# **Supporting Materials**

# Large–scale synthesis and characterization of magnetic poly(acrylic acid) nanogels *via* miniemulsion polymerization

Jianan Zhang, \* Zhengquan Lu, Mingyuan Wu, Qingyun Wu, Jianjun Yang

School of Chemistry and Chemical Engineering, Anhui University and Anhui Province Key Laboratory of Environment–friendly Polymer Materials, Hefei 230601, P. R. China

E-mail: jianan@mail.ustc.edu.cn

#### 1. The mass yields of the different steps

We have conducted the miniemulsion polymerization of PAN in a one-liter flask. The yield of PAN nanoparticles was calculated to be about 92.5%, which means that a high monomer conversion was obtained. After the hydrolysis reactions of cross–linked PAN nanoparticles, the molar yield of PAA nanogels was about 91.0 %. The yield was determined by gravimetric analysis. Because the molecular weights of acrylonitrile and acrylic acid are 53 and 72, the mass of PAA nanogels was higher than that of PAN nanoparticles after the hydrolysis reactions.

#### 2. TEM images of PAN nanoparticles prepared with different contents of SDS



Figure S1. TEM images of PAN nanoparticles prepared with 0.3 g of SDS.



Figure S2. TEM images of PAN nanoparticles prepared with 0.2 g of SDS.

## 3. TEM images of PAN nanoparticles prepared without addition of DVB



Figure S3. TEM images of PAN nanoparticles prepared without the addition of DVB.

### 4. Size distributions of PAA nanogels at different pH medium



**Figure S4.** Size distributions of PAA nanogels at pH (a) 4.01, (b) 7.40, (c) 9.18, and (d) 10.83, respectively. Insets show the corresponding average size of PAA nanogels.