

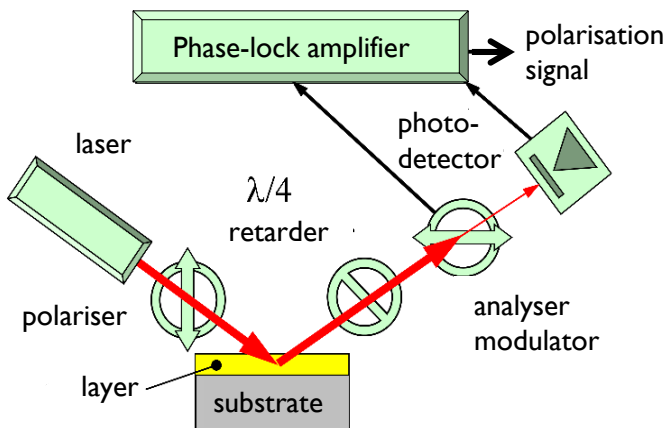
Ellipsometry is an analytical technique that measures the polarisation of light reflected off a surface.

In the electronics industry, it is used to measure the thickness of oxidation on silicon surfaces for wafer preparation.

Currently, the technique requires the use of relatively bulkier lab equipment.

## The IMRE Solution

An IMRE team developed a portable, battery-powered Precision Ellipsometry (PREL) system which has an increased sensitivity level that can measure ultra-thin films down to the molecular level, in real-time. The key to the performance of the PREL system is a polarisation modulator which allows the system to provide highly sensitive measurements, and yet be compact.



Schematic diagram of PREL system



Prototype of the PREL system device

## Key Features

- Real-time measurement of reactions and molecular interactions at sub-nanometre molecular sensitivity
- Ability to measure layers on substrates which can be in gas, liquid or vacuum
- Low cost per test as relatively cheaper substrates are used
- Battery-operated, compact and portable device
- Potentially low device production cost

## Potential Applications

- Biomedical (label-free) diagnostic tests
- Drug testing, e.g. measuring affinity of antibodies to antigens
- Measurement of kinetics of chemical reactions by fixing one of the precursors on the substrate
- Environmental monitoring “in the field” as device is portable, e.g. testing water and air purity
- Physics and Chemistry education – the PREL system places molecular science right on the desk

## Collaboration Opportunities

- Joint development of the device with industry for higher sensitivity and automation
- Licensing of PREL technology
- Joint collaboration with educational institutions to develop courses using PREL



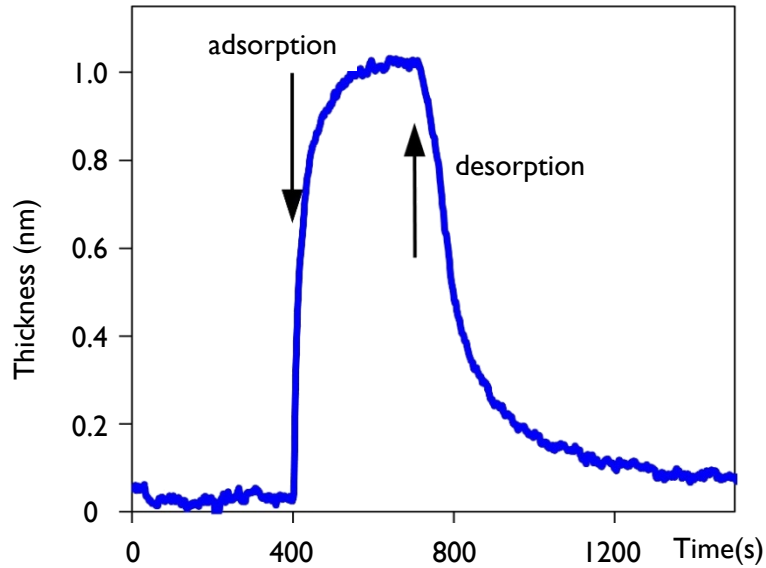
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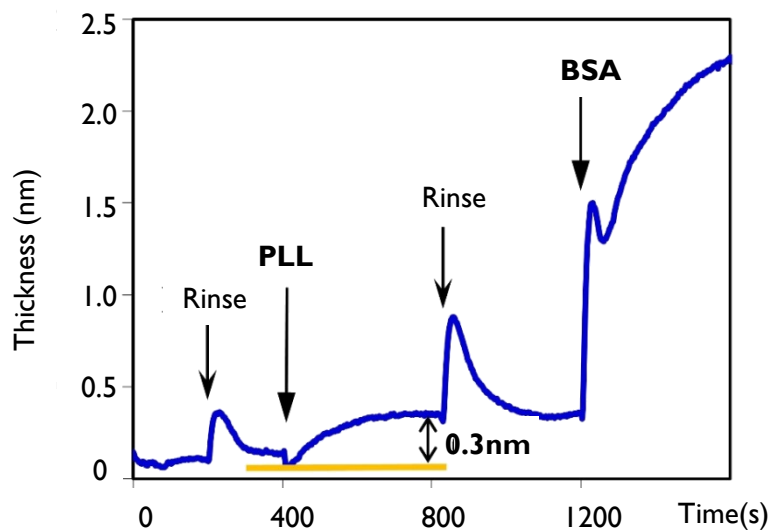
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## Performance Data:



\*Example of PREL substrate in air - adsorption and desorption of propanol on silicon surface



\*Example of PREL substrate in water - deposition of poly-L-lysine (PLL) and bovine serum albumin (BSA) on silicon substrate in optical cuvette