Supporting Information

Unraveling the Interfacial Degradation Mechanism of Metal Oxide Electrocatalyst/Gas Diffusion Layer in Zn-Air Batteries Through FIB-SEM Analysis

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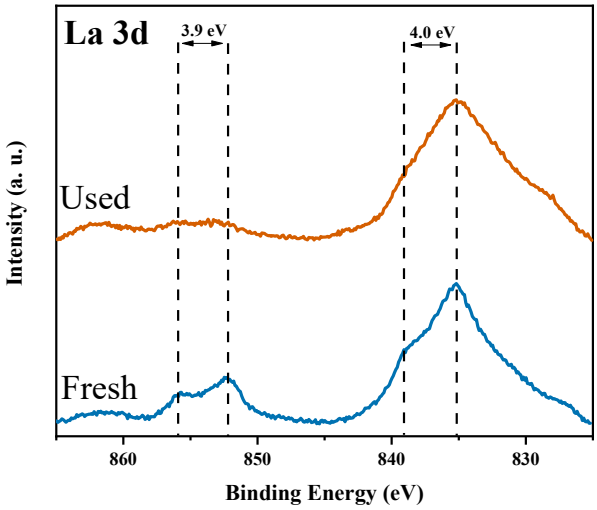

Figure S1. La 3d XPS spectra of the Used and Fresh samples.

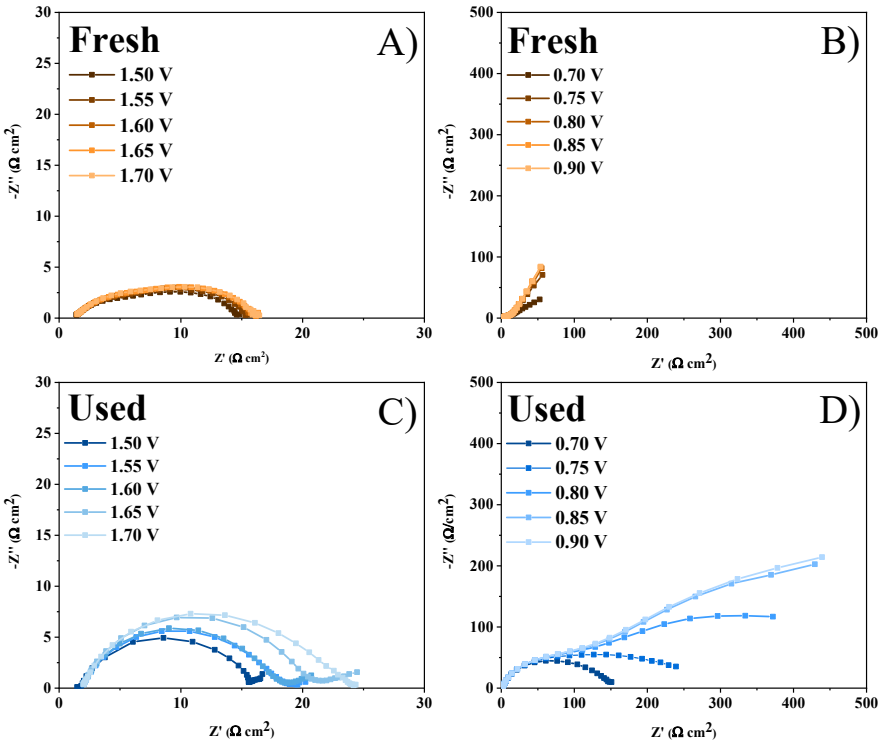

Figure S2. EIS plots at different potentials (V) vs. reversible hydrogen electrode (RHE) near the E_{ONSET} for Fresh and Used samples in A) and C) OER and B) and D) ORR.

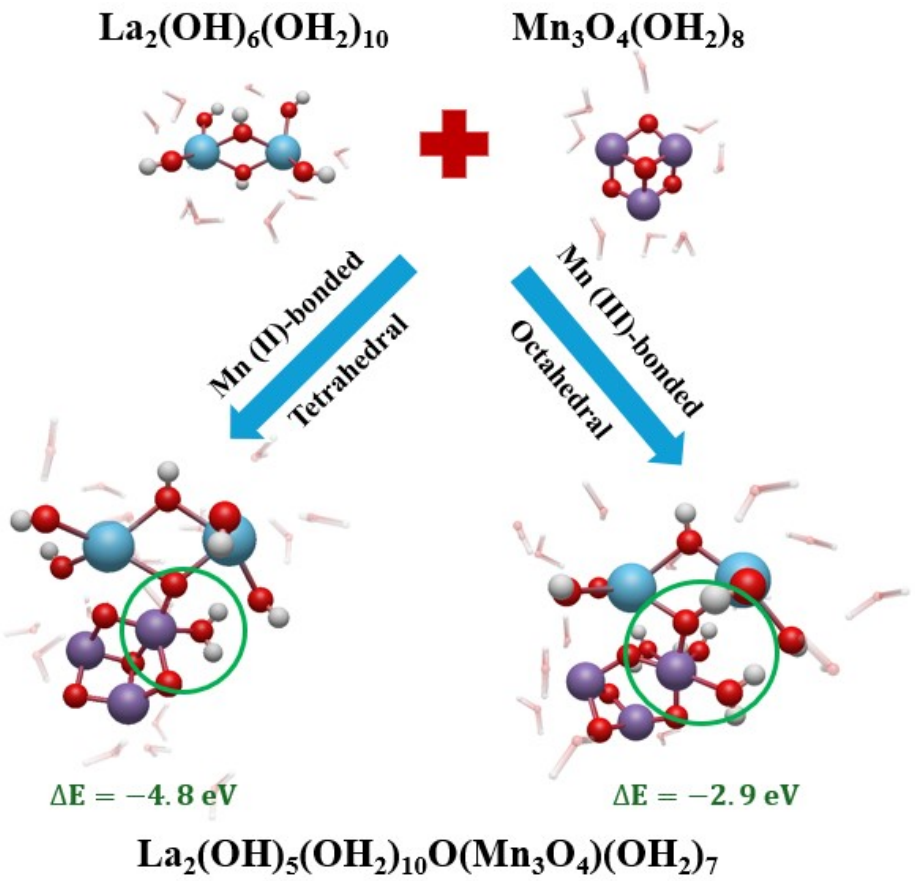

Figure S3. Clusters optimized by DFT calculations were used to study the interaction between $La_2(OH)_6(OH)_{10}$ and $Mn_3O_4(OH_2)_8$, considering the coordination environment of Mn_3O_4. The stabilization energy indicates a greater tendency for interaction through the tetrahedral coordination of Mn. The color code is as follows: La (blue), Mn (purple), O (red), H (white).

Table S1. Partial charge for metals by Mulliken Population Analysis obtained by DFT calculations. The atom designated as Mn1 is the atom that bonds to the La- and Zn-based clusters, where applicable.

	Mulliken Population Analysis (Charge)							
Base compound	**Mn_3O_4**	**$La(OH)_3$**			**$La(CH_3CO_2)$**	**$Zn(CH_3CO_2)_4$**	**Zn-Mn cluster**	
Element	**Not bonded**	**Not bonded**	**Mn(II)-bonded**	**Mn(III)-bonded**	**Not bonded**	**Not bonded**	**Mn(II)-bonded**	**Mn(III)-bonded**
La1	-	1.58	1.71	1.74	1.69	-	-	-
La2	-	1.7	1.86	1.79	1.78	-	-	-
Mn1	0.85	-	1.15	1.12	-	-	1.14	1.07
Mn2	0.94	-	1.05	1.05	-	-	0.91	1.11
Mn3	0.87	-	1.01	0.92	-	-	1.00	1.05
Zn1	-	-	-	-	-	0.75	0.83	0.87
Zn2	-	-	-	-	-	0.82	0.78	0.82