

222d To MIX or Not to MIX - Routes to Structured Materials

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Our previous work demonstrated the efficiency of microscale segmented gas-liquid flow as a tool to mix miscible liquid reactant streams [1,2] at narrow residence time distributions (RTD). Based on this concept, we synthesized nanoparticles (colloidal silica, CdSe quantum dots) with narrow size distributions [1,3].

In this talk we are interested in combining the interplay between diffusion/advection, flow instabilities, and additional transport processes. We demonstrate examples of structured materials with unique phase distributions and/or optical properties.

References:

[1] Guenther, A., Khan, S.A., Trachsel, F., Thalmann, M., Jensen, K.F. "Transport and reaction in microscale segmented flow." *Lab on a Chip*, 4, pp. 278-286, 2004.

[2] Guenther, A., Jhunjhunwala, M., Thalmann, M., Schmidt, M.A., and Jensen, K.F. "Liquid mixing in microscale slug flow by introduction and subsequent removal of gas," *Langmuir*, 21 (4), 1547-1555, 2005.

[3] Yen, B.K.H., Guenther, A., Schmidt, M.A., Jensen, K.F., Bawendi, M.G. "A microfabricated gas-liquid segmented flow reactor for high temperature synthesis: the case of CdSe quantum dots," *Angewandte Chemie, Int. Ed.*, 2005.