In the present work, the mixing behaviour of a T-shaped micro-mixer is investigated as well as for a zig-zag mixer with rectangular cross sections, each. For that purpose, numerical simulations are performed by solving the Navier-Stokes´ equations together with the transport equation of a species and/ or a passive scalar. To characterize the mixedness of the system, the intensity of mixing, a quantity which is derived from Danckwerts´ definition of the intensity of segregation as well as the potential for diffusive mixing, a measurement for the driving force for diffusive equalization is used. Additionally to determine the effectiveness of dissipated energy, the ratio of cross-directional dissipated energy is investigated by an analyzation of the deformationrate tensor.
Main focus is the investigation of mixing processes depending on the mean velocity on one hand for symmetrical and on the other hand for non-symmetrical inletstreams as well as for modulated flows. Furthermore investigations concerning residence time distributions were performed. By the secondary flow in the vortex and engulfment regime a narrower distribution is achieved. This can lead to advantages in respect to selectivity for reactions.