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Supporting Information

Facile synthesis of *Camellia oleifera* shells-derived hard carbon as an anode material for lithium-ion batteries

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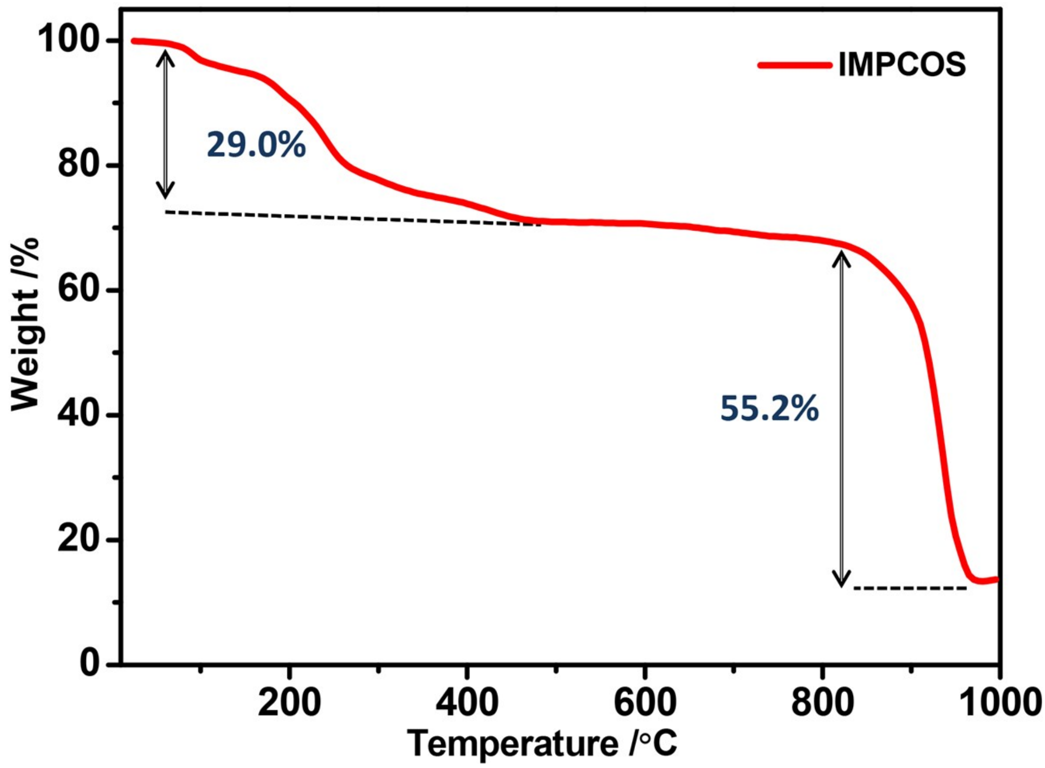


Fig. S1 TG curve of the impregnated *Camellia oleifera* shells.

In our synthesis route, there occurs several reactions during K_2CO_3 activation process. When the temperature was higher than 700 ℃, the K_2CO_3 started to decompose, generating K_2O and CO. As the temperature rises further, K vapor (T_{ev}759 ℃) and CO are produced. The mechanism of K_2CO_3 activation can be summarized as follows:

$$K_2CO_3 \longrightarrow K_2O + CO_2 \quad (1)$$

$$K_2CO_3 + 2C \longrightarrow 2K + 3CO \quad (2)$$

$$K_2O + C \longrightarrow 2K + CO \quad (3)$$

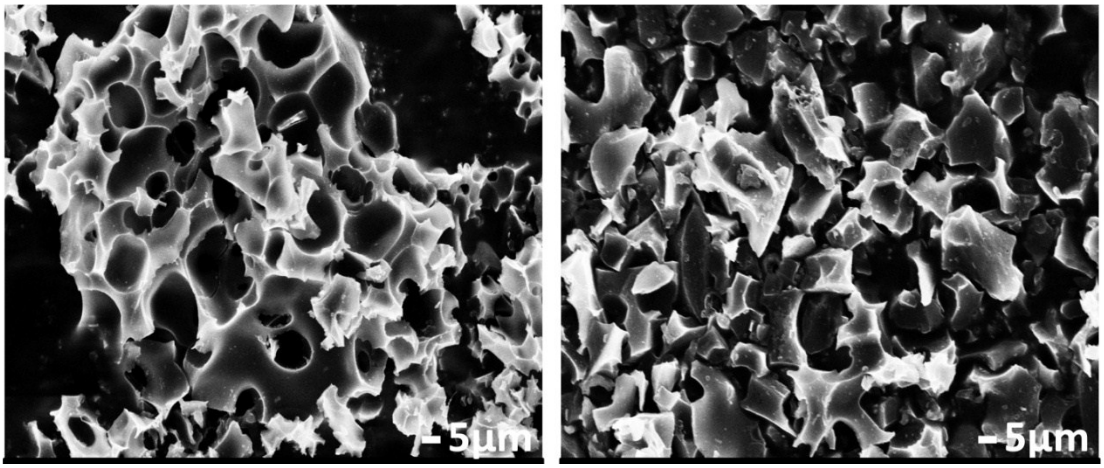
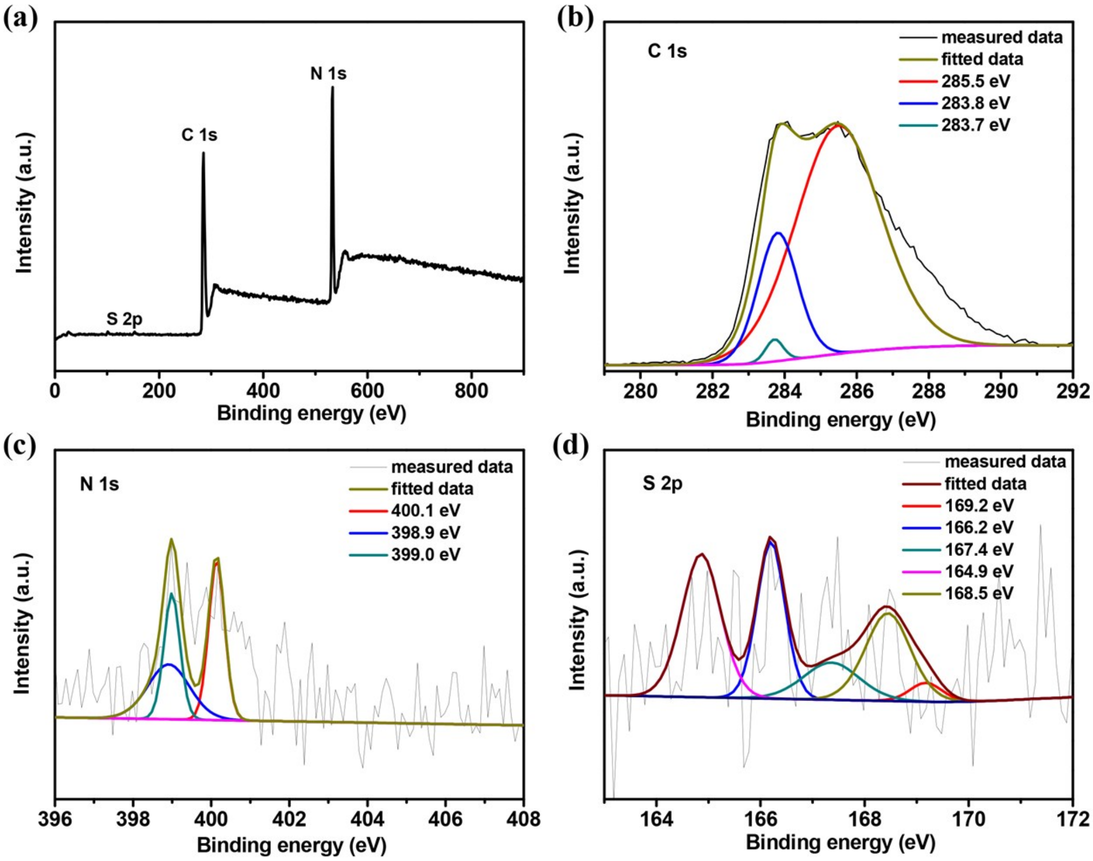


Fig. S2 SEM of COSDHC800-1 and COSDHC800-2.



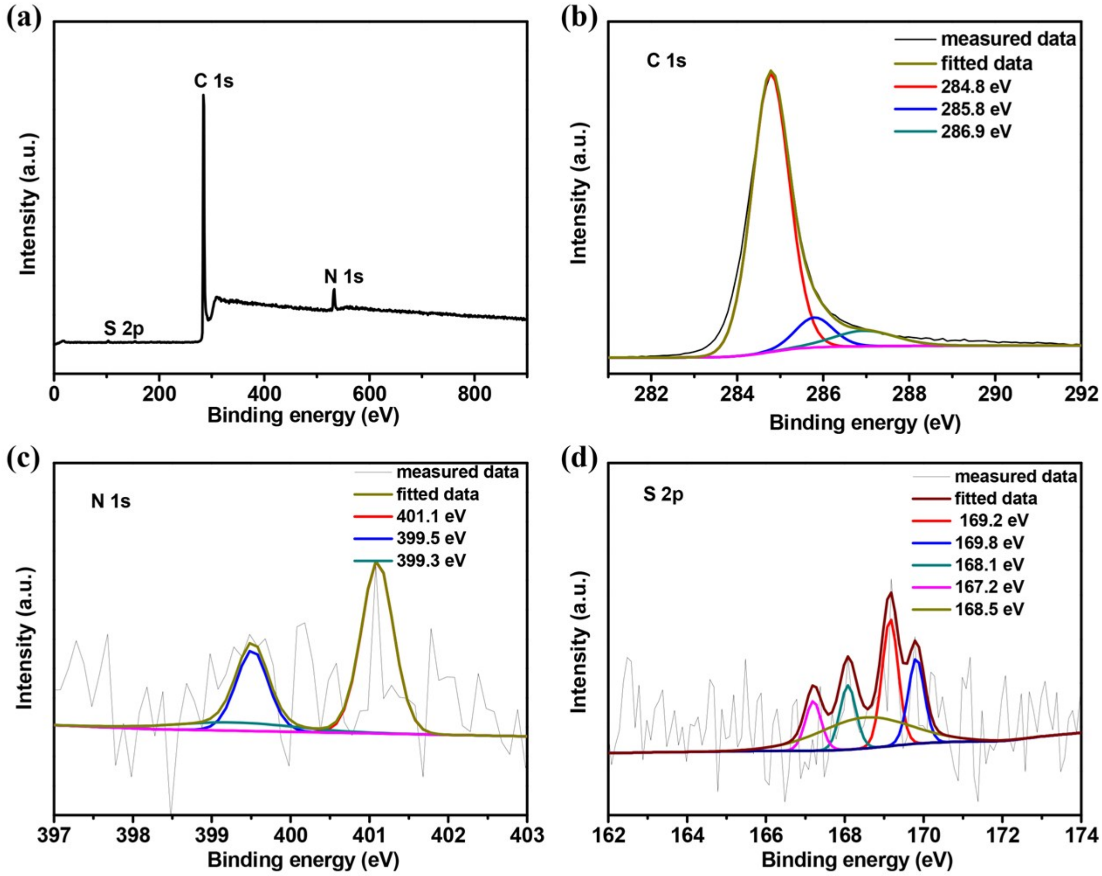


Fig. S3 i) XPS of raw material, ii) XPS of COSDHC900-1.

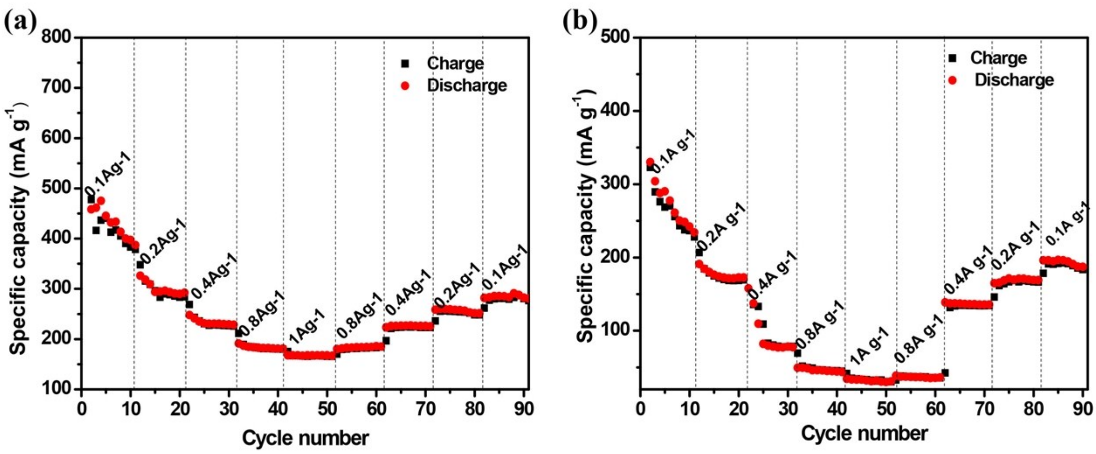


Fig. S4 Rate performance of COSDHC800-1 and COSDHC800-2.

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