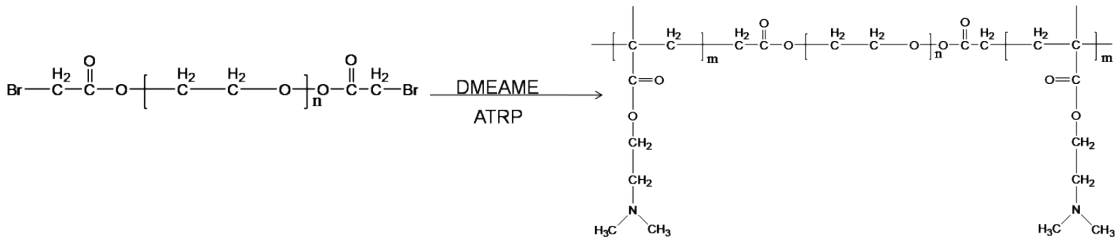
Electronic Supplementary Material (ESI) for RSC Advances.

A facile CO2 switchable nanocomposite with reversible transition from sol to self-healable hydrogel

Synthesis of PDMAEMA-PEO-PDMAEMA

As illustrated in Scheme S1, the triblock polymer PDMAEMA-b-PEO-b-PDMAEMA was synthesized by ATRP of DMAEMA with Br-PEO-Br. Br-PEO-Br (4800 g/mol, 0.328 g, 0.0683 mmol), CuCl (9.8mg, 0.068mmol), DMAEMA (1.07g, 6.81mmol), PMDETA (0.0118g, 0.0685mmol) and 4mL THF were added into a 10mL flask. The reaction mixture was degassed by three-pump-thaw cycles, back-filled with argon and placed in an oil bath thermostated at 65 °C for 24 h. The mixture was then diluted with THF and precipitated in petroleum ether twice. After drying, precipitates were dissolved in dichloromethane and extracted by saturated salt water twice to remove metal salt. After precipitation of the THF solution in petroleum ether twice, the targeted triblock copolymer was collected by filtration and then dried under vacuum overnight, yielding a dark yellow solid. From the ^{1}HNMR spectrum, comparing the integrals of the resonance peaks of -OCH_2CH_2- of PEO and –N(CH_3)$_2$ of DMAEMA (2.30 ppm). The ratio of block number was obtained through the integration area.



Scheme S1. Synthetic of PDMAEMA-b-PEO-b-P

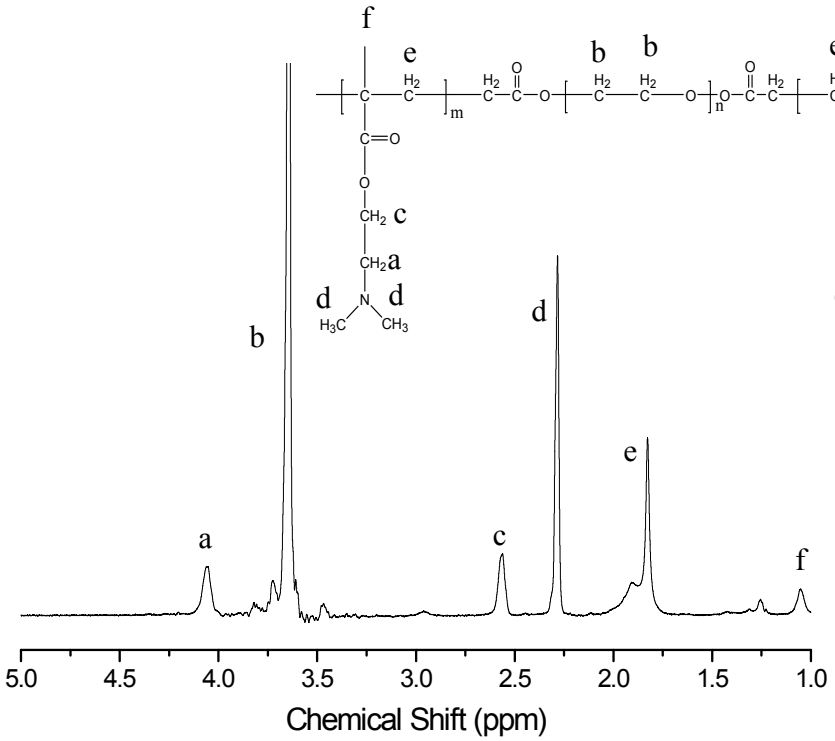


Figure S1 1HNMR spectra of the synthetic triblock copolymer in CCl3D

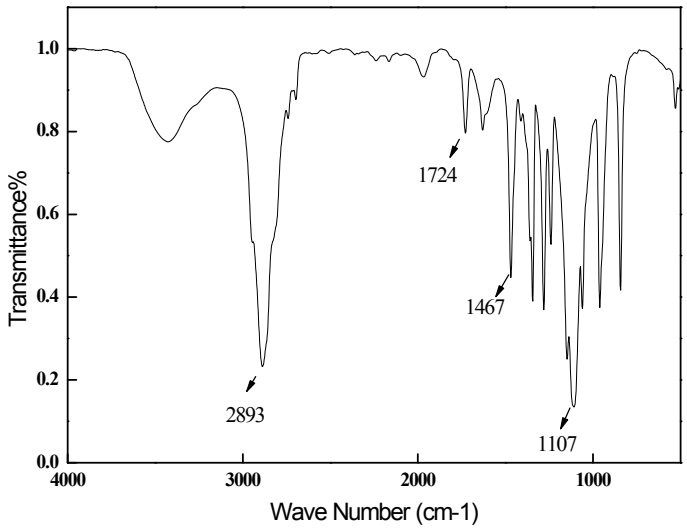


Figure S2 FTIR spectra of the synthetic triblock copolymer. 2893cm-1 CH2,1724cm-1 C=O, 1467cm-1 –CH2-, 1107cm-1 –C-O-C-.