Supplementary Material (ESI) for Chemical Communications

One-step Synthesis of Ordered Mesoporous Carbonaceous Spheres by an Aerosol-Assisted Self-assembly

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Thermogravimetric analyses (TGA) were employed to investigate the degradation behavior of the F127- and P123-templated hexagonal mesostructured particles in a N_2 atmosphere. Three detectable weight loss steps can be observed in both of the TGA curves. For the F127-templated spheres, the significant weight loss of 32 wt% occurs at the temperature of 300-400°C (maximum temperature of 375°C), which is mainly due to the further degradation of the template. The following weight loss of 30 wt% from 400 to 600°C is mainly attributed to the polymerization and dehydrogenation of the phenol frameworks. The weight loss is less than 15 wt% in the range of 600-900°C, implying a further dehydrogenation and carbonization of the frameworks. The P123-templated spheres perform similarly in the TGA curve. Notable weight loss of 33 wt% occurs at 300-400°C. The weight losses in range of 400-600°C as well as above 600°C are about 33 wt% and 13 wt% respectively, which indicates the continuous dehydrogenation and carbonization processes. These results indicate that the copolymer templates can be decomposed by calcination at 350°C for 3 h under N_2

atmosphere.

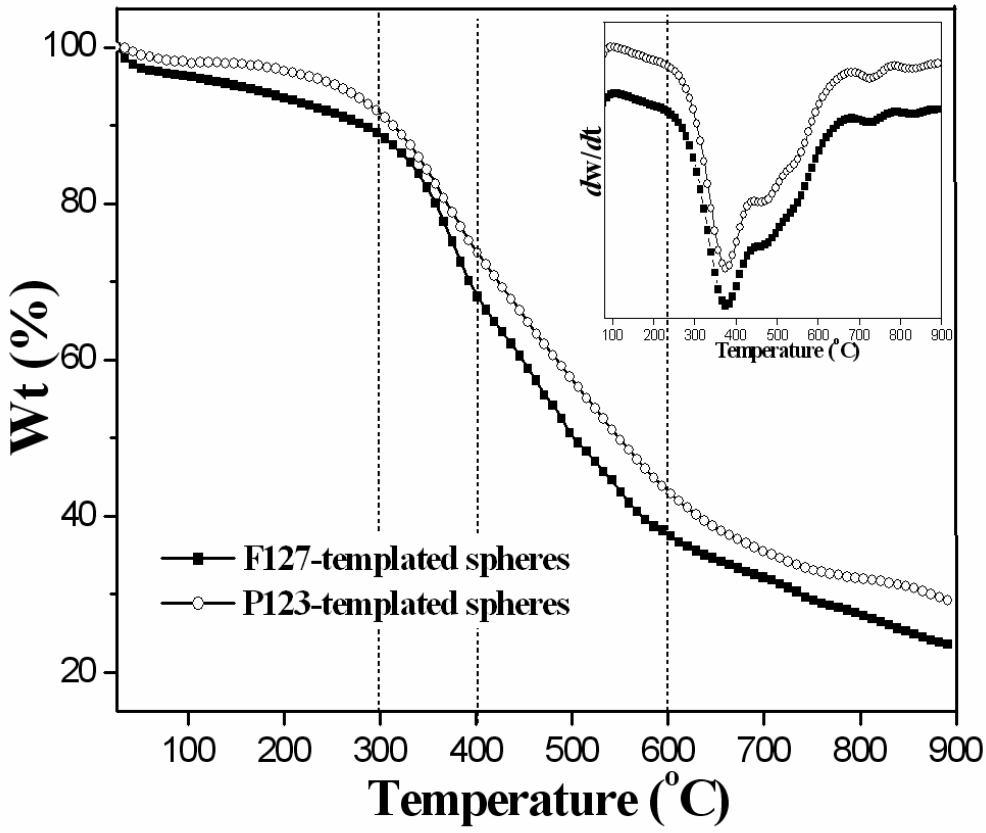

Fig. S1. TGA and differential thermogravimetry curves (inset) of the as-made hexagonal mesostructured particles templated by F127 and P123 at 250°C.