

**Voltammetric Studies of Diffusion of Molecular Probes in Thermoresponsive Poly(N-isopropylacrylamide) Hydrogels**

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Poly(N-isopropylacrylamide), NIPA, thermo-responsive hydrogels with well defined concentrations of electroactive probe, 1,1'-ferrocenedimethanol,  $\text{Fc}(\text{MeOH})_2$ , were prepared. The discontinuous, reversible volume phase transition of such gels occurs at 32 °C, and it results in a release of approximately 93% of the solvent from the polymeric network.

The diffusion of the  $\text{Fc}(\text{MeOH})_2$  in swollen and collapsed NIPA gels was studied using steady state voltammetry and chronoamperometry at platinum microelectrodes. The diffusion coefficient of  $\text{Fc}(\text{MeOH})_2$  in collapsed gels was almost two orders of magnitude smaller than that in swollen gels.

UV/vis spectroscopic studies show that concentration of  $\text{Fc}(\text{MeOH})_2$  changes as a result of the volume phase transition and for a 3% (w/w) NIPA gel, the concentration of  $\text{Fc}(\text{MeOH})_2$  was approximately 6 times higher in a collapsed polymeric phase than that in the released liquid, and 4.5 times higher than that in the original swollen gel.