

Nothing sticks to these surfaces



A new generation of omniphobic surfaces: ionogel-based coatings

CIDETEC has developed a disruptive family of coatings, based on innovative ionogels, that exhibit omniphobic functionality since they are able to repel not only water, oil and organic solvents, but also other species such as greases, ketchup and mustard.

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"Coatings having repellent function and use thereof"

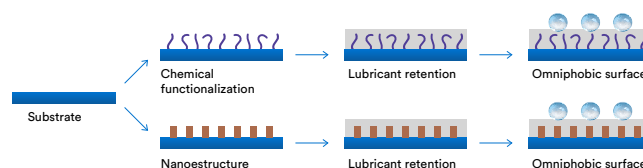
Concept

By combining a covalently anchored cross-linked polymer coating and non-volatile lubricants in an appropriate manner, a single-phase ionogel coating can be formed. The physico-chemical properties and functionality of the resulting coating can be adjusted by adding tailored functional groups to both building blocks (i.e. cross-linked polymer and lubricant). In particular, wettability of these versatile coatings may be tailored, reaching high repellency to fluids (i.e. omniphobicity).

SLIPS vs. superhydrophobic

Enhanced fluid slipperiness (i.e. even at modest contact angles).

No absolute need of hierarchical morphologies => wide room for transparency and enhanced robustness.



CIDETEC's omniphobic ionogel coatings vs. SLIPS



SLIPS limitations:

- Weak bonding to the substrate.
- Loss of lubricant (e.g. evaporation...).
- Mechanical robustness of the nanostructure (needed for high contact angles).



CIDETEC's omniphobic ionogel coatings*:

- Covalent bonding to the substrate.
- Cross-linked polymers.
- Non volatile lubricants.
- Single phase (i.e. ionogel) coatings.
- Wide versatility for customization.

* W=2018/122428 A 1

Biomimetic fluid-repellent surfaces



VS.



OMNIPHOBIC

Slippery Liquid infused Porous Surfaces (SLIPS)

- Nepenthes-like.
- Nanostructured surfaces retaining a liquid lubricant, which repels other fluids.
- Omniphobic functionality.

SUPERHYDROPHOBIC

Hierarchical surfaces

- Lotus leaf-like.
- Hierarchical morphology.
- Hydrophobic functionality.

Sliding occurs at very low tilting

Excellent slippery but high contact angles may also be possible

Opportunities

The omniphobic effect can be achieved on a wide range of materials: glass, metals, ceramics, polymers, papers...providing straightforward self-cleaning, anti-soiling and anti-icing solutions for different applications and sectors such as automotive, oil&gas, marine, buildings, packaging, paper industry.



SELF-CLEANING AND ANTI-FOGGING TRANSPARENT GLASS SURFACES



ANTI-STAIN AND SELF-CLEANING TEXTILES



HYDROPHOBIC AND OLEOPHOBIC EFFECT OF THE MIRROR INCREASING VISIBILITY



PERFECT, TRANSPARENT AND HYGIENIC OPTICAL APPEARANCE FOR TOUCH PANELS



ANTI-ICING AND ANTI-FOGGING COATING HEADLIGHTS, RADOMES, AIRCRAFT WINGS...



ANTI-BACTERIAL, ANTI-STICK AND EASY-TO-CLEAN HANDLES AND SEVERAL COMPONENTS THAT IMPROVE THE SOCIAL WELLNESS



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