Generation, dynamics and dissolution of bubbles in microchannels

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Résumé

This talk will discuss the generation and the dynamics of a train of unconfined droplets or bubbles flowing in microchannels. We first present a universal droplet generator based on non-embedded "co-flow-focusing". Next, we show how inertial and deformation-induced migration forces both play a crucial role in determining the transverse equilibrium position of the bubbles. In addition, we show how the bubble velocity is affected by Marangoni stresses due to the presence of surfactants. All these effects can all influence the surrounding flow structure, which is in turn determinant for the mass or heat transfer process in case of dissolution. Therefore, by varying the Péclet number over eight decades, we identify five different mass or heat transfer regimes.

Mots-Clés: bubbles generation, microchannels

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