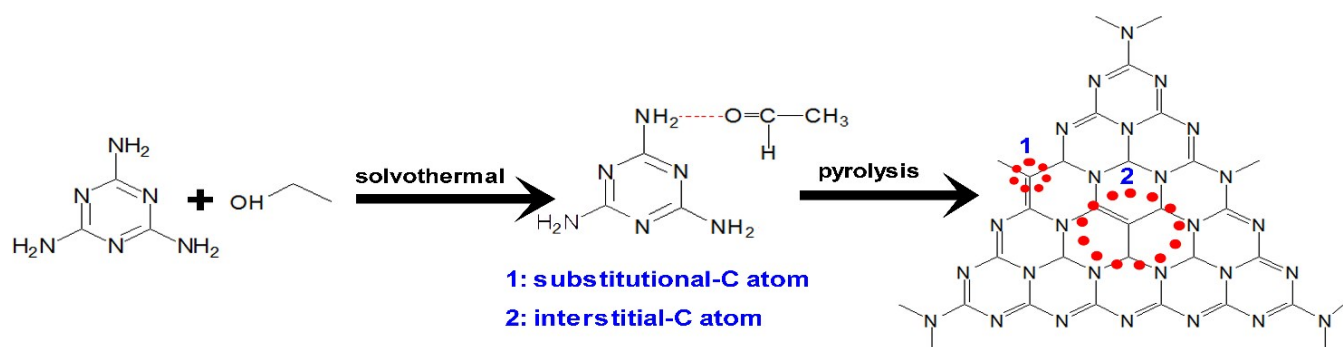
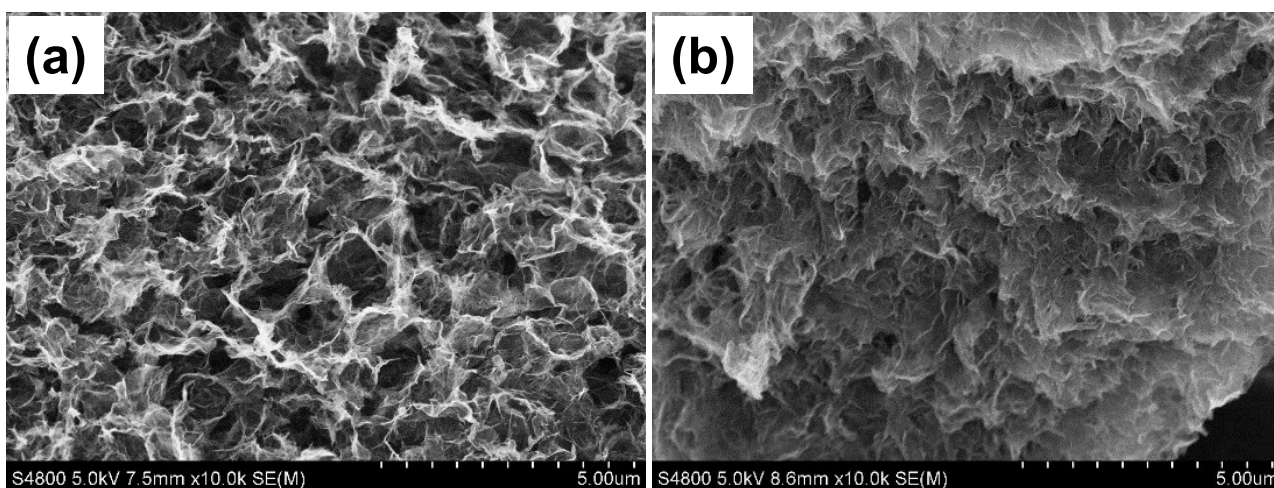


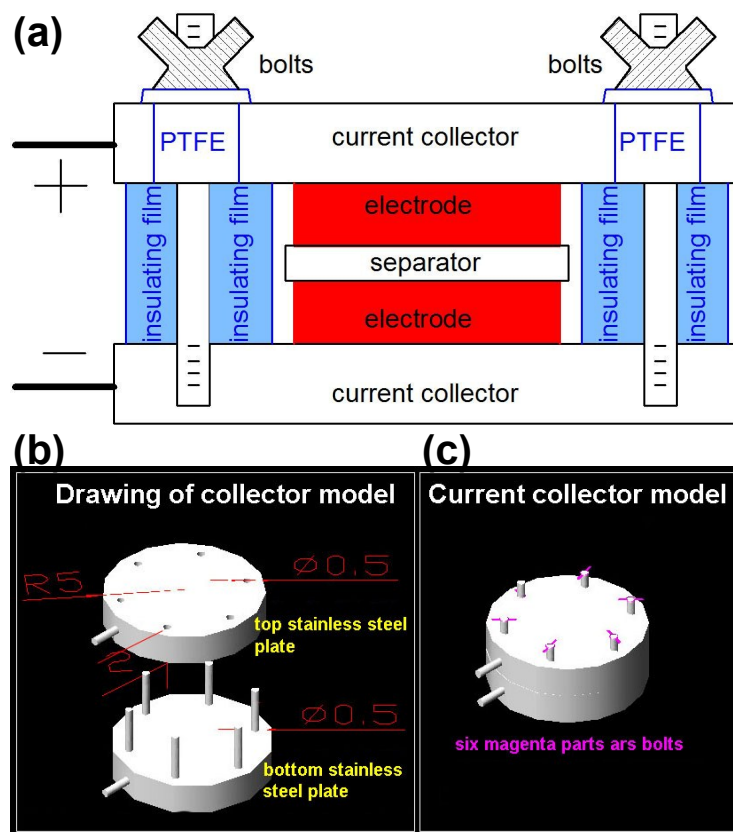
## Supporting Information



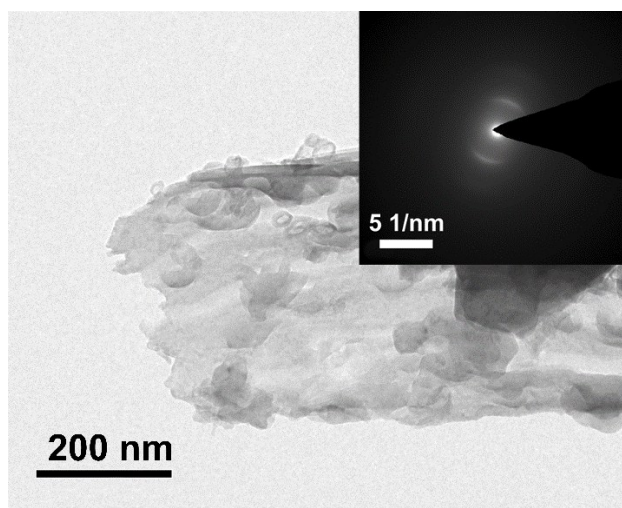
**Fig. S1** Reaction pathway for the development of C-C<sub>3</sub>N<sub>4</sub> using MA as the precursor and ethanol as the carbon source.



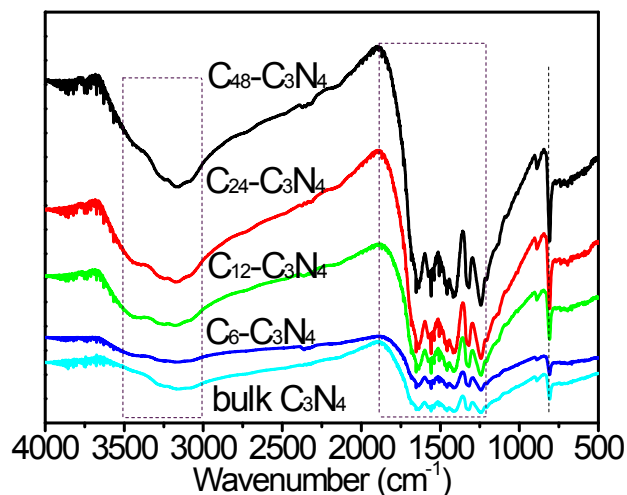
**Fig. S2** SEM images of C-C<sub>3</sub>N<sub>4</sub>@rGO before (a) and after (b) assembly.



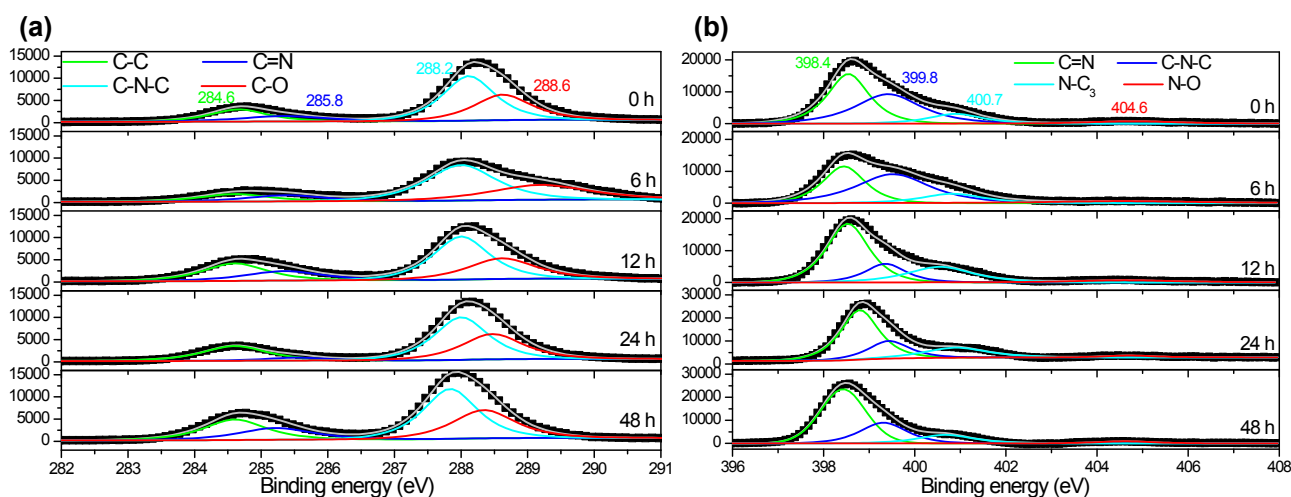
**Fig. S3** (a) Schematic of the two-electrode cell configuration assembly. (b) and (c) are the corresponding CAD draft of the current collector size and model, respectively.



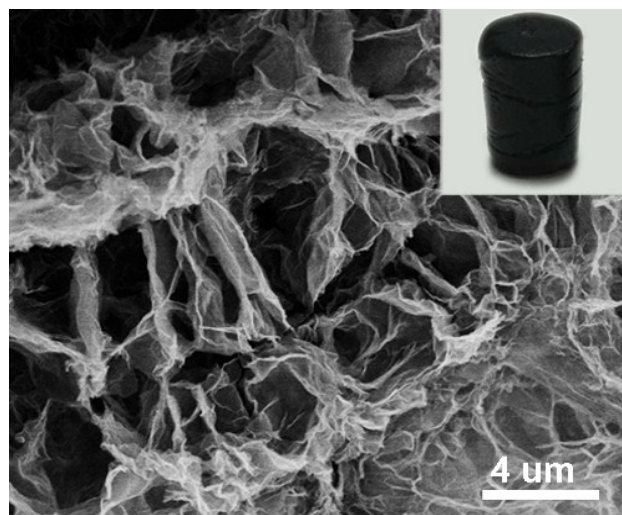
**Fig. S4** TEM image of bulk  $C_3N_4$  (Inset: SAED image of bulk  $C_3N_4$ ).



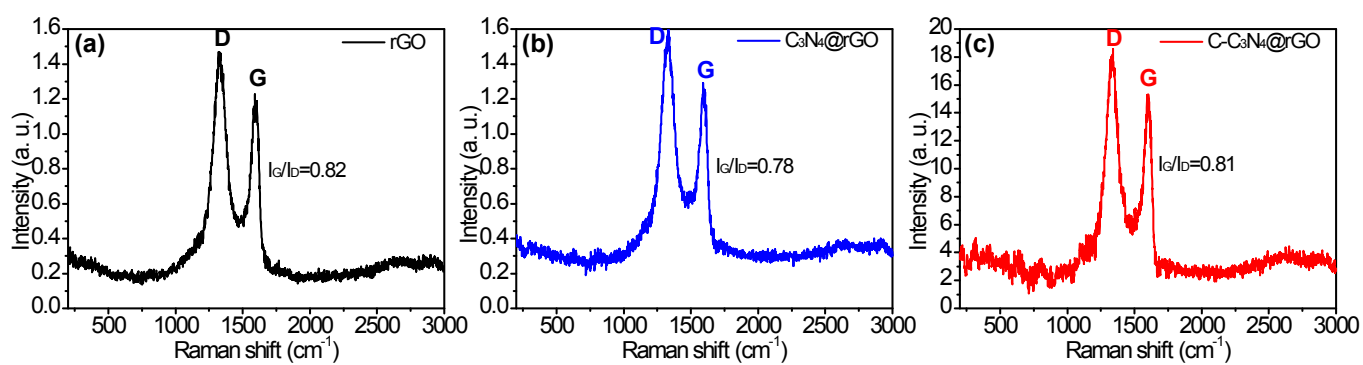
**Fig. S5** The IR spectra of bulk C<sub>3</sub>N<sub>4</sub> and C<sub>x</sub>-C<sub>3</sub>N<sub>4</sub> obtained at different solvothermal time (x=6, 12, 24, and 48 h).



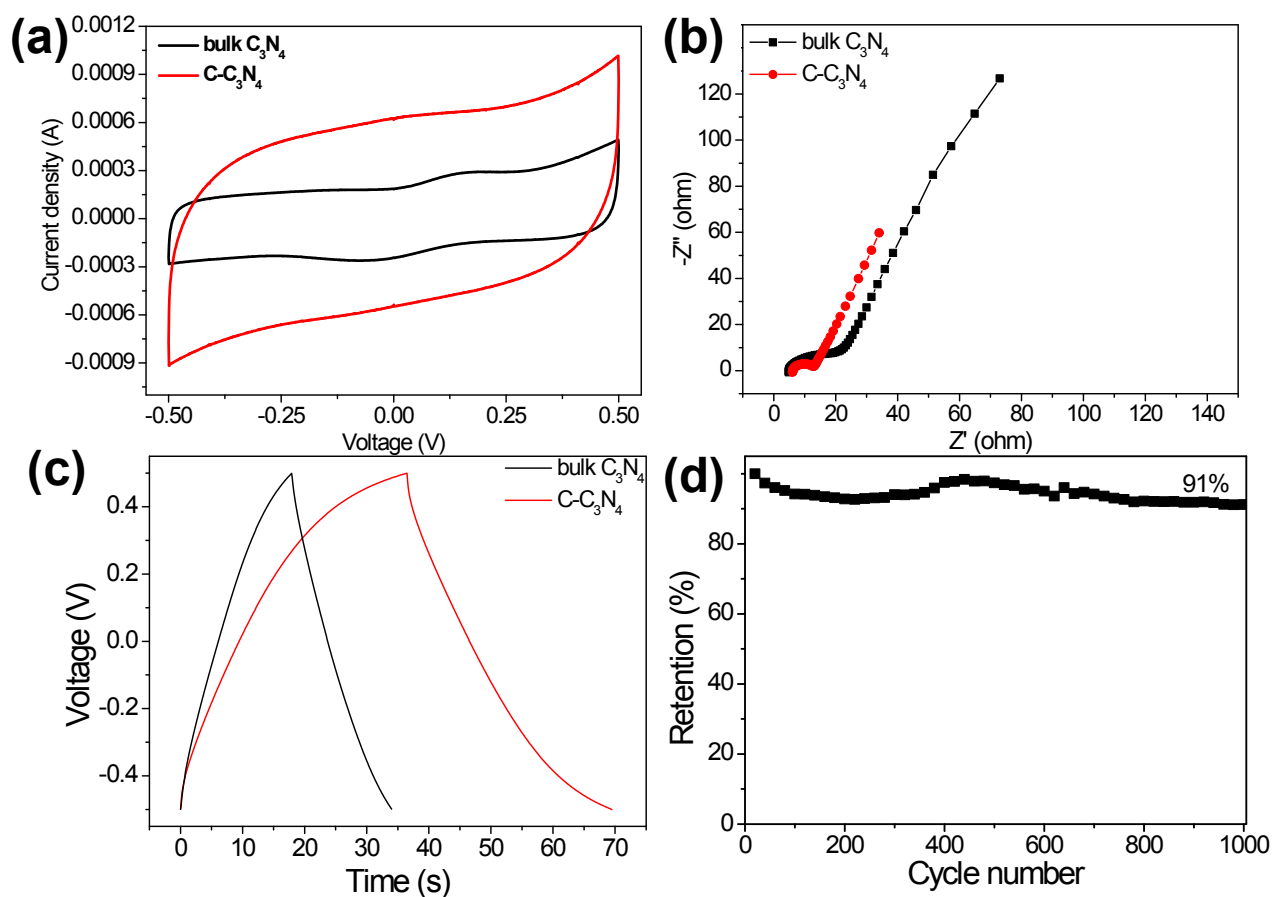
**Fig. S6** (a) C 1s XPS spectra of the samples with different carbon repairing levels. The fitted peaks are C–C at 284.6 eV (green), C=N at 285.8 eV (blue), C–N–C at 288.2 eV (cyan), and C–O at 288.6 eV (red); (b) N 1s XPS spectra of the samples with different repairing level. The fitted peaks are C=N at 398.4 eV (green), C–N–C at 399.8 eV (blue), N–C<sub>3</sub> at 400.7 eV (cyan), and N–O at 404.6 eV (red).



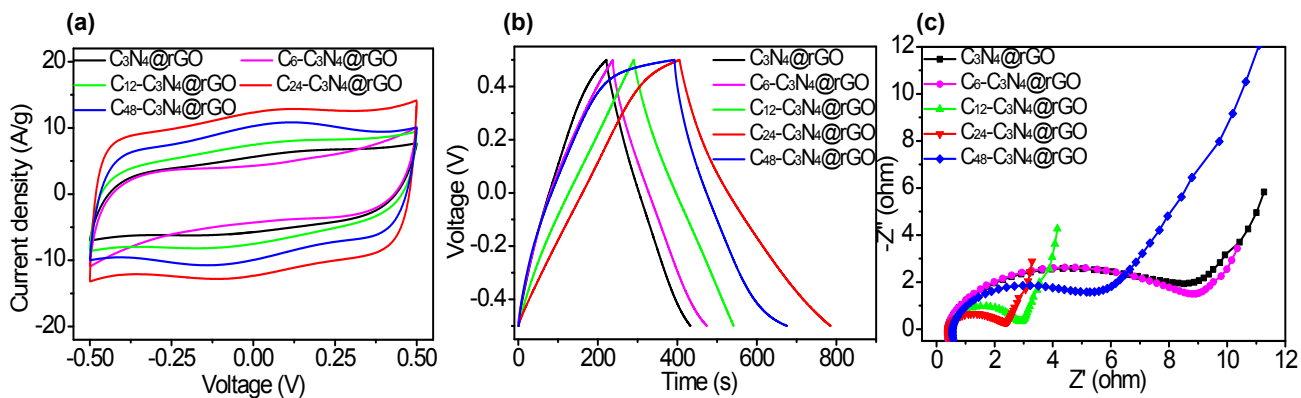
**Fig. S7** SEM image of the rGO. The inset is the photograph of rGO hydrogel.



**Fig. S8** Raman spectra of rGO (a), C<sub>3</sub>N<sub>4</sub>@rGO (b) and C-C<sub>3</sub>N<sub>4</sub>@rGO (c). The ratios of the G band (centered at 1600 cm<sup>-1</sup>) and D band (centered at 1340 cm<sup>-1</sup>) intensities ( $I_G/I_D$ ) of rGO, C<sub>3</sub>N<sub>4</sub>@rGO and C-C<sub>3</sub>N<sub>4</sub>@rGO were 0.82, 0.78 and 0.81, respectively.



**Fig. S9** (a) CV curves at the scan rate of  $100 \text{ mVs}^{-1}$ ; (b) Galvanostatic charge–discharge curves at current density of  $0.5 \text{ A g}^{-1}$  and (c) Nyquist plots of different samples of bulk  $C_3N_4$  and C- $C_3N_4$  electrode (d) Cycling stability of C- $C_3N_4$  electrode at high current density of  $10 \text{ A/g}$ . All the experiments were measured in a two-electrode system in the  $6 \text{ M KOH}$  electrolyte.



**Fig. S10** Electrochemical characterizations of  $C_x-C_3N_4@rGO$  electrodes measured in a two-electrode system in 6 M KOH electrolyte. (a) CV curves of different samples at a scan rate of 100 mV/s; (b) Galvanostatic charge/discharge curves at current density of 0.5 A/g; (c) Specific capacitance versus current density of different samples; (d) Nyquist plots of different samples. All the experiments were measured in a two-electrode system in the 6 M KOH electrolyte.