

Supporting Information

Effect of Cellulose Nanocrystals on the Coating of Chitosan Nanocomposite Film Using Plasma-Mediated Deposition of Amorphous Hydrogenated Carbon (a-C:H) Layers

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AFM roughness data

Table S1. AFM roughness data for the chitosan (CS) samples.

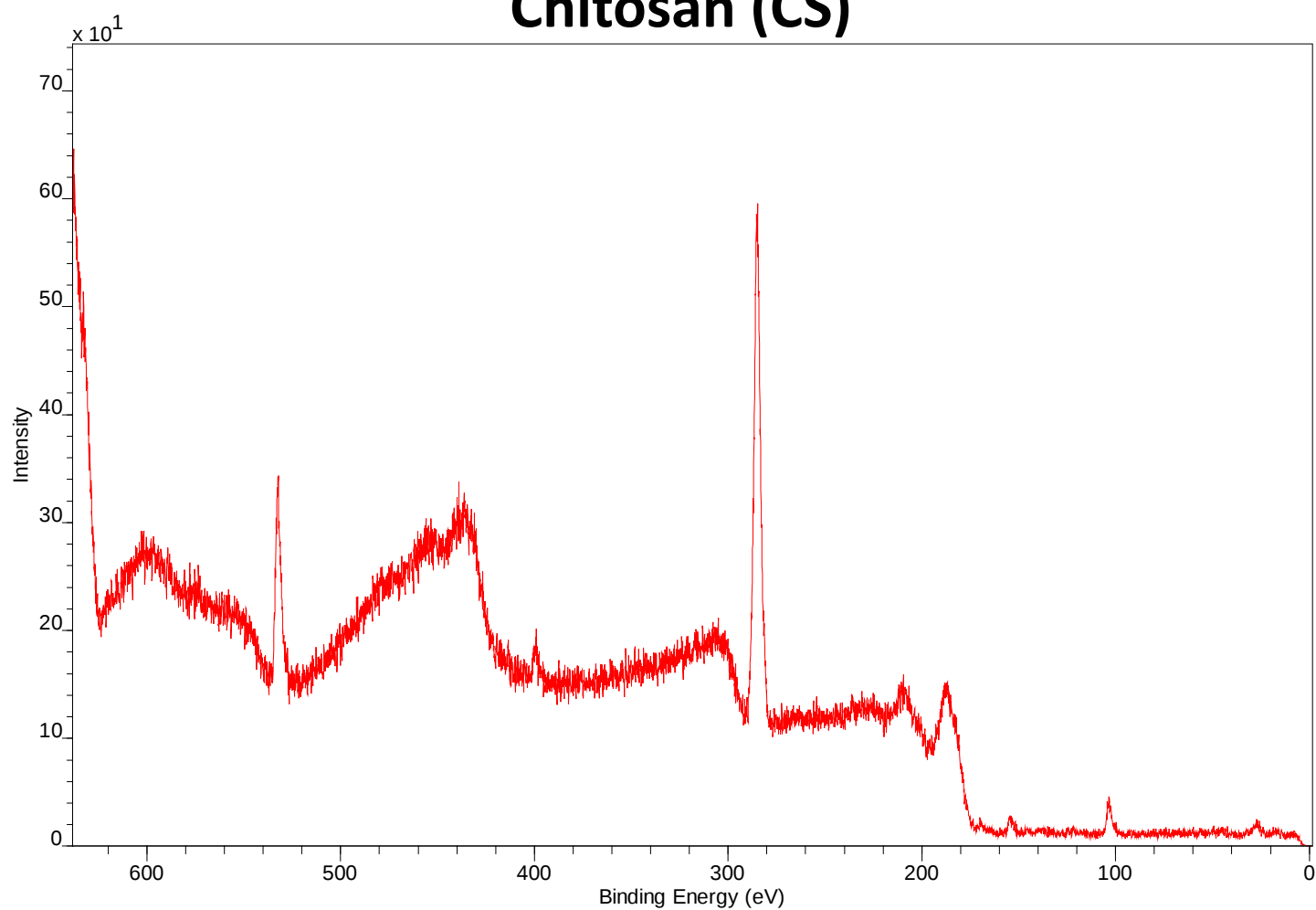
	Chitosan (CS)			
sample	average [nm]	rms [nm]	Max. valley depth [nm]	Max. peak hight [nm]
reference	8.37	10.19	25.37	47.20
O ₂ plasma treated	2.53	3.30	12.31	23.04
50 nm a-C:H	3.18	4.74	27.78	68.16
100 nm a-C:H	5.60	7.57	20.48	62.78

Table S2. AFM roughness data for the nanocrystal reinforced chitosan (CS-CN) samples.

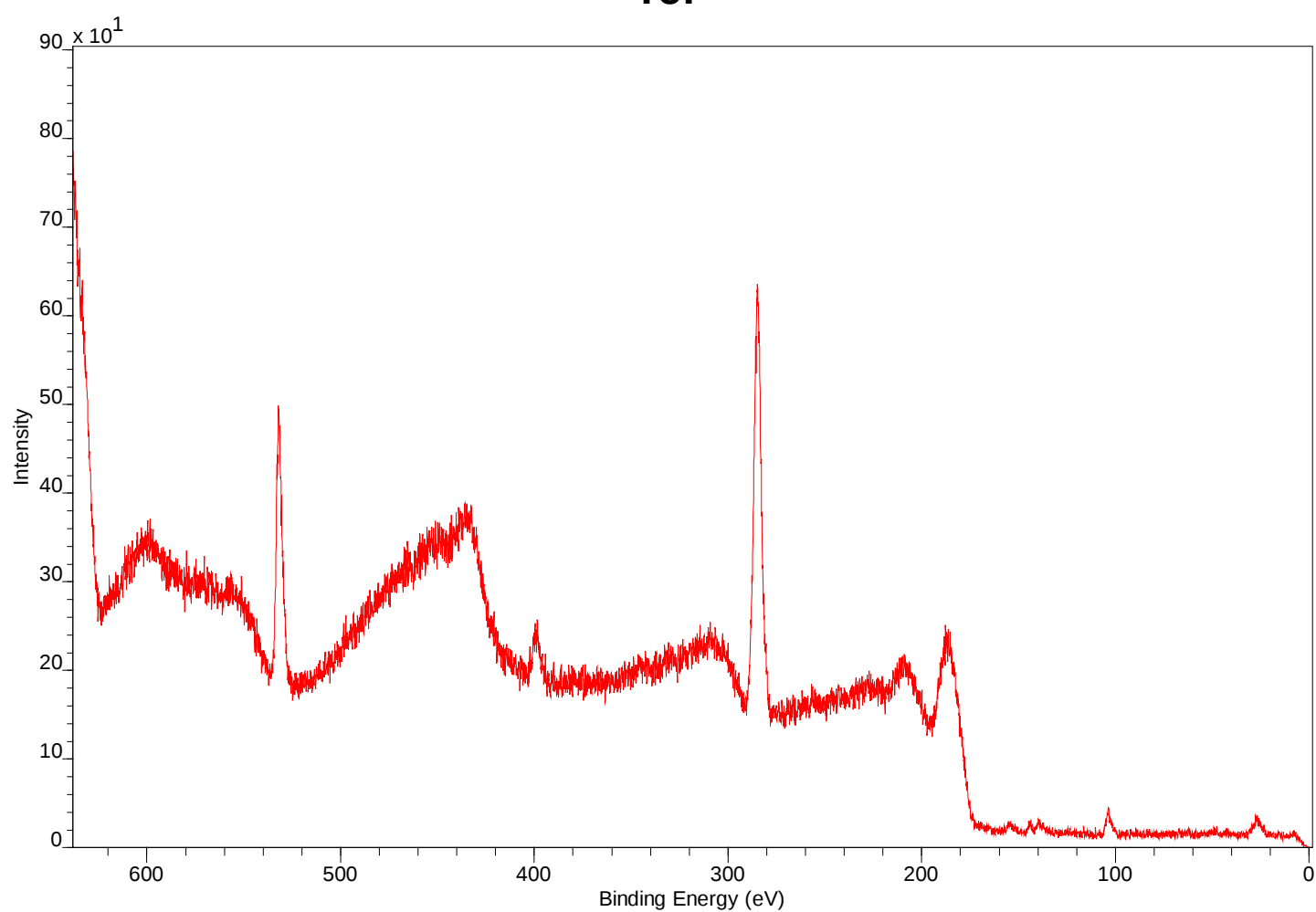
	Chitosan (CS) + CN			
sample	average [nm]	rms [nm]	Max. valley depth [nm]	Max. peak hight [nm]
reference	7.04	8.90	35.66	55.92
O ₂ plasma treated	9.68	13.36	40.67	183.15
50 nm a-C:H	25.03	32.53	139.55	247.67
100 nm a-C:H	13.29	17.13	46.64	66.76

XPS data – surveys

Chitosan (CS)



ref



O_2

Figure S1a. XPS survey spectra (ref + O_2 plasma treated) for the chitosan (CS) samples in the range from 0-700 eV.

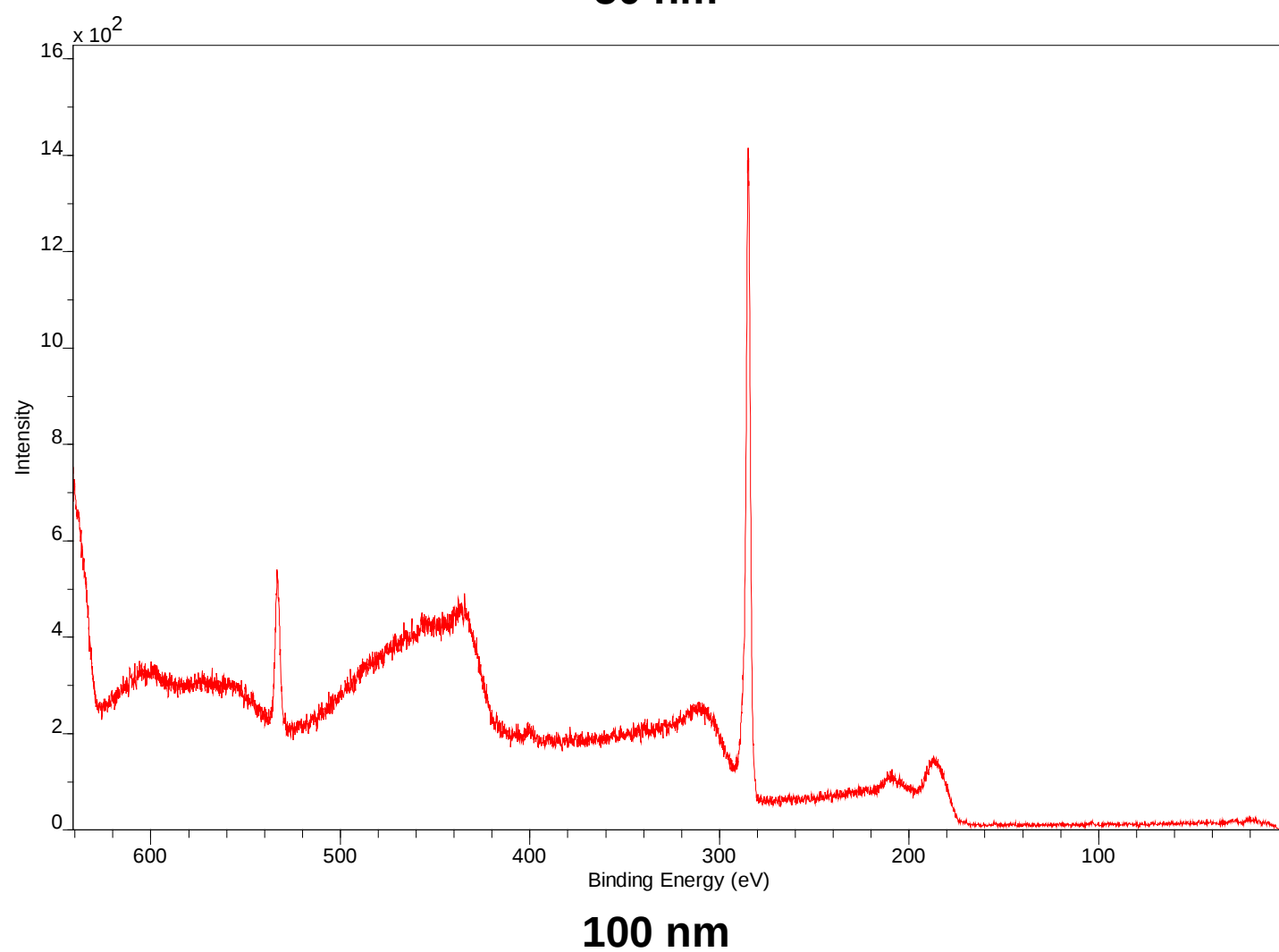
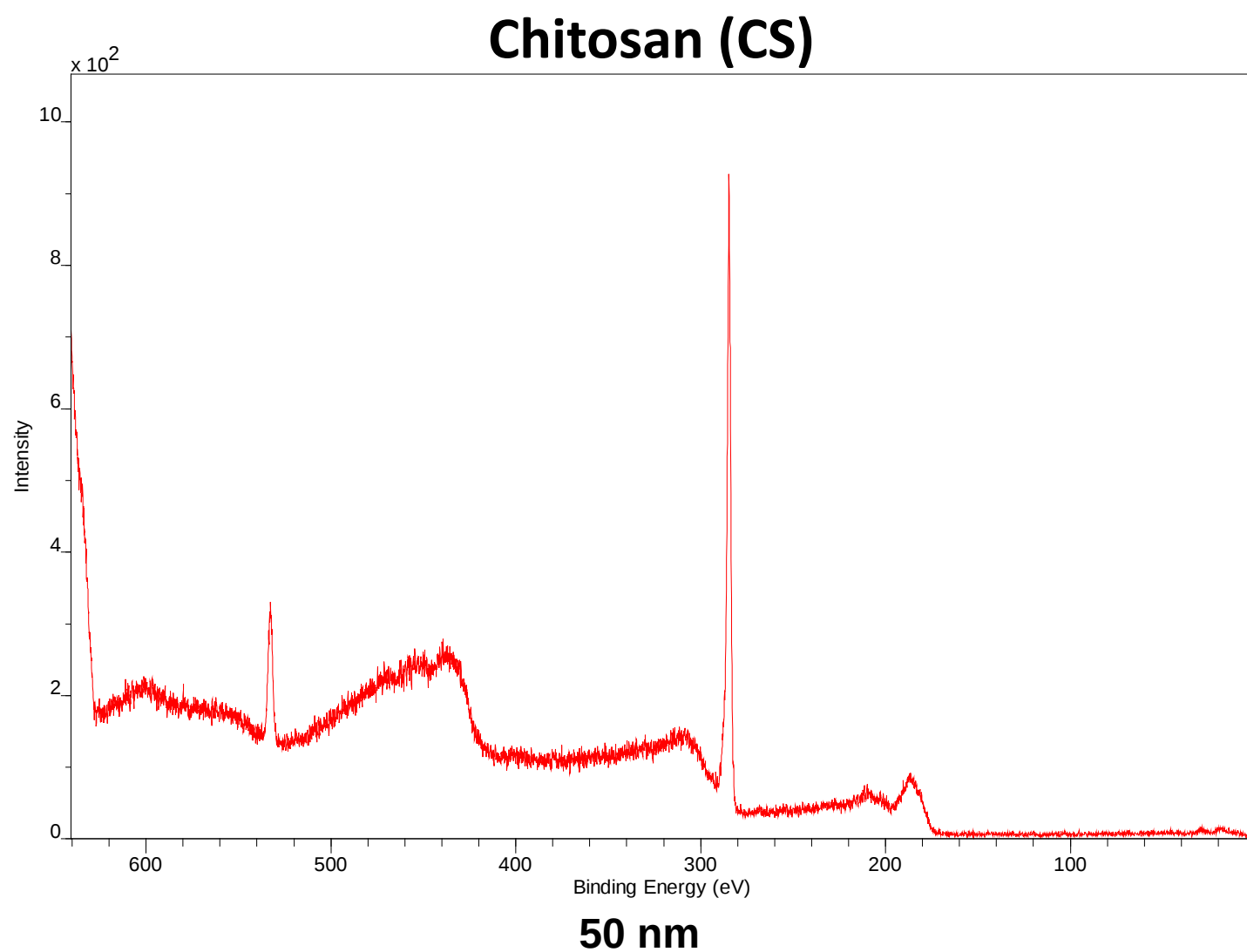


Figure S1b. XPS survey spectra (50 nm + 100 nm a-C:H) for the chitosan (CS) samples in the range from 0-700 eV.

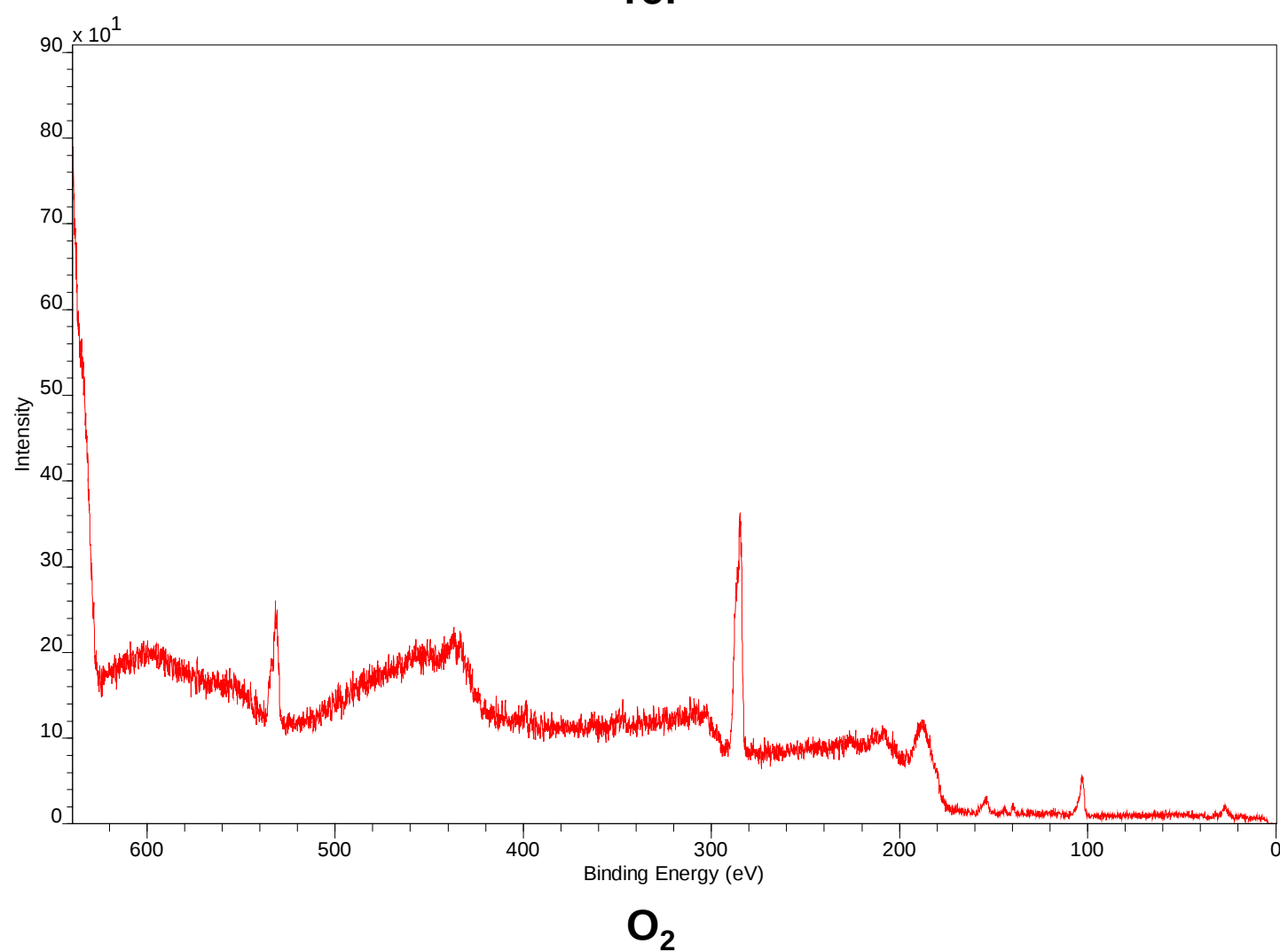
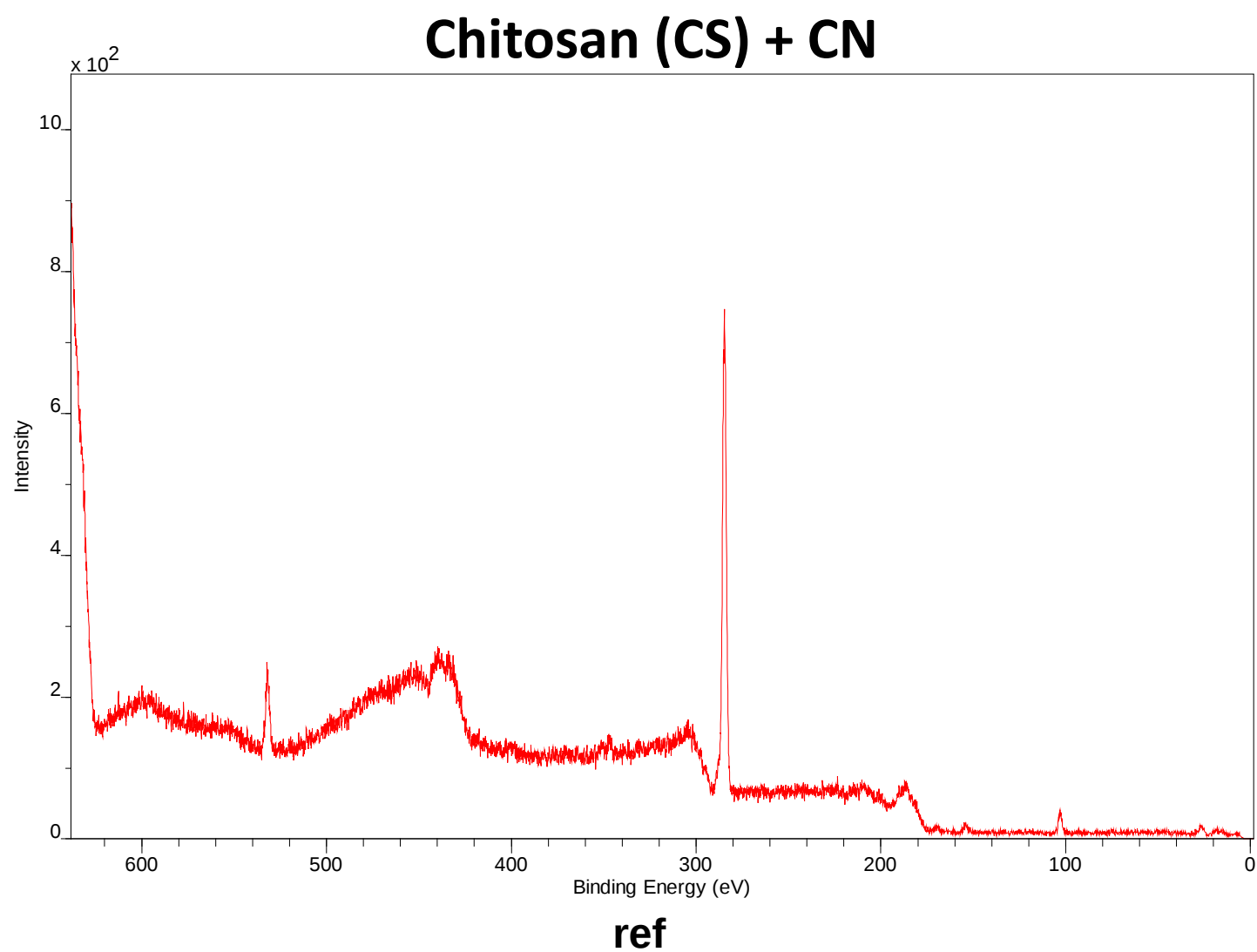


Figure S2a. XPS survey spectra (ref + O₂ plasma treated) for the reinforced chitosan (CS-CN) samples in the range from 0-700 eV.

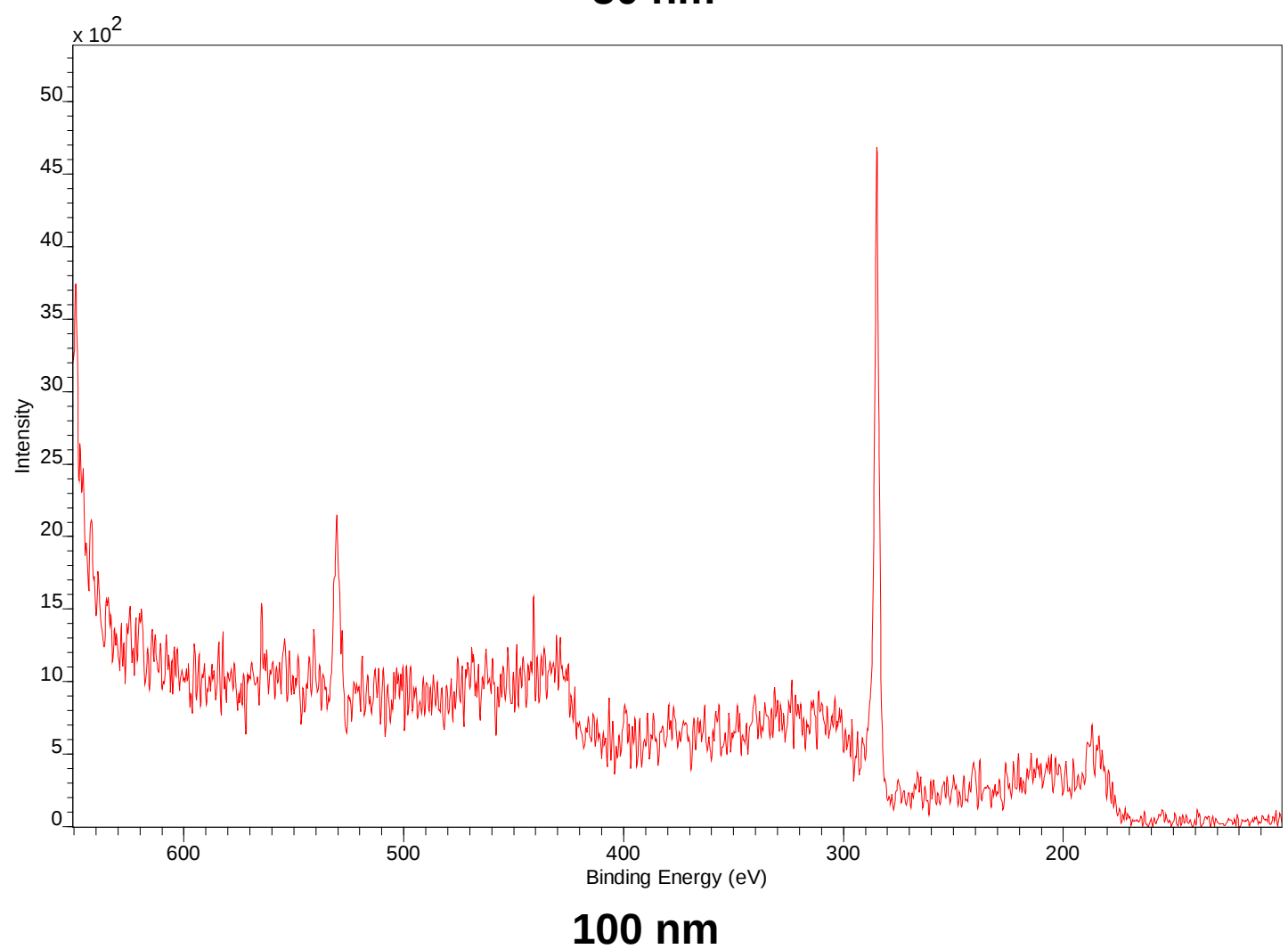
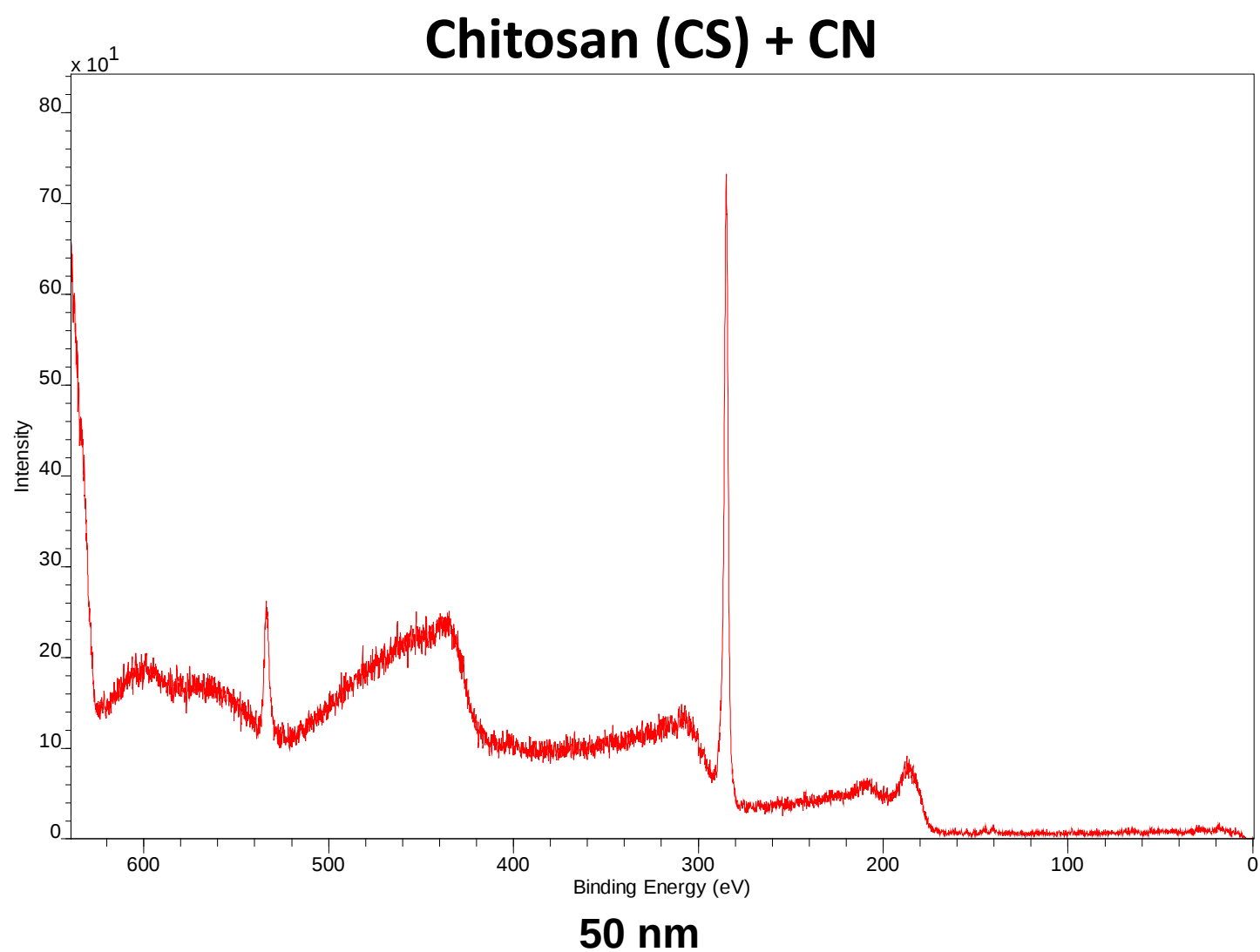
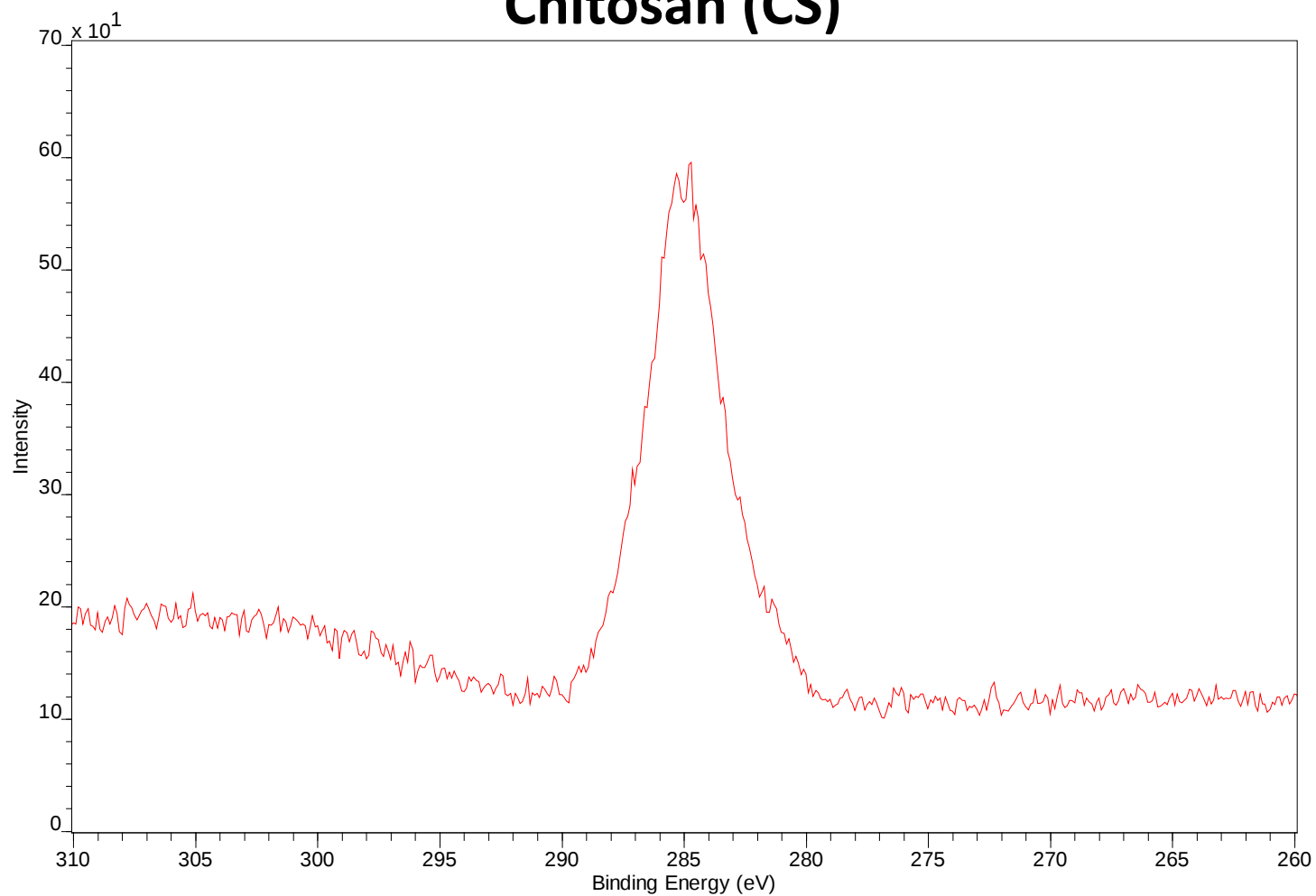


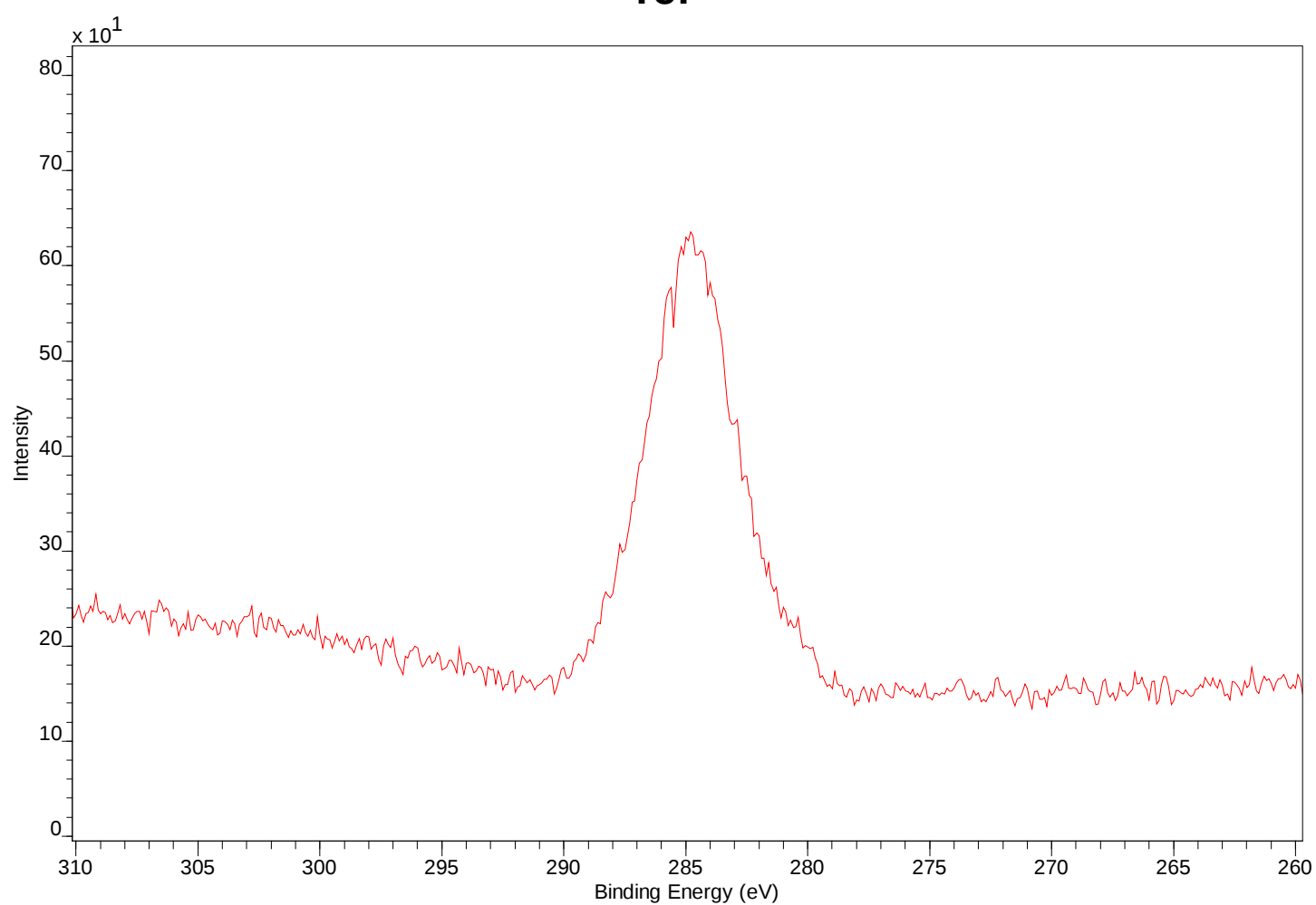
Figure S2b. XPS survey spectra (50 nm + 100 nm a-C:H) for the reinforced chitosan (CS-CN) samples in the range from 0-700 eV.

XPS data – C1s peaks

Chitosan (CS)



ref



O₂

Figure S3a. C1s peaks (ref + O₂ plasma treated) for the chitosan (CS) samples.

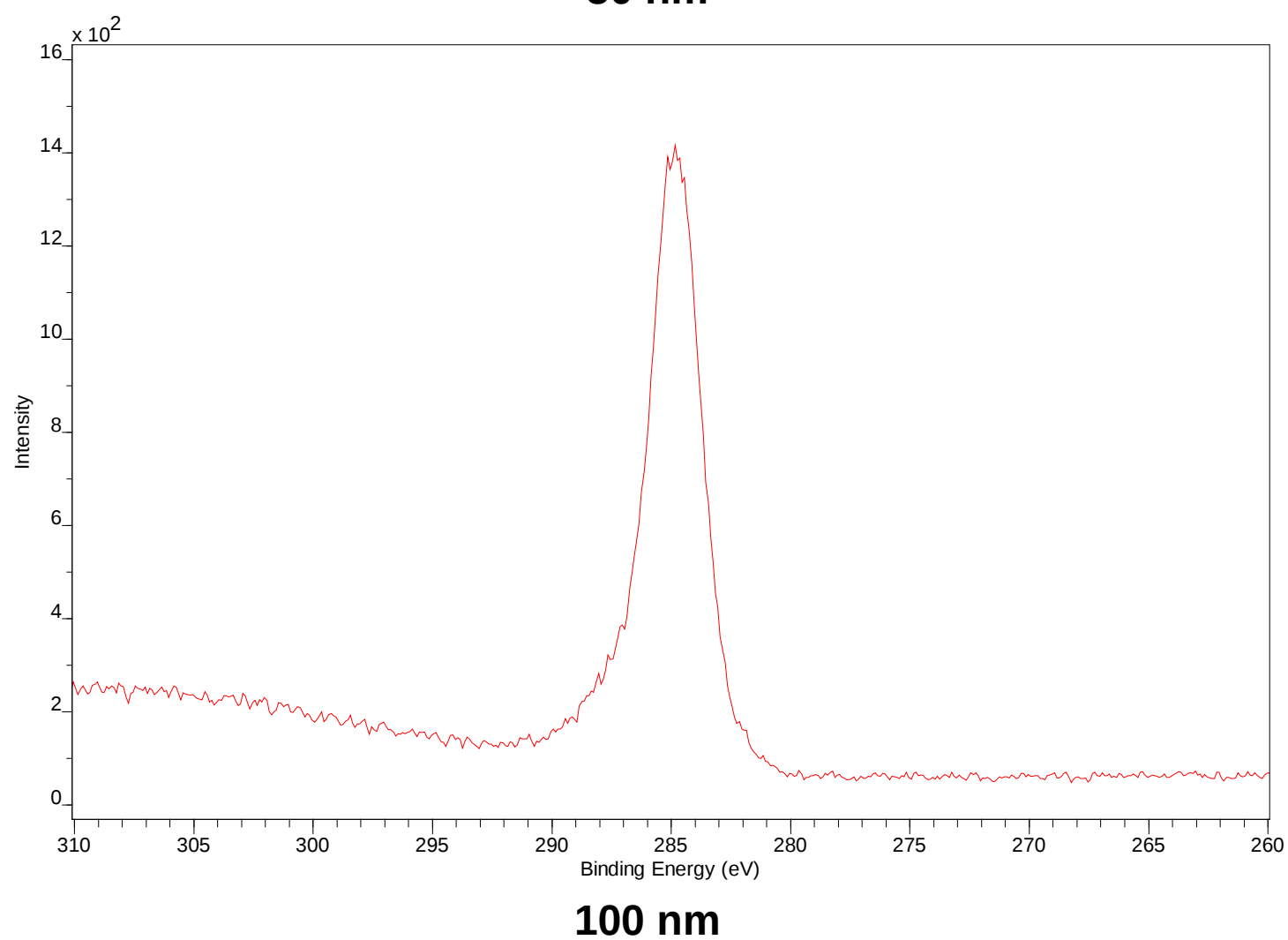
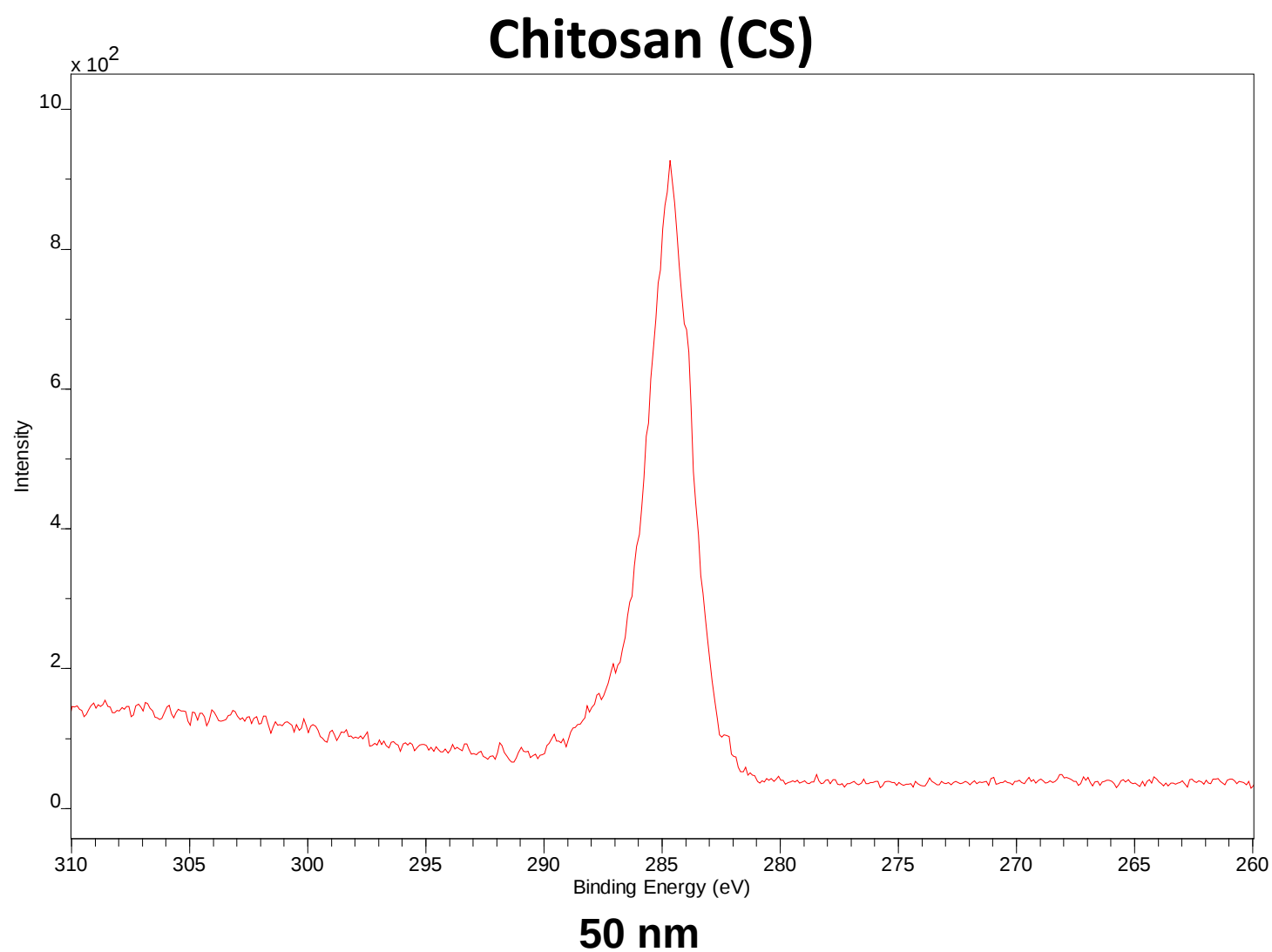


Figure S3b. C1s peaks (50 nm + 100 nm a-C:H) for the chitosan (CS) samples.

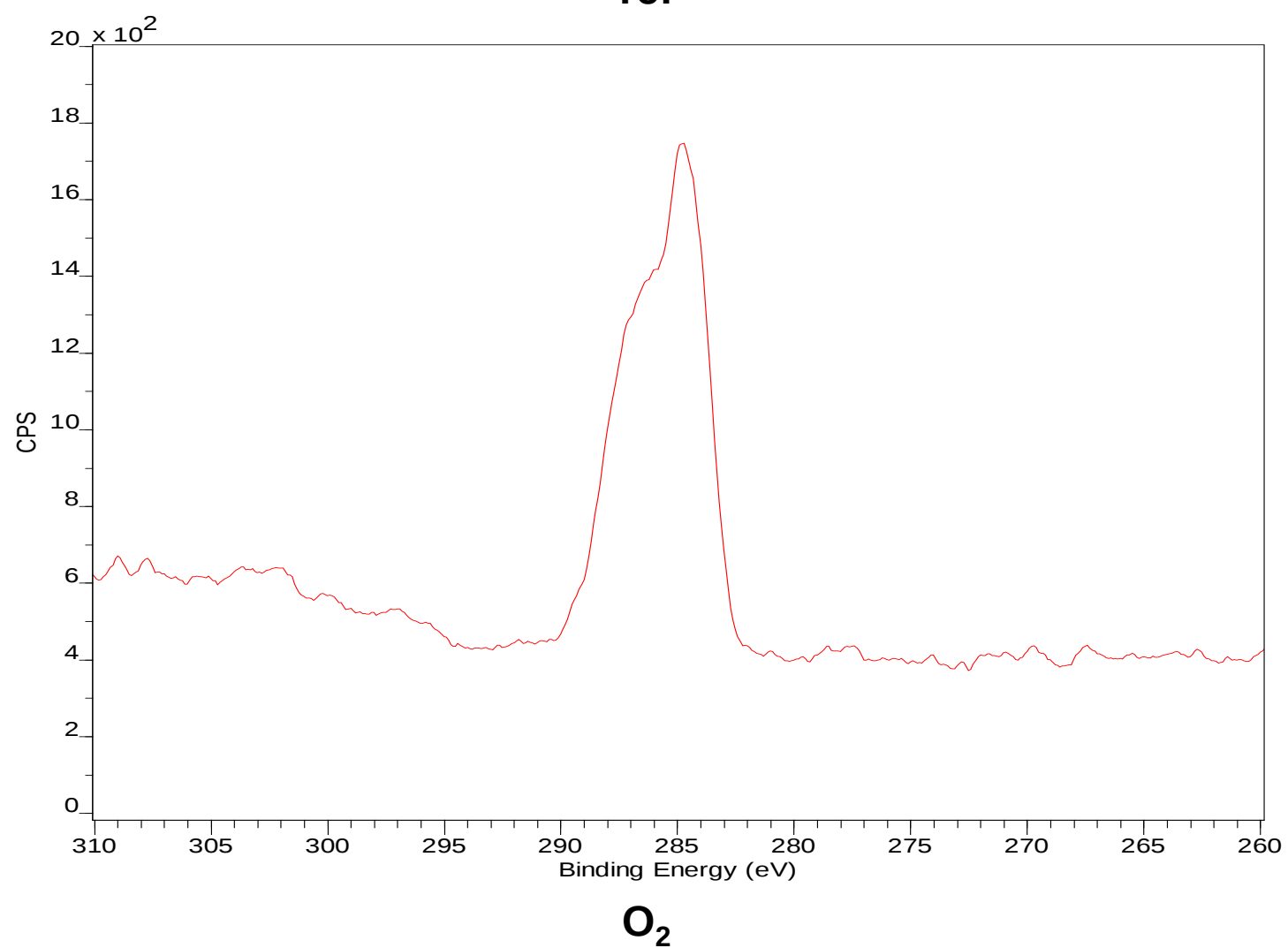
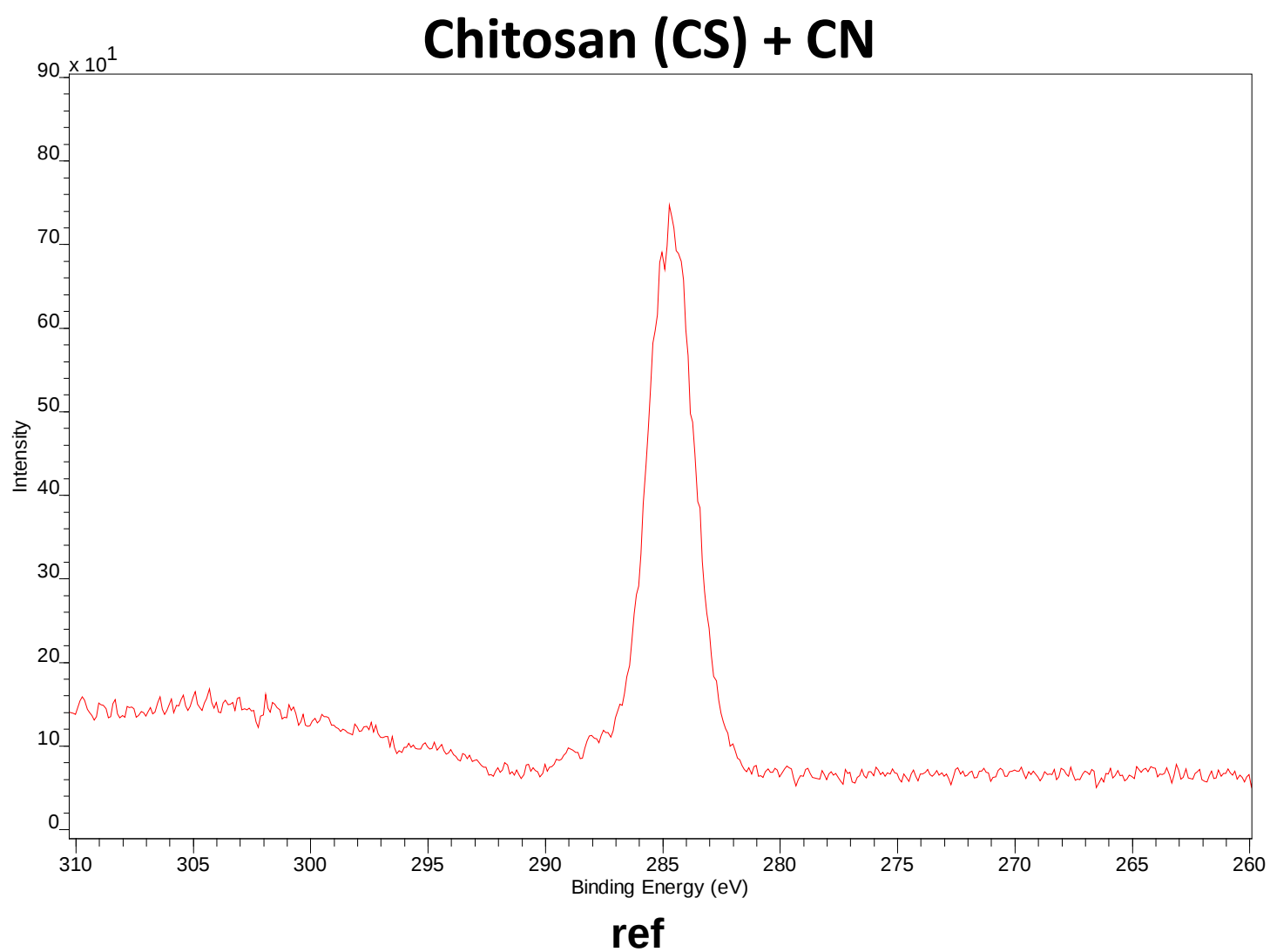


Figure S4a. C1s peaks (ref + O₂ plasma treated) for the reinforced chitosan (CS-CN) samples.

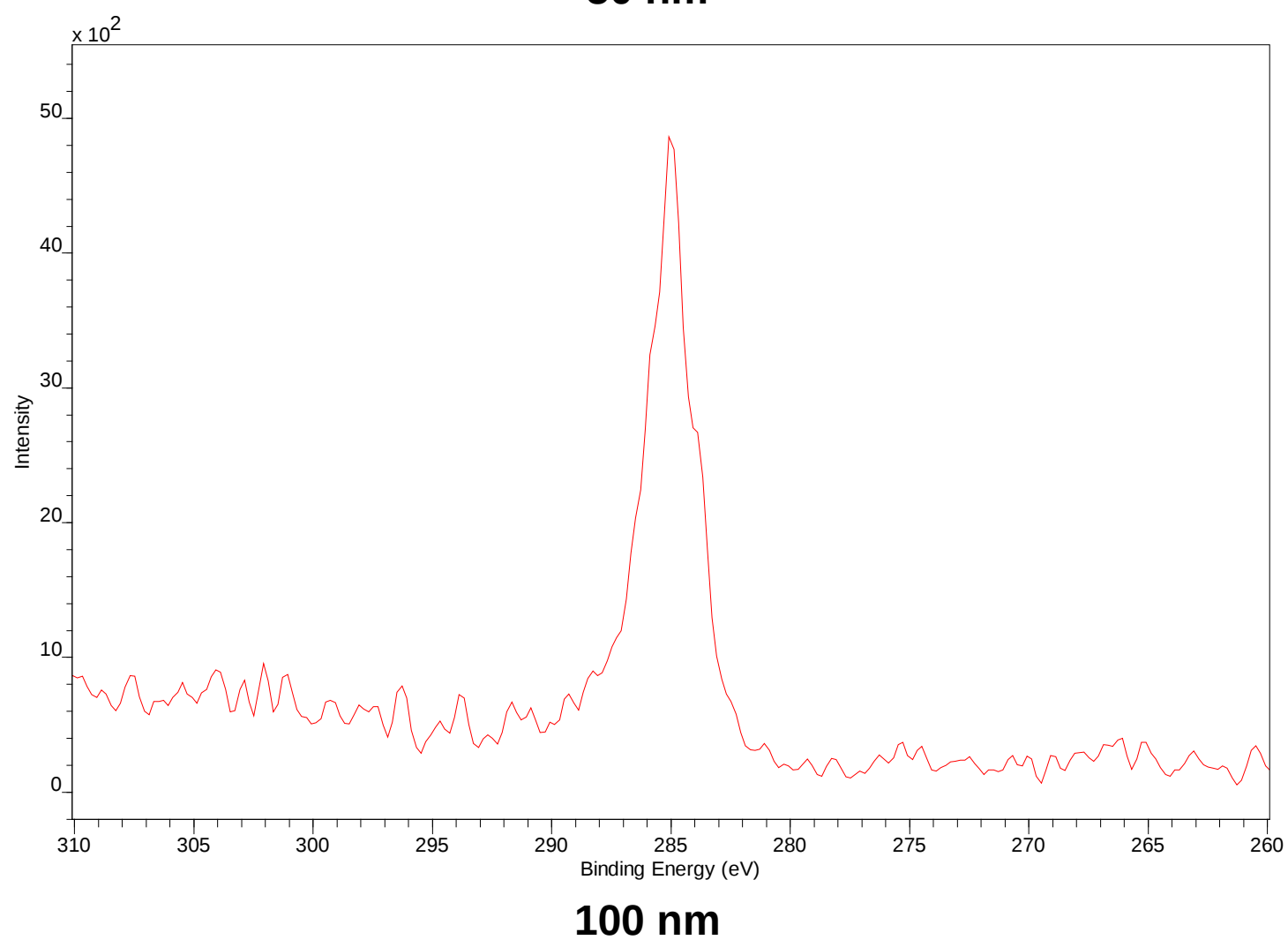
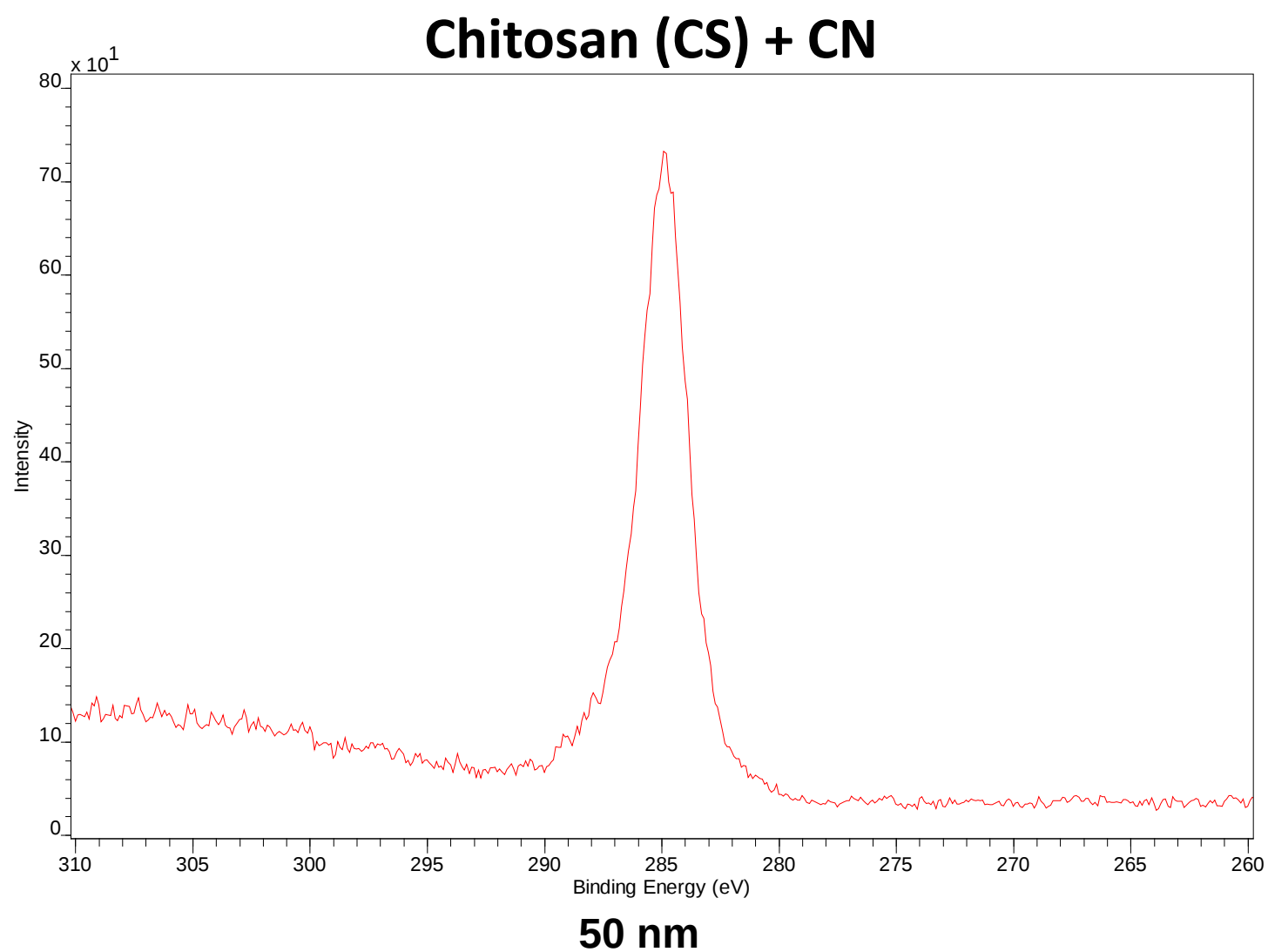


Figure S4b. C1s peaks (50 nm + 100 nm a-C:H) for the reinforced chitosan (CS-CN) samples.