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1 Phase diagrams of hybrid carrageenans extracted from *Ahnfeltiopsis devoniensis* and
2 *Chondrus crispus*

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6 KI aggregates show less tendency to phase separate from the liquid matrix than K+I aggregates

7 Gel formation occurs at smaller concentrations and ionic strengths for KI possessing larger fraction of K

8 Below 50 mol% of K, KI gels show different structure and elasticity

9 Large deformation behavior of KI gels does not depend on the KI chemical structure

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16

17 Abstract

18 NaCl and KCl phase diagrams of two kappa/iota-hybrid carrageenans (KI) are established, and the
19 rheological properties of obtained solutions and gels are reported. KI were extracted from
20 *Ahnfeltiopsis devoniensis* and *Chondrus crispus* seaweeds and showed different chemical
21 composition, 48 mol% of kappa carrageenan (K) and 52 mol% of iota carrageenan (I), and 78 mol%
22 of K and 22 mol% of I, respectively. Phase diagrams are systematically compared those of blends of
23 commercial K and I (K+I) showing equivalent chemical compositions. Results confirm that KI
24 clearly differ from mixtures of K and I. K+I form gels at lower polysaccharide concentration and
25 ionic strength, and exhibit gel separation from a liquid phase when large amount (>0.1 mol/L) of
26 KCl is used. In contrast, no syneresis was found in KI gels formed under similar conditions. Both KI
27 and K+I gels are strain hardening, and show a concentration scaling of the elasticity with exponents
28 ranging from 1.1 to 3.2 depending on the type of salt and ionic strength. The strain at break of KI

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