Slippery Rough Surfaces ID# 2014-4286





Technology Summary

This novel liquid-repellant surface design can maintain droplet mobility in both the Cassie and Wenzel states, by reducing the 'pinning' effect of the Wenzel state through the use of lubricants. The inventors used a microscopically-thin conformal layer of lubricant on the surface nanotextures to smoothen the sharp edges of the surface texture. This reduces immobility by reduced pinning effect.

Application & Market Utility

Owing to the high surface area relative, the slippery rough surface enhibits enhanced drop nucleation and coalescence, resulting in faster droplet removal. The slippery rough surface is also efficient in separating oils from an emulsion due to its superoleophilic nature. It also prevents fouling as an added advantage due to the extremely slippery nature which rids itself of all the oil during recovery, with bare minimal cleaning requirements. The longevity of the surface is also good when appropriate lubricant properties are chosen.

Next Steps

Applications may include fog harvesting, dropwise condensation, oil condensation, oil/water separation, anti-icing/frosting device, anti-fouling surfaces and drag reducing surfaces.

TECHNOLOGY READINESS LEVEL 4-7

Seeking

Investment | Licensing | Research

Keywords

- super liquid repellency surfaces
- liquid harvesting surfaces
- super condensing surfaces
- fog harvesting
- oil/water separation

Researchers

Tak-Sing Wong Associate Professor Online Bio Website

Other Researchers

Originating College College of Engineering

Office of Technology Management Contact

Matthew Smith mds126@psu.edu 814-863-1122



Invent Penn State is a Commonwealth-wide initiative to spur economic development, job creation, and student career success. Invent Penn State blends entrepreneurship-focused academic programs, business startup training and incubation, funding for commercialization, and university-community collaborations to facilitate the challenging process of turning research discoveries into valuable products and services that can benefit Pennsylvanians and humankind. Learn more at invent.psu.edu.

Penn State is an equal opportunity, affirmative action employer, and is committed to providing employment opportunities to all qualified applicants without regard to race, color, religion, age, sex, sexual orientation, gender identity, national origin, disability or protected veteran status.