Electronic Supplementary Material (ESI) for New Journal of Chemistry. This journal is © The Royal Society of Chemistry and the Centre National de la Recherche Scientifique 2021

New Journal of Chemistry

Electronic Supporting Information

Boosting the Electrochemistry of Li₂O₂ in Lithium-Oxygen

Batteries by Plasmon-induced Hot-Electron Injection

Weixue Yang, [†] Fei Li, [†] Huali Liu, Zhen Li, Jiaqi Zhao, and Yu Wang ^{*}

Table of Contents

Figure S1 Nitrogen adsorption-desorption isotherms of SO4
Figure S2 Photo response of the discharge voltage in a photo-assisted
Li– O_2 battery with a current density of 100 mA g ⁻¹ when illumination is
switched from "on" to "off"5
Figure S3 Schematic configuration diagram of light-assisted Li–O ₂ battery
Figure S4 CV curves of Li-O ₂ batteries with ASO-L and SO-L cathodes in
$O_2 \text{ at } 0.1 \text{ mV s}^{-1}$
Figure S5. CV curves of Li $-O_2$ batteries with and without illumination for SP cathodes (SP-L and SP) in O_2 at 0.1 mV S ⁻¹
Figure S6. LSV curves of ORR employing SP with and without
illumination at 50 mV s ⁻¹ in Li–O ₂ batteries9
Figure S7. LSV curves of OER employing SP with and without
illumination at 50 mV s ⁻¹ in Li– O_2 batteries10
Figure S8 The discharge and charge profiles of the Li–O ₂ batteries at 100
mA g ⁻¹ with and without illumination11

Figure S9 Voltage profiles of typical Li-O2 batteries cycled with the

current density of 200 mA g^{-1} with and without illumination
Figure S10 Galvanostatic charge–discharge profiles of the Li–O ₂ batteries
at different current densities with illumination13
Figure S11 Galvanostatic charge–discharge profiles of the Li–O ₂ batteries
at different current densities without illumination14
Figure S12. The XRD pattern of ASO after 40 cycles15
Figure S13. The charge–discharge profiles of SP at 100 mA g ⁻¹ with and
without illumination in Li–O ₂ batteries16



Figure S1. Nitrogen adsorption-desorption isotherms of a) ASO and b) SO.



Figure S2. Photo response of the discharge voltage in a photo-assisted $Li-O_2$ battery with a current density of 100 mA g⁻¹ when illumination is switched from "on" to "off".



Figure S3. Schematic configuration diagram of light-assisted Li–O₂ battery.



Figure S4. CV curves of Li– O_2 batteries with ASO-L and SO-L cathodes in O_2 at 0.1 mV s⁻¹.



Figure S5. CV curves of Li $-O_2$ batteries with and without illumination for SP cathodes (SP-L and SP) in O_2 at 0.1 mV S⁻¹.



Figure S6. LSV curves of ORR employing SP with and without illumination at 50 mV s⁻¹ in Li $-O_2$ batteries.



Figure S7. LSV curves of OER employing SP with and without

illumination at 50 mV s⁻¹ in Li–O₂ batteries.



Figure S8. The discharge and charge profiles of the $Li-O_2$ batteries at 100 mA g⁻¹ with and without illumination.



Figure S9. Voltage profiles of typical $\text{Li}-O_2$ batteries cycled with the current density of 200 mA g⁻¹ with and without illumination.



Figure S10. Galvanostatic charge–discharge profiles of the Li–O₂ batteries at different current densities with illumination.



Figure S11. Galvanostatic charge–discharge profiles of the Li–O₂ batteries at different current densities without illumination.



Figure S12. The XRD pattern of ASO after 40 cycles.



Figure S13. The charge–discharge profiles of SP at 100 mA g^{-1} with and without illumination in Li–O₂ batteries.