

# Hydrolyzable *vs.* Condensed Wood Tannins for Bio-based Antioxidant Coatings

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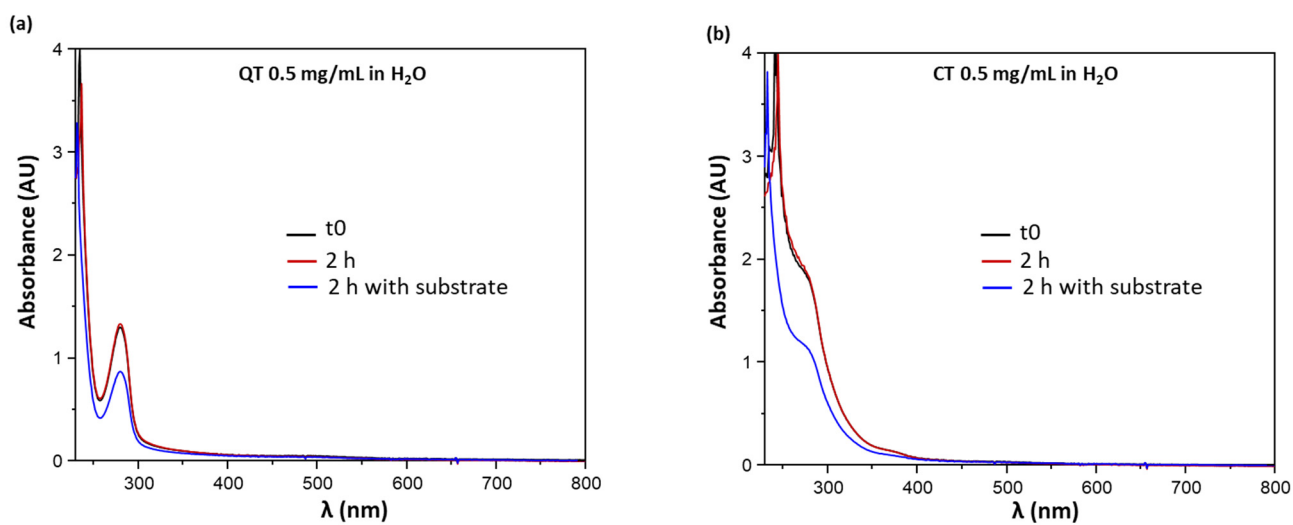
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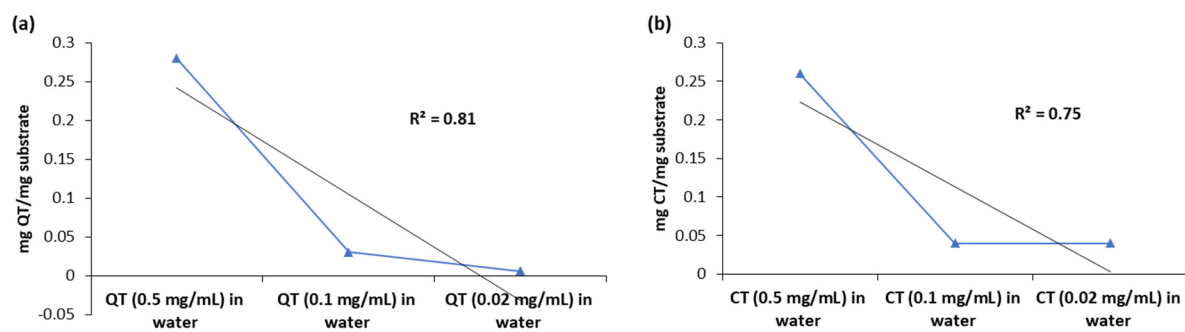


**Figure S1.** Comparison of the UV-vis spectra at 2 h of 0.5 mg/mL (a) QT and (b) CT solutions in the presence or absence of the nylon filter.

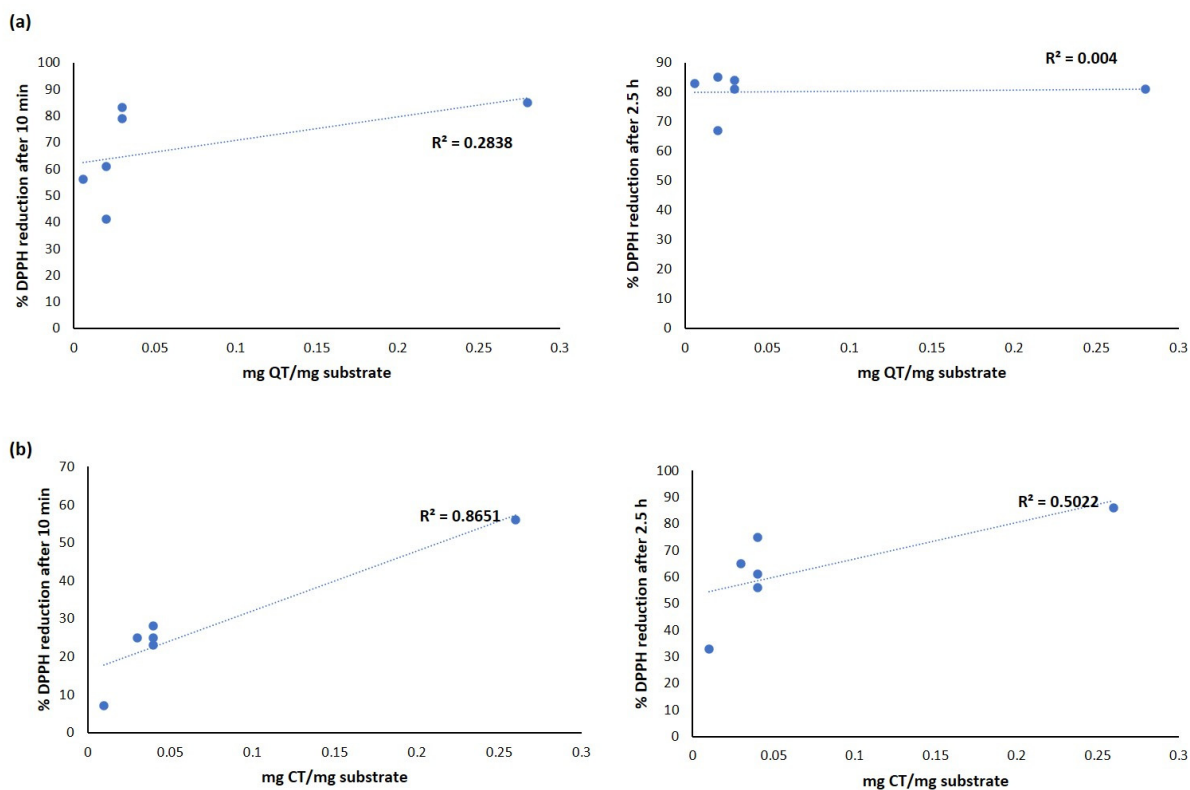
**Table S1.** Amounts of tannin adhered to the nylon membrane filter under the different coating conditions.<sup>1</sup>

<b>Sample</b>	<b>mg of tannins adsorbed/mg substrate (after 2 h)</b>
QT (0.5 mg/mL) in H <sub>2</sub> O	0.28 ± 0.01
QT (0.1 mg/mL) in H <sub>2</sub> O	0.031 ± 0.001
QT (0.02 mg/mL) in H <sub>2</sub> O	0.0061 ± 0.0003
QT (0.1 mg/mL) + laccase in H <sub>2</sub> O	0.031 ± 0.002
QT (0.1 mg/mL) + laccase in phosphate buffer pH 6.0	0.021 ± 0.001
QT (0.1 mg/mL) in carbonate buffer pH 9.0	0.021 ± 0.001
CT (0.5 mg/mL) in H <sub>2</sub> O	0.26 ± 0.01
CT (0.1 mg/mL) in H <sub>2</sub> O	0.042 ± 0.002
CT (0.02 mg/mL) in H <sub>2</sub> O	0.041 ± 0.002
CT (0.1 mg/mL) + laccase in H <sub>2</sub> O	0.041 ± 0.002
CT (0.1 mg/mL) + laccase in phosphate buffer pH 6.0	0.032 ± 0.002
CT (0.1 mg/mL) in carbonate buffer pH 9.0	0.011 ± 0.001

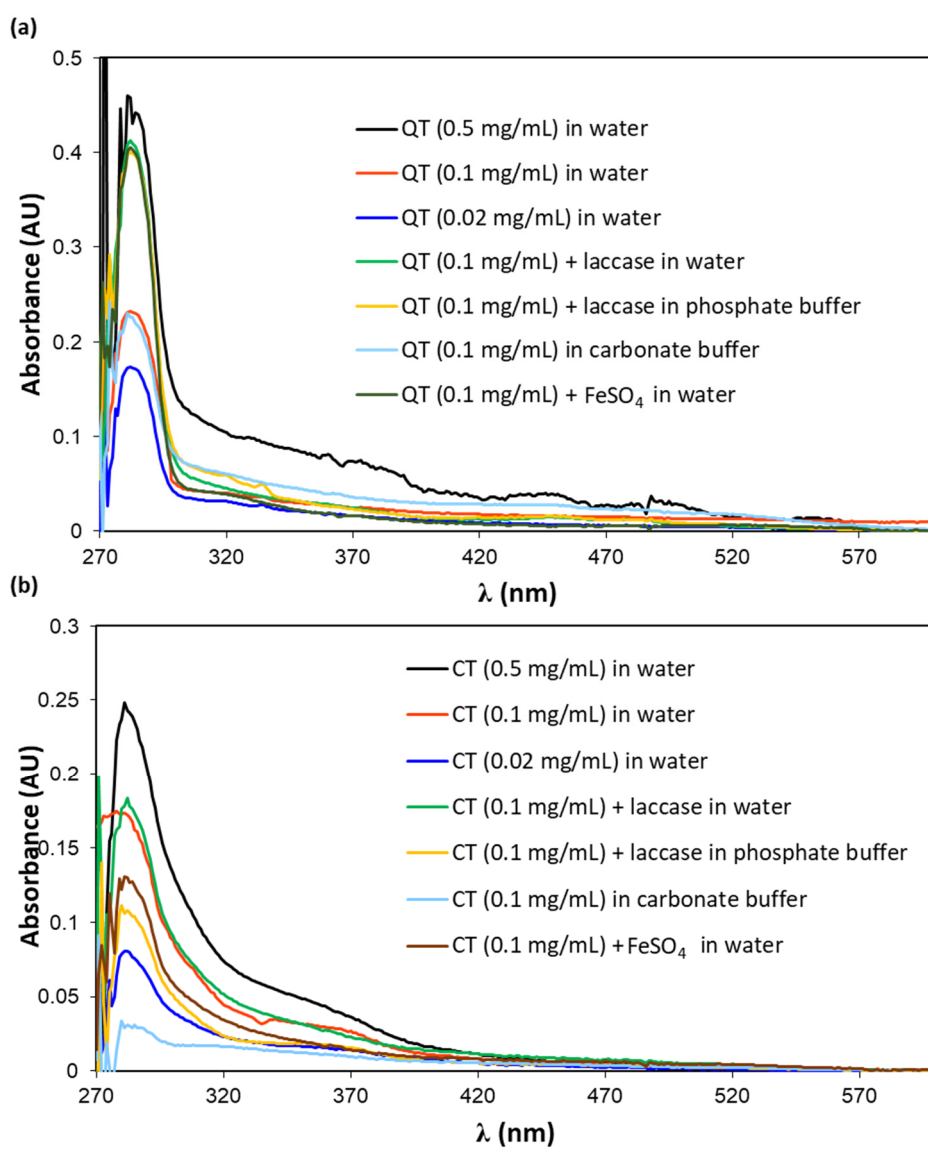
<sup>1</sup> Reported are the mean ± SD values of at least three experiments.



**Figure S2.** Correlation between the amounts of tannin adhered to the nylon membrane filters and the initial concentrations of (a) QT and (b) CT in water.



**Figure S3.** Correlation between the percentages of DPPH reduced after 10 min (left) and 2.5 h (right) and the amounts of (a) QT and (b) CT adhered to the nylon membrane filters.

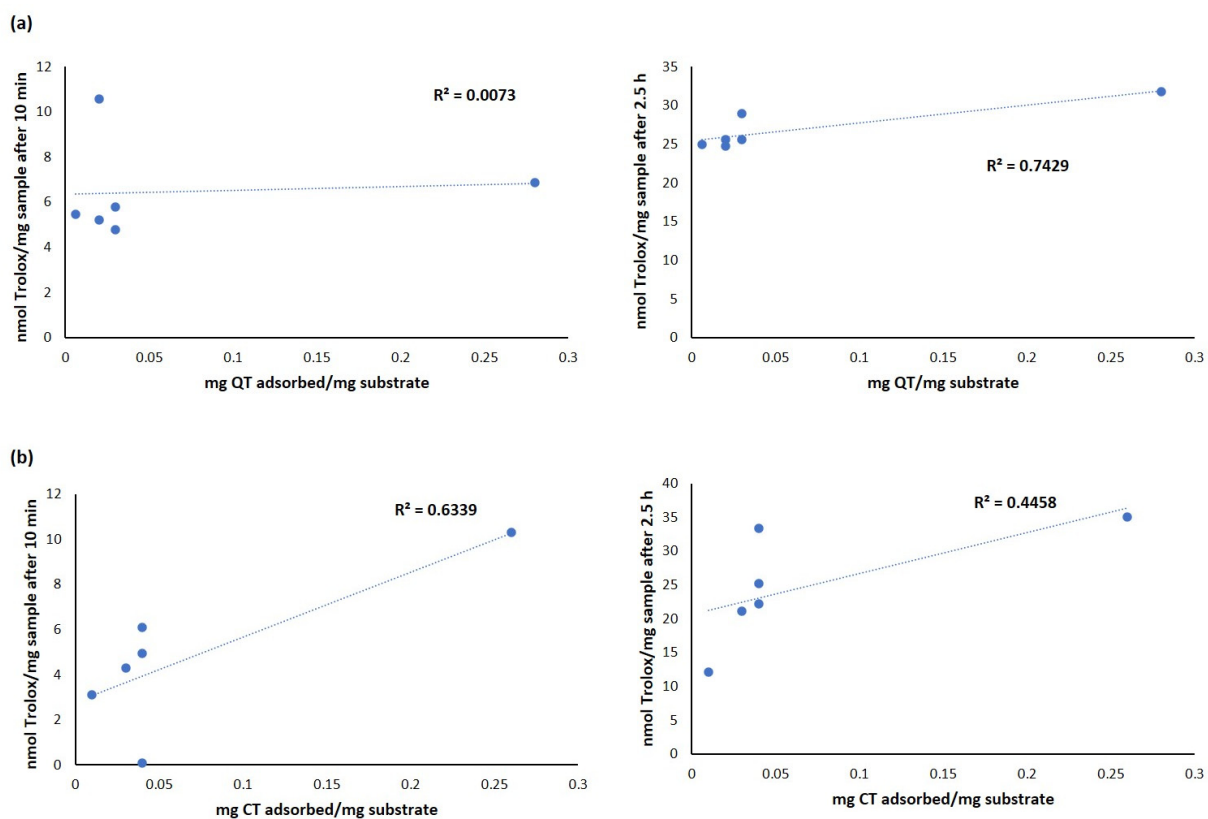


**Figure S4.** UV-vis spectra of (a) released QT and (b) released CT from the nylon filters after washing in ethanol for 2.5 h.

**Table S2.** Trolox equivalents determined for the tannin-coated nylon membrane filters in the FRAP assay.<sup>1</sup>

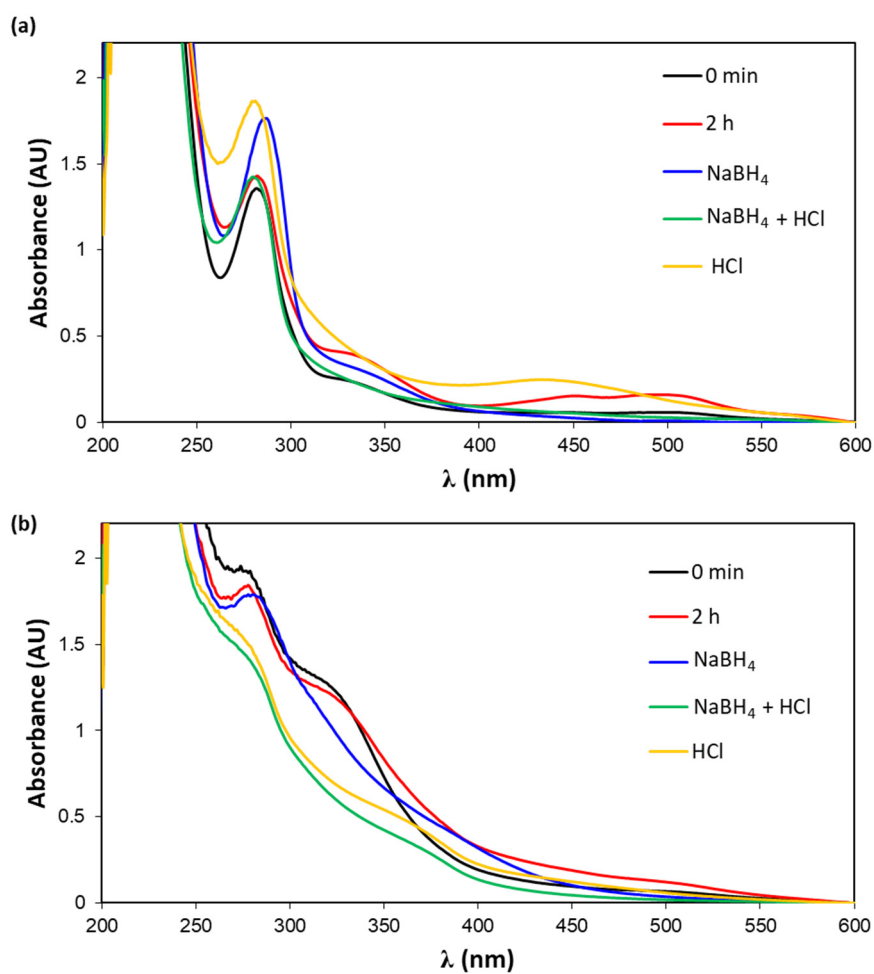
Sample	nmol Trolox/mg filter (after 10 min)	nmol Trolox/mg filter (after 2.5 h)
QT (0.5 mg/mL) in H <sub>2</sub> O	6.9 ± 0.7 <sup>a</sup>	32 ± 3 <sup>a</sup>
QT (0.1 mg/mL) in H <sub>2</sub> O	5.8 ± 0.6 <sup>a,b</sup>	29 ± 3 <sup>a,b</sup>
QT (0.02 mg/mL) in H <sub>2</sub> O	5.5 ± 0.5 <sup>b</sup>	25 ± 2 <sup>b,c</sup>
QT (0.1 mg/mL) + laccase in H <sub>2</sub> O	4.8 ± 0.5 <sup>b,c</sup>	26 ± 3 <sup>a,b,c</sup>
QT (0.1 mg/mL) + laccase in phosphate buffer (pH 6.0)	11 ± 1 <sup>d</sup>	26 ± 3 <sup>a,b,c</sup>
QT (0.1 mg/mL) in carbonate buffer (pH 9.0)	5.2 ± 0.5 <sup>b</sup>	25 ± 2 <sup>b,c</sup>
QT (0.1 mg/mL) + FeSO <sub>4</sub> in H <sub>2</sub> O	5.8 ± 0.6 <sup>a,b</sup>	28 ± 3 <sup>a,b</sup>
CT (0.5 mg/mL) in H <sub>2</sub> O	10 ± 1 <sup>d</sup>	35 ± 4 <sup>a</sup>
CT (0.1 mg/mL) in H <sub>2</sub> O	9 ± 1 <sup>d</sup>	33 ± 3 <sup>a</sup>
CT (0.02 mg/mL) in H <sub>2</sub> O	6.1 ± 0.7 <sup>a,b</sup>	22 ± 2 <sup>c</sup>
CT (0.1 mg/mL) + laccase in H <sub>2</sub> O	4.9 ± 0.5 <sup>b,c</sup>	25 ± 3 <sup>b,c</sup>
CT (0.1 mg/mL) + laccase in phosphate buffer (pH 6.0)	4.2 ± 0.4 <sup>c</sup>	21 ± 2 <sup>c</sup>
CT (0.1 mg/mL) in carbonate buffer (pH 9.0)	3.1 ± 0.3 <sup>e</sup>	12 ± 1 <sup>d</sup>
CT (0.1 mg/mL) + FeSO <sub>4</sub> in H <sub>2</sub> O	5.9 ± 0.6 <sup>a,b</sup>	26 ± 3 <sup>a,b,c</sup>

<sup>1</sup> Reported are the mean ± SD values of at least three experiments. Values in a column without a common letter are significantly different (P < 0.05).

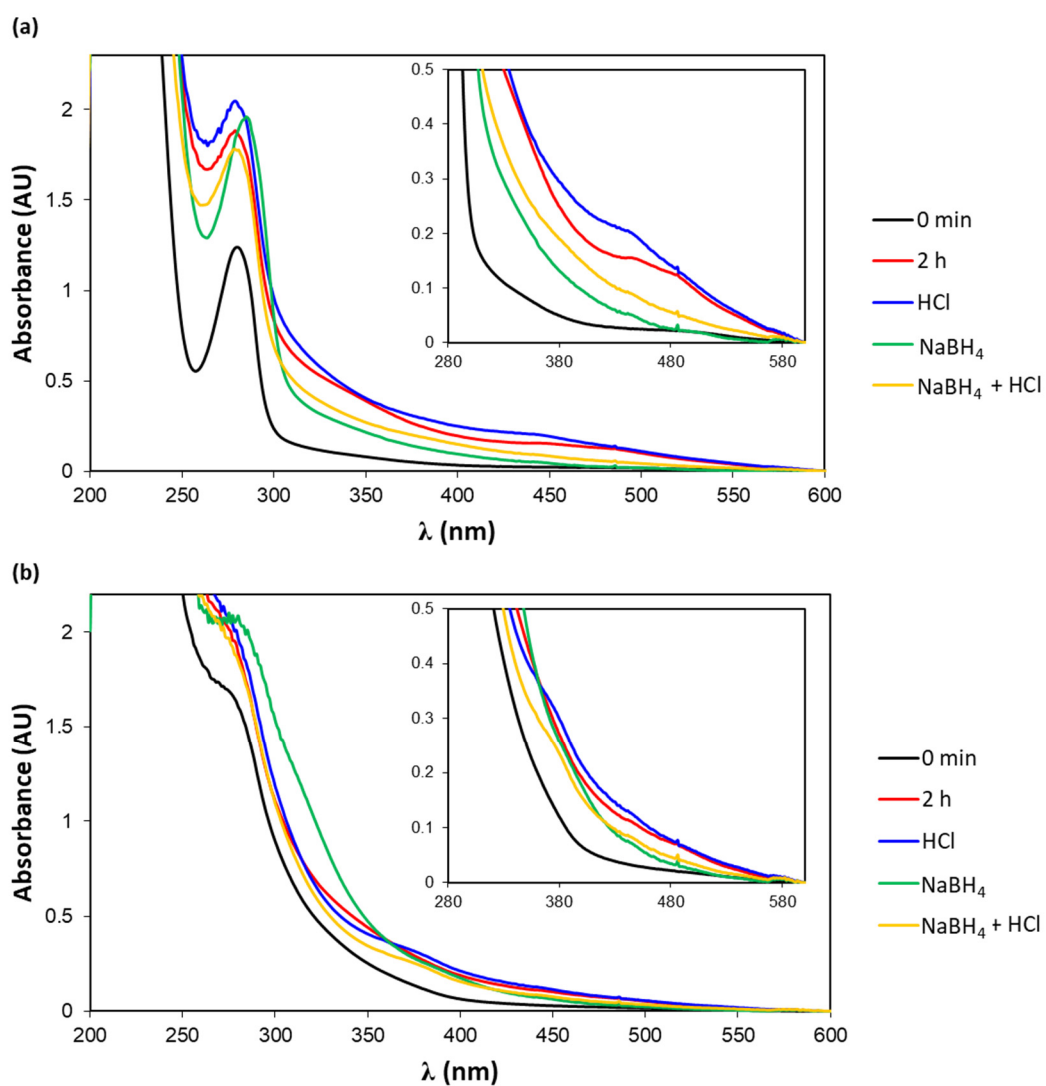


**Figure S5.** Correlation between the  $\text{Fe}^{3+}$ -reducing properties of the functionalized substrates after 10 min (left) and 2.5 h (right) and the amounts of (a) QT and (b) CT adhered to the substrate.

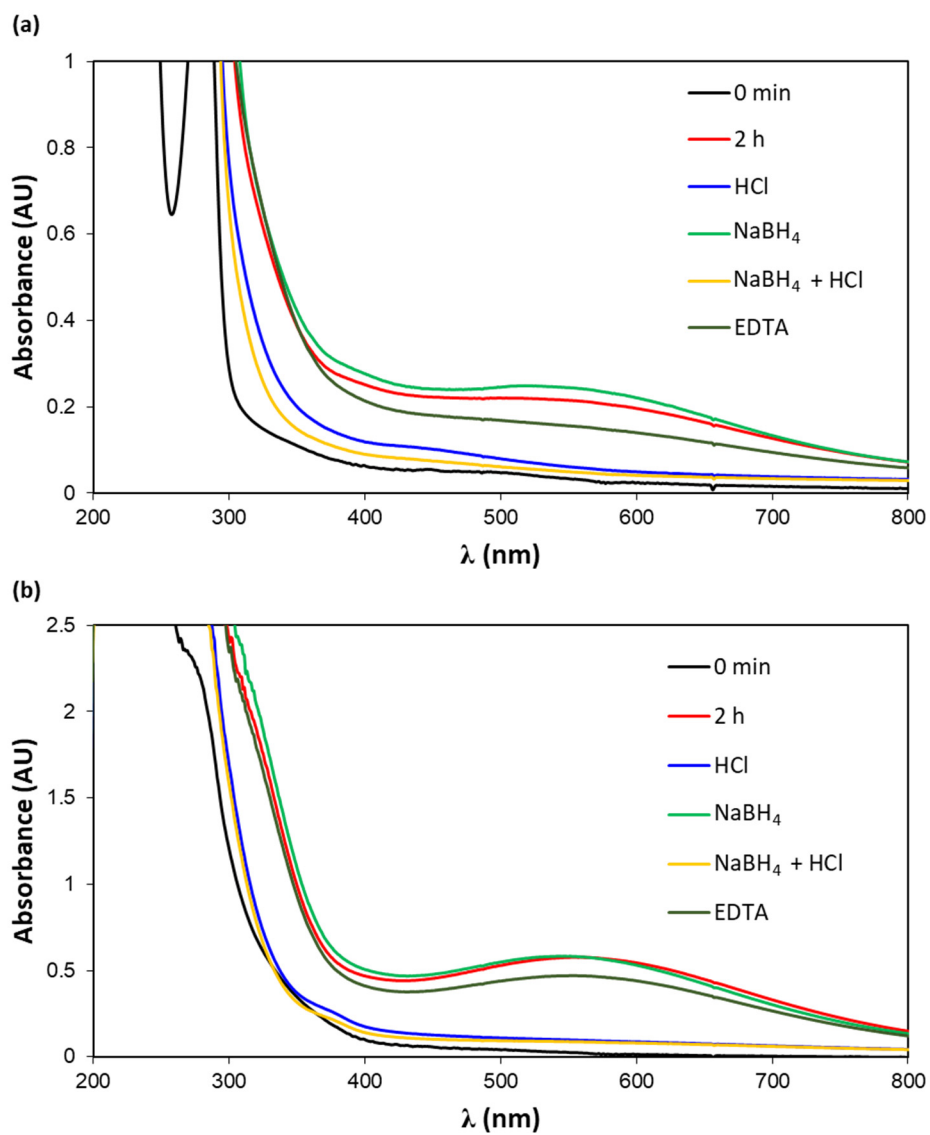




**Figure S6.** UV-vis spectra of (a) QT and (b) CT solutions in 0.1 M carbonate buffer (pH 9.0), before and after addition of different additives.



**Figure S7.** UV-vis spectra of (a) QT and (b) CT solutions in 0.05 M phosphate buffer (pH 6.0) containing laccase, before and after addition of different additives.



**Figure S8.** UV-vis spectra of (a) QT and (b) CT solutions in water containing FeSO<sub>4</sub>, before and after addition of different additives.