

Pseudoternary phase diagram construction

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Abstract

The development of self-microemulsifying drug delivery systems (SMEDDS) was obtained from pseudoternary phase diagram construction. This protocol demonstrates how to construct pseudoternary phase diagram. Tween 20, Tween 80, or Triton X-100 was used as a surfactant and absolute ethanol, propylene glycol, or isopropanol was used as a cosurfactant.

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Materials

Triton X-100 [0694](#) by [Amresco](#)

Ethanol absolute [107017](#) by [Merck Millipore](#)

✓ Propan-2-ol, AR [AR 1162](#) by Contributed by users

Propylene glycol [P4347](#) by [Sigma-aldrich](#)

Tween® 80 [822187](#) by [Merck Millipore](#)

Tween® 20 [822184](#) by [Merck Millipore](#)

Protocol

Preparation of surfactant systems

Step 1.

Prepare surfactant systems (Smix) by mixing surfactant (Tween 20, Tween 80, or Triton X-100) and cosurfactant (absolute ethanol, propylene glycol, or isopropanol) at weight ratios (surfactant:cosurfactant) of 1:2, 1:1, and 2:1.

Preparation of oil and surfactant mixtures

Step 2.

Mix *Alpinia galangal oil* (AGO) and Smix at weight ratios (AGO:Smix) of 0:1, 1:9, 2:8, 3:7, 4:6, 5:5, 6:4, 7:3, 8:2, 9:1 and 1:0.

Determination of composition at equilibrium point

Step 3.

Titrate the mixtures (resulted from step 2) with distilled water until the mixtures reached equilibrium

that the mixtures show an end point of clarity. The volume of the water used was recorded. The composition of each component at the equilibrium point was determined and calculated into a weight percent.

Construction of pseudoternary phase diagrams

Step 4.

The pseudoternary phase diagrams were constructed using OriginPro8 for Windows (OriginLab Corporation, USA) by adding the weight percent of Smix, AGO, and water in each equilibrium end point obtained from step 3.