NT1-04

Synthesis of Superhydrophobic and Water Slipping Perpendicular Nanorod Arrays with Hierarchy Architecture

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This report demonstrates a synthetic route of smooth gold nanorod. The utilization of vertically-aligned smooth gold nanorod arrays with and without nanoporous tip architectures as superhydrophobic surfaces is described. Nanoporous architecture was produced on the tips of nanorods by selectively dissolving less nobel component from the alloy nanorods. And the resulting nanoscopic dual-size roughness features enhanced surface dewettability after surface modification with surface energy materials such as long-chain normal alkanethiol and fluorinated organic compound. The contact angle measurements show nanorod length dependant contact angle variation. The surface cleaning properties were also tested with a water droplet rolling and sliding angle measurements.