

## PHASE TRANSITIONS IN HYDROGELS BY USING FLUORESCENCE TECHNIQUE

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Recent observations [1, 2] around the critical point showed that the critical exponents differed drastically for pure hydrogel systems depending on monomer concentration. To investigate hydrogels, the sol-gel phase transition during free radical crosslinking copolymerization the various amounts of acrylamide (AAM) and N-isopropylacrylamide (NIPA) mixtures was studied by using steady state fluorescence (SSF) technique [3]. N,N'-methylenebis(acrylamide) (BIS) and ammonium persulfate (APS) were used as crosslinker and an initiator, respectively. Pyranine (8-hydroxypyrene-1,3,6- trisulfonic acid, trisodium salt, HPTS) was added as a fluorophore for monitoring the polymerization [4]. It was observed that Pyranine molecules bind to AAM and NIPA chains upon the initiation of the polymerization, thus the fluorescence spectra of the bonded pyranines shift to the shorter wavelengths. Fluorescence spectra from the bonded pyranines allowed us to monitor the sol-gel phase transition, without disturbing the system mechanically, and to test the universality of the sol-gel transition as a function of polymer concentration ratios. Observations around the gel point of PAAM-PNIPA mixtures show that the gel fraction exponent  $\beta$  obeyed the percolation result.

### References:

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