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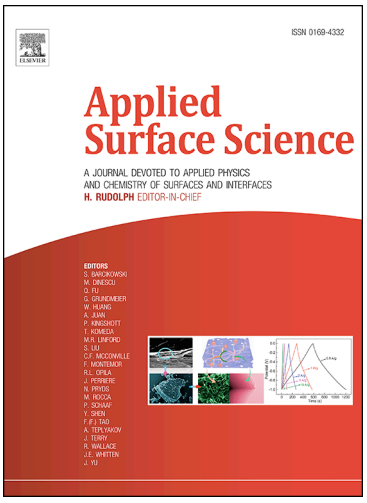

Full Length Article

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Fabrication of Superhydrophobic Cotton Fabrics by Grafting of POSS-Based Polymers on Fibers

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Abstract: Superhydrophobic fabrics were successfully prepared by modification of fibers with polymers containing polyhedral oligomeric silsesquioxane (POSS). The modification was conducted by chemical vapor deposition with mercapto silanes followed by click coupling with pentaerythritol tetrakis(3-mercaptopropionate) and octavinyl-POSS to form POSS-based polymers on the cotton fibers. The POSS-based polymers onto the fabric surfaces both increased the surface roughness and lowered the surface energy of the fabrics. The as-prepared superhydrophobic fabrics have excellent superhydrophobicity stablility toward acid, base, salt, acetone, and N,N-dimethylformamide. In addition, the fabrics maintained superhydrophobicity under long time exposure to UV irradiation, and have better antifouling properties.

Keywords: Superhydrophobic; antifouling property; thiol-ene click chemistry; POSS-based polymers