2.4.4 Organic Semiconductors

- This is were the action is in **2007**. **Organic semiconductors** are hot topics in **R&D**, and first products in the form of **OLED**'s are on the market. **RFID**'s may or may not follow soon.
 - Materials Science and technology for organic conductors and semiconductors is far from being well understood and there are major technological challenges, too. To give just one example: Oxygen, quite *ubiquitous* in air, is deadly for organic semiconductor devices. How can you keep a (cheap) device absolutely airtight for 20 years or so?

But first things first: What exactly are organic semiconductors?

- There is no simple answer. Essentially you need two ingredients: Some organic molecule with a conjugated carbon-carbon chain. This means that there is a succession of "single bond double bond", i.e.
 -C=C-C=C-C=C-C=C- with all kinds of stuff on the one remaining free valence of any C atom. There also must be some "doping" because the conjugated backbone chain of the polymer molecule is (surprisingly?!) not conductive or semi-conductive.
- **Doping** is written in quotation marks because it has nothing to do with what we have learned about doping in **Si** except that you add some impurities to your semiconductor.

We will come back to this topic later (if there is time). Meanwhile you may activate the following links:

- Basics about semiconducting polymers
- The Peierls instability: Why conjugated C-chains are not conductive contrary to expectation!