

Novel one-step method to create functional wrinkles in polymeric surfaces

The Spanish National Research Council (CSIC) has developed a method to produce structured and functional surfaces by sculpting wrinkles on polymeric materials in a controlled manner. Compared with other currently available techniques, this method is simple, is carried out in one step, in short times and without risk of toxicity due to the presence of residual monomers. The technique has potential use as antifouling and antiwetting coatings in aeronautics, construction or also as cell templates for tissue engineering.

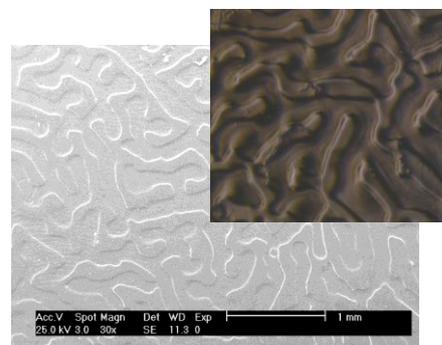
An industrial partner for a license agreement is sought

Controlled chemical composition without additional steps

The method is based on UV irradiation and simultaneous heating of a photosensitive solution. The technique allows to control at the same time, within few minutes, surface topography and chemical composition by using monomers with different functionalities as well as by incorporating copolymers and/or fillers in the starting mixture.

Currently available approaches require multiple steps of either/both functionalization or/and structuration. The method developed by a group of researchers at the CSIC allowed them to fabricate wrinkled-functionalized surfaces in one step and in just few minutes without the need of additional functionalization steps.

The size of the wrinkles can be varied depending on the formulation and preparation conditions employed: the first results allowed the preparation of wrinkles with both hydrophilic and hydrophobic functional groups with wrinkle periods of 100-720 μm and buckle amplitudes between 4 and 15 μm can be obtained.



The size of the wrinkles can be controlled.

Main applications and advantages

- **Reproducible at industrial scale:** The process is carried out in one step at short times and do not require particular equipments what make it profitable at industrial scale.
- **Good final properties:** final product exhibit high thermal and chemical stability since the material is covalently crosslinked.
- **Wide range of applications:** These surfaces with controlled wettability can be used as coating for glasses, fabrics, furniture or floors among others. They can be also of interest in the design of self-cleaning paintings or to achieve antiadherent or antifouling surface properties.
- **Environmentally friendly:** Compared with other techniques, with this method there is no risk of residual monomers in the final product enabling its use in environmental or biological applications.

Patent Status

PCT ("International) application filed. Priority established by Spanish patent application.

For further information, please contact

Patricia Thomas V, Ph.D.
Material Science Area
Deputy Vice-Presidency for Knowledge Transfer
Spanish National Research Council (CSIC)
Tel.: + 34 – 91 561 34 41
Fax: + 34 – 91 564 48 53
E-mail: patricia.thomas@ictp.csic.es