Superhydrophobic Properties of Nanotextured Polypropylene Foils Fabricated by Roll-to-Roll Extrusion Coating

We demonstrate the use of roll-to-roll extrusion coating (R2R-EC) for fabrication of nanopatterned polypropylene (PP) foils with strong antiwetting properties. The antiwetting nanopattern is originated from textured surfaces fabricated on silicon wafers by a single-step method of reactive ion etching with different processing gas flow rates. We provide a systematic study of the wetting properties for the fabricated surfaces and show that a controlled texture stretching effect in the R2R-EC process is instrumental to yield the superhydrophobic surfaces with water contact angles approaching 160° and droplet roll-off angles below 10°.

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