

MIMICKING THE SUPERHYDROPHOBICITY OF LOTUS LEAVES - DESIGNING SELF-CLEANING SURFACES

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The apparent contact angle of a drop on a rough surface is often modeled using either Wenzel's or Cassie's formulas. Previous experiments are not conclusive regarding which formula to use and when. This information is critical in designing a superhydrophobic substrate for applications in microscale devices. We propose a design to develop a rough superhydrophobic substrate. The microstructure of superhydrophobic leaves (such as lotus) will be discussed and a possible way to mimic their the excellent water repellent property will be proposed. This understanding is useful to artificially prepare 'self-cleaning surfaces'. The technological impact of such surfaces is considered to be significant.

The change in the apparent contact angle due to a rough surface can be also used to move liquid droplets (carrying e.g. biomolecules) inside micro-channels. Our results above also help in the modeling and simulation of surface roughness induced droplet motion.