Supporting Information

Promoting Oxygen Electrode Reaction Kinetics in Photo-Assisted Li-O_2 Batteries Through Heterostructure Design and Built-In Electric Field Construction

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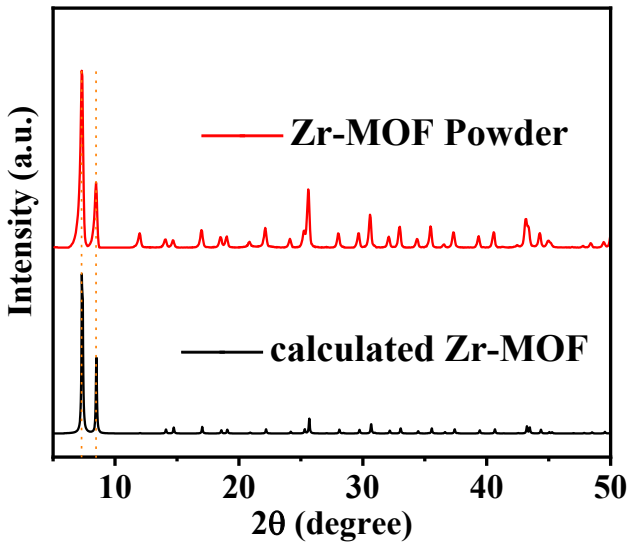

Figure S1. XRD spectra of Simulated Zr-MOF and Zr-MOF powder.

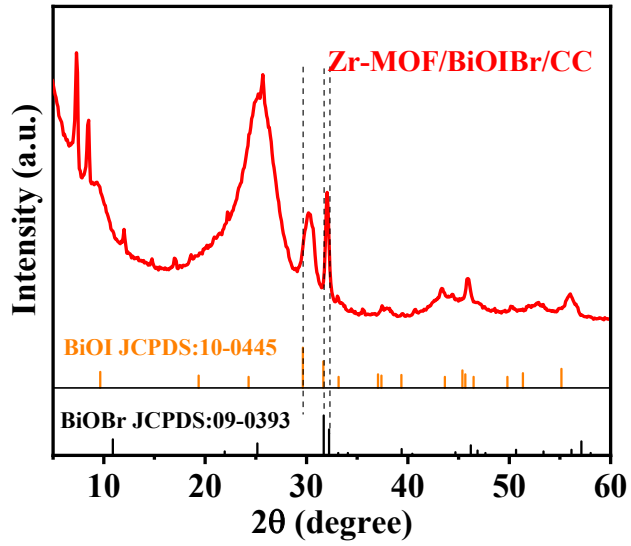

Figure S2. XRD pattern of Zr-MOF/BiOBr/CC.

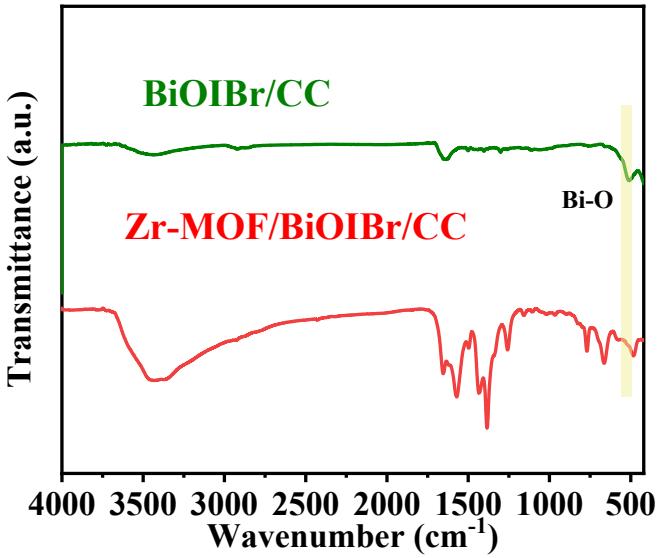

Figure S3. FTIR spectra of BiOIBr/CC and Zr-MOF/BiOIBr/CC.

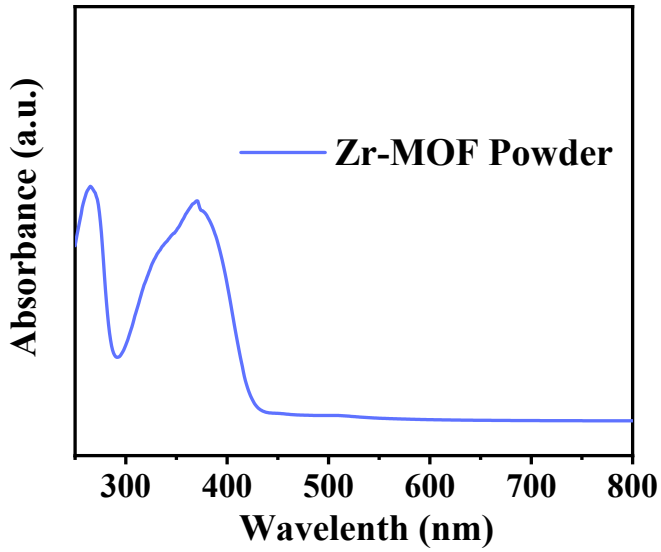

Figure S4. UV-vis spectrum of Zr-MOF powder.

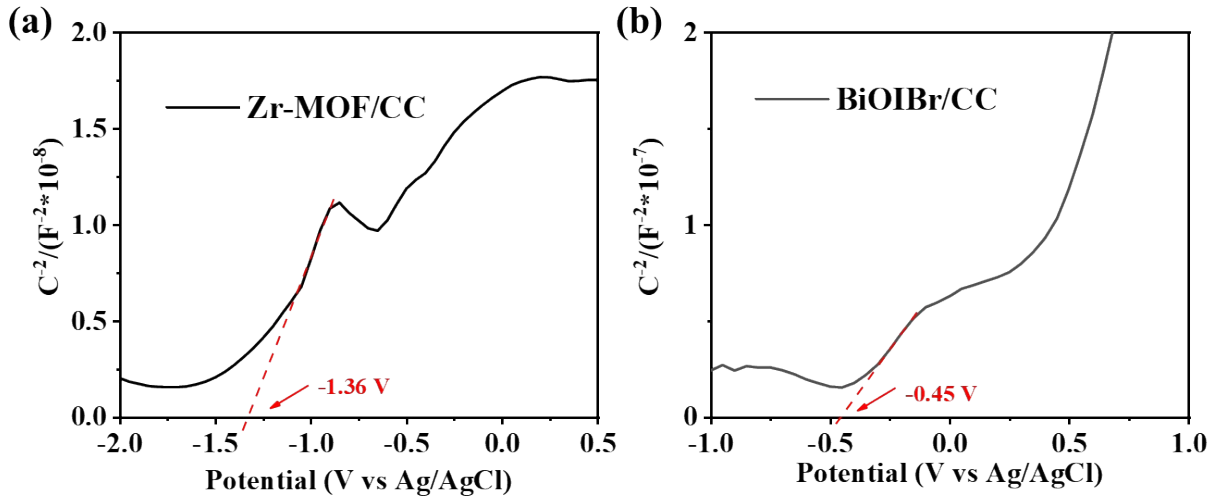

Figure S5. Mott-Schottky plots of (a) Zr-MOF/CC and (b) BiOIBr/CC.

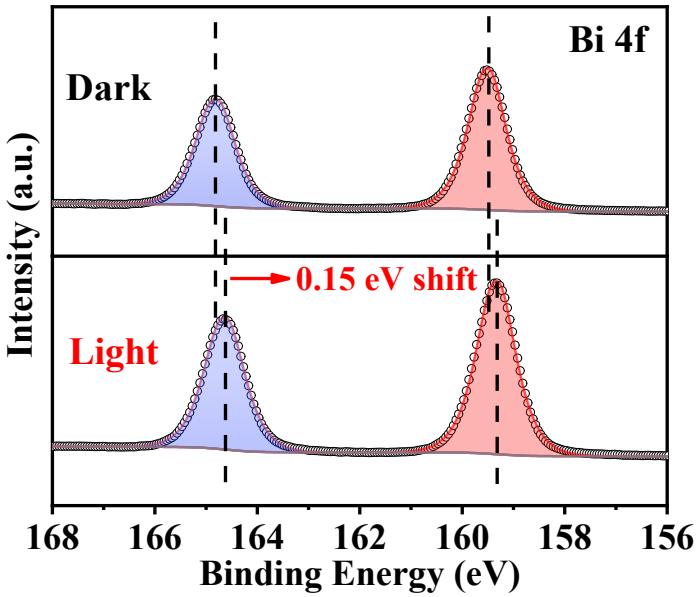

Figure S6. In-situ XPS spectra under dark and irradiation conditions: Bi 4f.

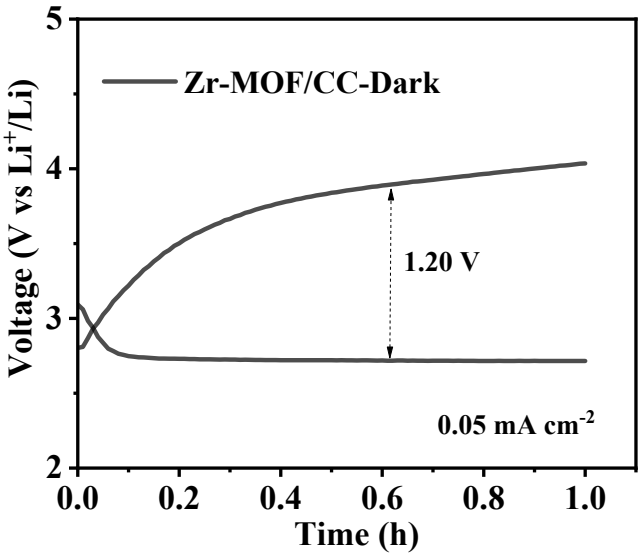

Figure S7. Constant current charge/discharge curve of Zr-MOF/CC cathode without illumination.

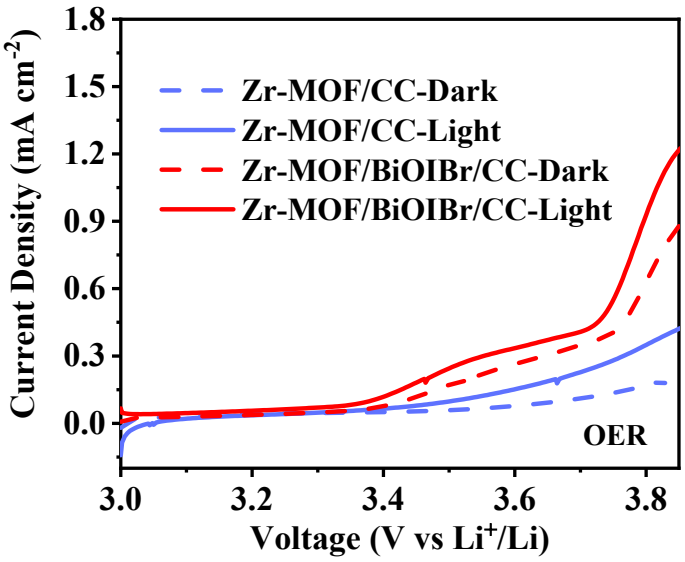

Figure S8. LSV curves during OER process.

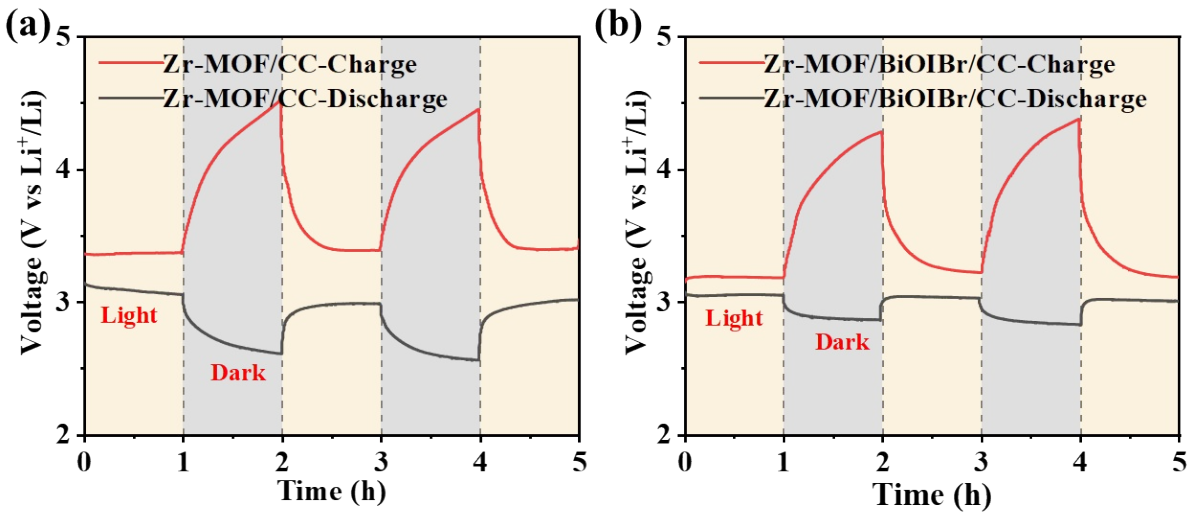

Figure S9. The charge and discharge behavior of Zr-MOF/CC and Zr-MOF/BiOIBr/CC cathodes during intermittent light on/off.

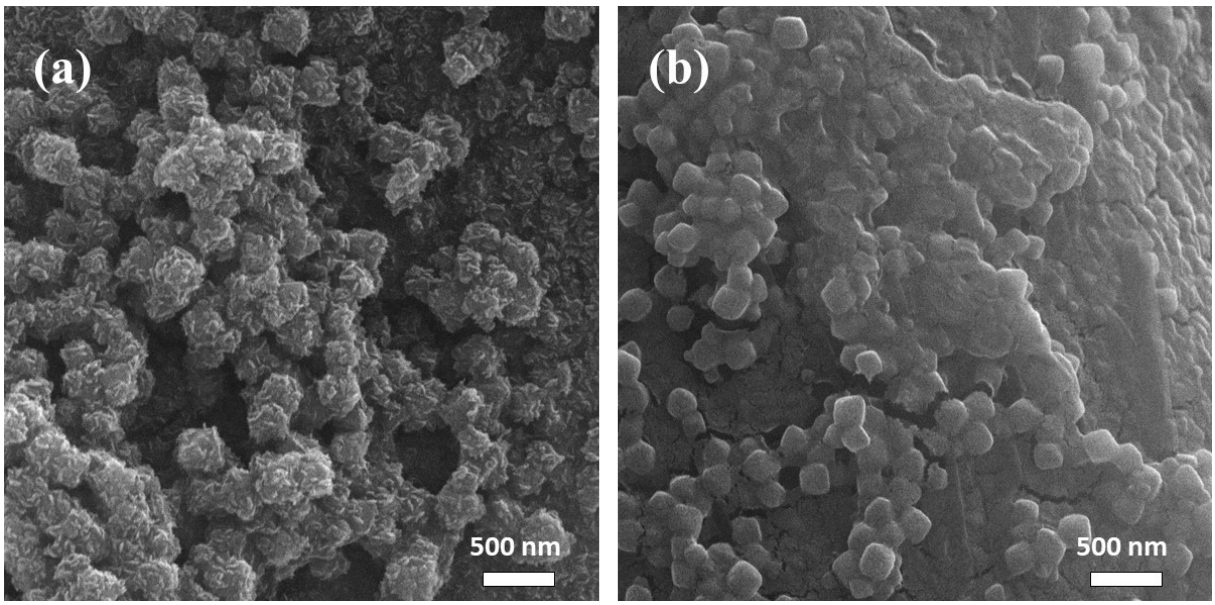

Figure S10. (a) SEM image of Zr-MOF/CC cathode after discharge without illumination. (b) SEM image of Zr-MOF/CC cathode after discharge with illumination.

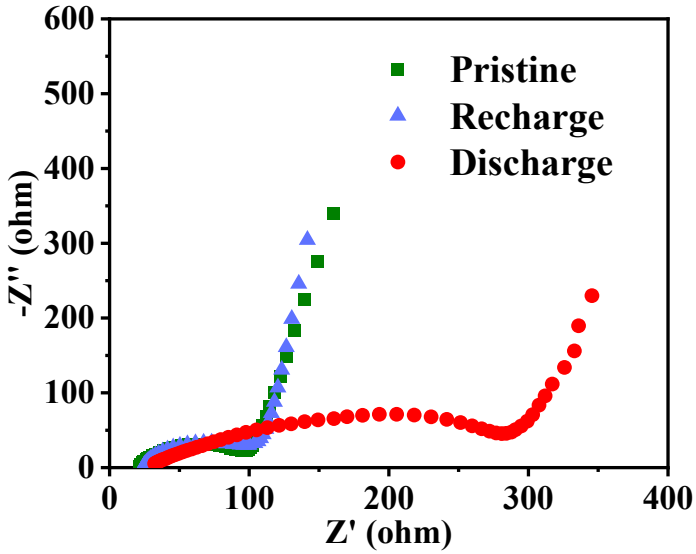

Figure S11. EIS spectra of Zr-MOF/BiOIBr/CC cathodes in various states.

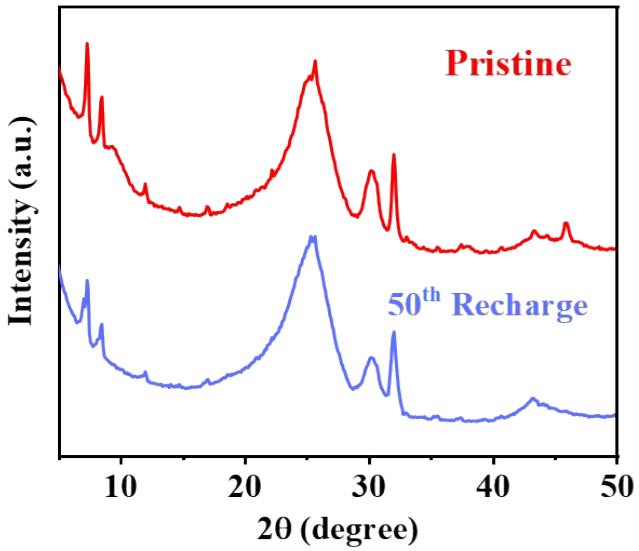

Figure S12. XRD spectra of Zr-MOF/BiOBr/CC cathode after 50 cycles.

Table S1 Comparison of the performance in this study with some previously reported work in a photo-assisted aprotic Li-O_2 system.

Cathode	Current density (mA cm^{-2})	Overpotential (V)	Energy efficiency (%)	Cycle number (n)	Ref.
Zr-MOF/BiOIBr/CC	**0.05**	**0.15**	**95**	**255**	**This work**
b-TiO_2	0.05	0.76	80	90	Nano Energy., **2022,** 98, 107248.
Ce-UiO-66	0.09	0.50	86	160	Adv. Mater. Interfaces., **2023**, 10, 2300074.
Co-TABQ	0.10	0.2	94	50	J. Am. Chem. Soc., **2021**, 143, 1941–1947.
2-WO_3	0.04	0.41	88	56	Energy Environ. Sci., **2023**, 16, 523–534.
$CsPbBr_3$@PCN-333(Fe)	0.01	0.25	92	100	J. Am. Chem. Soc., **2021**, 143, 14253–14260.
TiO_2/Fe_2O_3	0.01	0.19	94	100	Adv. Mater., **2020,** 32, 1907098.
PVSK/CNS	0.01	0.5	85	85	ChemSusChem, **2022**, 15, e202201473.