

## Melting and gelation of kappa-Carrageenan by MICROCALVET

### INTRODUCTION

Carrageenans are extracted from red algae and used in food processing for their gelation properties. This polysaccharide shows an order-disorder transition when heat-treated.

The kappa-carrageenan, obtained under aggregating conditions in the presence of K<sup>+</sup> ion, shows a single molecular process when heated and cooled. The kappa-carrageenan forms rigid, thermally reversible, high strength gels e.g. dessert gels, petfood gels, air freshener gels. The microcalorimetry technique is well adapted to investigate the formation and the melting of such gels.

### EXPERIMENT

k-carrageenan (0.5 %) in KCl 0.1 M solution pH 5.

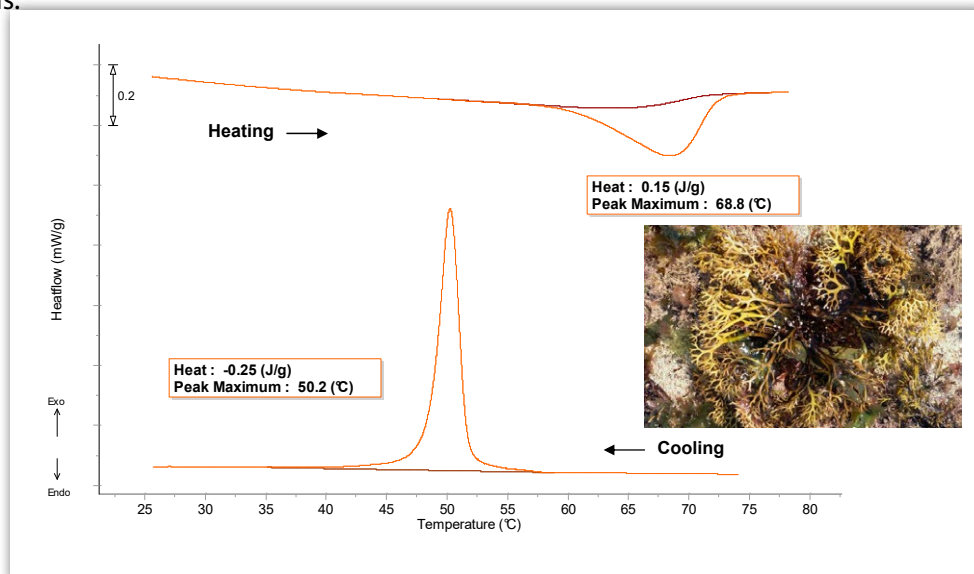
MICROCALVET experimental conditions:

Sample mass: about 620 mg

Cells : Standard cells

Experimental procedure:

Heating from 20°C up to 80°C at 0.5°C/min.



### RESULTS AND CONCLUSION

During the heating phase, an endothermic effect corresponding to the melting of the carrageenan is observed with a maximum at 68.8°C.

When cooling, an exothermic effect is detected at 50.2°C, with a significant hysteresis, corresponding to the gelation process.

### INSTRUMENT

#### MICROCALVET

-45°C to 120°C



#### HIGHEST HEAT MEASUREMENT ACCURACY

3D sensor based on Peltier elements with Joule effect calibration.

#### MODIFIABLE TEMPERATURE CONDITIONS

for increased flexibility and replication of real life conditions.

#### CONVENIENT INTERCHANGEABLE CRUCIBLES AND CELLS

to perform even the most demanding experiments using one instrument :

- high pressure (1000bar) and high vacuum
- pressure measurement and control
- mixing experiment

#### EXTERNAL COUPLING CAPABILITY

designed to increase your research options including manometry, BET instrumentation, gas analyzers, humidity controllers and gas panels