Supporting information of

Improvement of catalytic activity of platinum nanoparticles decorated carbon graphene composite on oxygen electroreduction for fuel cells

Halima Begum, Young-Bae Kim*

Department of Mechanical Engineering, Chonnam National University, Gwangju, Republic of Korea. *E-mail address: ybkim@chonnam.ac.kr

**Figure S1:** XPS survey spectra for Pt/C, Pt/C₈:G₂, Pt/C₆:G₄ and Pt/C₁:G₉ samples.

**Figure S2:** C 1s XPS spectra for Pt/C (a), Pt/C₈:G₂ (b), Pt/C₆:G₄ (c) and G-sheets (d) samples.
**Figure S3:** Pt 4f XPS spectra for Pt/C (a), Pt/C₈:G₂ (b) and Pt/C₆:G₄ (c) samples.

**Figure S4:** Curves showing the ORR onset potential for Pt/C₈:G₂ (a), Pt/C₆:G₄ (b), Pt/C (c) and G-sheets (d) electrodes.

**Figure S5:** Comparison of MA and SA for Pt/C, Pt/C₈:G₂ and Pt/C₆:G₄ electrodes at 0.9 V.
Figure S6: LSV curves for ORR at various rpm on G-sheets (a), Pt/C (c), Pt/C8:G2 (e) and Pt/C8:G4 (g) electrodes in an O2-saturated 0.1 M HClO4 electrolyte at a scan rate of 5 mV s⁻¹; the corresponding K-L plots for G-sheets (b), Pt/C (d), Pt/C8:G2 (f) and Pt/C8:G4 (h) at different electrode potentials.
**Figure S7:** Comparison of TEM images of Pt/C (a, c), and Pt/C8:G2 (b, d) before (a, b) and after (c, d) long-term stability test.