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Supporting Information

A Facile Synthesis of Octa(carboxyphenyl)silsesquioxane

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Generally, all reagents were purified or dried by published methods before use and purchased from Aladdin-Reagent (China). Fourier transform infrared (FT-IR) spectrums were recorded with a Bruker Tensor 27 infrared spectrophotometer using KBr discs. ^{1}H, ^{13}C and ^{29}Si nuclear magnetic resonance (NMR) spectrums were measured on Bruker AM-400S (400 MHz) spectrometer using tetramethylsilane (TMS) as internal standard and DMSO-*d* as solvent. UV spectrum was measured with a UV-8000 UV-vis spectrometer (Metash, China) from 800 to 100 nm. The wide-angle X-ray diffraction (W-XRD) measurement was carried out at room temperature on a Rigaku D/MAX-1200 X-ray diffractometer in normal reflection mode with Ni-filtered Cu Kα radiation (λ = 1.54 Å). Matrix-assisted laser desorption/ionization-time of flight (MALDI-TOF) mass spectrum was recorded with a Bruker AutoflexTM III smartbean spectrometer using α-cyano-4-hydroxycinnamic acid as matrix. The thermogravimetric analysis (TGA) measurement was performed with a Perkin-Elmer TGA-6 thermogravimetric analyzer over a temperature range of between 50 and 850 ºC at a heating rate of 10 ºC/min under nitrogen.

Captions of Figures

Fig. 1s The ^{1}H NMR spectrum of OCS.

Fig. 2s The ^{13}C NMR spectrum of OCS. The peaks located at 167.2 ppm and 140-125 ppm were identified characteristic peak of carbon atom of carboxyl group and aryl group, respectively.

Fig. 3s The ^{29}Si NMR spectrum of OCS.

Fig. 4s The FT-IT spectrum of OCS. 3400-2800 cm^{-1} (stretching vibration: HO- of -COOH), 1695 cm^{-1} (stretching vibration: CO of -COOH), 1598 cm^{-1} (characteristic absorption: benzene ring), 1432, 1400 cm^{-1} (bending vibration: CH of benzene ring), 1295 cm^{-1} (stretching vibration: Si-C), 1108 cm^{-1} (stretching vibration: Si-O-Si).

Fig. 5s The W-XRD pattern of OCS. The peaks located at 8.12, 12.08, 13.78, 19.10, 21.86 and 24.38, respectively indicated OCS was crystal, but the melt point did not be detected before 300 ^{o}C by differential scanning calorimetry.

Fig. 6s The UV spectrums of OCS and benzoic acid (BA) in DMSO. The peaks of characteristic absorption of OCS and BA located at 274 nm and 272 nm wavelength, respectively.

Fig. 7s The TGA curve of OCS in nitrogen. OCS degraded from 321 ^{o}C, after 700 ^{o}C, the rate of decomposition of it suddenly decreased and char yield maintained about 58%.

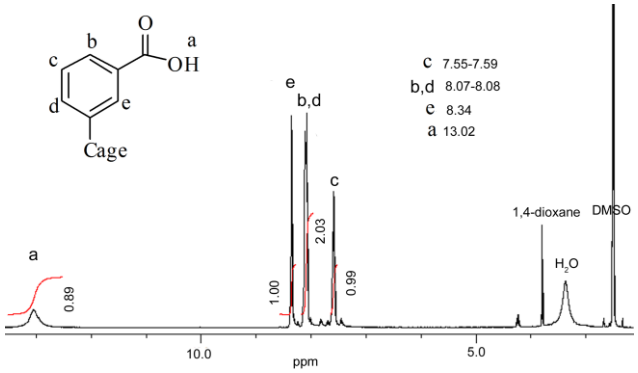

Fig. 1s The ^{1}H NMR spectrum of OCS.

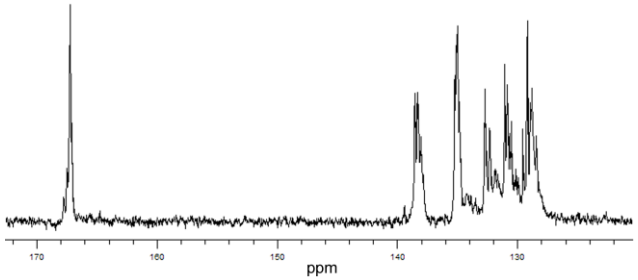

Fig. 2s The ^{13}C NMR spectrum of OCS. The peaks located at 167.2 ppm and

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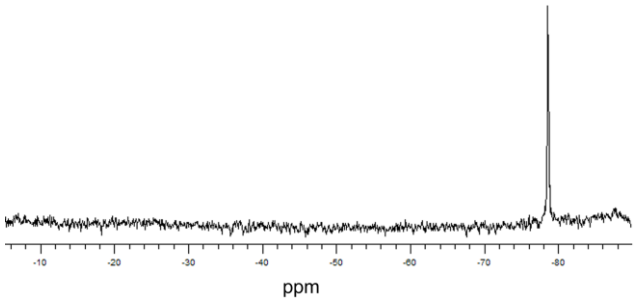
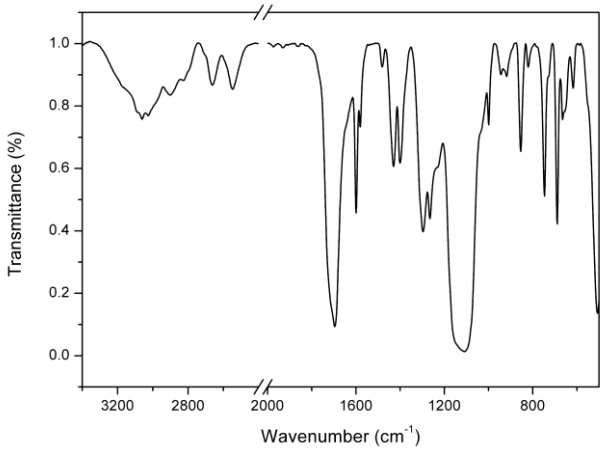


Fig. 3s The ^{29}Si NMR spectrum of OCS.



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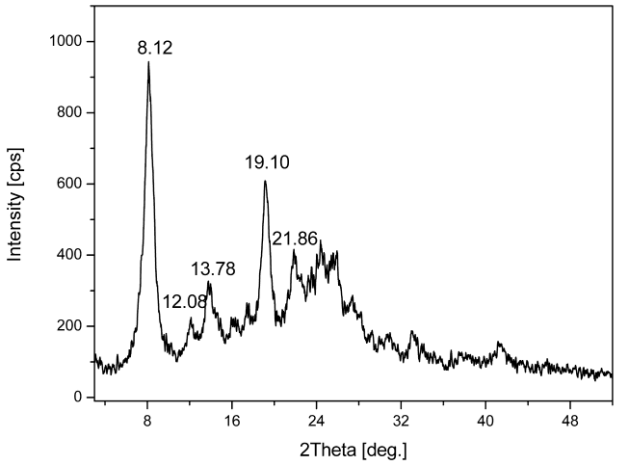

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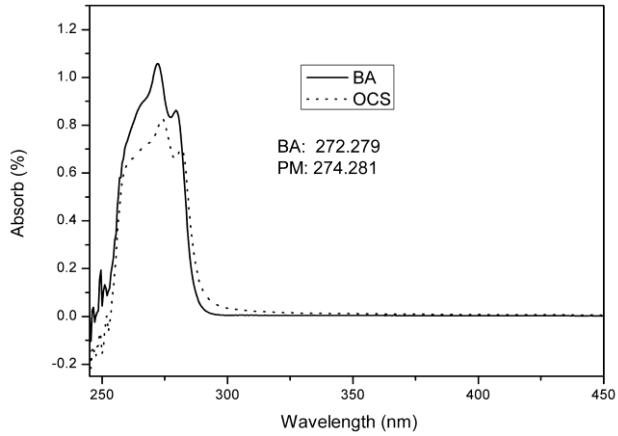

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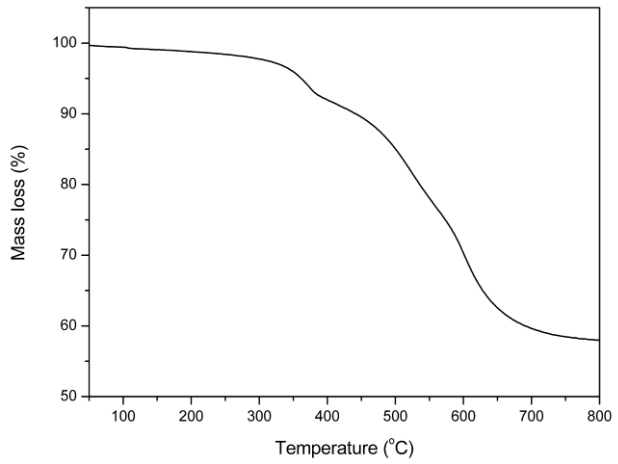

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