

ALI Deposition For Large and Fragile Molecules

HV and UHV Equipment

▶ Working Principle

1. Fragile molecules are placed in a suspension with an adequate solvent.

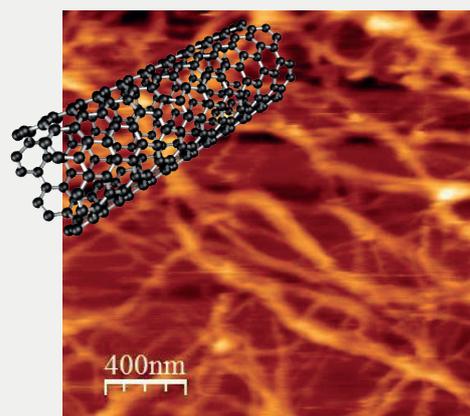
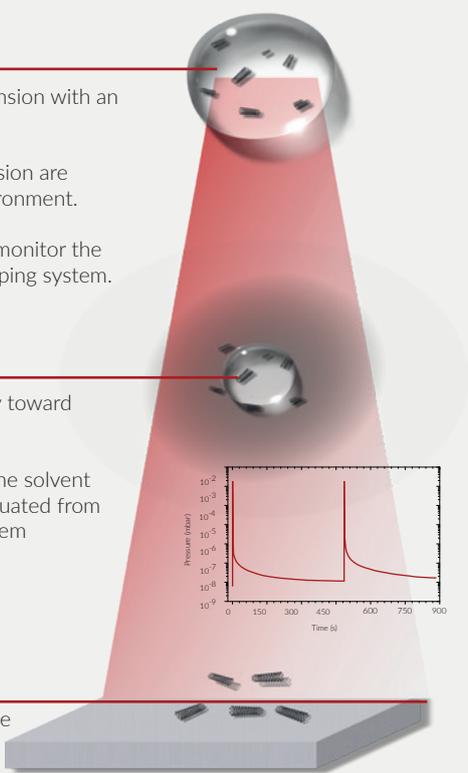
Very controlled amounts of the suspension are injected in the Ultra High Vacuum environment.

Several Pressure gauges automatically monitor the process and avoid overload of the pumping system.

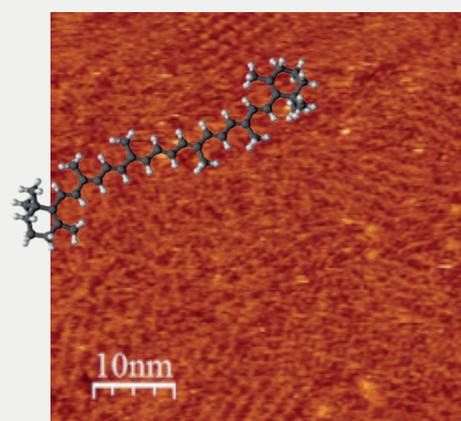
2. The droplets follow a ballistic trajectory toward the target substrate.

Under Ultra High Vacuum conditions, the solvent undergoes fast evaporation and is evacuated from the chamber through the pumping system

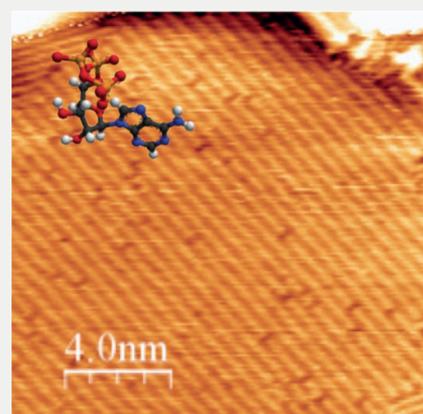
3. Once all the solvent has evaporated, the molecules continue their ballistic trajectory until they arrive at the target substrate



Carbon Nanotubes on Au(111). Courtesy of NanoPhysics Lab, Centro de Física de Materiales (CSIC-UPV/EHU), Donostia-San Sebastián, Spain



β -Carotene on Au(111). Courtesy of Franz Himpsel and Celia Rogers, NanoPhysics Lab, Centro de Física de Materiales (CSIC-UPV/EHU), Donostia-San Sebastián, Spain



ATP islands on Cu(110). Courtesy of J. Sobrado, Centro de Astrobiología (INTA-CSIC), Madrid, Spain

▶ Applications

with the deposition of...

-  Molecular electronics → π -conjugated polymers
-  Energy storage → carbon nanostructures (nanotubes, fullerenes)
-  Molecular machines → lander molecules
-  Biotechnology → DNA, ATP, proteins
-  Self-assembly → pyrroles, and more...

▶ The ALI Series

Automated Control

- A proprietary algorithm implementing several safety features constantly monitors pressures at different points and adjusts the process to prevent damaging the pumping system

Modular Design

- A detached Control Unit allows placement far from the UHV chamber.
- All ALI deposition heads are compatible with the same Control Unit, thus allowing to expand and upgrade in an affordable way.

Simple integration

- Designed with UHV standards and with a small form factor for easy integration
- An intuitive Software Interface allows full control over the deposition process.

ALI-1000

1 - 1100 mbar

0.3 ml

< 0.5 mM

Dry pump w/ gas-ballast (not included)

min. 3ms

Liquids and gases

CF40

Vertical $\pm 45^\circ$

Operational pressure range

Solution deposit capacity

Solution molarity

Pumping requirements

Pulse duration

Media

Mounting flange

Configuration set-up

ALI-5000

1-5 bar

50 ml

< 0.5 mM

Pumping station (included)

min. 3ms

Liquids and gases

CF40

$\pm 180^\circ$

