Supporting Information

Antibacterial nitrogen-containing mesostructured SBA-15-type materials: Insight on functional groups and surface polarity

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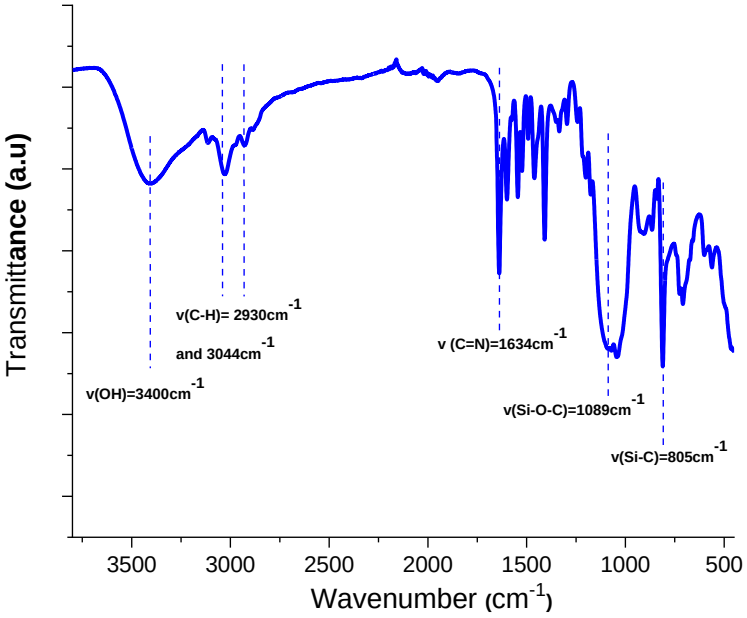
Figure S1. FTIR spectra and UV–Vis absorption spectra of 1-(3-trimethoxysilylpropyl)-4-(4-pyridyl)pyridinium bromide



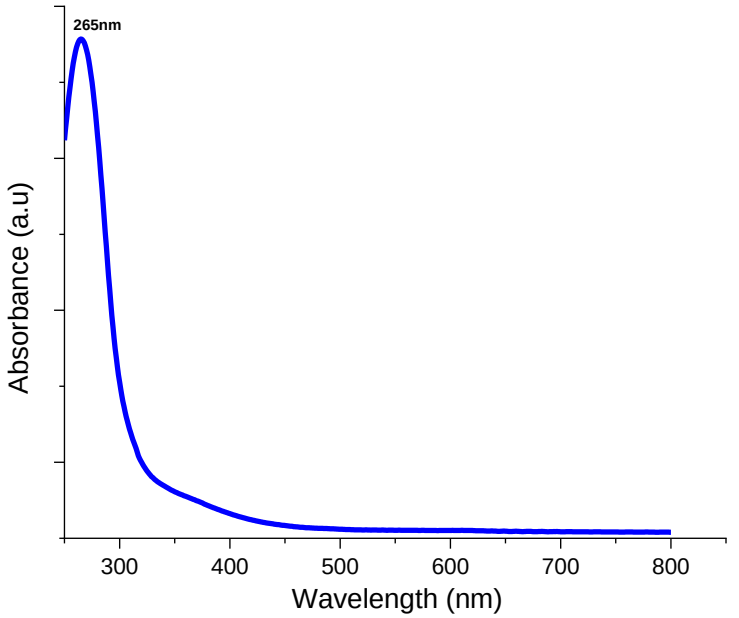
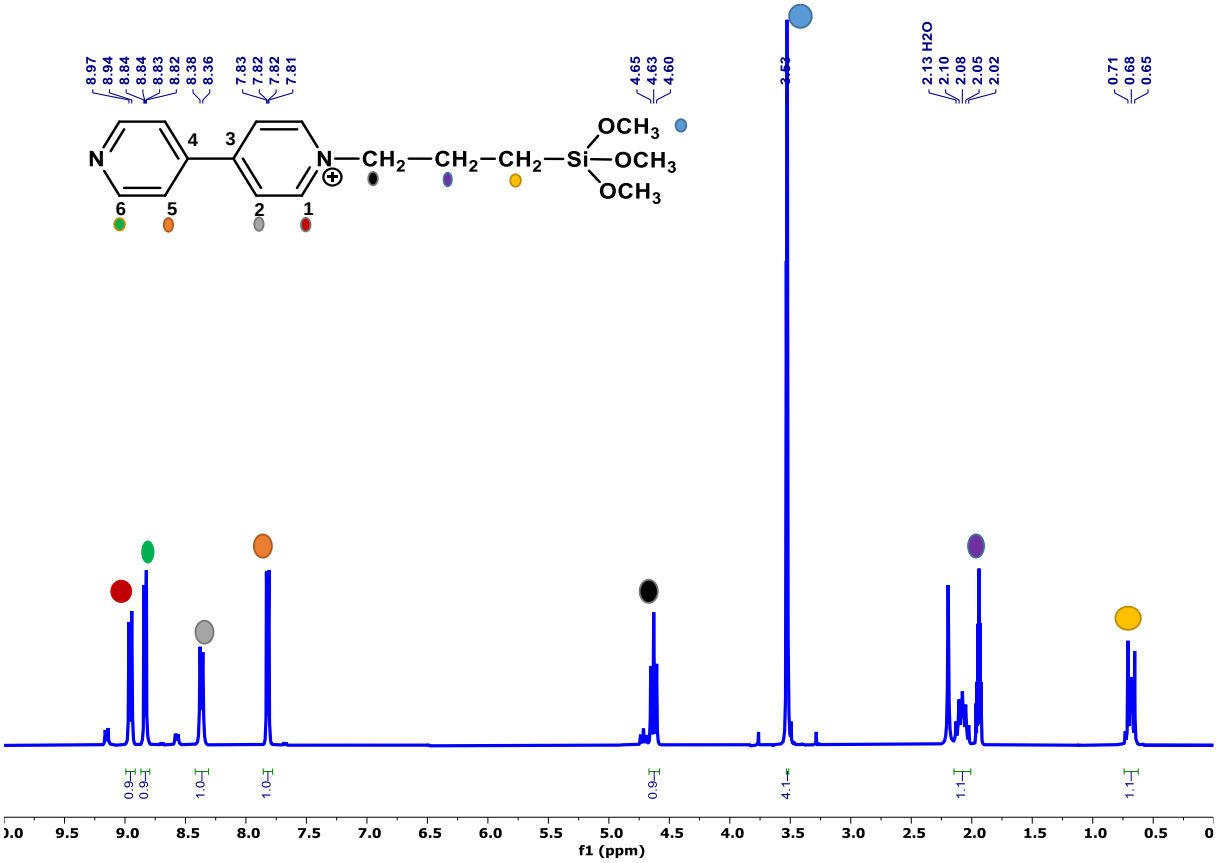
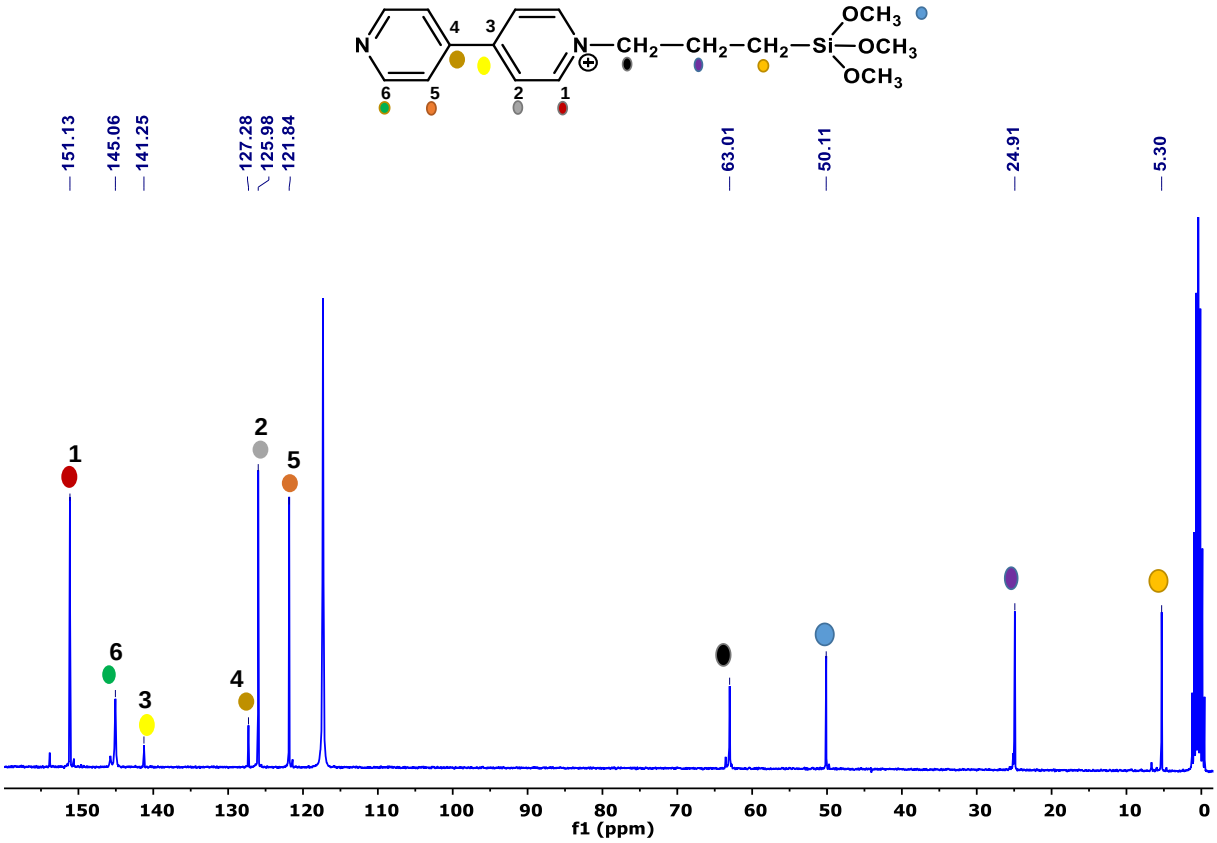


Figure S2. ^{1}H NMR of 1-(3-trimethoxysilylpropyl)-4-(4-pyridyl)pyridinium bromide



^{1}H NMR (400 MHz,CD_3CN) δ 0.62-0.74 (m, 2H, CH_2-Si), 2.01-2.15 (m, 2H, C**H**$_2$-CH_2-Si), 3.53 (s, 9H, Si-O-C**H**$_3$), 4.63 (t, $^{3}J_{HH}$ = 7.3 Hz, 2H, N-C**H**$_2$), 7.78-7.86 (m, 2H, **H**^{5}), 8.37 (d, $^{3}J_{HH}$ =6.9 Hz, 2H, **H**^{2}), 8.80-8.87 (m, 2H, **H**^{6}), 8.96 (d, $^{3}J_{HH}$ =7 Hz, 2H, **H**^{1}).

Figure S3. ^{13}C NMR of 1-(3-trimethoxysilylpropyl)-4-(4-pyridyl)pyridinium bromide



^{13}C NMR (101 MHz, CD_3CN): δ 5.3 (**C**H_2-Si), 24.9 (**C**H_2-CH_2-Si), 50.11 (Si-O**C**H_3), 63 (N-CH_2), 121.84 (**C**^{5}), 125.98 (**C**^{2}), 127.27 (**C**^{4}), 141.25 (**C**^{3}), 146.06 (**C**^{6}), 151.13 (**C**^{1})

Figure S4. FTIR spectrum of organomodified mesoporous SBA-15 and HMDS passivated organosilica

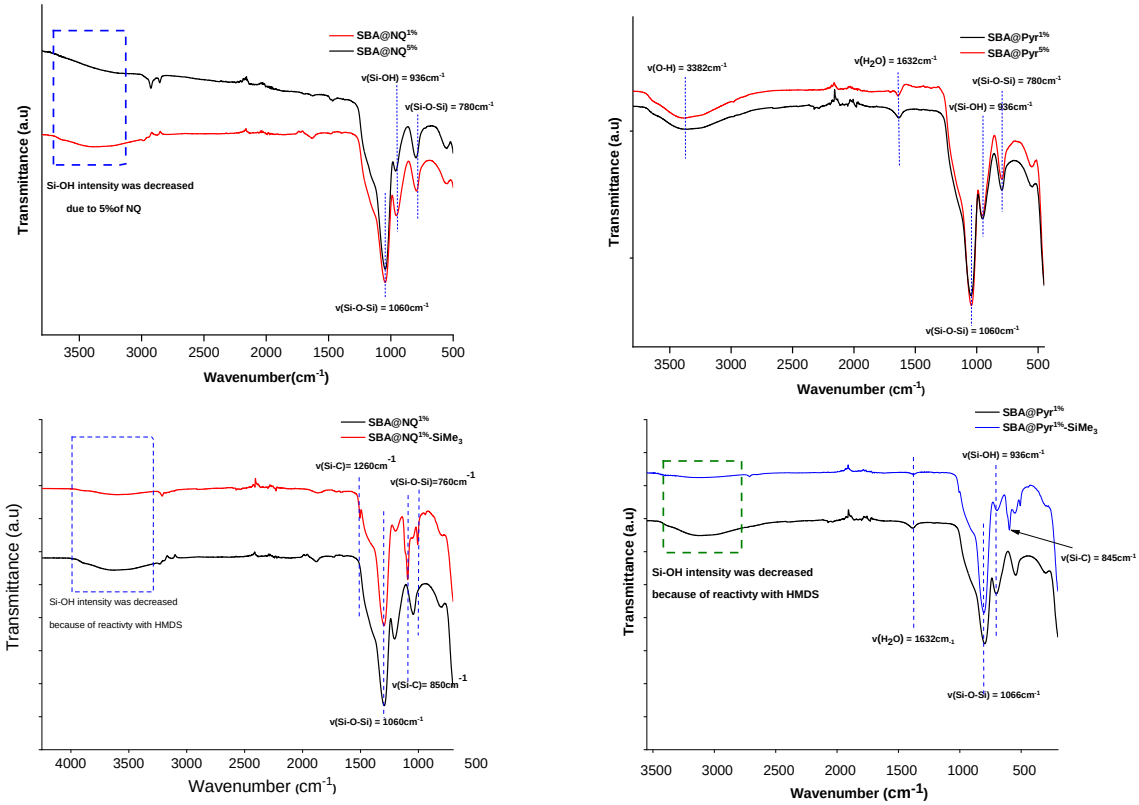


Figure S5. Solid state NMR ^{13}C spectra of SBA@NQ $^{5\%}$

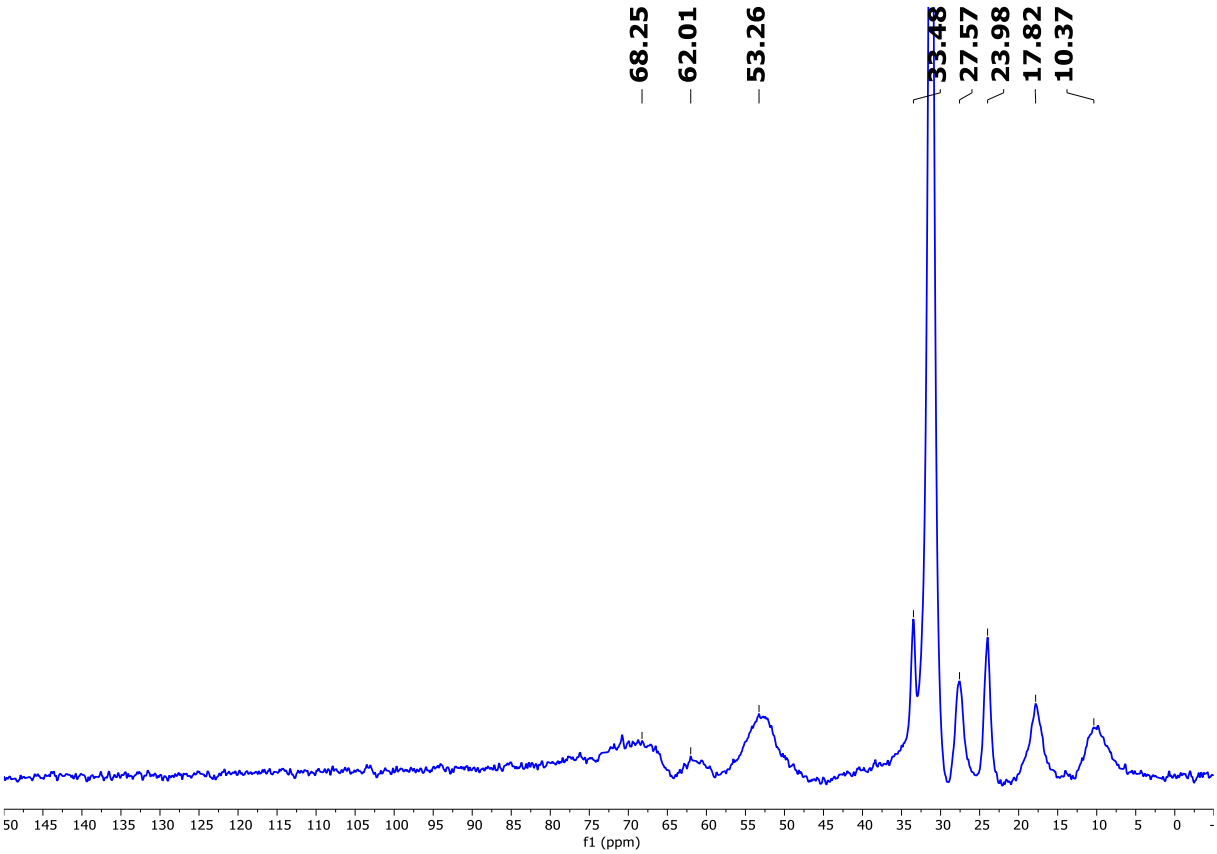
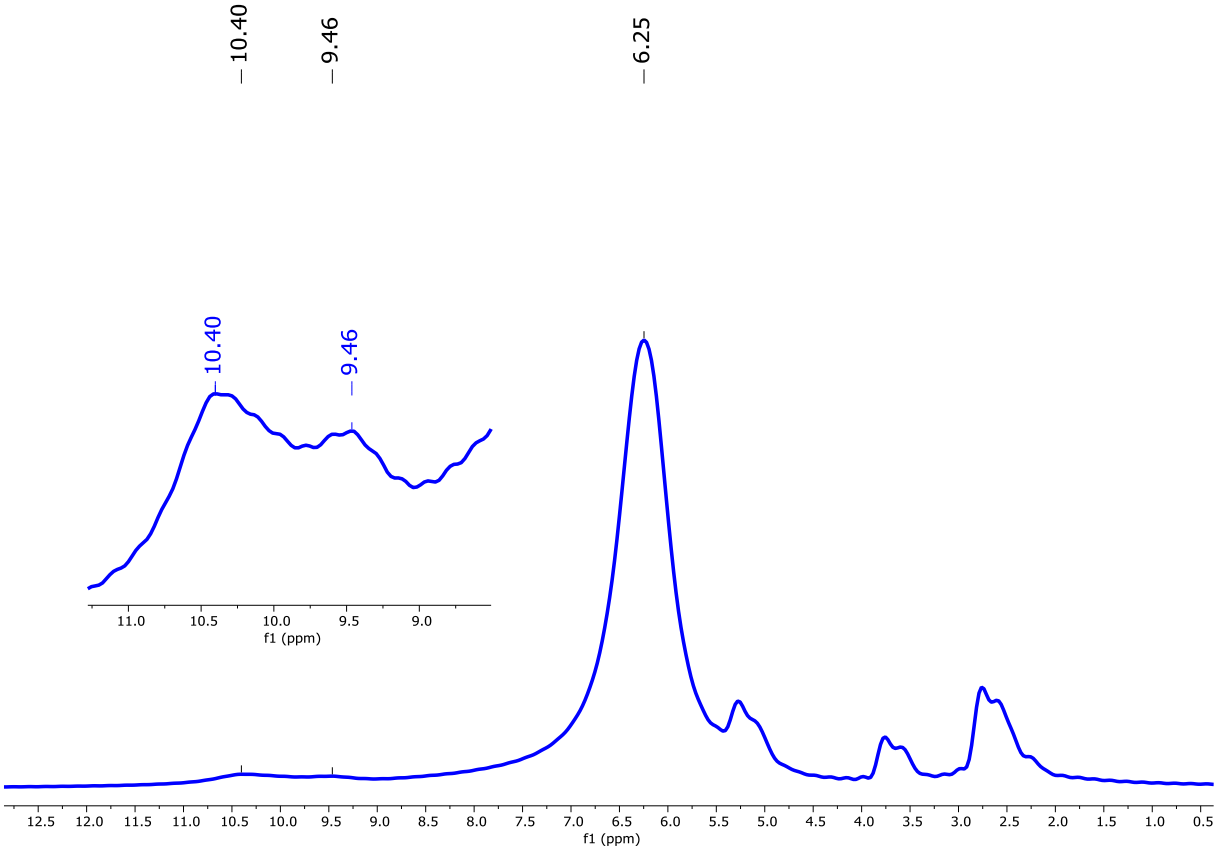


Figure S6. High resolution ^{1}H NMR spectra and COSY spectra of SBA@Pyr$^{5\%}$



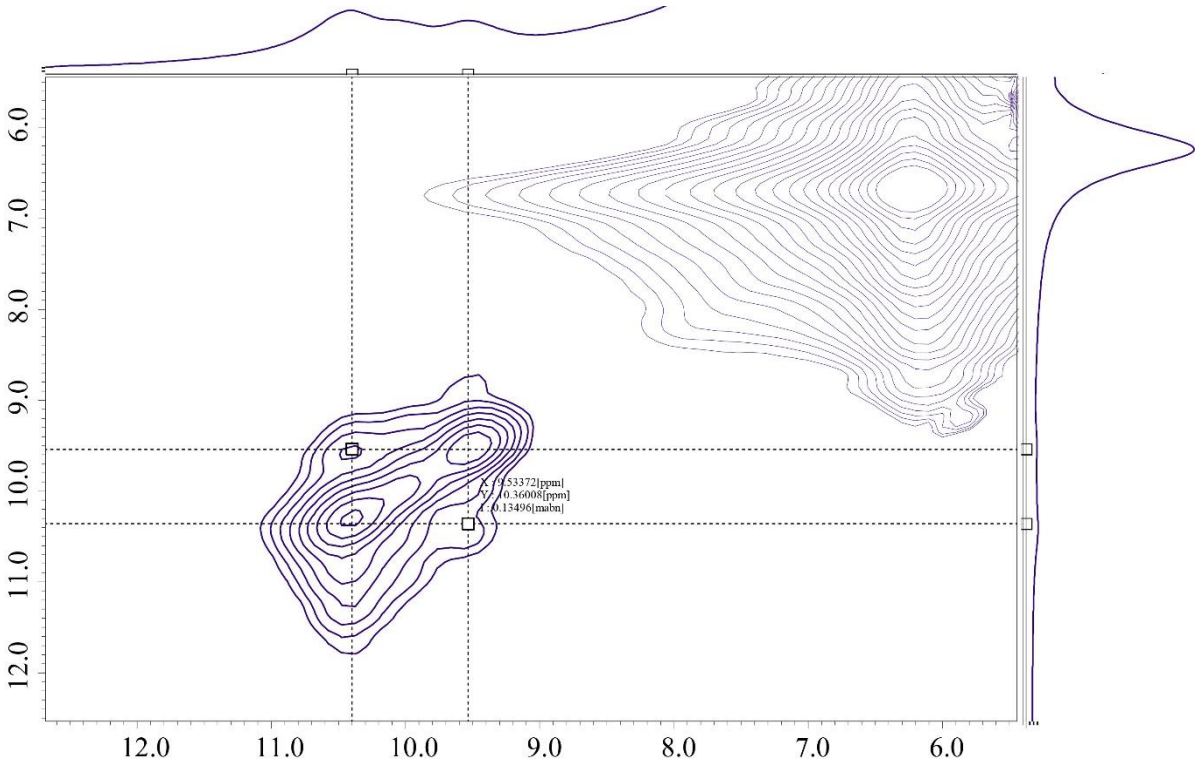


Figure S7. Thermogravimetric analysis (TGA) of organomodified mesoporous silica

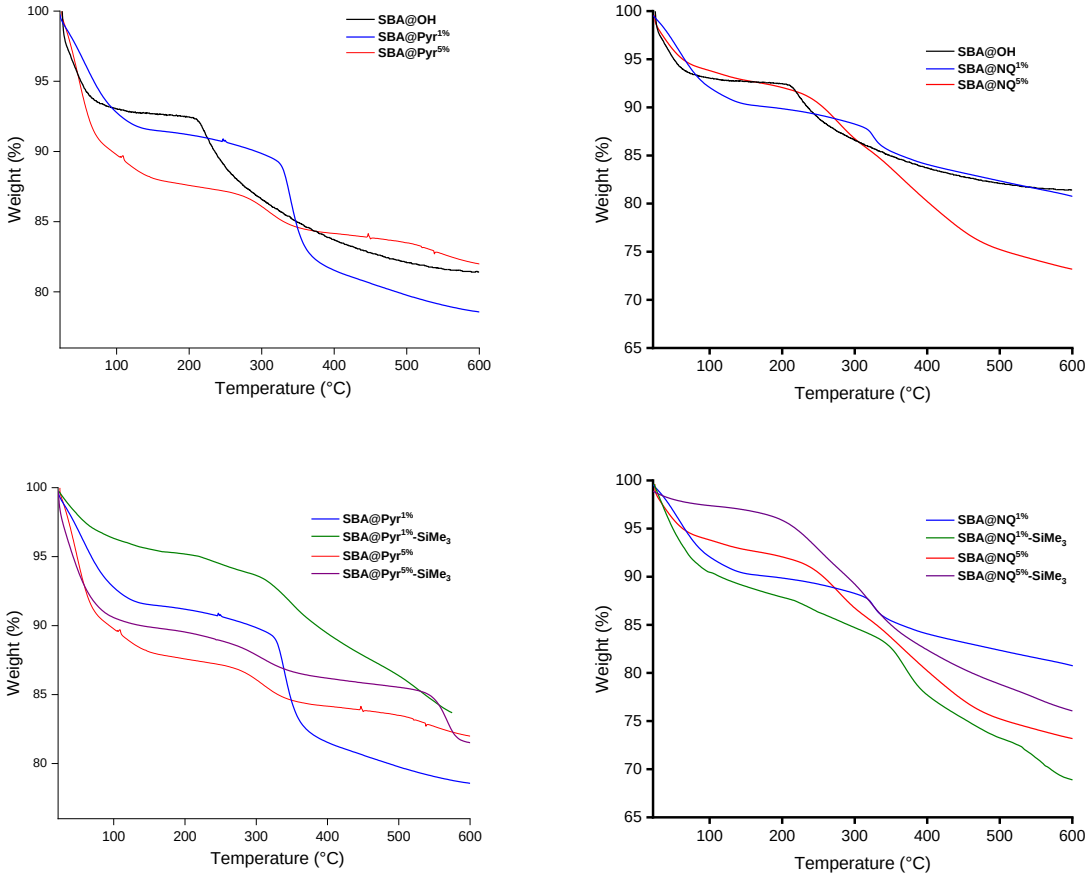


Figure S8. Nitrogen sorption analysis of organosilica materials

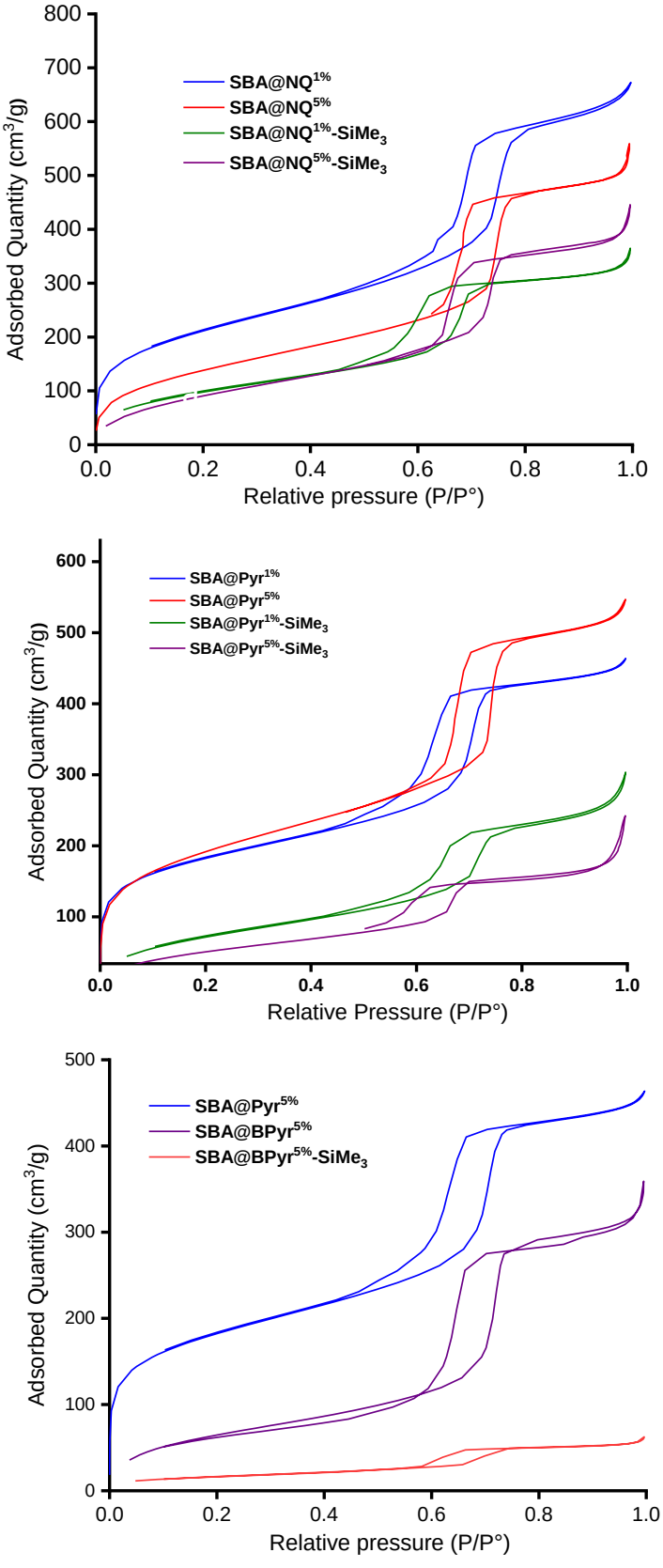


Figure S9. SEM images of SBA@OH and SBA@$NH_2^{5\%}$

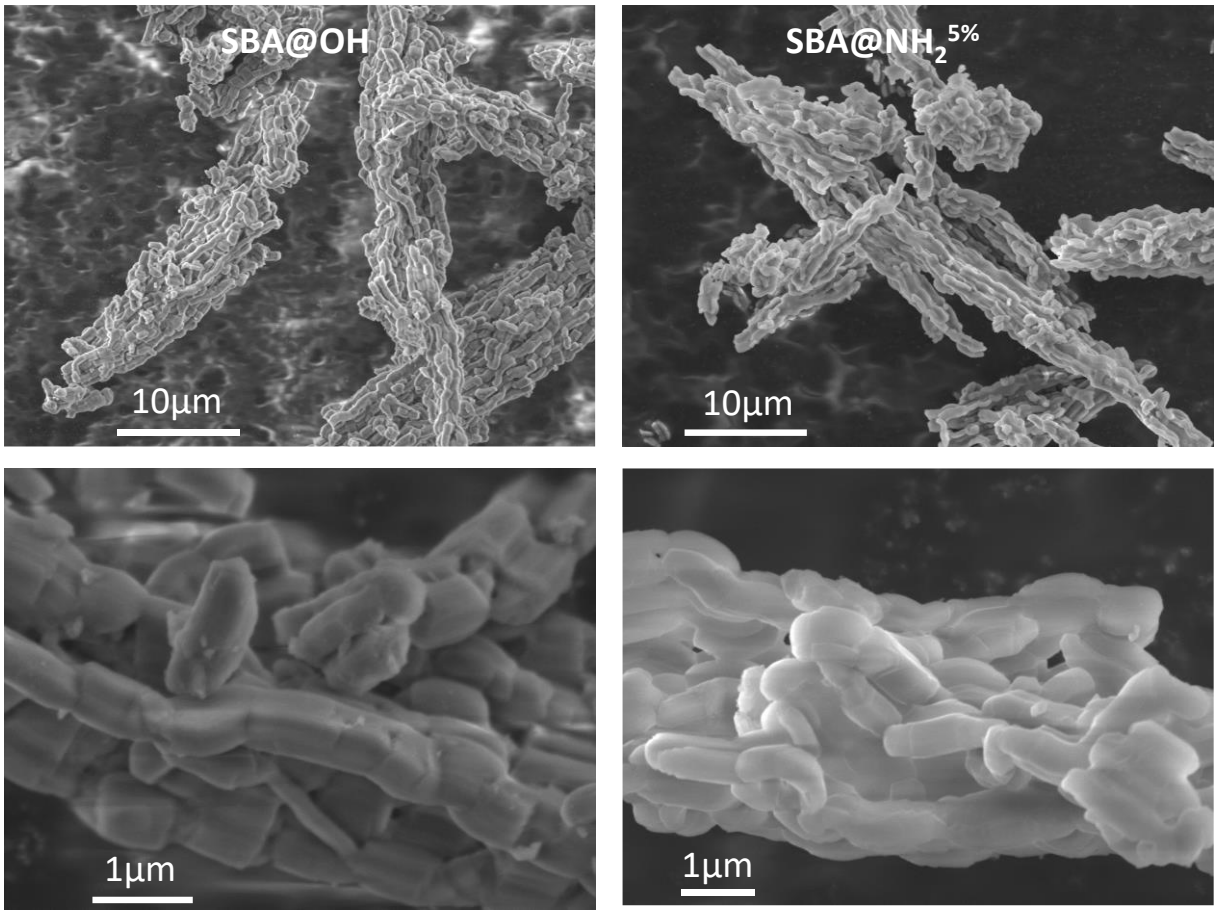


Table S1. Quantification of anion exchange sites within the material

Materials		n_{ads} (mmol/g)			n_{Sites} (mmol/g)	Fraction of occupied sites F (%)		
	C (mol/L)	pH = 2	pH = 6.5	pH = 9.5		pH = 2	pH = 6.5	pH = 9.5
SBA@$NH_2^{5\%}$	10^{-4}	0.0163	0.0143	0.00049	0.36	4.5	4	0.14
SBA@Pyr$^{5\%}$	10^{-4}	0.0133	0.00202	0.00306	0.47	2.8	0.43	0.65
SBA@Bpyr$^{5\%}$	10^{-4}	0.0235	0.0220	0.00713	0.47	5	4.7	1.5
SBA@NQ$^{5\%}$	10^{-4}	0.0504	0.0504	0.0504	0.41	12.3	12.3	12.3
SBA@NQ$^{5\%}$	5.10^{-4}	0.231			0.41	56		
SBA@NQ$^{5\%}$	10^{-3}	0,375			0.41	90		

Figure S10. Removal of helianthine (methyl orange) using **SBA@NQ$^{5\%}$** at different concentration. a) Percentage of Helianthine removal, b) Adsorption capacity (Q_e, mg/g)

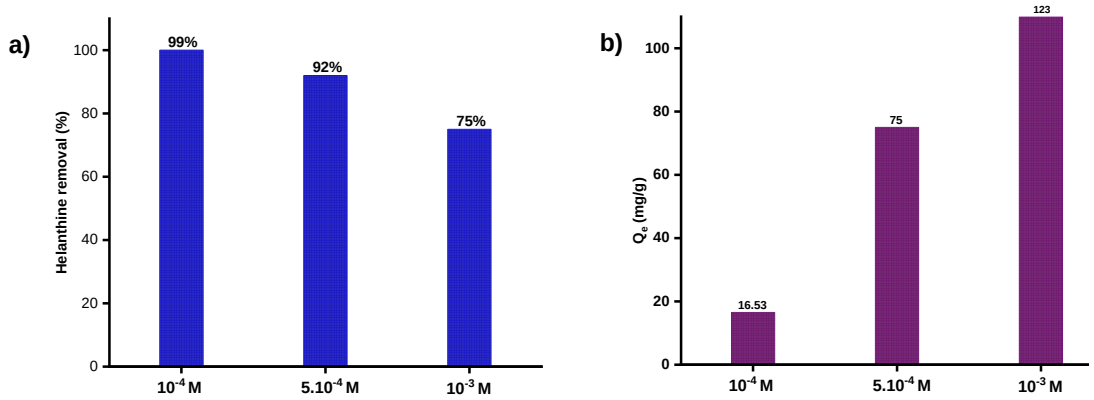


Figure S11. Quercetin adsorption through organosilica and Quercetin release in water