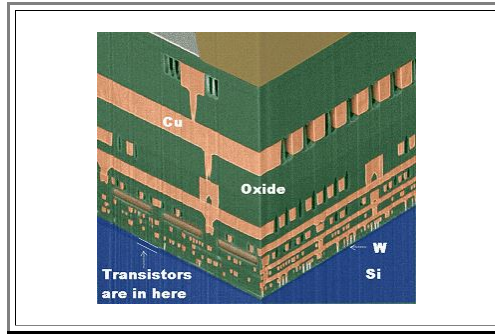


3.1.3 Summary to: 3.1 Thin Films - General

Semiconductor technology is almost synonymous with thin film technology

- A thin film is adhering to a substrate and (at least originally) continuous.
- Thin films may still be found in the product or may have been "sacrificed" during the making of the product.
- An **IC** is a study of thin films in and on the **Si** substrate.
- The same is true for pretty much every semiconductor product.



Thin always means "thin" relative to some intrinsic (internal) length scale.

Examples are:

- Structural length scales
- Wavelength and interaction length scales
- Transport parameter length scales
- Electrical scales

- Dimensions $d_{x, y, z}$
- Grain size d_{grain}
- Lattice constants a_0
- λ radiation (light, IR, UV)
- Absorption depths
- Mean free path lengths.
- Diffusion length

- SCR width d_{SCR}
- Debye length d_{Debye}
- Critical thickness d_{crit} for electrical break down
- Critical thickness d_{tu} for tunneling

There are many thin film applications outside of semiconductor technology:

- Optical, electrical, chemical, mechanical, magnetical technologies use thin films

Exercise 3.1-1

All Questions to 3.1