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# Electronic Supporting Information

## Boosting the Electrochemistry of $Li_2O_2$ in Lithium−Oxygen Batteries by Plasmon-induced Hot-Electron Injection

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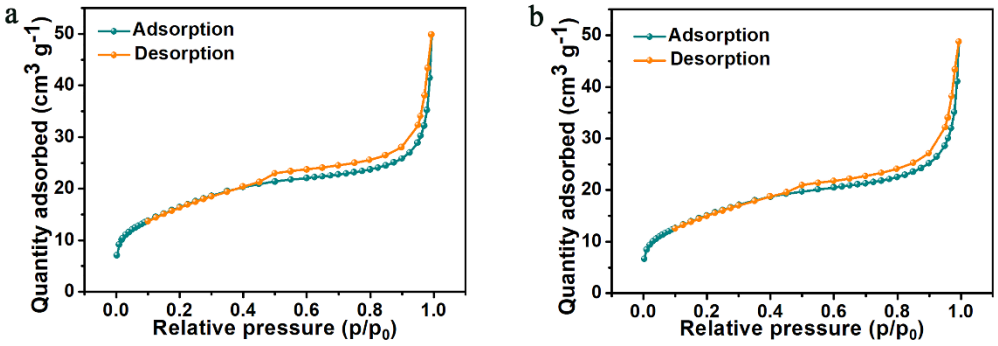


**Figure S1.** Nitrogen adsorption-desorption isotherms of a) ASO and b) SO.

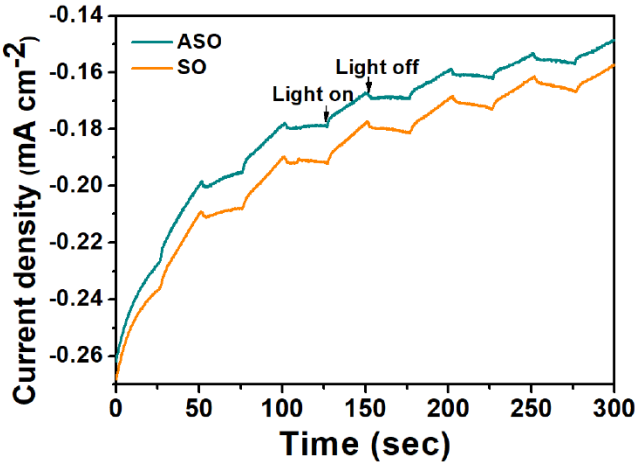


**Figure S2.** Photo response of the discharge voltage in a photo-assisted Li–$O_2$ battery with a current density of 100 mA $g^{-1}$ when illumination is switched from "on" to "off".

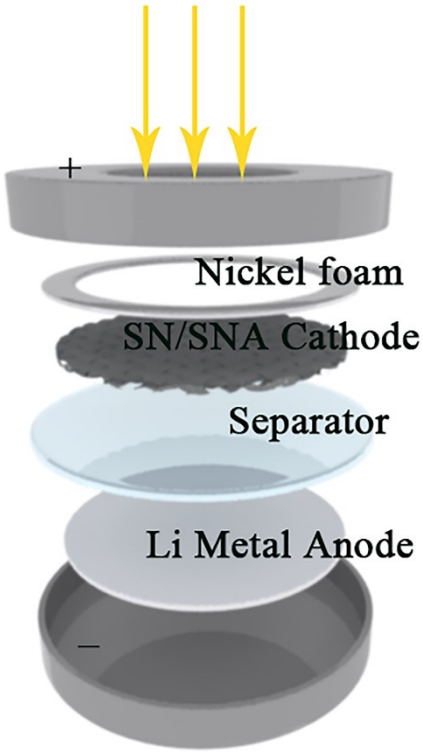


**Figure S3.** Schematic configuration diagram of light-assisted Li−$O_2$ battery.

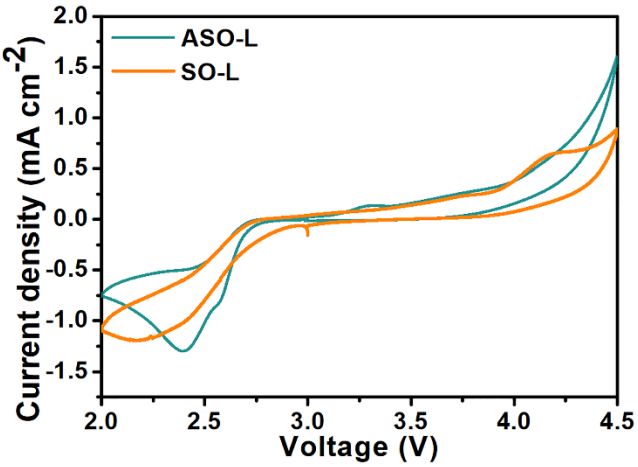


**Figure S4.** CV curves of Li−$O_2$ batteries with ASO-L and SO-L cathodes in $O_2$ at 0.1 mV $s^{-1}$.

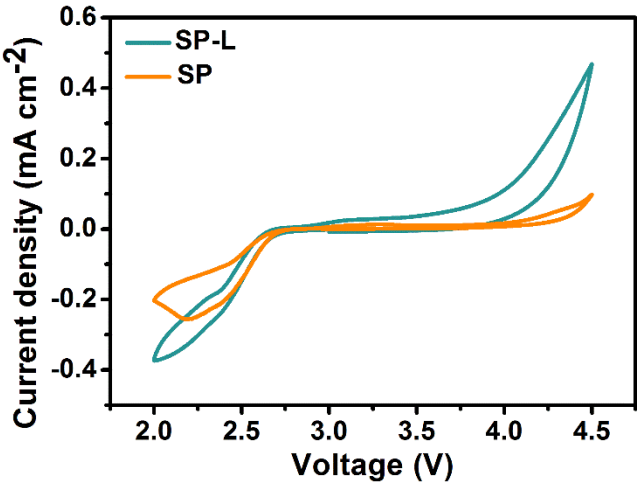


**Figure S5.** CV curves of Li−$O_2$ batteries with and without illumination for SP cathodes (SP-L and SP) in $O_2$ at 0.1 mV $S^{-1}$.

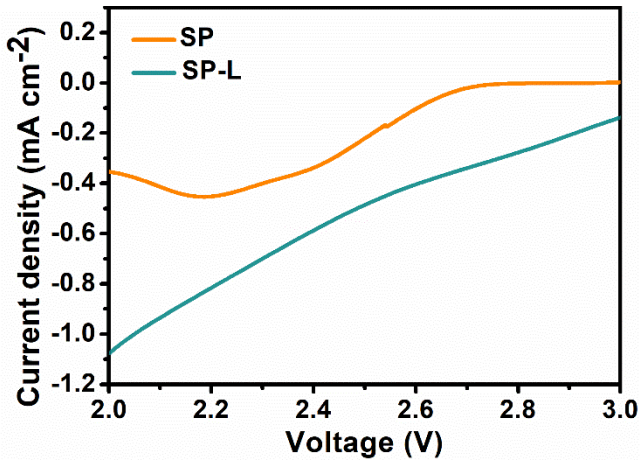


**Figure S6.** LSV curves of ORR employing SP with and without illumination at 50 mV $s^{-1}$ in Li−$O_2$ batteries.

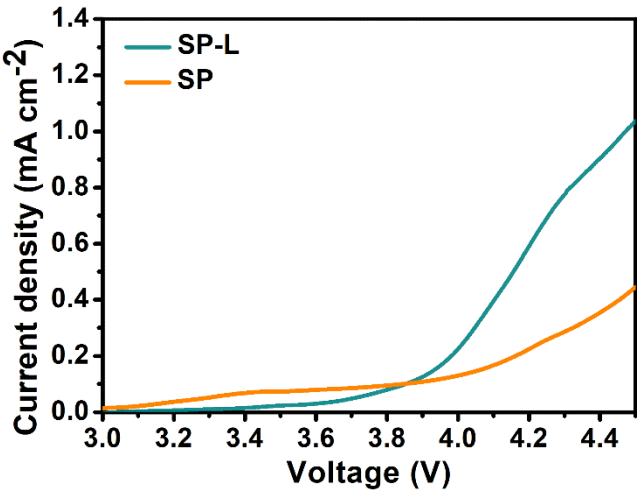


**Figure S7.** LSV curves of OER employing SP with and without illumination at 50 mV $s^{-1}$ in Li−$O_2$ batteries.

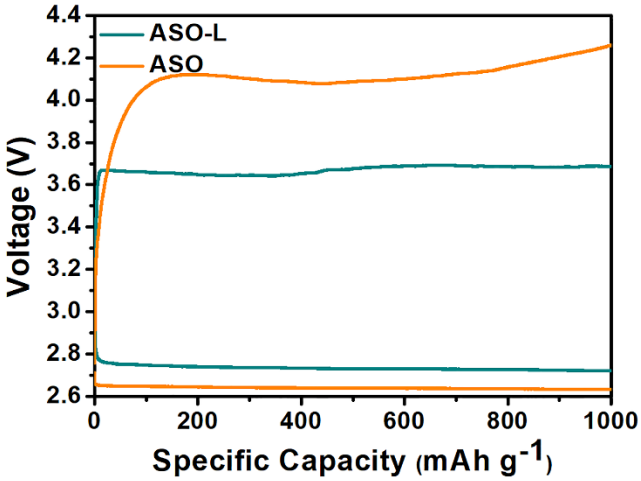


**Figure S8.** The discharge and charge profiles of the Li–$O_2$ batteries at 100 mA $g^{-1}$ with and without illumination.

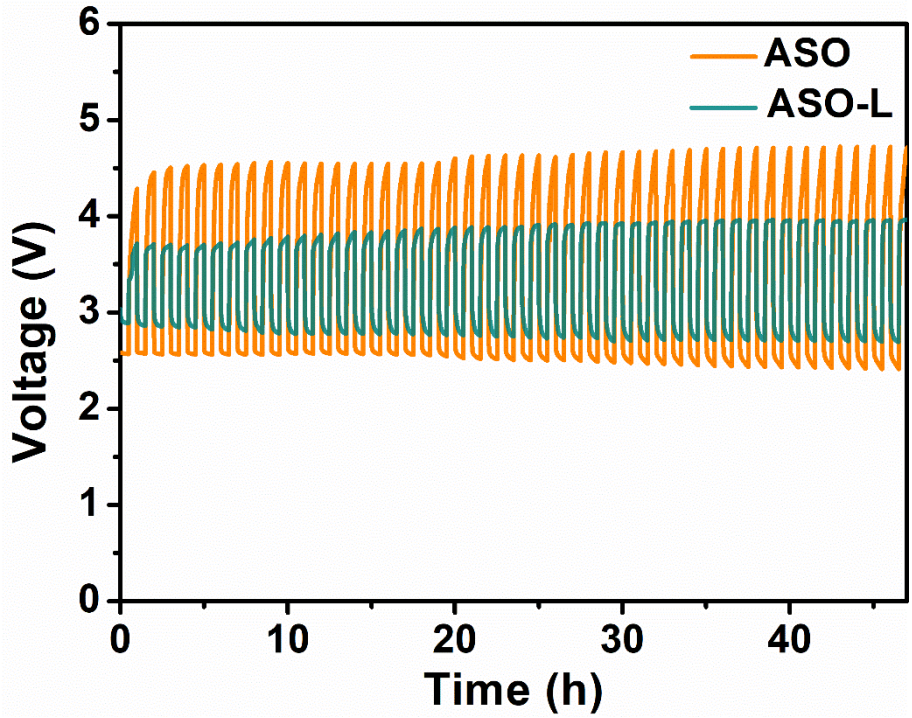


**Figure S9.** Voltage profiles of typical Li–$O_2$ batteries cycled with the current density of 200 mA $g^{-1}$ with and without illumination.

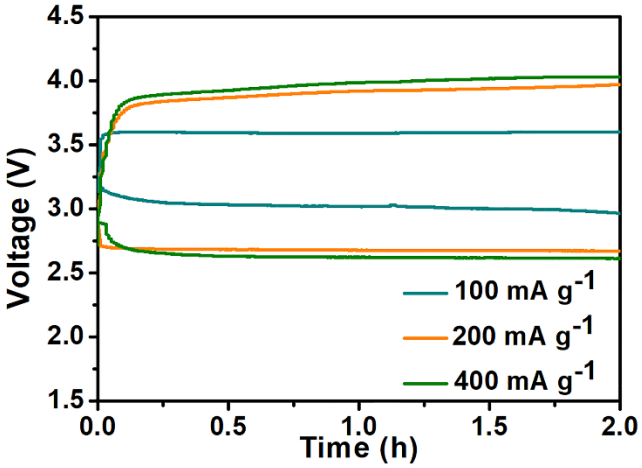


**Figure S10.** Galvanostatic charge–discharge profiles of the Li–$O_2$ batteries at different current densities with illumination.

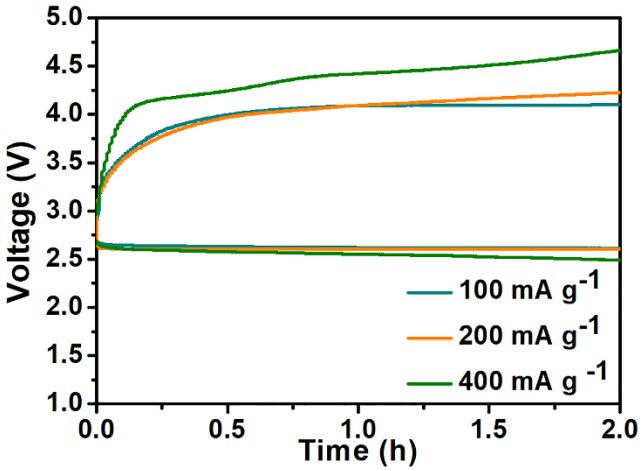


**Figure S11.** Galvanostatic charge–discharge profiles of the Li–$O_2$ batteries at different current densities without illumination.

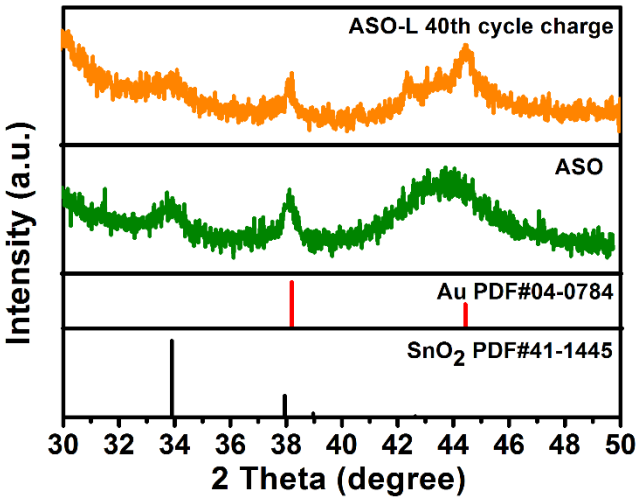


**Figure S12.** The XRD pattern of ASO after 40 cycles.

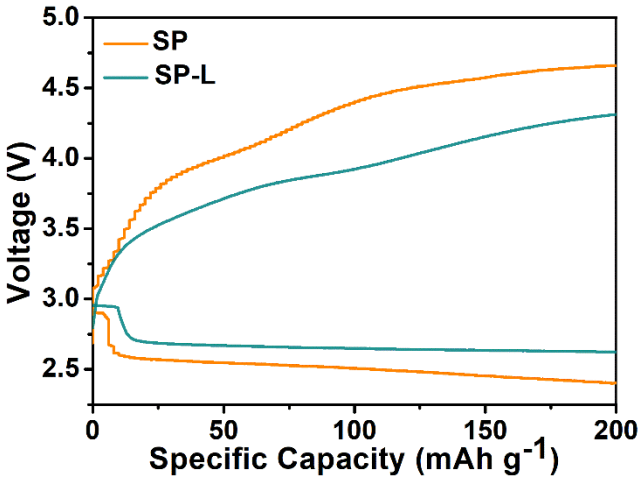


**Figure S13.** The charge–discharge profiles of SP at 100 mA $g^{-1}$ with and without illumination in Li–$O_2$ batteries.