



GEMaC

Groupe de de la Matière Condensée

ALD FOR OXIDES

Growth reactor Atomic Layer Deposition (ALD) and CVD for functional oxides (Annealsys MC-050 DLI-CVD/ALD)

GEMaC laboratory develops an ALD growth reactor with liquid injection for the growth 2" of the functional oxide thin films.

The oxides currently under consideration are the references:

- SrTiO₃ as a perovskite substrate oxide
- BiFeO₃ as a multiferroic film

for growth on silicium, germanium

Technical specifications

MC-050:

- Multiprocess capability: DLI-CVD, DLI-ALD, MO-CVD, RTP and RT-CVD
- Oxidants: H₂O / O₃ & (O₂) CVD
- Surface treatment: H₂ line
- Direct injection liquid (up to 6 DLI vaporizers):
 - » use of **diluted** chemical precursors (liquid or solid)
 - » use of precursors with **low vapor pressure** (solid)
 - » flash atomization & vaporization (a few ms)
 - » sources at room temperature

Process chamber (cold wall reactor):

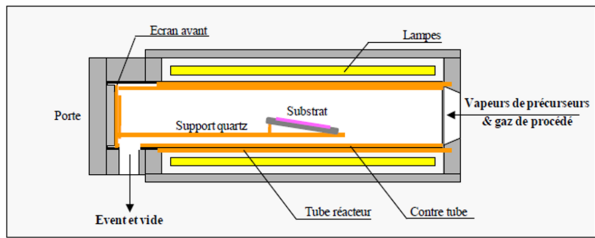
- Rapid Thermal Annealing (RTA) up to 1100°C
- Infrared halogen lamp heating
- Atmosphere to 1e-3 mbar

This equipment was subsidized via « AXION » (Flagship LabEx NanoSaclay IDEX ParisSaclay) and « OGRAAL » (DIM Oxymore – région IdF) projects

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Annealsys MC-050
DLI-CVD/ALD



Schematic representation of the reactor