

***Electronic Supplementary Information***

Exfoliating Nanomaterials in Canola Protein Derived Adhesive  
Improves Strength and Water Resistance

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Figure S1 - Elemental composition and C:O ratio of prepared graphite oxide

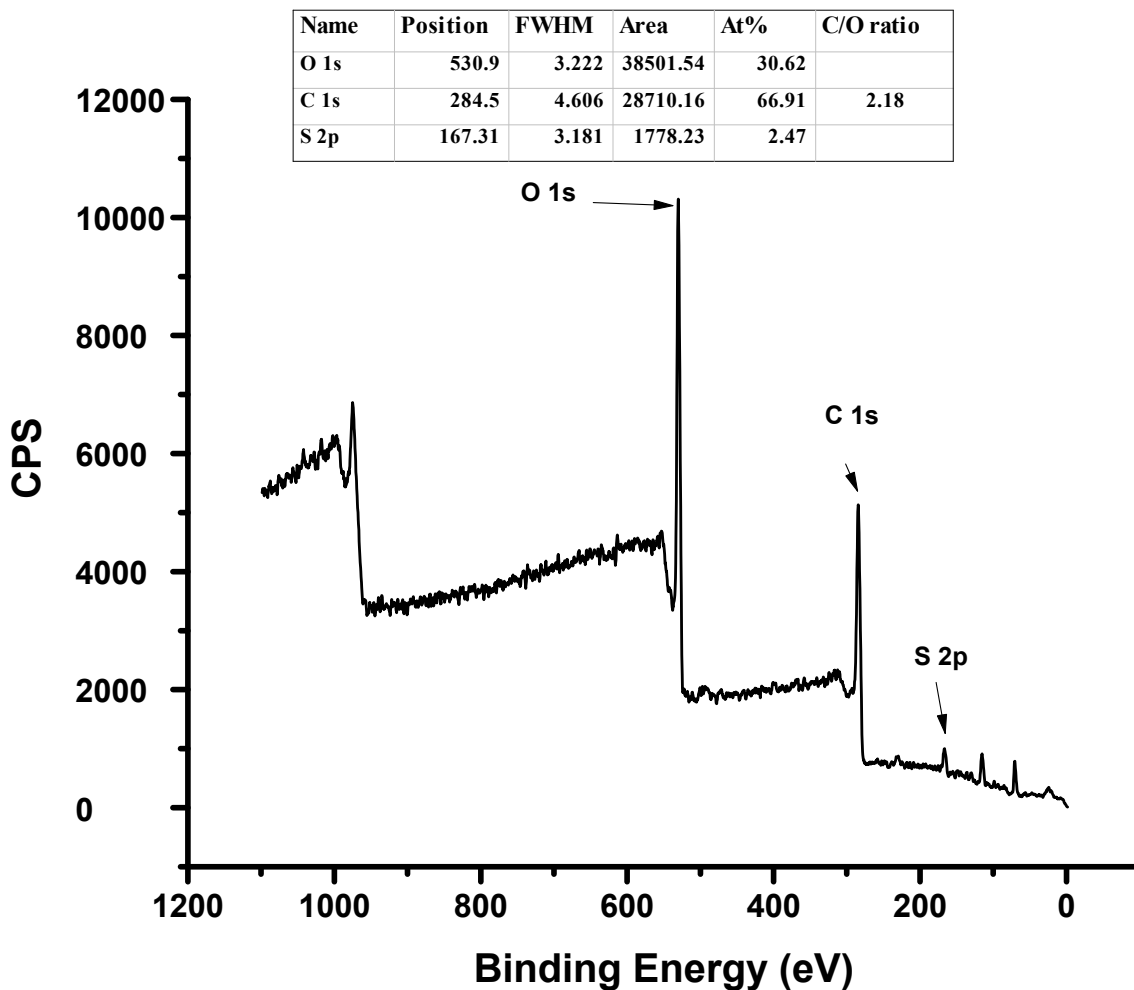


Figure S1 – X-ray photoelectron spectra showing elemental composition and C/O ratio in graphite oxide used for the study

**Table S1 - Adhesion strength of SM-MMT and NCC dispersed Canola protein adhesive (SM-MMT/NCC addition was carried out according the protocol of Zhang et al (2014) to compare the method develop in our lab)**

<b>Sample</b>	<b>Method developed by Zhang et al (2014)</b>		<b>Method developed in our lab</b>	
	<i>Dry Strength (MPa)</i>	<i>Wet Strength (MPa)</i>	<i>Dry Strength (MPa)</i>	<i>Wet Strength (MPa)</i>
<b>(-) Control</b>	3.41 ± 0.38	1.23 ± 0.07	3.41 ± 0.38	1.23 ± 0.07
<b>pH Control</b>	6.38 ± 0.84	1.98 ± 0.22	6.38 ± 0.84	1.98 ± 0.22
<b>1% SM-MMT</b>	6.20 ± 0.53	1.81 ± 0.53	9.29 ± 1.53	3.19 ± 0.57
<b>3% SM-MMT</b>	5.76 ± 0.34	1.57 ± 0.14	7.51 ± 1.11	2.81 ± 0.38
<b>5% SM-MMT</b>	5.16 ± 0.62	1.43 ± 0.18	6.71 ± 1.04	2.35 ± 0.47
<b>7% SM-MMT</b>	3.94 ± 0.49	1.36 ± 0.22	4.85 ± 0.64	1.85 ± 0.43
<b>1% NCC</b>	6.57 ± 0.38	1.95 ± 0.14	10.37 ± 1.63	3.57 ± 0.57
<b>3% NCC</b>	6.26 ± 0.27	1.78 ± 0.10	9.86 ± 1.87	3.03 ± 0.42
<b>5% NCC</b>	5.90 ± 0.21	1.63 ± 0.08	9.58 ± 1.14	2.99 ± 0.68
<b>7% NCC</b>	5.78 ± 0.35	1.61 ± 0.14	8.46 ± 1.31	2.84 ± 0.53

# Nanomaterial induced protein secondary structural changes

## Figure S2: Effect of bentonite concentration on protein secondary structure

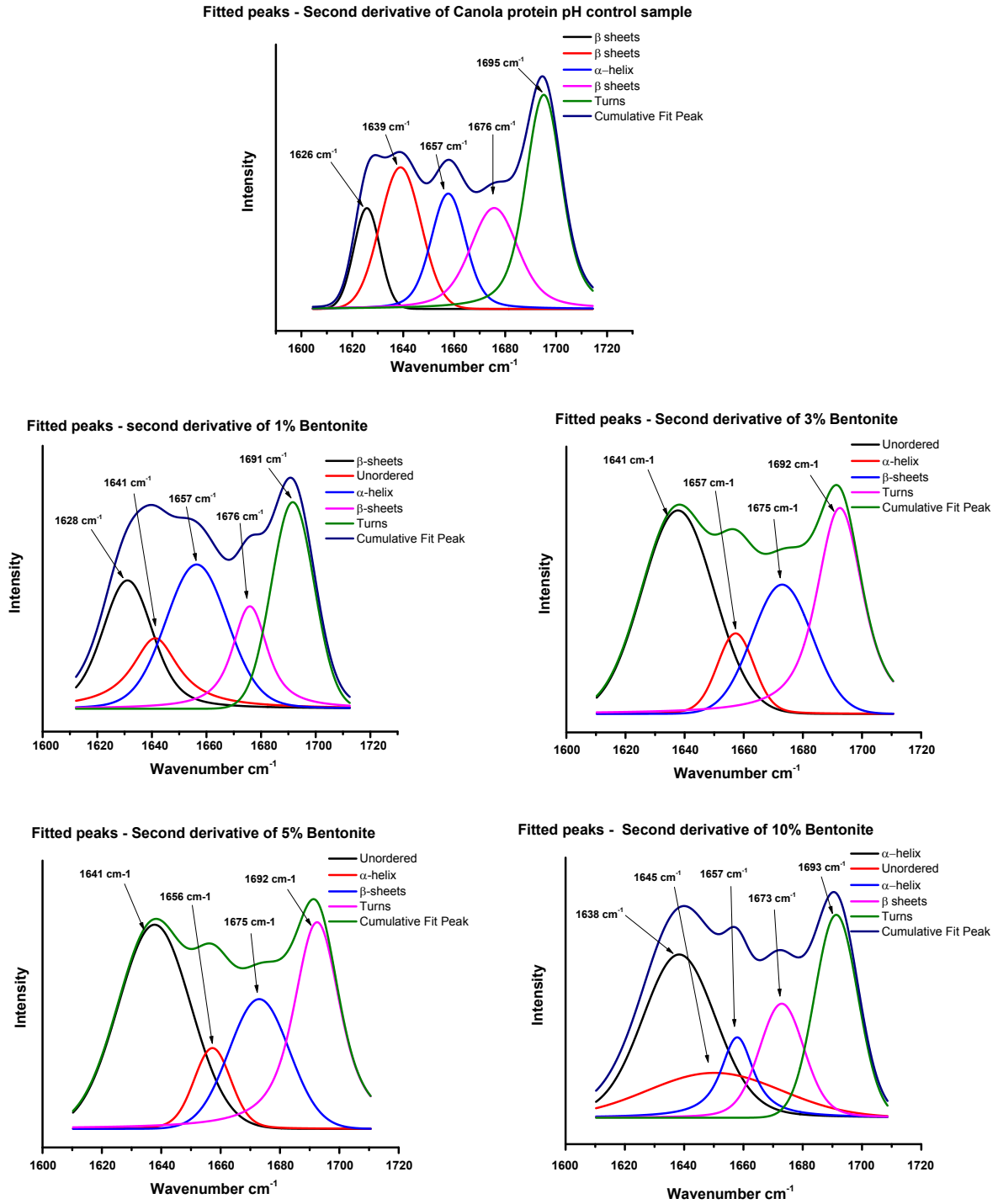
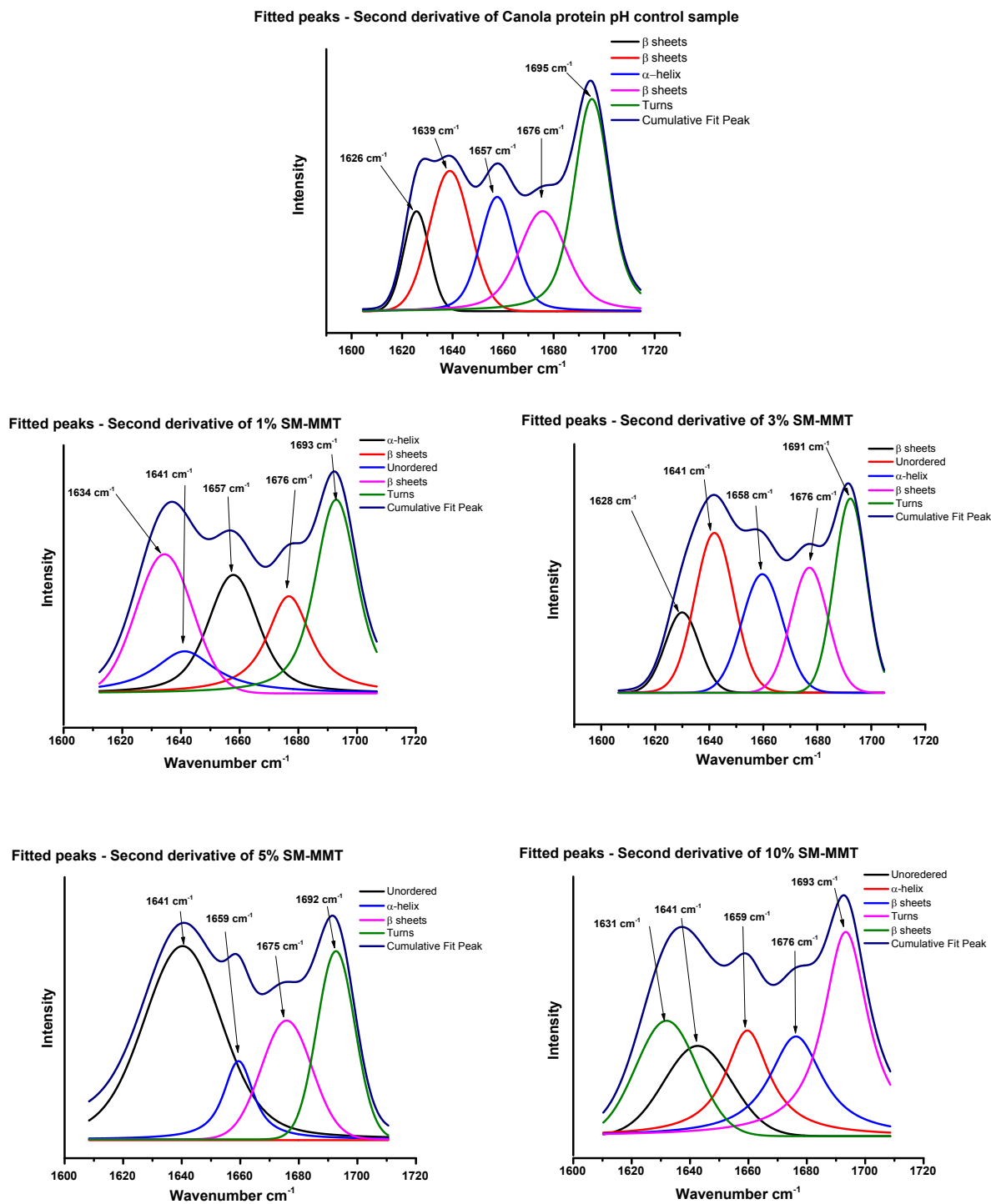


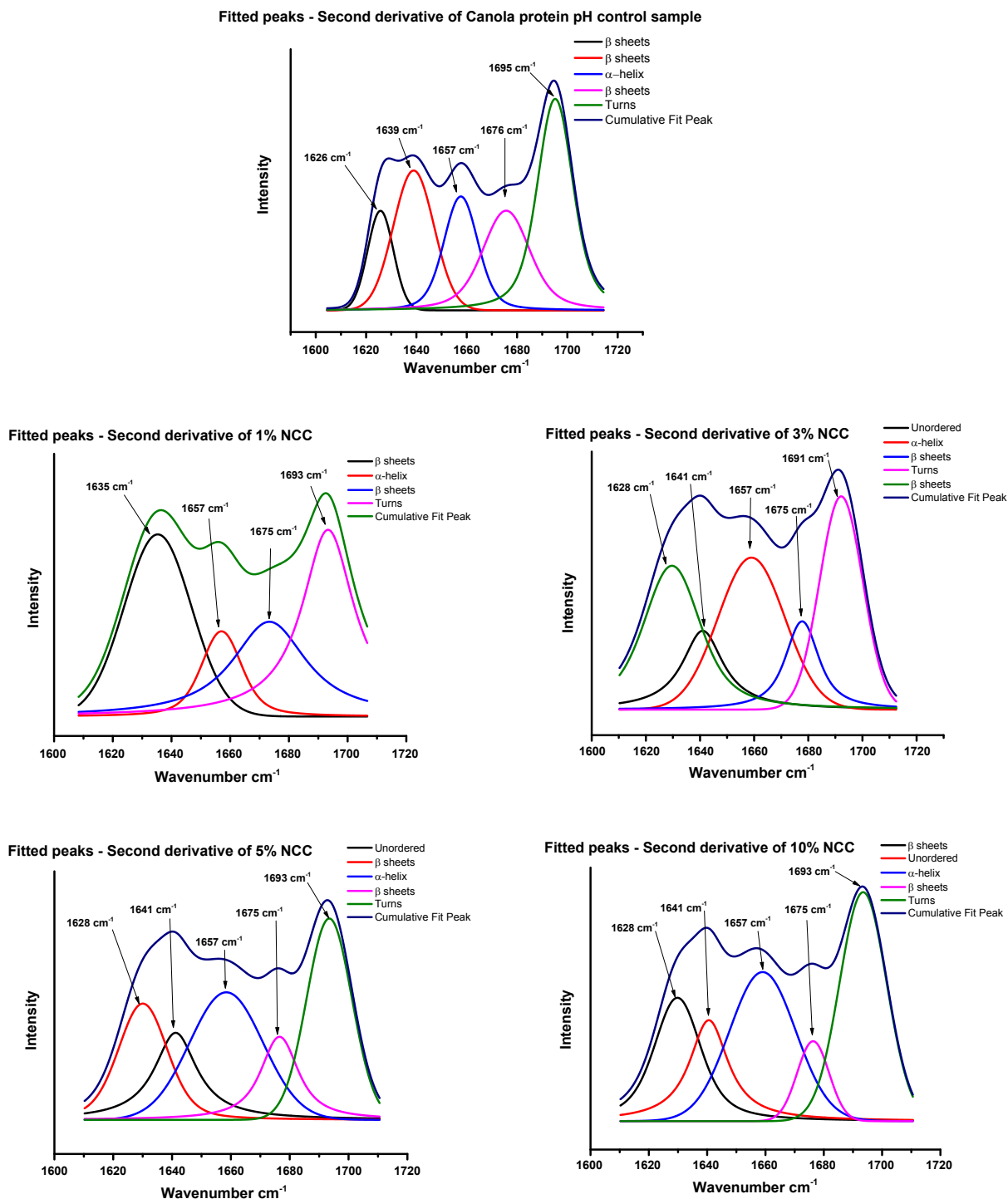
Figure S2 – Peak fitting of FTIR second derivative spectra showing bentonite induced changes in protein secondary structure

**Figure S3: Effect of SM-MMT concentration on protein secondary structure**



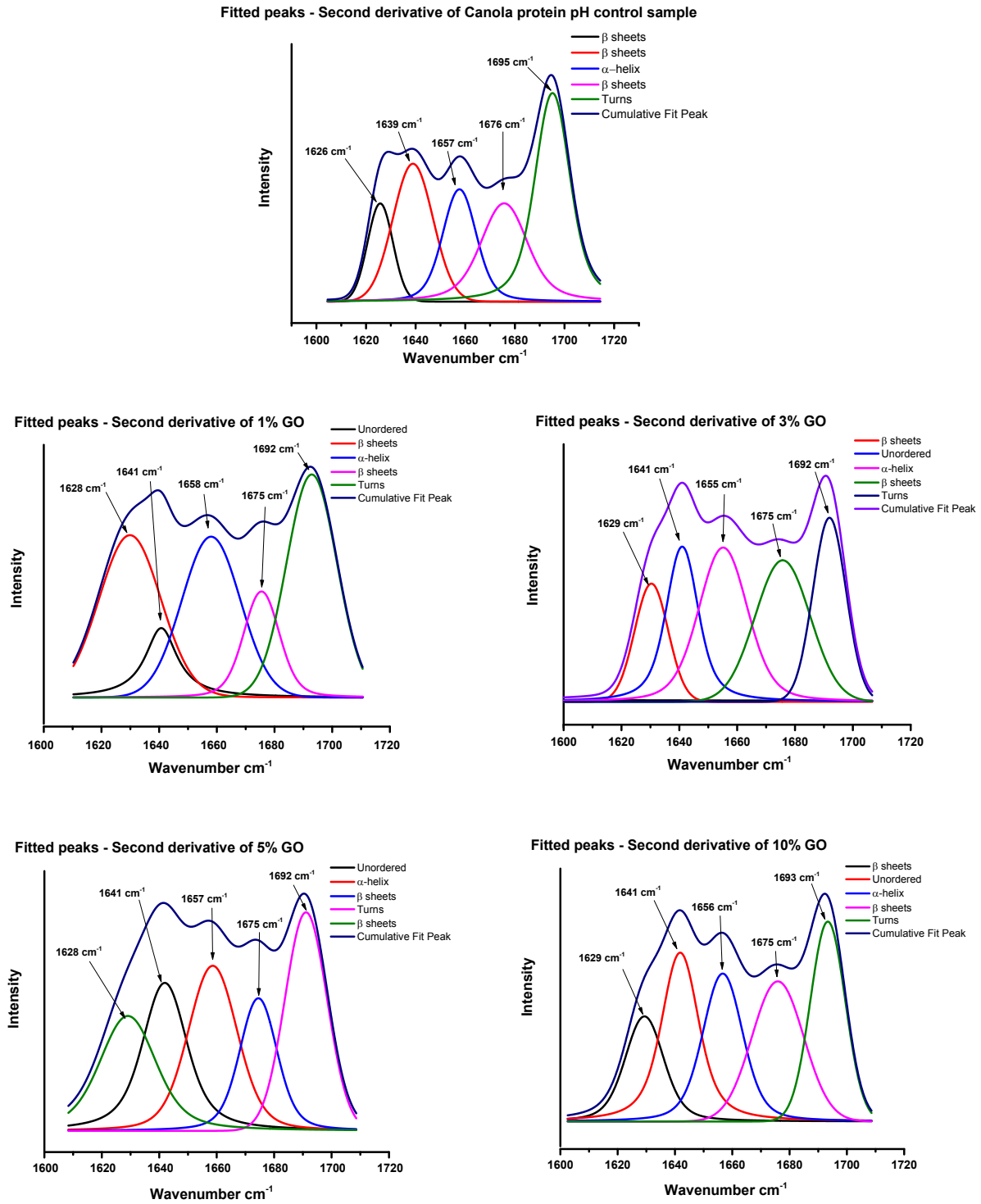
*Figure S3 – Peak fitting of FTIR second derivative spectra showing SM-MMT induced changes in protein secondary structure*

**Figure S4: Effect of NCC concentration on protein secondary structure**



*Figure S4 – Peak fitting of FTIR second derivative spectra showing NCC induced changes in protein secondary structure*

**Figure S5: Effect of GO concentration on protein secondary structure**



*Figure S5 – Peak fitting of FTIR second derivative spectra showing GO induced changes in protein secondary structure*