Supporting information for

Shear-induced self-thickening in chitosan-grafted polyacrylamide aqueous solution

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Elemental analysis (EA)

Table S1 shows the elemental analysis results of GPAM and calculated graft ratio. The calculation process is shown as follows.

Table S1. The elemental analysis results of GPAM and calculated graft ratio.

Sample	N(%)	C(%)	H(%)	Graft Ratio(%)
GPAM1	8.28	33.50	6.18	70.8
GPAM2	13.55	40.27	6.88	324
GPAM3	13.10	36.89	6.51	481

Calculation process:

Let the mass fractionW_{CS} = x,W_{PAM} = y and the $W_{impurity}$ (the moisture and bonded water content of Chitosan) = z, and x+y+z=1, as equation(3). Equation(1) indicates the measured content of N(*N%*) and equation(2) the calculated O content, based on the theoretical content of Chitosan and PAM in **Table S2**. Then *x* and *y* are calculated from the equation set and final graft ratio equals to y/x.

Table S2. The theoretical content of each element in the chosen chitosan and PAM.

Elements	Chitosan(CS)	PAM
N(%)	6.89	19.72
O(%)	34.16	22.54

$$\begin{cases} W_{CS} = x; \\ W_{PAM} = y; \\ W_{\text{impurity}} = z; \end{cases} \qquad \begin{cases} N\% = 7.41\%x + 19.72\%y \quad \text{.....(1)} \\ 33.86\%x + 22.54\%y = 1 - (N + C + H)\% - z \quad \text{.....(2)} \\ x + y + z = 1 \quad \text{.....(3)} \end{cases}$$

$$G\% = \frac{y}{x}$$

Rheology

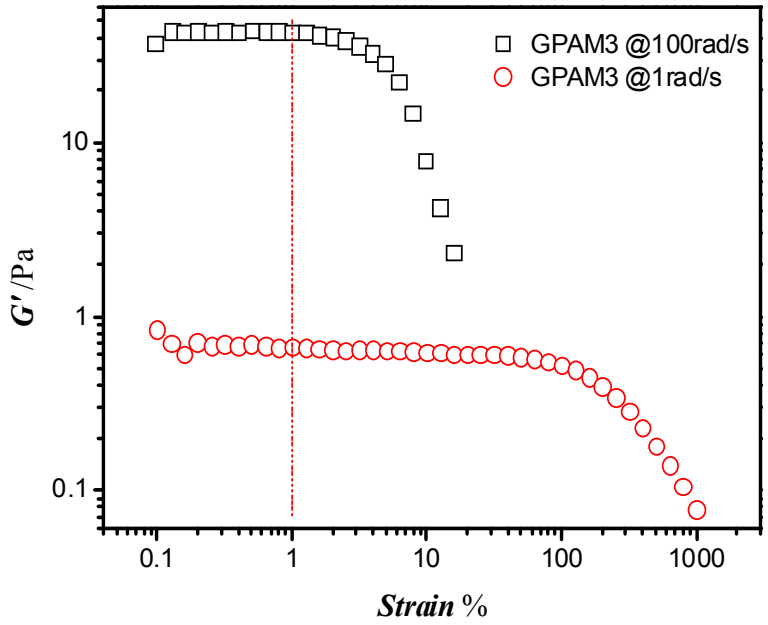

Figure S1. Strain sweep for 1 wt% GPAM3 solution and the LVR was determined.

Fig.S1 gives strain sweep results for 1 wt% GPAM3 solution**.** whole frequency range in dynamic rheological experiments is involved in the linear viscoelastic region.

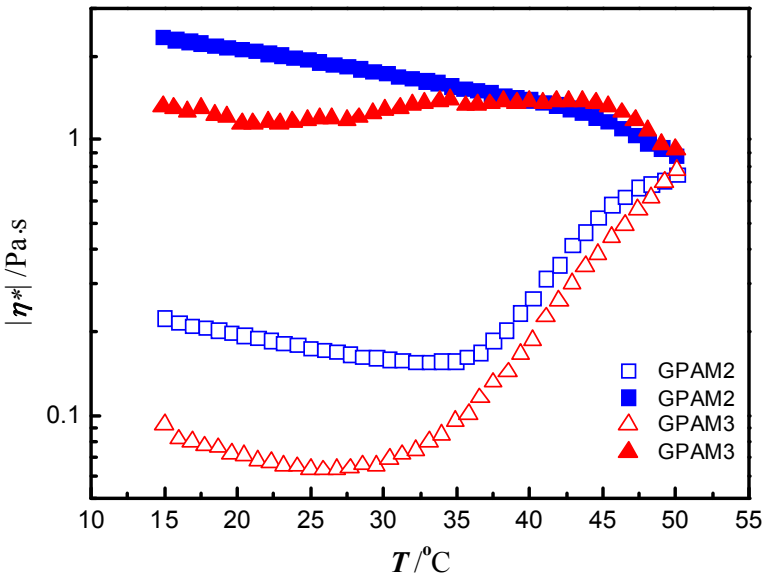

Figure S2. Thermo-thickening for 1 wt% GPAM solutions at the rate of 2.5 °C/min (heating, open; cooling, solid; strain γ=1%，angular frequency ω=6.28rad/s).

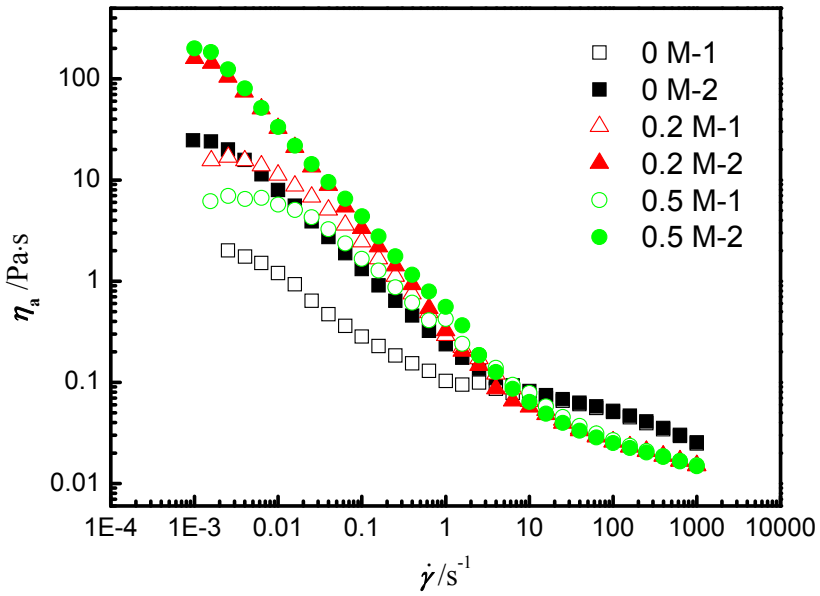

Figure S3. Influences of added salt(NaCl, 0.2 M and 0.5 M) on steady flow curves of 0.75 wt% GPAM3 solutions before (open,1) and after (solid,2) shear-induced thickening for 30 min.