

Melting and gelation of iota-kappa carrageenan

Introduction:

Carrageenans are linear sulfated polysaccharides extracted from Red Algae and used in food processing for their gelation properties. Three types of carrageenan exist: iota, kappa and lambda. Gelation is only obtained with the kappa and iota forms.

Iota carrageenan produces soft gels whereas the gels obtained with the kappa form are strong. The MicroDSC technique is well adapted to investigate the formation and the melting of such gels.

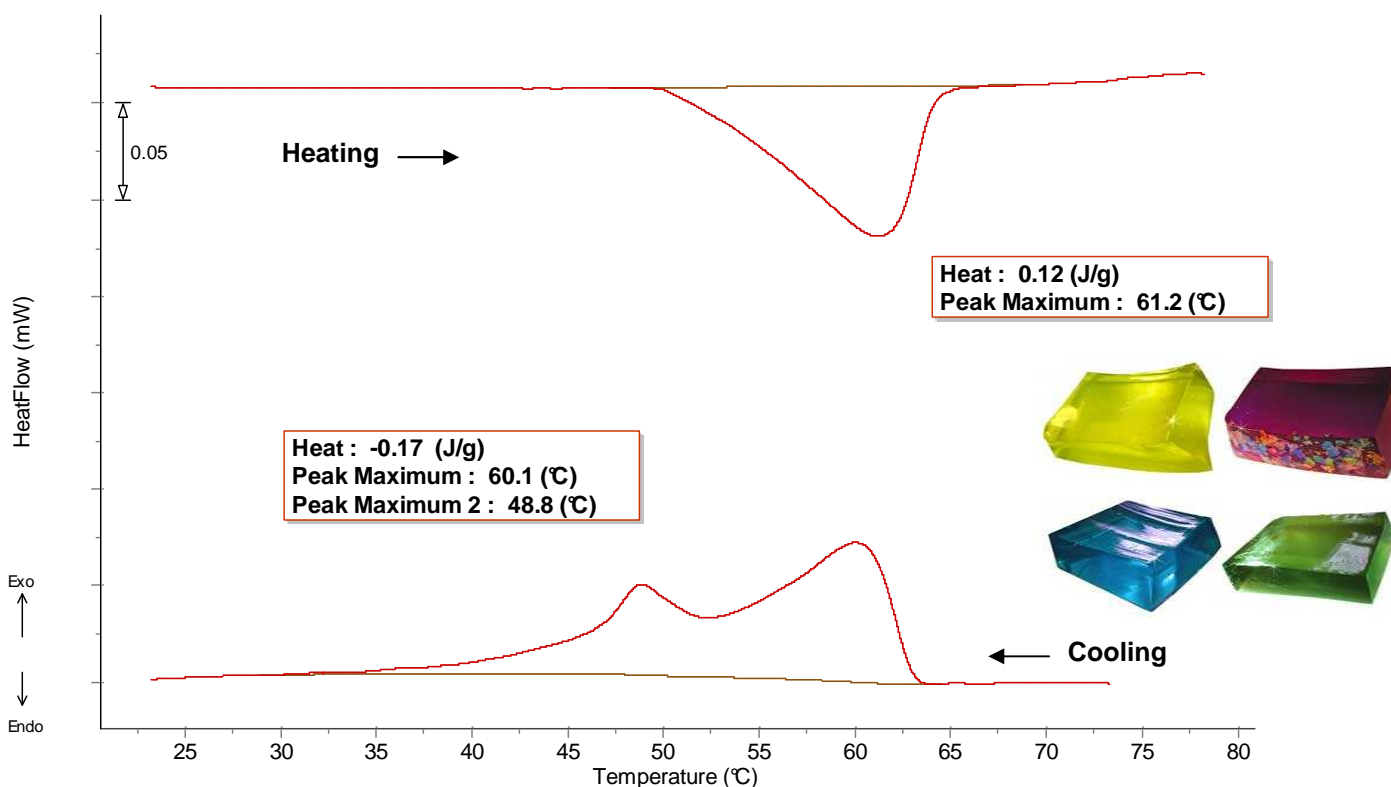


Figure 2 – HeatFlow vs. Temperature signals during heating and cooling operations

Experimental conditions

600mg of sample were tested in a μ DSC7 Evo calorimetric vessel. It was composed of a 1% aqueous solution of carrageenan (mostly composed of iota form), with 0.1M KCl at pH 5. It was heated from 20°C up to 80°C at 0.5°C.min⁻¹ and cooled back down to 20°C at the same rate.

Results

During the heating phase, an endothermic effect corresponding to the melting of the carrageenan gel is observed. A single peak is detected with a maximum at 61°C. When cooling, an exothermic effect composed of two maxima is detected corresponding to the gelation of the two carrageenan forms, the iota form at 60.1°C and the kappa form at 48.8°C.

μ DSC7 Evo
-45°C to 120°C



www.setaram.com
sales@setaram.com

