## SUPPORTING INFORMATION

## PEO2K-TTC adsorption isotherm

The Langmuir coefficients for the linearized Langmuir equation were obtained by plotting Ce/Qe versus Ce (mg  $L^{-1}$ ) according to:

$$\frac{Ce}{Qe} = \frac{1}{Q_{\max}K_L} + \frac{Ce}{Q_{\max}}$$
(S1)

where  $K_L$  (L mg<sup>-1</sup>) is the Langmuir sorption constant related to the adsorption energy and  $Q_{max}$  (mg g<sup>-1</sup>) is the maximum sorption capacity of the solid. The isotherm was found to be linear over the entire concentration range studied with a good square correlation coefficient showing that the data correctly fit the Langmuir relation (Figure SI-2). The Langmuir constants determined from the slope of the line (1/Q<sub>max</sub>) and the intercept (1/Q<sub>max</sub>K<sub>L</sub>) are summarized in Table SI-1.



**Figure SI-1.** Linearized Langmuir isotherm for PEO2*K*-TTC adsorption onto Laponite in water at pH = 9.8 and 25 °C for a fixed Laponite concentration of 10 g L<sup>-1</sup>.

**Table SI-1**. Langmuir constants and correlation coefficient for adsorption of PEO2*K*-TTC onto Laponite in water at pH = 9.8 and 25 °C.

Slope (1/Q <sub>max</sub> )	Intercept $(1/Q_{max}K_L)$	Q <sub>max</sub> (mg g <sup>-1</sup> )	$K_L (L mg^{-1})$	Correlation coefficient
1.94 x 10 <sup>-3</sup>	3.35 x 10 <sup>-4</sup>	515.46	5.79	0.993

## Emulsion copolymerization of MMA and BA in presence of Laponite

First, Laponite (0.125 g) was dispersed in 19 mL of water and stirred for 30 min. Then, 1.5 mL of an aqueous solution containing 0.15 g of PEO2*K*-TTC was added and the mixture was stirred for another 60 min. The resulting dispersion was introduced in a 50 mL three-necked round bottle flask equipped with a condenser, a nitrogen purging tube and a magnetic stirrer. Emulsion copolymerization of MMA and BA (80:20 v/v) was carried out at 80 °C for 24 hours using a semi-continuous process. The monomer mixture was added during 4 hours at the rate of 8.2 mg min<sup>-1</sup>. The initial amount of monomer mixture was 5 wt% based on overall monomer mass. The final monomer concentrations were: [MMA] = 0.74 mol L<sup>-1</sup> and [BA] = 0.14 mol L<sup>-1</sup> for an overall solids content of 9.5 wt%. ACPA (5.2 mg, 0.25 wt% based on overall monomer mass) were dissolved in 2 mL of an aqueous solution of the peptizer (Na<sub>4</sub>P<sub>2</sub>O<sub>7</sub>, 5.8 g L<sup>-1</sup>) before introduction in the reactor. The results are summarized in Table SI-2.

Lap RD <sup>a</sup> (wt%)	6.1
[PEO2K-TTC] <sub>0</sub> (mmol L <sup>-1</sup> )	2.5
[PEO2K-TTC] <sub>free</sub> <sup>b</sup> (mmol L <sup>-1</sup> )	0.79
[ACPA] (mmol L <sup>-1</sup> )	0.83
[Monomer]/[PEO2K-TTC]	355
[PEO2K-TTC]/[ACPA]	2.9
X (%)/time (h)	100.0/24.0
Z <sub>av.</sub> (nm)/ Poly <sup>c</sup>	264/0.2
$M_{\rm n, theo} ({\rm g \ mol^{-1}})$	35570
$M_{\rm n} ({\rm g \ mol^{-1}})/(M_w/M_n)^{\rm d}$	37500/1.6

**Table SI-2**. Experimental conditions for the copolymerization of MMA/BA (80:20 v/v) in the presence of Laponite, and main characteristics of the resulting latex (Run 9 in Table 2).

<sup>a</sup> Relative to monomer mass. <sup>b</sup> PEO2*K*-TTC equilibrium concentration in water. <sup>c</sup> Determined by DLS. <sup>d</sup> Determined by SEC using PMMA standards for calibration.



**Figure SI-2.** (a) Evolution of a) monomer conversion with time and b) of the average particle size and *Poly value* with conversion during the synthesis of P(MMA-*co*-BA)/Laponite nanocomposite latexes via RAFT-mediated emulsion polymerization using PEO2*K*-TTC as macroRAFT agent in a semi-continuous process.