

Supporting information

Functionalization of an alginate-based Material by Oxidation and Reductive Amination

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The molecular weight of commercial sodium alginate was evaluated by Size-exclusion chromatography (SEC) with online multi-angle static laser light scattering (MALLS), which were performed at ambient temperature on an HPLC system consisting of a solvent reservoir, on-line degasser, HPLC isocratic pump, automatic sample injector, pre-column, and a G6000PW main column. The column outlet was connected to a Dawn HELEOS-II multiangle laser light scattering photometer (Wyatt, U.S.A.) ($\lambda_0 = 663.8$ nm) followed by Shodex RI-501 refractive index detector. The eluent was 0.15 mol L⁻¹ NaNO₃, 0.01 mol L⁻¹ EDTA (pH = 6.0) and the flow rate was 0.5 mL min⁻¹. Samples (1 mg mL⁻¹) were filtered (pore size 0.45 μ m) before injection and each sample were analyzed twice with injection volume 50 and 100 μ L. Data were collected and processed (with $dn/dc = 0.150$ mL g⁻¹) using the Astra (v. 7.3.0) software (Wyatt, U.S.A.). The analysis was performed according to the ASTM protocol nr. F2602 – 13.

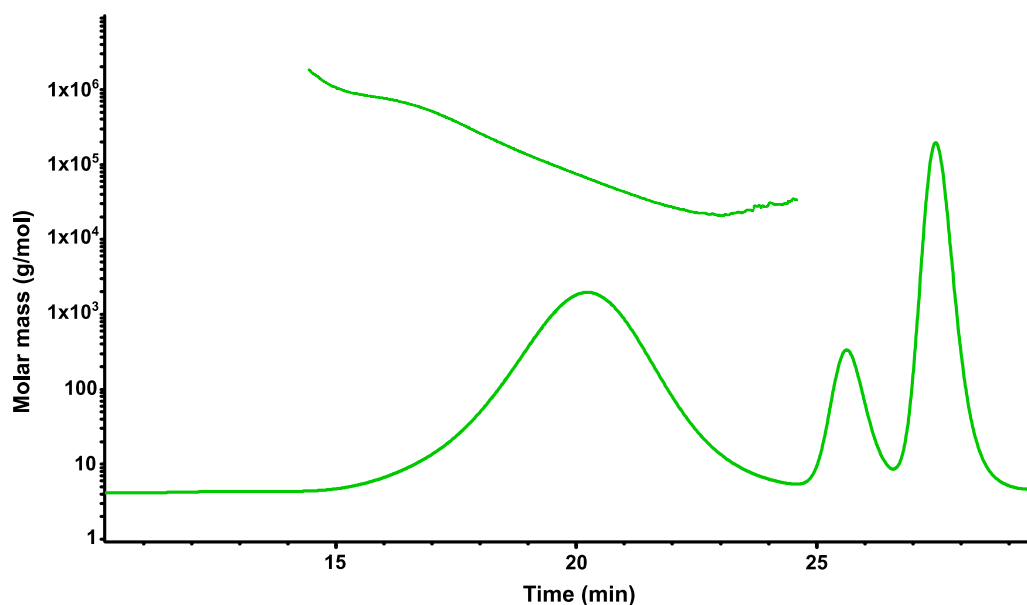


Figure S1. Refractive index chromatogram of commercial sodium alginate used as starting material.

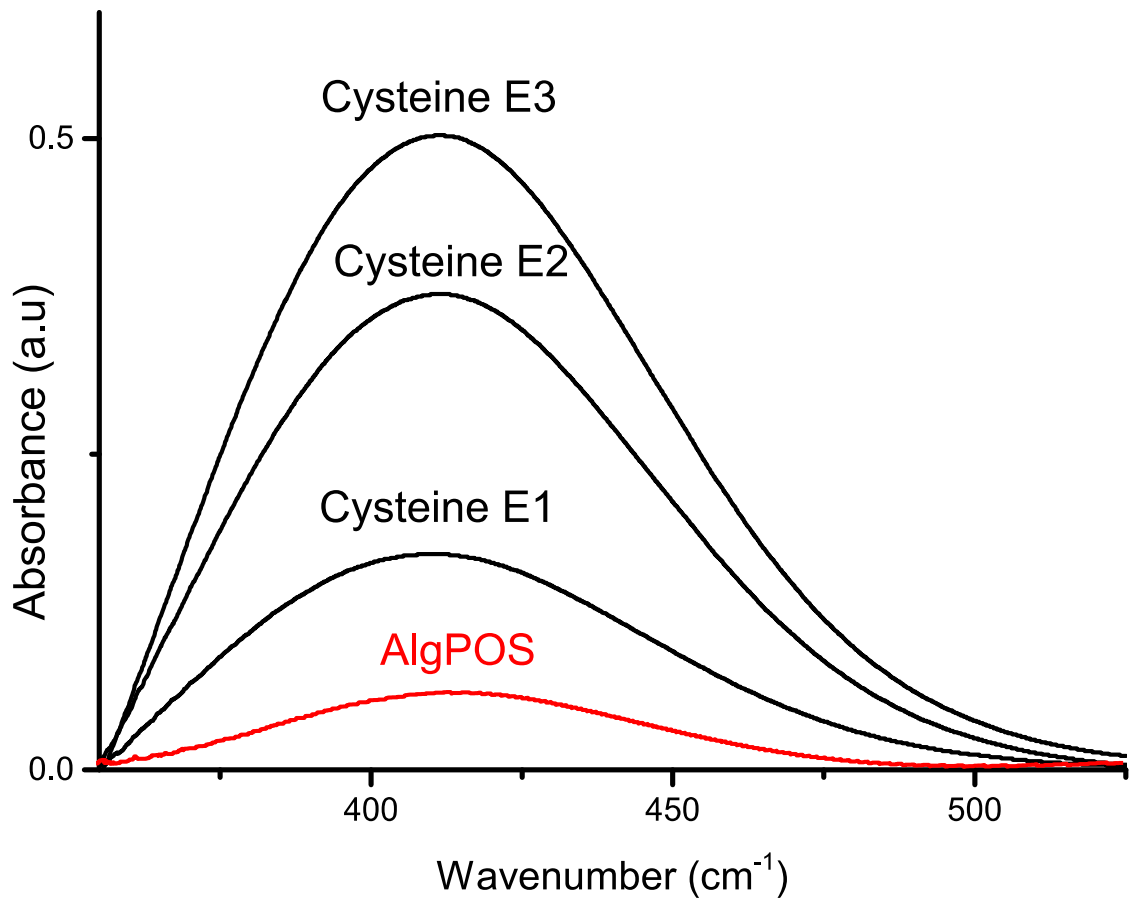


Figure S2. UV-Vis spectra of cysteine standards (E1, E2 and E3) and AlgPOS. Evaluation of thiols group by Ellman’s reaction.

Table S1. Values obtained of commercial sodium alginate by SEC-MALS

| Sample | Mn | Mw | PI (Mw/Mn) |
|------------------------------------|-------------|--------------|------------|
| Sodium alginate (Sigma Aldrich) | 58.6 | 124.7 | 2.1 |
| | 57.0 | 123.7 | 2.2 |
| Average | 57.8 | 124.2 | 2.1 |

Table S2. Values obtained of commercial sodium alginate by ¹H NMR

| Sample | F _G | F _M | F _{GG} | F _{GM} | F _{MM} | F _{GGM} | F _{MGM} | F _{GGG} | N(G>1) | M/G |
|------------------------------------|----------------|----------------|-----------------|-----------------|-----------------|------------------|------------------|------------------|--------|------|
| Sodium alginate (Sigma Aldrich) | 0.49 | 0.50 | 0.30 | 0.18 | 0.31 | 0.07 | 0.11 | 0.24 | 5.33 | 1.02 |

Table S3. Values obtained of AlgPOS by UV-Visible.

| Sample | Absorbance | [C] (μM) | V(mL) |
|-------------|------------|-----------------------|-------|
| Cysteine E1 | 0.171 | 24.6 | 10 |
| Cysteine E2 | 0.377 | 49.2 | 10 |
| Cysteine E3 | 0.503 | 61.5 | 10 |
| AlgPOS | 0.086 | 74.7 | 200 |