

Supplementary Information

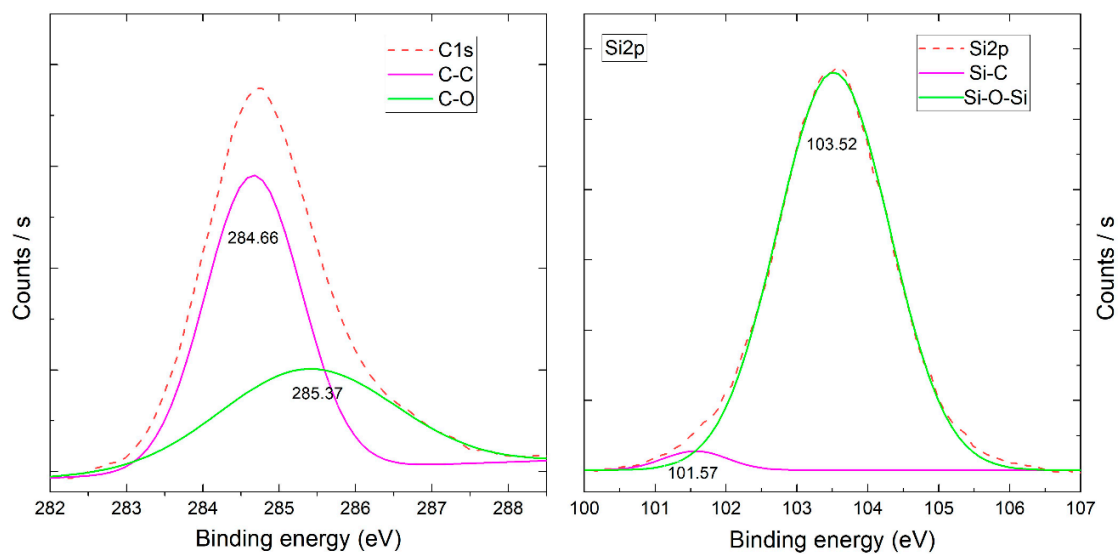


Figure S1. Deconvolution analysis for Si2p and C1s orbitals of SiO₂-a particles.

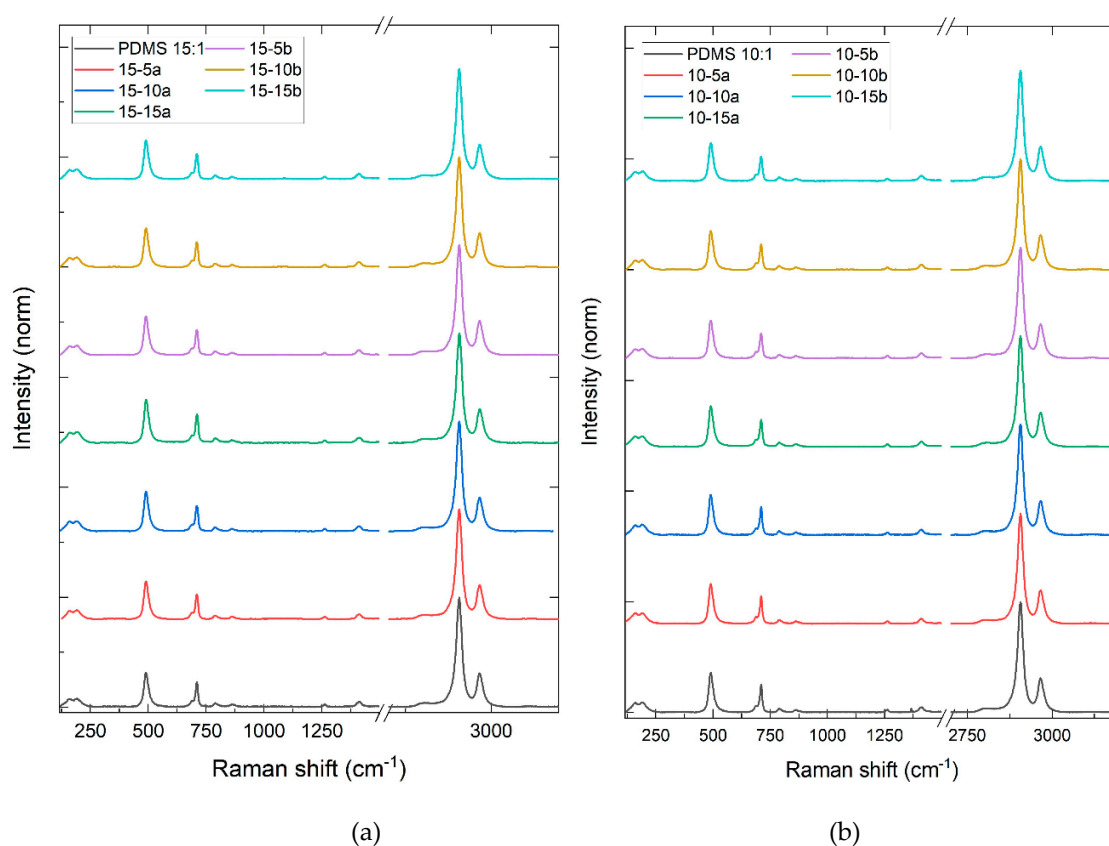


Figure S2. Raman spectra of (a) PDMS 15:1 and (b) PDMS 10:1 composite with different NPs SiO₂ concentration (5%, 10% and 15%).

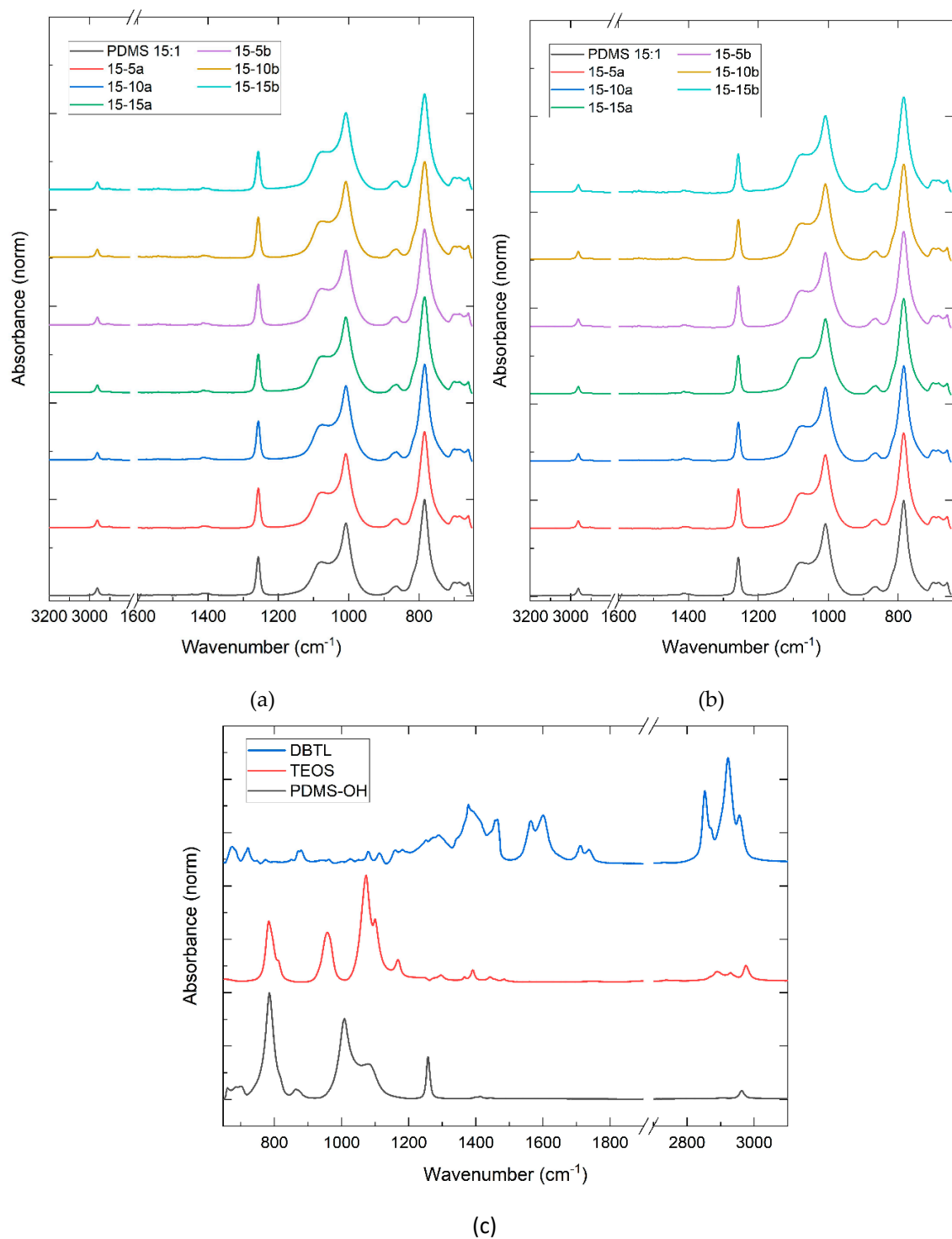
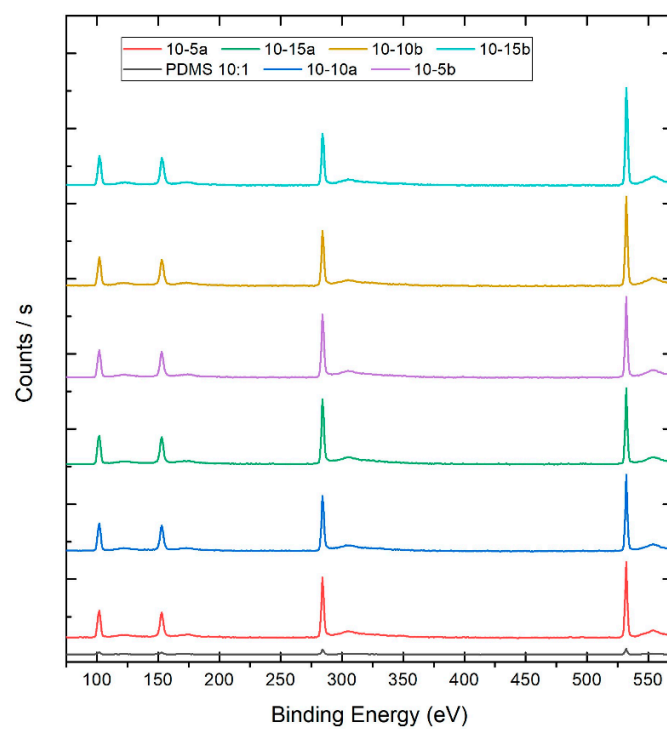
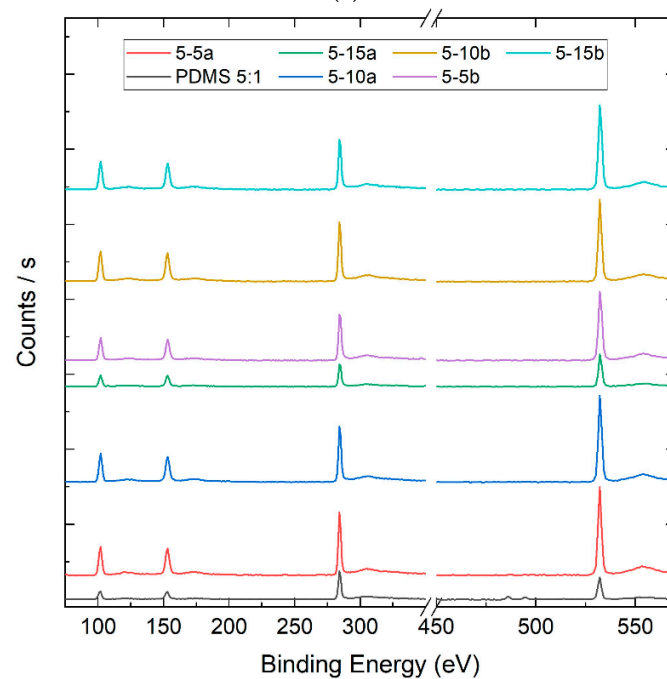


Figure S3. FTIR spectra of (a) PDMS 15:1 and (b) PDMS 10:1 composite with different NPs SiO₂ concentration (5%, 10% and 15%). (c) FTIR spectra of principal components of PDMS-SiO₂ composites.

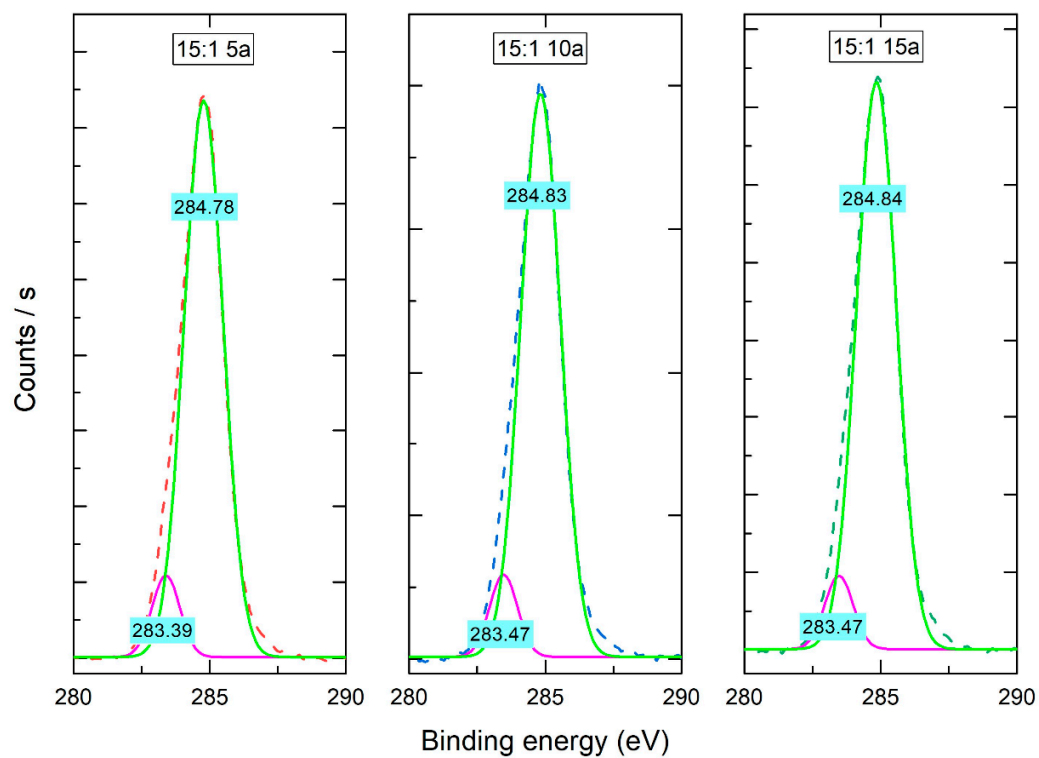


(a)

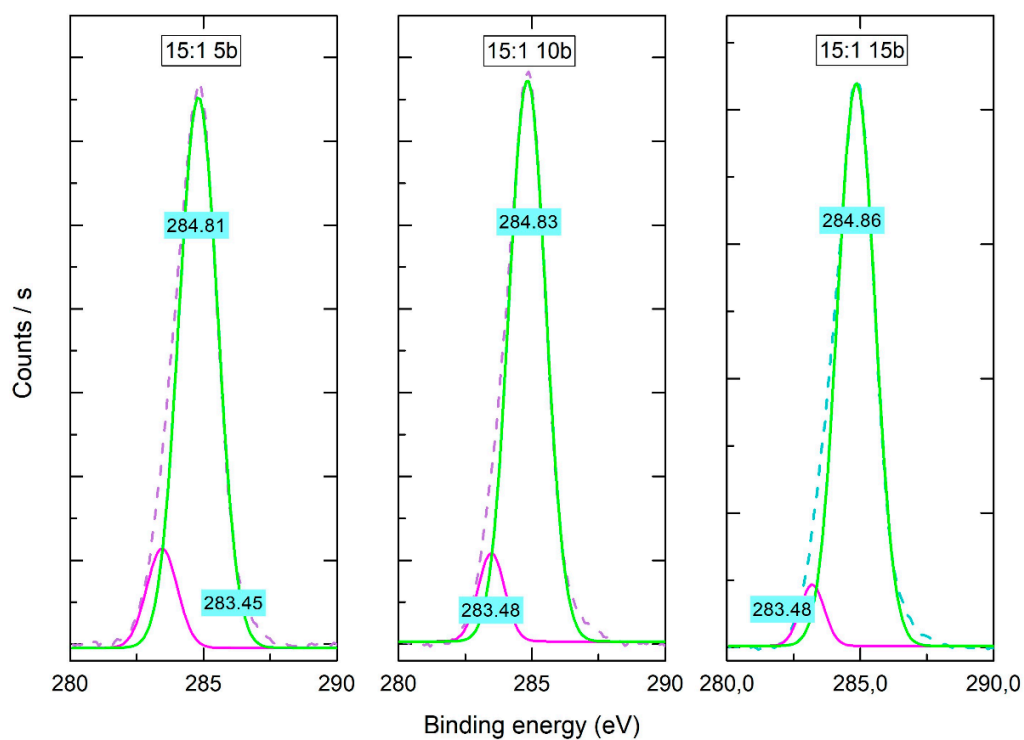


(b)

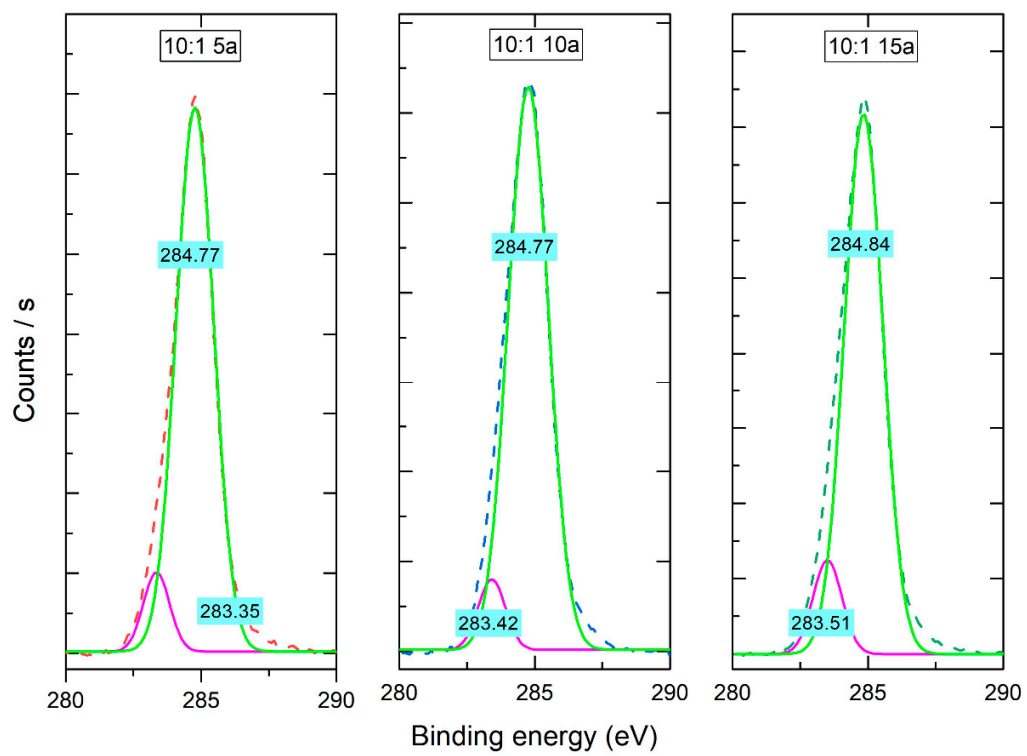
Figure S4. XPS spectra of (a) PDMS 10:1 and (b) PDMS 5:1 composite with different NPs SiO₂ concentration (5%, 10% and 15%).



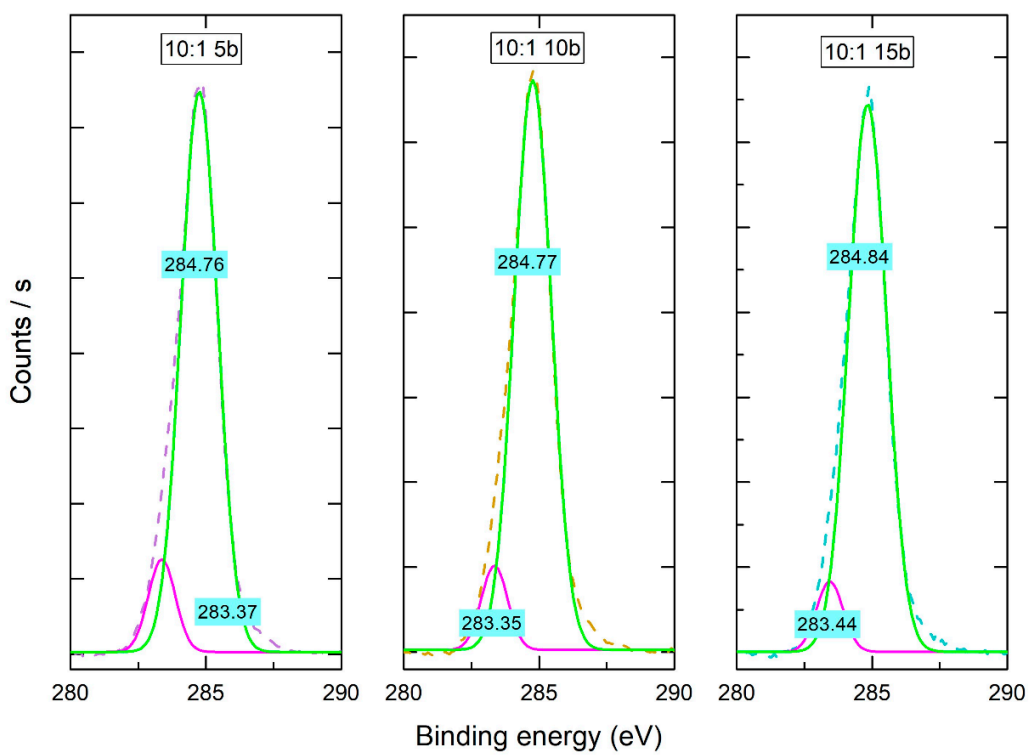
(a)



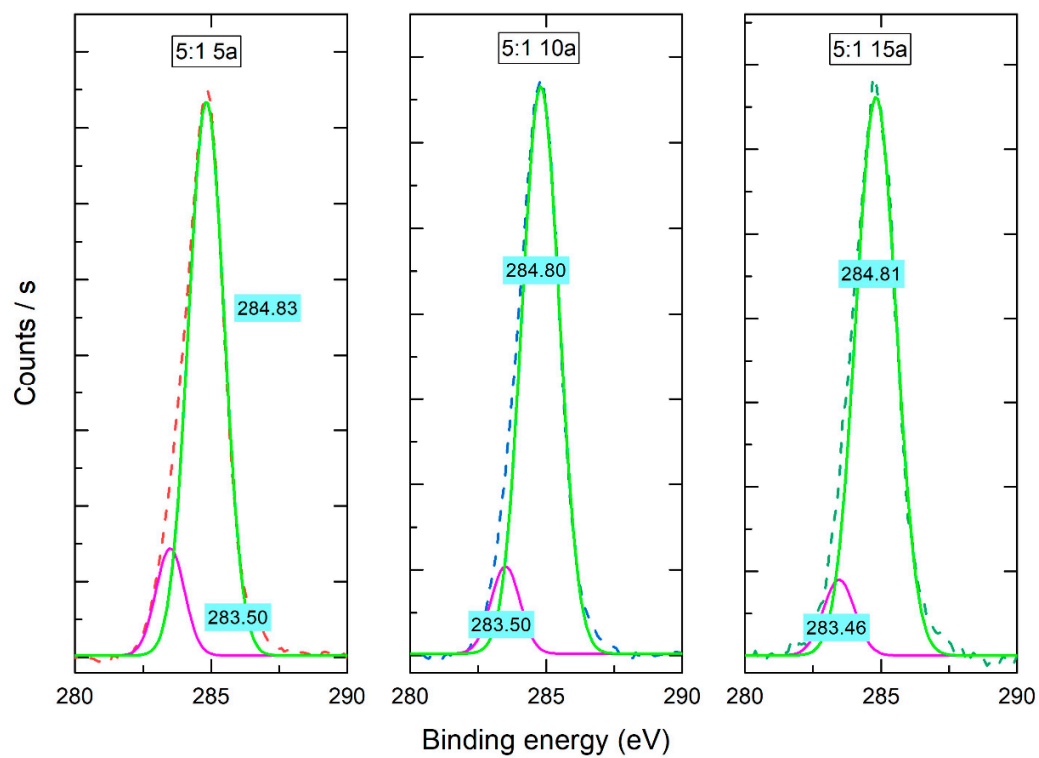
(b)



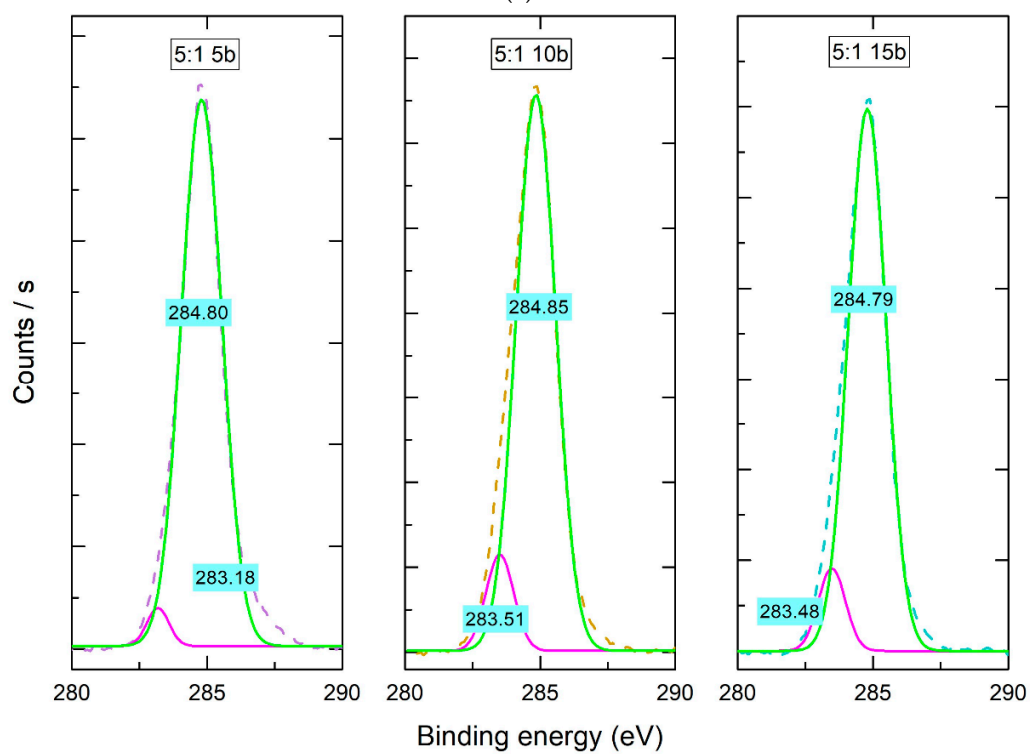
(c)



(d)

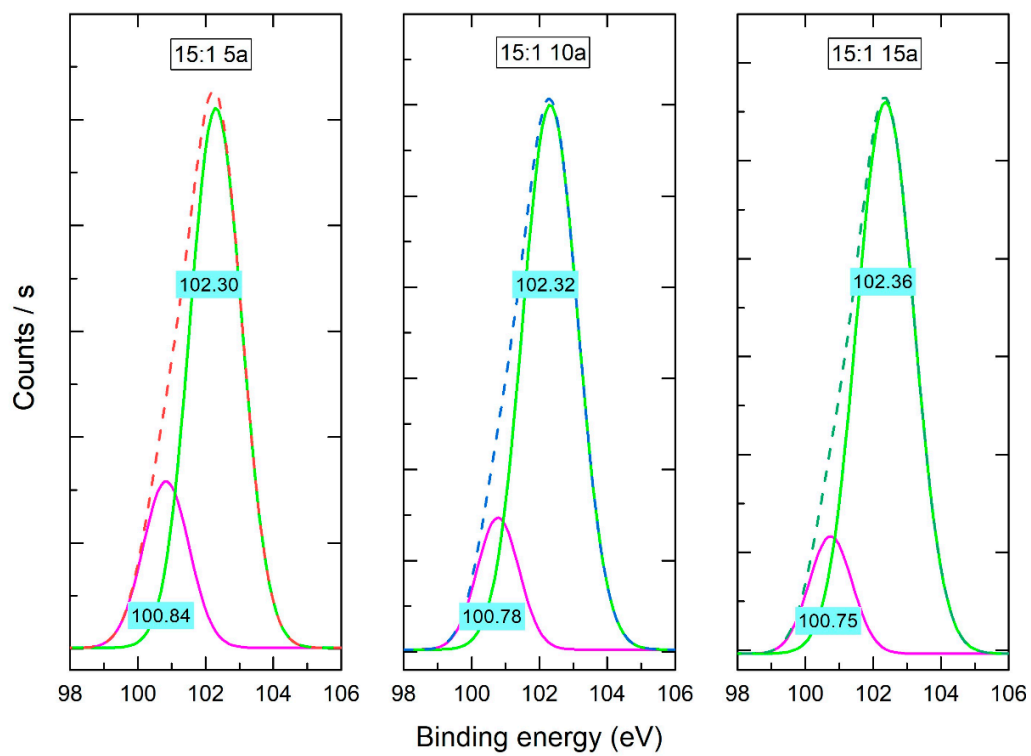


(e)

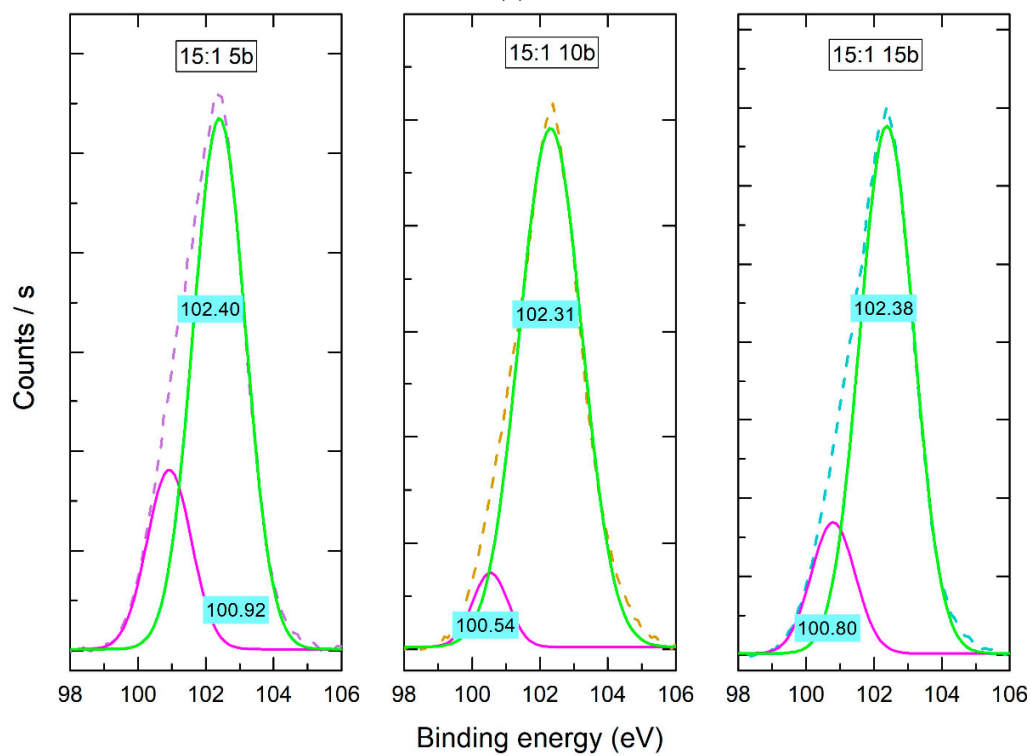


(f)

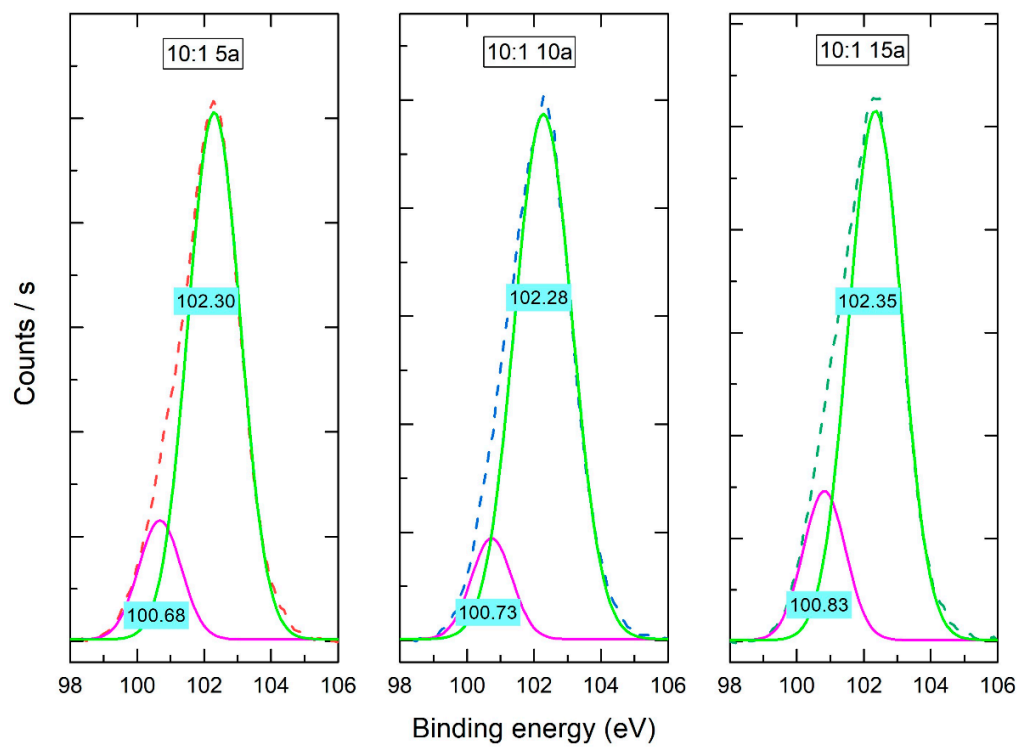
Figure S5. Deconvolution analysis for C1s species of PDMS-%SiO₂ composites: C1s (dash), C-Si (magenta) and C-C (green).



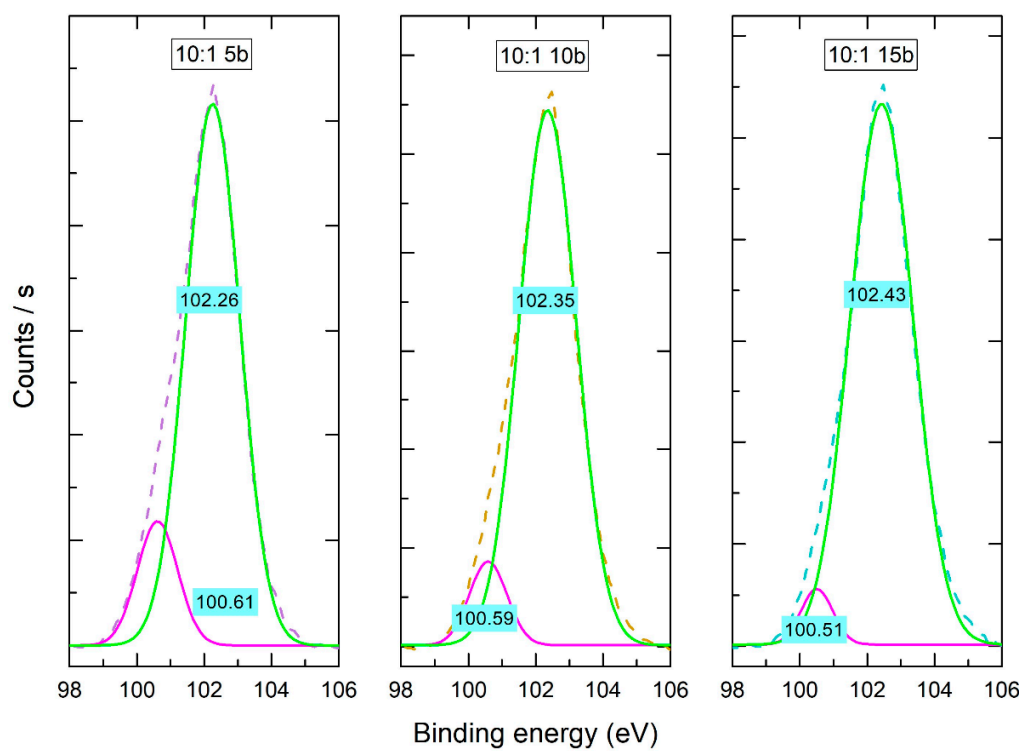
(a)



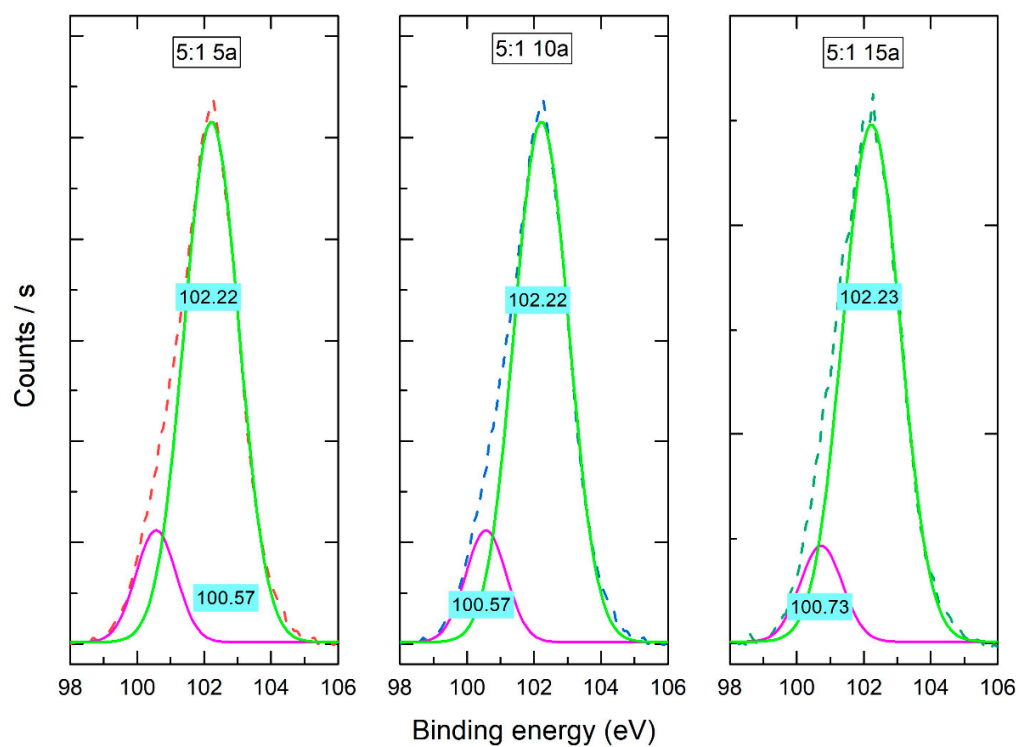
(b)



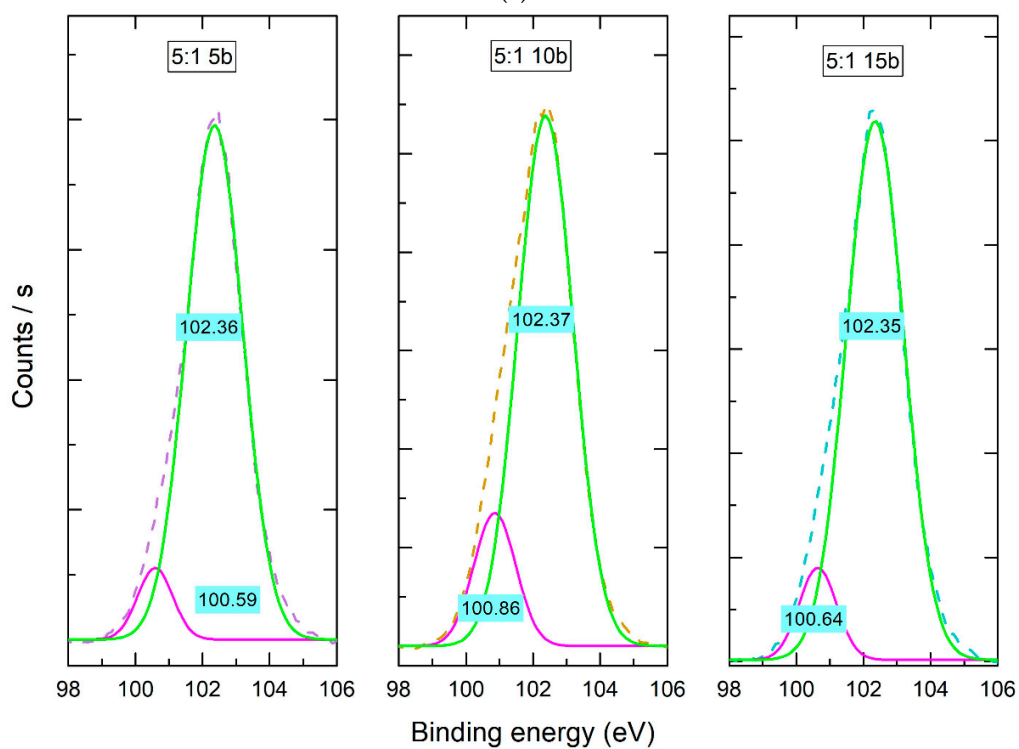
(c)



(d)



(e)



(f)

Figure S6. Deconvolution analysis for Si₂p species of PDMS-%SiO₂ composites: Si₂p (dash), Si-C (magenta) and O-Si-O (green).