2.4.5 Summary to: 2.4: Other Semiconductors and Related Products

- Germanium (**Ge**) and **SiC**
  - Germanium was almost "useless" but is experiencing some comeback now (**2007**) in conjunction with **Si** technology.
  - **SiC** is very difficult to obtain as a good single crystal (many polytypes) but has some desirable properties for high speed or high power devices
- **II-VI** semiconductors are objects of heavy research but hardly used for products at present.
  - The only used material is **CdTe** for solar cells that are actually on the market. We might see, maybe, **ZnO** being used for **LED's** in the future.
- "Chalcogenides", meaning compounds with "Chalcogens", i.e. **S**, **Se**, and **Te** as major elements, are often semiconductors
  - Oxygen, in the same **IIa** group, forms "oxides"!
  - The most prominent representative of chalcogenides (besides **CdTe**) is "**CIS**" (**$CuInSe_2$**) or better "**CIGS**" (**$CuIn_xGa_{1-x}Se_2$**) used for solar cells and actually on the market.
- **Organic semiconductors**. A relatively recent addition to the club, organic semiconductors seem to have a bright future at least in optoelectronics
  - **OLED's** are on the market, in particular as part of a flat panel display; the first **OLED** based TV screen has been announced for **2008**.
  - The big problem of **OLED's** is their sensitivity to oxygen.

Exercise 2.4-1
Some quick questions to 2.4