



1 Construction of Pseudo-ternary Phase Diagram

2 ~~The ranges of the concentrations of different components for the existing boundary of MEs were~~
3 ~~examined based on p~~Pseudo-ternary phase diagrams of free drug MEs ~~were supplied to~~
4 ~~investigate the concentration ranges of the components for the existing boundary of MEs.~~
5 ~~Therefore~~This process was carried out by constructing ~~two-phase diagrams were constructed~~
6 with ~~two different weight ratios (1:1 and 3:1) of~~ Tween80/Span 20-propylene glycol ~~weight~~
7 ~~ratios of 1:1 and 3:1.~~ The surfactant mixture was added to the oleic acid/Transcutol P (10:1)
8 ~~blend at several different weight ratios (i.e., 1:9, 2:8, 3:7, 4:6, 5:5, 6:4, 7:3, 8:2, and 9:1) f~~For
9 each phase diagram, ~~the surfactant mixture was added to the blended oil (oleic acid/Transeutol P~~
10 ~~(10:1)) at weight ratios of 1:9, 2:8, 3:7, 4:6, 5:5, 6:4, 7:3, 8:2, and 9:1. These mixtures~~During this
11 ~~step, a magnetic stirrer was employed to mix all solutions were vigorously.~~ Once sufficiently
12 mixed, each mixture was mixed using a magnetic stirrer and diluted drop by drop with into
13 double distilled water using a dropper at $25 \pm 1^\circ \text{C}$. Once a mixture became a clear liquid, it was
14 considered~~The samples were classified as~~ MEs ~~when they appeared as clear liquids.~~ ^[22]

Commented [E1]: I might have unintentionally changed the meaning of this sentence by altering the highlighted text. Please ensure that this phrase still portrays what you intended it to mean.

15 Polarized Light Microscopy

16 Cross-polarized light microscopy (Olympus BX53 P, Tokyo, Japan) was utilized to check
17 whether all samples possessed~~To confirm the the isotropic nature-property of MEs, samples were~~
18 examined using cross polarized light microscopy (Olympus BX53 P, Tokyo, Japan). This was
19 accomplished by observing a drop of each sample under a cross-polarized light after putting
20 drop of each ME sample was placed it between a coverslip and a glass slide ~~and observed under~~
21 cross-polarized light. In contrast toWhereas anisotropic liquid crystals interfere with the
22 polarized light, isotropic substances do not— therefore, such as MEs, do not interfere with the
23 polarized light, andif the field of view ~~remains da~~id not become brighter during this step, the
24 sample was confirmed as being an ME.^[22]

25 Preparation of Microemulsions

26 ~~After the boundaries of the MEs's boundary were determined using~~in the phase diagrams ~~,~~
27 ~~Thereafter~~was defined, three variables, each at two levels (resulting in a total of eight ME
28 ~~formulations), were a~~implemented not a full factorial design ~~was utilized regarding the three~~
29 ~~variables at two levels for preparing eight ME formulations.~~ Surfactant/co-surfactant ratio (S/C),
30 as well as the oil and water percentages (%Oil and %W), were ~~(The main-primary variables used~~

31 ~~to determine each used to determine each~~ ME's qualities ~~were the surfactant/co-surfactant ratio~~
32 ~~(S/C), percentage of oil (%Oil), and water percentage (%W). Each of the e~~Eight ME
33 formulations ~~had either with~~ low (5%) ~~or and~~ high (50%) levels of oil content, low (5%) or high
34 (10%) ~~(5% and 50%)~~, water (5%, 10%)~~content~~, and a low (1:1) or high (3:1) S/Co mixing ratio
35 (1:1, 3:1) were selected for preparing ME formulations.

36 ~~Various MEs with Tween 80/Span 20-propylene glycol weight ratios of either 1:1 or 3:1 were~~
37 ~~selected-chosen~~ from the pseudo-ternary phase diagram ~~with Tween 80/Span 20-propylene~~
38 ~~glycol weight ratios of 1:1 and 3:1~~ (Table 1). ~~The oil phase of each ME had q~~Quercetin (0.2%)
39 ~~was added to the oil phase it.~~ Then followed by the (dropwise) addition of an S/Co mixture and a
40 ~~suitable amount of~~ double distilled water ~~were added to the mixture dropwise. Finally, each~~
41 ~~mixture was stirred. The mixtures were stirred continuously~~ at ambient temperature until a clear
42 liquid was formed~~becoming a clear liquid.~~ [23,24]

43 **Droplet Size**

44 The ~~range droplet size of~~ MEs' droplet size ranges ~~was were~~ determined by a SCATTER SCOPE
45 ¹ ~~QUIDIX apparatus (operated at room temperature) using a SCATTER SCOPE ¹ QUIDIX~~
46 ~~apparatus.~~