

MICROCAPSULES AND MICROCAGES VIA TEMPLATING OF PICKERING EMULSIONS

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ABSTRACT

Inverse Pickering emulsions consist of particle-stabilized water droplets dispersed in a continuous oil phase. The stabilization by nano- or micro-sized particles provides high stability to the droplets, which creates an ideal template for the formation of a microcapsule. These capsules can be formed in different ways, e.g. via sintering of the stabilizing particles into a closed shell, or via interfacial polymerization to create a shell at the oil-water interface. Examples of both systems will be discussed leading to porous microcages or non-porous microcapsules. A sol-gel synthesis of silica has been utilized in conjunction with silica microparticles as well as with polymer microparticles. A detailed study of the process has led to mechanistic insights in the formation of a silica shell. Also those results will be presented. Figure 1 shows some of the results that will be highlighted in the presentation.

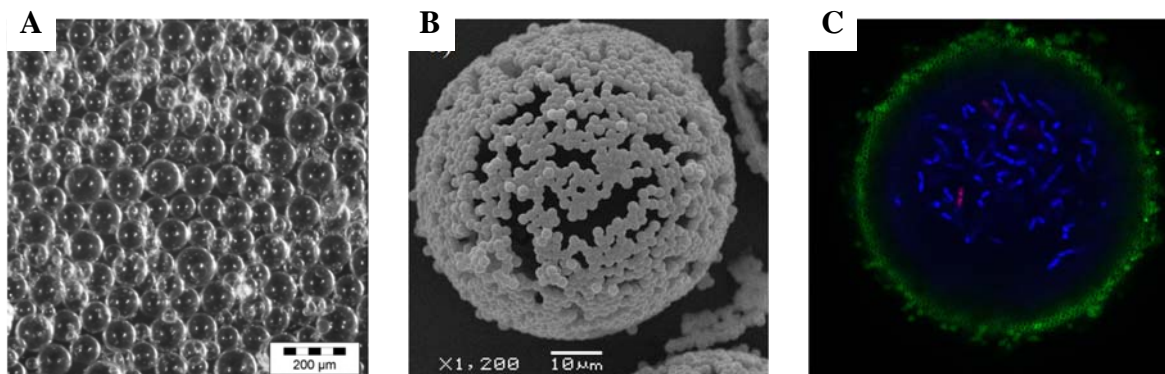


Figure 1. Microcapsules and microcages templated on water-in-oil Pickering emulsions. A. Polystyrene microcapsules by complete fusion of polystyrene particles. B. Microcage formed by partial sintering of polystyrene particles. C. Entrapped bacteria in a silica-particle-stabilized Pickering emulsion.