

Supplementary Materials: Photocatalytic Graphene-TiO₂ Thin Films Fabricated by Low-Temperature Ultrasonic Vibration-Assisted Spin and Spray Coating in a Sol-Gel Process

Fatemeh Zabihi, Mohammad-Reza Ahmadian-Yazdi and Morteza Eslamian

Table S1. Experimental conditions used for the fabrication of graphene, TiO₂, and graphene-TiO₂ thin films via spin coating followed by substrate vibration post treatment (spin-SVPT) and substrate vibration-assisted spray coating (SVASC). GD stands for graphene disperse and TS stands for TiO₂ precursor solution.

TS:GD Volume Ratio	Casting Method	Annealing Temp. (°C)
TiO ₂ film	Spin-SVPT	150
graphene film	Spin-SVPT	150
graphene film	Spin-SVPT	450
1:4	Spin	150
1:4	Spray	150
1:9	Spin-SVPT	150
1:9	Spin-SVPT	450
1:4	Spin-SVPT	150
1:4	Spin-SVPT	450
1:4	SVASC	150
1:4	SVASC	450

500 nm

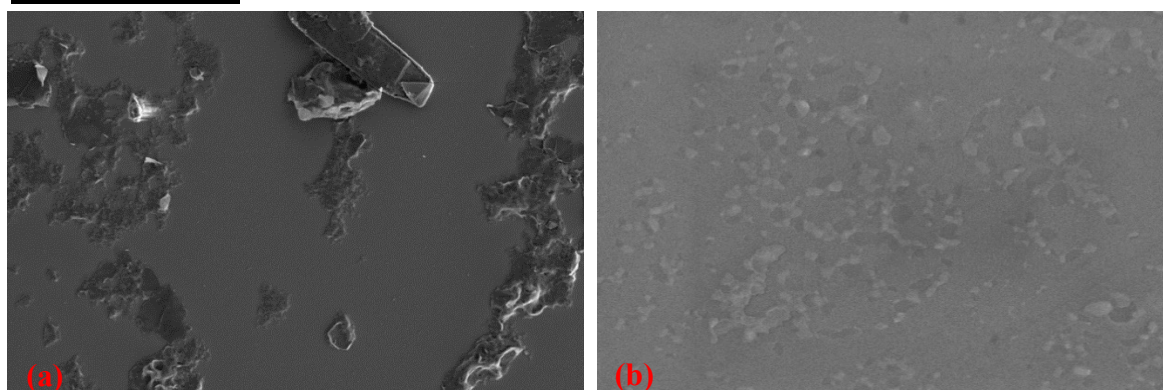


Figure S1. Surface morphology of graphene-TiO₂ thin films prepared by conventional spin (a) and spray (b) coating. Both films were deposited from precursor solution with TS:GD volume ratio of 1:4, and the films were annealed at 150 °C.

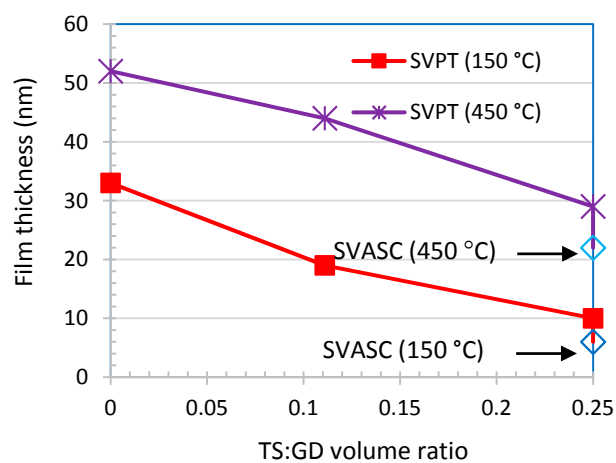


Figure S2. Effect of precursor composition and annealing temperature on the thickness of graphene-TiO₂ composite thin films.

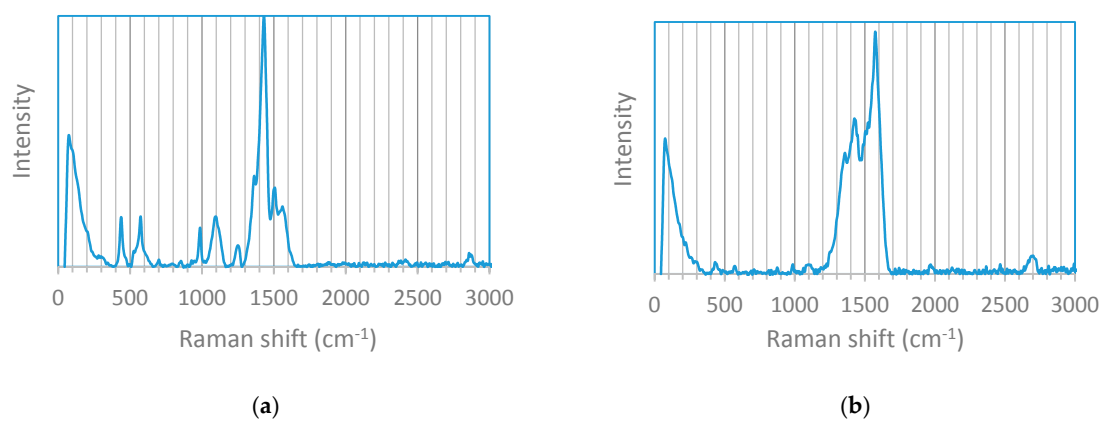


Figure S3. Raman spectra of graphene-TiO₂ thin films, deposited from the precursor solution with TS:GD volume ratio of 1:4. (a) Spin-SVPT, and (b) SVASC, both annealed at 450 °C.

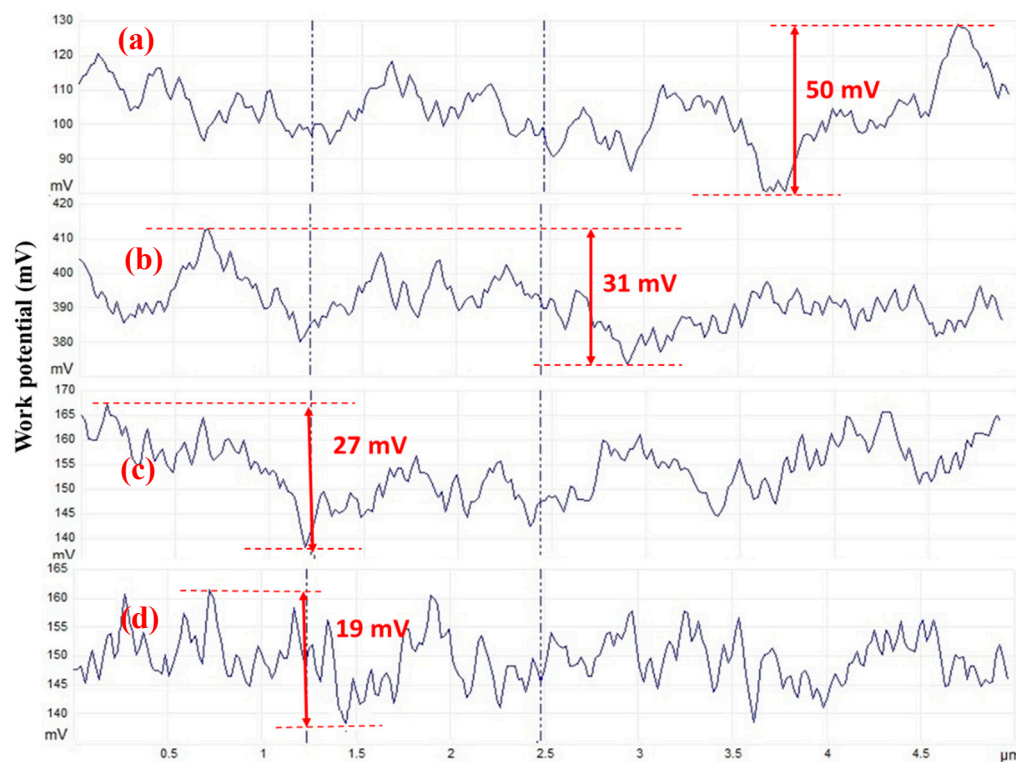


Figure S4. Line potential profiles of graphene-TiO₂ films with various TiO₂ contents (TS:GD vol. ratio), annealed at 150°C. (a) spin-SVPT graphene, (b) spin-SVPT graphene-TiO₂ at TS:GD = 1:9, (c) spin-SVPT graphene-TiO₂ at TS:GD = 1:4, and (d) SVASC graphene-TiO₂ thin film at TS:GD = 1:4. The line profiles were obtained along the lines shown on the AFM potential images of Figure 9.

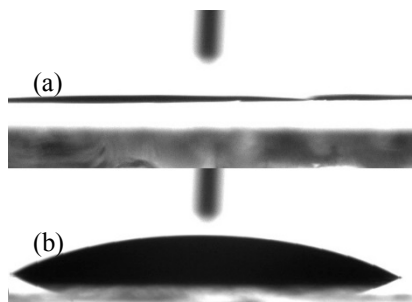


Figure S5. Contact angle measurement tests of water droplets on (a) graphene-TiO₂ thin films fabricated by spin-SVPT using a solution with TS:GD volume ratio of 1:4 and annealed at 150°C, and (b) graphene deposited by spin-SVPT and annealed at 150 °C.