



Light Trapping Effect in Perovskite Solar Cells by the Addition of Ag Nanoparticles, using Textured Substrates

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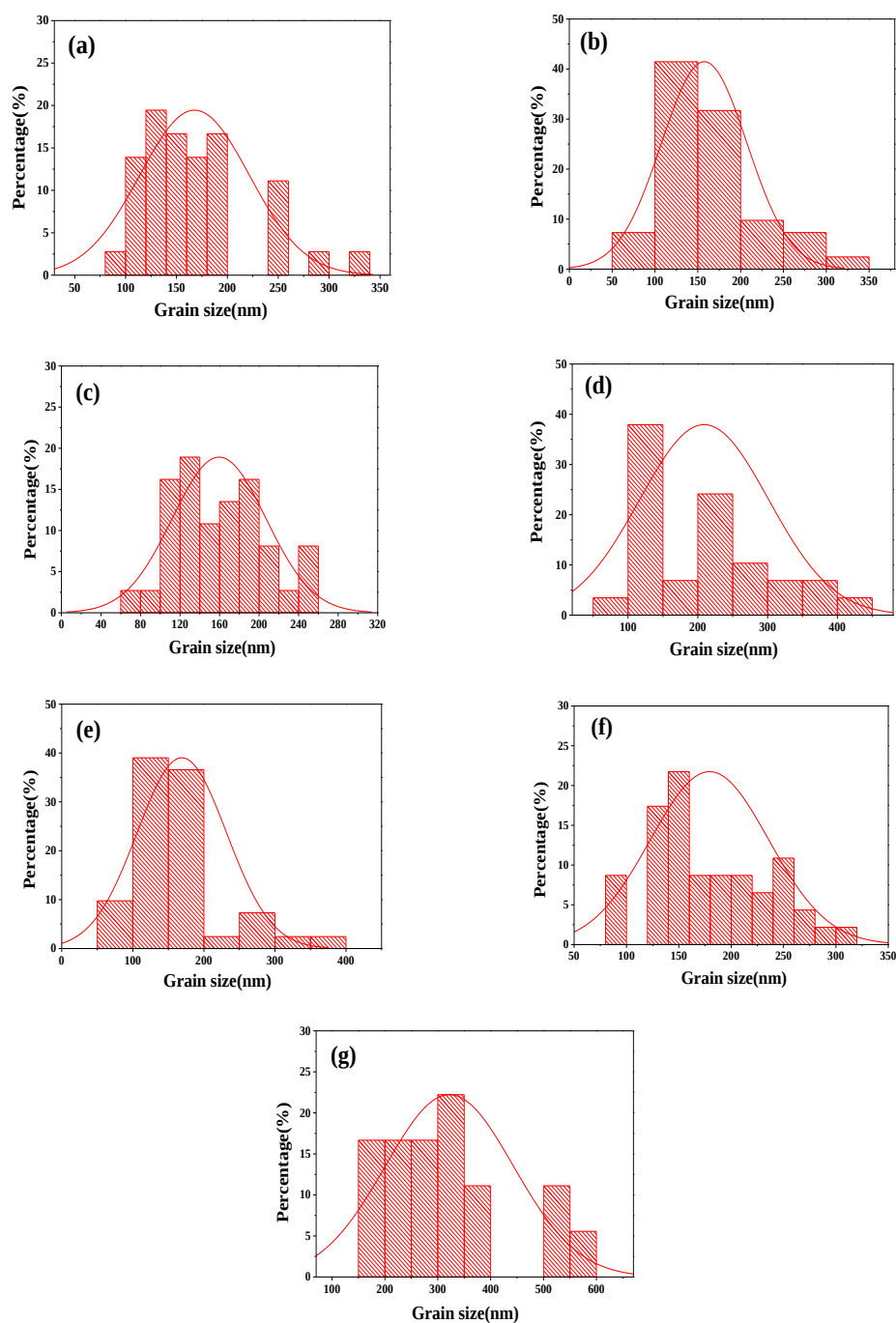


Figure S1. Grain size distribution of perovskite films on TiO_2 layer embedded Ag NPs of (a)–(g): 0, 5 wt.%, 6.7 wt.%, 10 wt.%, 20 wt. %, 33.3 wt.% and 10 wt.%, (a)–(f) upper films are on S-FTO and (g) on T-FTO.

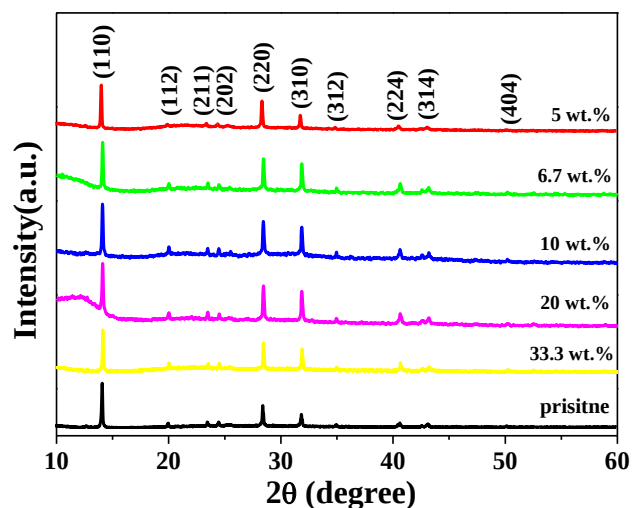


Figure S2. XRD patterns of the perovskite layers on FTO/TiO₂ with various Ag NPs concentrations of 0, 5 wt.%, 6.7 wt.%, 10 wt.%, 20 wt.%, 33.3 wt.%.

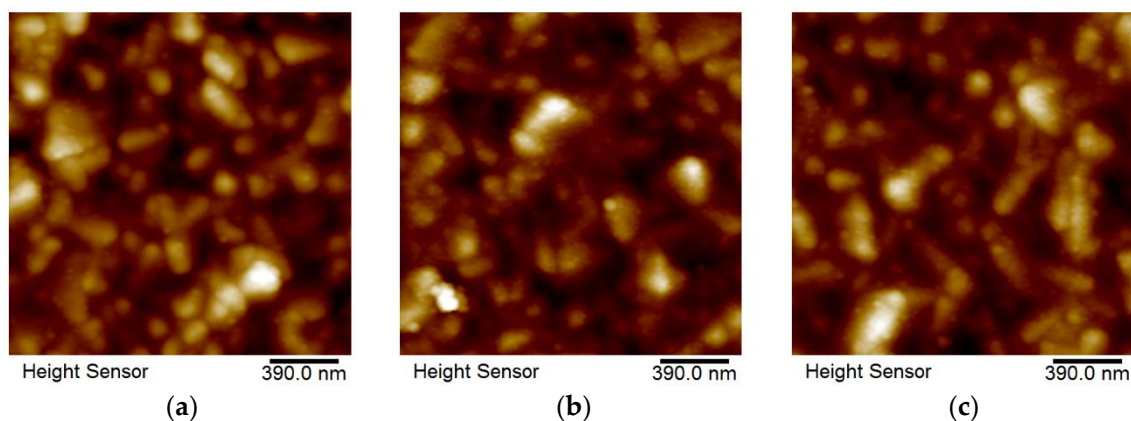


Figure S3. Surface morphologies of AFM images of (a) c-TiO₂ /S-FTO and (b) c-TiO₂ after embedding 10 wt.% Ag NPs /S-FTO (c) c-TiO₂ after embedding 10 wt.% Ag NPs /T-FTO.

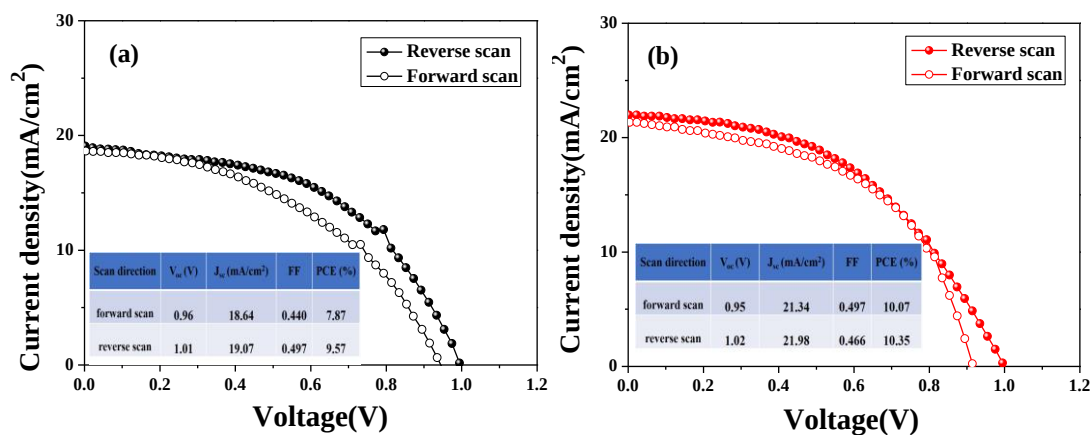


Figure S4. The device performance under forward scan and reverse scan of (a) pristine sample and (b) T-10 wt.% sample.

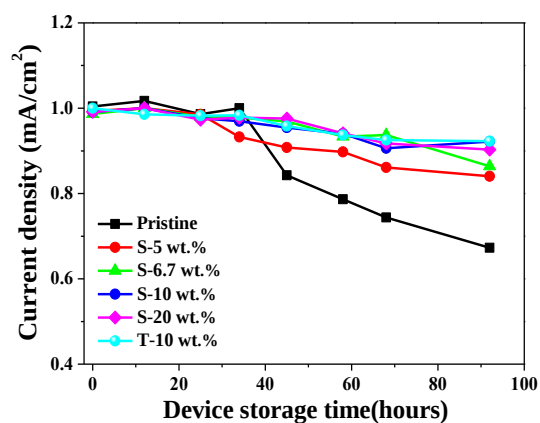


Figure S5. The stability test of PSCs without or with Ag NPs concentration from 5 wt.% to 20 wt.% without encapsulation conditions.

Table S1. The average photovoltaic performances summary of the perovskite devices.

Samples	V _{oc} (V)	J _{sc} (mA/cm ²)	FF	PCE (%)
Pristine	0.93 ± 0.06	20.12 ± 2.24	0.49 ± 0.06	9.18% ± 0.99
S-5 wt. %	0.92 ± 0.06	20.99 ± 2.11	0.48 ± 0.05	9.19% ± 1.30
S-6.7 wt. %	0.91 ± 0.04	21.06 ± 1.74	0.47 ± 0.04	9.03% ± 1.16
S-10 wt. %	0.95 ± 0.06	21.37 ± 1.80	0.50 ± 0.06	10.42% ± 1.41
S-20 wt. %	0.92 ± 0.05	21.39 ± 1.37	0.47 ± 0.05	9.37% ± 1.25
S-33.3 wt. %	0.92 ± 0.05	21.42 ± 1.26	0.48 ± 0.05	9.43% ± 1.32
T-10 wt. %	0.99 ± 0.06	21.61 ± 1.93	0.54 ± 0.07	11.73% ± 2.28