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SYNTHESIS AND CHARACTERIZATION OF GREEN CROSSLINKED HYDROGELS

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Abstract & Background

Hydrogels are three-dimensional polymeric networks able to absorb and maintain significant amounts of water or biological fluids even under pressure conditions. Due to their characteristics, hydrogels have been developed for various applications including tissue engineering, and drug delivery systems.
Salecan, is a recently developed bacterial polysaccharide obtained from *Agrobacterium sp. ZX09*, which present a good water-solubility and excellent biological properties as immunity enhancement, biocompatibility and adequate biodegradability. The biocompatible properties of citric acid and its multifunctional chemistry have attracted the attention of researchers from biomaterials field. Citric acid can used to crosslink polymeric networks due to its three carboxylic (-COOH) groups and single hydroxyl (-OH) group, improving also their properties.

Aims

The purpose of this study was to synthesize and characterize green crosslinked salecan hydrogels using various citric acid concentrations.

Methods and Results

The structures of the crosslinked hydrogels were characterized by FTIR and SEM analyses. TGA measurements showed the thermal stability for salecan crosslinked hydrogels. The swelling ratio and mechanical properties of hydrogels were also studied.

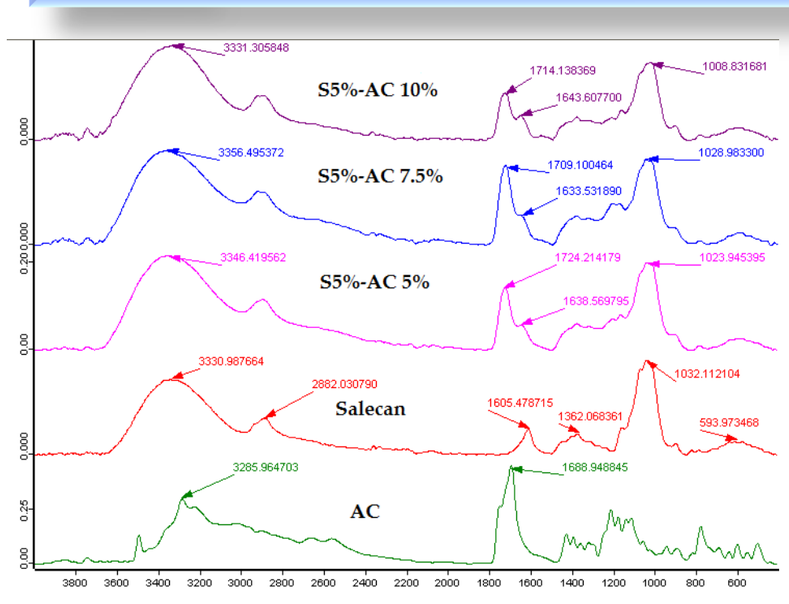

Figure 1. *FTIR analyses on the crosslinked samples*

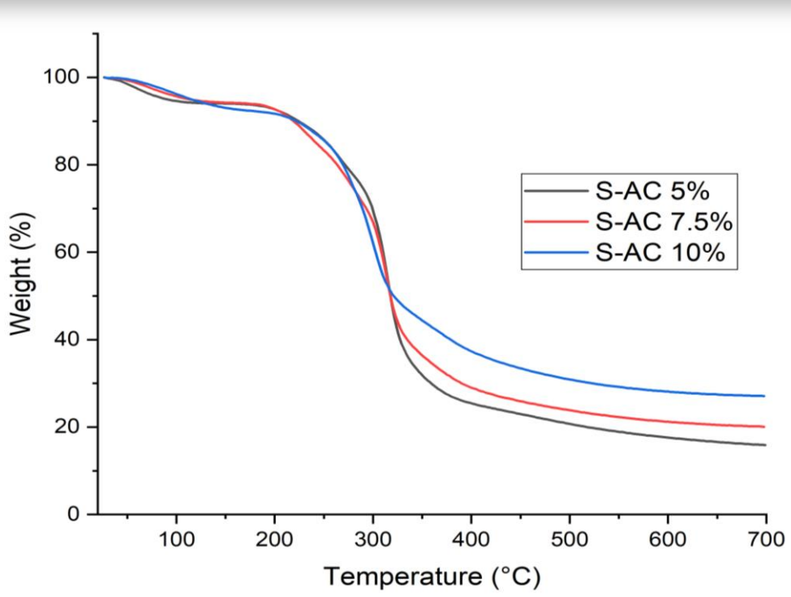

Figure 2. *Thermogravimetric curves of the samples*

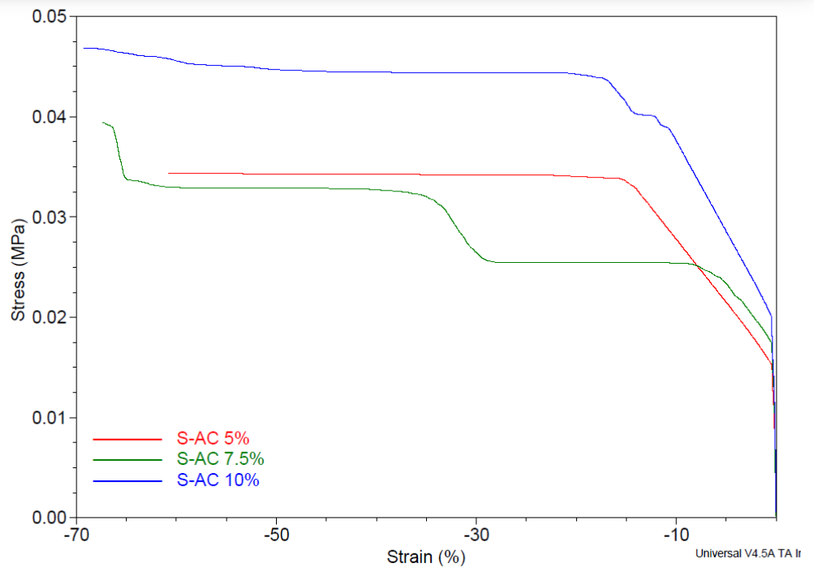

Figure 3. *DMA analyses on the PBS swollen samples*

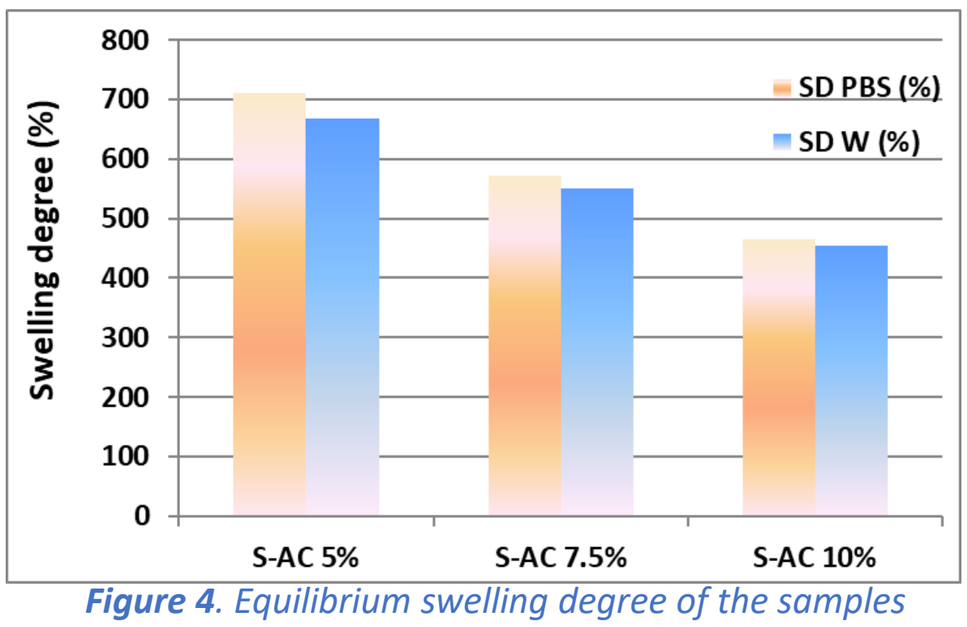

Figure 4*. Equilibrium swelling degree of the samples*

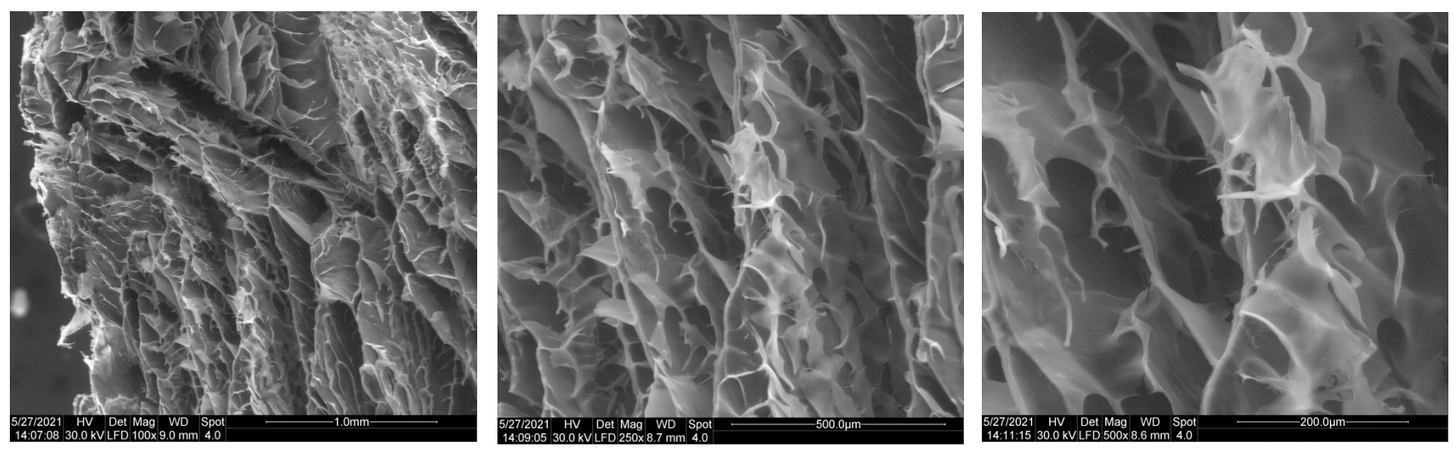

Figure 5. *SEM images of salecan based crosslinked xerogel (different magnitudes)*

Conclusions

The obtained results highlighted the achievement of novel green crosslinked salecan based hydrogels as promising materials for future applications in the biomedical field.

Acknowledgement

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