Manufacturing monodispersed drops and advanced micro/nano-particles using microfluidics

[Powerpoint Presentation]

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MANUFACTURING MONODISPERSED DROPS AND ADVANCED MICRO/NANO-PARTICLES USING MICROFLUIDICS

Goran T. Vladisavljević

Microfluidic Group Leader, Chemical Engineering Department, Loughborough University, LE11 3TU, United Kingdom. Email: G.Vladisavljevic@lboro.ac.uk
High-throughput step microfluidic emulsification

Vladisavljević, Kobayashi, Nakajima, Microfluid. Nanofluid., 2012

Glass plate

MC
Membrane emulsification

Silicon straight-through microchannel plates

Eudragit microbeads

pH-sensitive PLA capsules loaded with Eudragit solution


Janus particles

Electrospun nanofibres

Ekanem, Zhang, Vladisavljević, *J. Colloid Interface Sci.*, 2017

Patchy particles

Chitosan microbeads


Crescent particles

Hemispherical particles


pH-sensitive capsules for CO₂ sensing


Golf ball-like particles


100 μm

10 μm

150 μm
MICROFLUIDIC EMULSIFICATION

Oligomer + crosslinker + initiator

Surfactant solution

CO₂ capture solution

UV protected area

„ON-THE-FLY“ PHOTOPOLYMERISATION

Oligomer + Cross-linker

Polymer

CH₃

Si

CH₂CH₂Si

O

O

UV lamp

Osmotic swelling

Cavitation

water

Saturated water vapour (2.3 kPa)

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