

INTRODUCTION

Overview

- Emulsions are a mixture of two or more immiscible liquids with one phase dispersed in another phase.
- Reconfigurable emulsion systems have emerged as a growing field in colloidal science, offering the ability to undergo changes in droplet shape and morphology with variations in environmental conditions.
- These systems can potentially serve as dynamically tunable materials with wide-ranging applications.¹

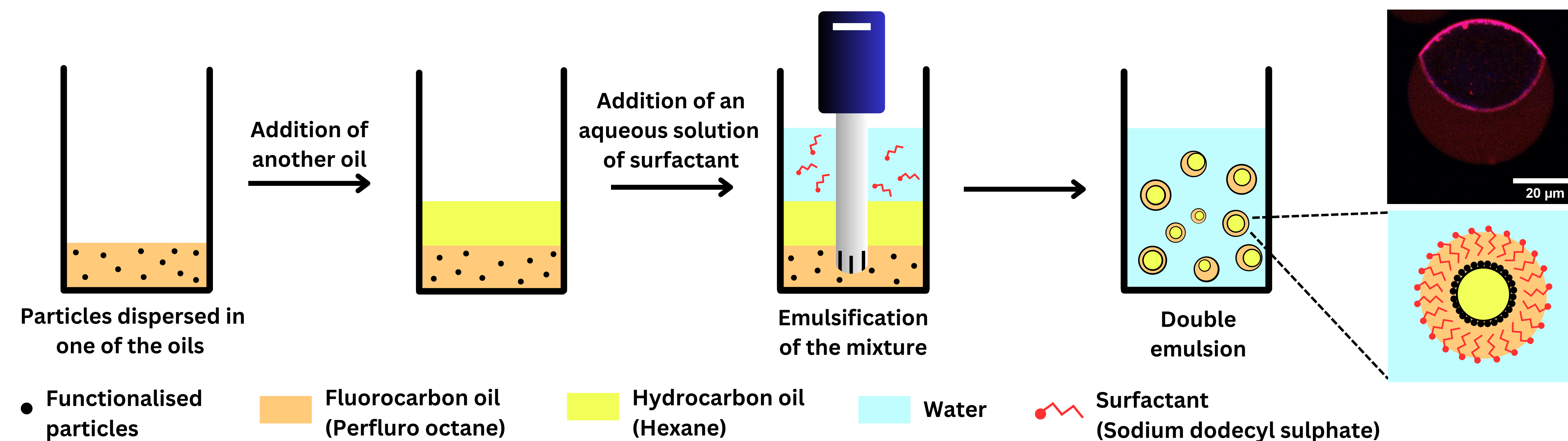
Motivation

- Emulsions stabilised by particles (rather than surfactant) offer various advantages like long-lasting stability and lower environmental impact.
- The ability to combine the advantages of Pickering emulsions and the adaptability of reconfigurable systems can offer new opportunities.
- Investigating particle-stabilized reconfigurable emulsions is a critical area that requires further exploration and understanding.

Research question to address

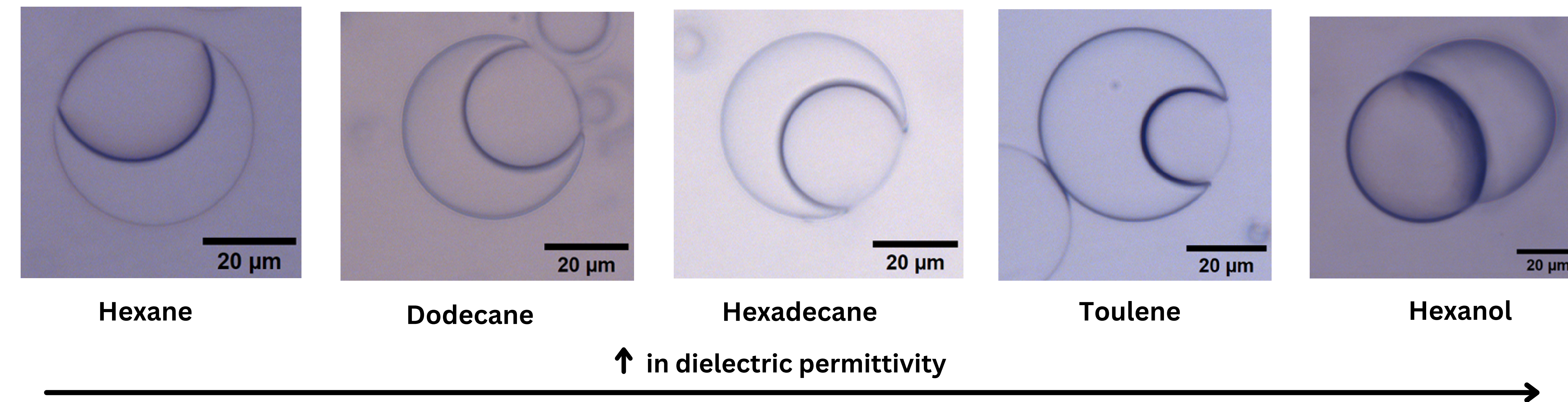
How can reconfigurable Pickering emulsions be further developed and optimized to control droplet morphology and emulsion stability precisely?

METHOD

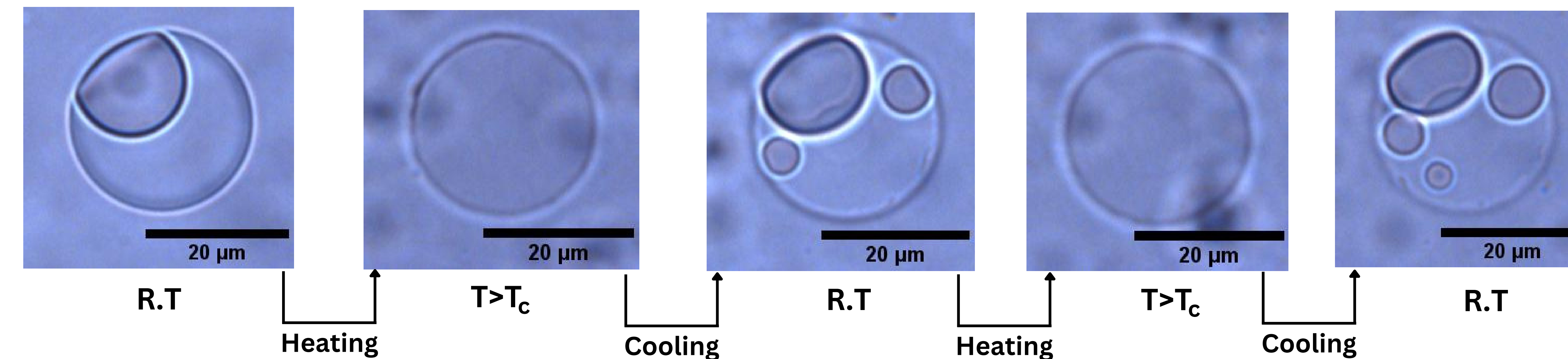


RESULTS

Change in dielectric permittivity of hydrocarbon oil



Change in temperature



CONCLUSION

- Increasing the polarity of hydrocarbon oils causes the droplet morphology to transition from a nested droplet configuration to a Janus-type arrangement due to an increase in oil-oil interfacial tension.
- As the temperature increases above the upper consolute point, the hydrocarbon and fluorocarbon oils merge into a single phase. Subsequent cooling of the emulsion leads to the formation of multiple droplets of one oil ensconced within the confines of the other oil.