Supporting Information

Synthesis and Characterization of Superhydrophobic Epoxy Resin Coating with SiO_2@CuO/HDTMS for Enhanced Self-Cleaning, Photocatalytic, and Corrosion-Resistant Properties

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Table S1. A comparison was conducted to assess the contact angle between our developed coating and the commercially available superhydrophobic coating (Ultra-ever Dry®).

No.	Substrate	Coating	Superhydrophobicity	Ref.
1	Stainless steel	Ultra-ever Dry®	WCA = 155.0°	[1]
2	Glass slides	Ultra-ever Dry®	WCA = 151.2°	[2]
3	Glass slides	Ultra-ever Dry®	WCA = 152.6°	[3]
4	Nylon mesh	Ultra-ever Dry®	WCA = 151.3°	[4]
5	Carbon fiber	Ultra-ever Dry®	WCA = 161.2°	[5]
6	Aluminum alloy	Ultra-ever Dry®	WCA = 157.6°	[6]
7	Aluminum alloy	SiO_2@CuO/HDTMS	WCA = 157.4°	This work

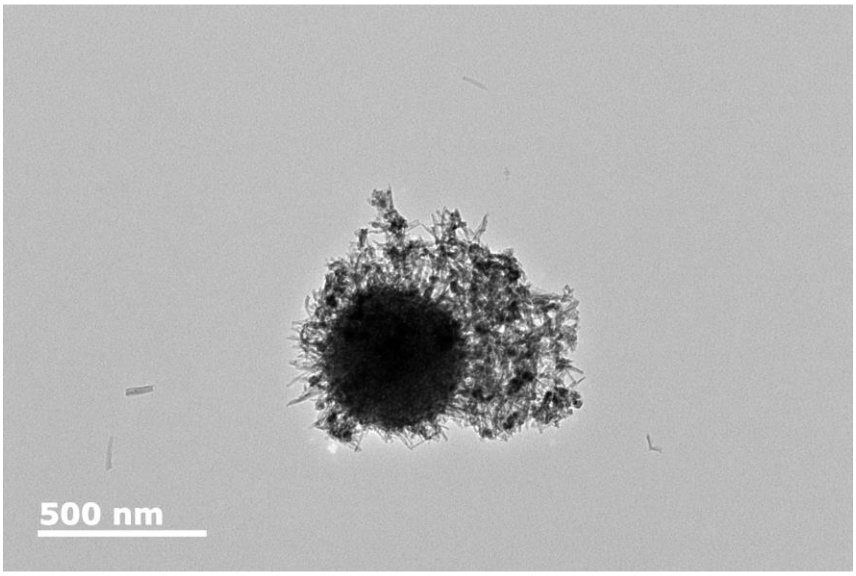

Figure S1. TEM images of SiO_2@CuO/HDTMS nanoparticle.

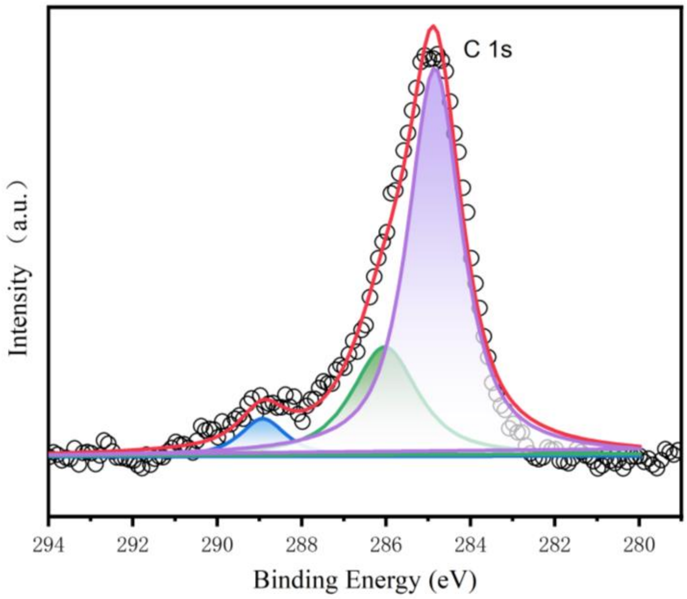

Figure S2. XPS narrow scans spectra of C1s.

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Table S2. Comparison of properties of self-cleaning surfaces through synergistic action of superhydrophobicity and photocatalytic activity.

Materials	Super-hydrophobicity	Photocatalytic activity	Applications	Ref.
Dual-scale TiO_2/ER/FAS	WCA >150° θSA < 10°	0.6893 h^{-1} for NR degradation under UV light	Self-cleaning Anti-icing	Zhu et al. (2021) [7]
FAS-SiO_2/ZnO/PDMS	WCA = 151° θ_{SA} = 2°	0.0073 h^{-1} for RhB degradation under yellow light	Self-cleaning Antifouling against stains Antibacterial	Zhao et al. (2022) [8]
TMCS-SiO_2/TiO_2/FEP	WCA >150° θ_{SA} < 3_o	0.6931 h^{-1} for MB degradation under UV light	Self-cleaning Antifouling against algae	Ansari and Nouri (2023) [9]
CeO_2/SiO_2/TiO_2/PDMS	WCA = 153.4°	NA for OA degradation under UV light	Self-cleaning UV-blocking Anti-reflection	Keshavarzi et al. (2020) [10]
ZnO nanorods/PDMS	WCA = 158.1°	1.2166 h^{-1} for MB degradation under UV light	Self-Cleaning Antibacterial	Wang et al. (2021b) [11]

TMCS-TiO_2@SiO_2/ Paraloid B72	WCA = ~150°	5.7420 h^{-1} for MB degradation under UV light	Self-cleaning Anti-corrosion	Bai et al. (2022) [12]
Ag_2O/SiO_2/TMCS	WCA >150° θ_{SA} < 8°	NA for RhB degradation under visible light	Self-cleaning Oil/water separation	(Rahman and R, 2022) [13]
TiO_2/UltraEverDry	WCA = 152.9°	0.1815 h^{-1} for NO degradation under UV light 0.0192 h^{-1} for NO degradation under	Self-cleaning Antifouling against algae	Trávníčková et al. [14]
TiO_2/wrinkled-SiO_2	WCA = 156° θ_{SA} = 6.6°	0.0854 h^{-1} for MO degradation under UV light	Self-cleaning Antifouling against stains Anti-corrosion	Zhang et al. (2020) [15]
TiO_2/PDMS	WCA = 156.9° θ_{SA} = 6.8°	NA for OR/MB degradation under UV light	Self-cleaning Oil/water separation Water Purification	Yang et al. (2020a) [16]
SiO_2@CuO/HDTMS	WCA = 157.4° θ_{SA} = 4.6°	0.5257 h^{-1} for RhB degradation under UV light	Self-cleaning Anti-corrosion	This work

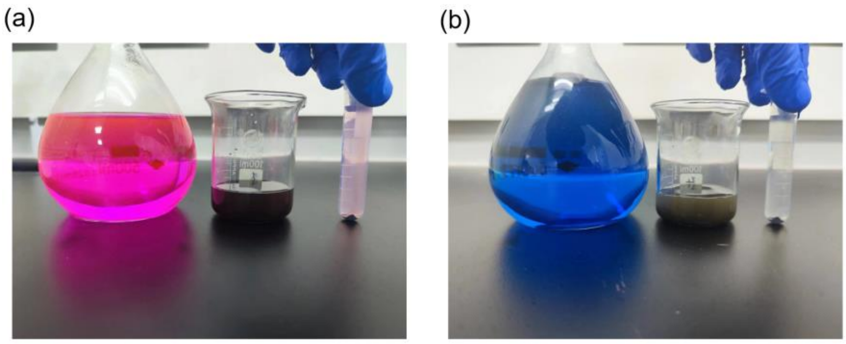

Figure S3. Before and after images of the degradation of (a) Rhodamine B and (b) Methylene Blue. The volumetric flask displays the color of the solution before degradation, while the centrifugal tube displays the color of the solution after degradation.

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