Gram-scale Production of Holey Vertically Aligned Graphene Nanosheet Arrays Derived from Renewable Biomass Precursor by Facile Hydrothermal/Salt-assisted Pyrolysis Method for aqueous high-performance redox supercapacitors

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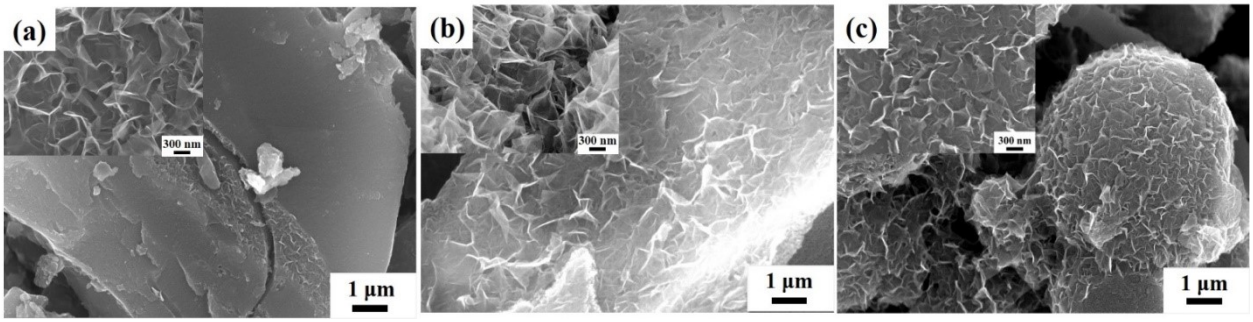

Fig. S1 FE-SEM images of VAGNA-S-1000，VAGNA-T-1000 and VAGNA-L-1000.

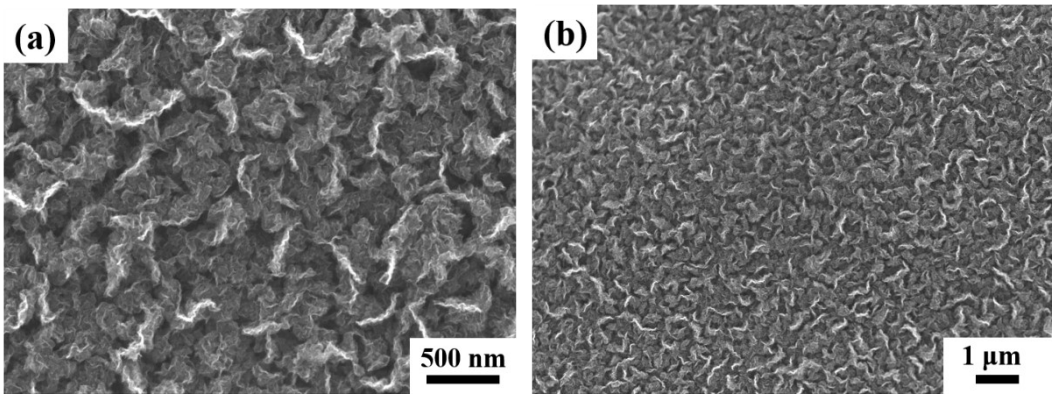

Fig. S2 SEM diagram of VAGNAS prepared by PECVD method

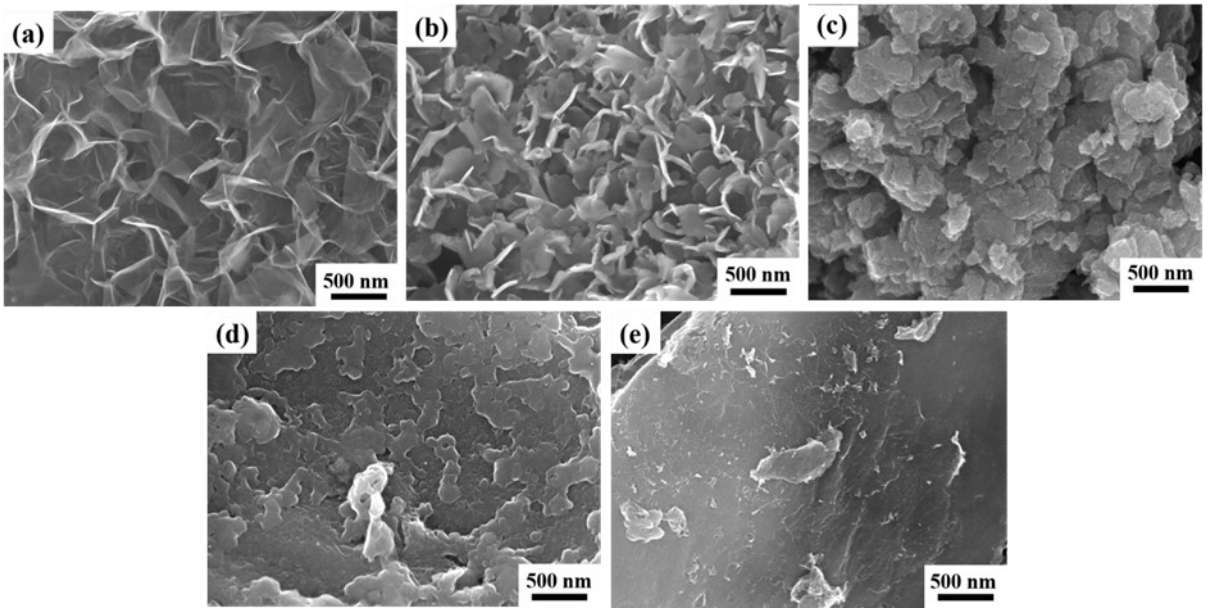

Fig. S3 FE-SEM images of spruce bark-derived products when treated with different activators. (a)K_2CO_3; (b)Na_2CO_3; (c)Li_2CO_3; (d)KCl ;(e)K_3PO_4.

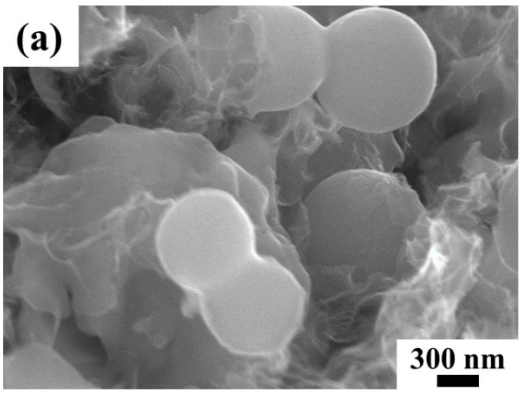

Fig. S4 FE-SEM images of lotus pollen derived carbons without hydrothermal pretreatment at 1100℃

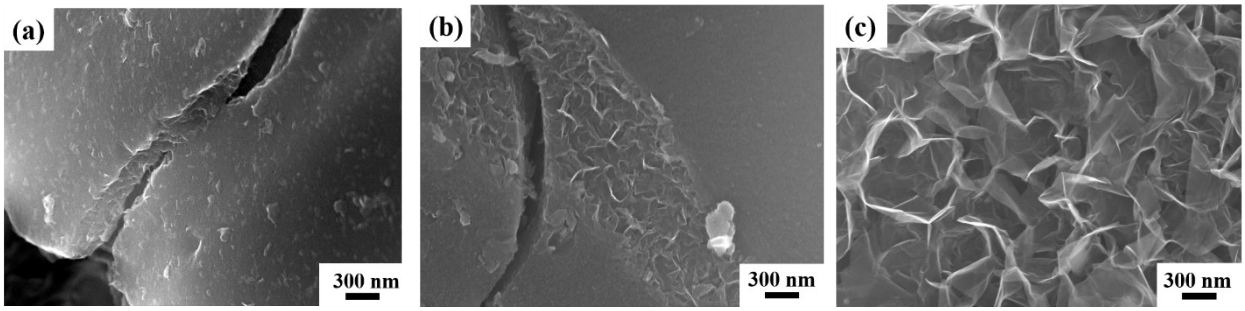

Fig. S5 FE-SEM images of hydrothermal treated spruce bark-derived carbon materials at different pyrolysis temperatures: (a) 850℃；(b) 900℃；(c)1000℃.

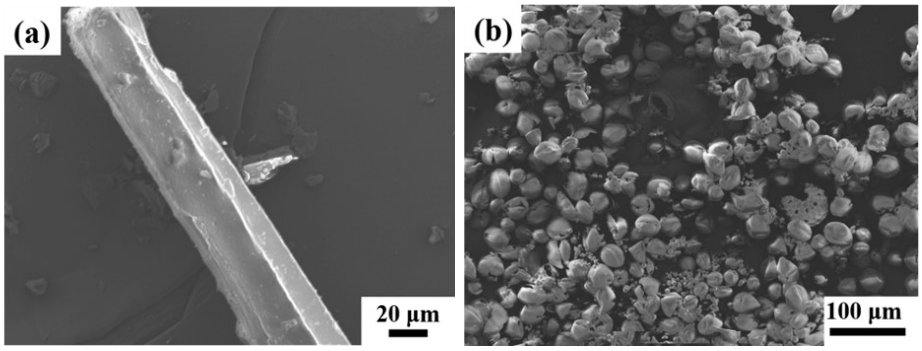

Fig. S6 FE-SEM images of the hydrothermal product (a) spruce bark (b) lotus flower powder.

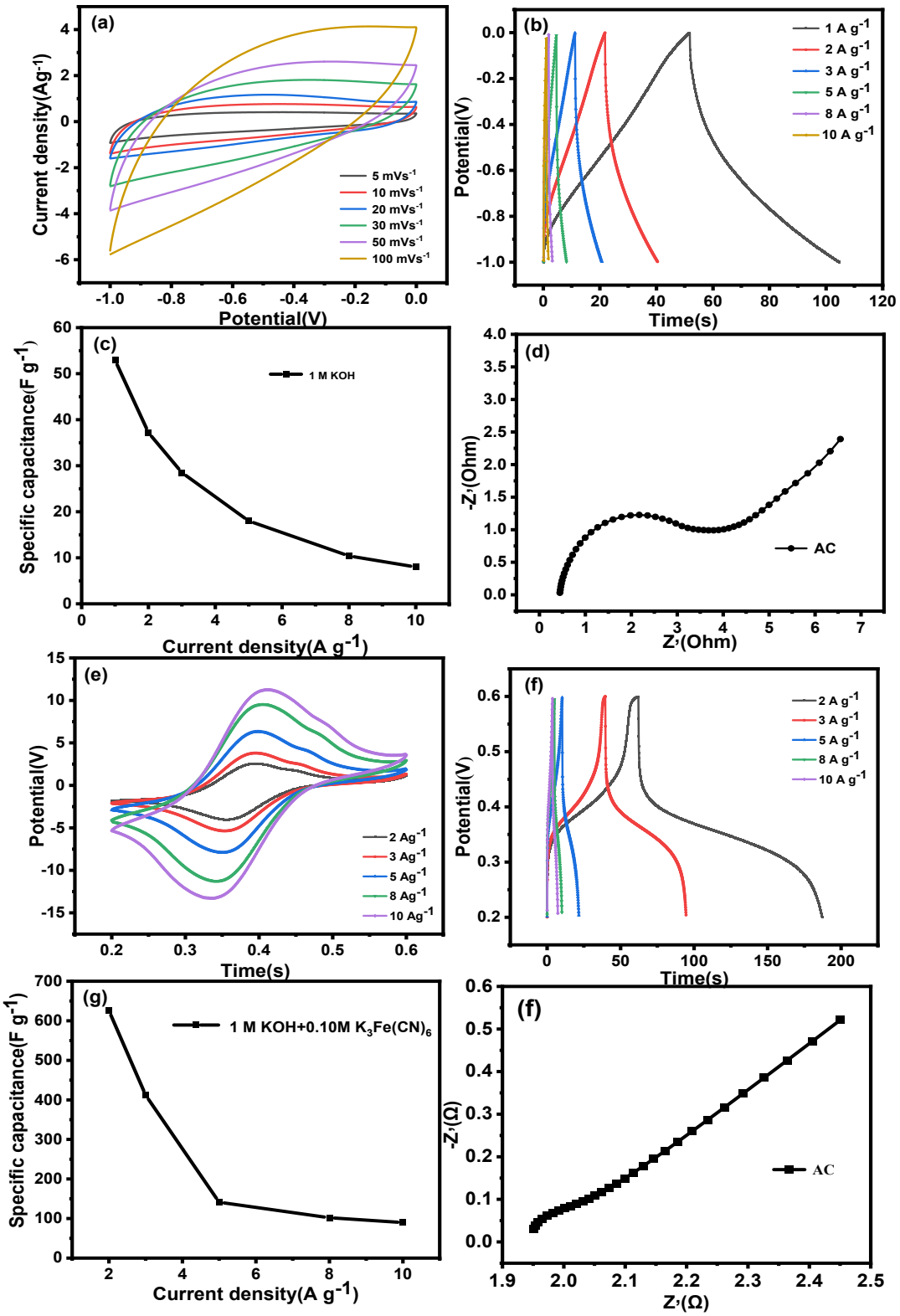

Fig. S7 Electrochemical properties of AC in 1M KOH electrolyte: (a)Cyclic voltammetry curves at different scan rates; (b) Constant-current charge/discharge curves at different current densities; (c) Multiplicity curves with the addition; (d) Ac impedance curve. Electrochemical properties of AC in 1M KOH+0.10 M $K_3Fe(CN)_6$ electrolyte: (e)Cyclic voltammetry curves at different scan rates; (f) Constant-current charge/discharge curves at different current densities; (g) Specific capacitance at different current densities; (h) EIS Nyquist plot.

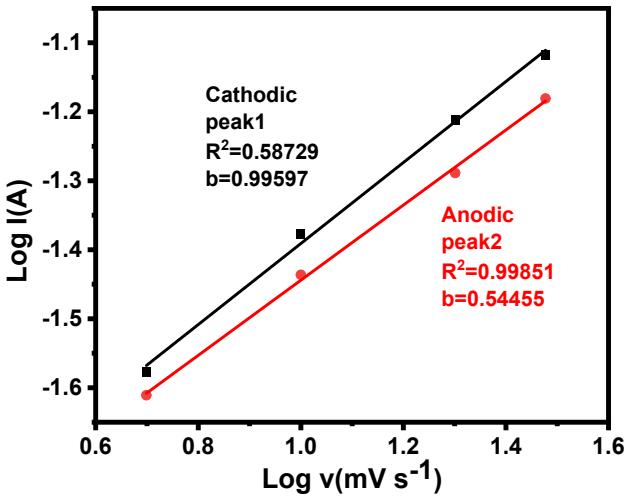

Fig. S8 Log i *vs* Log v plots