

Isolation and Functionalization of Carrageenan Produces a Composite with Increased Swelling Capacity

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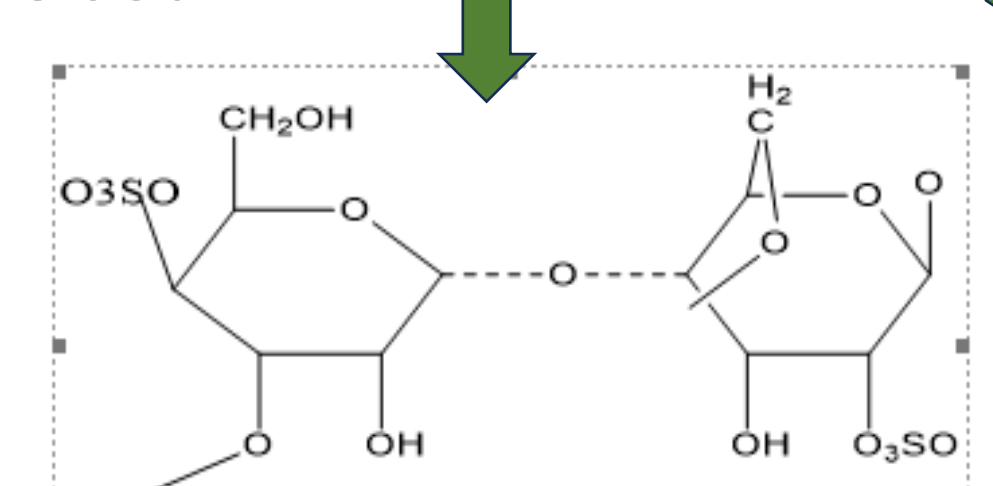
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Introduction

- The environmental pollution has remained a major threat to the health of the plants and animals.
- Major pollutants are synthetic materials that are non biodegradable and also produces harmful chemicals upon disposal.
- Carrageenan is a bioproduct that is isolated from sea weed plants. Upon functionalization with other polymers, it produce biopolymer products that are environmental friendly, which are biodegradable and does not emit harmful substances with high swelling capacity to absorb more fluids.
- The high swelling capacity product can be used to boost agriculture hence increase in food production and also in medical field.
- Also in sanitary towels and diapers hence reduce infections that arise as a result of dampness.
- This implies that on using these biopolymers, there will be a guarantee of health society due to increase in food production, proper drug delivery and personal hygiene.
- Also upon disposal, there will be no environmental pollution thus society will not be exposed to the dangers associated to the emissions.



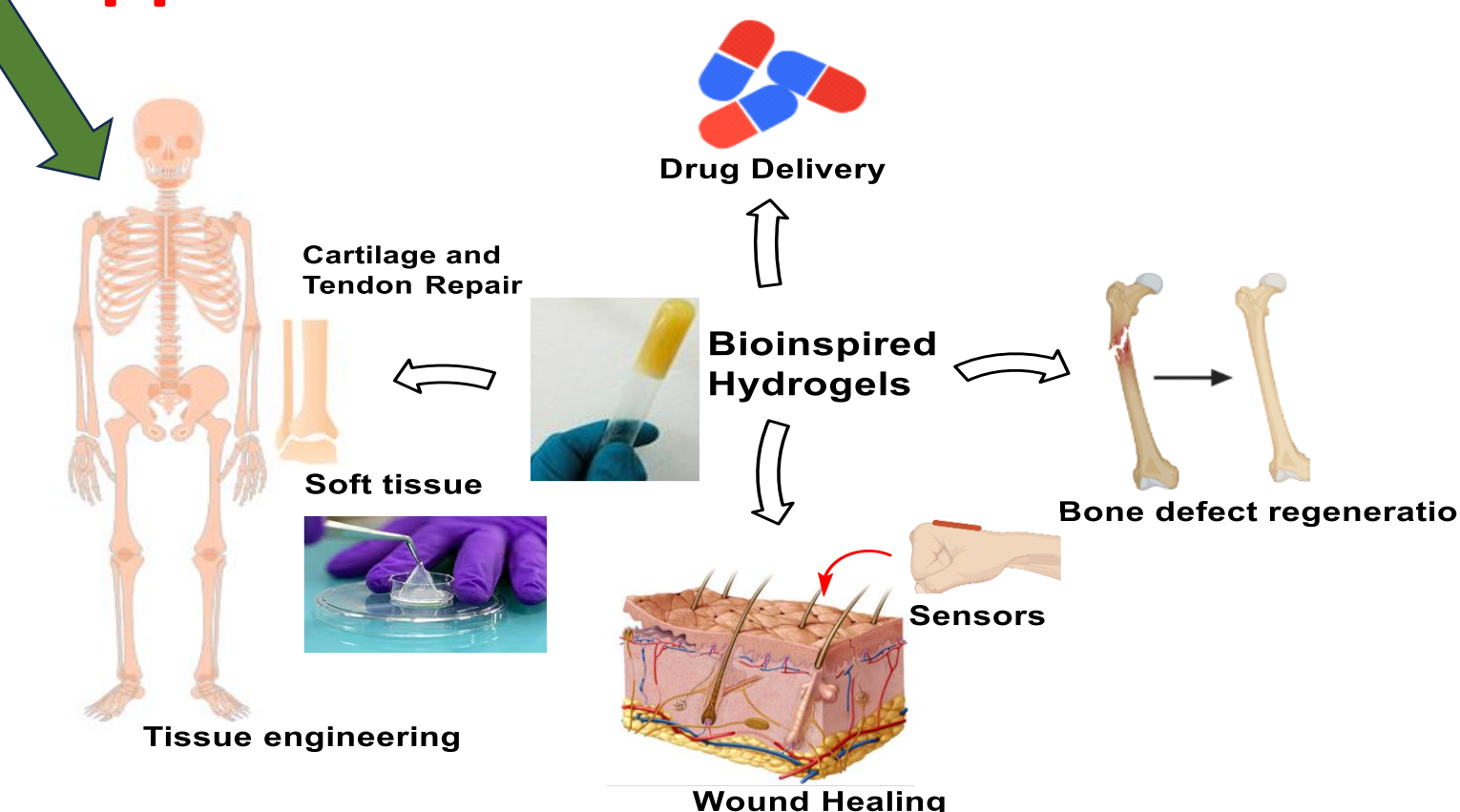
Sea weed
growing in
Indian
Ocean



Carrageenan isolated from sea weed with sulphates and hydroxyl groups.

Carboxymethylcarrageenan (CMC)-High swelling product after functionalization by replacing hydroxyl group with carbonyl group

Applications of CMC



Objective

- To develop the high swelling capacity cellulose carrageenan copolymer hydrogels for optimal fluid absorbance

Methodology

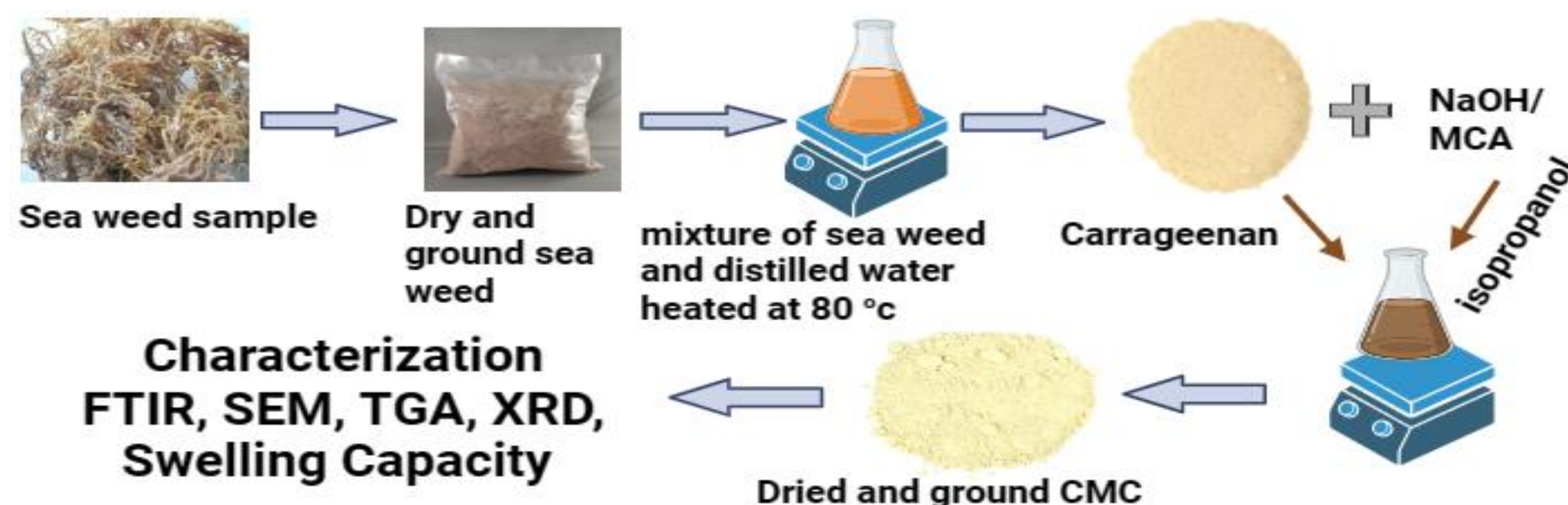


Figure 2. Schematic diagram showing of sample collection to characterization of CMC

Results

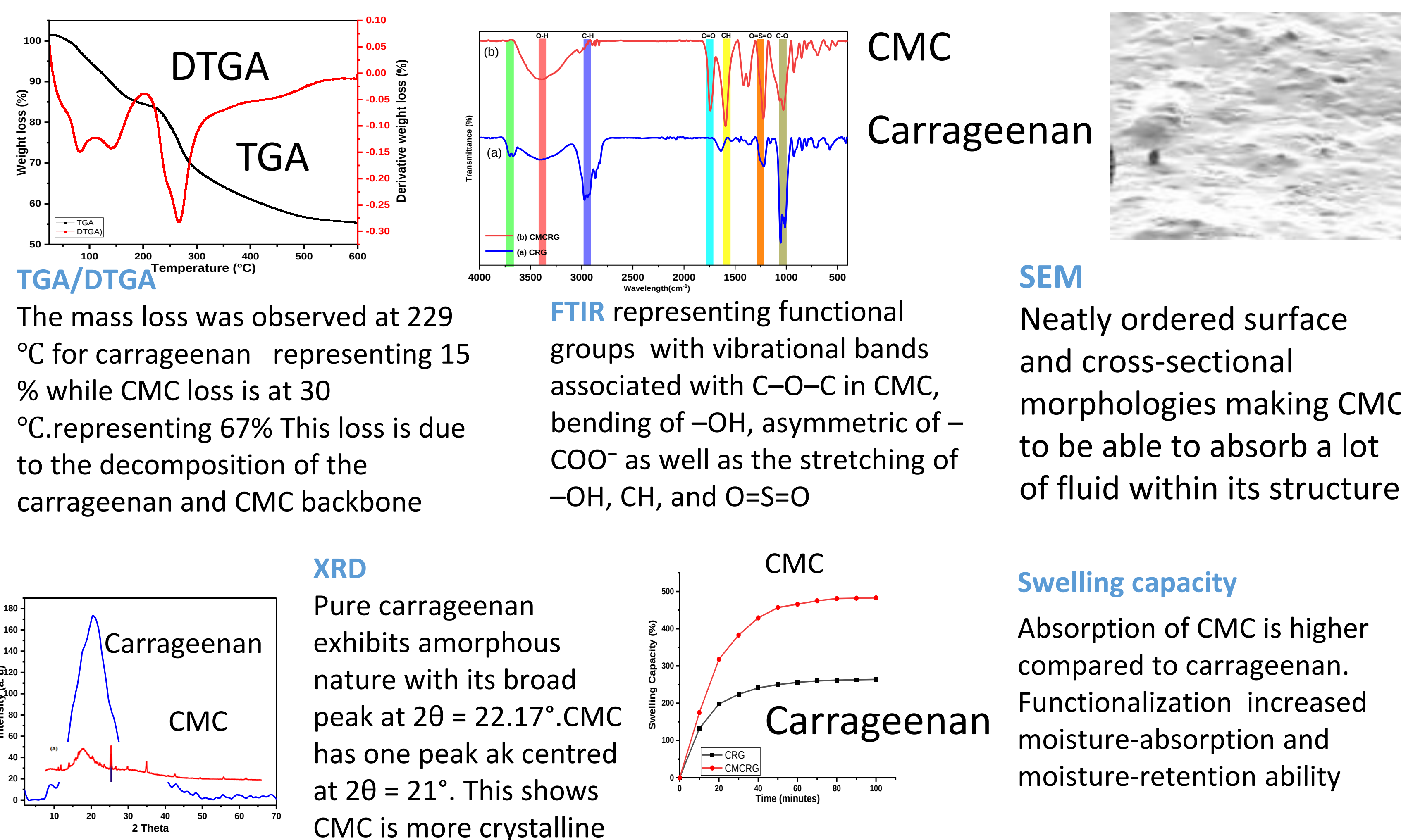


Figure 3. Characterization of carrageenan and CMC using TGA/DTGA, FTIR, SEM, XRD and investigation of their swelling capacity

Conclusion

- Biocompatibility and simplicity to functionalize carrageenan with monochloroacetic acid allowed the development a high swelling biopolymer.
- This product has a role in manufacturing of high absorbent materials that can be used in agriculture and medical fields, considering they cannot undergo dissolution and they have stability when presented at high temperature, and can release the fluids slowly.
- The product is also biodegradable thus environmentally friendly.
- This product promotes good health and well being of the society by reducing pollution infections.
- It increases agricultural production and therefore boost economic growth of the country.
- Finally it support personal hygiene in sanitary towels and diapers due to its absorption level.

References

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Acknowledgment