

Pyrolyzed Bacterial Cellulose as the Backbone of the Cathode Catalyst-CoFe₂O₄ for the Li-O₂ Battery

Figure S1 shows the initial discharge curves of the Li-O₂ batteries (LOB) with different CFO@KB samples incorporating the oxygen electrodes loaded with a cutoff voltage of 2.0 V. The initial discharge capacities were, successively, 281 mAh·g⁻¹, 99 mAh·g⁻¹, 83 mAh·g⁻¹, and 75 mAh·g⁻¹ for CFO@KB-1, CFO@KB-3, CFO@KB-5, and CFO@KB-7, respectively. The LOB with CFO@KB-1 had the best performance, with a relatively long discharge stage at 2.4–2.5 V.

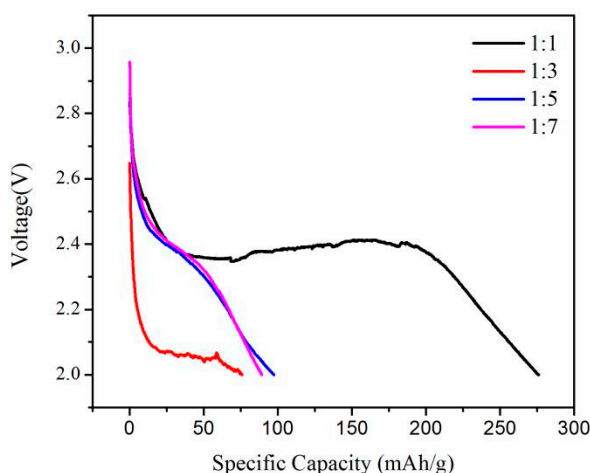


Figure S1. Initial discharge curves of Li-O₂ cells with different CFO@KB samples at a current density of 100 mA g⁻¹.

Figure S2 shows the first 20 limited-capacity cycles of the LOB with different CFO@KB samples with a limited capacity of 180 mAh·g⁻¹ (electrode). The discharge platforms for the first cycles were at 2.75 V, 2.41 V, 1.95 V, and 2.32 V for CFO@KB-1, CFO@KB-3, CFO@KB-5, and CFO@KB-7 respectively. The voltages of the charging platforms of the first cycles were 3.72 V, 3.35 V, 3.42 V, and 3.27 V. The overpotentials were below 1 V except for CFO@KB-5. This indicated that the Li₂O₂ in CFO@KB-5 more easily formed a granular shape, so decomposition during the charging needed higher potential.

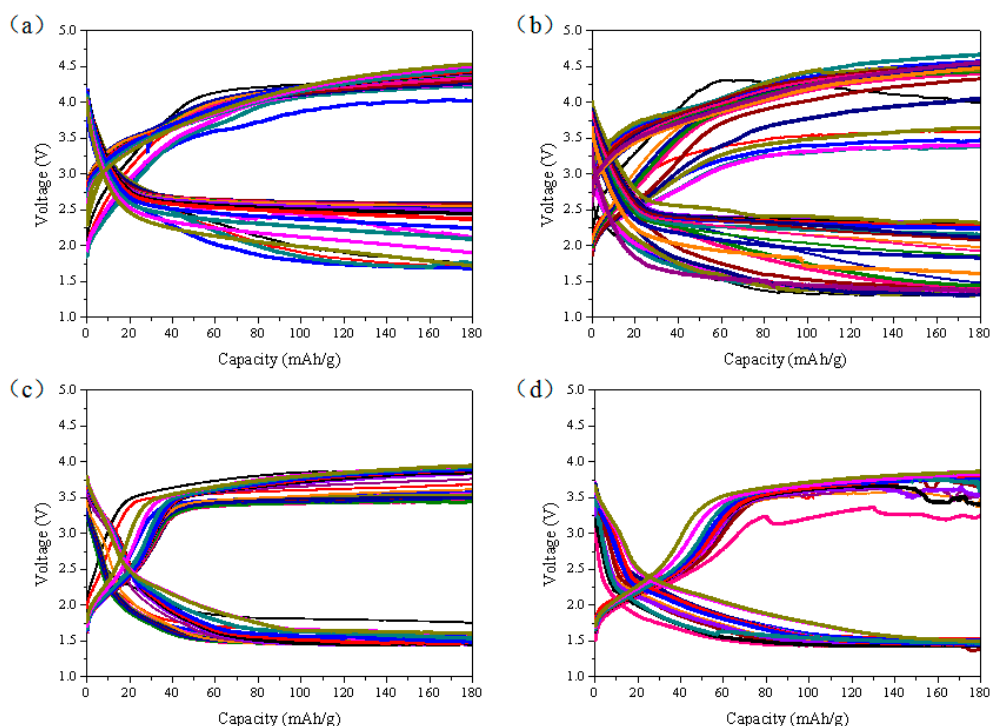


Figure S2. The first 20 limited-capacity cycles of the Li-O₂ batteries with CFO@KB-1 (a), CFO@KB-3 (b), CFO@KB-5 (c), and CFO@KB-7 (d).

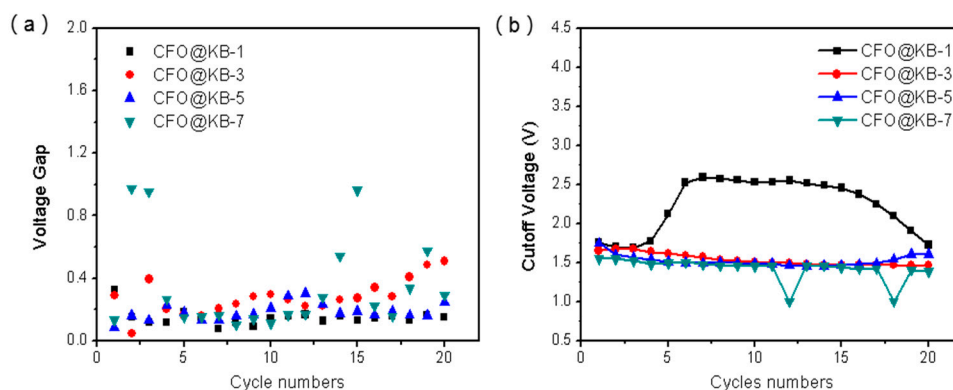


Figure S3. The voltage gap (a) and cutoff voltage (b) for the first 20 limited-capacity cycles of the Li-O₂ batteries with CFO@KB samples.

Figure S3 shows the voltage gap and the discharge cutoff voltages of the LOB with CFO@KB samples. The LOB with CFO@KB-1 had a lower voltage gap and higher cutoff voltage than that of the other CFO@KB samples. The electrocatalytic catalyst, CFO, was synthesized with different proportions of KB and tested in the LOB. The results showed that the CFO@KB-1 had the best capacity and cycle stability, which was due to the suitable size CFO grain with a weight ratio of 1:1. The Li-O₂ battery with an CFO@KB-1 electrode showed an initial discharge capacity of 281 mAhg⁻¹ (electrode), while the capacities decreased with the increase in the weight ratios of CFO and KB. The first 20 cycles of the LOB showed that the CFO@KB-1 had better stability with the capacity and higher cutoff voltages.