

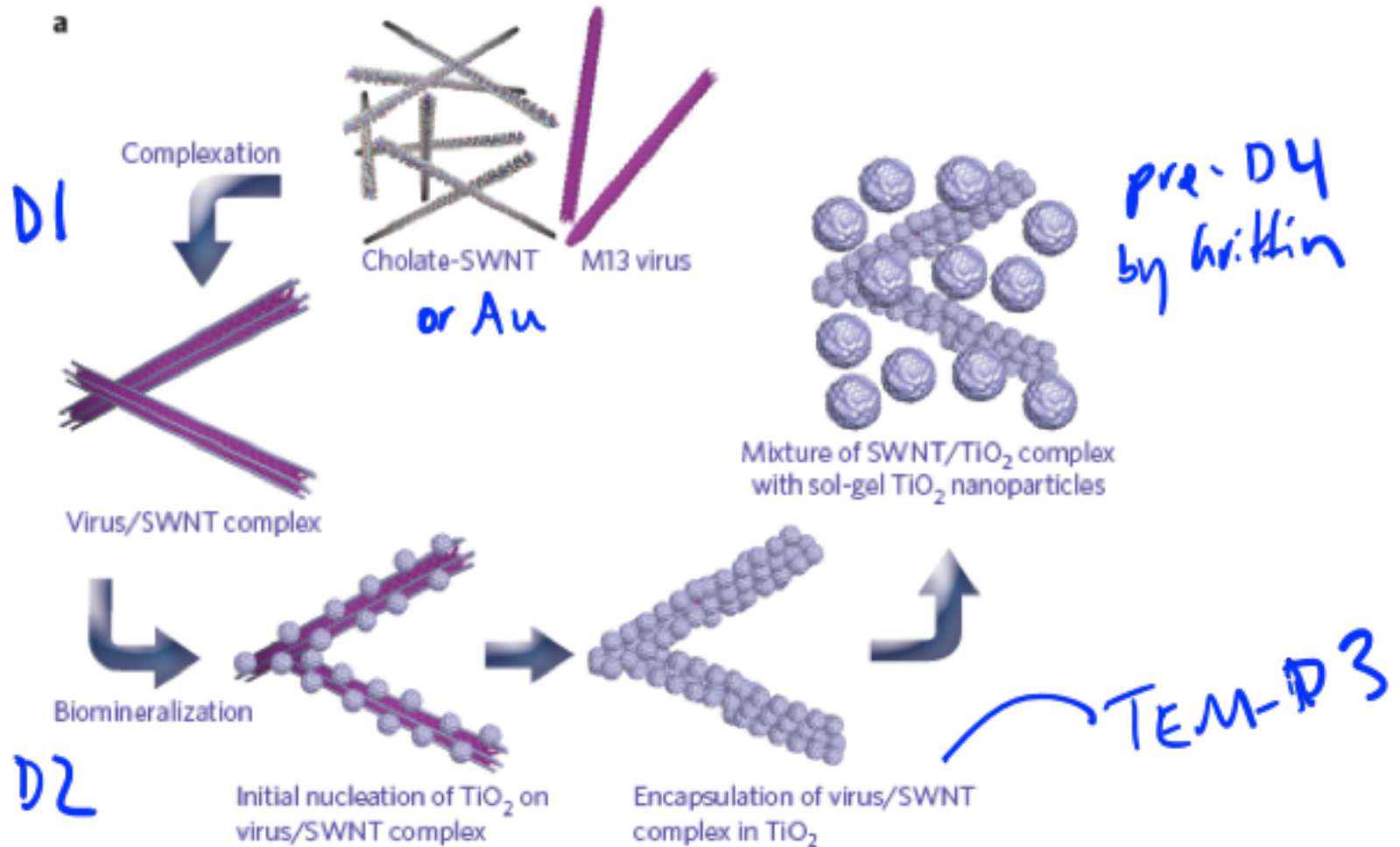
- Announcements
- Lab Quiz (last one!)
- Pre-lab Lecture
 - ❖ M3 summary review
 - ❖ Solar cell measurement
 - ❖ Today in Lab (M3D5)

Announcements

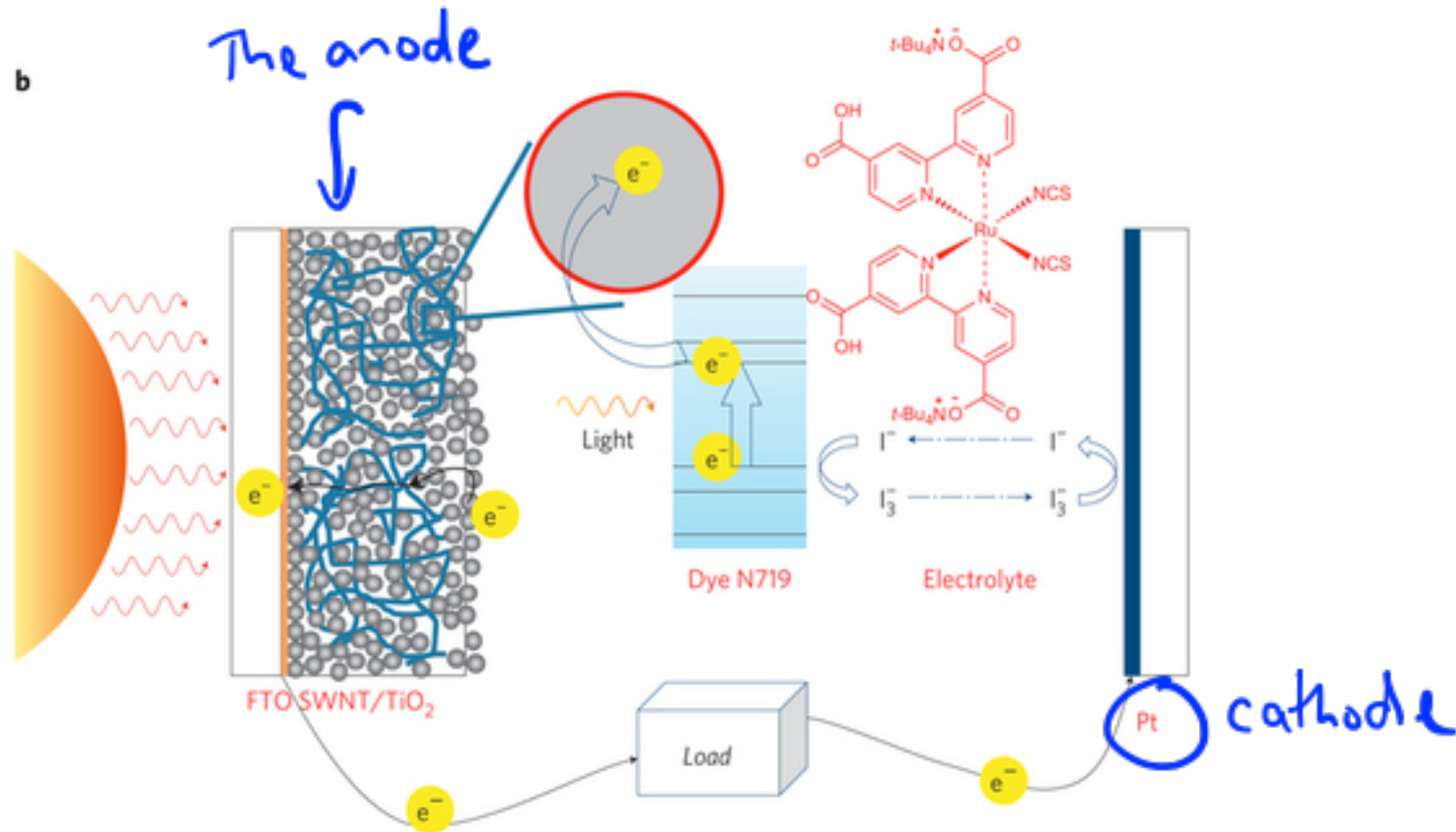
- M3 mini-report due **12/6 by 5pm**
 - See suggestions on wiki, esp. for Figures & Discussion
 - D6 lecture (second half): discussing your data
- M3 notebooks due **12/6**
- Research proposals
 - Presentations in one week! **12/11**
 - D6 lecture (first half): Atissa on giving this talk
- Final reflection due **12/12 by 11am**
 - Extra credit, optional reflections due **12/12**

+ clean-up today or next time

Construction phase review



What have we made so far?



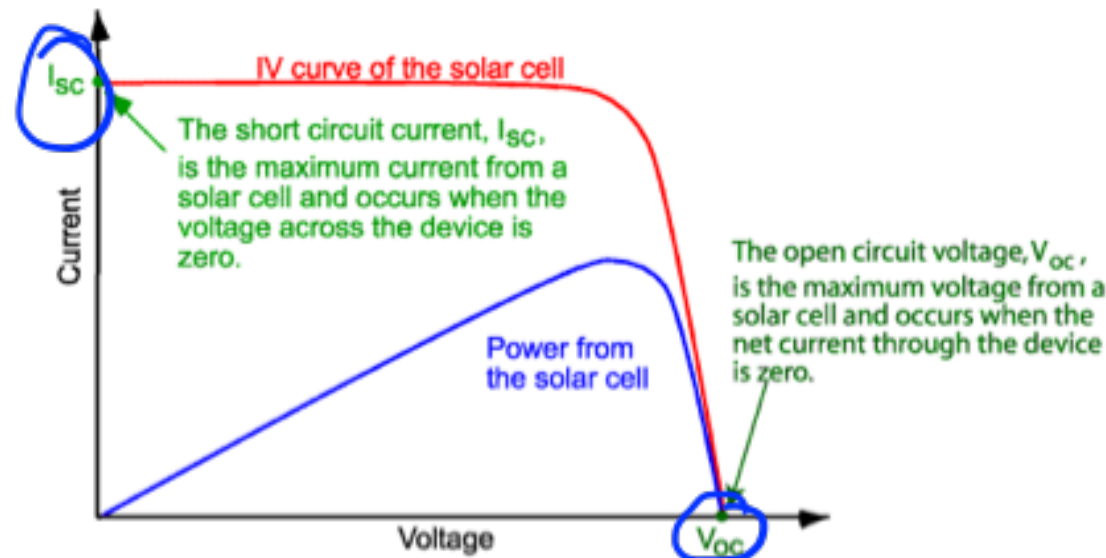
SWNTs: improve e⁻ paths to detector, collection efficiency
Au: improve *light* collection efficiency, plasmonic effect

Image from wiki

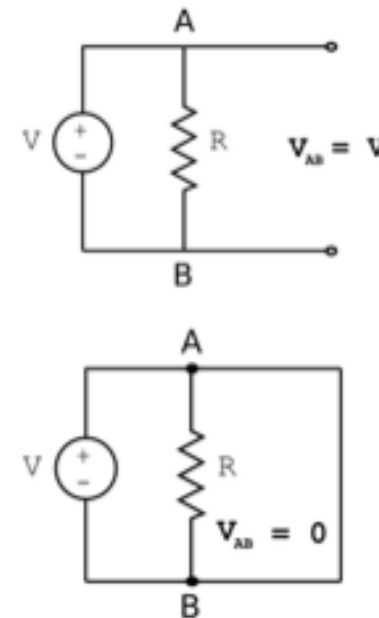
Solar cell measurement: Voc and Isc

- Voc and Isc are maximum ^{observed} possible V and I $\therefore P=0$
- Theoretical max power, $P_{ideal} = Voc * Isc$
- Real Pmax reflects internal dissipation
 - see also <http://www.ni.com/white-paper/7230/en/>

Image from pveducation.org



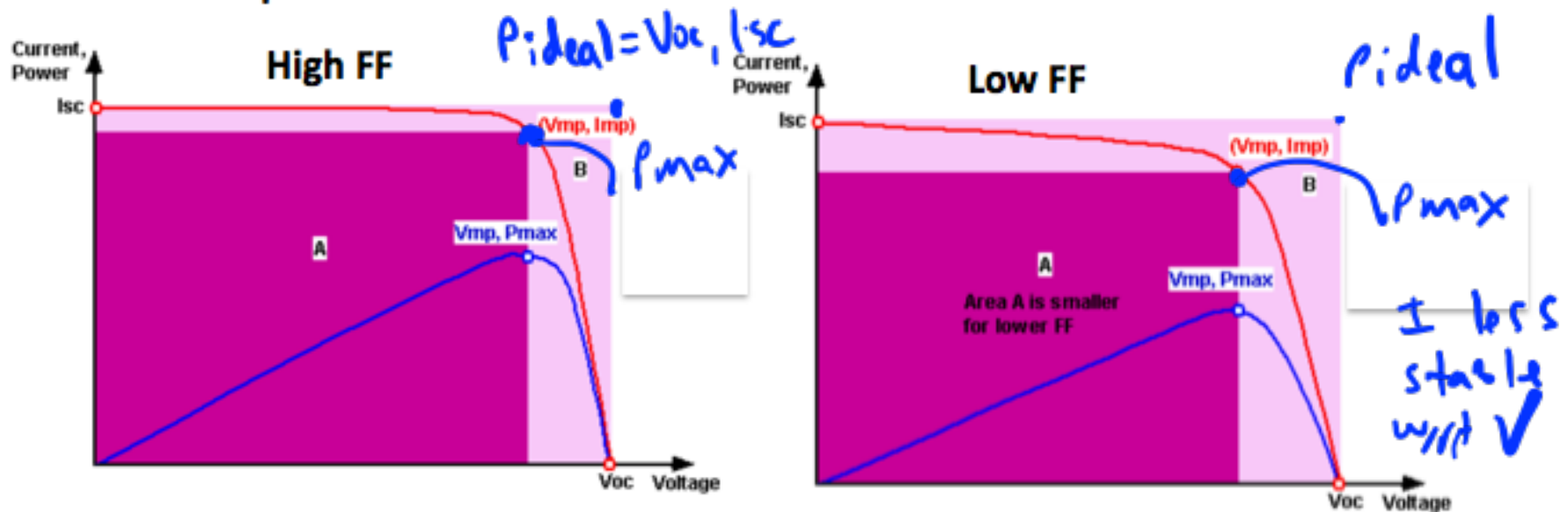
Own images (20.309)



Simple model
(not DSSC circuit)

Solar cell measurement: efficiency

- Fill factor = $FF = P_{max}/(V_{oc} * I_{sc})$
 - measure of solar cell quality (dissipation ↓, FF ↑)
- Overall conversion efficiency $\eta = P_{max}/P_{in}$
 - solar to electric power
- Requires accurate solar cell area measurement!



Images from pveducation.org

Solar cell completion (M3D5)

- Dye added to anode for you
- You will...
- ... contain + cook the anode
- ... add redox mediator/recycler
- ... add counter-electrode (Pt)

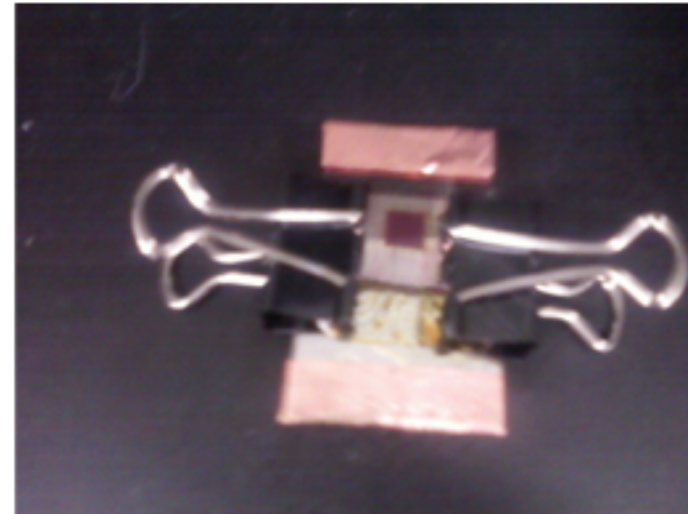
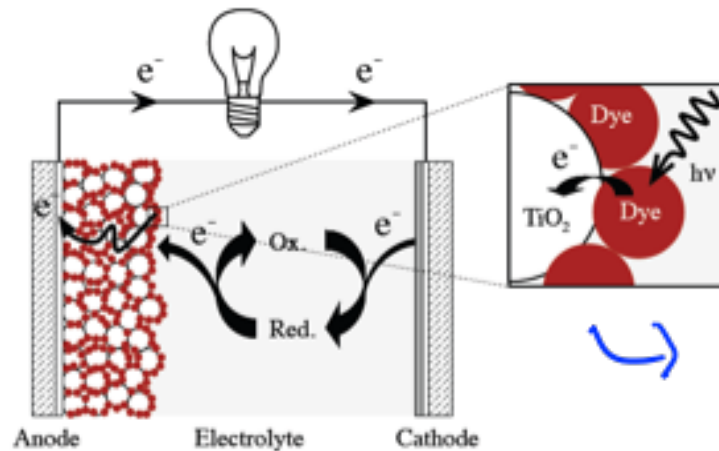


Image from wiki



↳ chemisorption → new(ester) bond

And... your toddler inspiration!

<p>Discussion:</p> <p>What did you learn/enjoy learning about space?</p>	<p>I learn about astronauts float up in the air in gravity. The moon is not a planet. -X</p> <p>We don't have no gravity in space. -Feliks</p> <p>I like the moon project. It was kind of like rocky. I learned the moon is not a planet. -Y</p> <p>I liked the Earth. -Z</p> <p>I like Pluto. Pluto is the smallest planet. They call it a dwarf planet. In the space book, I learned about planets and Pluto. -A</p> <p>About Earth, Jupiter, Saturn, Mars, and the even sun. We have some planets up in the air, and gas dust, shooting stars. Then a hot sun. -B</p>
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What did you learn/enjoy learning about biological engineering experiments? 😊