molecules

MDPI

Article

Synthesis and application of scaffolds of Chitosan-Graphene oxide by the Freeze-drying method for tissue regeneration

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1. Experimental

1.1. Deacetylation degree and characterization of CS by potentiometric method

For the DD calculation, a potentiometric titration of CS with a WTW pHmeter pH 3310 was performed, a NaOH solution of 0.101 M previously standardized with $C_8H_5KO_4$ as titrating agent was used and a solution of 0.253 g of CS in 20 ml HCl 0.3M.

1.2. Capillary viscosimetry for the calculation of the Mv.

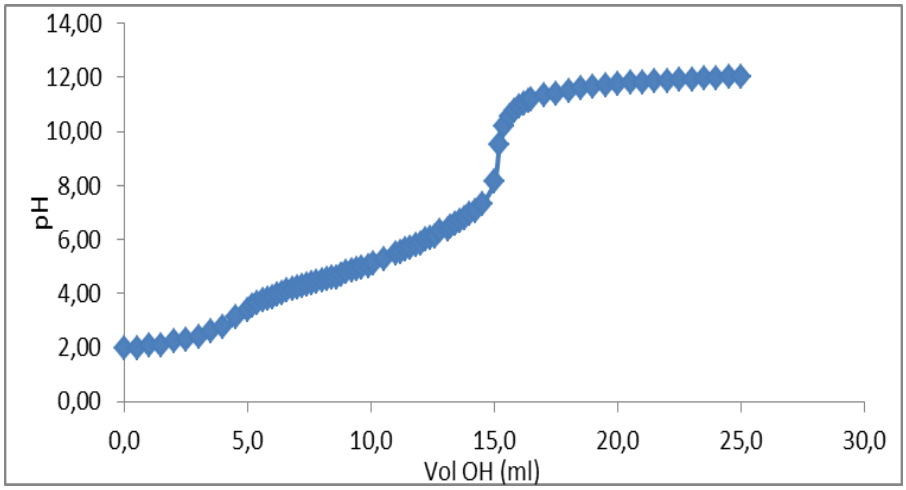
A standard solution of 100 mL of CH_3COOH 0.1 M, NaCl 0.2 M and 0.02 g/mL of CS was prepared for the calculation of the Mv of CS. From this 5 solutions of 25 mL were prepared with the concentrations shown in figure 3 and the density was measured with a pycnometer of 1 mL and the fall time with a viscometer of ubbelohde viscometer with constant β of $3.31x10^{-5}$ that is calculated with the time of fall of the water.

1. Supporting tables

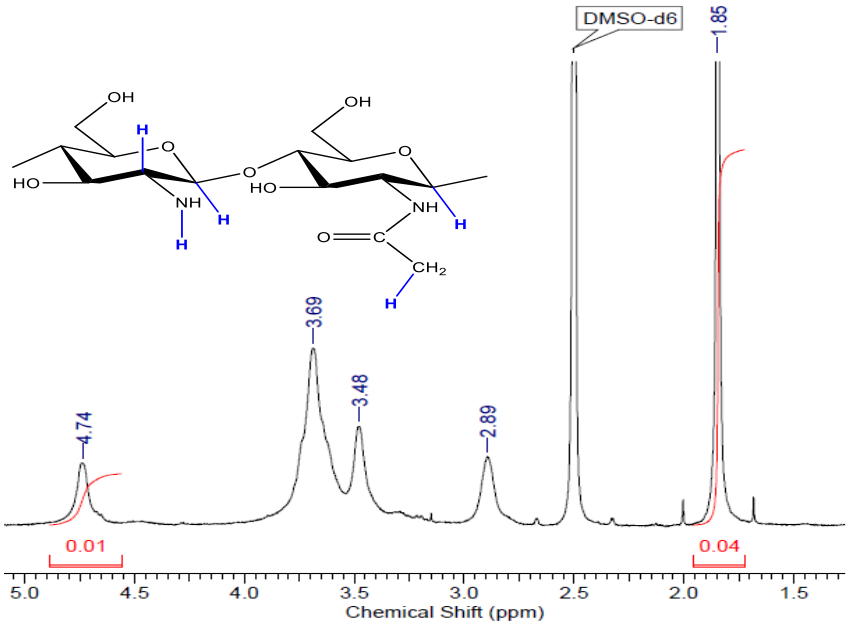
Table S1. Concentrations and drop times of solutions taken in an ubbelohde viscometer.

Concentration (mL/g)	Time (s)	ρ (g/mL)
Solvent	277	1.0320
0.0008	279	1.0324
0.0010	282	1.0327
0.0013	283	1.0332
0.0015	284	1.0348
0,0018	285	1.0360
0.0020	286	1.0368

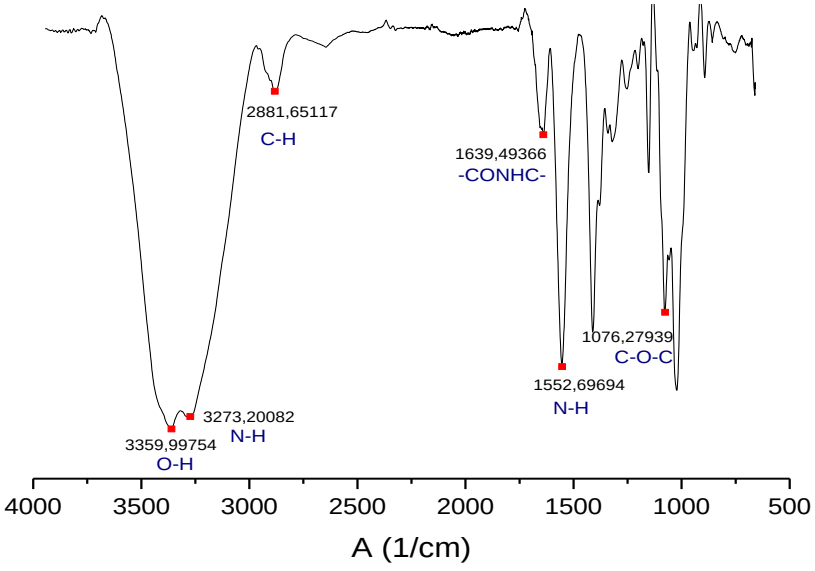
2. Supporting images



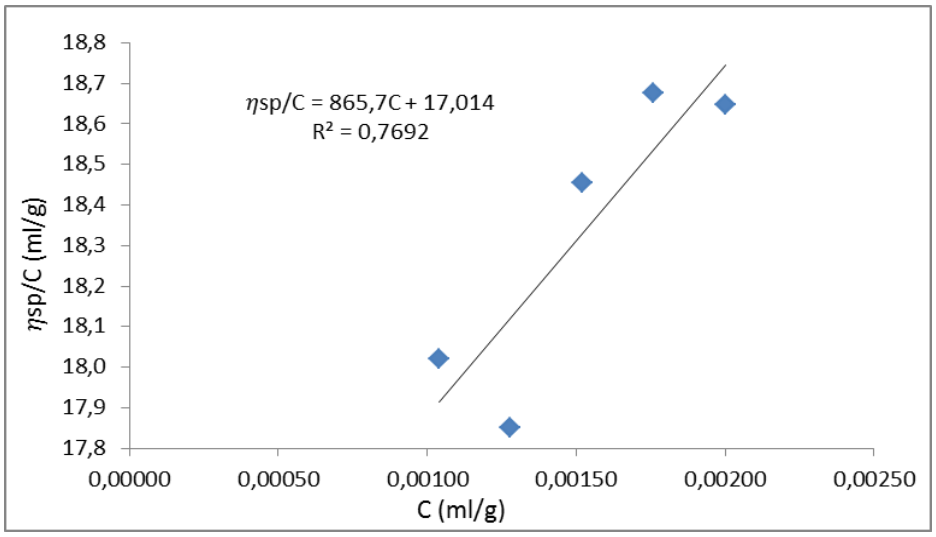
31 **Figure S1**. Potentiometric titration of the CS.



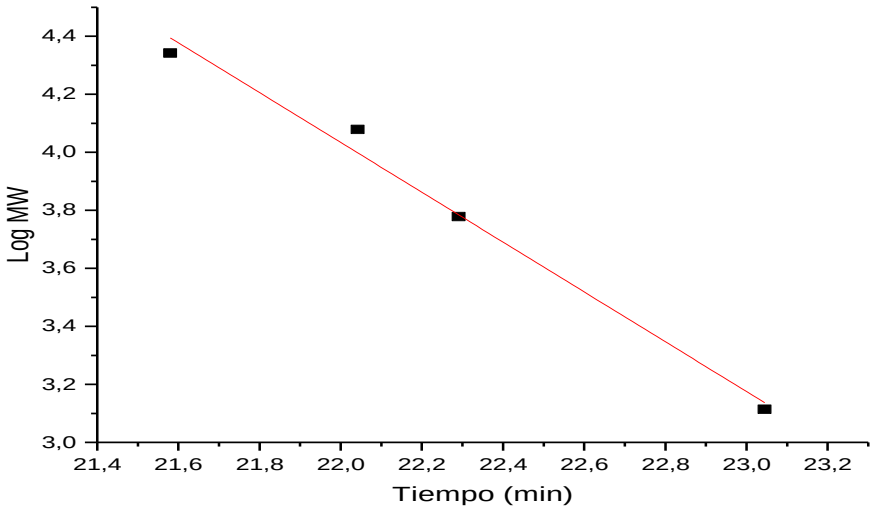
32 **Figure S2**. [1]H-NMR of the CS.



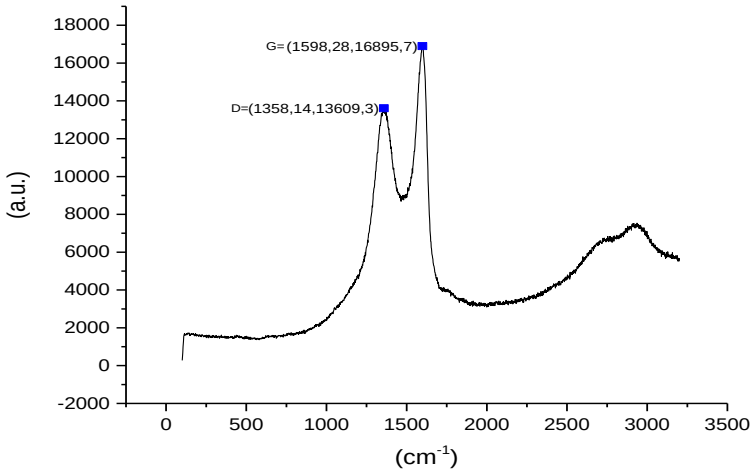
33 **Figure S3.** FTIR of the CS.



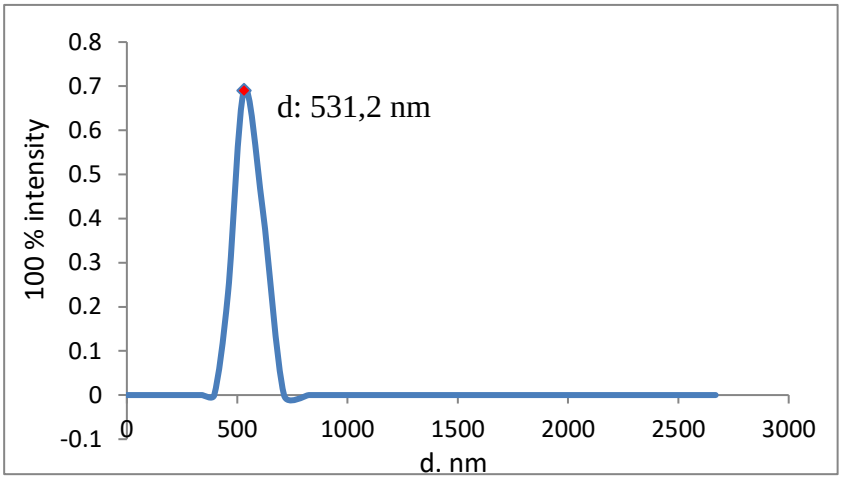
34 **Figure S4.** Viscosity curve. Specific viscosity vs concentration.



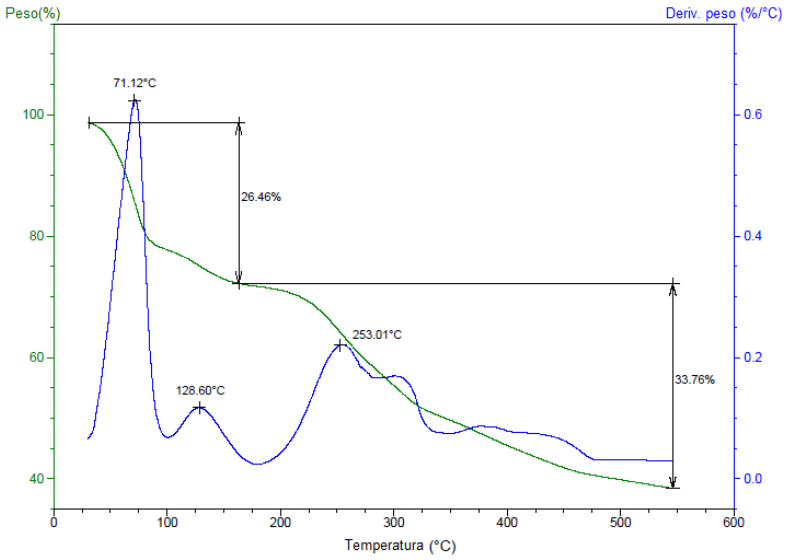
35 **Figure S5.** Calibration curve of GPC with pululan standards.



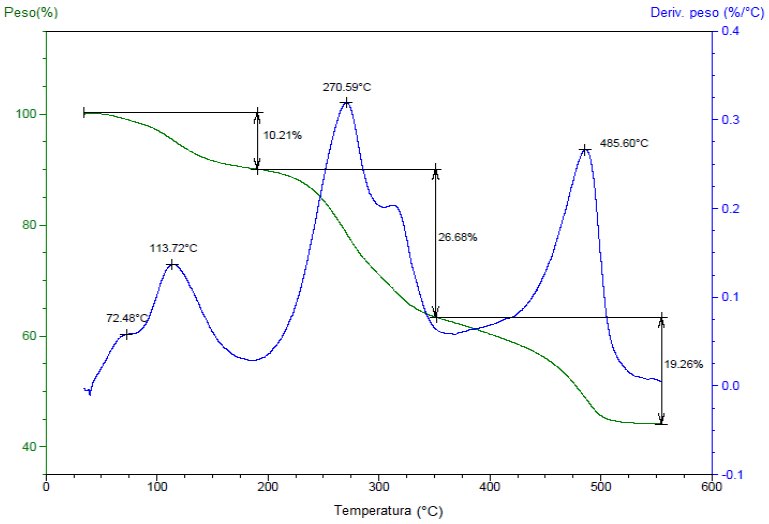
36 **Figure S6.** Raman spectrum of the GO



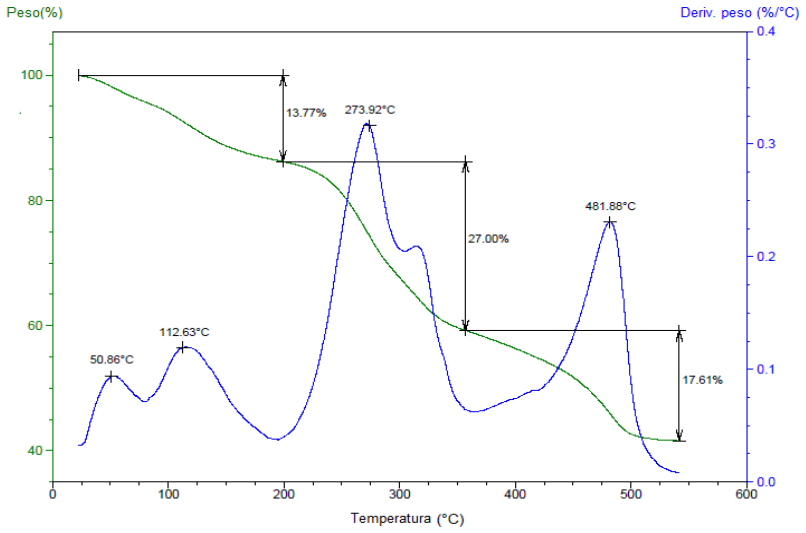
37 **Figure S7.** DLS of the GO



(**a**)

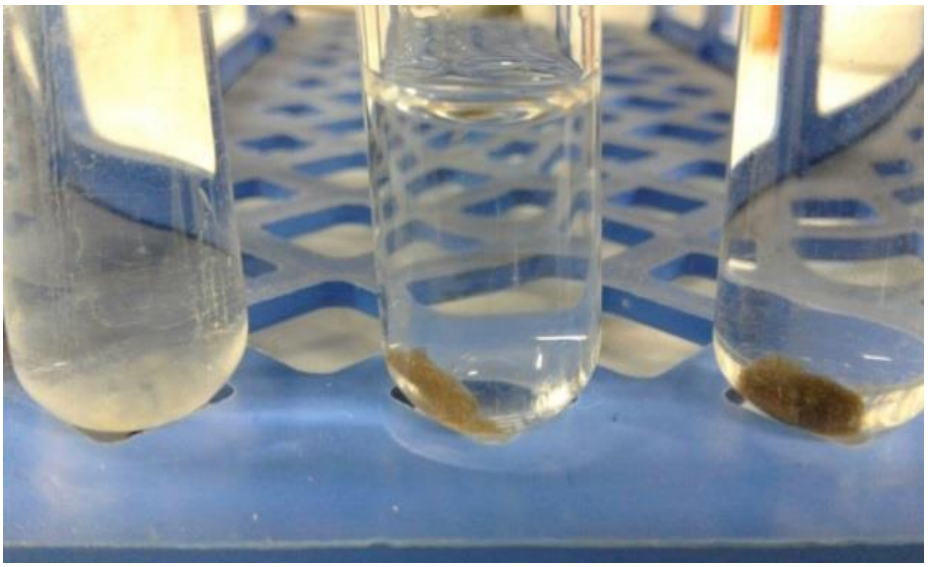


(**b**)



(**c**)

Figure S8. Termogravimetric curve of CS scaffolds (a) without GO, (b) with 0.5% GO and (c) with 1.0% GO.



(**a**) (**b**) (**c**)

Figure S9. Degradability test of CS scaffolds in physiological serum (a) without GO, (b) with 0.5% GO and (c) with 1.0% GO added.