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# Supporting Information

## Wetting Behavior of Zirconia nanotubes

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### Experimental

#### XPS- Characterization parameters

XPS spectra were recorded on a PerkinElmer Physical Electronics 5600 spectrometer. The specimens were excited using a monochromatic radiation source ( Al Kα - 1486.6 eV, 300 W). Spectra (O 1s, C 1s, Zr 2p, P 2p) were recorded under a takeoff angle of 45° and the binding energy was determined at a pass energy of 23.5 eV, with a resolution of 0.2 eV. For charge compensation, the binding energy of the C 1s signal was used. The background was subtracted using the Shirley method and the molar fractions of each species were acquired via the acquisition software (MultiPak V6.1A, Copyright Physical Electronics Inc., 1994−1999). The data curated as a result of this experiment may be seen in Figure-2 in the main-manuscript.

#### Figure-S1

#### Water Contact Angle Measurements

Two contact angle goniometer devices (*Leica application suite* and *Ossilla* device and software) were used to determine the static water contact angle values (DI water droplet with a volume of 10µl). Figure-S1, depicts the optical microscopy images of the water droplets on the respective OPA-modified Zirconia substrates as measured using the two devices. Both instruments produce deviations of results only with the regular error of the measurement. The WCAs for OPA modified ZrNTs recorded on the *Ossila* device produces marginally enhanced values ($WCA_{Ossila}$ = 160 ± 3˚) to the *Leica suite* ones ($WCA_{Leica}$ = 159 ± 3˚). This most likely is caused by a small deviation in the angle of substrate and camera, as can be deduced from Figure S1. In conclusion, iterative experiments resulted in all OPA modified zirconia nanotube substrates demonstrating superhydrophobicity independent on tube morphology and geometry.

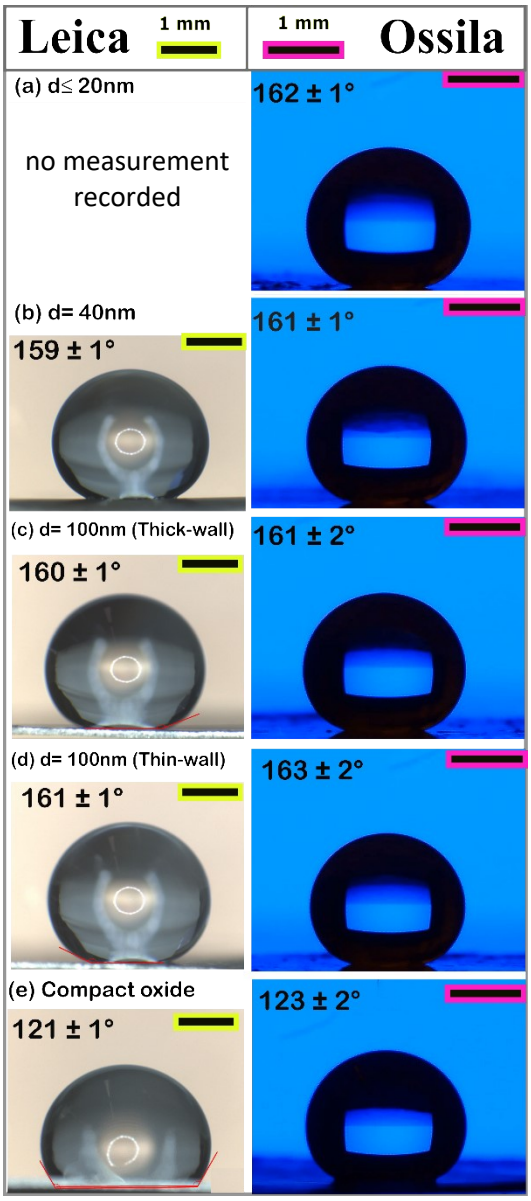


*Figure S1: Optical image comparison of WCA as measured by different goniometers.*