

Supporting documents

1 Effects of Different Surfactants on the Morphology of Microspheres

DAAF/HNIW

Effects of different surfactants on the morphology of microspheres DAAF/HNIW crystal were studied with the quantity of surfactant. The morphology of the DAAF/HNIW crystal was obtained by the microfluidics technology. Figure 5 shows DAAF/HNIW composite using different surfactants. DAAF/HNIW crystal with SDS has uneven particle size distribution and rough surface. Most of the products DAAF/HNIW crystals were irregular shape with more rectangular structure when PVP was added. However, DAAF/HNIW crystal assembled into microspheres during process when SDBS was added.

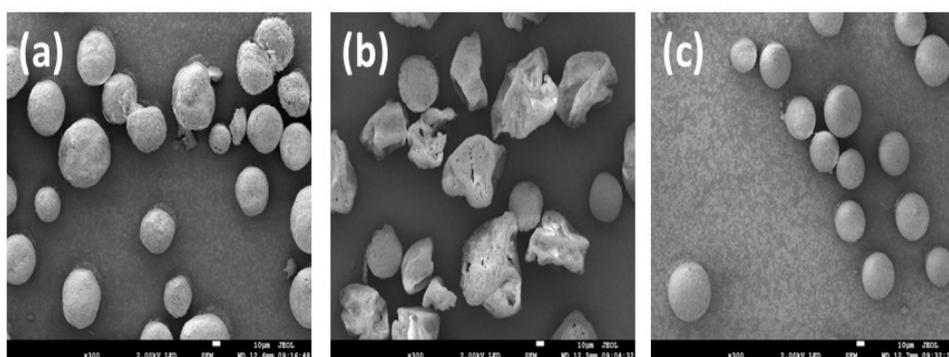


Figure 1. SEM of microspheres DAAF/HNIW crystal structures using different surfactants: (a) Sodium dodecyl sulfate, (b) Polyvinylpyrrolidone, (c) Sodium dodecylbenzenesulphonate

2 Effects of Different Temperatures on the Morphology of Microspheres

DAAF/HNIW

Microspheres DAAF/HNIW crystals show higher degree of sphericity. However, processing of DAAF/HNIW crystals in laboratory by microfluidics technology shows some characteristics at different temperatures. Experiments were carried out by varying the temperature such as 40, 50 and 60 °C. They were spherical in shape and ranged

from 60 μm to 70 μm . The difference was observed between the morphology of the microspheres DAAF/HNIW by different temperatures. The surface of the microspheres was smoother at 50 $^{\circ}\text{C}$, while the surface of the particles is rough and has cracks at 40 and 60 $^{\circ}\text{C}$ as shown in Figure 6 (a) and Figure 6 (c).

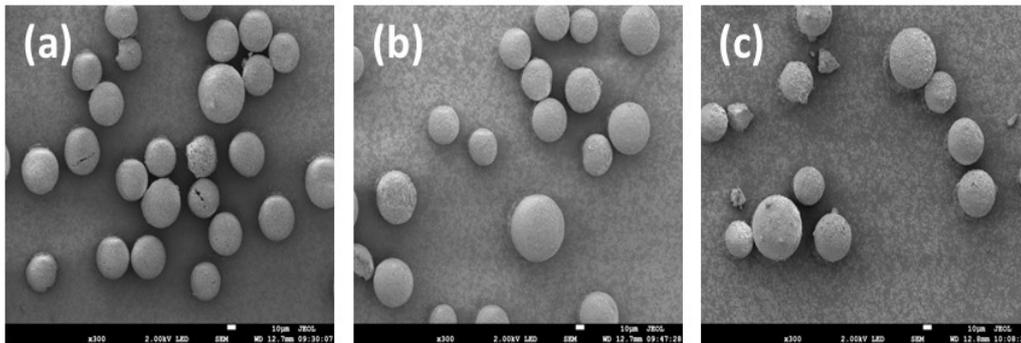


Figure 2. SEM of microspheres DAAF/HNIW crystals using different temperatures:
(a) 60 $^{\circ}\text{C}$, (b) 50 $^{\circ}\text{C}$, (c) 40 $^{\circ}\text{C}$.