Electronic Supplementary Information

Electrochemical Synthesis of a Nanohybrid Film Consisting of Stacked Graphene Sheets and Manganese Oxide as Oxygen Evolution Reaction Catalyst

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**Fig. S1** EDS mapping of C (red), Mn (yellow), and O (purple) elements in the cross section of the electrodeposited film with PDDA-GR⁺.
Fig. S2 XRD patterns of graphite, GO, and PDDA-GR\(^+\) in a powder form and that of the electrodeposited film with PDDA-GR\(^+\).

Fig. S3 Potential-time curves obtained for the electrolysis of aqueous Mn\(^{2+}\) ions in the presence of K\(^+\), PDDA\(^+\), and PDDA-GR\(^+\) at a constant anodic current density of 0.06 mA cm\(^{-2}\).
We conducted another stability test using a HR-103A rotating disk electrode system (Hokuto Denko). MnOₓ/GR film was loaded on a glassy carbon disk electrode (0.20 cm²) by the similar procedure described in the main text. The modified electrode was subjected to potential cycling for 1,000 cycles between 1.2 and 2.1 V at a scan rate of 100 mV s⁻¹ in 0.1 M KOH solution, and the rotating rate was 1600 rpm. The anodic curves at 1st, 500th, and 1,000th cycles are depicted in Fig. S4. Note that the activity of the catalyst film remained unchanged at least 1,000 cycles.”

![Stability test](image)

**Fig. S4** Stability test for MnOₓ/GR film-modified grassy carbon electrode in 0.1 M KOH solution. Anodic curves were recorded at 1st, 500th, and 1000th cycles in the potential cycling at a scan rate of 100 mV s⁻¹ between 1.2 and 2.1 V.