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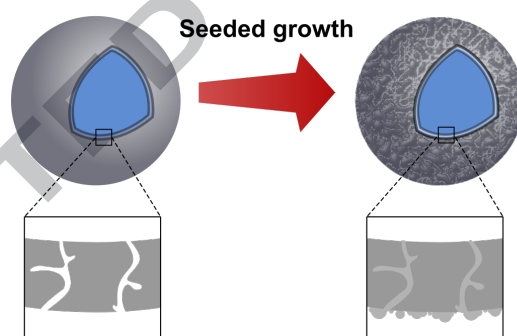
Synthesis and characterisation of robust emulsion-templated silica microcapsules

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Abstract

Robust silica microcapsules were synthesised using an emulsion template via a seeded growth strategy. Multiple additions of the silica precursor tetraethyl orthosilicate (TEOS) were observed to result in a number of physical and property changes of the capsule shells as compared to a single coating. Scanning electron microscopy indicated a morphological transition from a smooth to a roughened surface. Improved cargo retention and consolidation of the pore structure of the silica shells were observed using dye release experiments and nitrogen porosimetry respectively. In comparison to a typical hollow silica shell synthesis procedure, this one-pot loading and synthesis allows the simple production of robust capsules that are capable of sustained release, using mild conditions and reagents.



Keywords: Capsules, Silica synthesis, Emulsion templating, Porosity

1. Introduction

Encapsulation has long been used for the protection and controlled release of reagents across fields including pharmaceuticals, catalysis and food technology [1–7]. Silica has excellent properties for encapsulation: it is relatively inert, biocompatible and can be manipulated into forming

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