M3D3:
Solar cell assembly

4/29/15

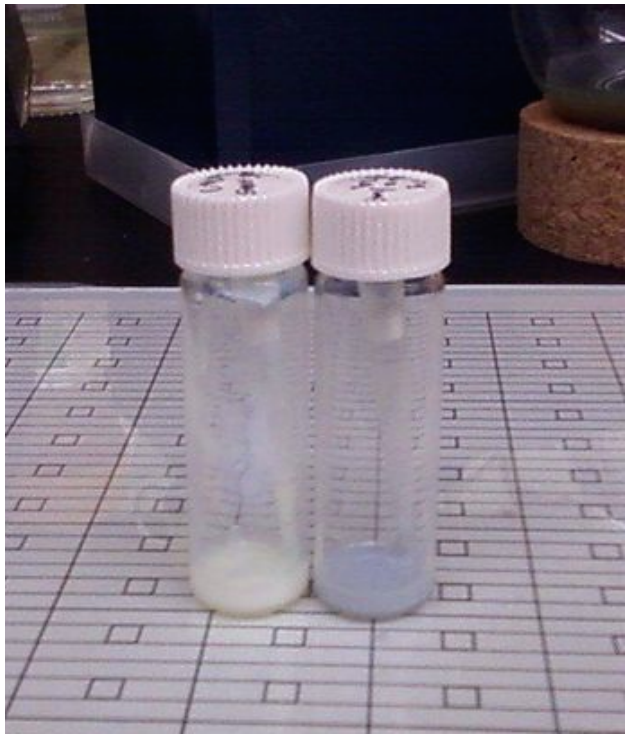
Lab business

- Lab treat…

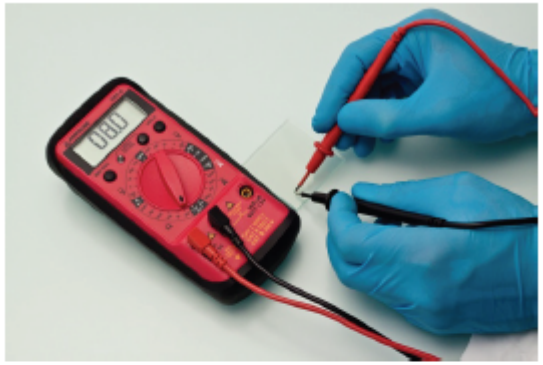
- Schedule changes
- Research proposal
  - Today: discuss topics with your partner and select one for further research
  - Friday: cross-group discussions

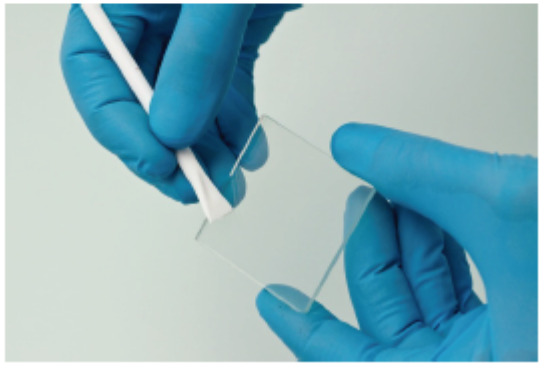
While you were away…

- Au:phage:TiO_2 complexes were dried and ground
  - Ethyl cellulose (binder) and terpineol (solvent) were added to make paste
- FTO glass (base of anode) was coated with TiO_2

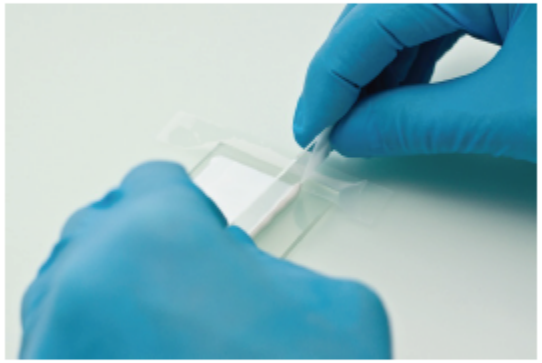


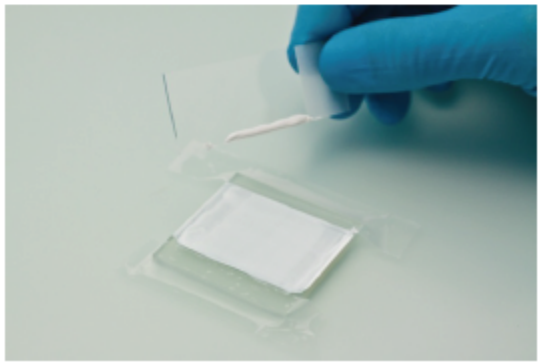
- **<u>Your part</u>** will be to apply the paste to the FTO glass base (doctor blading)





Identifying the conductive side of the TCO (transparent conductive oxide)



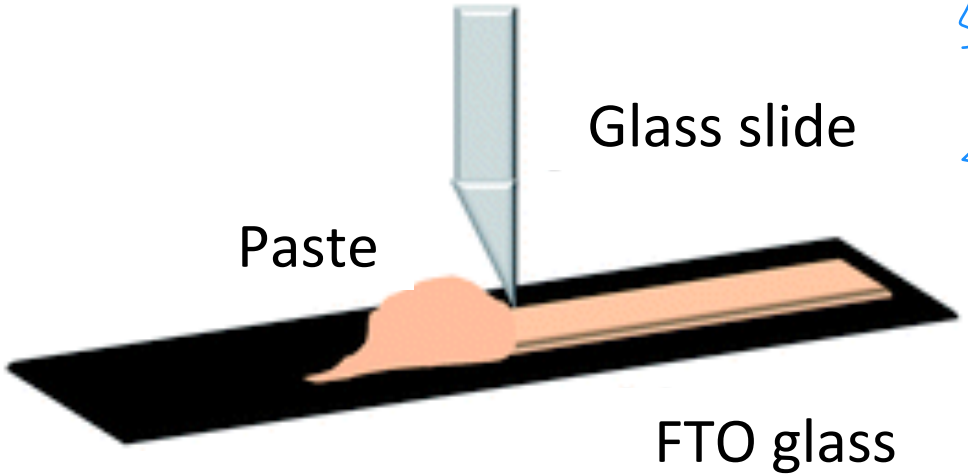


"Doctor-blading" the titania (TiO_2) paste

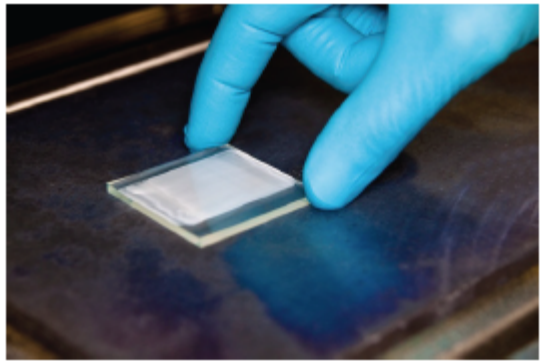
http://www.solaronix.com

Solar cell preparation

1 4x4mm
2 tape
3 paste
4 remove tape



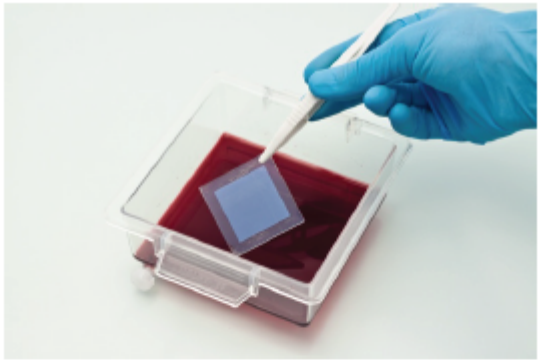
- Doctor blading
  - Caste created with tape
  - Paste equally distributed in caste using glass slide
- Demo and practice with glue, etc.

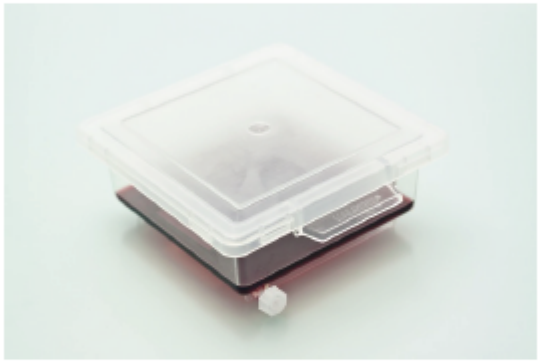


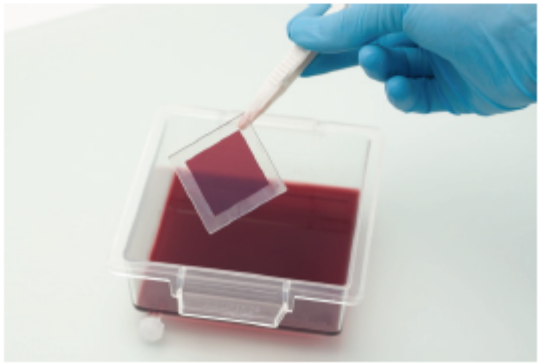
Sintering the film (heating)

http://www.solaronix.com

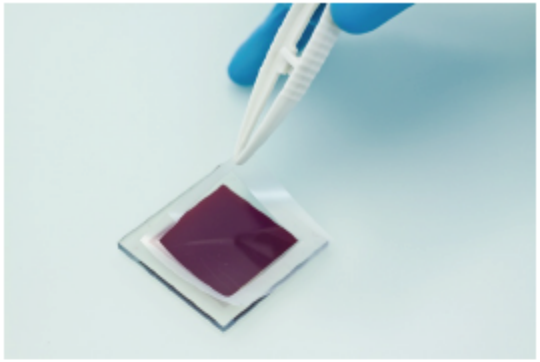
(1) Burn off polymer binder in paste to create pores for the dye. (Must be in air)
(2) Sinter nano-particles to connect in a conducting network. (Must be in argon)

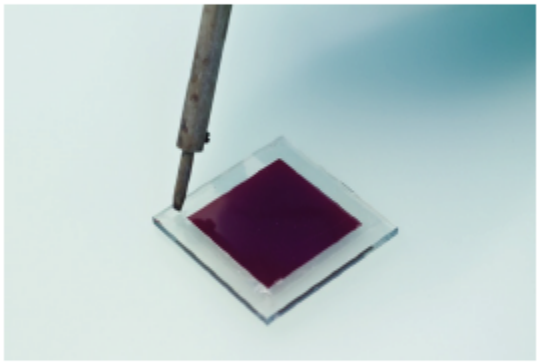


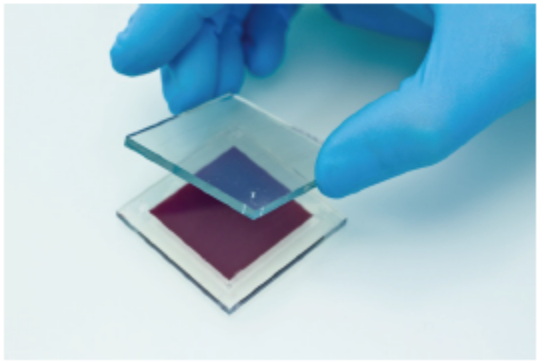




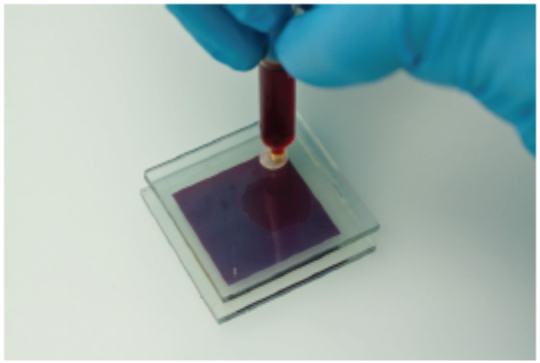
Dyeing the film http://www.solaronix.com

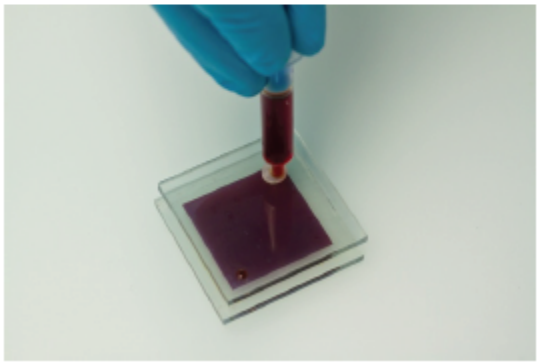






Assembling the device with another electrode





Filling the electrolyte

Today Noreen

1. Practice doctor blading
2. Assemble solar cells in Belcher Laboratory
3. Discuss research proposal ideas with partner and teaching faculty

4. See website for great overview of DSSC!
   - http://community.nsee.us/concepts_apps/dssc/DSSC.html