

Electronic Supplementary Information (ESI)

Graphene Oxide Reduced and Modified by Soft Nanoparticles and its Catalysis of the Knoevenagel Condensation

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1 Preparation of GO suspension and GO-PAMAM blend

A GO suspension was prepared from purified natural graphite by a modified Hummers method.^{1,2} Briefly, concentrated H₂SO₄ was added to a 250-mL flask filled with graphite, followed by the addition of NaNO₃, and then solid KMnO₄ was gradually added with stirring while the temperature of the mixture was kept below 20 °C. Next the temperature was increased to 30 °C, and excess distilled water was added to the mixture and then the temperature was increased to 80 °C. Finally, 30% H₂O₂ was added until the color of mixture changed to brilliant yellow. The mixture was filtered and washed several times with 5% aqueous HCl to remove metal ions and then washed with distilled water to remove the acid. The resulting filter cake was dried in air and then re-dispersed into water. Suspended GO sheets were obtained after ultrasonic treatment.

The GO suspension (0.3 g/L) and the G3 PAMAM solution (0.3 g/L) were mixed and sonicated for 10 min and then allowed to stand for 12 h for adsorption. The GO-PAMAM blend was obtained by centrifuging the above mixture.

2 Preparation of rGO and rGO-PAMAM blend

The rGO was prepared by thermal reduction. In short, the prepared GO powder was placed in an oven and heated at 180 °C for 12 h. The rGO-PAMAM blend was prepared by the following method. The rGO powder was added to a G3 PAMAM solution (0.3 g/L) and the mixture was sonicated for 30 min to obtain a stable suspension and then allowed to stand for 12 h for adsorption. The rGO-PAMAM blend was obtained by centrifuging the above suspension.

3 Raman spectrum of pure G3 PAMAM

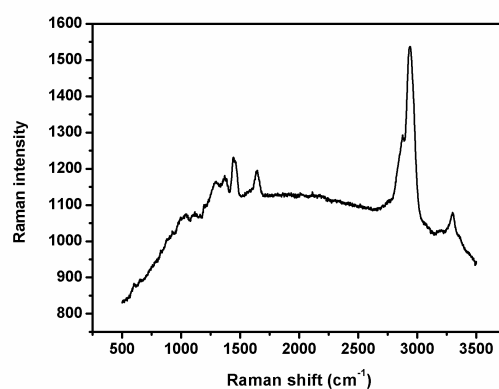


Figure S1. Raman spectrum of pure G3 PAMAM

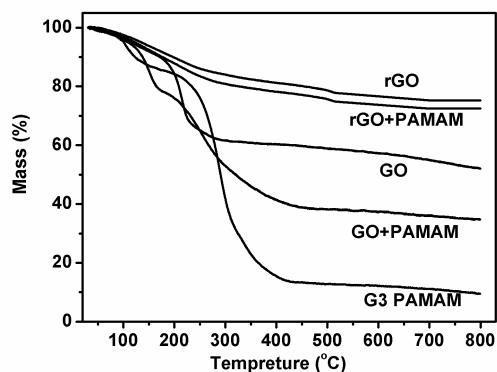


Figure S2. TGA curves of pure G3 PAMAM, rGO, GO-G3 PAMAM blend and
rGO-G3 PAMAM blend

Reference:

S1 W. Hummers, R. Offeman, J Am Chem Soc., 1958; 80, 1339-1340.

S2 N.N. Zhang, H.X. Qiu, Y.M. Si, W.Wang , J.P. Gao., Carbon, 2011,494, 827-837.