

عنوان مقاله:

Investigation of the effect of Debye length change on electroosmotic flow with using constant density weakly compressible smoothed particle hydrodynamics method

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خلاصه مقاله:

Electroosmotic is one of the four electrokinetic phenomena that is formed by applying an electric field to an ionized electrolyte near the charged dielectric surface. Due to the applying of this electric field change the arrangement of ions within the electrolyte, and eventually a region called the Electric double layer is formed near the surface. The thickness of this layer is approximated by the Debye length. In this study, the Because the Reynolds number in microfluidic devices is usually very low. Therefore, achieving to sufficient mixing in electroosmotic microchannel flow has been a challenge. For this purpose, a non uniform distribution of surface potential for flow mixing is considered. This type of charge distribution is very efficient for mixing purposes by creating circulations in the microchannel. Lagrangian description is used to solve the governing equations. The method used in this research is the constant density weakly compressible particle hydrodynamics method. In order to improve the mixing, the effect of changing the Debye length has been analyzed. The results show that increasing the Debye length causes smaller vortexes to be produced and mixing efficiency is reduced.

کلمات کلیدی:

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