Supplementary Materials

High-Efficiency Oxygen Reduction to Hydrogen Peroxide Catalyzed by Oxidized Mo_2TiC_2 MXene

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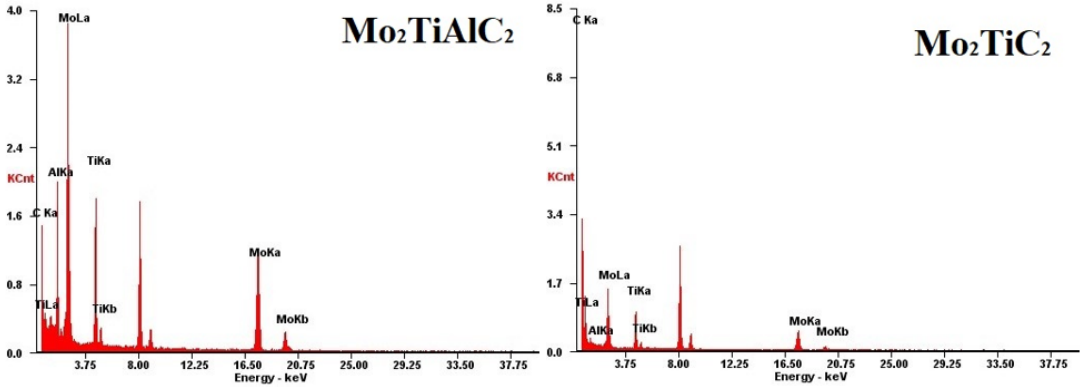

Figure S1. TEM-EDAX patterns of Mo_2TiC_2 MXene and O-Mo_2TiAlC_2.

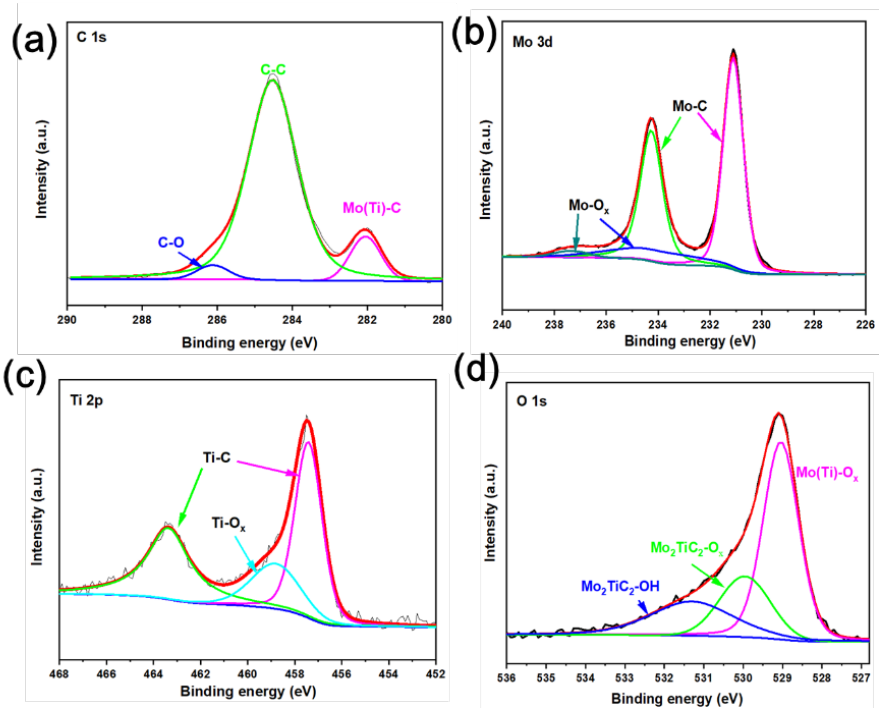

Figure S2. High-resolution XPS spectra of Mo_2TiC_2 MXene (a) C 1s, (b) Mo 3d, (c) Ti 2p and (d) O 1s.

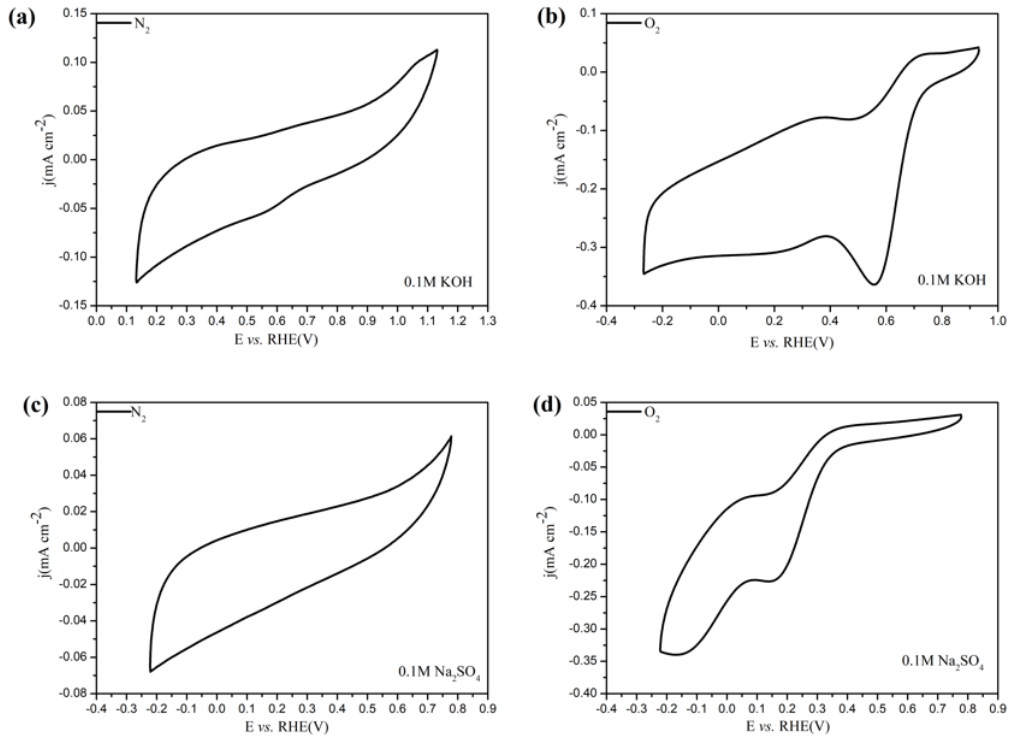

Figure S3. CV curves of O-Mo_2TiC_2 in two different electrolytes, with a scan rate of 50 mV s^{-1}. 0.1 M KOH solution: (a) saturated with N_2, (b) saturated with O_2; 0.1 M Na_2SO_4 solution: (c) N_2 saturated, (d) O_2 saturated.

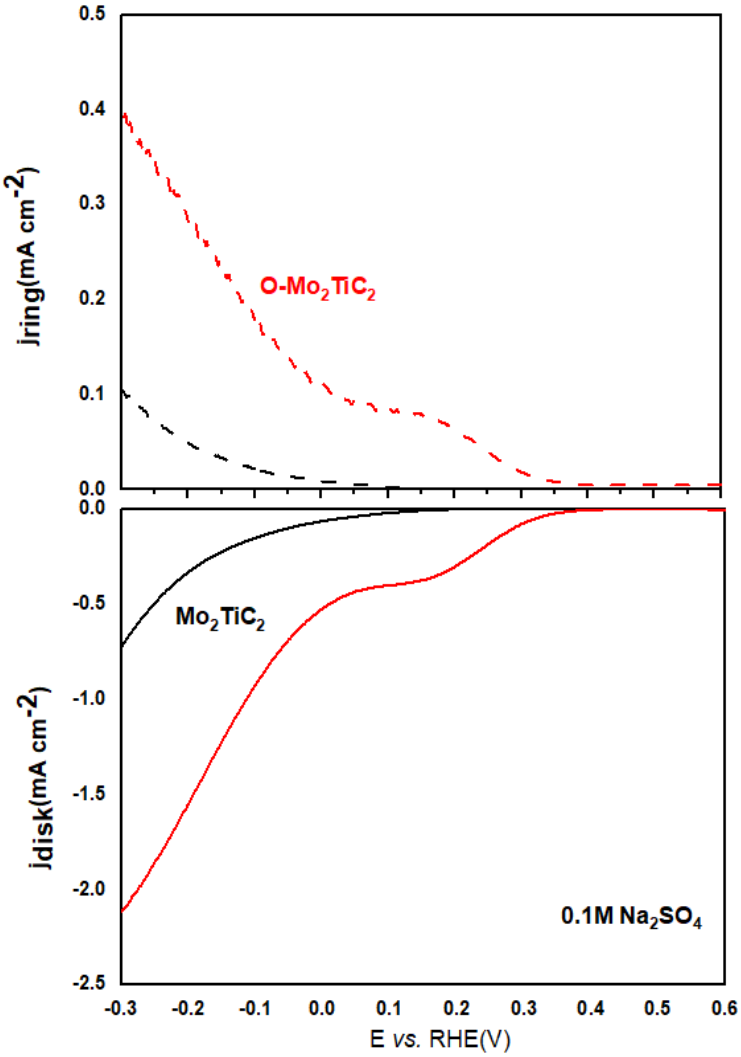

Figure S4. Polarization curves (solid line) and H_2O_2 detection current densities (dashed lines) at the ring electrode for Mo_2TiC_2 MXene and O-Mo_2TiC_2t at 1600 rpm in 0.1 M Na_2SO_4 solution.

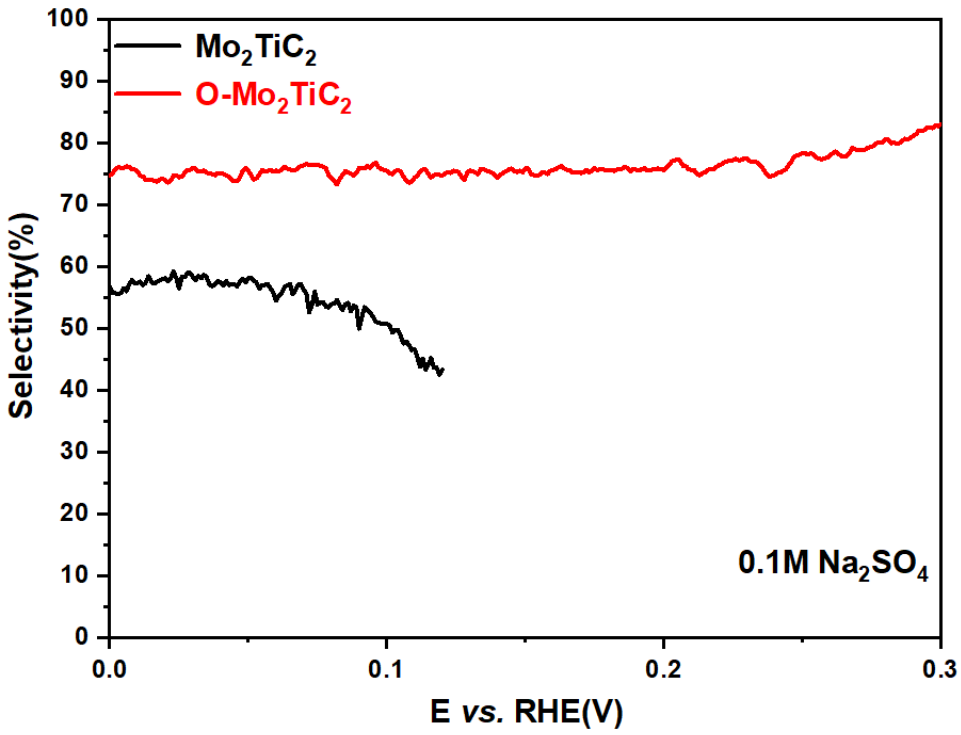

Figure S5. H_2O_2 selectivity of Mo_2TiC_2 MXene and O-Mo_2TiC_2 in 0.1 M Na_2SO_4 solution.

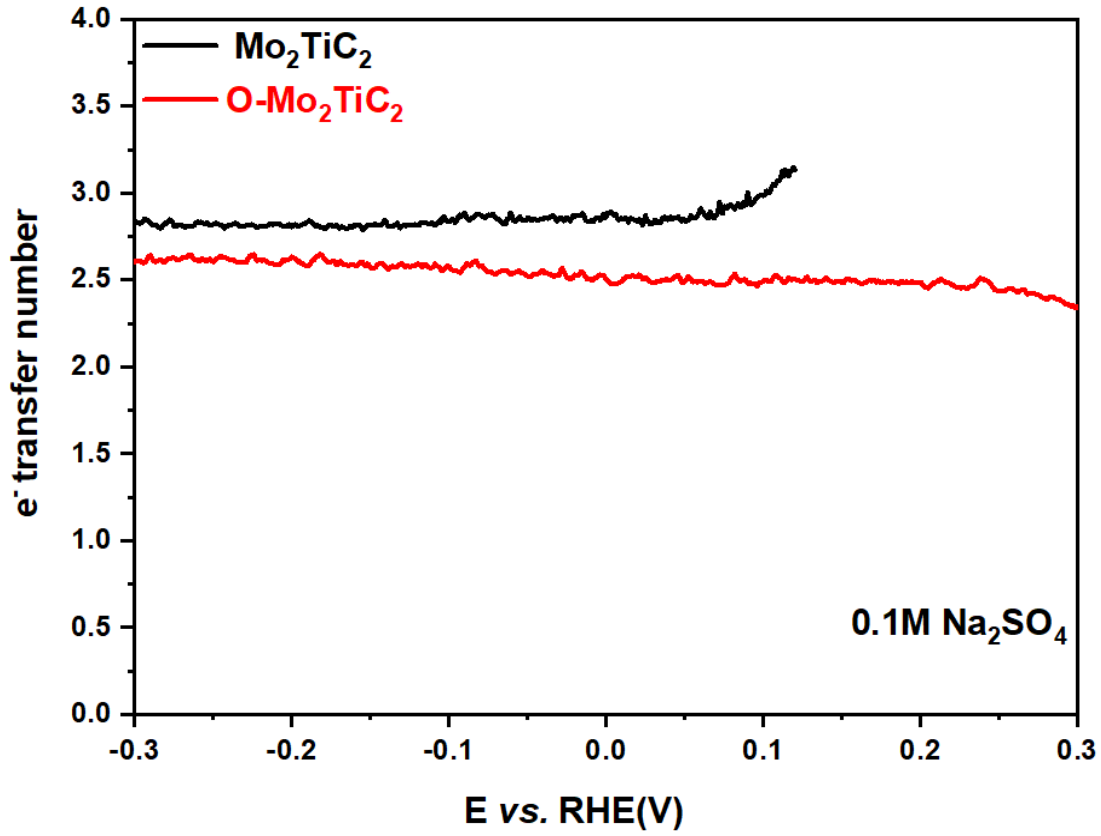

Figure S6. Transfer electron number of Mo_2TiC_2 MXene and O-Mo_2TiC_2 in 0.1 M Na_2SO_4 solution.

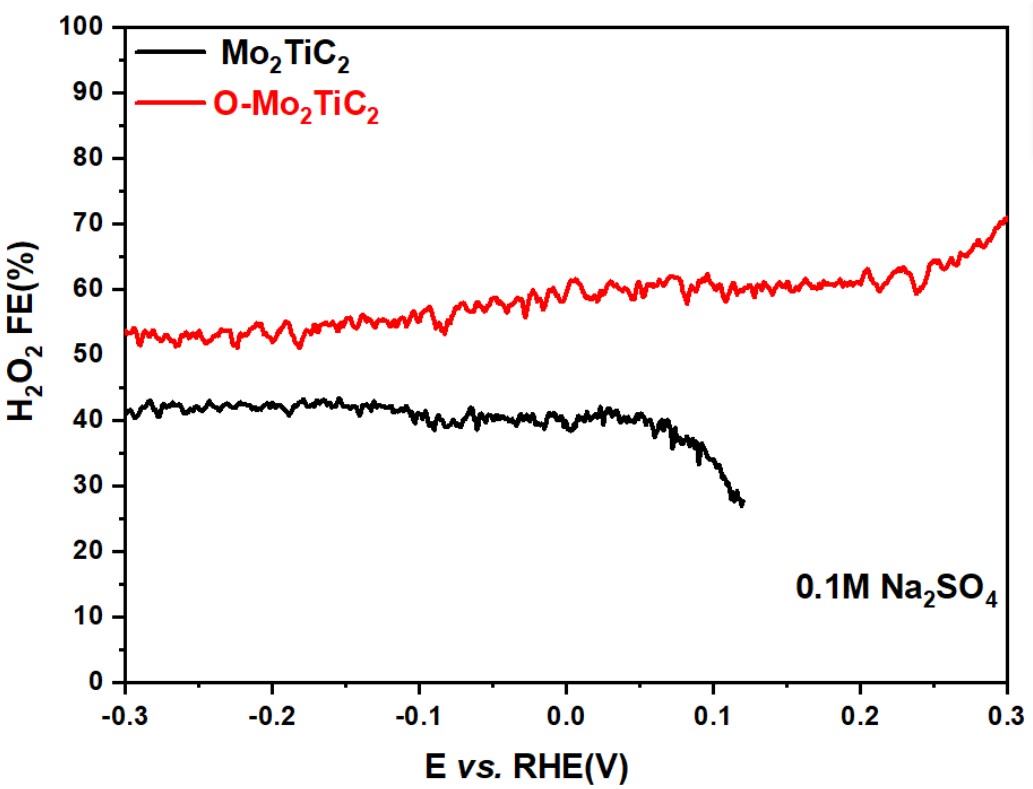

Figure S7. Faradaic efficiency of Mo_2TiC_2 MXene and O-Mo_2TiC_2 in 0.1 M Na_2SO_4 solution.

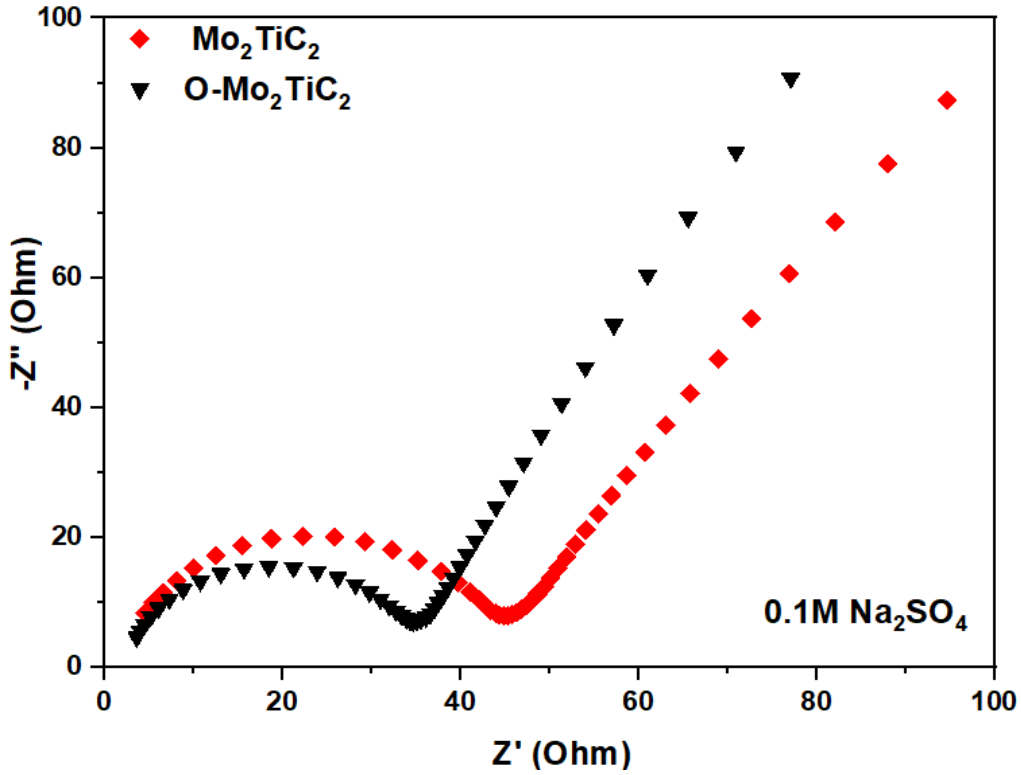

Figure S8. Nyquist plots of catalysts Mo_2TiC_2 MXene and O-Mo_2TiC_2 in 0.1 M Na_2SO_4 solution.

Table S1 EIS data obtained by fitting the experimental data, R_1 is the simulated internal resistance, R_2 is the charge transfer resistance

Electrocatalysts	R_1 (Ω)	R_2 (Ω)
Mo_2TiC_2 MXene (0.1 M KOH)	2.59	50.05
O-Mo_2TiC_2 (0.1 M KOH)	2.137	33.5
Mo_2TiC_2 MXene (0.1 M Na_2SO_4)	2.19	38.79
O-Mo_2TiC_2 (0.1 M Na_2SO_4)	1.845	32.03

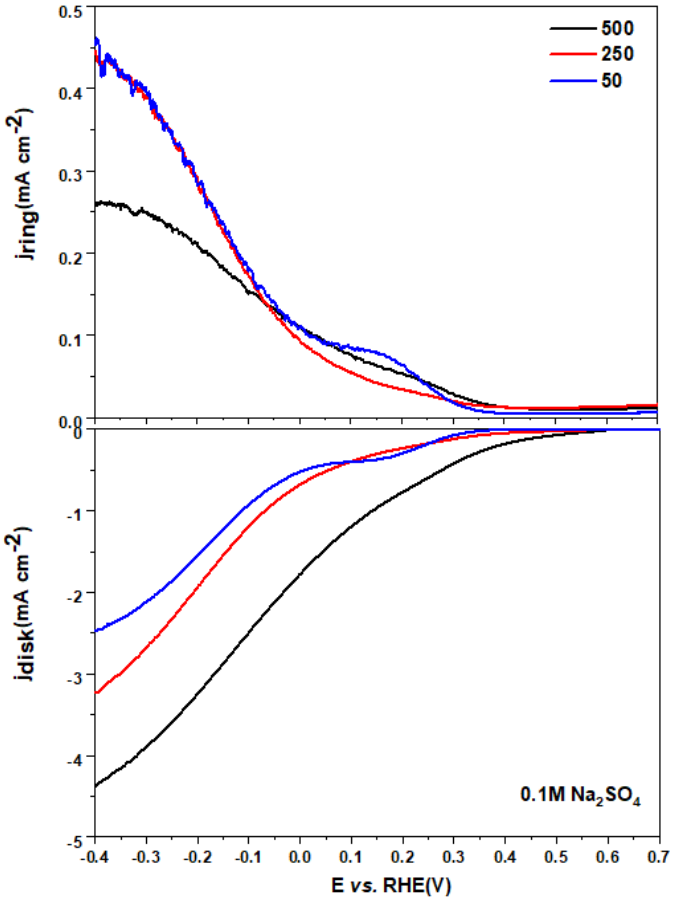

Figure S9. Different loadings of O-Mo_2TiC_2 LSV curves in 0.1 M Na_2SO_4 solution at 1600 rpm.

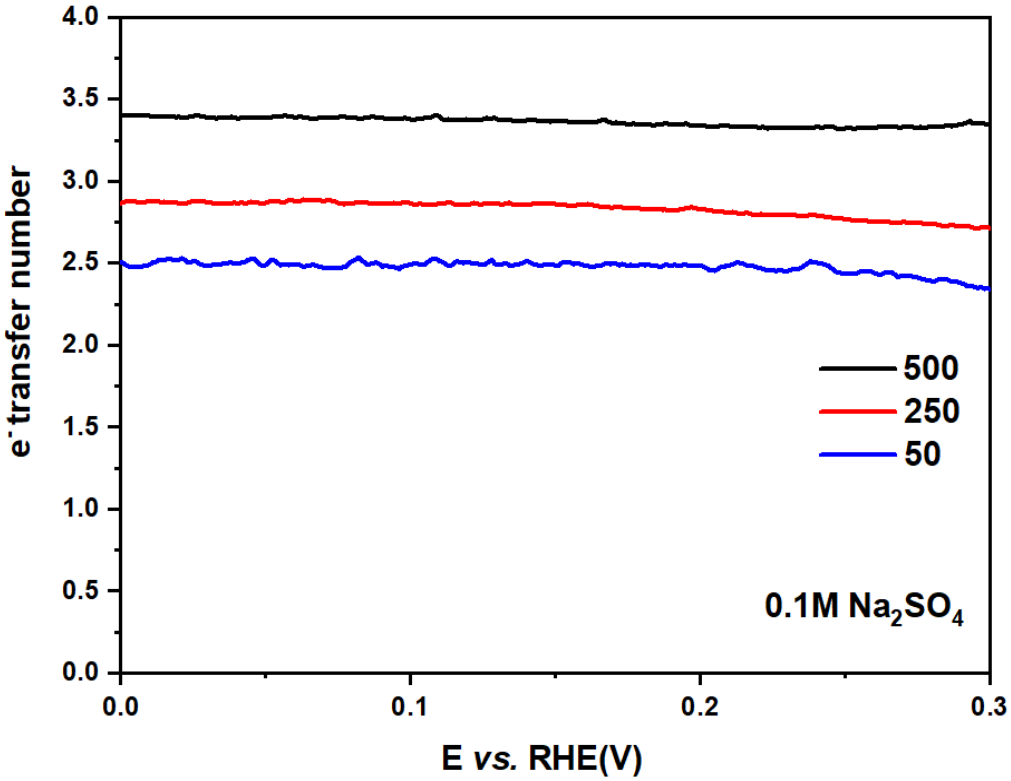

Figure S10. Number of transferred electrons of O-Mo_2TiC_2 with different loadings in 0.1 M Na_2SO_4 solution.

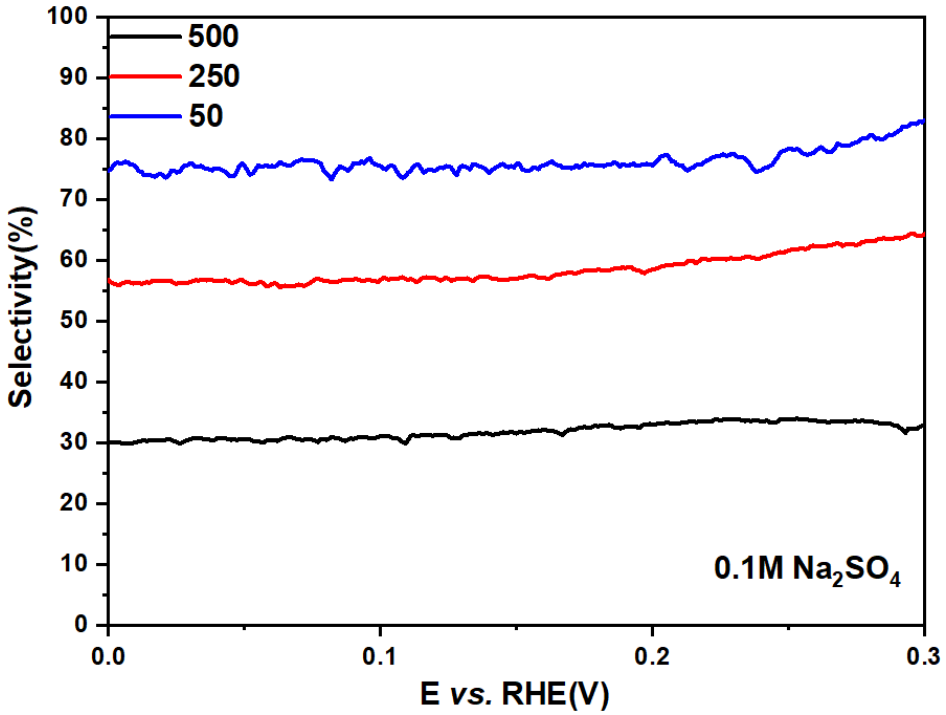

Figure S11. H_2O_2 selectivity of O-Mo_2TiC_2 with different loadings in 0.1 M Na_2SO_4 solution.

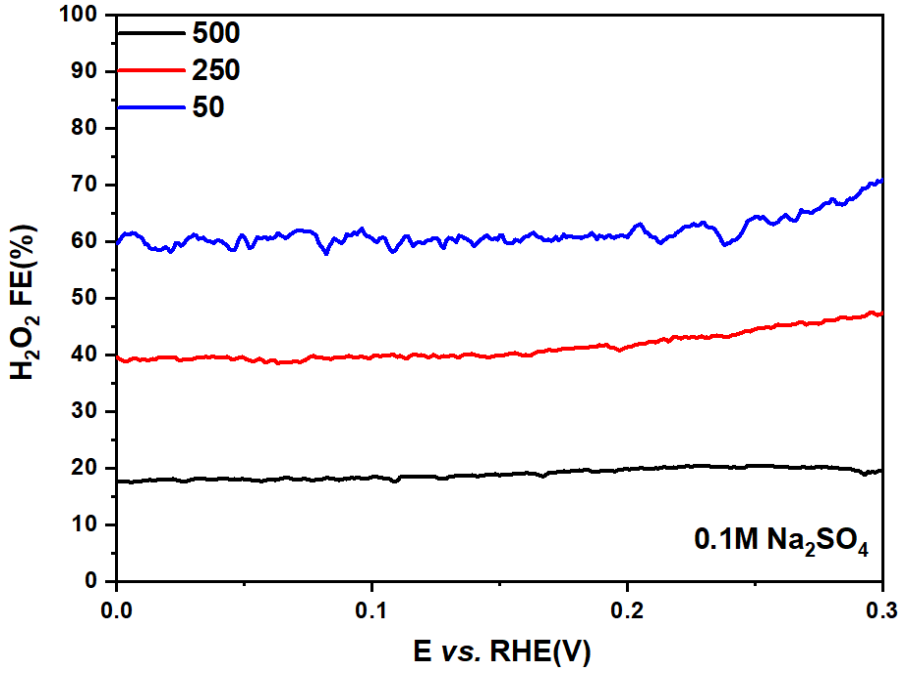

Figure S12. Faradaic efficiency of O-Mo_2TiC_2 with different loadings in 0.1 M Na_2SO_4 solution.

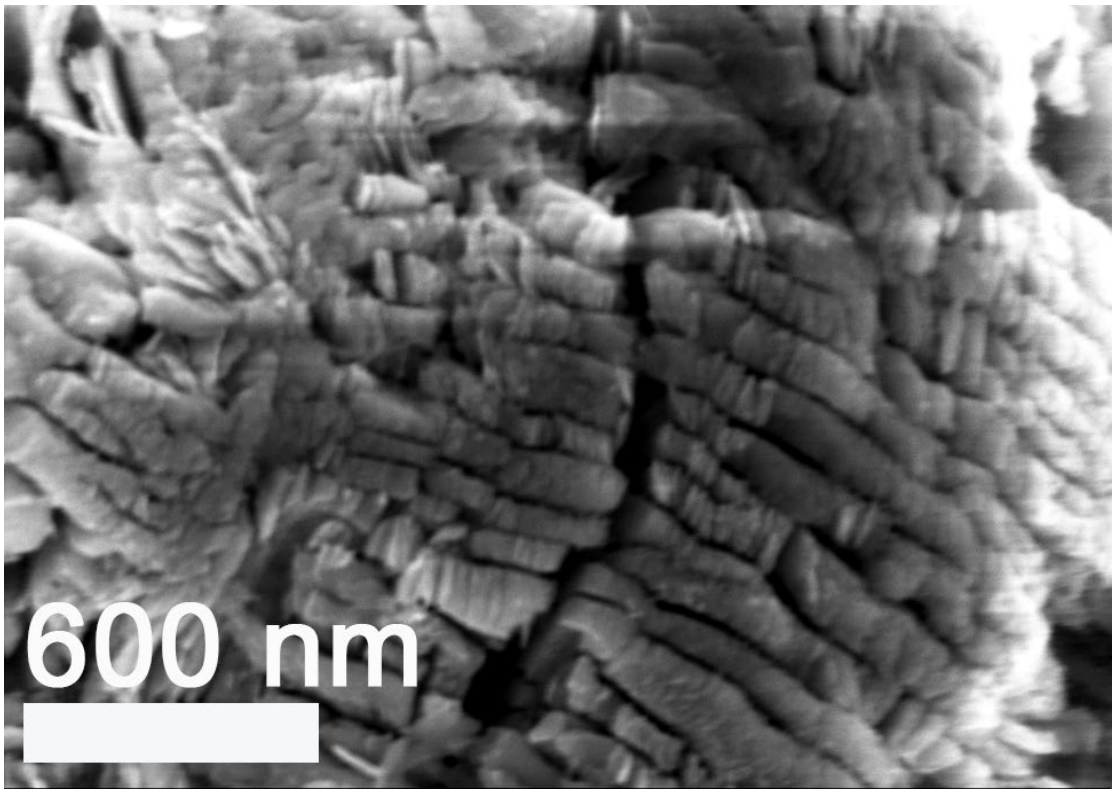

Figure S13. SEM image of O-Mo_2TiC_2 with thicker thickness.

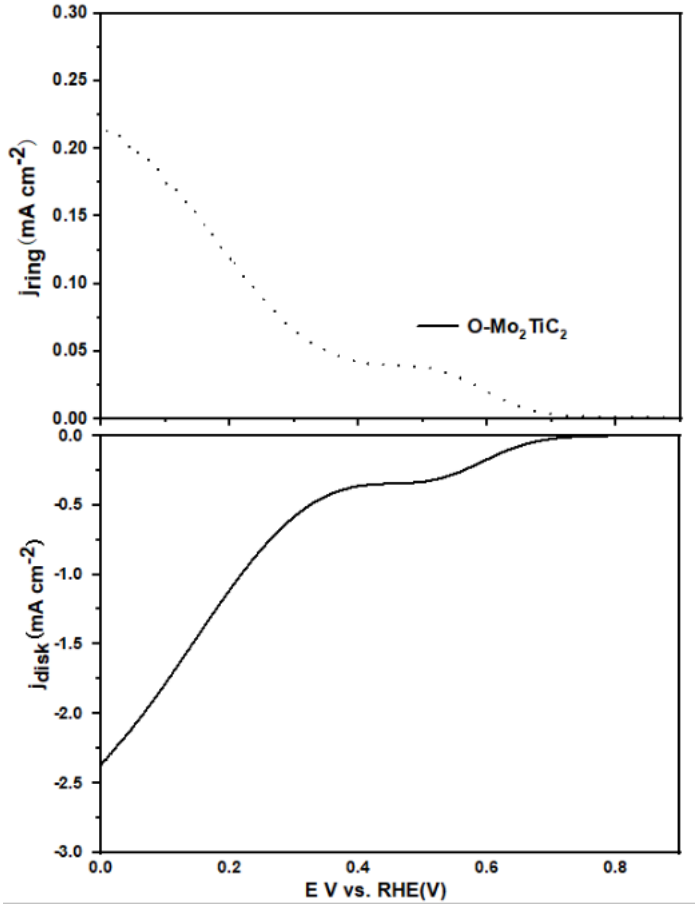

Figure S14. LSV curves of O-Mo_2TiC_2 with thicker thickness in 0.1M KOH.

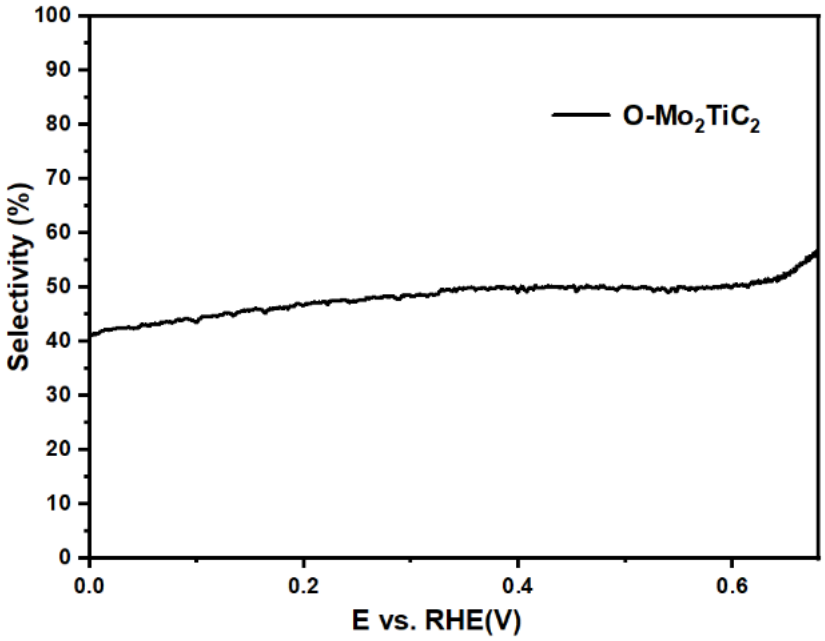

Figure S15. H_2O_2 selectivity of O-Mo_2TiC_2 with thicker thickness in 0.1M KOH.

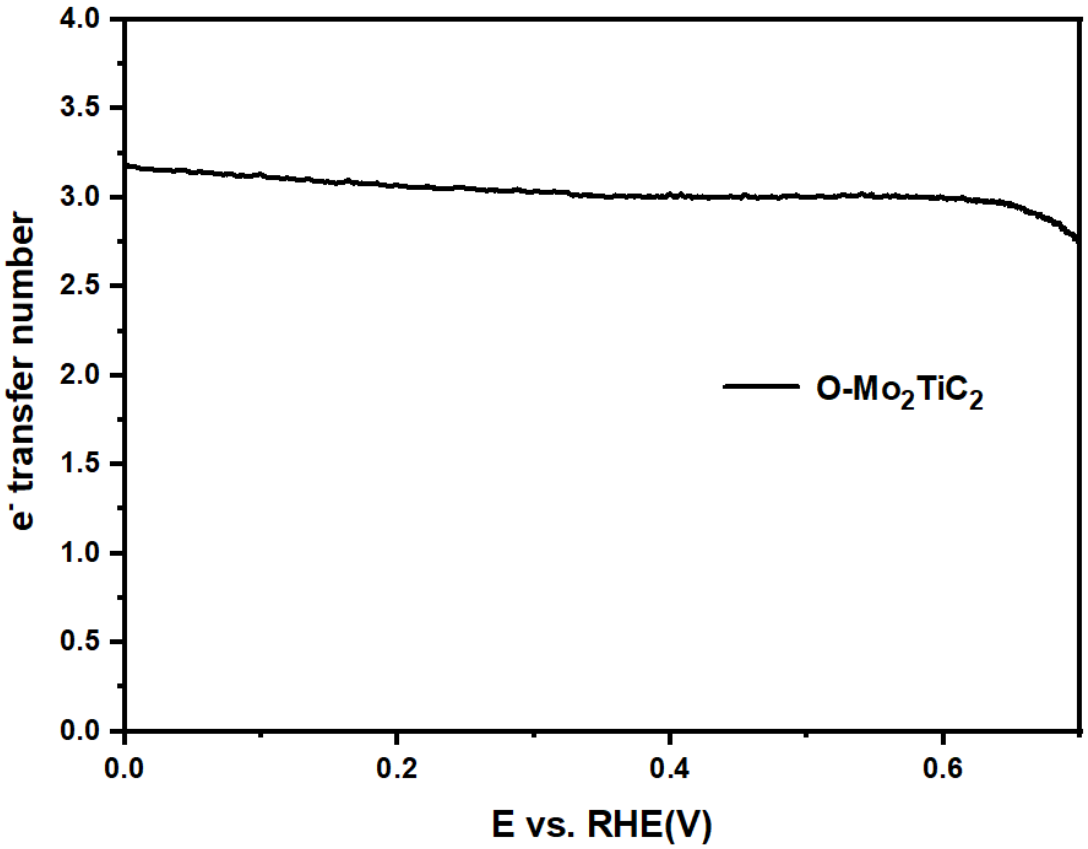

Figure S16. Number of transferred electrons of O-Mo_2TiC_2 with thicker thickness in 0.1M KOH.

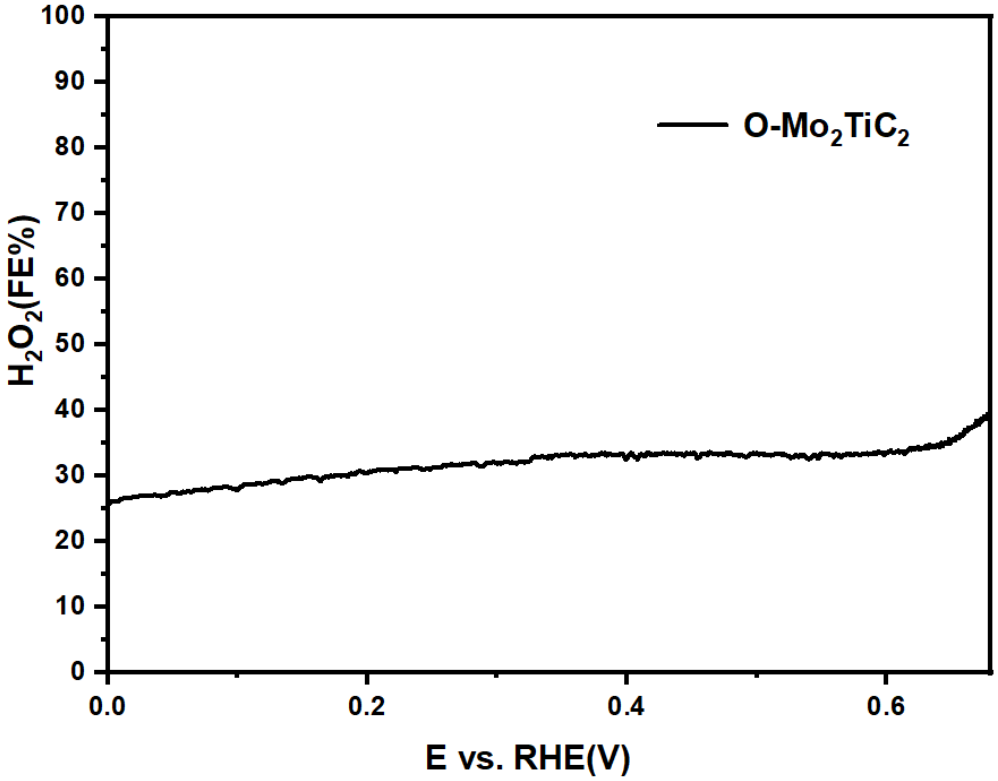

Figure S17. Faradaic efficiency of O-Mo_2TiC_2 with thicker thickness in 0.1M KOH.

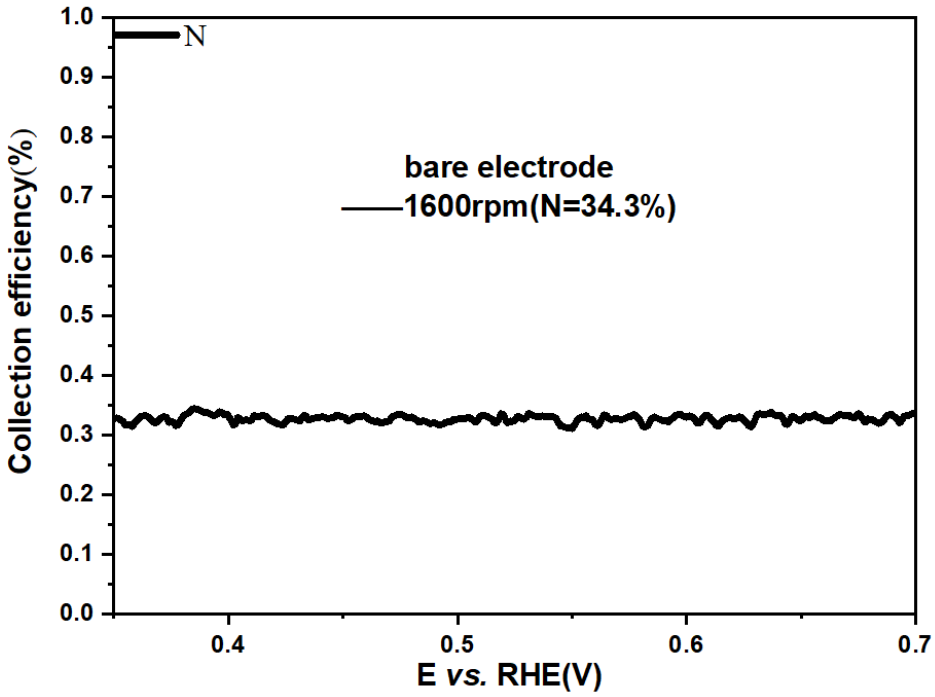

Figure S18. Collection efficiency of pure RRDE electrodes: N=34.3%.