

A Technical Solution for Micro Mixture with Micro Fluidic Oscillator in Chemistry

Authors : Brahim Dennai, Abdelhak Bentaleb, Rachid Khelfaoui, Asma Abdenbi

Abstract : The diffusion flux given by the Fick's law characterizes the mixing rate. A passive mixing strategy is proposed to enhance mixing of two fluids through perturbed jet flow. A numerical study of passive mixers has been presented. This paper is focused on the modeling of a micro-injection system composed of passive amplifier without mechanical part. The micro-system modeling is based on geometrical oscillators form. An asymmetric micro-oscillator design based on a monostable fluidic amplifier is proposed. The characteristic size of the channels is generally about a few hundred of microns. The numerical results indicate that the mixing performance can be as high as 99 % within a typical mixing chamber of 0.20 mm diameter inlet and 2.0 mm distance of nozzle - splitter. In addition, the results confirm that self-rotation in the circular mixer significantly enhances the mixing performance. The novel micro mixing method presented in this study provides a simple solution to mixing problems in microsystem for application in chemistry.

Keywords : micro oscillator, modeling, micro mixture, diffusion, size effect, chemical equation

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