Supporting Information

to

Coating of vesicles with hydrophilic reactive polymers

Čestmír Koňák,[1] Vladimír Šubr,[1] Libor Kostka,[1] Petr Štěpánek,*[1] Karel Ulbrich,[1] and Helmut Schlaad[2]

[1] *Institute of Macromolecular Chemistry, Academy of Sciences of the Czech Republic, Heyrovsky Sq. 2, 162 06 Prague 6, Czech Republic.* [2] *Max Planck Institute of Colloids and* [2]*Interfaces, Colloid Chemistry, Research Campus Golm, 14424 Potsdam, Germany.*

Calculation of the amount of bound coating polymer

Without coating, M_w^v was calculated from

$$R^v(q^2) = \mathrm{K}\, c_v\, P^v(q^2) M_w^v \tag{1}$$

and after coating with pHPMA copolymers, saturated M_{wa}^c of vesicles was calculated from

$$R^c(q^2) = \mathrm{K}\, c_v\, P^c(q^2) M_{wa}^c \tag{2}$$

where $R(q^2)$ is the Rayleigh ratio of the scattering intensity, K is a contrast factor containing the optical parameters, c_v is the vesicle concentration, M_{wa}^c is the apparent weight-average of molecular weight of vesicles after coating calculated using c_v, $P(q^2)$ is the vesicle scattering function dependent on the size and structure of nanoparticles and q is the scattering vector. Dividing (A2) with (A1):

$$R^c(q^2)/R^v(q^2) = (1+(\Delta M_{wa}^c / M_w^v))P^c(q^2)/P^v(q^2), \tag{3}$$

where

$$M_{wa}^c = M_w^v + \Delta M_{wa}^c \tag{4}$$

Since the size of nanoparticles changes only slightly by polymer coating we can assume that also the $P(q^2)$ function changes only slightly, therefore the Taylor expansion can be applied for $P_2(\theta)/P_1(\theta)$, then

$$R^c(q^2)/R^v(q^2) \cong 1 + (\Delta M^c_{wa}/M^v_w) + Aq^2 + Bq^4 \quad (5)$$

The relative change of the vesicle molecular weight $1 + \Delta M_{wa}{}^c/M_w{}^v$ can be obtained by linear or quadratic fits to the experimental ratio $R^c(q^2)/R^v(q^2)$. The zero angle limit of $R^c(q^2)/R^v(q^2)$ equals $1 + (\Delta M^c{}_{wa}/M_v{}^w)$; for low concentrations $\Delta M^c{}_w \cong \Delta M^c{}_{wa}$.

Examples of the procedure application are shown in Figure SI-1:

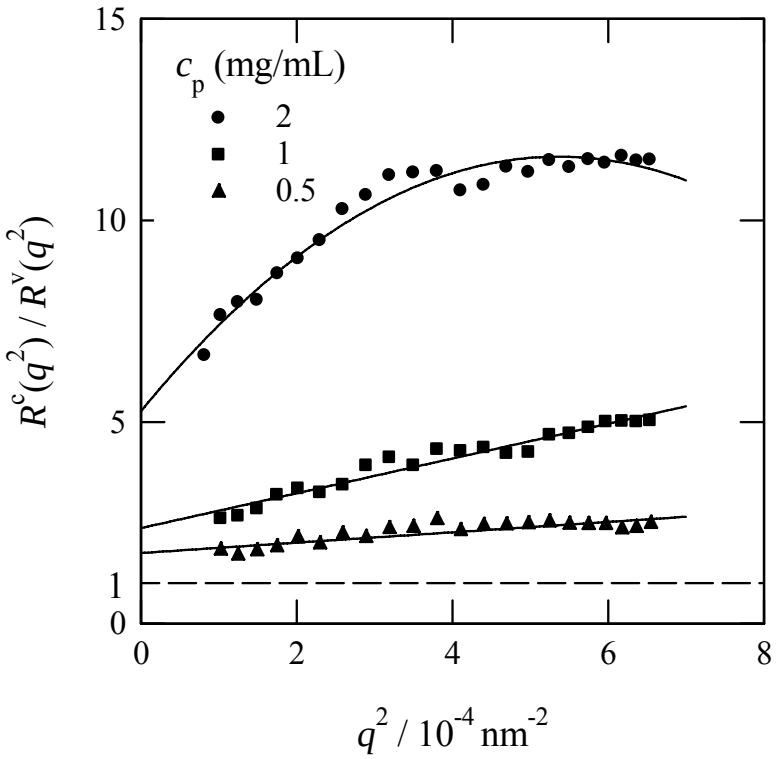

Figure SI-1. Plot of $R^c(q^2)/R^v(q^2)$ vs. q^2 for vesicles **2** coated with the positively charged PHPMA-TT **II** polymer. Concentration of coating polymer is shown in the legend. The solid lines are the best linear and quadratic fits to experimental results.