Hydrophobic Forces in Liquid Selfassembly

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Objective

Liquid mediated selfassembly of different functional parts assisted by...

...a microfluidic system
  (i) delivery of parts into
  (ii) reaction chamber and
  (iii) selection

...orthogonal functionalisation
  (i) hydrophilic
  (ii) hydrophobic

Parts

...have different functions like
  (i) sensor
  (ii) actuator
  (iii) transmitter

...are orthogonally functionalised by
  ... carbon
  ... teflon (C₄F₈)
  ... thiols
  ... plasma O₂ treatment

Hydrophobic Interaction

has been investigated by

... molecular dynamic simulations
  (i) molecular layering
  (ii) orientation of molecules
  (iii) interaction length

Surface Microstructuring

...allows the precise engineering of spacial binding energy.

Microfabrication of Silicon Parts

(i) DRIE technology, (ii) Dry pre-release, (iii) Microstructured rim, (iv) Gold top for functionalisation

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Background image
Optical image of in liquid pairwise selfassembled SU8 parts functionalised by local plasma O₂ surface treatment
(by L. Jacot-Descombes)