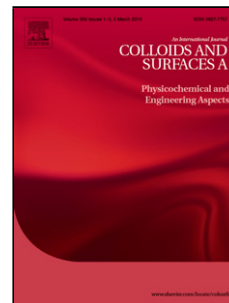


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Encapsulation of Hydrophilic Payload by PU-PMF Capsule: Effect of Melamine-Formaldehyde Pre-polymer Content, pH and Temperature on Capsule Morphology

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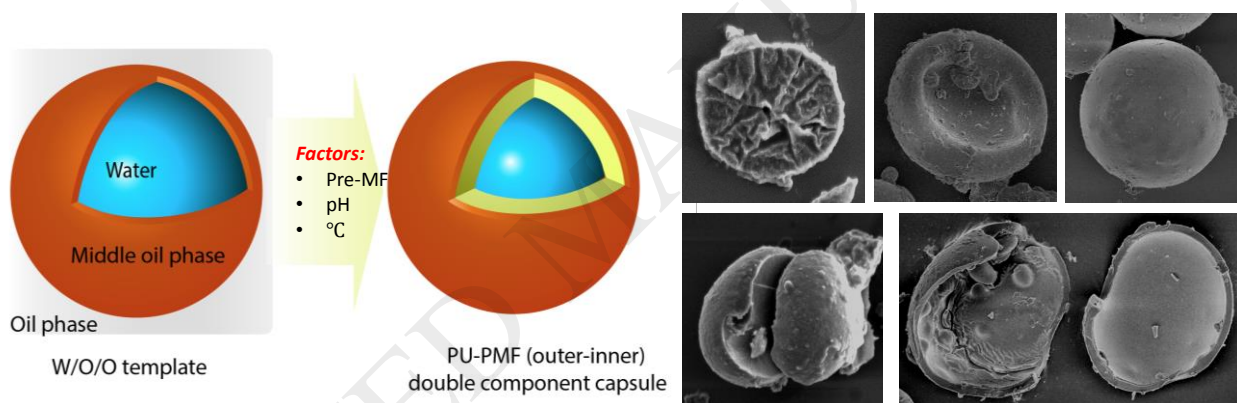
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Graphical abstract



Abstract:

In our earlier study, we developed a strategy to encapsulate an aqueous solution by a dual-composition capsule fabricated on the basis of a water-in-oil-in-oil Pickering emulsion template. This present contribution entails a systematic elucidation of the effect of three key synthesis parameters, specifically the concentration of the melamine-formaldehyde pre-polymer (pre-MF), the pH, and the temperature, on the synthesis and the morphology of the capsules. It was found that, the capsule with typical architecture, dense and robust shell could only be synthesized in the system with the pre-MF concentration above 75% of the pre-MF master solution, within the pH range of 4.0-6.0, and at the reaction temperature no less than 50°C. The pre-MF content affects the size of the Pickering emulsion template, which further determines the size of the resultant capsule. The appropriate pH determines the formation of shell-cavity architecture via controlling the PMF precipitates out as particles and deposits on the interface.

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