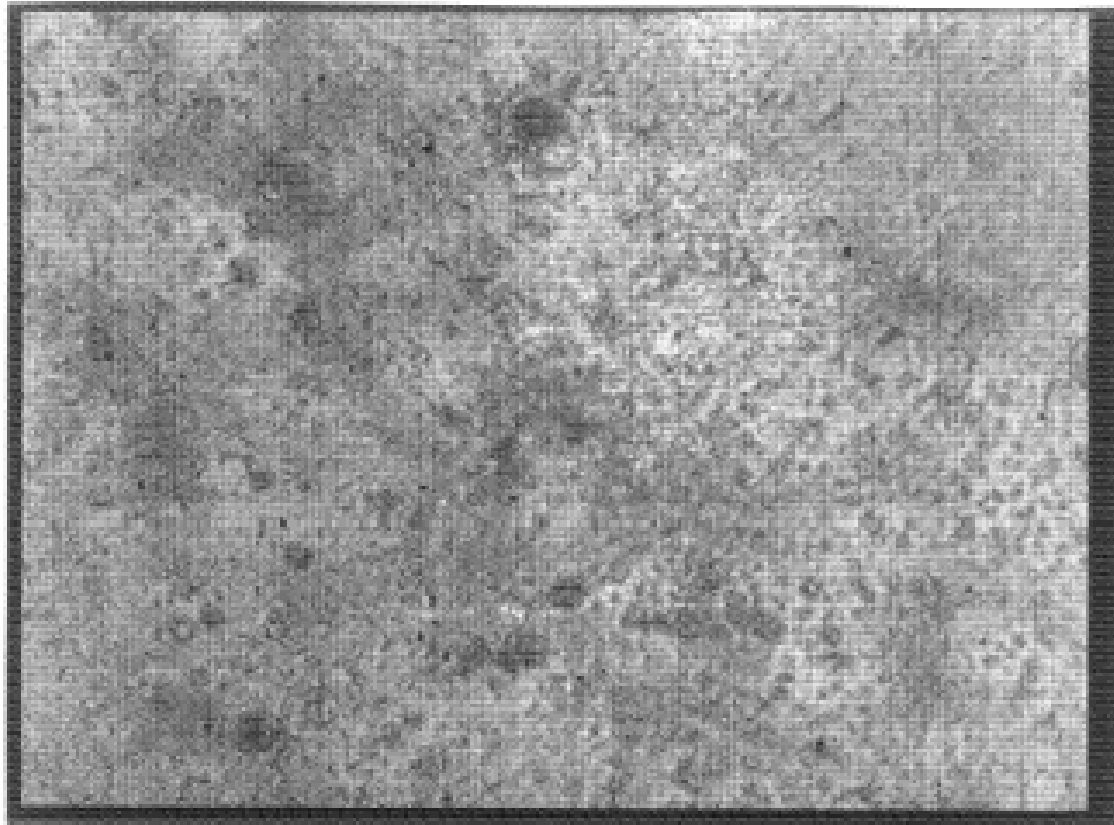
# Paste stability

- Water based formulation with PEO and PEG
- Daily treated at RT, then 110 °C
- XRD of film
- Photo's of film
- Results

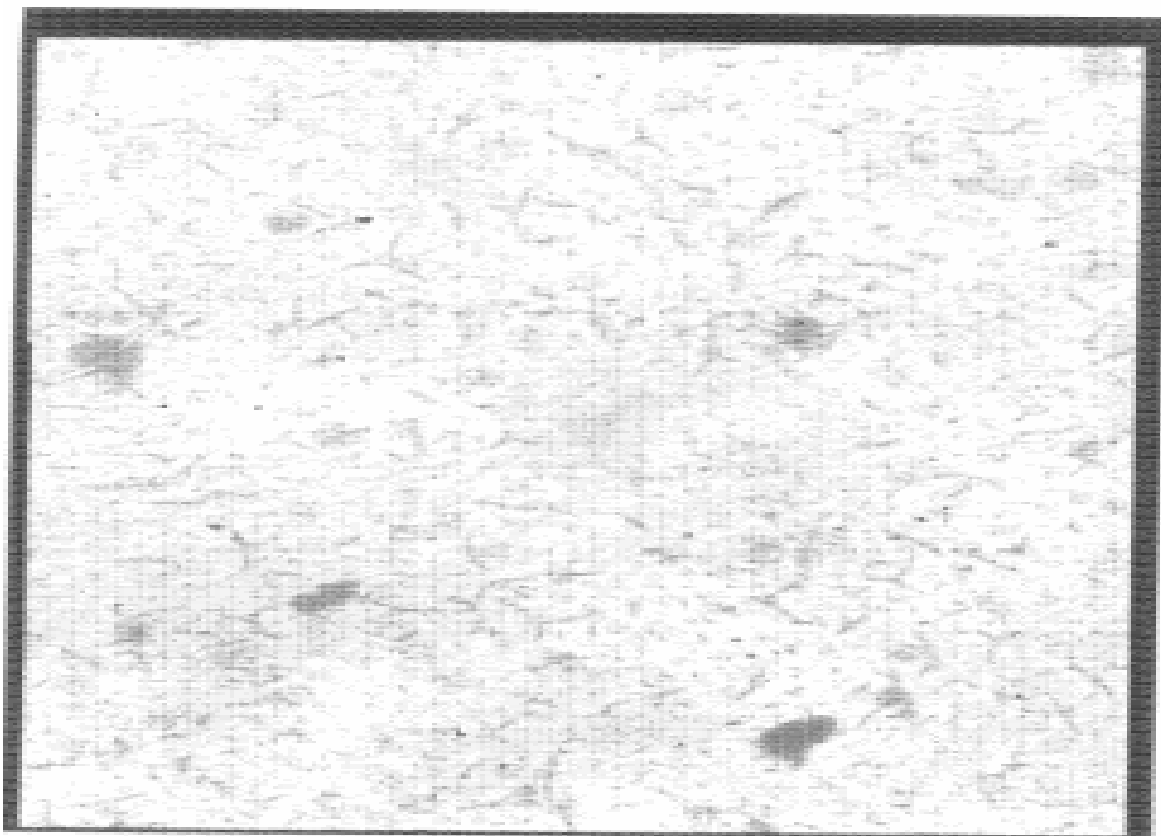


# Photographs of the film @ 20x

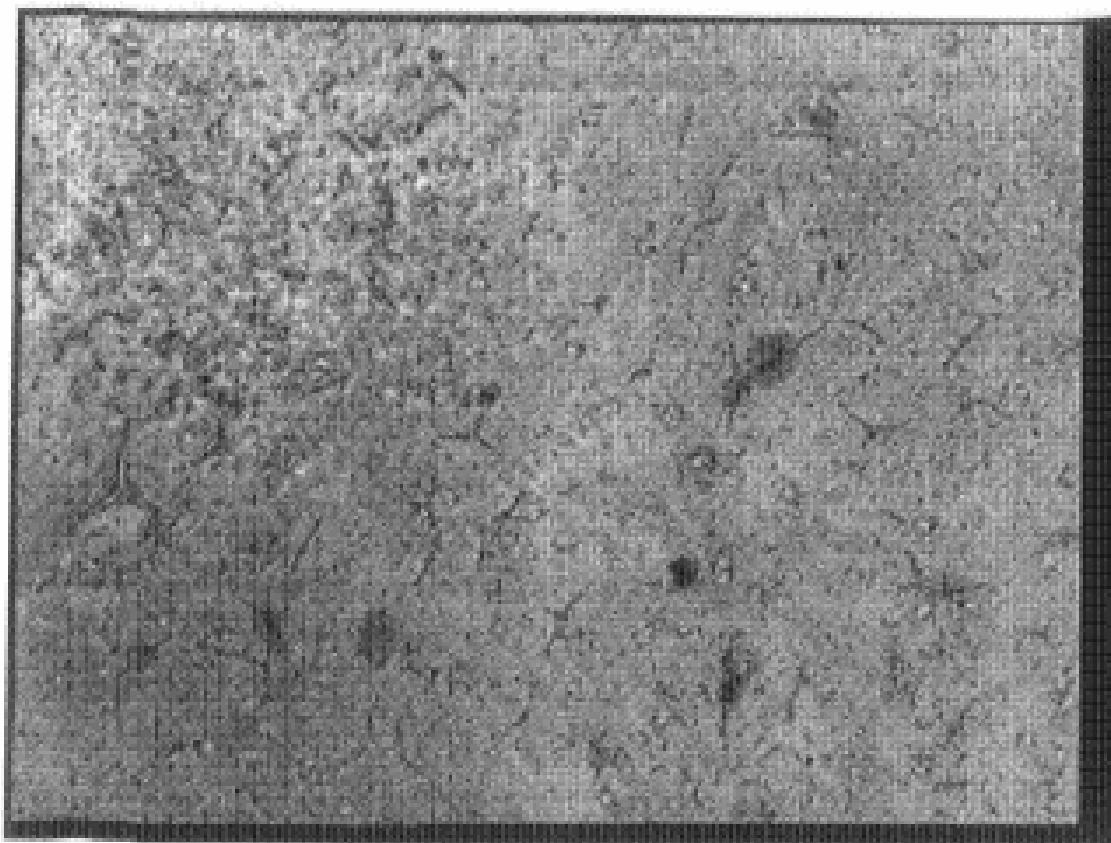
Day 1



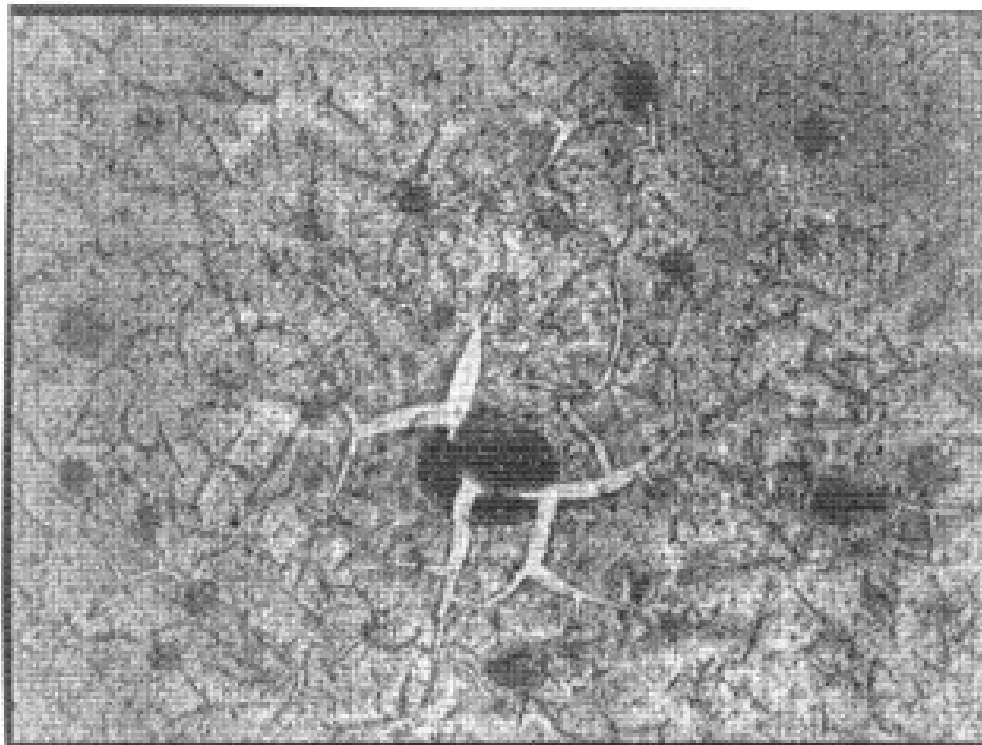
# Day 3



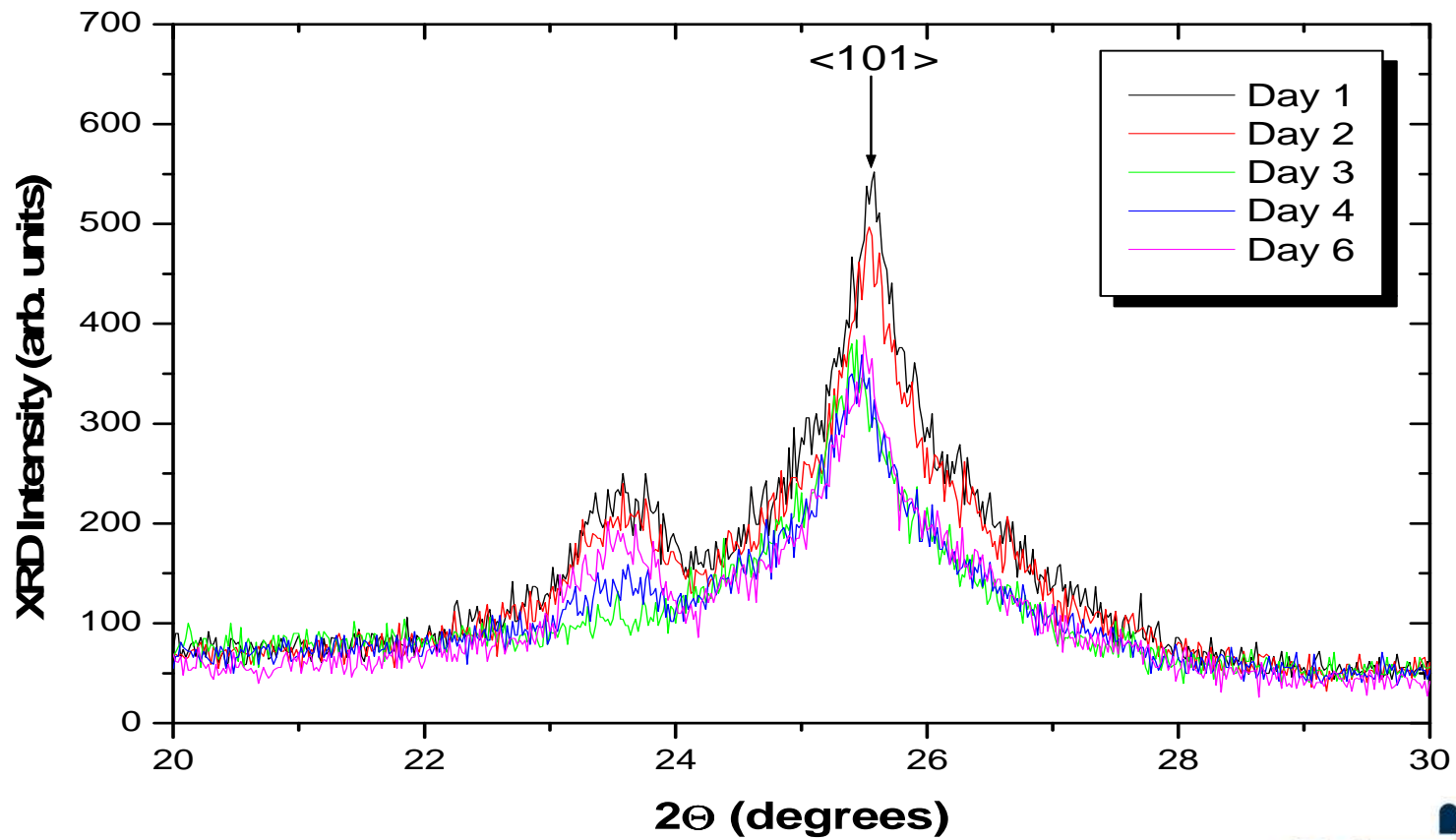
# Day 5



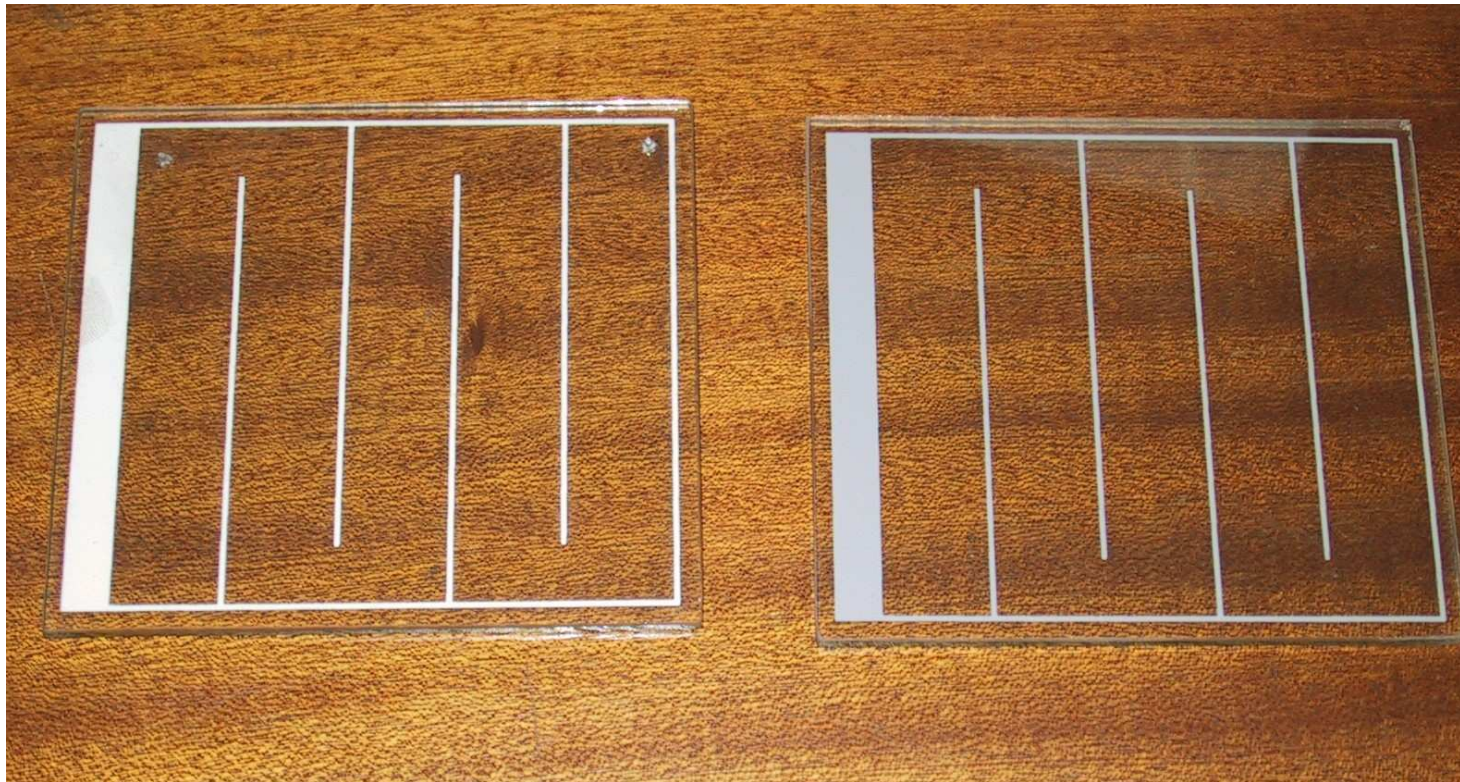
# Day 8



# XRD results



# Two half-cells















© CSIR 2006

[www.csir.co.za](http://www.csir.co.za)

**CSIR**  
*our future through science*









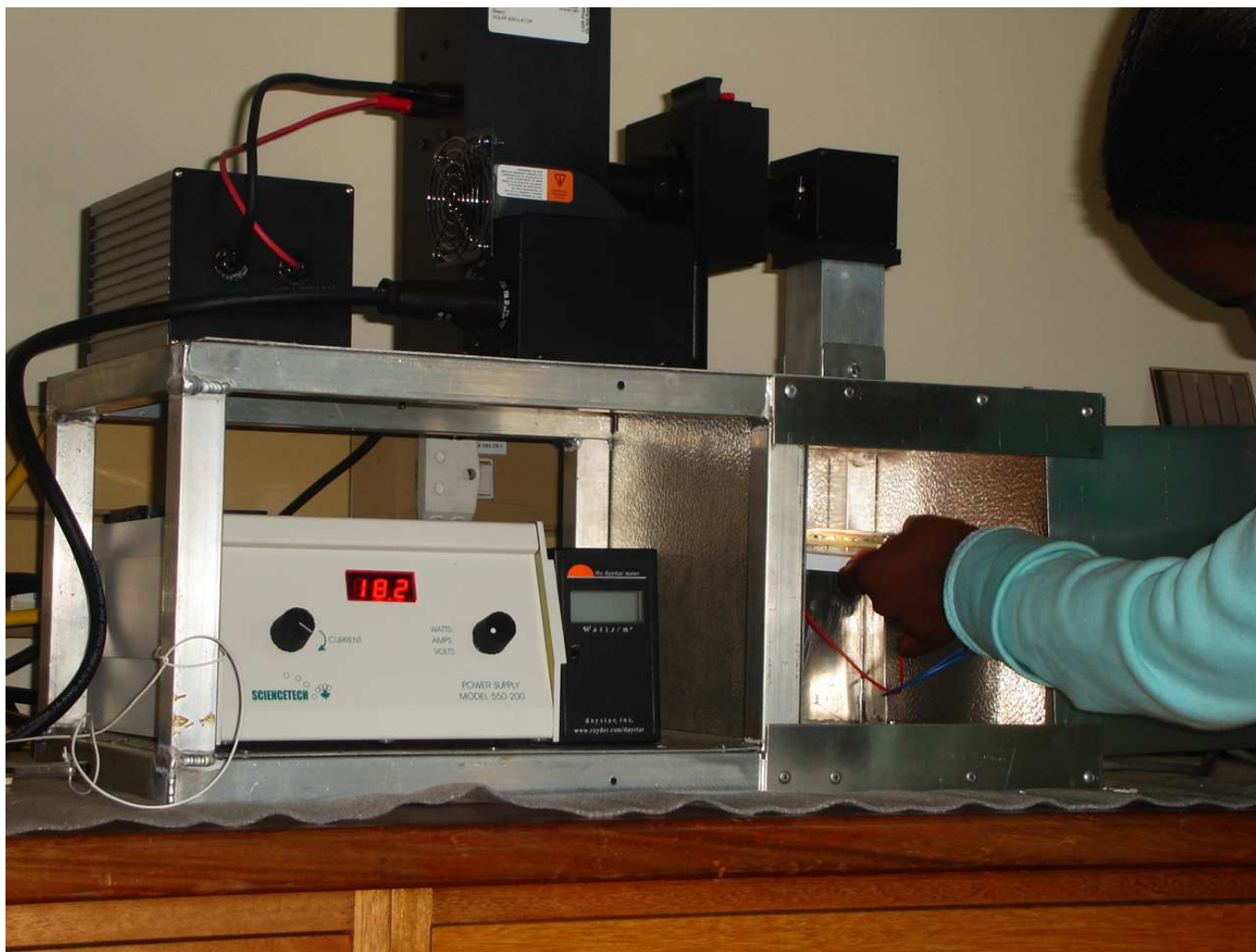


© CSIR 2006

[www.csir.co.za](http://www.csir.co.za)

**CSIR**  
*our future through science*









© CSIR 2006

[www.csir.co.za](http://www.csir.co.za)

**CSIR**  
*our future through science*

# D.S.C. demonstration and team



THANK YOU FOR YOUR ATTENTION