

Process for controlling surface wettability

Description

A new method for controlling the surface wettability of silicon/glass containing substrates is proposed. Mono- or Polycrystalline silicon, quartz, glass, or other materials having high silicon content can be treated. Conventional methods for preparing nanostructured surfaces having controlled topography and surface wettability use electron beam lithography and reactive ion etching technique, which are complex, expensive, and rather time-consuming methods not adapted to large scale production of large area substrates.

The present innovative method provides an alternative process for controlling surface wettability of silicon/glass substrates, faster and less expensive than conventional methods. The method allows controlling the surface wettability of selected surface regions by tailoring their surface topography and chemical properties. The roughness of the surface, and thereby the hydrophobicity, can be controlled by a polymer coating followed by a plasma etching procedure with a fluorinated plasma and a surface energy modifying treatment.

The invention is particularly effective to create a high roughness of the silicon surface, hence increasing its repellent or wetting behaviour. Another merit of the invention is the transferability of the roughness profile from the polymer coating to the underlying substrate surface by over-etching the polymer coating. This permits to produce high surface roughness that cannot be obtained by over-etching non-coated and flat silicon substrates.

Innovative aspects and main advantages

- Control of wettability of silicon/glass containing substrates
- Transferability of roughness profile to the underlying silicon surface
- Fast simple and non-expensive method
- Method adapted to large area substrate
- Method adapted for large scale production

Areas of application

- Silicon chip producers
- Microarray producers
- Glass producer

Stages of development

Patent Priority date 02.02.06
Patent pending PCT/EP06/050628

Scientific contact

Dr. François Rossi
Joint Research Centre, IHCP
European Commission - I-21020 Ispra - Italy
Tel: (+39)0332/785443
Email address: francois.rossi@jrc.it

Licensing contact

Intellectual Property and Scientific Collaboration Unit
DG JRC - European Commission
B-1049 Brussels, Belgium
Email: JRC-TechTransfer@ec.europa.eu

Reference: file n°2761