SUPPLEMENTARY MATERIAL FOR

NANOGEELS OF POLY(N-VINYLCAPROLACTAM) CORE AND POLYETHYLENEGLYCOL SHELL BY SURFACTANT FREE EMULSION POLYMERIZATION

M.A. Gonzalez-Ayon, N.A. Cortez-Lemus, A. Zizumbo-Lopez and A. Licea-Claverie*

Instituto Tecnológico de Tijuana, Centro de Graduados e Investigación en Química, A.P. 1166, 22000 Tijuana, B.C., México.

1.-EQUATIONS FOR LIGHT SCATTERING STUDIES

Hydrodynamic radius calculated using the STOKES-EINSTEIN equation for spheres, from diffusion coefficient determination:

$$R_h = \frac{kT}{6\pi\eta_o D} \quad (1)$$

Where k is the Boltzmann constant, T is the absolute temperature, η_o is the solvent viscosity and D is the diffusion coefficient obtained from the DLS data.

Molecular weight, radius of gyration and second virial coefficient, were obtained by using the Berry-plot [27].

$$\left(\frac{KC}{R_\theta}\right)^{1/2} = \left(\frac{1}{M_w}\right)^{1/2} \left(1 + \frac{1}{6}(q^2)(R_g^2)\right) - (1 + A_2 M_w C) \quad (2)$$

Where:

$$q = \left(\frac{4\pi * n}{\lambda_o}\right) \text{Sen}\left(\frac{\theta}{2}\right), \quad K = \frac{2\pi^2 n_A^2 \left(\frac{dn}{dc}\right)^2}{N\lambda_o^4} f, \quad \Delta R_\theta = \Delta \left(\frac{I(\theta)}{I_o} r^2\right) \quad (3)$$

being: C the concentration; ($f=1$, n = refractive index, dn/dc variation of the refractive index of the polymer with its concentration, N Avogadro number y λ_o the wavelength of the incident light), ΔR_θ the Rayleigh ratio ($\Delta R_\theta \equiv R_\theta$), $I(\theta)$ scattering intensity at the angle θ , I_o is the primary light intensity, r the distance of scattered volume to the detector, λ_o wavelength in vacuum.

2.-ADDITIONAL RESULTS OF LIGHT SCATTERING STUDIES

FIGURE S1 Effect of concentration of crosslinker (EGDMA) on the size distribution of nanogels NVCL:PEGMA (70:30) with 4 mol% of APS.

FIGURE S2 Size distribution at 25 °C of NVCL:PEGMA (60:40) nanogels synthesized with different concentrations of crosslinker (EGDMA) and 4 mol% of APS.

FIGURE S3 Size distribution at 25 °C of NVCL:PEGMA (55:45) nanogels synthesized with different concentrations of crosslinker (EGDMA) and 4 mol% of APS.

FIGURE S4 Effect of reaction temperature on the size distribution of nanogels NVCL:PEGMA (60:40) with 2 mol% of EGDMA and 4 mol% of APS

FIGURE S5 Berry Plot of nanogel NVCL:PEGMA(55:45) crosslinked with EGDMA 3.5 mol% (NG35).

FIGURE S6 Mean average size of nanogels NVCL:PEGMA 60:40, DVA 1 mol% in water as a function of temperature: (A) 20 min of reaction time (NG25), (B) 10 min of reaction time (NG26).