

## **Supporting Information**

# **Enhanced Photovoltaic Properties and Long-term Stability in Plasmonic Dye-Sensitized Solar Cells via Noncorrosive Redox Mediator**

Heesuk Jung,<sup>a†</sup> Bonkee Koo,<sup>a,b†</sup>, Jae-Yup Kim,<sup>a</sup> Taehee Kim,<sup>a</sup> Hae Jung Son,<sup>a</sup> BongSoo Kim,<sup>a,c</sup> Jin Young Kim,<sup>a,c</sup> Doh-Kwon Lee,<sup>a</sup> Honggon Kim,<sup>a,c</sup> Jinhan Cho,<sup>b</sup> and Min Jae Ko<sup>a,c,\*</sup>

<sup>a</sup>Photo-Electronic Hybrids Research Center, Korea Institute of Science and Technology (KIST), Seoul 136-791, Korea

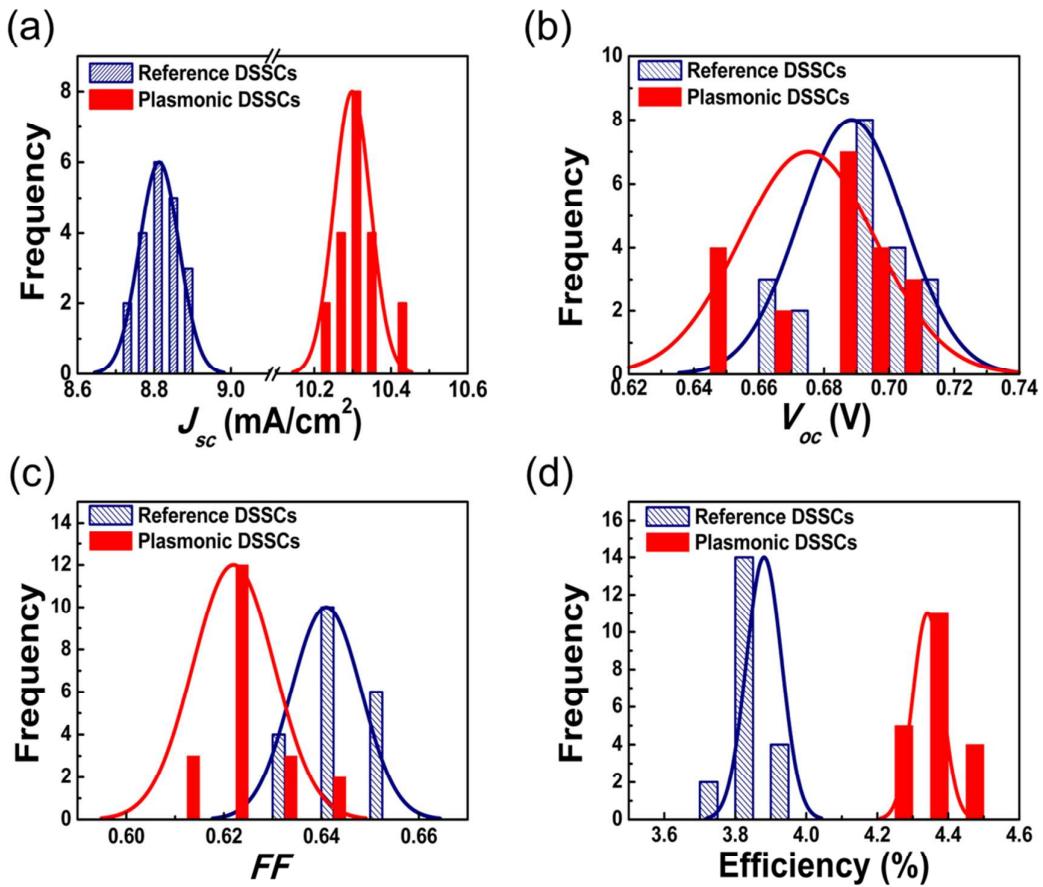
<sup>b</sup>Department of Chemical and Biological Engineering, Korea University, Anam-dong, Seongbuk-gu, Seoul 136-713, Korea

<sup>c</sup>Green School, Korea University, 145, Anam-ro, Seongbuk-gu, Seoul 136-701, Korea

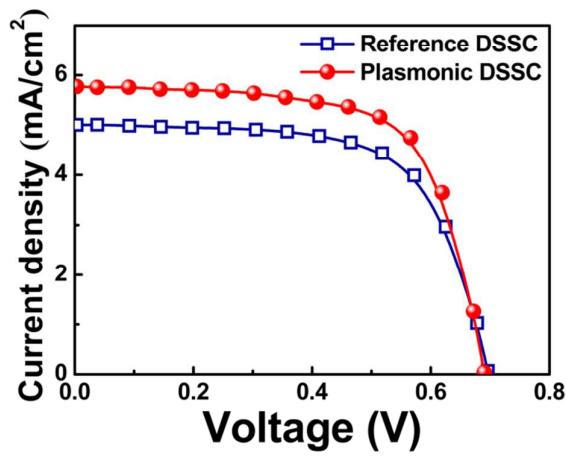
<sup>†</sup>These authors contributed equally to this work

\*Corresponding Author: Dr. Min Jae Ko

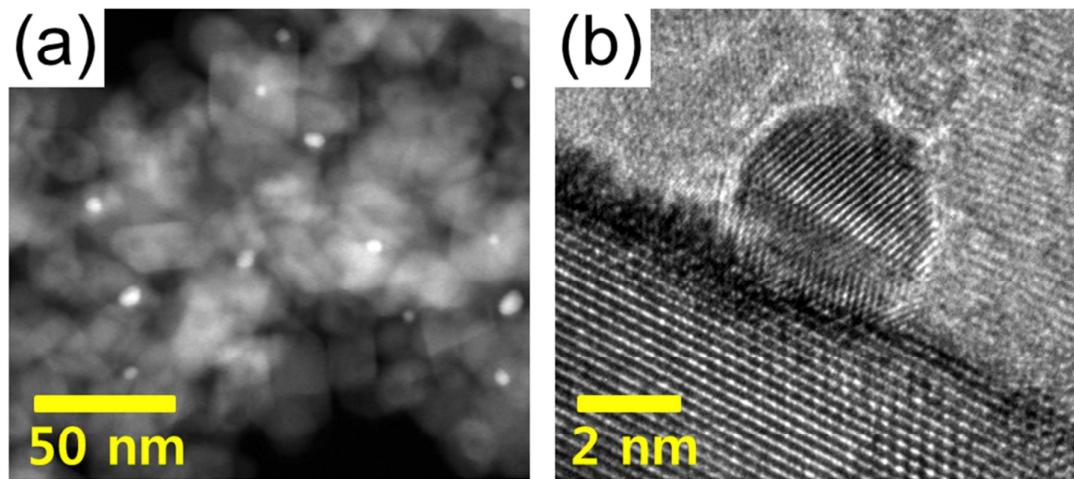
Tel.: +82-2-958-5518. Fax: +82-2-958-6649. E-mail: [mjko@kist.re.kr](mailto:mjko@kist.re.kr)



**Figure S1.** Histograms of device performance parameters (a)  $J_{sc}$  (b)  $V_{oc}$  (c) FF and (d)  $\eta$  for reference DSSCs and Plasmonic DSSCs with 0.07 wt% Au NPs. The histograms are fitted with normal distribution curves. Photovoltaic parameters were acquired from 20 devices at each condition.



**Figure S2.** Photocurrent density-voltage ( $J$ - $V$ ) curves of reference DSSC with 1.1  $\mu\text{m}$  pristine  $\text{TiO}_2$  photoanodes (blue line) and plasmonic DSSC with 1.1  $\mu\text{m}$  photoanodes containing 0.07wt% Au NPs (red line)



**Figure S3.** Characterization of Au NPs in TiO<sub>2</sub> photoanode after sintering process (a) Au NPs distributed over TiO<sub>2</sub> film (b) Au NP on TiO<sub>2</sub> nanostructure

**Table S1.** The standard deviations of photovoltaic parameters of reference DSSCs and plasmonic DSSCs with 0.07 wt% Au NPs incorporated photoanodes

<b>Samples</b>	<b><math>J_{sc}</math></b>	<b><math>V_{oc}</math></b>	<b><math>FF</math></b>	<b><math>\eta</math></b>
Reference	0.051	0.016	0.007	0.051
0.07wt%	0.052	0.019	0.008	0.063

**Table S2.** Photovoltaic parameters of reference DSSC and plasmonic DSSC with 1.1  $\mu\text{m}$  thickness photoanodes

<b>Samples<sup>a</sup></b>	<b><math>J_{sc}</math> (mA/cm<sup>2</sup>)</b>	<b><math>V_{oc}</math> (V)</b>	<b><math>FF</math></b>	<b><math>\eta</math> (%)</b>
Reference	5.01	0.70	0.67	2.35
0.07wt%	5.77	0.69	0.66	2.63