Supporting information

Polyacrylamide-Polydivinylbenzene Decorated Membrane for Sundry Ionic Stabilized Emulsions Separation via a Facile Solvothermal Method

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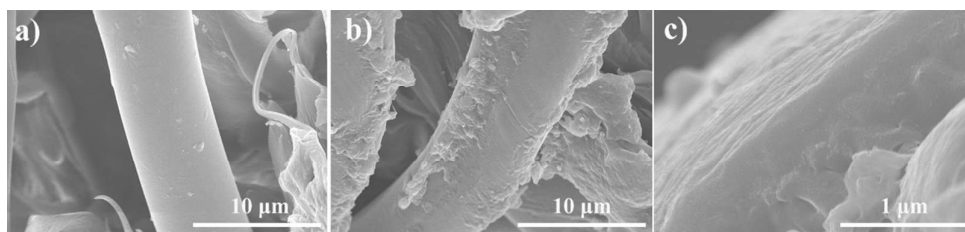*Corresponding author: fl@mail.tsinghua.edu.cn

Figure S1. The cross-section SEM images of a) the original nylon membrane and b) the PAM-PDVB coated membrane. c) The high-magnification cross-section SEM image of the as-prepared material.
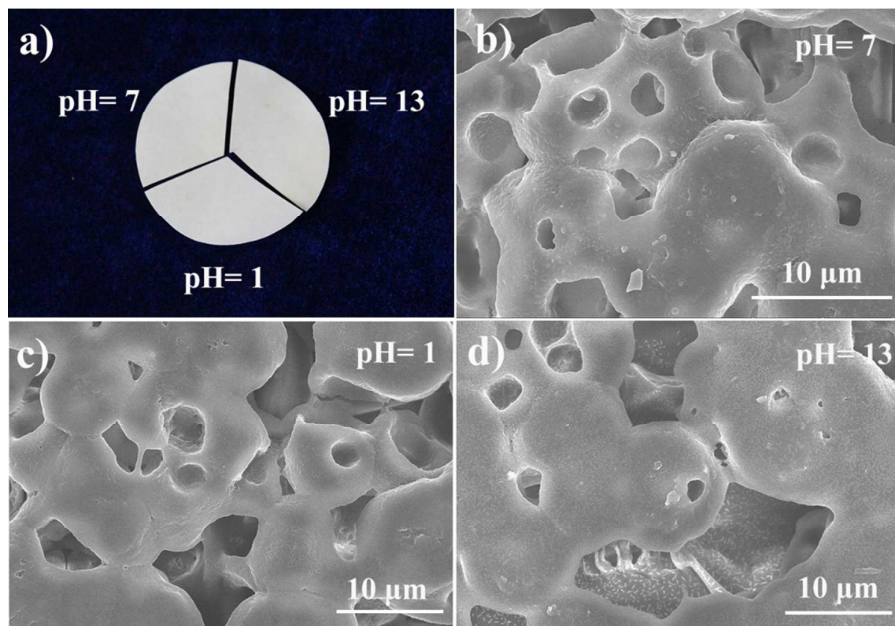

Figure S2. a) The digital photos of the membrane after immersion in strong acid and alkali solutions after 48 hours. b-d) SEM images of the corresponding membranes.
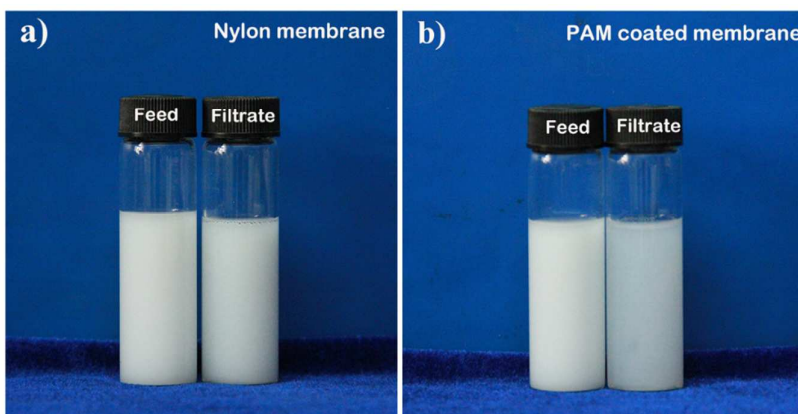

Figure S3. Emulsion separation process of the a) nylom membrane and b) PAM coated membrane. Both the membranes cannot separate the stabilized toluene in water emulsion.
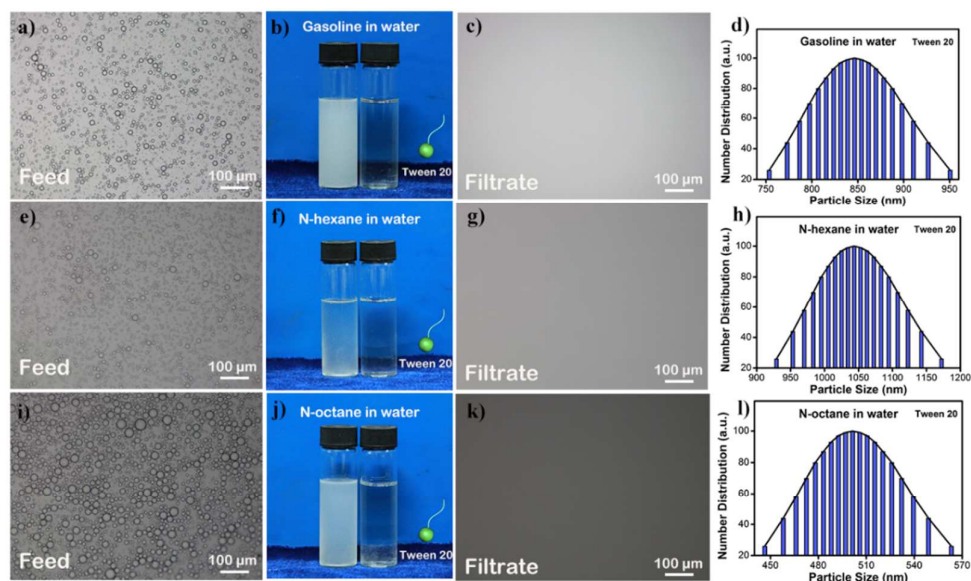
Figure S4. The separation performance of the material toward non-ionic gasoline in water emulsion, n-hexane in water emulsion and n-octane in water emulsion. a)-c) The optical images of the corresponding feed emulsions. d)-f) The photographs of the corresponding emulsions before and after separation. g)-i) The optical images of the corresponding filtrate emulsions. j)-l) The droplet size analysis of the corresponding emulsions.
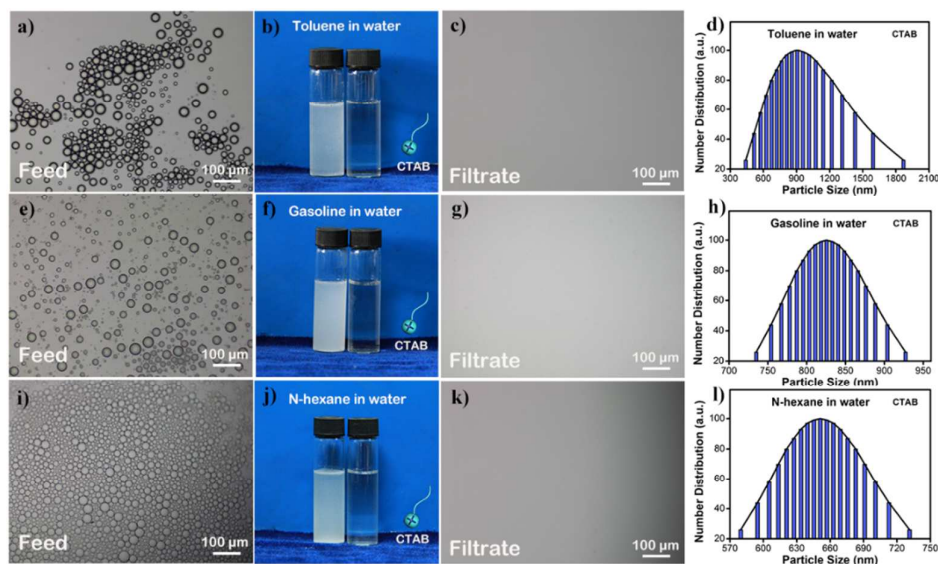

Figure S5. The separation performance of the material toward cationic toluene in water emulsion, gasoline in water emulsion and n-hexane in water emulsion. a)-c) The optical images of the corresponding feed emulsions. d)-f) The photographs of the corresponding emulsions before and after separation. g)-i) The optical images of the corresponding filtrate emulsions. j)-l) The droplet size analysis of the corresponding emulsions.
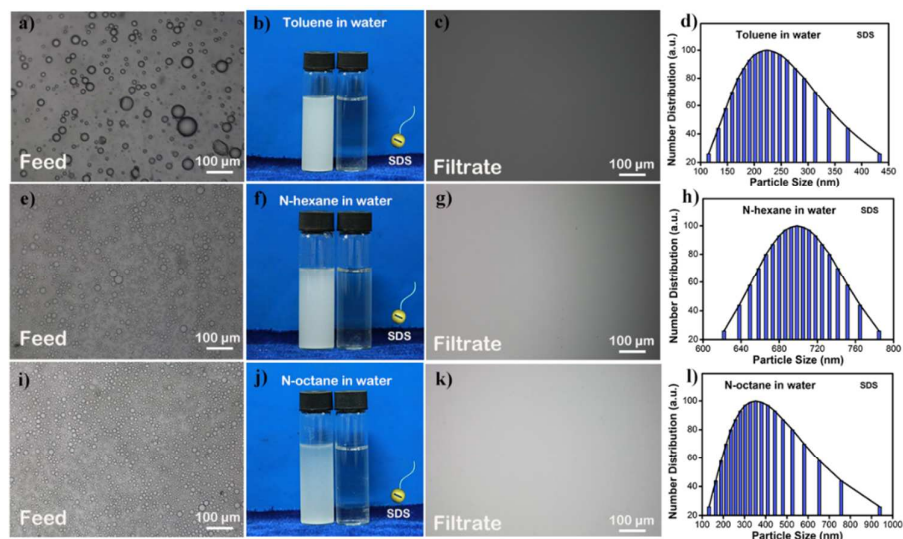
Figure S6. The separation performance of the material toward anionic toluene in water emulsion, n-hexane in water emulsion and n-octane in water emulsion. a)-c) The optical images of the corresponding feed emulsions. d)-f) The photographs of the corresponding emulsions before and after separation. g)-i) The optical images of the corresponding filtrate emulsions. j)-l) The droplet size analysis of the corresponding emulsions.
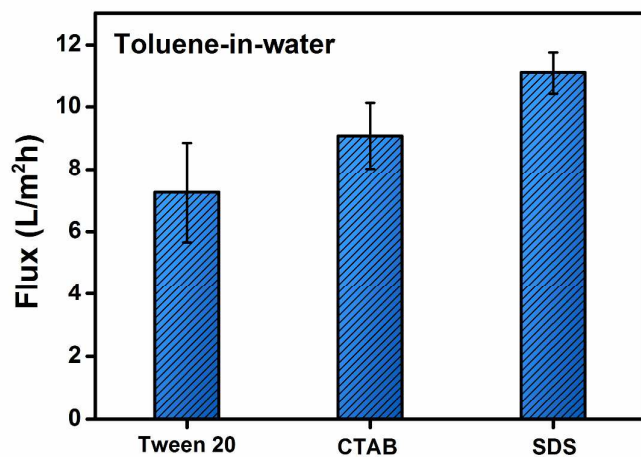

Figure S7. The flux of the non-ionic, cationic and anionic surfactant-stabilized toluene-in-water emulsions.
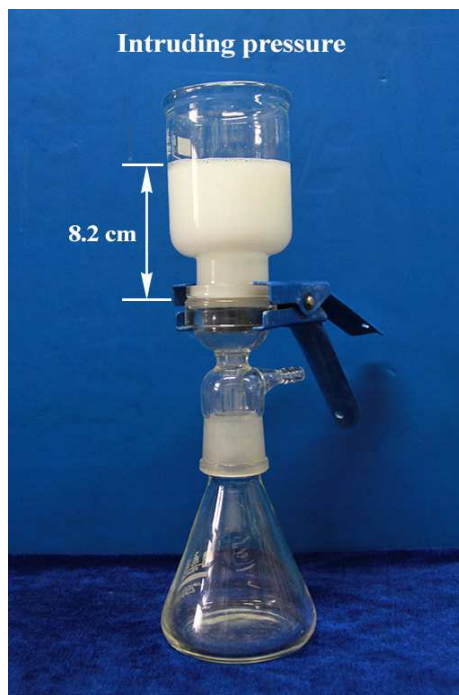
Figure S8. The intruding pressure photograph of the PAM-PDVB membrane.
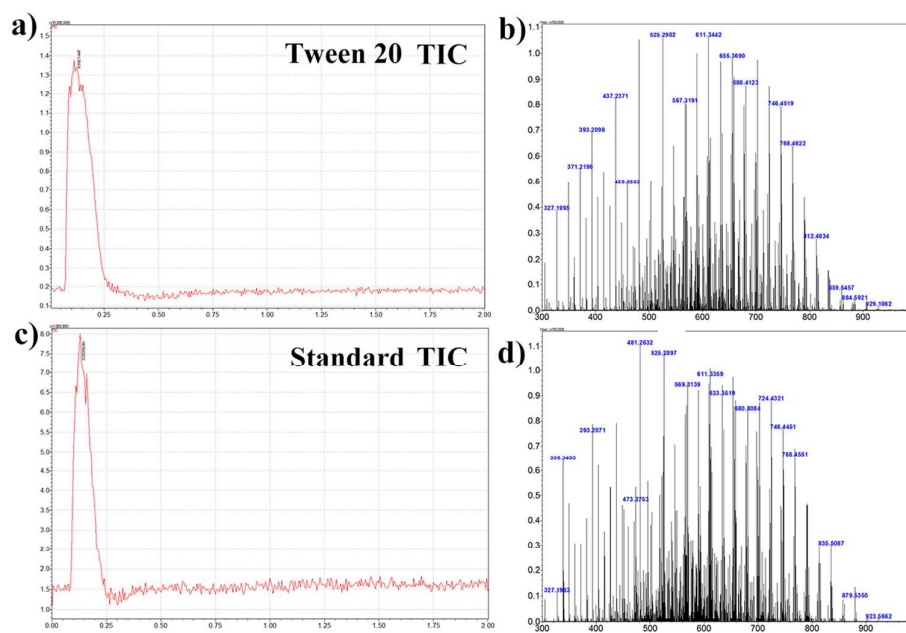

Figure S9. a-b) The TIC image and mass spectrum of the filtrate with tween 20. c-d) The TIC image and mass spectrum of the standard tween 20 solution.
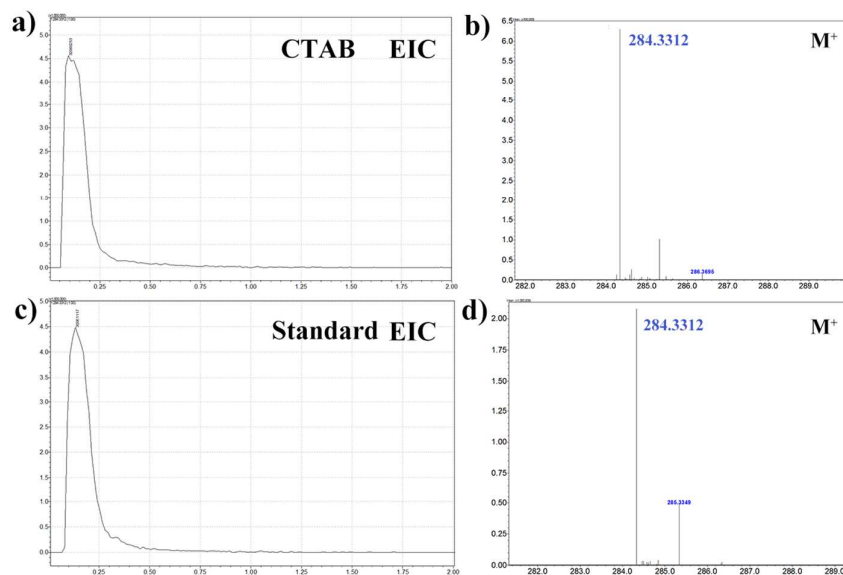
Figure S10. a-b) The TIC image and mass spectrum of the filtrate with CTAB. c-d) The TIC image and mass spectrum of the standard CTAB solution.
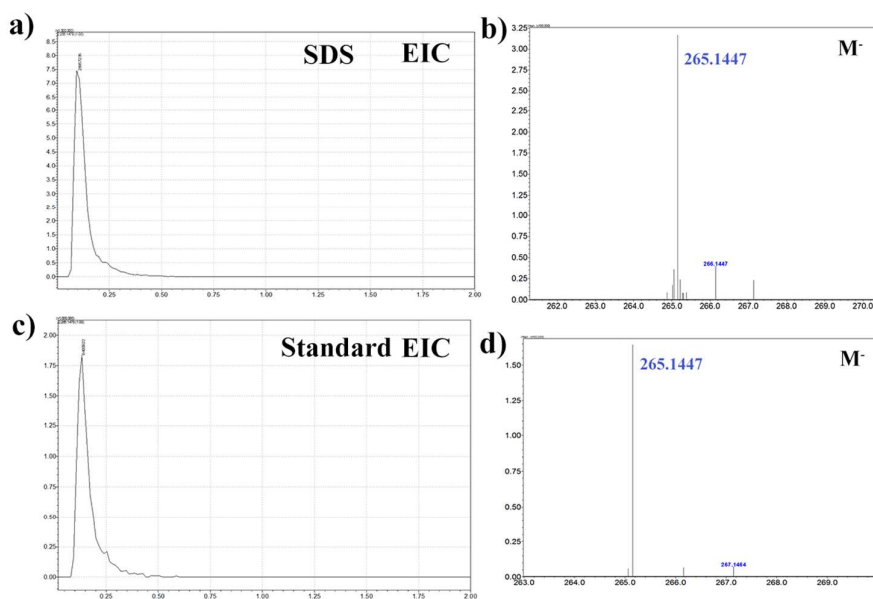

Figure S11. a-b) The TIC image and mass spectrum of the filtrate with SDS. c-d) The TIC image and mass spectrum of the standard SDS solution.
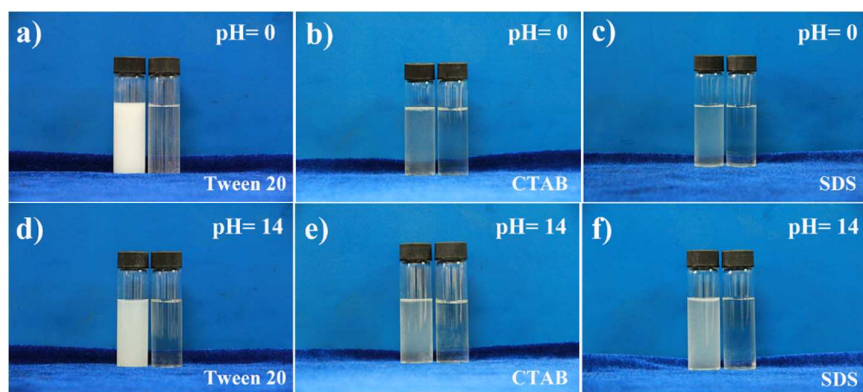
Figure S12. a-c) The digital images of the non-ionic, cationic and anionic toluene-in-water emulsions with the pH values of 0. d-f) The digital images of the non-ionic, cationic and anionic toluene-in-water emulsions with the pH values of 14.
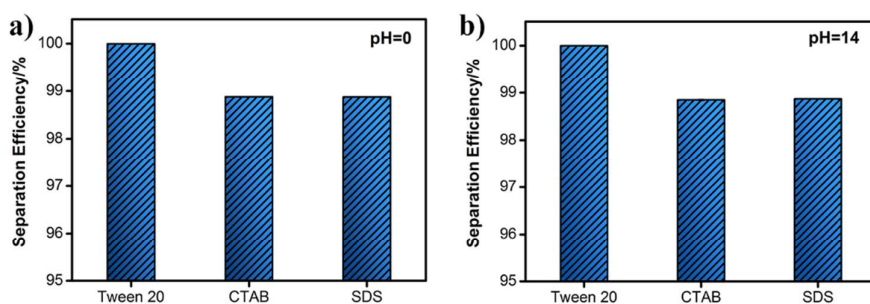

Figure S13. The separation efficiency of the non-ionic, cationic and anionic toluene-in-water emulsions at a) pH value of 0 and b) pH value of 14.