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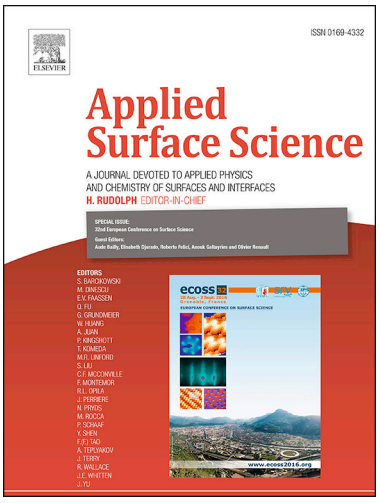

Full Length Article

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Superhydrophobic Polymeric Films with Hierarchical Structures Produced by Nanoimprint (NIL) and Plasma Roughening

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The structuration of various polymeric films has been studied to create superhydrophobic surfaces. Nanoimprint lithography and/or plasma etching processes with CF_4/Ar have been used on FEP, PMMA and PET polymer films. On the one hand, the effect of the CF_4/Ar gases, the input power and the plasma treatment duration have been investigated in terms of etching and fluorination degree, and XPS analyses are precisely discussed. On the other hand, wettability performances were characterized. Relationships between the contact angle, the contact angle hysteresis and the surface structures have been investigated. The wetting behaviors and the transition between the Wenzel and the Cassie-Baxter states was discussed as a function of the roughness. We have prepared each studied polymer films in transparent and flexible superhydrophobic surfaces whose contact angle are ~160° and hysteresis are ~2°. A short