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Computational fluid dynamics (CFD) simulation on mixing in Y-shaped micromixer

Abstract

Computational Fluid Dynamics (CFD) is used to analyse the mixing process inY-shaped micromixer. This study used two different species which is ethanol/water and glycerol/water to see the differences of mixing quality between them based on their diffusion coefficient. The effect of the inlet velocity and mixing angle towards the mixing intensity in the Y-shaped micromixer were investigated via COMSOL Multiphysics software. Mixing intensity quantify the mixing performance is good or bad for every parameter simulated. The finding shows that the lower the inlet velocity, the higher the mixing intensity across the micromixer. The good mixing quality was at inlet velocity of 0.0001m/s while the ideal mixing angle was 90° degree. However, the mixing quality in term of diffusion coefficient, ethanol/water and glycerol/water shows insignificant differences.