

| Levels | Factor                 |                                |                                |                                         |                      |                     |                                |                     |
|--------|------------------------|--------------------------------|--------------------------------|-----------------------------------------|----------------------|---------------------|--------------------------------|---------------------|
|        | A                      | B                              | C                              | D                                       | E                    | F                   | G                              | K                   |
|        | The type of surfactant | Tween 80 concentration (mg/ml) | Apigenin concentration (mg/ml) | Antisolvent/ Solvent volume ratio (v/v) | Stirring speed (rpm) | Stirring time (min) | Precipitation temperature (°C) | Drop speed (ml/min) |
| 1      | Tween 80               | 1                              | 5                              | 3                                       | 400                  | 5                   | 15                             | 1                   |
| 2      | PEG-400                | 2                              | 10                             | 5                                       | 800                  | 10                  | 25                             | 2                   |
| 3      | Poloxamer188           | 3                              | 20                             | 10                                      | 1200                 | 20                  | 35                             | 3                   |
| 4      |                        | 4                              | 30                             | 15                                      | 1600                 | 30                  | 45                             | 4                   |
| 5      |                        | 5                              | 40                             | 20                                      | 2000                 | 40                  | 55                             | 5                   |
| 6      |                        |                                |                                |                                         |                      | 50                  |                                | 6                   |
| 7      |                        |                                |                                |                                         |                      | 60                  |                                |                     |

**Table S1** The factors and levels of the single factor design <sup>a</sup>

When one of the variables was investigated and other variables were fixed.