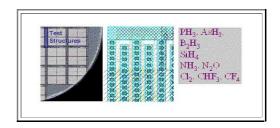
## 4.1.4 Summary to: 4.1 Input to Si Processing in an Industrial Environment

- Semiconductor technology happens in factories. They need special materials, "reticles" (= structures), "know-how" and huge amoundt of money (= capital) as major inputs
  - It's always about money! Only mass production will recover large investments.
  - The materials side always contains semiconductor substrates ("wafers") and often very dangerous special "raw" materials.
  - A number tells it all: 500 1.000 wafers /day are processed in a large Si "wafer fab"



Sand (SiO<sub>2</sub>) Metallurgical Si Poly-Si

⇒ ⇒ ⇒ Metallurgical Si clean (doped) poly-Si. Single crystal / wafer

- Three big steps to Si wafers
  - Si single crystal growth is done by "Czochralski process" (CZ).
  - Dislocation-free crystals are possible but "bulk microdefects" and impurities cannot be totally avoided.
  - Nearly perfect 300 mm wafers are standard.

Exercise 4.1-1

All Questions to 4.1