

Supplementary Information

Pyridinic and pyrrolic nitrogen-rich ordered mesoporous carbon for efficient oxygen reduction in microbial fuel cells

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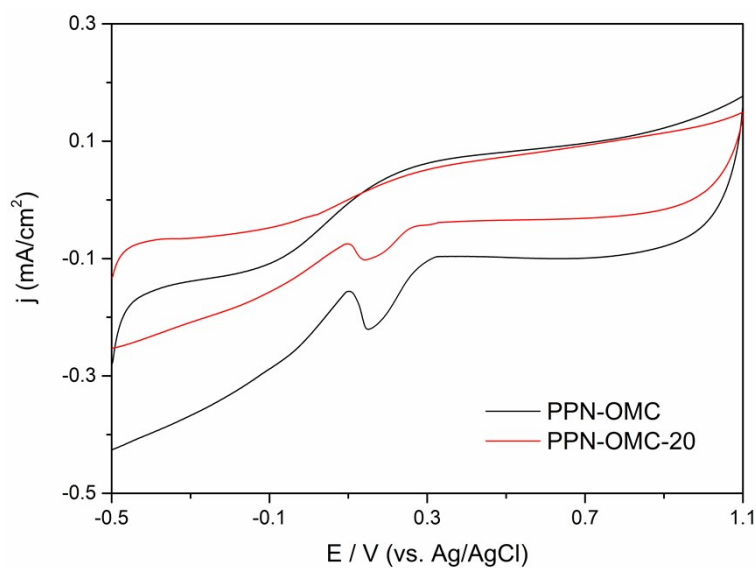


Fig. S1. CVs of ORR on PPN-OMC and PPN-OMC-20 electrodes

Therefore, the nitrogen-doped ordered mesoporous carbon with lower nitrogen content by using the same method except that the amount of urea was reduced to 20 mg (named as PPN-OMC-20). The nitrogen content in PPN-OMC-20 catalyst was measured to be 6.6%, and the content of pyridinic and pyrrolic N was 38.9% and 35.3%. Further comparison of ORR CVs from PPN-OMC/GC and PPN-OMC-20/GC found that the position and intensity of PPN-OMC were greater, demonstrating that PPN-OMC possessed a better electrocatalytic activity for ORR in the neutral electrolyte solution. It is clear that higher nitrogen content in the certain range with high pyridinic and pyrrolic ratios could enhance the electrocatalytic activity of mesoporous carbon materials.

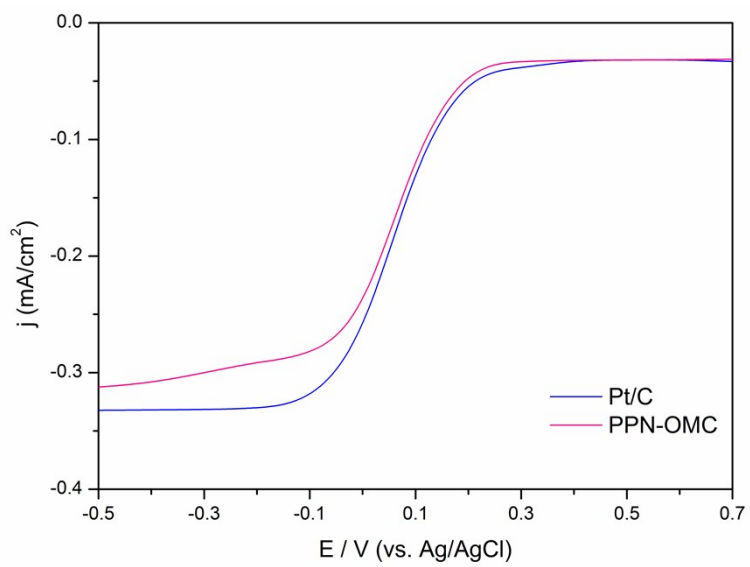


Fig. S2. LSV of PPN-OMC and Pt/C on RDE at 1200 revolutions per minute

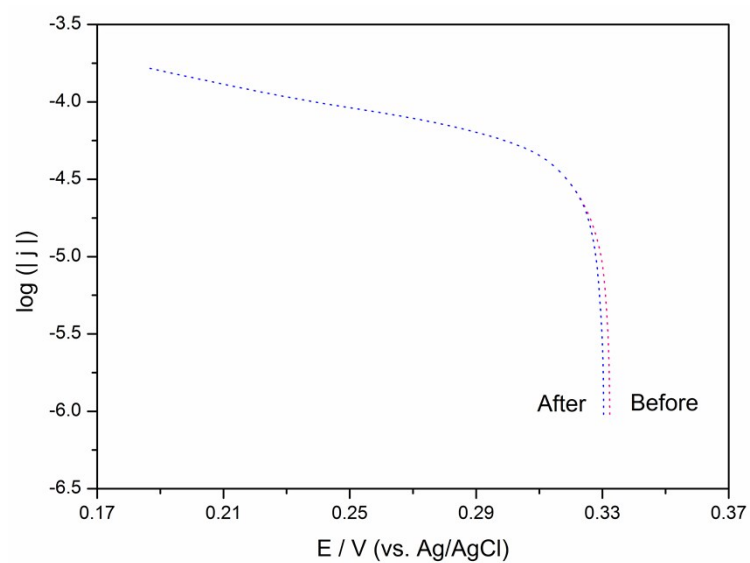


Fig. S3. Tafel plots of PPN-OMC electrode in O_2 -saturated neutral phosphate buffer solution. The plots show the ORR performance of PPN-OMC electrode before and after addition of 6 mM sodium formate to the electrolyte solution. The galvanodynamic experiments were performed at a scan rate of 10^{-7} A/s.

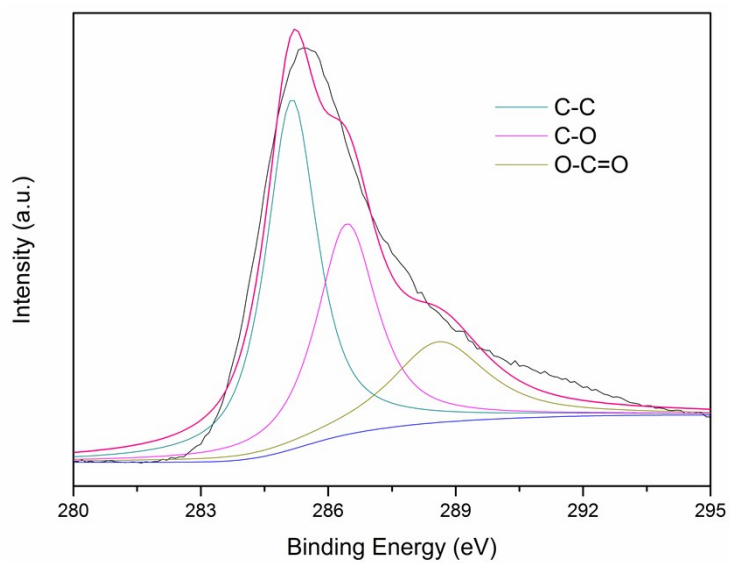


Fig. S4. High-resolution C 1s XPS spectrum of PPN-OMC material

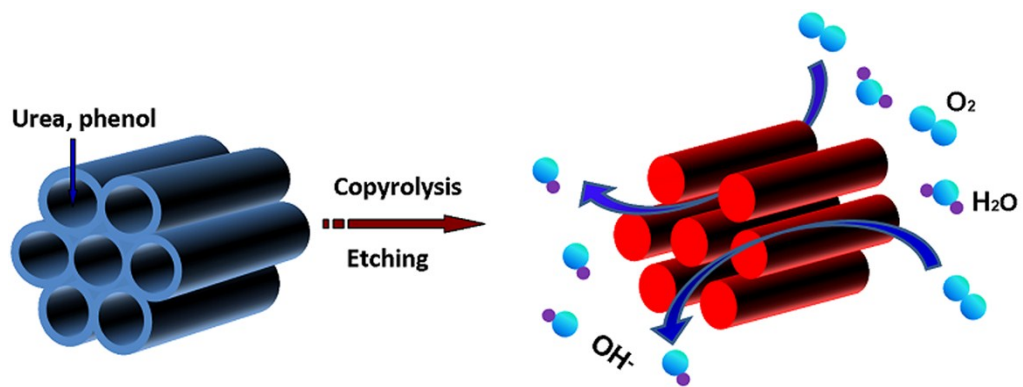


Fig. S5. Schematic illustration of PPN-OMC fabrication