Supporting Information

Proton Exchange Membrane Flow Reactor with Ozone-Treated Gas Diffusion Layers for Production of Pure H_2O_2 in Aqueous and Methanol Solutions

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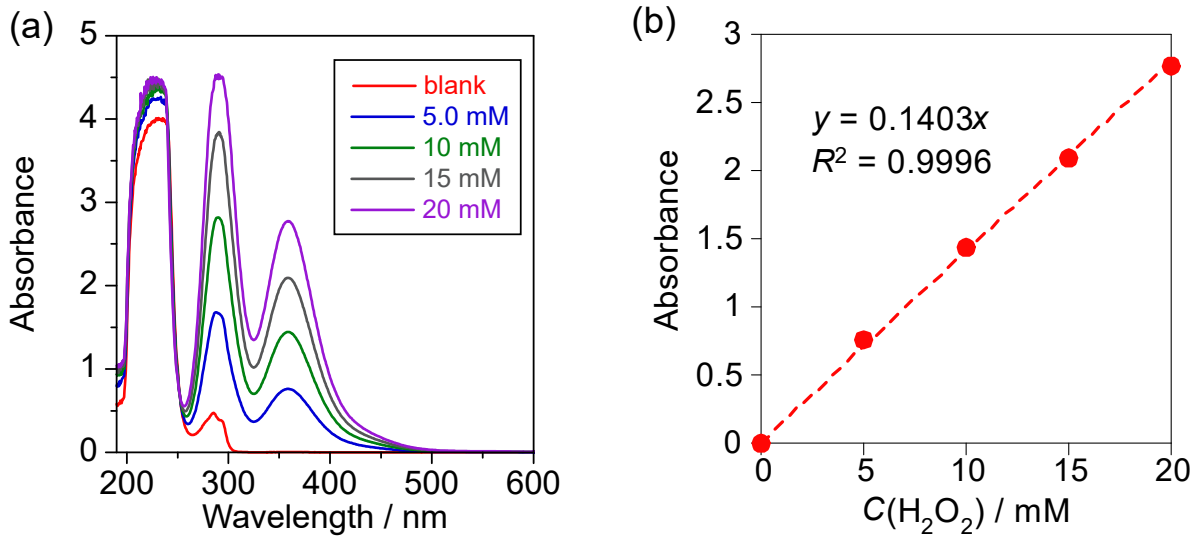

Figure S1. Spectrophotometric determination of H_2O_2 in methanol by potassium iodide method: (a) Absorption spectra and (b) calibration curve at maximum absorbance around 360 nm.

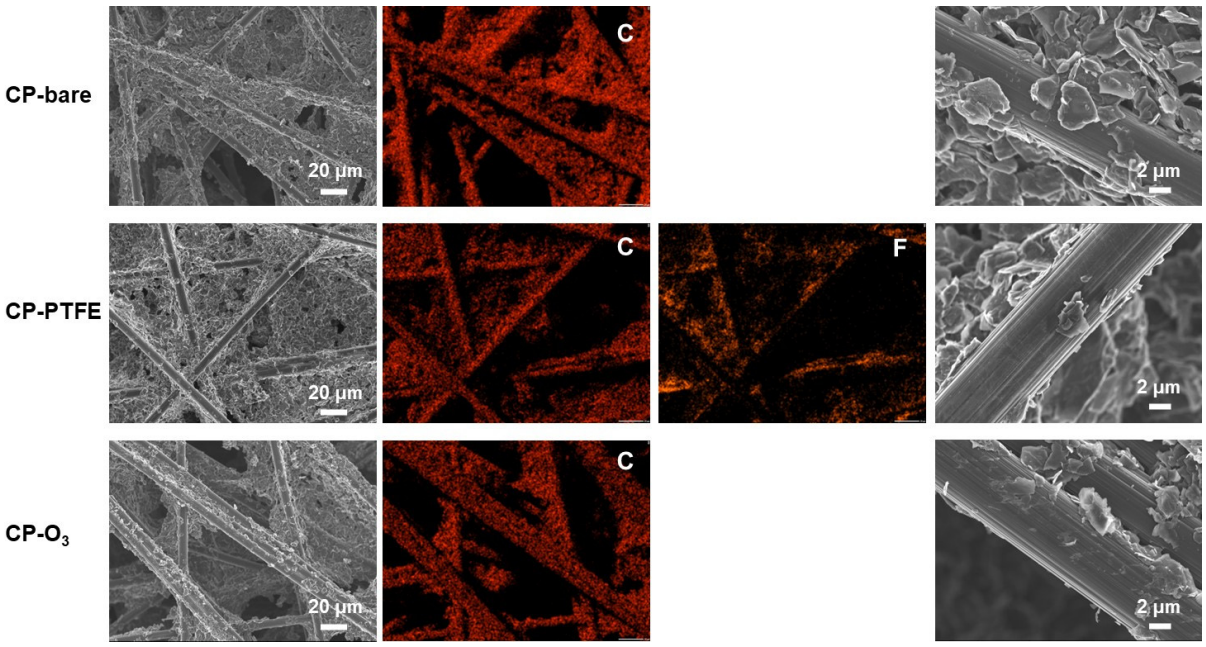

Figure S2. Scanning electron microscope (SEM) images of the surfaces of carbon paper (CP-bare), carbon paper loaded with PTFE (CP-PTFE), and ozone-treated carbon paper (CP-O_3). Energy dispersive X-ray spectroscopy (EDS) mapping of carbon and fluorine for CP-bare and CP-PTFE.

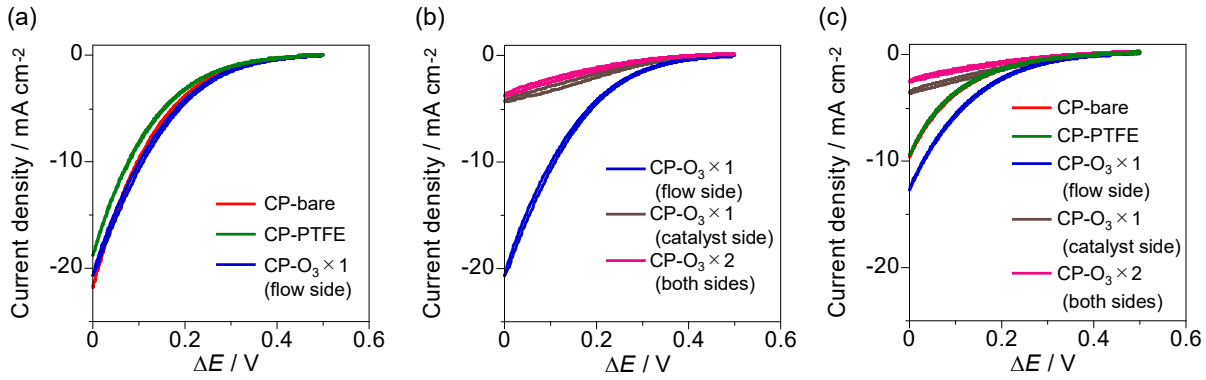

Figure S3. Cyclic voltammograms of the PEMFR with different GDLs: CP-bare, CP-PTFE, and CP-O_3×1 (flow side treated) (a) and various ozone-treated CP-O_3 (b). O_2 and water simultaneously flowed into the cathode at 50 and 0.50 mL min^{-1}, respectively. Cyclic voltammograms after the reactor operation for 4 h at a fuel cell voltage of 0.10 V (c).

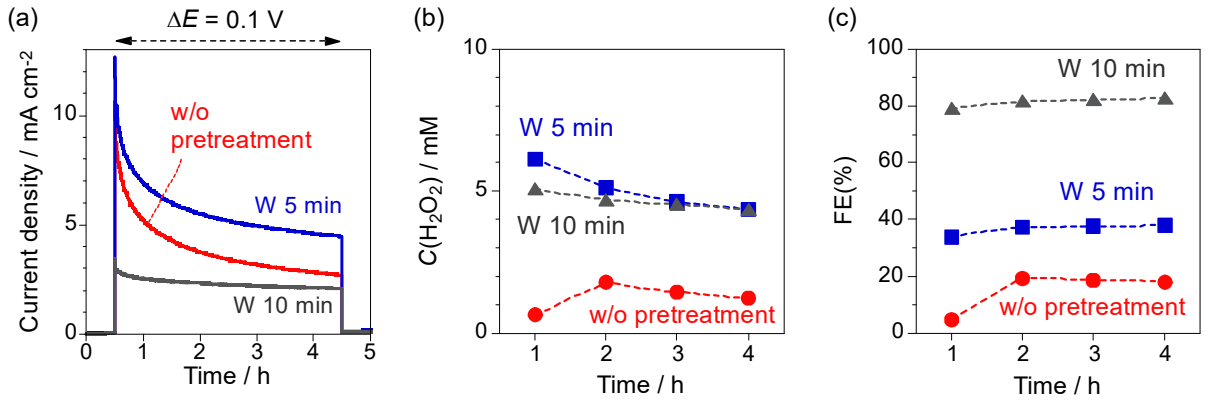

Figure S4. Current-time curves (a), the concentration of produced H_2O_2 (b), and FE for H_2O_2 (c) of the PEMFR with CP-O_3×1 (catalyst side) GDL after different pretreatment with water flow at 5.0 mL min^{-1} for 5 min (W 5 min) and 10 min (W 10 min). The reaction was performed under simultaneous flows of O_2 gas (50 mL min^{-1}) and water (0.50 mL min^{-1}).