Supporting Information

1. $^1$H NMR spectrum of HMPAM/α-CD

Figure S1 $^1$H NMR spectra of 2.5wt%HMPAM/15mM α-CD in D$_2$O at T =25 °C.

2. Viscosity study of HMPAM/α-CD solution

Figure S2. Zero-shear viscosity as a function of α-CD for mixtures of P(AM/C$_{12}$) and for mixtures of p(AM/C12) and α-CD under an applied stress of 1.0 Pa. Polymer concentration = 2.5wt%.

3. Fluorescence study of HMPAM/PAM
1. Variation of the ratio $I_1/I_3$ of aqueous solutions of 0.5wt% HMAPM and 2.0wt% PAM with temperature between 25°C and 70°C.

2. Rheology study of HMAPM/$\alpha$-CD

Figure S3 Variation of the ratio $I_1/I_3$ of aqueous solutions of 0.5wt% HMAPM and 2.0wt% PAM with temperature between 25°C and 70°C.

4. Rheology study of HMAPM/$\alpha$-CD

Figure S4 Storage modulus G’ (filled circles) and loss modulus G” (empty circles) as a function of temperature for HMAPM/$\alpha$-CD solution. A shear strain amplitude of 3% and an angular frequency of 1 rad/s were applied. The concentration of polymer is set as 2.5wt%.

5. The measurement of the association constants
Figure S5  The Benesi-Hildebrand plots of the α-CD/HMPAM system at 25°C(a) and 70°C(b). error, within ±10%.

According to the method previously reported\textsuperscript{1-4}, the determination of the association constants of the complex between the α-CD and the HMPAM were carried out by measuring the difference between the chemical shifts of the HMPAM alone and the same guest with increasing the concentration of α-CD. For the systems of 1:1 inclusion complex between guest and host, equilibrium constants (Kc) were estimated by a modification of the Benesi-Hildebrand equation, using eq 2:

$$\frac{1}{\Delta H z} = \frac{1}{Kc} \bullet \frac{1}{[R] \Delta \delta} \bullet \frac{1}{[\beta - CD]} + \frac{1}{[R] \Delta \delta}$$

The association constant can be calculated from the slope of the straight line obtained by plotting $1/\Delta H z$ vs $1/[$α-CD$]$. 