

Electronic Supporting Information

Under-oil self-driven and directional transport of water on femtosecond laser-processed superhydrophilic geometry-gradient structure

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This file contains Supplementary Figures S1-S5 and Table S1.

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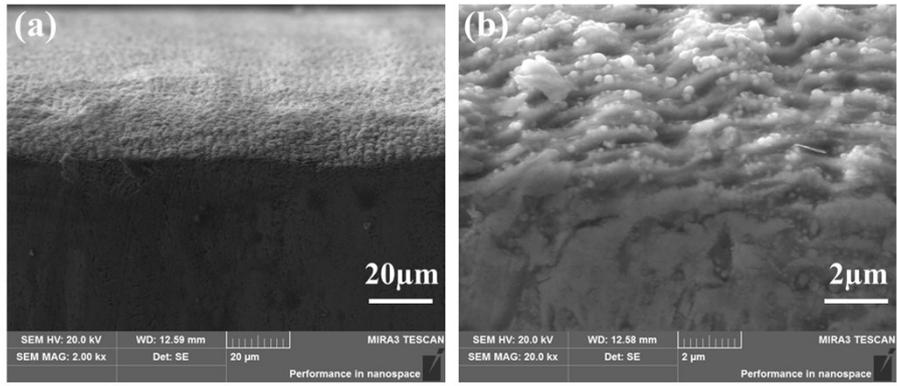


Figure S1. Cross-sectional SEM images of laser-treated stainless steel at different magnifications.

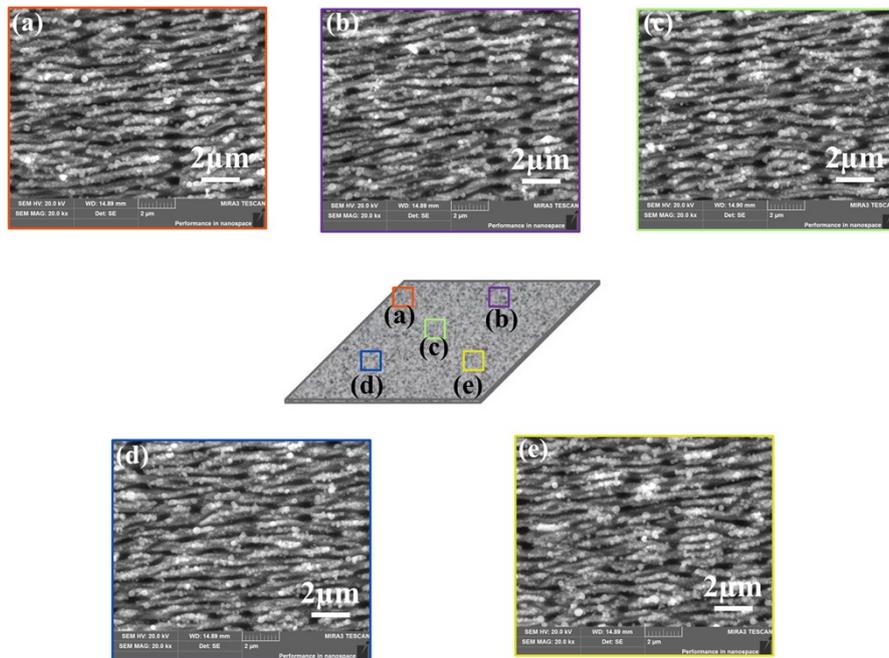


Figure S2. SEM images of different positions on the laser-treated stainless steel.

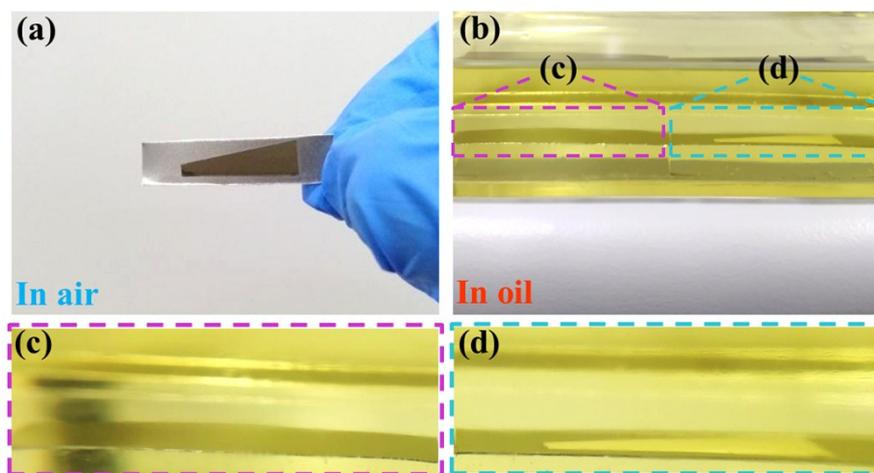


Figure S3. Photograph of the pristine and the laser-treated stainless steel (pre-wetted) in oil.

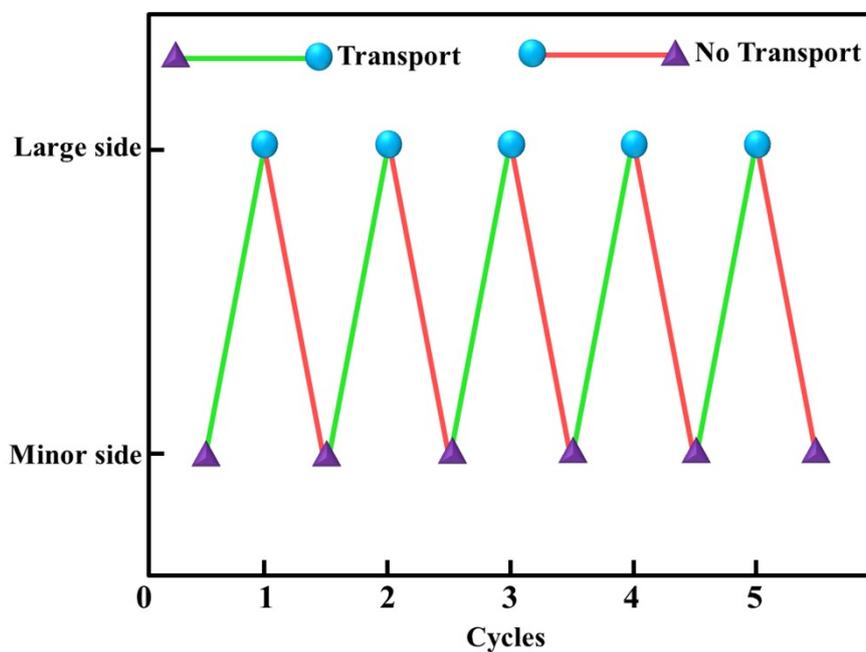


Figure S4. The cycles of water transport at the two sides of the trapezoid.

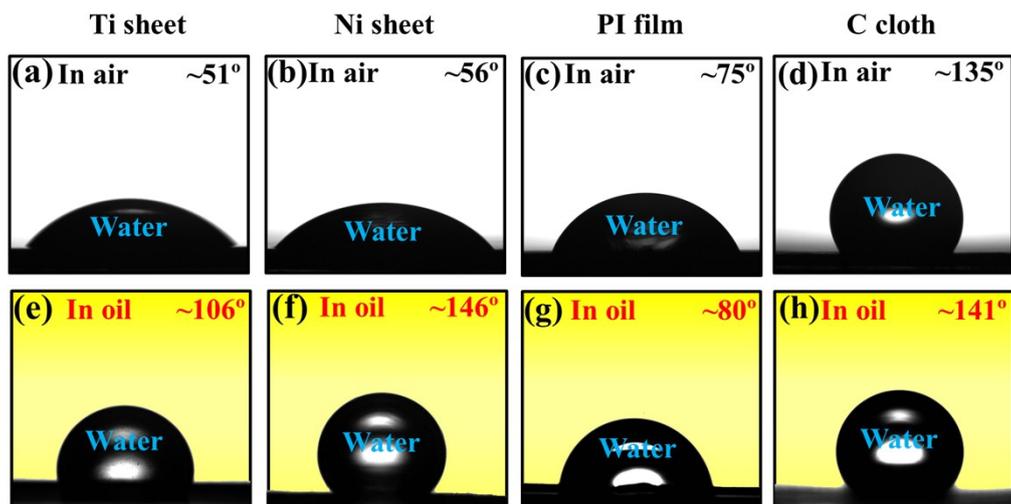


Figure S5. Water contact angles of the pristine (a,e) Ti sheet, (b,f) Ni sheet, (c,g) PI film, and (d,h) C cloth in air and oil.

Table S1. The carrier, environment and preparation efficiency of this work compared with other methods for directional transportation.

The carrier and environment of transporting	Wettability of materials	Geometric shape	Time consuming	Ref.
Water droplets manipulation in air	Hydrophilic below 30 °C and superhydrophobic above 36 °C.	Rectangle-shape	Two steps, >2 hours	12
Water droplet manipulation in air	-	Nano/ magnetic micropillar arrays	Several steps, >9 hours	18
Bubbles in aqueous environment	Hydrophobic and underwater aerophilic	A lubricant infused slippery surface	Three steps, >2 hours	32
Gas bubbles in aqueous environments	Superhydrophobic and underwater superaerophilic	Trapezia-shape	Four steps, >2 hours	33
Subaqueous gas bubbles	Exterior subaqueous superaerophobic and interior subaqueous superaerophilic	A serial wedge-shaped pattern	Four steps, >1 hour	36
Gas bubbles in organic solvents	Aerophilic in some organic solvents	A slippery copper cone	Four steps, >4 hours	37
Under-oil self-driven and directional transport of water	Under-oil superhydrophilic	Trapezia-shape	Two steps, < 8 minutes	This work

Note: Time consuming is the minimum time listed in the above ref.