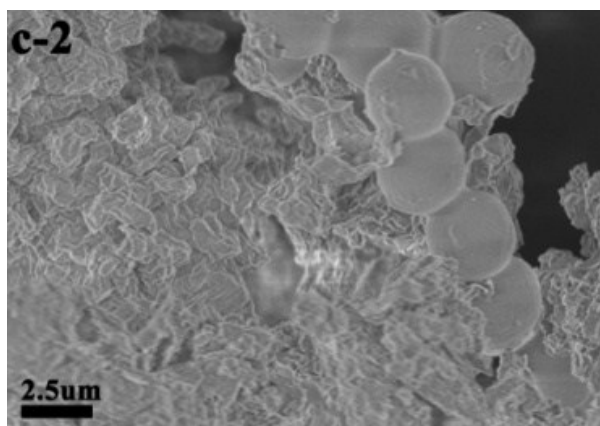
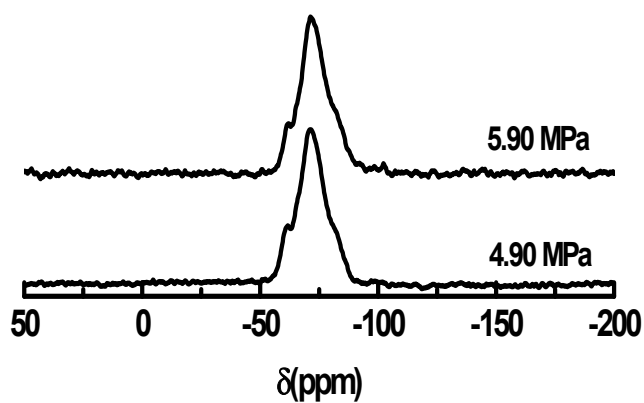


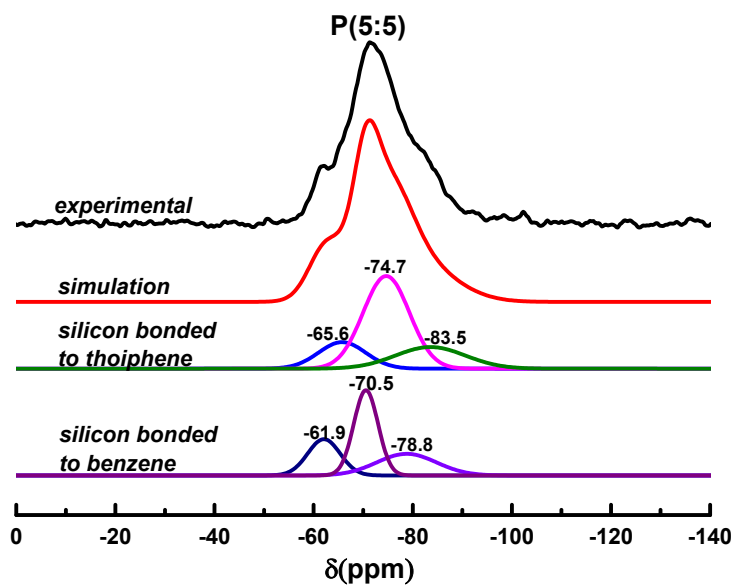
## Supporting Information



**Figure S1** Typical SEM image of the bifunctional PMOs synthesized with P123 as SDA and BTET/BTEB as the organosilica precursors with CO<sub>2</sub> pressure of 5.90 MPa .



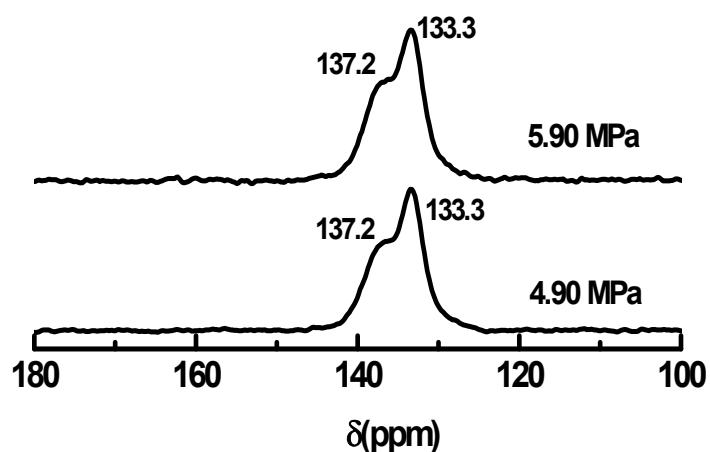
**Figure S2** <sup>29</sup>Si MAS NMR spectra of the bifunctional PMOs synthesized with P123 as SDA and BTET/BTEB as the organosilica precursors with different CO<sub>2</sub> pressures.



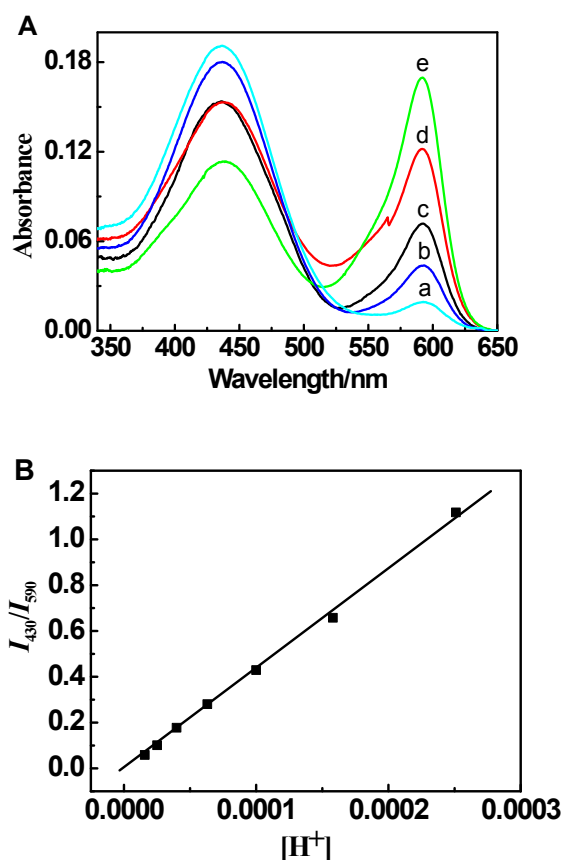
**Figure S3.** Simulation of the  $^{29}\text{Si}$  MAS NMR spectra of the bifunctional PMO materials according to Figure S2.

**Table S1.**  $^{29}\text{Si}$  MAS NMR data of the bifunctional PMO materials synthesized with P123 as SDA and BTET/BTEB as organosilica precursors with different  $\text{CO}_2$  pressures

Pressure (MPa)	$T^n(\text{thiophene})[\%]$			$T^n(\text{benzene})[\%]$			Ratio $\frac{\sum T^n_{\text{thiophene}}}{\sum T^n_{\text{benzene}}}$
	$T^1$	$T^2$	$T^3$	$T^1$	$T^2$	$T^3$	
5.90	10	27	13	12	25	13	1:1
4.90	10	27	13	12	25	13	1:1



**Figure S4.**  $^{13}\text{C}$  MAS NMR spectra of the bifunctional PMOs synthesized with P123 as SDA and BTET/BTEB as organosilica precursors with different  $\text{CO}_2$  pressures.



**Figure S5.** (A) Absorption spectra of BPB ( $4 \times 10^{-6}$  M) in citric acid buffers of pH 3.0 (a), 3.2 (b), 3.4 (c), 3.6 (d), and 3.8 (e) over the wavelength range of 350–660 nm. (B) Dependence of the ratio  $I_{430}/I_{590}$  on the hydrogen ion concentration of citric acid buffers.