

# Rapid Preparation of Fluorescent Carbon Dots from Pine Needles for Chemical Analysis

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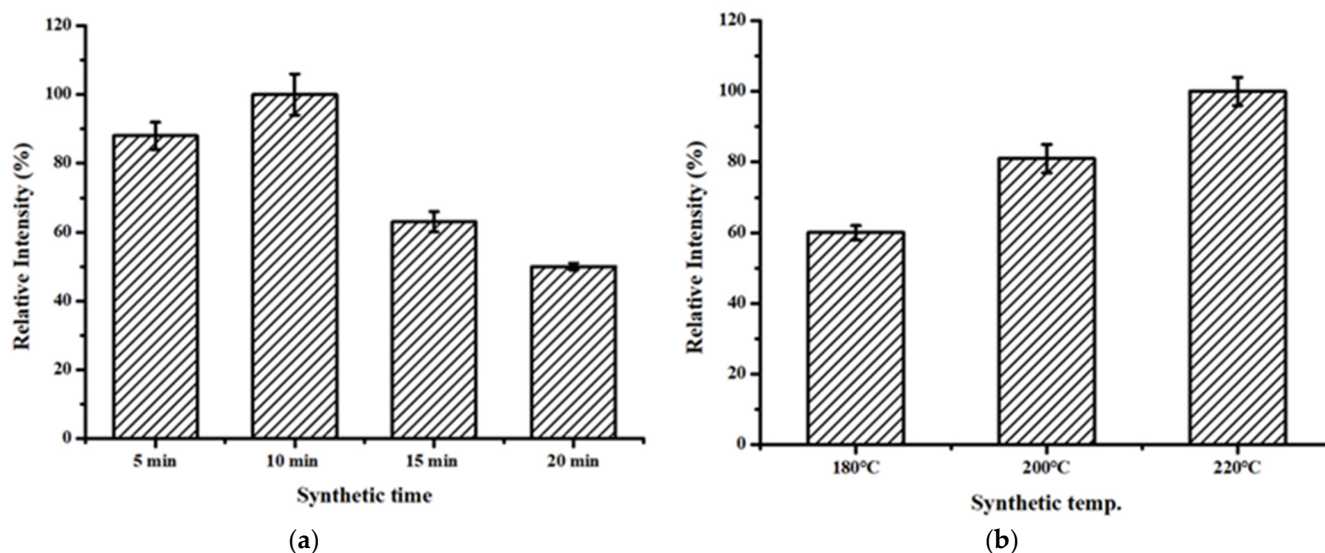
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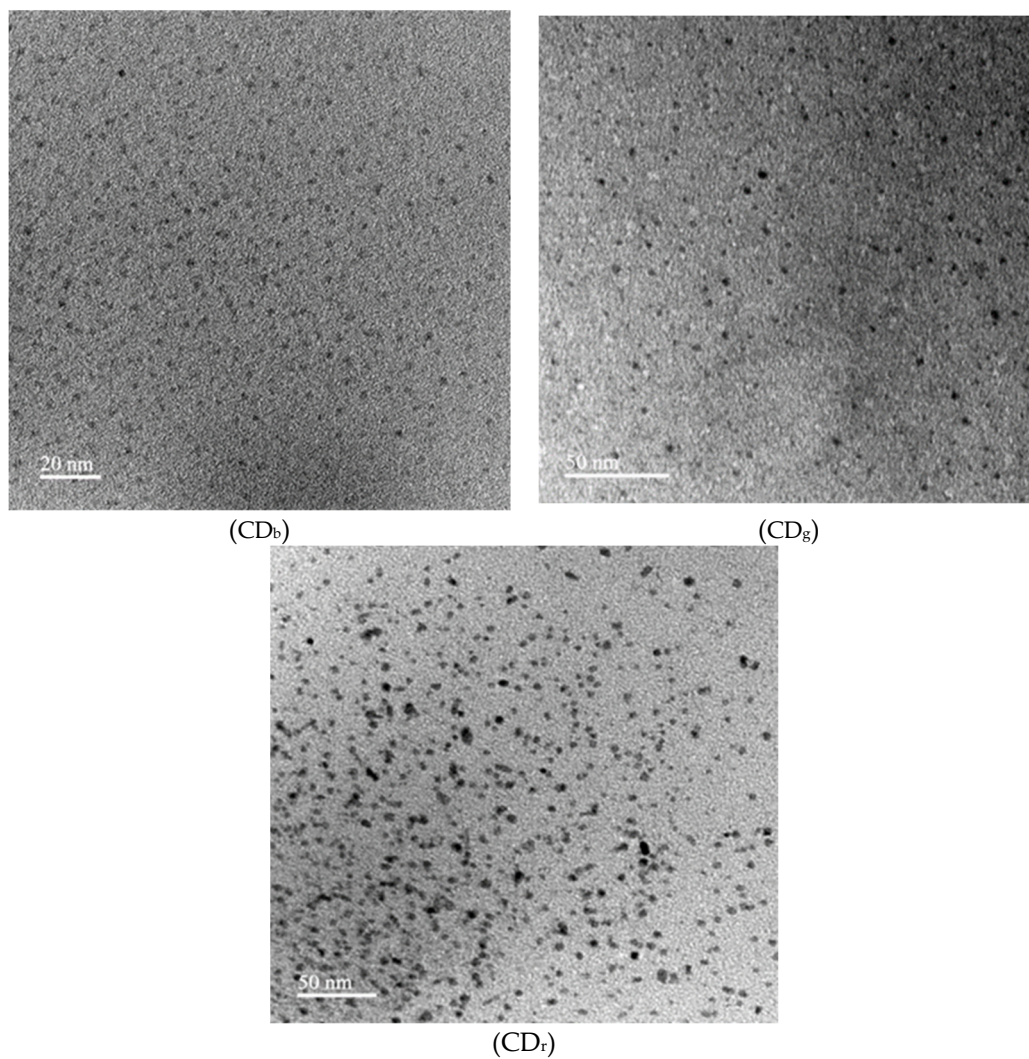
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**Table S1.** Comparison of the Concentrations of CEA and TNF- $\alpha$  Detected Under the Proposed Method and the ELISA (n = 5).

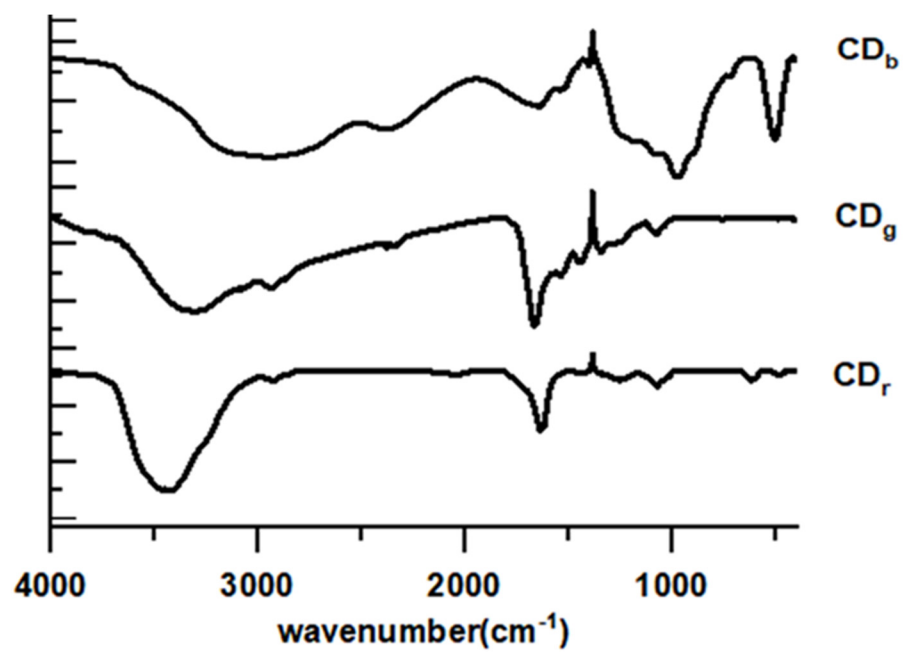
	Spiked	ELISA	This study
CEA (pg/mL)	400	385 $\pm$ 15	410 $\pm$ 13
	80	73 $\pm$ 4	77 $\pm$ 3
	16	17 $\pm$ 1	15 $\pm$ 1
TNF- $\alpha$ (pg/mL)	250	256 $\pm$ 12	243 $\pm$ 14
	50	52 $\pm$ 3	46 $\pm$ 2
	10	8 $\pm$ 1	9 $\pm$ 1



**Figure S1.** The optimization of reaction temperature for a fixed time (a) and reaction time for a fixed temperature (b).



**Figure S2.** TEM photographs of  $CD_b$ ,  $CD_g$ , and  $CD_r$  nanoparticles.



**Figure S3.** Infrared spectra of the three types of CDs.