

# Controlled release from polymeric core-shell particles

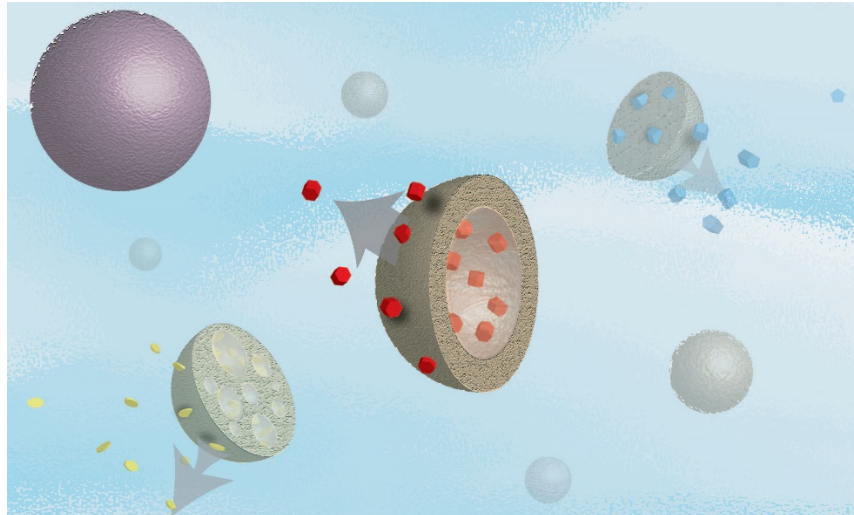


Figure 1 Schematic of the release from different types of core-shell particles.

Microencapsulation of active substances in core-shell particles or micro- or nanocapsules (depending on size) has found use in a wide range of industrial sectors such as the pharmaceutical, food, health-care and coating sector to name a few. We have long experience in encapsulating actives in core-shell particles to be used for controlled release from functional coatings. However, the details of this mass transport have never been analyzed in depth.

This project will focus on encapsulating model actives using the internal phase separation method. The core-shell particles will be characterized by light microscopy and the release will be investigated using UV-spectroscopy or Scintillation counting and analyzed using Fickian release models in order to extract the diffusion coefficients and partition coefficients. At a later stage, the obtained parameters will be used to assess the release from core-shell particles in coatings.

This thesis work will be performed at the Department of Chemistry and Chemical Engineering (Assoc. Prof. Lars Nordstierna and PhD student Jonatan Bergek) and in close collaboration with Dr. Markus Andersson Trojer at Swerea IVF. The focus will be:

- Formulation laboratory work
- Core-shell particle characterization
- Release analysis

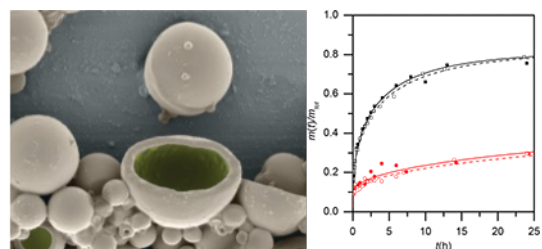


Figure 2 SEM image of a polymeric core-shell particle. Example of release data with applied diffusion models.

## Contact

Lars Nordstierna | Associate Professor | [lars.nordstierna@chalmers.se](mailto:lars.nordstierna@chalmers.se) (examiner)

Jonatan Bergek | PhD student | [jonatan.bergek@chalmers.se](mailto:jonatan.bergek@chalmers.se)

Markus Andersson Trojer | Research scientist | [markus.andersson@chalmers.se](mailto:markus.andersson@chalmers.se)