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Ionic and Biomolecular Transport in Nanochannels[1] A.T. CONLISK[2], ANKAN KUMAR[3], The Ohio State University, ARFAAN RAMPERSAUD[4], Columbus Nanoworks — In this work both steady and transient ionic and biomolecular transport in nanochannels is considered. Electroosmotic Flow (EOF) has been analyzed for both steady and transient two and three ionic component in a nanochannel. The sudden introduction of a species at the inlet of a channel generates a short transient regime followed by fully developed and steady state EOF in which the concentrations, potential and velocity are independent of the streamwise coordinate. In a channel with negatively charged walls and the cathode on the upstream side, a negatively charged species may move in a direction opposite to the direction of bulk fluid flow. A positively charged species is transported in the direction of fluid flow and there is a significant decrease in transit time as compared to an uncharged or negatively charged species. Results for concentration and species flux are presented for both charged and uncharged species. The steady state model is compared with a number of experimental results and the comparisons are extremely good.

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