

142ab Superhydrophobic Conducting Polymer Films: Synthesis and Reversible Wettability

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Superhydrophobic conducting polymer (such as polyaniline, polypyrrole, and polythiophene) films are electrochemically grown in acetonitrile electrolyte containing perfluorooctanesulfonate (PFOS). The PFOS-doped polyaniline films exhibit extended network structure composed of helical polyaniline fibers, while polypyrrole and polythiophene films show highly porous structure. The water contact angle is about 150° - 155° . Reducing the PFOS-doped conducting polymer films by negative potential leads to undoped films, which are superhydrophilic (water contact angle close to 0°). By controlling the electrical potential, conducting polymer films are changed between doped state and undoped state, resulting in reversibly switchable superhydrophobic and superhydrophilic surface. Details on the preparation and characterization of the conducting polymer films are presented including scanning electron microscopy (SEM), energy dispersive X-ray spectroscopy (EDS), UV-Vis spectroscopy, cyclic voltammetry (CV), contact angle, and conductivity measurements.