Abstract

Hydrogels Based on Polysaccharides Grafted Ferulic Acid: A Biomimetic Approach †

Ahdi Hadrich, Didier Le Cerf ©, Virginie Dulong © and Luc Picton * ©

Polymères, Biopolymères, Surfaces (PBS) UMR6270 CNRS, Université de Rouen Normandie, 76821 Mont Saint Aignan, France; hadrich.ahdi@hotmail.fr (A.H.); didier.lecerf@univ-rouen.fr (D.L.C.); virginie.dulong@univ-rouen.fr (V.D.)
* Correspondence: luc.picton@univ-rouen.fr
† Presented at the 17th International Symposium "Priorities of Chemistry for a Sustainable Development" PRIOCHEM, Bucharest, Romania, 27–29 October 2021.

Keywords: hydrogels; biomimetic approach; artificial polysaccharides

Some cereal seeds present mucilage composed of polysaccharides bearing ferulic acid (FA) groups, which are capable of reacting in the presence of an enzyme such as laccase to generate chemical hydrogels [1]. The main idea of this work, following a biomimetic approach, is to elaborate artificial polysaccharides grafted with ferulic acid groups [2]. Various polysaccharides have been studied: anionic ones (carboxymethylpullulan (CMP) as a model, hyaluronan (HA) for application) and neutral ones (pullulan (P)). We report here the availability of the grafting, the evidence of crosslinking (Figure 1) leading to hydrogels in the presence of laccase (as a function of FA, polymer and laccase amount) and evidence of antioxidant properties of such derivatives [3].

Figure 1. G’ vs. time for CMP-FA for various DSFA. Laccase at 2 nkat, 20 g L−1 in polymer, 25 °C in citrate/phosphate buffer (0.1 mol L−1 pH 5.5).
**Author Contributions:** Conceptualization, all; methodology, all; software, L.P.; validation, all; formal analysis, all; investigation, all; resources, all; data curation, all; writing—original draft preparation, all; writing—review and editing, L.P.; visualization, L.P.; supervision, L.P.; project administration, V.D. and L.P.; funding acquisition, V.D. and L.P. All authors have read and agreed to the published version of the manuscript.

**Funding:** This research received no external funding.

**Institutional Review Board Statement:** Not applicable.

**Informed Consent Statement:** Not applicable.

**Data Availability Statement:** Not applicable.

**Conflicts of Interest:** The authors declare no conflict of interest.

**References**