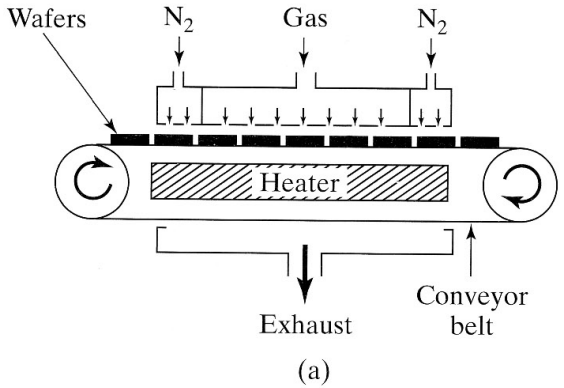
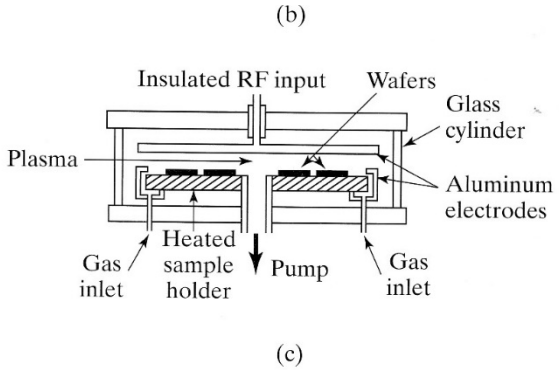
Chemical Vapour Deposition (CVD)

- Form thin films by thermal decomposition or reaction of gaseous compounds.
- Atmospheric Pressure (AP), Low Pressure (LP) or Vacuum, Plasma Enhanced (PE) CVD reactors or furnaces.
- Polysilicon, Silicon Dioxide, Silicon Nitride, Metals (Silicides) thin films can be formed by CVD.

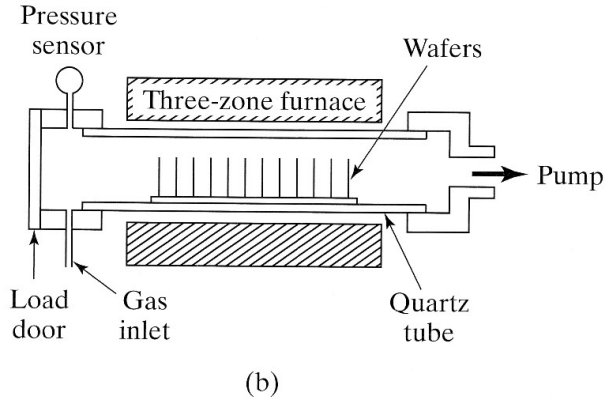
Chemical Vapour Deposition (CVD)



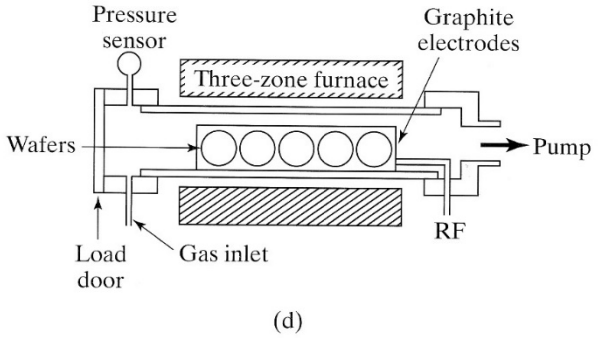
APCVD



PECVD



LPCVD



CVD of Polysilicon

Decomposition of Silane

$SiH_4 \rightarrow Si + 2H_2$

Use: Polysilicon gate in MOS Transistor

CVD of Silicon Dioxide

- Insulator between metal layer.
- Passivation (P\protection from scratches) layer.
- Different from oxidation which is a growth not deposition technique.
- Deposition of Silicon Dioxide after metallization & interconnection of components has to be done at low temperature in contrast to oxidation without melting the metals.
- Reaction of Silane and Oxygen gas compounds

CVD of Silicon Nitride

- Passivation layer, barrier mask, insulator, gate dielectric.
- Reaction of Silane with Nitrogen or Ammonia (NH_3) gas compounds.

CVD of Metals

- Mo, Ta, Ti, W are deposited on polysilicon to form silicides with silicon.
- Silicide is used to reduce the resistance of the polysilicon gate.