

Accepted Manuscript

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PII: S0308-8146(18)30939-7
DOI: <https://doi.org/10.1016/j.foodchem.2018.05.116>
Reference: FOCH 22949

To appear in: *Food Chemistry*

Received Date: 4 February 2018
Revised Date: 22 May 2018
Accepted Date: 25 May 2018

Please cite this article as: Zhou, Y., Jiang, R., Perkins, W.S., Cheng, Y., Morphology Evolution and Gelation Mechanism of Alkali Induced Konjac Glucomannan Hydrogel, *Food Chemistry* (2018), doi: <https://doi.org/10.1016/j.foodchem.2018.05.116>

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Morphology Evolution and Gelation Mechanism of Alkali Induced Konjac
Glucomannan Hydrogel

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Abstract

A molecular-level mechanism of alkali induced konjac glucomannan (KGM) hydrogel gelation processing is considered with the application of nuclear magnetic resonance (NMR) spectroscopy and atomic force microscopy (AFM) as complementary methods to diffusive wave spectroscopy (DWS) microrheology and thermoanalysis. It is shown that deacetylation of KGM chains occurs immediately upon mixing with Na_2CO_3 , inducing self-packaging. Partial unfolding of the packed loose structure of dehydrated KGM is observed upon heating. The configuration transition from random coils to self-assembling filament networks takes place before KGM aggregating to form large irreversible bundles with a lower degree of cross-linking. The gelation is not fulfilled

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