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# Abiogenically Relevant Self-Assembly Processes within Silica Hydrogels

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## Abstract

Hydrogels have recently been identified as potential environments for abiogenesis (origins of life) in which water-activity can be modified. One such hydrogel environment of great potential significance in this regard are silica hydrogels (SHGs) as they represent an important phase in geology *en route* to silicification and rock formation. Like other hydrogels, SHGs have the ability to retain or absorb large amount of water in their molecular structure without dissolving in that water. The presentation, are described studies directed towards self-assembly of amphiphiles in SHG environments. The driving force behind this work being to understand whether self-assembly behaviour is promoted under different conditions within a gel environment, compared to an aqueous environment. Here are described also the preparation of SHG systems, scanning electron microscopy (SEM) studies of the solid silicate matrix of SHGs, measurements of critical micelle concentrations (CMCs) of a simple model amphiphile under both aqueous and SHG conditions to ascertain differences in its self-assembly and merocyanine decolourisation behaviour in SHG.

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