

Influence of Selected NSAIDs on Volume Phase Transition in Poly(2-(2-methoxyethoxy)ethyl Methacrylate) Hydrogels

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Supplementary information

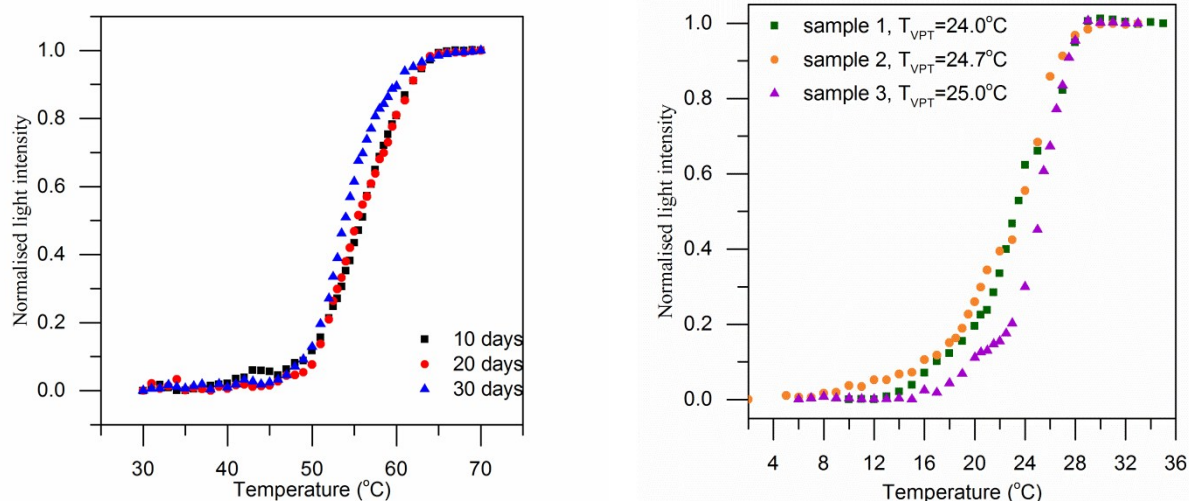


Fig. S1 Exemplary Thermo-Optical Analysis (TOA) results for poly(2-(2-methoxyethoxy)ethyl methacrylate) (PMEO₂MA) gels immersed in 41 mM of ibuprofen solution for 10, 20 and 30 days (left); reproducibility of TOA results – three independent scans done on three separate samples (right).

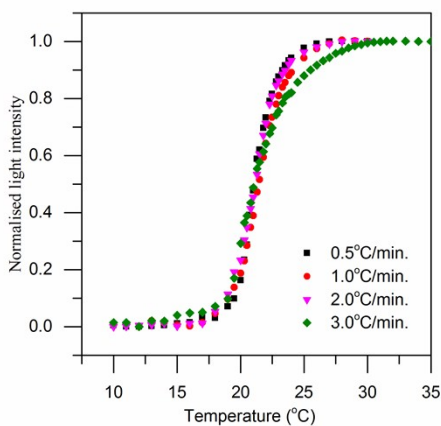


Fig. S2 TOA results for neat PMEO₂MA hydrogels, carried out at various temperature scan rates.

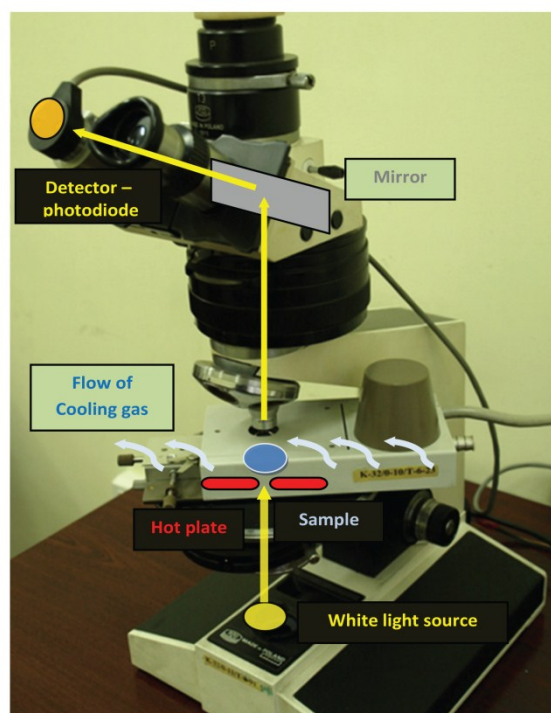


Fig. S3 Simplified scheme of Thermo-Optical Analysis used to determine the PMEO₂MA cloud point along with its VPT. In this method, white light transmittance through the sample as a function of temperature is measured.

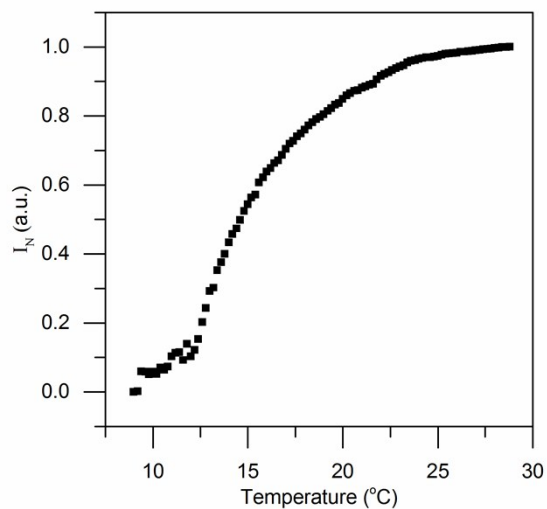


Fig. S4 Influence of 154 mM NaCl solution on VPT in PMEO₂MA hydrogels. I_N (normalised white light intensity transmitted through the sample) as a function of temperature for PMEO₂MA hydrogels immersed in aqueous solutions of NaCl with respect to T .

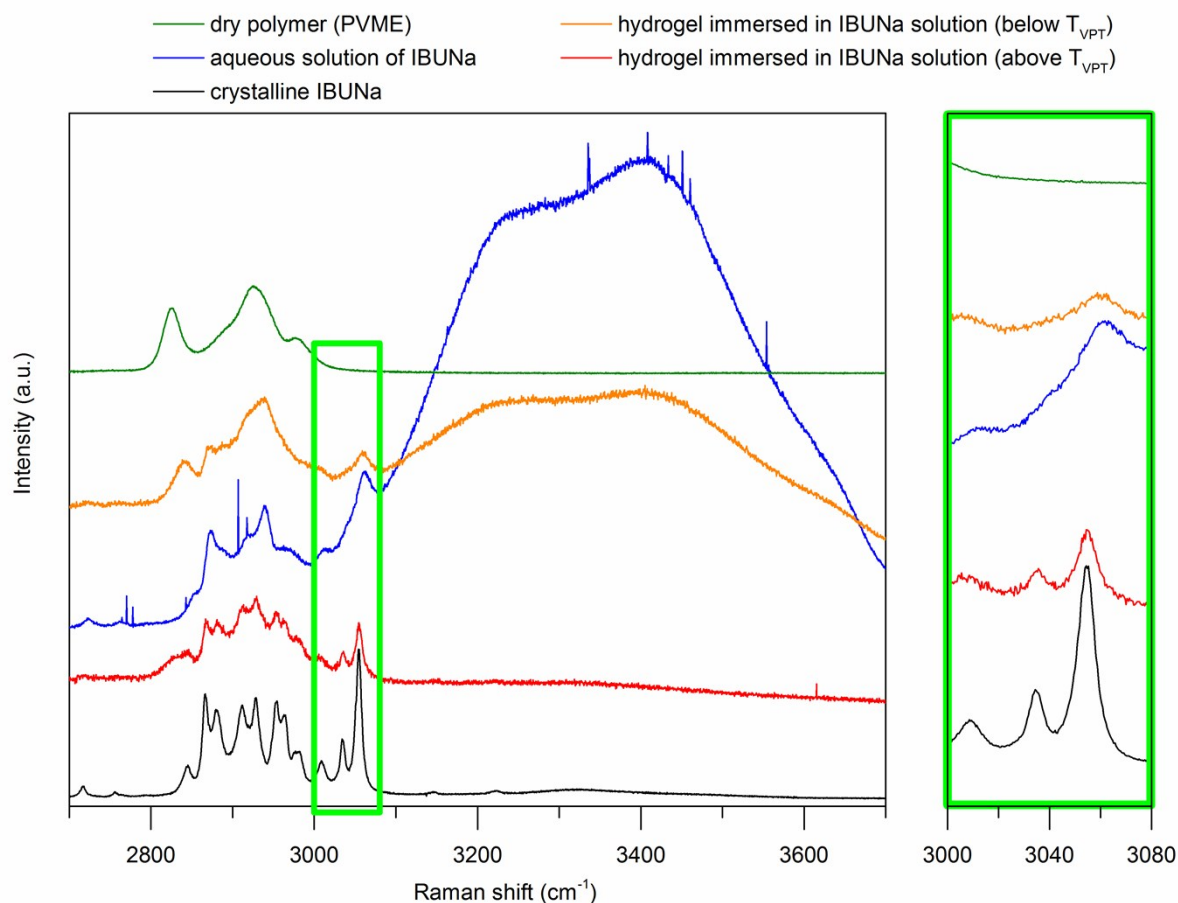


Fig. S5 Results of confocal Raman micro-spectroscopy studies performed on poly(vinyl methyl ether) (PVME) hydrogel sample, synthesised via electron-beam irradiation induced free radical polymerisation (dose 25 kGy). Dry polymer (green curve) was immersed in aqueous 8 %wt. solution of ibuprofen sodium salt (IBUNa) (blue curve) for four weeks. Then, the isothermal Raman measurements were performed in the temperature range between 22 and 45°C. In the figure, the spectra recorded only at the lowest (orange) and highest (red) temperatures are presented. Spectrum of crystalline IBUNa (black) is shown for comparison.

As shown in Figure S5, the dissolution of crystalline IBUNa in water results in significant broadening of the Raman bands. Moreover, the strong line with a maximum at 3055 cm^{-1} ^{S1} is located between the main Raman bands of water and PVME (wavenumber ranges of $3200\text{--}3700\text{ cm}^{-1}$ and $2800\text{--}3000\text{ cm}^{-1}$, respectively); as a result, it is useful as the analytical band for IBUNa, which shifts toward higher frequency (3060 cm^{-1}). This peak has the same position in the case of IBUNa introduced into fully swollen PVME hydrogels. During the VPT, water diffused outside the polymer network (which is manifested by the decay of water Raman bands), while in the spectrum of the gel, the bands characteristic of crystalline IBUNa appear. It is necessary to underline that the measurements were performed in a closed chamber in water conditions.

References

- [S1] A. Jubert, M. L. Legarto, N. E. Massa, L. L. Tévez, and N. B. Okulik *Journal of Molecular Structure*, 2006, **783**, 34.