Electronic supplementary information (ESI) to:

Structure of hyaluronan during acid catalyzed hydrolysis according to a kinetic study of both chain scission and disaggregation

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Section A - Error Analysis

Before comparing our E_a values to literature values we make an indication of its reliability. Since E_a was determined from the slope of a line through only 4 points, we approached this as follows. For the k_h values resulting from reducing-end analysis, we took the vertical distance from the determined data points to the fitted line in the Arrhenius plot. The largest difference in $\ln(k_h)$ was found to be 0.04. We assumed this as a maximum error, and used it to calculate a range for the determined E_a within which, differences in E_a are insignificant. Changing the slope of the fitted line by elevating it at the beginning (at T = 70 ºC) by 0.04 and lowering the end (at T = 40 ºC) by 0.04 and vice versa yields a range for E_a between 94 and 100 kJ/mol for the reducing-end analysis (E_a = 97 ± 3 kJ/mol).

Based on Tømmeraas'[1] published data points, we calculate similarly to above, that the largest difference in $\ln(k_h')$ is 0.58, and that consequently, the E_a may range between 110 to 164 kJ/mol (E_a = 137 ± 27 kJ/mol).

For the light scattering results, we calculate similarly to above, that the largest found vertical distance of the data points to the fitted line, in units of $\ln(k_d)$ was 0.18 resulting in an E_a range of 91 to 112 kJ/mol (E_a = 101 ± 10 kJ/mol).

Section B – Fitting Details Scattered Light Intensity

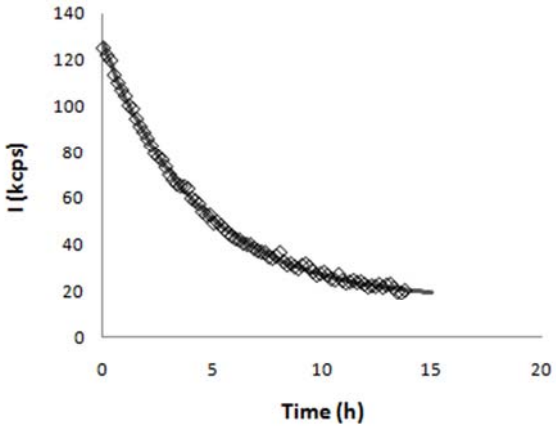

Figure S1 Total scattered light intensity (I) vs. time measurements for 2 g/l hyaluronan being degraded at pH 1.1 and 70 ºC (rhombi). Background I was determined by fitting a mono-exponential function + background (black line) to the $I_{(t)}$ data points. Data from the first 3 h were excluded, so, the x axis in this figure starts at t=0 where the $I_{(t)}$ measurement was already at t = 3h. The complete fitted function had the form: $I = b + ae^{(-ct)}$, in which b is the background with a value of 15.95 kcps (kilo counts per second)

Reference

1. K. Tømmeraas and C. Melander, *Biomacromolecules*, 2008, **9**, 1535-1540.

Electronic Supplementary Material (ESI) for Soft Matter