<u>Title:</u> Transient changes in degree of swelling and ion partitioning of negatively charged polyelectrolyte gels

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<u>Abstract:</u> A multicomponent model is analyzed to determine transient changes in a negatively charged gel exposed to a solution containing both mono- and divalent cations. Association of ion exchange with gel volume is achieved by imposing a linear relation between the Flory interaction parameter and concentration of adsorbed divalent cations onto the polymer chains. We demonstrate that the simple relation is sufficient to obtain semi-quantitative results that agree with measurements made on polyacrylate gels. Compatibility is achieved in three aspects: (1) dynamics of gel swelling and deswelling, (2) ion partitioning coefficient, and (3) effect of crosslink density. Our investigation contributes to understand the coupled dynamics of the gel system components in a realistic non-equilibrium scenario over macroscopic length and time scales.