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APPENDICES

APPENDIX A

Physicochemical properties of substances

1. Soybean oil (Kibbe, 2000)

1.1 Chemical name

Soybean oil

1.2 Appearance

Soybean oil is a clear pale yellow colored, odorless or almost odorless liquid, with a bland taste that solidifies at –10 to -16°C.

1.3 Solubility

Soybean oil is a practically insoluble in ethanol (95%) and water; miscible with carbon disulfide, chloroform, ether and light petroleum.

1.4 Purity

A typical analysis of refined soybean oil indicates the composition of the acids, present as glycerides, to be: linoleic acid 50-57%; linolenic acid 5-10%; oleic acid 17-26%; palmitic acid 9-13%; and stearic acid 3-6%. Other acids are present in trace quantities.

1.5 Applications in pharmaceutical formulation

In pharmaceutical preparations, soybean oil emulsion is primarily used as a fat source in total parenteral nutrition (TPN) regimens. Although other oils, such as peanut oils, have been used for this propose, soybean oil is now preferred since it is associated with fewer adverse reactions. Emulsions containing soybean oil have also been used as vehicle for the oral and intravenous administration of drugs; drug substances that have been incorporated into such emulsions included amphotericin, retinoids, vitamins, poorly soluble steriods, and fluorocarbons.

1.6 Safety

Soybean oil is widely used intramuscularly as a drug vehicle, or as a component of emulsions used in parenteral nutrition regimens; it is also consumed as an edible oil. Generally, soybean oil is regarded as an essential nontoxic and nonirritant material. However, serious adverse reactions to soybean oil emulsions administered parenterally have been reported. These conclude cases of hypersensitivity, CNS reactions and fat embolism.

LD_{50} (mouse,IV) : 22.1 g/kg

LD_{50} (rat,IV) : 16.5 g/kg

1.7 Regulatory status

Included in the FDA Inactive Ingredients Guide (IV injections, oral capsules, and topical preparations). Included in non-parenteral and parenteral medicines licensed in the UK.

2. Tween 80 (Kibbe, 2000)

2.1 Chemical name

Polyoxyethylene 20 sorbitan monooleate

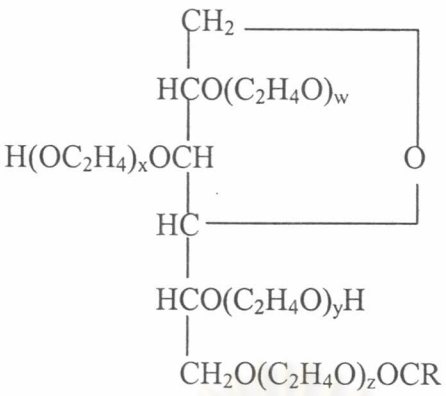
2.2 Molecular formula

$C_{64}H_{124}O_{26}$

2.3 Molecular weight

1310

2.4 Chemical structure



w + x + y + z = 20

R = oleic acid

2.5 Appearance

Tween 80 is a clear yellow oily liquid with a faint characteristic odor, somewhat bitter taste. It has a HLB value of 15.

2.6 Solubility

Tween 80 is soluble in water and ethanol, insoluble in mineral oil and vegetable oil.

2.7 Applications in pharmaceutical formulation

Polysorbates containing 20 units of oxyethlene are hydrophilic non-ionic surfactants, which are used widely as emulsifying agents in the preparation of stable o/w pharmaceutical emulsions. They may also be used as solubilizing agents for a variety of substances including in oil and oil-soluble vitamins, and as wetting agent in the formulation of oral and parenteral suspensions.

2.8 Safety

Tween 80 is widely used in cosmetics, food products and oral, parenteral and topical formulations and is generally regarded as nontoxic and nonirritant material. The WHO has set an estimated acceptable daily intake for tween80, calculated as total polysorbate esters, at up to 25 mg/kg.

LD_{50} (mouse, oral): 25 g/kg

Polysorbate60; LD50 (rat, IV): 1.22 g/kg

2.9 Regulatory status

Polysorbate 80 is included in the FDA Inactive Ingredients Guide (IV, IM, oral, rectal, topical, and vaginal preparations). Polysorbates are included in non-parenteral and parenteral medicines licensed in the UK.

3. Tween 20 (Kibbe, 2000)

3.1 Chemical name

Polyoxyethylene 20 sorbitan monolaurate

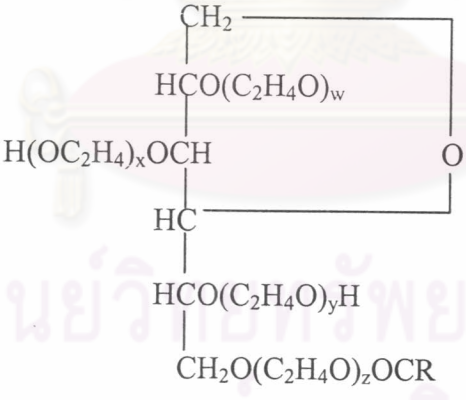
3.2 Molecular formula

$C_{58}H_{114}O_{26}$

3.3 Molecular weight

1128

3.4 Chemical structure



$w + x + y + z = 20$

R = lauric acid

3.5 Appearance

Tween 20 is a clear yellow oily liquid with a faint characteristic odor, somewhat bitter taste. It has a HLB value of 16.7.

3.6 Solubility

Tween 20 is soluble in water and ethanol, insoluble in mineral oil and vegetable oil.

3.7 Applications in pharmaceutical formulation

Polysorbates containing 20 units of oxyethlene are hydrophilic non-ionic surfactants, which are used widely as emulsifying agents in the preparation of stable o/w pharmaceutical emulsions. They may also be used as solubilizing agents for a variety of substances including in oil and oil-soluble vitamins, and as wetting agent in the formulation of oral and parenteral suspensions.

3.8 Safety

Tween 20 is widely used in cosmetics, food products and oral, parenteral and topical formulations and is generally regarded as nontoxic and nonirritant material. The WHO has set an estimated acceptable daily intake for tween80, calculated as total polysorbate esters, at up to 25 mg/kg.

LD_{50} (rat, oral): 37 g/kg

3.9 Regulatory status

Polysorbate 20 is included in the FDA Inactive Ingredients Guide (IV, IM, oral, rectal, topical, and vaginal preparations). Polysorbates are included in non-parenteral and parenteral medicines licensed in the UK.

4. Glycerin (Kibbe, 2000)

4.1 Chemical name

Propane-1,2,3-triol

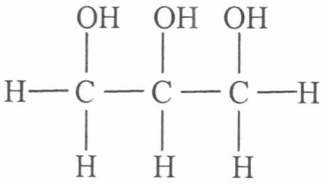
4.2 Molecular formula

$C_3H_8O_3$

4.3 Molecular weight

92.09

4.4 Chemical structure



4.5 Appearance

Glycerin is a clear, coloress, odorless, viscous, hygroscopic liquid; it has sweet taste, approximately 0.6 times as sweet as sucrose.

4.6 Solubility

Glycerin is soluble in water, ethanol (95%), and methanol; slightly soluble in acetone and practically insoluble in benzene and chloroform.

4.7 Applications in pharmaceutical formulation

Glycerin is used in wide variety of pharmaceutical formulations including oral, otic, ophthalmic, topical, and parenteral preparations. It also used in cosmetics and as food additive.

In topical pharmaceutical formulations and cosmetics, glycerin is used in primary for its humectant and emollient properties. In parenteral formulations glycerin is mainly used as a solvent. In concentration up to 50%, have been used as the vehicle for parenteral dosage forms.

4.8 Safety

Glycerin is used in wide variety of pharmaceutical formulations including oral, ophthalmic, parenterally and topical preparations.

LD_{50} (mouse, IV): 6.2 g/kg

LD_{50} (mouse, oral): 4.1 g/kg

LD_{50} (rat, IV): 5.6 g/kg

LD_{50} (rat, oral): 12.6 g/kg

4.9 Regulatory status

Accepted as a food additive in Europe. Included in the FDA Inactive Ingredients Guide (inhalations, injections, nasal, ophthalmic, oral capsules, solution, suspension, and tablet). Included in non-parenteral and parenteral medicines licensed in the UK.

5. Propylene Glycol (Kibbe, 2000)

5.1 Chemical name

1,2-Propanediol

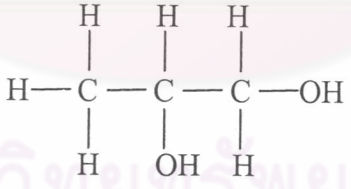
5.2 Molecular formula

$C_3H_8O_2$

5.3 Molecular weight

76.1

5.4 Chemical structure



5.5 Appearance

Propylene glycol is a clear, colorless, viscous, practically odorless liquid with a sweet, slightly acrid taste resembling glycerin.

5.6 Solubility

Propylene glycol is miscible with acetone, chloroform, ethanol (95%), glycerin, and water; soluble in 1 in 6 parts of ether; not miscible with light mineral oil or fixed oils, but will dissolve some essential oils.

5.7 Application in pharmaceutical formulation

Propylene glycol is widely used as a solvent, extractant, and preservative in a variety of parenteral and non-parenteral pharmaceutical formulations. For parenterals, the concentrations 10-60% have been used as the vehicle.

5.8 Safety

Propylene glycol is used in wide variety of pharmaceutical formulations and is generally regarded as a nontoxic material. Probably as a consequence of its metabolism and excretion, propylene glycol is less toxic than other glycols.

In animal studies, there has been no evidence that propylene glycol is teratogenic or mutagenic. Rats can tolerate a repeated oral daily dose of up to 30 ml/kg in the diet over 6 months, while the dog is unaffected by a repeated oral daily dose of 2 g/kg on the diet for 2 years.

LD_{50} (dog, IV): 25.9 g/kg

LD_{50} (mouse, IV): 7.6-8.3 g/kg

LD_{50} (rabbit, IV): 5-6.5 g/kg

LD_{50} (rat, IV): 6.2-12.7 g/kg

5.9 Regulatory status

Accepted for use as a food additive in Europe (does not have a code number). Included in the FDA Inactive Ingredients Guide (dental preparations, IM and IV injections, inhalations, ophthalmic, oral, otic, percutaneous, rectal, topical, and vaginal preparation). Included in non-parenteral and parenteral medicines licensed in the UK.

6. Polyethylene glycol 400 (Kibbe, 2000)

6.1 Chemical name

α-hydro-ω-hydroxy-poly(oxy-1,2-ethanediyl)

6.2 Molecular formula

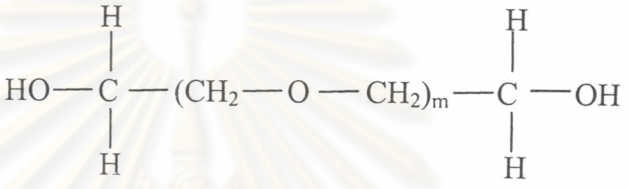
$HOCH_2(CH_2OCH_2)_mCH_2OH$

Where m represents the average number of oxyethylene groups. For polyethylene glycol 400, m is 8.7.

6.3 Molecular weight

380-420 (average molecular weight)

6.4 Chemical structure



6.5 Appearance

Polyethylene glycol400 is a liquid grade as clear, colorless, or slightly yellow-colored, viscous liquid. It has slight odor and bitter, slightly burning taste.

6.6 Solubility

Polyethylene glycol 400 is soluble in water, acetone, alcohol, benzene, glycerin, and glycols, insoluble in fats, fixed oils, and mineral oil.

6.7 Application in pharmaceutical formulation

Polyethylene glycols are widely used in a variety of pharmaceutical formulations including parenteral, topical, ophthalmic, oral, and rectal preparations. Aqueous polyethylene glycol solutions can be used either as suspending agents or to adjust the viscosity and consistency of other suspending vehicles. When used in conjunction with other emulsifiers, polyethylene glycols can act as emulsion stabilizers.In concentration up to approximately 30%v/v, PEG400 have been used as the vehicle for parenteral dosage forms.

6.8 Safety

Polyethylene glycols are widely used in a variety of pharmaceutical formulations. Generally, they are regarded as nontoxic materials.

LD_{50} (mouse, IV): 8.6 g/kg

LD_{50} (rat, IV): 7.3 g/kg

6.9 Regulatory status

Included in the FDA Inactive Ingredients Guide (dental preparations, IM and IV injections, ophthalmic preparations, oral capsules, solutions, syrups and tablets, rectal, topical, and vaginal preparation).

APPENDIX B

Calibration curve

1. The UV-visible spectrophotometric method

The UV-visible spectrophotometric method was used to determine the permeability of DZP in drug release testing. The wavelength used to analyze DZP in this study was 231 nm, which was the λ_{max} of drug absorbances in mixture of 80% v/v phosphate buffer and 20% v/v of propylene glycol. The spectra were shown in Figure b1.

The data relationship between concentration and absorbance of DZP in medium at 231 nm are presented in Table b1, and calibration curve of DZP is illustrated in Figure b2.

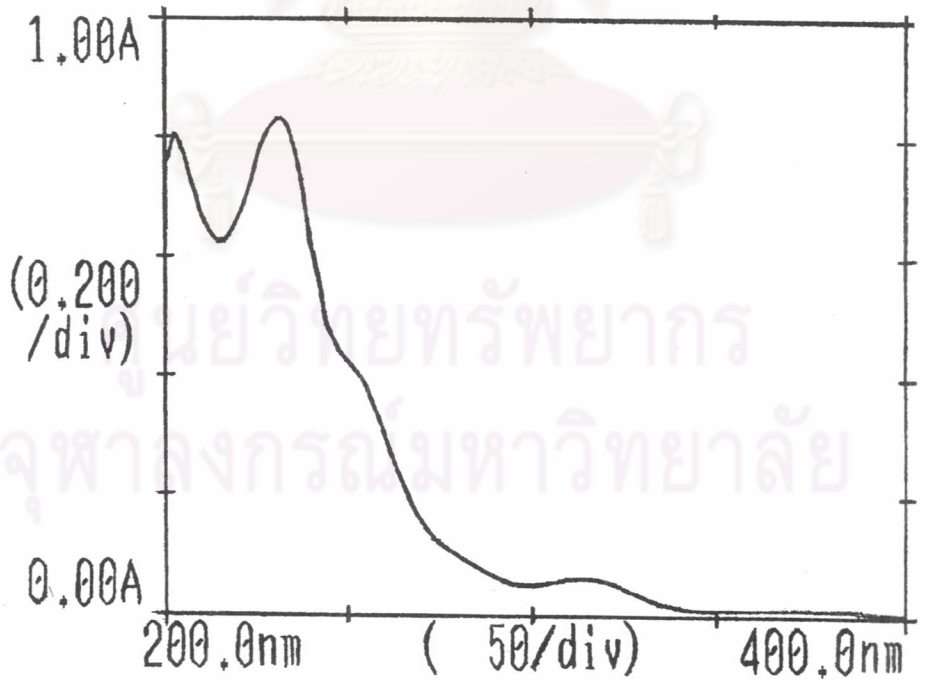


Figure b1 The UV spectrum of diazepam in mixture of 80% v/v phosphate buffer pH 7.4 and 20% v/v propylene glycol.

Table b1 The relationship between absorbances and concentrations of diazepam in mixture of 80% v/v phosphate buffer pH 7.4 and 20% v/v propylene glycol at 231 nm.

Concentration (μg/ml)	Absorbance					
	n1	n2	n3	mean	SD	%CV
2	0.246	0.246	0.234	0.242	0.007	2.86
3	0.361	0.363	0.361	0.362	0.001	0.32
4	0.479	0.474	0.488	0.480	0.007	1.48
5	0.602	0.600	0.602	0.601	0.001	0.19
6	0.724	0.726	0.737	0.729	0.007	0.96

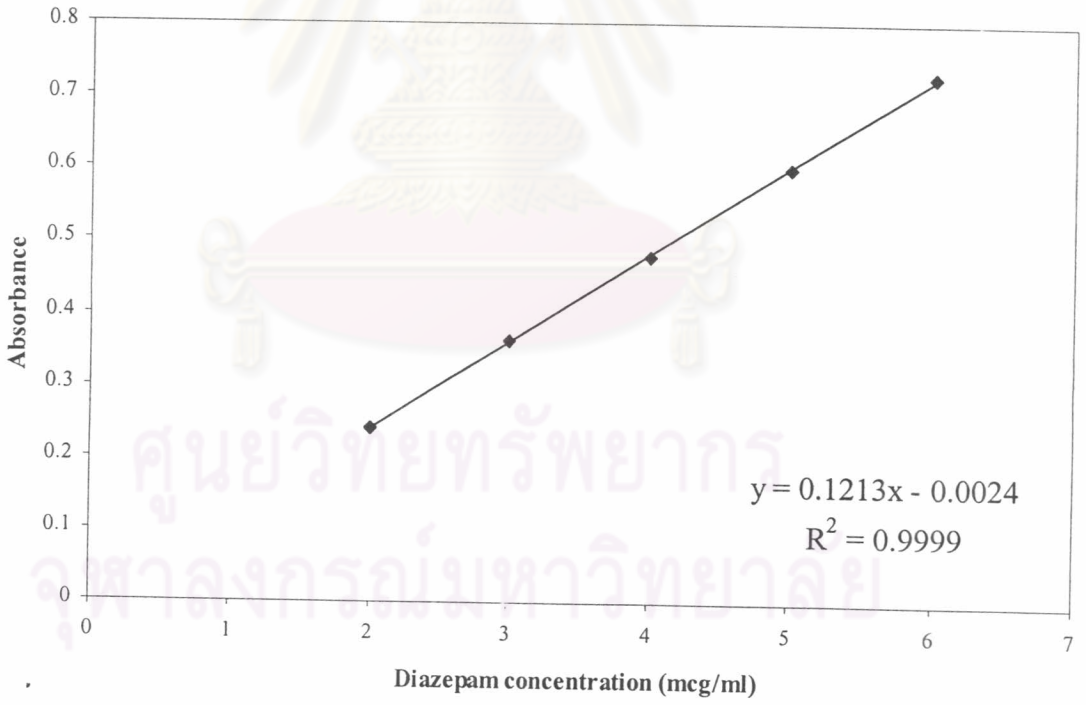


Figure b2 Calibration curve of diazepam in mixture of 80% v/v phosphate buffer pH 7.4 and 20% v/v propylene glycol at 231 nm.

2. The high performance liquid chromatography method

Validation for the quantitative determination of diazepam by HPLC

The diazepam concentrations for the percentage of drug incorporated could be determined by HPLC assay with UV detection. The wavelength used to analyze diazepam in this study was 320 nm. The validation of the HPLC method used are represented as follows:

1. Specificity

Figure b3 shows the chromatograms of diazepam and internal standard solution of blank preparation. Diazepam was eluted as a distinct with retention time of 4.058 minutes. This peak was not interfered by peak of internal standard, which had a retention time of 2.3 minutes. For tween80, glycerin, propylene glycol, and polyethylene glycol 400, their peak not show in this condition. These results indicated that the peak of diazepam was not interfered with peak of internal standard and other components in the sample.

2. Accuracy

Table b2 shows the percentage of analytical recovery in each concentration of diazepam. The mean percent recovery was 100.82% and the %CV value of percent recovery was very low (1.05%) which indicated that the HPLC method could be used to accurately determine diazepam within the concentration range studied (5-25μg/ml).

3. Precision

Table b3 to b4 show data of within run precision and between run precision of diazepam assayed by HPLC method, respectively. The percentage of coefficient of variation (%CV) values of peak area ratios in both within run and between run precision were low (0.45-1.16% and 1.26-1.91%, respectively) which indicated that the HPLC methods could be used to determine the amount of diazepam over the period of time studied.

4. Calibration curve and linearity of diazepam ranging 5-25 μg

The chromatograms of standard solutions are shown in Figure b4. The retention times of internal standard and diazepam were about 2.290-2.292 and 4.057-4.067 minutes, respectively. The calibration curve was plotted between the peak area ratios of diazepam to furosemide and the concentrations of diazepam in μg/ml. The results are shown in Table b4 and Figure b5. Linear regression analysis was performed with the coefficient of determination (R2) of 0.9999. These results indicated that the HPLC method was acceptable for quantitative analysis of diazepam.

Table b2 Data of accuracy of diazepam assayed by the HPLC method.

Actual concentration (μg/ml)	Analytical concentration (μg/ml)			%Recovery		
	n1	n2	n3	n1	n2	n3
5.00	4.95	4.97	4.99	98.97	99.43	97.74
10.00	10.00	10.05	10.06	100.02	100.52	100.61
15.00	15.12	15.13	15.16	100.77	100.86	101.09
20.00	20.21	20.28	20.26	101.04	101.42	101.32
25.00	25.84	25.36	25.41	103.37	101.44	101.62
	mean = 100.82 SD = 1.06 %CV = 1.05					

Table b3 Data of within run precision of diazepam assayed by the HPLC method.

Diazepam concentration (μg/ml)	Peak area ratios					
	n1	n2	n3	mean	SD	%CV
5.00	0.5938	0.5925	0.5977	0.5947	0.0027	0.45
10.00	1.1621	1.1690	1.1434	1.1581	0.0132	1.14
15.00	1.7952	1.7631	1.7666	1.7750	0.0176	0.99
20.00	2.3412	2.3736	2.3602	2.3584	0.0163	0.69
25.00	2.9432	2.9557	3.0082	2.9690	0.0345	1.16

Table b4 Data of between run precision of diazepam assayed by the HPLC method.

Diazepam concentration (μg/ml)	Peak area ratios					
	day1	day2	day3	mean	SD	%CV
5.00	0.5947	0.6033	0.6098	0.6026	0.0076	1.26
10.00	1.1902	1.2209	1.2022	1.2044	0.0155	1.29
15.00	1.8093	1.8622	1.8246	1.8320	0.0272	1.49
20.00	2.3584	2.4417	2.4301	2.4101	0.0451	1.87
25.00	2.9690	3.0692	3.0700	3.0361	0.0581	1.91

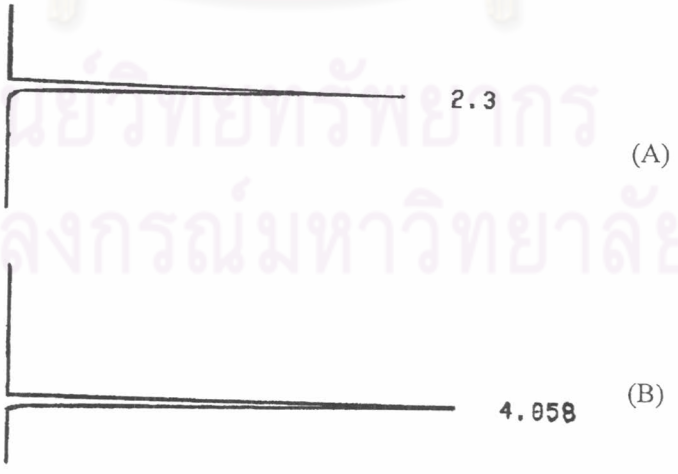


Figure b3 The HPLC chromatogram of (A) internal standard; and (B) diazepam.

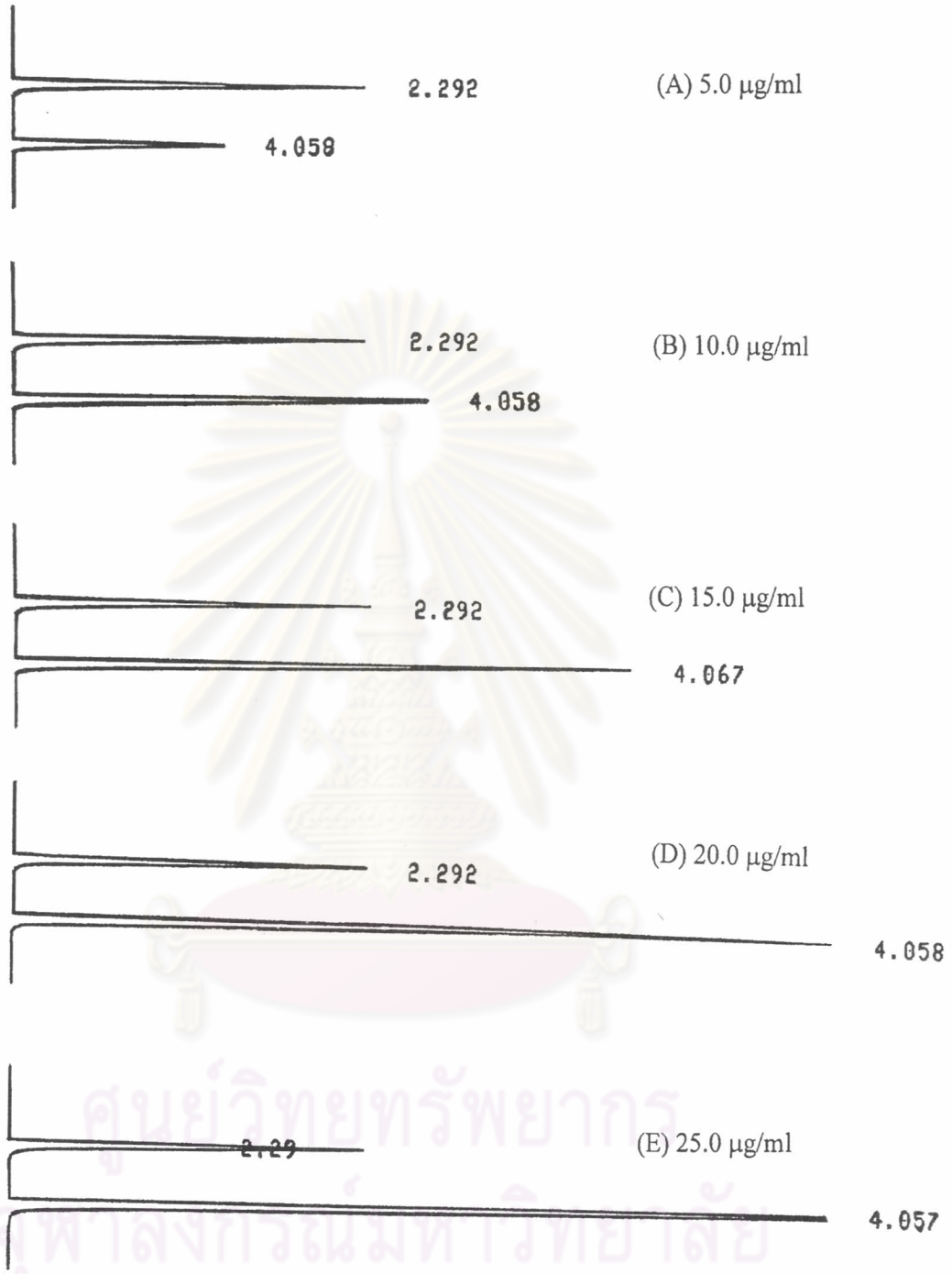


Figure b4 The HPLC chromatograms of the standard solutions of diazepam (RT = 4.057-4.07 minutes) and the internal standard (furosemide; RT = 2.290-2.292 minutes).

Table b5 Data of calibration curve of standard solutions of diazepam.

Diazepam concentration (μg/ml)	Peak area ratios					
	n1	n2	n3	mean	SD	%CV
5.00	0.5938	0.5925	0.5977	0.5947	0.0027	0.45
10.00	1.1621	1.1690	1.1434	1.1581	0.0132	1.14
15.00	1.7952	1.7631	1.7666	1.7750	0.0176	0.99
20.00	2.3412	2.3736	2.3602	2.3584	0.0163	0.69
25.00	2.9432	2.9557	3.0082	2.9690	0.0345	1.16

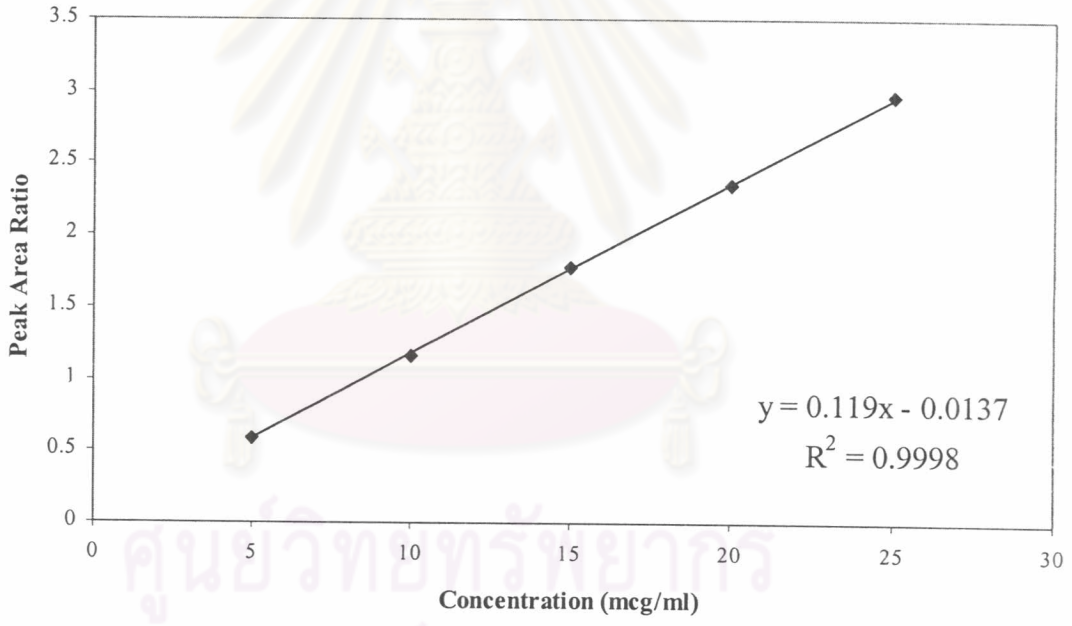


Figure b5 Calibration curve of diazepam assay by HPLC method.

System suitability

5. Resolution and tailing factor

Figure b6 shown the HPLC chromatograms of the standard solutions of diazepam and the internal standard (furosemide) that used to calculated resolution and tailing factor. The resolution value was 3.92 and the tailing factor of diazepam and internal standard were 1.45 and 1.5, respectively. From these results indicated that the system was acceptable for analysis of diazepam.

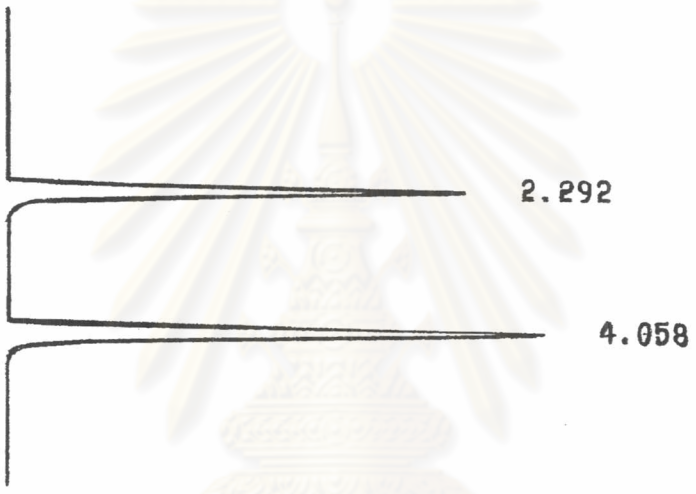


Figure b6 The HPLC chromatograms of the standard solutions of diazepam and the internal standard (furosemide) for calculated resolution and tailing factor.

APPENDIX C

Results

Table c1 The viscosity of microemulsions.

Formulation	n1	n2	n3	Average(cps)	SD
T1 G1.5 O8	815.11	814.77	809.99	813.29	2.86
T1 G1.5 O8 D5	975.43	984.43	977.35	979.07	4.74
T1 G1.5 O8 D10	1,058.33	1,058.46	1,069.30	1,062.03	6.30
T1 G1.5 O6	368.65	368.17	358.30	365.04	5.84
T1 G1.5 O6 D5	432.19	432.96	430.35	431.83	1.34
T1 G1.5 O6 D10	522.22	525.98	518.33	522.18	3.83
T1 G1.5 O4	729.11	723.39	723.32	725.27	3.32
T1 G1.5 O4 D5	850.30	860.33	852.30	854.31	5.31
T1 G1.5 O4 D10	936.11	940.72	944.17	940.33	4.04
T1 G1 O8	1,088.36	1,087.32	1,080.64	1,085.44	4.19
T1 G1 O8 D5	1,137.38	1,135.20	1,142.38	1,138.32	3.68
T1 G1 O8 D10	1,230.40	1,232.67	1,240.97	1,234.68	5.56
T1 G1 O6	948.65	953.11	944.28	948.68	4.42
T1 G1 O6 D5	1,005.34	1,012.65	1,008.64	1,008.88	3.66
T1 G1 O6 D10	1,130.42	1,133.71	1,121.17	1,128.43	6.50
T1 G1 O4	1,052.36	1,055.42	1,050.19	1,052.66	2.63
T1 G1 O4 D5	1,144.91	1,138.65	1,152.22	1,145.26	6.79
T1 G1 O4 D10	1,222.11	1,214.87	1,213.78	1,216.92	4.53
T1 P0.7 O8	708.27	698.27	710.11	705.55	6.37
T1 P0.7 O8 D5	770.27	777.74	764.93	770.98	6.43
T1 P0.7 O8 D10	852.97	845.88	847.69	848.85	3.68
T1 P0.7 O6	462.34	462.33	455.37	460.01	4.02
T1 P0.7 O6 D5	532.22	534.99	538.17	535.13	2.98
T1 P0.7 O6 D10	649.45	653.15	656.10	652.90	3.33
T1 P0.7 O4	451.39	454.17	452.20	452.59	1.43
T1 P0.7 O4 D5	518.33	515.62	508.99	514.31	4.81
T1 P0.7 O4 D10	653.54	656.19	648.21	652.65	4.06
T1 P0.5 O8	962.34	959.45	970.17	963.99	5.55
T1 P0.5 O8 D5	1037.69	1,043.25	1,049.11	1,043.35	5.71
T1 P0.5 O8 D10	1138.33	1,143.19	1,144.67	1,142.06	3.32
T1 P0.5 O6	772.29	777.28	773.28	774.28	2.64
T1 P0.5 O6 D5	833.56	839.19	831.31	834.69	4.06
T1 P0.5 O6 D10	921.11	914.38	911.58	915.69	4.90
T1 P0.5 O4	724.28	728.32	718.66	723.75	4.85
T1 P0.5 O4 D5	874.33	877.32	881.11	877.59	3.40
T1 P0.5 O4 D10	912.32	924.67	920.15	919.05	6.25

Table c2 The refractive index of microemulsions before stability testing.

Formulation	n1	n2	n3	Average	SD
T1 G1.5 O8	1.4484	1.4480	1.4469	1.4478	0.0008
T1 G1.5 O8 D5	1.4488	1.4492	1.4490	1.4490	0.0002
T1 G1.5 O8 D10	1.4478	1.4481	1.4489	1.4483	0.0006
T1 G1.5 O6	1.4397	1.4388	1.4381	1.4389	0.0008
T1 G1.5 O6 D5	1.4401	1.4399	1.4389	1.4396	0.0006
T1 G1.5 O6 D10	1.4399	1.4396	1.4397	1.4397	0.0002
T1 G1.5 O4	1.4472	1.4471	1.4477	1.4473	0.0003
T1 G1.5 O4 D5	1.4481	1.4478	1.4480	1.4480	0.0002
T1 G1.5 O4 D10	1.4469	1.4470	1.4466	1.4468	0.0002
T1 G1 O8	1.4498	1.4499	1.4484	1.4494	0.0008
T1 G1 O8 D5	1.4499	1.4495	1.4495	1.4496	0.0002
T1 G1 O8 D10	1.4494	1.4488	1.4490	1.4491	0.0003
T1 G1 O6	1.4388	1.4387	1.4380	1.4385	0.0004
T1 G1 O6 D5	1.4401	1.4389	1.4396	1.4395	0.0006
T1 G1 O6 D10	1.4399	1.4390	1.4405	1.4398	0.0008
T1 G1 O4	1.4489	1.4490	1.4495	1.4491	0.0003
T1 G1 O4 D5	1.4488	1.4488	1.4485	1.4487	0.0002
T1 G1 O4 D10	1.4487	1.4490	1.4492	1.4490	0.0003
T1 P0.7 O8	1.4498	1.4490	1.4492	1.4493	0.0004
T1 P0.7 O8 D5	1.4479	1.4482	1.4475	1.4479	0.0004
T1 P0.7 O8 D10	1.4488	1.4480	1.4489	1.4486	0.0005
T1 P0.7 O6	1.4400	1.4385	1.4396	1.4394	0.0008
T1 P0.7 O6 D5	1.4389	1.4406	1.4395	1.4397	0.0009
T1 P0.7 O6 D10	1.4384	1.4388	1.4381	1.4384	0.0004
T1 P0.7 O4	1.4387	1.4396	1.4399	1.4394	0.0006
T1 P0.7 O4 D5	1.4376	1.4387	1.4390	1.4384	0.0007
T1 P0.7 O4 D10	1.4399	1.4403	1.4386	1.4396	0.0009
T1 P0.5 O8	1.4481	1.4479	1.4477	1.4479	0.0002
T1 P0.5 O8 D5	1.4493	1.4490	1.4488	1.4490	0.0003
T1 P0.5 O8 D10	1.4490	1.4491	1.4486	1.4489	0.0003
T1 P0.5 O6	1.4368	1.4376	1.4388	1.4377	0.0010
T1 P0.5 O6 D5	1.4371	1.4376	1.4385	1.4377	0.0007
T1 P0.5 O6 D10	1.4382	1.4380	1.4377	1.4380	0.0003
T1 P0.5 O4	1.4385	1.4376	1.4381	1.4381	0.0005
T1 P0.5 O4 D5	1.4380	1.4378	1.4375	1.4378	0.0003
T1 P0.5 O4 D10	1.4381	1.4388	1.4378	1.4382	0.0005

Table c3 The refractive index of microemulsions after stability testing.

Formulation	n1	n2	n3	Average	SD
T1 G1.5 O8 D5	1.4490	1.4492	1.4491	1.4491	0.0001
T1 G1.5 O8 D10	1.4475	1.4482	1.4485	1.4481	0.0005
T1 G1.5 O6 D5	1.4395	1.4397	1.4390	1.4394	0.0004
T1 G1.5 O6 D10	1.4396	1.4396	1.4391	1.4394	0.0003
T1 G1.5 O4 D5	1.4480	1.4485	1.4479	1.4481	0.0003
T1 G1.5 O4 D10	1.4470	1.4471	1.4475	1.4472	0.0003
T1 G1 O8 D5	1.4495	1.4496	1.4490	1.4494	0.0003
T1 G1 O8 D10	1.4494	1.4490	1.4491	1.4492	0.0002
T1 G1 O6 D5	1.4396	1.4392	1.4396	1.4395	0.0002
T1 G1 O6 D10	1.4393	1.4398	1.4399	1.4397	0.0003
T1 G1 O4 D5	1.4490	1.4488	1.4487	1.4488	0.0002
T1 G1 O4 D10	1.4489	1.4489	1.4493	1.4490	0.0002
T1 P0.7 O8 D5	1.4480	1.4477	1.4485	1.4481	0.0004
T1 P0.7 O8 D10	1.4483	1.4486	1.4489	1.4486	0.0003
T1 P0.7 O6 D5	1.4395	1.4391	1.4398	1.4395	0.0004
T1 P0.7 O6 D10	1.4387	1.4388	1.4382	1.4386	0.0003
T1 P0.7 O4 D5	1.4388	1.4383	1.4385	1.4385	0.0003
T1 P0.7 O4 D10	1.4396	1.4399	1.4389	1.4395	0.0005
T1 P0.5 O8 D5	1.4490	1.4493	1.4486	1.4490	0.0004
T1 P0.5 O8 D10	1.4489	1.4493	1.4489	1.4490	0.0002
T1 P0.5 O6 D5	1.4382	1.4379	1.4378	1.4380	0.0002
T1 P0.5 O6 D10	1.4378	1.4383	1.4379	1.4380	0.0003
T1 P0.5 O4 D5	1.4381	1.4380	1.4377	1.4379	0.0002
T1 P0.5 O4 D10	1.4385	1.4381	1.4381	1.4382	0.0002

Table c4 The viscosity of compounds.

Material	n1	n2	n3	Average (cps)	SD
Soybean oil	54.11	53.20	57.13	54.81	2.06
Tween 80	425.10	420.11	416.33	420.51	4.40
Glycerin	812.37	808.19	817.66	812.74	4.75
PEG 400	84.02	90.25	88.34	87.54	3.19
PG	45.51	50.07	51.23	48.94	3.02

Table c5 The refractive index of compounds.

Material	n1	n2	n3	Average	SD
Soybean oil	1.4726	1.4722	1.4723	1.4724	0.0002
Tween 80	1.4716	1.4711	1.4717	1.4715	0.0003
Glycerin	1.4722	1.4725	1.4724	1.4724	0.0002
PEG 400	1.4645	1.4644	1.4648	1.4646	0.0002
PG	1.4310	1.4313	1.4315	1.4313	0.0003
Water	1.3333	1.3333	1.3332	1.3333	0.0001

Table c6 The content of diazepam in microemulsions before stability testing.

Formulation	N1	n2	n3	Average	SD
T1 G1.5 O8 D5	104.76	104.72	104.55	104.68	0.1102
T1 G1.5 O8 D10	102.08	102.41	102.44	102.31	0.1995
T1 G1.5 O6 D5	97.53	97.98	97.71	97.74	0.2284
T1 G1.5 O6 D10	100.06	100.46	100.55	100.36	0.2643
T1 G1.5 O4 D5	106.23	104.45	105.85	105.89	0.9362
T1 G1.5 O4 D10	98.10	100.05	99.82	99.73	1.0688
T1 G1 O8 D5	104.45	103.97	103.80	104.07	0.3398
T1 G1 O8 D10	98.04	97.92	98.32	98.78	0.2038
T1 G1 O6 D5	96.86	98.26	98.67	97.93	0.9525
T1 G1 O6 D10	101.81	102.29	102.22	103.18	0.2594
T1 G1 O4 D5	99.05	97.73	102.44	100.14	2.4388
T1 G1 O4 D10	105.02	99.98	103.39	103.19	2.5708
T1 P0.7 O8 D5	99.87	101.06	99.20	100.04	0.9393
T1 P0.7 O8 D10	98.48	97.74	100.76	99.28	1.5732
T1 P0.7 O6 D5	105.80	105.71	102.98	105.09	1.6035
T1 P0.7 O6 D10	99.67	99.01	99.60	99.71	0.3618
T1 P0.7 O4 D5	104.48	103.85	104.72	104.73	0.4520
T1 P0.7 O4 D10	97.86	97.03	97.99	98.04	0.5182
T1 P0.5 O8 D5	97.73	97.49	97.391	97.54	0.1742
T1 P0.5 O8 D10	102.93	101.90	98.86	101.51	2.113
T1 P0.5 O6 D5	104.27	104.68	99.54	103.10	2.8557
T1 P0.5 O6 D10	100.01	98.77	99.71	99.78	0.6488
T1 P0.5 O4 D5	103.11	102.05	103.78	102.98	0.8723
T1 P0.5 O4 D10	100.54	98.33	100.32	99.73	1.2174

Table c7 The content of diazepam in microemulsions after stability testing.

Formulation	n1	n2	n3	Average	SD
T1 G1.5 O8 D5	97.84	99.25	99.04	98.71	0.7607
T1 G1.5 O8 D10	98.14	94.08	93.13	95.12	2.6610
T1 G1.5 O6 D5	102.71	102.05	103.78	102.85	0.8731
T1 G1.5 O6 D10	100.35	98.95	97.31	98.87	1.5216
T1 G1.5 O4 D5	103.65	102.05	100.97	102.22	1.3484
T1 G1.5 O4 D10	99.07	100.02	101.12	100.07	1.0259
T1 G1 O8 D5	102.11	101.33	100.62	101.35	0.7453
T1 G1 O8 D10	101.11	98.24	100.07	99.81	1.4530
T1 G1 O6 D5	97.57	97.33	95.61	96.84	1.0691
T1 G1 O6 D10	99.98	101.05	100.22	100.42	0.5615
T1 G1 O4 D5	103.11	104.47	106.77	104.78	1.8500
T1 G1 O4 D10	98.45	93.01	97.00	96.15	2.8171
T1 P0.7 O8 D5	100.39	98.12	99.79	99.43	1.1763
T1 P0.7 O8 D10	103.24	102.05	102.32	102.54	0.6239
T1 P0.7 O6 D5	101.33	100.45	102.38	101.39	0.9662
T1 P0.7 O6 D10	98.14	100.85	100.87	99.95	1.5704
T1 P0.7 O4 D5	99.64	101.20	97.86	99.57	1.6712
T1 P0.7 O4 D10	102.75	98.24	100.45	100.48	2.2551
T1 P0.5 O8 D5	99.14	95.66	96.21	97.00	1.8707
T1 P0.5 O8 D10	102.98	101.84	103.56	102.79	0.8751
T1 P0.5 O6 D5	100.34	98.12	100.08	99.51	1.2136
T1 P0.5 O6 D10	99.87	102.33	102.09	101.43	1.3563
T1 P0.5 O4 D5	104.15	100.50	102.97	102.54	1.8626
T1 P0.5 O4 D10	103.47	102.58	104.39	103.48	0.9050

V04-007

หน้า 1 / 3

แผนกศูนย์เครื่องมือวิทยาศาสตร์
กองพัฒนาคุณภาพ ฝ่ายประกันคุณภาพ
บันทึกผลการสอบเทียบเครื่องวัด Vernier Caliper

วันที่ทำการสอบเทียบ วันที่ 2 มีนาคม พ.ศ. 2545 ผู้ทำการสอบเทียบ นายสมชาย ศรีภูมมา

สถานที่ทำการสอบเทียบ Calibration Room อุณหภูมิ 20 oC ความชื้น 51.2 %RH

รายละเอียดของเครื่องวัด Vernier Caliper ที่ทดสอบ

รุ่นของเครื่องวัด Vernier Caliper Digimatic Caliper 500-321

Serial number	7296569	Code number	3-420501-0017		
บริษัทผู้ผลิต	Mitutoyo	ตัวแทนจำหน่าย	-	โทร	-
สถานที่ใช้งาน	แผนกมาตรฐานบรรจุภัณฑ์ 2			โทร	1733

รายละเอียดของ Standard Gauge Block Set ที่ใช้

บริษัทผู้ผลิต	Mitutoyo	ตัวแทนจำหน่าย	หจก.ศิริแมชชินเนอรี่ โทร 0-2223-7191
Serial number	967926	Set number	BM1-D47-0
Code number	516-962	Grade	0
Expiry date	ก.ค.45		

สรุป : ☑ ผ่านการสอบเทียบ เครื่องวัด Vernier Caliper สามารถใช้ในงานวัดได้

☐ ไม่ผ่านการสอบเทียบ ให้แยกเครื่องวัด Vernier Caliper ออกจากบริเวณที่ทำงาน พร้อมติดป้ายห้ามใช้และติดต่อบริษัทตัวแทนจำหน่ายเพื่อดำเนินการแก้ไข

ประเมินผลโดย : ..... วันที่ : 4 / 3 / 45

อนุมัติโดย : ..... วันที่ : 4 / 3 / 45

V 04-007

แผนกศูนย์เครื่องมือวิทยาศาสตร์

กองพัฒนาคุณภาพ ฝ่ายประกันคุณภาพ

บันทึกผลการสอบเทียบเครื่องวัด Vernier Caliper

หัวข้อการทดสอบ

1. สภาพโดยทั่วไป Vernier Caliper Serial No. 7296569

ยี่ห้อ Mitutoyo รุ่น

2. การทดสอบความสามารถในการวัด

ค่าที่แท้จริงของ Standard length (mm)	Tolerance Limit (mm)	ค่าที่อ่านได้ 1	2	3	4	Accuracy of Reading (± 0.02 mm)	$\bar{X}$ $\sum Xi/n$	%RSD $(SD/\bar{X}) \times 100$	Repeatability of Reading (≤ 1.0% RSD)	Correction (mm)	Uncertainty at 95%
1	0.98 - 1.02	1.01	1.01	1.01	1.01	☑ Passed ☐ Failed	1.0100	0.0000	☑ Passed ☐ Failed	-0.0100	1.0100 ± 0.0000 (Ua)
3	2.98 - 3.02	3.01	3.01	3.01	3.01	☑ Passed ☐ Failed	3.0100	0.0000	☑ Passed ☐ Failed	-0.0100	3.0100 ± 0.0000 (Ua)
5	4.98 - 5.02	5.00	5.00	5.00	5.00	☑ Passed ☐ Failed	5.0000	0.0000	☑ Passed ☐ Failed	0.0000	5.0000 ± 0.0000 (Ua)
10	9.98 - 10.02	10.00	10.00	10.00	10.00	☑ Passed ☐ Failed	10.0000	0.0000	☑ Passed ☐ Failed	0.0000	10.0000 ± 0.0000 (Ua)
30	29.98 - 30.02	30.00	30.00	30.00	30.00	☑ Passed ☐ Failed	30.0000	0.0000	☑ Passed ☐ Failed	0.0000	30.0000 ± 0.0000 (Ua)
50	49.98 - 50.02	50.00	50.00	50.00	50.00	☑ Passed ☐ Failed	50.0000	0.0000	☑ Passed ☐ Failed	0.0000	50.0000 ± 0.0000 (Ua)
100	99.98 - 100.02	100.01	100.01	100.01	100.01	☑ Passed ☐ Failed	100.0115	0.0050	☑ Passed ☐ Failed	-0.0115	100.0115 ± 0.0050 (Ua)

สูตร $r = \frac{n\sum XY - (\sum X)(\sum Y)}{\sqrt{[n\sum X^2 - (\sum X^2)][n\sum Y^2 - (\sum Y)^2]}}$

= 0.9999 (ใช้เครื่องคิดเลข)

Linearity ($r \geq 0.995$) ☑ Passed ☐ Failed

Result ☑ **Passed** ☐ **Failed**

ผู้ทำการสอบเทียบ : [illegible] วันที่ : 2/3/45

V04-007 หน้า 3 3

การคำนวณ Uncertainty

Nominal Value	Type of Uncertainty	แหล่งที่มา	ค่า Uncertainty ที่ได้ / ระบุ	ค่า สัมประสิทธิ์	Uncertainty ที่ 68 %
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
Total Uncertainty at 95% = (mean ± uncertainty at 95 %) unit = ...					

การคำนวณ

ที่ 1 mm. $Ua_{std.} = \frac{SD}{\sqrt{n}} = \frac{0.0000}{\sqrt{2}} = 0.0000$

$Ua_{95\%} = 0.0000 \times 3 = 0.0000$

ที่ 2 mm. $Ua_{95\%} = 0.0000 \times 3 = 0.0000$

ที่ 5 mm. $Ua_{95\%} = 0.0001 \times 3 = 0.0003$

ที่ 10 mm. $Ua_{95\%} = 0.0000 \times 3 = 0.0000$

ที่ 20 mm. $Ua_{95\%} = 0.0000 \times 3 = 0.0000$

ที่ 50 mm. $Ua_{95\%} = 0.0000 \times 3 = 0.0000$

ที่ 100 mm. $Ua_{95\%} = 0.0017 \times 3 = 0.0050$

หมายเหตุ $Ua = Sx / \sqrt{n}$ $Sx = \sqrt{\frac{\sum_{i=1}^{n} (xi - \bar{x})^2}{(n-1)}}$ Ub ที่ได้จาก Certificate หารด้วย k (2)

Ub ที่ได้จาก Resolution , Hysteresis คูณด้วย 0.29 Ub ที่ได้จาก Specification , Hanbook หารด้วย $\sqrt{3}$

Uc ที่ 68 % = $\sqrt{Ua^2 + Ub_1^2 + Ub_2^2 + ... + Ub_n^2}$ Uc approximately ที่ 95 % = 2 x Uc ที่ 68 %

TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
INDUSTRIAL INSTRUMENTS CALIBRATION CENTER
534/4 SOI PATTANAKARN 18, PATTANAKARN ROAD, SUANLUANG, SUANLUANG BANGKOK 10250
TEL. 0-2717-3000-24 FAX. 0-2719-9484

Cert.No.: 02G106
Page: 1 of 3

Certificate of Calibration

Equipment :	Gauge Block Set
Model :	516-962
Serial No. :	967926
ID No. :	-
Manufacturer :	Mitutoyo
Made in :	Japan
Submitted by :	The Government Pharmaceutical Organization Bangkok 10400
Ambient Temperature :	(20 +/- 1) °C
Relative Humidity :	(50 +/- 10) % R.H.
Calibrated by :	Wattana Pamon

Approved by :

( ) Mitr Veeratham
(✓) Suchat Nantawitaya

Approved Signatory

Issue Date : 27 June 2002

A 0052645

Equipment : Gauge Block Set
Material : Steel Ceramic
Grade : 0
Model : 516-962
Serial No. : 967926
ID No. : -
Manufacturer : Mitutoyo
Received Date : 14 June 2002
Calibration Date : 24 June 2002
Reference : 206-277

Cert.No.: 02G106
Page: 2 of 3

Procedure used :-

This gauge block set was calibrated by using in-house calibration method. The measured deviation of nominal length at center of the gauge and measured variation in length at five point of the gauge in unit of μm.

Condition of this result of calibration

1. Reference standard instruments:-

Instrument	Model	Serial No.	Test report No.	Due date
1) Gauge Block Set	516-937	990609	22354	19 Sep 2003
2) Gauge Block Comparator	IVC-154	4180	Z2036	-

2. This result of calibration was found accurate as shown on date and place of calibration only.
3. This certification is traceable to :-
   -National Physical Laboratory (NPL),England through the accredited calibration laboratory of Alan Browne Gauges Limited.

Result of calibration :- Without adjustment

The uncertainty of measurement
length-up to and included

10 mm	+/-0.05	μm
25 mm	+/-0.06	μm
50 mm	+/-0.07	μm
75 mm	+/-0.08	μm
100 mm	+/-0.10	μm

The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor k = 2.00, providing a level of confidence of approximately 95 %.

a 0073330

Equipment : Gauge Block Set
Model : 516-962
Serial No. : 967926
ID No. : -
Manufacturer : Mitutoyo
Received Date : 14 June 2002
Calibration Date : 24 June 2002
Reference : 206-277

Cert.No.: 02G106
Page: 3 of 3

Result of calibration :-

Unit : µm

Nominal Length (mm)	Serial Number	Deviation of Nominal Length	Variation in Length
1	960258	-0.01	0.02
2	960472	0.06	0.07
3	960065	0.04	0.02
4	960174	0.08	0.02
5	960738	0.07	0.02
6	963561	0.05	0.02
7	962743	0.08	0.02
8	963038	0.05	0.03
9	963068	0.03	0.01
10	965015	0.03	0.04
20	962776	0.01	0.04
50	963942	0.02	0.05
100	957948	0.07	0.09

a 0073329

Appendix D

Particle size determination of microemulsions

The particle size of microemulsion was determined by transmission electron microscopy (TEM) following negative staining. The average particle diameter of each sample was measured from pictures of about 300 particles/formulation. For measurement of particle diameter, the program computer was developed for accurate measurement. The average particle size and %frequency of each sample were calculated by program SPSS version 10. The result is number based.

The data particle size determination of microemulsion are listed in Tables d1 to d40. And the TEM photomicrographs of each formulation are shown in Figures d1 to d40.

Table d1 Particle size distribution of Formulation T1 G1.5 O8 before autoclaving.

Distribution Type : Number	n = 300
Mean Diameter : 90.03	SD = 23.01

size low (nm)	size in %	size high (nm)	under %	size low (nm)	size in %	size high (nm)	under %
1.00	0.00	3.00	0.00	105.00	20.30	120.00	92.00
3.00	0.00	5.00	0.00	120.00	6.00	135.00	98.00
5.00	0.00	10.00	0.00	135.00	0.70	150.00	98.70
10.00	0.00	15.00	0.00	150.00	1.00	165.00	99.70
15.00	0.00	22.00	0.00	165.00	0.00	172.00	99.70
22.00	0.00	30.00	0.00	172.00	0.30	180.00	100.00
30.00	1.00	45.00	1.00	180.00	0.00	185.00	100.00
45.00	7.00	60.00	8.00	185.00	0.00	190.00	100.00
60.00	22.30	75.00	30.30	190.00	0.00	195.00	100.00
75.00	21.00	90.00	51.30	195.00	0.00	198.00	100.00
90.00	20.40	105.00	71.70	198.00	0.00	200.00	100.00

Table d2 Particle size distribution of Formulation T1 G1.5 O8 after autoclaving.

Distribution Type : Number	n = 300
Mean Diameter : 96.86	SD = 25.87

size low (nm)	size in %	size high (nm)	under %	size low (nm)	size in %	size high (nm)	under %
1.00	0.00	3.00	0.00	105.00	21.30	120.00	83.70
3.00	0.00	5.00	0.00	120.00	12.40	135.00	96.10
5.00	0.00	10.00	0.00	135.00	2.90	150.00	99.00
10.00	0.30	15.00	0.30	150.00	0.70	165.00	99.70
15.00	0.00	22.00	0.30	165.00	0.30	172.00	100.00
22.00	0.00	30.00	0.30	172.00	0.00	180.00	100.00
30.00	1.50	45.00	1.80	180.00	0.00	185.00	100.00
45.00	8.00	60.00	9.80	185.00	0.00	190.00	100.00
60.00	12.30	75.00	22.10	190.00	0.00	195.00	100.00
75.00	17.60	90.00	39.70	195.00	0.00	198.00	100.00
90.00	22.70	105.00	62.40	198.00	0.00	200.00	100.00

Table d3 Particle size distribution of Formulation T1 G1.5 O6 before autoclaving.

Distribution Type : Number	n = 300
Mean Diameter : 85.78	SD = 19.79

size low (nm)	size in %	size high (nm)	under %	size low (nm)	size in %	size high (nm)	under %
1.00	0.00	3.00	0.00	105.00	11.70	120.00	94.00
3.00	0.00	5.00	0.00	120.00	5.00	135.00	99.00
5.00	0.00	10.00	0.00	135.00	0.70	150.00	99.70
10.00	0.00	15.00	0.00	150.00	0.30	165.00	100.00
15.00	0.00	22.00	0.00	165.00	0.00	172.00	100.00
22.00	0.00	30.00	0.00	172.00	0.00	180.00	100.00
30.00	1.30	45.00	1.30	180.00	0.00	185.00	100.00
45.00	4.00	60.00	5.30	185.00	0.00	190.00	100.00
60.00	29.00	75.00	34.30	190.00	0.00	195.00	100.00
75.00	28.40	90.00	62.70	195.00	0.00	198.00	100.00
90.00	19.60	105.00	82.30	198.00	0.00	200.00	100.00

Table d4 Particle size distribution of Formulation T1 G1.5 O6 after autoclaving.

Distribution Type : Number	n = 300
Mean Diameter : 88.25	SD = 26.32

size low (nm)	size in %	size high (nm)	under %	size low (nm)	size in %	size high (nm)	under %
1.00	0.00	3.00	0.00	105.00	15.30	120.00	87.00
3.00	0.00	5.00	0.00	120.00	10.00	135.00	97.00
5.00	0.00	10.00	0.00	135.00	2.00	150.00	99.00
10.00	0.30	15.00	0.30	150.00	0.70	165.00	99.70
15.00	0.40	22.00	0.70	165.00	0.30	172.00	100.00
22.00	0.00	30.00	0.70	172.00	0.00	180.00	100.00
30.00	4.00	45.00	4.70	180.00	0.00	185.00	100.00
45.00	11.00	60.00	15.70	185.00	0.00	190.00	100.00
60.00	17.00	75.00	32.70	190.00	0.00	195.00	100.00
75.00	20.70	90.00	53.40	195.00	0.00	198.00	100.00
90.00	18.30	105.00	71.70	198.00	0.00	200.00	100.00

Table d5 Particle size distribution of Formulation T1 G1.5 O4 before autoclaving.

Distribution Type : Number	n = 300
Mean Diameter : 85.81	SD = 24.07

size low (nm)	size in %	size high (nm)	under %	size low (nm)	size in %	size high (nm)	under %
1.00	0.00	3.00	0.00	105.00	11.70	120.00	93.00
3.00	0.00	5.00	0.00	120.00	6.00	135.00	99.00
5.00	0.00	10.00	0.00	135.00	1.00	150.00	100.00
10.00	0.00	15.00	0.00	150.00	0.00	165.00	100.00
15.00	0.00	22.00	0.00	165.00	0.00	172.00	100.00
22.00	0.00	30.00	0.00	172.00	0.00	180.00	100.00
30.00	1.30	45.00	1.30	180.00	0.00	185.00	100.00
45.00	11.00	60.00	12.30	185.00	0.00	190.00	100.00
60.00	25.00	75.00	37.30	190.00	0.00	195.00	100.00
75.00	29.00	90.00	66.30	195.00	0.00	198.00	100.00
90.00	15.00	105.00	81.30	198.00	0.00	200.00	100.00

Table d6 Particle size distribution of Formulation T1 G1.5 O4 after autoclaving.

Distribution Type : Number	n = 300
Mean Diameter : 88.31	SD = 21.18

size low (nm)	size in %	size high (nm)	under %	size low (nm)	size in %	size high (nm)	under %
1.00	0.00	3.00	0.00	105.00	11.70	120.00	89.30
3.00	0.00	5.00	0.00	120.00	5.30	135.00	94.60
5.00	0.00	10.00	0.00	135.00	3.00	150.00	97.60
10.00	0.00	15.00	0.00	150.00	1.70	165.00	99.30
15.00	0.30	22.00	0.30	165.00	0.00	172.00	99.30
22.00	0.00	30.00	0.30	172.00	0.70	180.00	100.00
30.00	5.30	45.00	5.60	180.00	0.00	185.00	100.00
45.00	14.30	60.00	19.90	185.00	0.00	190.00	100.00
60.00	19.70	75.00	39.60	190.00	0.00	195.00	100.00
75.00	20.30	90.00	59.90	195.00	0.00	198.00	100.00
90.00	17.70	105.00	77.60	198.00	0.00	200.00	100.00

Table d7 Particle size distribution of Formulation T1 G1.5 O4 D5 after autoclaving.

Distribution Type : Number	n = 300
Mean Diameter : 84.65	SD = 29.15

size low (nm)	size in %	size high (nm)	under %	size low (nm)	size in %	size high (nm)	under %
1.00	0.00	3.00	0.00	105.00	13.70	120.00	89.70
3.00	0.00	5.00	0.00	120.00	7.30	135.00	97.00
5.00	0.00	10.00	0.00	135.00	3.00	150.00	100.00
10.00	0.70	15.00	0.70	150.00	0.00	165.00	100.00
15.00	0.30	22.00	1.00	165.00	0.00	172.00	100.00
22.00	0.00	30.00	1.00	172.00	0.00	180.00	100.00
30.00	4.30	45.00	5.30	180.00	0.00	185.00	100.00
45.00	16.70	60.00	22.00	185.00	0.00	190.00	100.00
60.00	20.30	75.00	42.30	190.00	0.00	195.00	100.00
75.00	19.00	90.00	61.30	195.00	0.00	198.00	100.00
90.00	14.70	105.00	76.00	198.00	0.00	200.00	100.00

Table d8 Particle size distribution of Formulation T1 G1.5 O4 D10 after autoclaving.

Distribution Type : Number	n = 300
Mean Diameter : 83.31	SD = 17.56

size low (nm)	size in %	size high (nm)	under %	size low (nm)	size in %	size high (nm)	under %
1.00	0.00	3.00	0.00	105.00	6.30	120.00	95.00
3.00	0.00	5.00	0.00	120.00	3.70	135.00	98.70
5.00	0.00	10.00	0.00	135.00	0.30	150.00	99.00
10.00	0.00	15.00	0.00	150.00	0.70	165.00	99.70
15.00	0.00	22.00	0.00	165.00	0.30	172.00	100.00
22.00	0.00	30.00	0.00	172.00	0.00	180.00	100.00
30.00	0.40	45.00	0.40	180.00	0.00	185.00	100.00
45.00	4.30	60.00	4.70	185.00	0.00	190.00	100.00
60.00	32.00	75.00	36.70	190.00	0.00	195.00	100.00
75.00	34.00	90.00	70.70	195.00	0.00	198.00	100.00
90.00	18.00	105.00	88.70	198.00	0.00	200.00	100.00

Table d9 Particle size distribution of Formulation T1 G1 O8 before autoclaving.

Distribution Type : Number	n = 300
Mean Diameter : 67.88	SD = 20.71

size low (nm)	size in %	size high (nm)	under %	size low (nm)	size in %	size high (nm)	under %
1.00	0.00	3.00	0.00	105.00	2.60	120.00	96.30
3.00	0.00	5.00	0.00	120.00	3.40	135.00	99.70
5.00	0.00	10.00	0.00	135.00	0.30	150.00	100.00
10.00	0.00	15.00	0.00	150.00	0.00	165.00	100.00
15.00	0.00	22.00	0.00	165.00	0.00	172.00	100.00
22.00	0.00	30.00	0.00	172.00	0.00	180.00	100.00
30.00	8.30	45.00	8.30	180.00	0.00	185.00	100.00
45.00	26.00	60.00	34.30	185.00	0.00	190.00	100.00
60.00	40.00	75.00	74.30	190.00	0.00	195.00	100.00
75.00	13.00	90.00	87.30	195.00	0.00	198.00	100.00
90.00	6.40	105.00	93.70	198.00	0.00	200.00	100.00

Table d10 Particle size distribution of Formulation T1 G1 O8 after autoclaving.

Distribution Type : Number	n = 300
Mean Diameter : 76.69	SD = 22.44

size low (nm)	size in %	size high (nm)	under %	size low (nm)	size in %	size high (nm)	under %
1.00	0.00	3.00	0.00	105.00	9.00	120.00	96.00
3.00	0.00	5.00	0.00	120.00	3.60	135.00	99.60
5.00	0.00	10.00	0.00	135.00	0.40	150.00	100.00
10.00	0.30	15.00	0.30	150.00	0.00	165.00	100.00
15.00	0.00	22.00	0.30	165.00	0.00	172.00	100.00
22.00	0.30	30.00	0.60	172.00	0.00	180.00	100.00
30.00	3.70	45.00	4.30	180.00	0.00	185.00	100.00
45.00	18.00	60.00	22.30	185.00	0.00	190.00	100.00
60.00	30.70	75.00	53.00	190.00	0.00	195.00	100.00
75.00	22.60	90.00	75.60	195.00	0.00	198.00	100.00
90.00	11.40	105.00	87.00	198.00	0.00	200.00	100.00

Table d11 Particle size distribution of Formulation T1 G1 O6 before autoclaving.

Distribution Type : Number	n = 300
Mean Diameter : 68.09	SD = 25.05

size low (nm)	size in %	size high (nm)	under %	size low (nm)	size in %	size high (nm)	under %
1.00	0.00	3.00	0.00	105.00	3.70	120.00	91.70
3.00	0.00	5.00	0.00	120.00	4.70	135.00	96.40
5.00	0.00	10.00	0.00	135.00	2.30	150.00	98.70
10.00	0.00	15.00	0.00	150.00	1.00	165.00	99.70
15.00	0.00	22.00	0.00	165.00	0.00	172.00	99.70
22.00	0.00	30.00	0.00	172.00	0.30	180.00	100.00
30.00	8.70	45.00	8.70	180.00	0.00	185.00	100.00
45.00	31.60	60.00	40.30	185.00	0.00	190.00	100.00
60.00	36.70	75.00	77.00	190.00	0.00	195.00	100.00
75.00	7.70	90.00	84.70	195.00	0.00	198.00	100.00
90.00	3.30	105.00	88.00	198.00	0.00	200.00	100.00

Table d12 Particle size distribution of Formulation T1 G1 O6 after autoclaving.

Distribution Type : Number	n = 300
Mean Diameter : 72.54	SD = 23.88

size low (nm)	size in %	size high (nm)	under %	size low (nm)	size in %	size high (nm)	under %
1.00	0.00	3.00	0.00	105.00	10.70	120.00	92.40
3.00	0.00	5.00	0.00	120.00	5.30	135.00	97.70
5.00	0.30	10.00	0.30	135.00	1.30	150.00	99.00
10.00	0.30	15.00	0.60	150.00	0.00	165.00	99.00
15.00	0.00	22.00	0.60	165.00	0.30	172.00	99.30
22.00	0.00	30.00	0.60	172.00	0.70	180.00	100.00
30.00	3.80	45.00	4.40	180.00	0.00	185.00	100.00
45.00	14.60	60.00	19.00	185.00	0.00	190.00	100.00
60.00	22.60	75.00	41.60	190.00	0.00	195.00	100.00
75.00	23.80	90.00	65.40	195.00	0.00	198.00	100.00
90.00	16.30	105.00	81.70	198.00	0.00	200.00	100.00

Table d13 Particle size distribution of Formulation T1 G1 O4 before autoclaving.

Distribution Type : Number	n = 300
Mean Diameter : 62.15	SD = 17.09

size low (nm)	size in %	size high (nm)	under %	size low (nm)	size in %	size high (nm)	under %
1.00	0.00	3.00	0.00	105.00	1.70	120.00	99.00
3.00	0.30	5.00	0.30	120.00	1.00	135.00	100.00
5.00	0.00	10.00	0.30	135.00	0.00	150.00	100.00
10.00	0.00	15.00	0.30	150.00	0.00	165.00	100.00
15.00	0.00	22.00	0.30	165.00	0.00	172.00	100.00
22.00	0.00	30.00	0.30	172.00	0.00	180.00	100.00
30.00	8.70	45.00	9.00	180.00	0.00	185.00	100.00
45.00	33.00	60.00	42.00	185.00	0.00	190.00	100.00
60.00	43.00	75.00	85.00	190.00	0.00	195.00	100.00
75.00	10.00	90.00	95.00	195.00	0.00	198.00	100.00
90.00	2.30	105.00	97.30	198.00	0.00	200.00	100.00

Table d14 Particle size distribution of Formulation T1 G1 O4 after autoclaving.

Distribution Type : Number	n = 300
Mean Diameter : 67.16	SD = 25.38

size low (nm)	size in %	size high (nm)	under %	size low (nm)	size in %	size high (nm)	under %
1.00	0.00	3.00	0.00	105.00	2.30	120.00	99.30
3.00	0.00	5.00	0.00	120.00	0.70	135.00	100.00
5.00	0.00	10.00	0.00	135.00	0.00	150.00	100.00
10.00	0.00	15.00	0.00	150.00	0.00	165.00	100.00
15.00	0.30	22.00	0.30	165.00	0.00	172.00	100.00
22.00	0.00	30.00	0.30	172.00	0.00	180.00	100.00
30.00	11.70	45.00	12.00	180.00	0.00	185.00	100.00
45.00	17.60	60.00	29.60	185.00	0.00	190.00	100.00
60.00	25.40	75.00	55.00	190.00	0.00	195.00	100.00
75.00	22.70	90.00	77.70	195.00	0.00	198.00	100.00
90.00	19.30	105.00	97.00	198.00	0.00	200.00	100.00

Table d15 Particle size distribution of Formulation T1 G1 O4 D5 after autoclaving.

Distribution Type : Number	n = 300
Mean Diameter : 65.49	SD = 18.68

size low (nm)	size in %	size high (nm)	under %	size low (nm)	size in %	size high (nm)	under %
1.00	0.00	3.00	0.00	105.00	4.40	120.00	100.00
3.00	0.00	5.00	0.00	120.00	0.00	135.00	100.00
5.00	0.00	10.00	0.00	135.00	0.00	150.00	100.00
10.00	0.00	15.00	0.00	150.00	0.00	165.00	100.00
15.00	0.00	22.00	0.00	165.00	0.00	172.00	100.00
22.00	0.30	30.00	0.30	172.00	0.00	180.00	100.00
30.00	11.70	45.00	12.00	180.00	0.00	185.00	100.00
45.00	27.30	60.00	39.30	185.00	0.00	190.00	100.00
60.00	33.30	75.00	72.60	190.00	0.00	195.00	100.00
75.00	15.70	90.00	88.30	195.00	0.00	198.00	100.00
90.00	7.30	105.00	95.60	198.00	0.00	200.00	100.00

Table d16 Particle size distribution of Formulation T1 G1 O4 D10 after autoclaving.

Distribution Type : Number	n = 300
Mean Diameter : 68.74	SD = 23.07

size low (nm)	size in %	size high (nm)	under %	size low (nm)	size in %	size high (nm)	under %
1.00	0.00	3.00	0.00	105.00	4.30	120.00	99.70
3.00	0.30	5.00	0.30	120.00	0.30	135.00	100.00
5.00	0.30	10.00	0.60	135.00	0.00	150.00	100.00
10.00	0.00	15.00	0.60	150.00	0.00	165.00	100.00
15.00	0.00	22.00	0.60	165.00	0.00	172.00	100.00
22.00	2.60	30.00	3.20	172.00	0.00	180.00	100.00
30.00	14.00	45.00	17.20	180.00	0.00	185.00	100.00
45.00	18.40	60.00	35.60	185.00	0.00	190.00	100.00
60.00	23.00	75.00	58.60	190.00	0.00	195.00	100.00
75.00	24.30	90.00	82.90	195.00	0.00	198.00	100.00
90.00	12.50	105.00	95.40	198.00	0.00	200.00	100.00

Table d17 Particle size distribution of Formulation T1 P0.7 O8 before autoclaving.

Distribution Type : Number	n = 300
Mean Diameter : 67.53	SD = 20.94

size low (nm)	size in %	size high (nm)	under %	size low (nm)	size in %	size high (nm)	under %
1.00	0.00	3.00	0.00	105.00	5.00	120.00	99.70
3.00	0.00	5.00	0.00	120.00	0.30	135.00	100.00
5.00	0.00	10.00	0.00	135.00	0.00	150.00	100.00
10.00	0.00	15.00	0.00	150.00	0.00	165.00	100.00
15.00	0.00	22.00	0.00	165.00	0.00	172.00	100.00
22.00	0.30	30.00	0.30	172.00	0.00	180.00	100.00
30.00	13.70	45.00	14.00	180.00	0.00	185.00	100.00
45.00	24.00	60.00	38.00	185.00	0.00	190.00	100.00
60.00	27.00	75.00	65.00	190.00	0.00	195.00	100.00
75.00	20.30	90.00	85.30	195.00	0.00	198.00	100.00
90.00	9.40	105.00	94.70	198.00	0.00	200.00	100.00

Table d18 Particle size distribution of Formulation T1 P0.7 O8 after autoclaving.

Distribution Type : Number	n = 300
Mean Diameter : 77.83	SD = 22.83

size low (nm)	size in %	size high (nm)	under %	size low (nm)	size in %	size high (nm)	under %
1.00	3.00	3.00	0.00	105.00	120.00	120.00	96.40
3.00	5.00	5.00	0.00	120.00	135.00	135.00	99.00
5.00	10.00	10.00	0.00	135.00	150.00	150.00	99.70
10.00	15.00	15.00	0.00	150.00	165.00	165.00	100.00
15.00	22.00	22.00	0.70	165.00	172.00	172.00	100.00
22.00	30.00	30.00	1.00	172.00	180.00	180.00	100.00
30.00	45.00	45.00	4.00	180.00	185.00	185.00	100.00
45.00	60.00	60.00	14.40	185.00	190.00	190.00	100.00
60.00	75.00	75.00	35.70	190.00	195.00	195.00	100.00
75.00	90.00	90.00	62.40	195.00	198.00	198.00	100.00
90.00	105.00	105.00	80.10	198.00	200.00	200.00	100.00

Table d19 Particle size distribution of Formulation T1 P0.7 O6 before autoclaving.

Distribution Type : Number	n = 300
Mean Diameter : 64.44	SD = 20.26

size low (nm)	size in %	size high (nm)	under %	size low (nm)	size in %	size high (nm)	under %
1.00	0.00	3.00	0.00	105.00	3.30	120.00	100.00
3.00	0.00	5.00	0.00	120.00	0.00	135.00	100.00
5.00	0.00	10.00	0.00	135.00	0.00	150.00	100.00
10.00	0.70	15.00	0.70	150.00	0.00	165.00	100.00
15.00	0.00	22.00	0.70	165.00	0.00	172.00	100.00
22.00	2.00	30.00	2.70	172.00	0.00	180.00	100.00
30.00	13.30	45.00	16.00	180.00	0.00	185.00	100.00
45.00	27.30	60.00	43.30	185.00	0.00	190.00	100.00
60.00	26.70	75.00	70.00	190.00	0.00	195.00	100.00
75.00	19.30	90.00	89.30	195.00	0.00	198.00	100.00
90.00	7.40	105.00	96.70	198.00	0.00	200.00	100.00

Table d20 Particle size distribution of Formulation T1 P0.7 O6 after autoclaving.

Distribution Type : Number	n = 300
Mean Diameter : 67.42	SD = 21.72

size low (nm)	size in %	size high (nm)	under %	size low (nm)	size in %	size high (nm)	under %
1.00	0.00	3.00	0.00	105.00	3.70	120.00	99.70
3.00	0.00	5.00	0.00	120.00	0.30	135.00	100.00
5.00	0.00	10.00	0.00	135.00	0.00	150.00	100.00
10.00	0.00	15.00	0.00	150.00	0.00	165.00	100.00
15.00	0.00	22.00	0.00	165.00	0.00	172.00	100.00
22.00	2.00	30.00	2.00	172.00	0.00	180.00	100.00
30.00	14.70	45.00	16.70	180.00	0.00	185.00	100.00
45.00	19.30	60.00	36.00	185.00	0.00	190.00	100.00
60.00	26.70	75.00	62.70	190.00	0.00	195.00	100.00
75.00	21.00	90.00	83.70	195.00	0.00	198.00	100.00
90.00	12.30	105.00	96.00	198.00	0.00	200.00	100.00

Table d21 Particle size distribution of Formulation T1 P0.7 O4 before autoclaving.

Distribution Type : Number	n = 300
Mean Diameter : 63.63	SD = 27.51

size low (nm)	size in %	size high (nm)	under %	size low (nm)	size in %	size high (nm)	under %
1.00	0.00	3.00	0.00	105.00	2.70	120.00	98.00
3.00	0.00	5.00	0.00	120.00	1.70	135.00	99.70
5.00	0.70	10.00	0.70	135.00	0.30	150.00	100.00
10.00	0.00	15.00	0.70	150.00	0.00	165.00	100.00
15.00	1.30	22.00	2.00	165.00	0.00	172.00	100.00
22.00	6.70	30.00	8.70	172.00	0.00	180.00	100.00
30.00	14.00	45.00	22.70	180.00	0.00	185.00	100.00
45.00	23.30	60.00	46.00	185.00	0.00	190.00	100.00
60.00	24.00	75.00	70.00	190.00	0.00	195.00	100.00
75.00	16.30	90.00	86.30	195.00	0.00	198.00	100.00
90.00	9.00	105.00	95.30	198.00	0.00	200.00	100.00

Table d22 Particle size distribution of Formulation T1 P0.7 O4 after autoclaving.

Distribution Type : Number	n = 300
Mean Diameter : 67.14	SD = 19.36

size low (nm)	size in %	size high (nm)	under %	size low (nm)	size in %	size high (nm)	under %
1.00	0.00	3.00	0.00	105.00	4.30	120.00	96.20
3.00	0.00	5.00	0.00	120.00	3.80	135.00	100.00
5.00	0.00	10.00	0.00	135.00	0.00	150.00	100.00
10.00	0.00	15.00	0.00	150.00	0.00	165.00	100.00
15.00	0.30	22.00	0.30	165.00	0.00	172.00	100.00
22.00	0.30	30.00	0.60	172.00	0.00	180.00	100.00
30.00	11.30	45.00	11.90	180.00	0.00	185.00	100.00
45.00	17.70	60.00	29.60	185.00	0.00	190.00	100.00
60.00	29.00	75.00	58.60	190.00	0.00	195.00	100.00
75.00	24.60	90.00	83.20	195.00	0.00	198.00	100.00
90.00	8.70	105.00	91.90	198.00	0.00	200.00	100.00

Table d23 Particle size distribution of Formulation T1 P0.7 O4 D5 after autoclaving.

Distribution Type : Number	n = 300
Mean Diameter : 56.26	SD = 21.09

size low (nm)	size in %	size high (nm)	under %	size low (nm)	size in %	size high (nm)	under %
1.00	0.00	3.00	0.00	105.00	1.00	120.00	99.70
3.00	0.00	5.00	0.00	120.00	0.30	135.00	100.00
5.00	0.00	10.00	0.00	135.00	0.00	150.00	100.00
10.00	0.00	15.00	0.00	150.00	0.00	165.00	100.00
15.00	0.00	22.00	0.00	165.00	0.00	172.00	100.00
22.00	1.30	30.00	1.30	172.00	0.00	180.00	100.00
30.00	38.40	45.00	39.70	180.00	0.00	185.00	100.00
45.00	27.30	60.00	67.00	185.00	0.00	190.00	100.00
60.00	15.00	75.00	82.00	190.00	0.00	195.00	100.00
75.00	9.00	90.00	91.00	195.00	0.00	198.00	100.00
90.00	7.70	105.00	98.70	198.00	0.00	200.00	100.00

Table d24 Particle size distribution of Formulation T1 P0.7 O4 D10 after autoclaving.

Distribution Type : Number	n = 300
Mean Diameter : 59.52	SD = 17.91

size low (nm)	size in %	size high (nm)	under %	size low (nm)	size in %	size high (nm)	under %
1.00	0.00	3.00	0.00	105.00	0.70	120.00	100.00
3.00	0.00	5.00	0.00	120.00	0.00	135.00	100.00
5.00	0.00	10.00	0.00	135.00	0.00	150.00	100.00
10.00	0.00	15.00	0.00	150.00	0.00	165.00	100.00
15.00	0.00	22.00	0.00	165.00	0.00	172.00	100.00
22.00	3.70	30.00	3.70	172.00	0.00	180.00	100.00
30.00	26.00	45.00	29.70	180.00	0.00	185.00	100.00
45.00	31.60	60.00	61.30	185.00	0.00	190.00	100.00
60.00	25.40	75.00	86.70	190.00	0.00	195.00	100.00
75.00	9.00	90.00	95.70	195.00	0.00	198.00	100.00
90.00	3.60	105.00	99.30	198.00	0.00	200.00	100.00

Table d25 Particle size distribution of Formulation T1 P0.5 O8 before autoclaving.

Distribution Type : Number	n = 300
Mean Diameter : 55.47	SD = 19.94

size low (nm)	size in %	size high (nm)	under %	size low (nm)	size in %	size high (nm)	under %
1.00	0.00	3.00	0.00	105.00	2.00	120.00	99.70
3.00	0.00	5.00	0.00	120.00	0.30	135.00	100.00
5.00	0.00	10.00	0.00	135.00	0.00	150.00	100.00
10.00	0.30	15.00	0.30	150.00	0.00	165.00	100.00
15.00	0.00	22.00	0.30	165.00	0.00	172.00	100.00
22.00	5.00	30.00	5.30	172.00	0.00	180.00	100.00
30.00	26.00	45.00	31.30	180.00	0.00	185.00	100.00
45.00	32.40	60.00	63.70	185.00	0.00	190.00	100.00
60.00	19.30	75.00	83.00	190.00	0.00	195.00	100.00
75.00	10.70	90.00	93.70	195.00	0.00	198.00	100.00
90.00	4.00	105.00	97.70	198.00	0.00	200.00	100.00

Table d26 Particle size distribution of Formulation T1 P0.5 O8 after autoclaving.

Distribution Type : Number	n = 300
Mean Diameter : 59.43	SD = 23.19

size low (nm)	size in %	size high (nm)	under %	size low (nm)	size in %	size high (nm)	under %
1.00	0.00	3.00	0.00	105.00	4.30	120.00	99.00
3.00	0.00	5.00	0.00	120.00	1.00	135.00	100.00
5.00	0.00	10.00	0.00	135.00	0.00	150.00	100.00
10.00	0.70	15.00	0.70	150.00	0.00	165.00	100.00
15.00	0.30	22.00	1.00	165.00	0.00	172.00	100.00
22.00	2.00	30.00	3.00	172.00	0.00	180.00	100.00
30.00	28.70	45.00	31.70	180.00	0.00	185.00	100.00
45.00	25.00	60.00	56.70	185.00	0.00	190.00	100.00
60.00	20.30	75.00	77.00	190.00	0.00	195.00	100.00
75.00	12.00	90.00	89.00	195.00	0.00	198.00	100.00
90.00	5.70	105.00	94.70	198.00	0.00	200.00	100.00

Table d27 Particle size distribution of Formulation T1 P0.5 O6 before autoclaving.

Distribution Type : Number	n = 300
Mean Diameter : 57.99	SD = 21.22

size low (nm)	size in %	size high (nm)	under %	size low (nm)	size in %	size high (nm)	under %
1.00	0.00	3.00	0.00	105.00	0.30	120.00	100.00
3.00	0.00	5.00	0.00	120.00	0.00	135.00	100.00
5.00	0.00	10.00	0.00	135.00	0.00	150.00	100.00
10.00	0.00	15.00	0.00	150.00	0.00	165.00	100.00
15.00	0.00	22.00	0.00	165.00	0.00	172.00	100.00
22.00	2.00	30.00	2.00	172.00	0.00	180.00	100.00
30.00	33.70	45.00	35.70	180.00	0.00	185.00	100.00
45.00	41.30	60.00	77.00	185.00	0.00	190.00	100.00
60.00	20.00	75.00	97.00	190.00	0.00	195.00	100.00
75.00	2.70	90.00	99.70	195.00	0.00	198.00	100.00
90.00	0.00	105.00	99.70	198.00	0.00	200.00	100.00

Table d28 Particle size distribution of Formulation T1 P0.5 O6 after autoclaving.

Distribution Type : Number	n = 300
Mean Diameter : 59.52	SD = 15.82

size low (nm)	size in %	size high (nm)	under %	size low (nm)	size in %	size high (nm)	under %
1.00	0.00	3.00	0.00	105.00	0.30	120.00	100.00
3.00	0.00	5.00	0.00	120.00	0.00	135.00	100.00
5.00	0.00	10.00	0.00	135.00	0.00	150.00	100.00
10.00	0.00	15.00	0.00	150.00	0.00	165.00	100.00
15.00	0.30	22.00	0.30	165.00	0.00	172.00	100.00
22.00	0.70	30.00	1.00	172.00	0.00	180.00	100.00
30.00	19.00	45.00	20.00	180.00	0.00	185.00	100.00
45.00	30.70	60.00	50.70	185.00	0.00	190.00	100.00
60.00	32.60	75.00	83.30	190.00	0.00	195.00	100.00
75.00	13.00	90.00	96.30	195.00	0.00	198.00	100.00
90.00	3.40	105.00	99.70	198.00	0.00	200.00	100.00

Table d29 Particle size distribution of Formulation T1 P0.5 O4 before autoclaving.

Distribution Type : Number	n = 300
Mean Diameter : 48.98	SD = 10.46

size low (nm)	size in %	size high (nm)	under %	size low (nm)	size in %	size high (nm)	under %
1.00	0.00	3.00	0.00	105.00	0.00	120.00	100.00
3.00	0.00	5.00	0.00	120.00	0.00	135.00	100.00
5.00	0.70	10.00	0.70	135.00	0.00	150.00	100.00
10.00	0.00	15.00	0.70	150.00	0.00	165.00	100.00
15.00	0.30	22.00	1.00	165.00	0.00	172.00	100.00
22.00	0.70	30.00	1.70	172.00	0.00	180.00	100.00
30.00	33.30	45.00	35.00	180.00	0.00	185.00	100.00
45.00	48.00	60.00	83.00	185.00	0.00	190.00	100.00
60.00	16.30	75.00	99.30	190.00	0.00	195.00	100.00
75.00	0.70	90.00	100.00	195.00	0.00	198.00	100.00
90.00	0.00	105.00	100.00	198.00	0.00	200.00	100.00

Table d30 Particle size distribution of Formulation T1 P0.5 O4 after autoclaving.

Distribution Type : Number	n = 300
Mean Diameter : 58.13	SD = 17.34

size low (nm)	size in %	size high (nm)	under %	size low (nm)	size in %	size high (nm)	under %
1.00	0.00	3.00	0.00	105.00	1.60	120.00	99.00
3.00	0.00	5.00	0.00	120.00	0.00	135.00	99.00
5.00	0.30	10.00	0.30	135.00	0.30	150.00	99.30
10.00	0.70	15.00	1.00	150.00	0.70	165.00	100.00
15.00	0.00	22.00	1.00	165.00	0.00	172.00	100.00
22.00	0.30	30.00	1.30	172.00	0.00	180.00	100.00
30.00	18.40	45.00	19.70	180.00	0.00	185.00	100.00
45.00	32.30	60.00	52.00	185.00	0.00	190.00	100.00
60.00	25.70	75.00	77.70	190.00	0.00	195.00	100.00
75.00	13.70	90.00	91.40	195.00	0.00	198.00	100.00
90.00	6.00	105.00	97.40	198.00	0.00	200.00	100.00

Table d31 Particle size distribution of Formulation T1 P0.5 O4 D5 after autoclaving.

Distribution Type : Number	n = 300
Mean Diameter : 46.18	SD = 13.92

size low (nm)	size in %	size high (nm)	under %	size low (nm)	size in %	size high (nm)	under %
1.00	0.00	3.00	0.00	105.00	0.00	120.00	99.70
3.00	0.00	5.00	0.00	120.00	0.30	135.00	100.00
5.00	0.30	10.00	0.30	135.00	0.00	150.00	100.00
10.00	0.00	15.00	0.30	150.00	0.00	165.00	100.00
15.00	0.00	22.00	0.30	165.00	0.00	172.00	100.00
22.00	8.70	30.00	9.00	172.00	0.00	180.00	100.00
30.00	39.70	45.00	48.70	180.00	0.00	185.00	100.00
45.00	33.60	60.00	82.30	185.00	0.00	190.00	100.00
60.00	16.00	75.00	98.30	190.00	0.00	195.00	100.00
75.00	1.40	90.00	99.70	195.00	0.00	198.00	100.00
90.00	0.00	105.00	99.70	198.00	0.00	200.00	100.00

Table d32 Particle size distribution of Formulation T1 P0.5 O4 D10 after autoclaving.

Distribution Type : Number	n = 300
Mean Diameter : 53.64	SD = 12.98

size low (nm)	size in %	size high (nm)	under %	size low (nm)	size in %	size high (nm)	under %
1.00	0.00	3.00	0.00	105.00	0.00	120.00	100.00
3.00	0.00	5.00	0.00	120.00	0.00	135.00	100.00
5.00	0.00	10.00	0.00	135.00	0.00	150.00	100.00
10.00	0.30	15.00	0.30	150.00	0.00	165.00	100.00
15.00	0.00	22.00	0.30	165.00	0.00	172.00	100.00
22.00	2.00	30.00	2.30	172.00	0.00	180.00	100.00
30.00	22.70	45.00	25.00	180.00	0.00	185.00	100.00
45.00	41.30	60.00	66.30	185.00	0.00	190.00	100.00
60.00	28.00	75.00	94.30	190.00	0.00	195.00	100.00
75.00	5.40	90.00	99.70	195.00	0.00	198.00	100.00
90.00	0.30	105.00	100.00	198.00	0.00	200.00	100.00

Table d33 Particle size distribution of Formulation T1 G1.5 O4 D5 after stability testing.

Distribution Type : Number	n = 300
Mean Diameter : 92.60	SD = 29.82

size low (nm)	size in %	size high (nm)	under %	size low (nm)	size in %	size high (nm)	under %
1.00	0.00	3.00	0.00	105.00	7.00	120.00	100.00
3.00	0.00	5.00	0.00	120.00	0.00	135.00	100.00
5.00	0.00	10.00	0.00	135.00	0.00	150.00	100.00
10.00	0.00	15.00	0.00	150.00	0.00	165.00	100.00
15.00	1.30	22.00	1.30	165.00	0.00	172.00	100.00
22.00	4.70	30.00	6.00	172.00	0.00	180.00	100.00
30.00	11.70	45.00	17.70	180.00	0.00	185.00	100.00
45.00	10.00	60.00	27.70	185.00	0.00	190.00	100.00
60.00	17.00	75.00	44.70	190.00	0.00	195.00	100.00
75.00	26.30	90.00	71.00	195.00	0.00	198.00	100.00
90.00	22.00	105.00	93.00	198.00	0.00	200.00	100.00

Table d34 Particle size distribution of Formulation T1 G1.5 O4 D10 after stability testing.

Distribution Type : Number	n = 300
Mean Diameter : 83.46	SD = 18.37

size low (nm)	size in %	size high (nm)	under %	size low (nm)	size in %	size high (nm)	under %
1.00	0.00	3.00	0.00	105.00	18.30	120.00	84.30
3.00	0.00	5.00	0.00	120.00	8.00	135.00	92.30
5.00	0.00	10.00	0.00	135.00	5.70	150.00	98.00
10.00	0.00	15.00	0.00	150.00	2.00	165.00	100.00
15.00	0.30	22.00	0.30	165.00	0.30	172.00	100.30
22.00	0.70	30.00	1.00	172.00	0.70	180.00	100.00
30.00	5.60	45.00	6.60	180.00	0.00	185.00	100.00
45.00	8.40	60.00	15.00	185.00	0.00	190.00	100.00
60.00	14.60	75.00	29.60	190.00	0.00	195.00	100.00
75.00	14.00	90.00	43.60	195.00	0.00	198.00	100.00
90.00	21.40	105.00	65.00	198.00	0.00	200.00	100.00

Table d35 Particle size distribution of Formulation T1 G1 O4 D5 after stability testing.

Distribution Type : Number	n = 300
Mean Diameter : 73.71	SD = 23.86

size low (nm)	size in %	size high (nm)	under %	size low (nm)	size in %	size high (nm)	under %
1.00	0.00	3.00	0.00	105.00	10.60	120.00	88.30
3.00	0.00	5.00	0.00	120.00	7.00	135.00	95.30
5.00	0.00	10.00	0.00	135.00	4.00	150.00	99.30
10.00	0.00	15.00	0.00	150.00	0.70	165.00	100.00
15.00	0.00	22.00	0.00	165.00	0.00	172.00	100.00
22.00	0.00	30.00	0.00	172.00	0.00	180.00	100.00
30.00	5.00	45.00	5.00	180.00	0.00	185.00	100.00
45.00	18.70	60.00	23.70	185.00	0.00	190.00	100.00
60.00	24.60	75.00	48.30	190.00	0.00	195.00	100.00
75.00	19.70	90.00	68.00	195.00	0.00	198.00	100.00
90.00	9.70	105.00	77.70	198.00	0.00	200.00	100.00

Table d36 Particle size distribution of Formulation T1 G1 O4 D10 after stability testing.

Distribution Type : Number	n = 300
Mean Diameter : 82.63	SD = 27.48

size low (nm)	size in %	size high (nm)	under %	size low (nm)	size in %	size high (nm)	under %
1.00	0.00	3.00	0.00	105.00	11.30	120.00	99.00
3.00	0.00	5.00	0.00	120.00	0.70	135.00	99.70
5.00	0.00	10.00	0.00	135.00	0.30	150.00	100.00
10.00	0.00	15.00	0.00	150.00	0.00	165.00	100.00
15.00	0.00	22.00	0.00	165.00	0.00	172.00	100.00
22.00	1.30	30.00	1.30	172.00	0.00	180.00	100.00
30.00	2.00	45.00	3.30	180.00	0.00	185.00	100.00
45.00	6.00	60.00	9.30	185.00	0.00	190.00	100.00
60.00	27.00	75.00	36.30	190.00	0.00	195.00	100.00
75.00	28.40	90.00	64.70	195.00	0.00	198.00	100.00
90.00	23.00	105.00	87.70	198.00	0.00	200.00	100.00

Table d37 Particle size distribution of Formulation T1 P0.7 O4 D5 after stability testing.

Distribution Type : Number	n = 300
Mean Diameter : 72.46	SD = 31.28

size low (nm)	size in %	size high (nm)	under %	size low (nm)	size in %	size high (nm)	under %
1.00	0.00	3.00	0.00	105.00	4.00	120.00	99.70
3.00	0.30	5.00	0.30	120.00	0.00	135.00	99.70
5.00	0.40	10.00	0.70	135.00	0.30	150.00	100.00
10.00	0.00	15.00	0.70	150.00	0.00	165.00	100.00
15.00	0.00	22.00	0.70	165.00	0.00	172.00	100.00
22.00	0.60	30.00	1.30	172.00	0.00	180.00	100.00
30.00	4.40	45.00	5.70	180.00	0.00	185.00	100.00
45.00	17.30	60.00	23.00	185.00	0.00	190.00	100.00
60.00	24.00	75.00	47.00	190.00	0.00	195.00	100.00
75.00	32.30	90.00	79.30	195.00	0.00	198.00	100.00
90.00	16.40	105.00	95.70	198.00	0.00	200.00	100.00

Table d38 Particle size distribution of Formulation T1 P0.7 O4 D10 after stability testing.

Distribution Type : Number	n = 300
Mean Diameter : 75.43	SD = 19.07

size low (nm)	size in %	size high (nm)	under %	size low (nm)	size in %	size high (nm)	under %
1.00	0.00	3.00	0.00	105.00	1.70	120.00	98.70
3.00	0.00	5.00	0.00	120.00	1.30	135.00	100.00
5.00	0.00	10.00	0.00	135.00	0.00	150.00	100.00
10.00	0.00	15.00	0.00	150.00	0.00	165.00	100.00
15.00	0.00	22.00	0.00	165.00	0.00	172.00	100.00
22.00	1.70	30.00	1.70	172.00	0.00	180.00	100.00
30.00	13.00	45.00	14.70	180.00	0.00	185.00	100.00
45.00	40.30	60.00	55.00	185.00	0.00	190.00	100.00
60.00	25.70	75.00	80.70	190.00	0.00	195.00	100.00
75.00	12.30	90.00	93.00	195.00	0.00	198.00	100.00
90.00	4.00	105.00	97.00	198.00	0.00	200.00	100.00

Table d39 Particle size distribution of Formulation T1 P0.5 O4 D5 after stability testing.

Distribution Type : Number	n = 300
Mean Diameter : 62.13	SD = 18.64

size low (nm)	size in %	size high (nm)	under %	size low (nm)	size in %	size high (nm)	under %
1.00	0.00	3.00	0.00	105.00	2.30	120.00	100.00
3.00	0.00	5.00	0.00	120.00	0.00	135.00	100.00
5.00	0.00	10.00	0.00	135.00	0.00	150.00	100.00
10.00	0.00	15.00	0.00	150.00	0.00	165.00	100.00
15.00	0.00	22.00	0.00	165.00	0.00	172.00	100.00
22.00	3.30	30.00	3.30	172.00	0.00	180.00	100.00
30.00	9.70	45.00	13.00	180.00	0.00	185.00	100.00
45.00	25.70	60.00	38.70	185.00	0.00	190.00	100.00
60.00	33.30	75.00	72.00	190.00	0.00	195.00	100.00
75.00	20.00	90.00	92.00	195.00	0.00	198.00	100.00
90.00	5.70	105.00	97.70	198.00	0.00	200.00	100.00

Table d40 Particle size distribution of Formulation T1 P0.5 O4 D10 after stability testing.

Distribution Type : Number	n = 300
Mean Diameter : 65.92	SD = 17.66

size low (nm)	size in %	size high (nm)	under %	size low (nm)	size in %	size high (nm)	under %
1.00	0.00	3.00	0.00	105.00	9.00	120.00	94.30
3.00	0.00	5.00	0.00	120.00	4.70	135.00	99.00
5.00	0.00	10.00	0.00	135.00	0.70	150.00	99.70
10.00	0.00	15.00	0.00	150.00	0.00	165.00	99.70
15.00	0.00	22.00	0.00	165.00	0.00	172.00	99.70
22.00	5.70	30.00	5.70	172.00	0.00	180.00	99.70
30.00	22.30	45.00	28.00	180.00	0.30	185.00	100.00
45.00	16.70	60.00	44.70	185.00	0.00	190.00	100.00
60.00	15.30	75.00	60.00	190.00	0.00	195.00	100.00
75.00	12.60	90.00	72.60	195.00	0.00	198.00	100.00
90.00	12.70	105.00	85.30	198.00	0.00	200.00	100.00

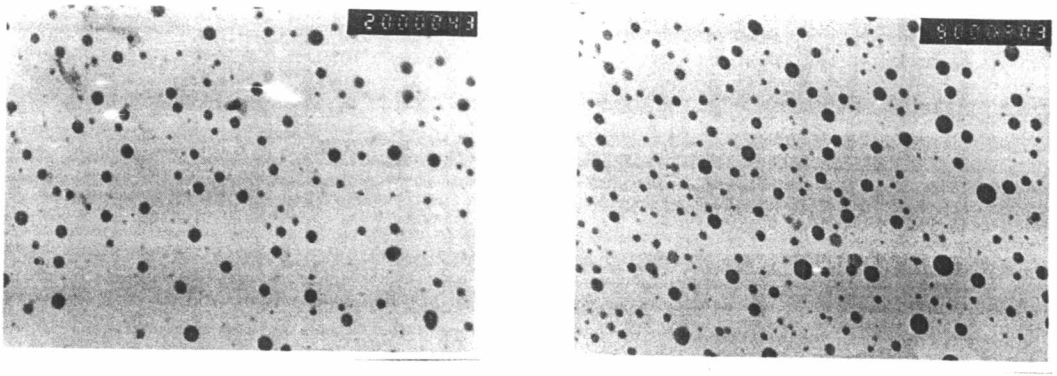


Figure d1 The TEM photomicrographs of Formulation T1 G1.5 O8 before autoclaving (× 30,000).

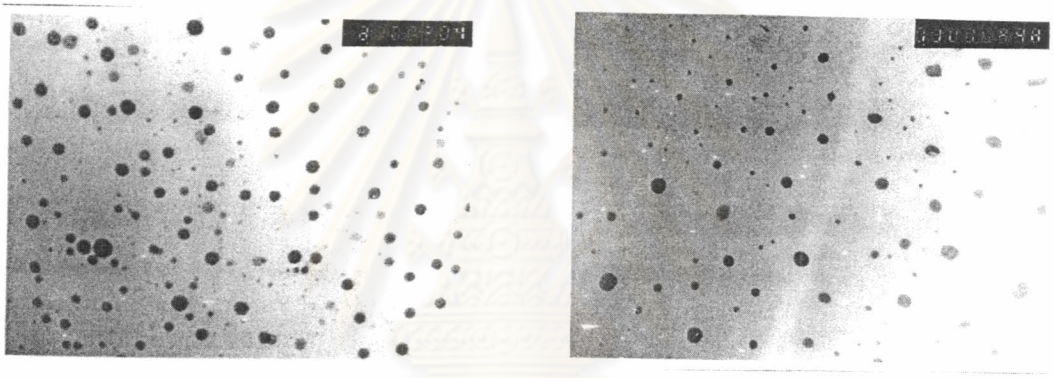


Figure d2 The TEM photomicrographs of Formulation T1 G1.5 O8 after autoclaving (× 30,000).

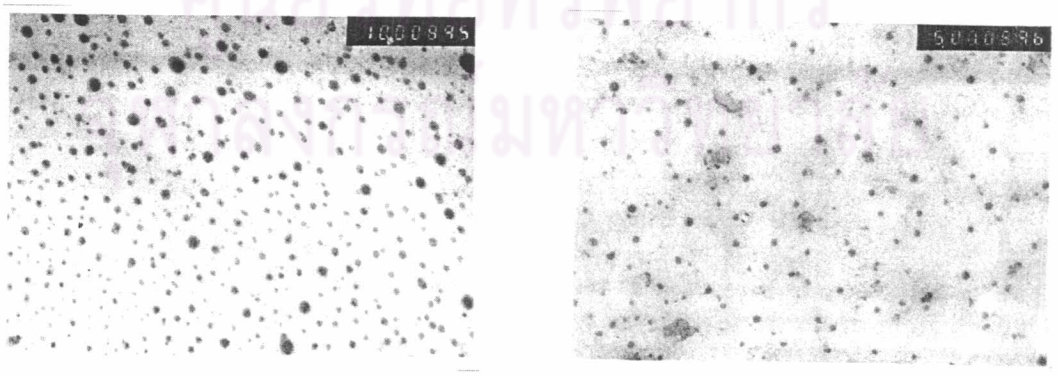


Figure d3 The TEM photomicrographs of Formulation T1 G1.5 O6 before autoclaving (× 16,500).

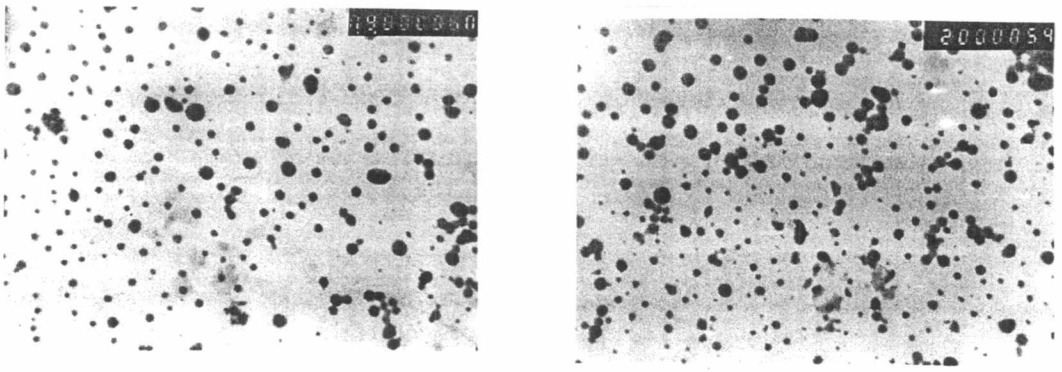


Figure d4 The TEM photomicrographs of Formulation T1 G1.5 O6 after autoclaving (× 30,000).

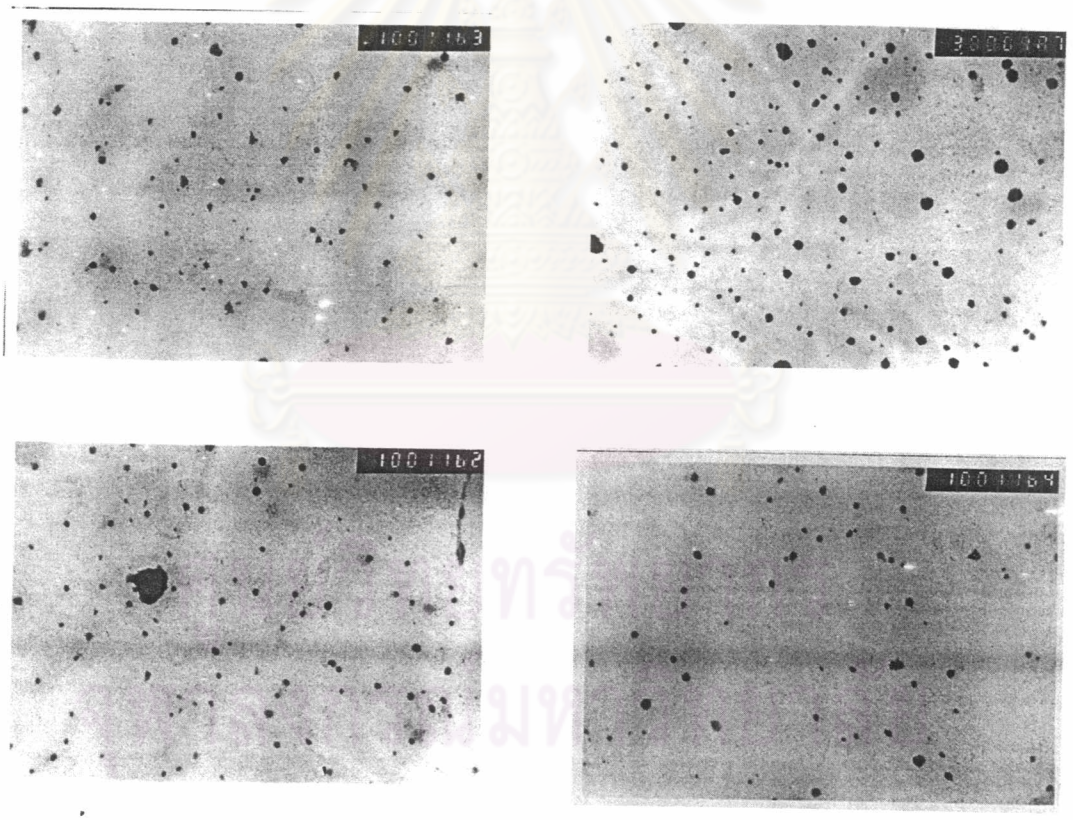


Figure d5 The TEM photomicrographs of Formulation T1 G1.5 O4 before autoclaving (× 16,500).

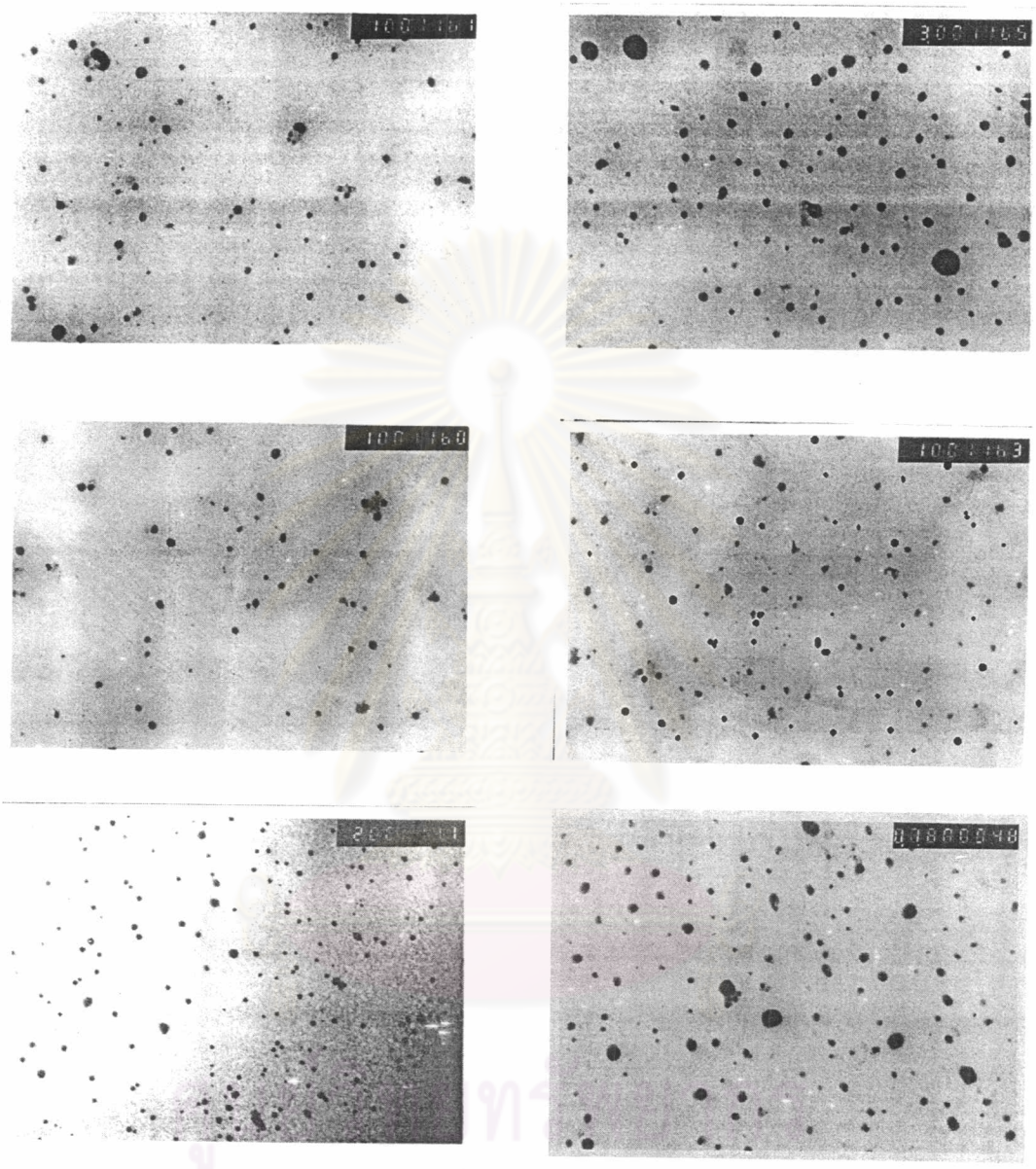


Figure d6 The TEM photomicrographs of Formulation T1 G1.5 O4 after autoclaving (× 16,500).

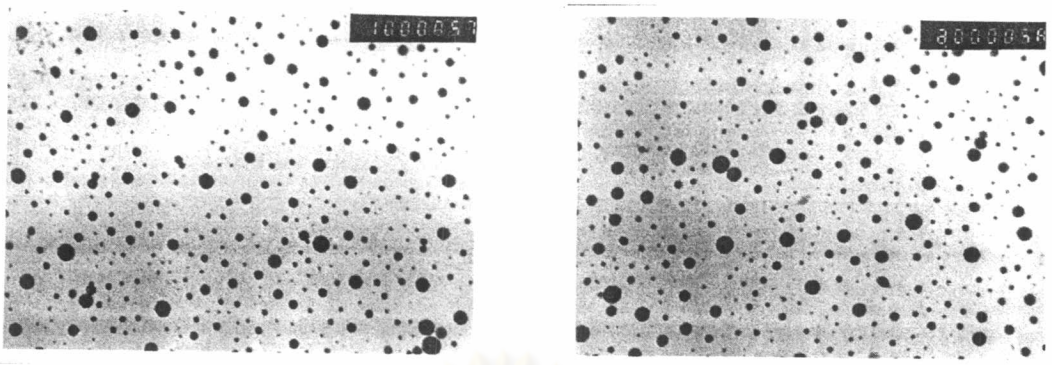


Figure d7 The TEM photomicrographs of Formulation T1 G1.5 O4 D5 after autoclaving (× 30,000).

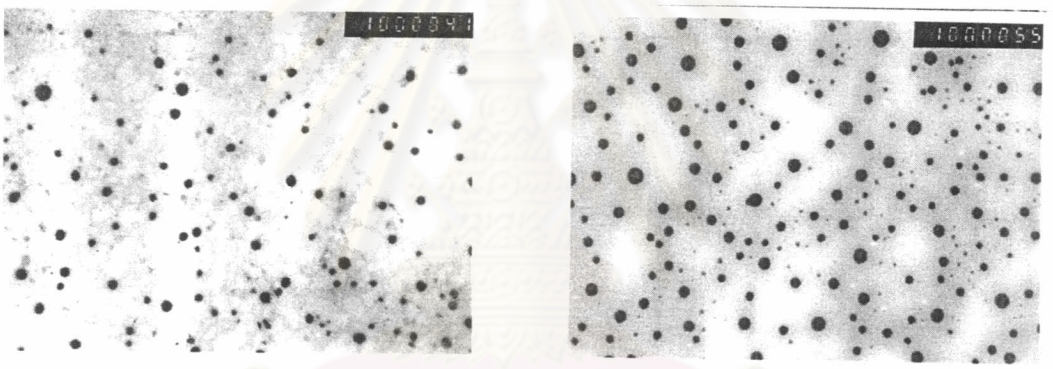


Figure d8 The TEM photomicrographs of Formulation T1 G1.5 O4 D10 after autoclaving (× 30,000).

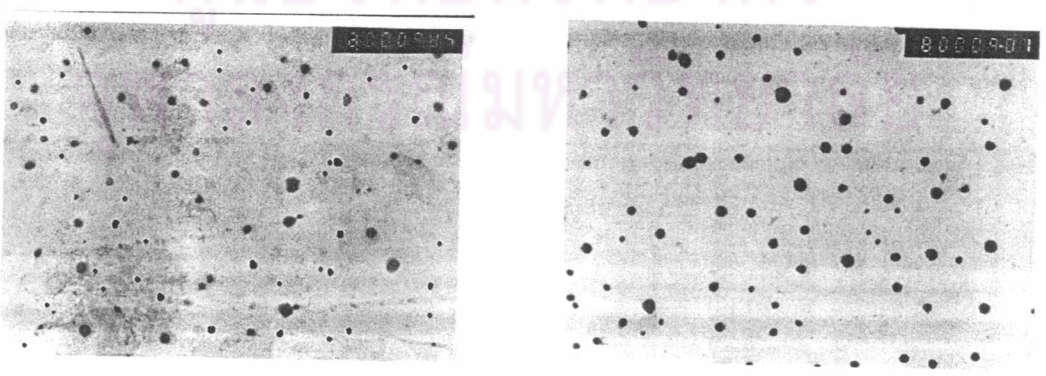


Figure d9 The TEM photomicrographs of Formulation T1 G1 O8 before autoclaving (× 30,000).

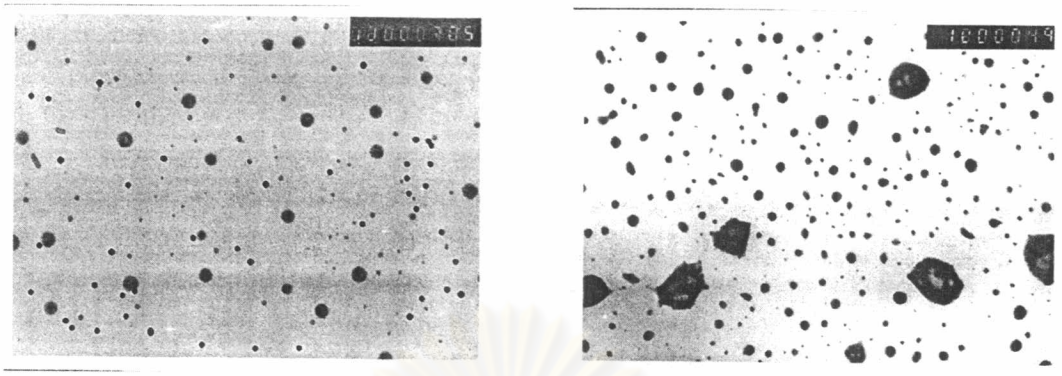


Figure d9 (Cont.) The TEM photomicrographs of Formulation T1 G1 O8 before autoclaving (× 30,000).

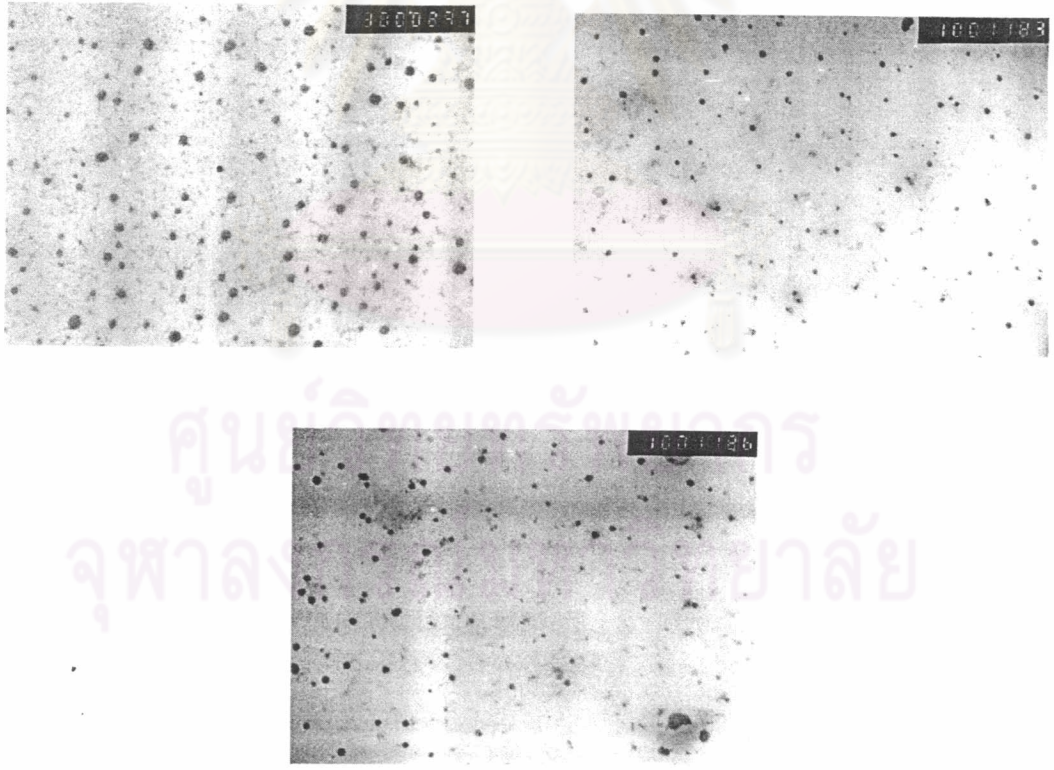


Figure d10 The TEM photomicrographs of Formulation T1 G1 O8 after autoclaving (× 16,500).

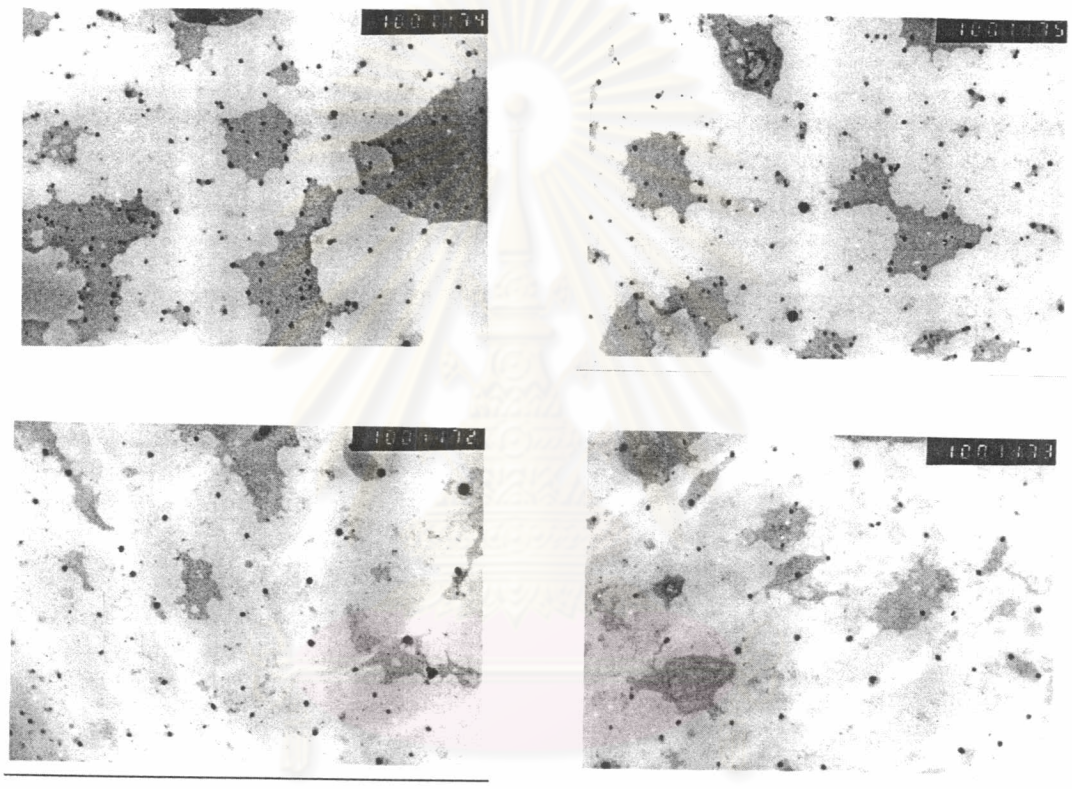


Figure d11 The TEM photomicrographs of Formulation T1 G1 O6 before autoclaving (× 16,500).

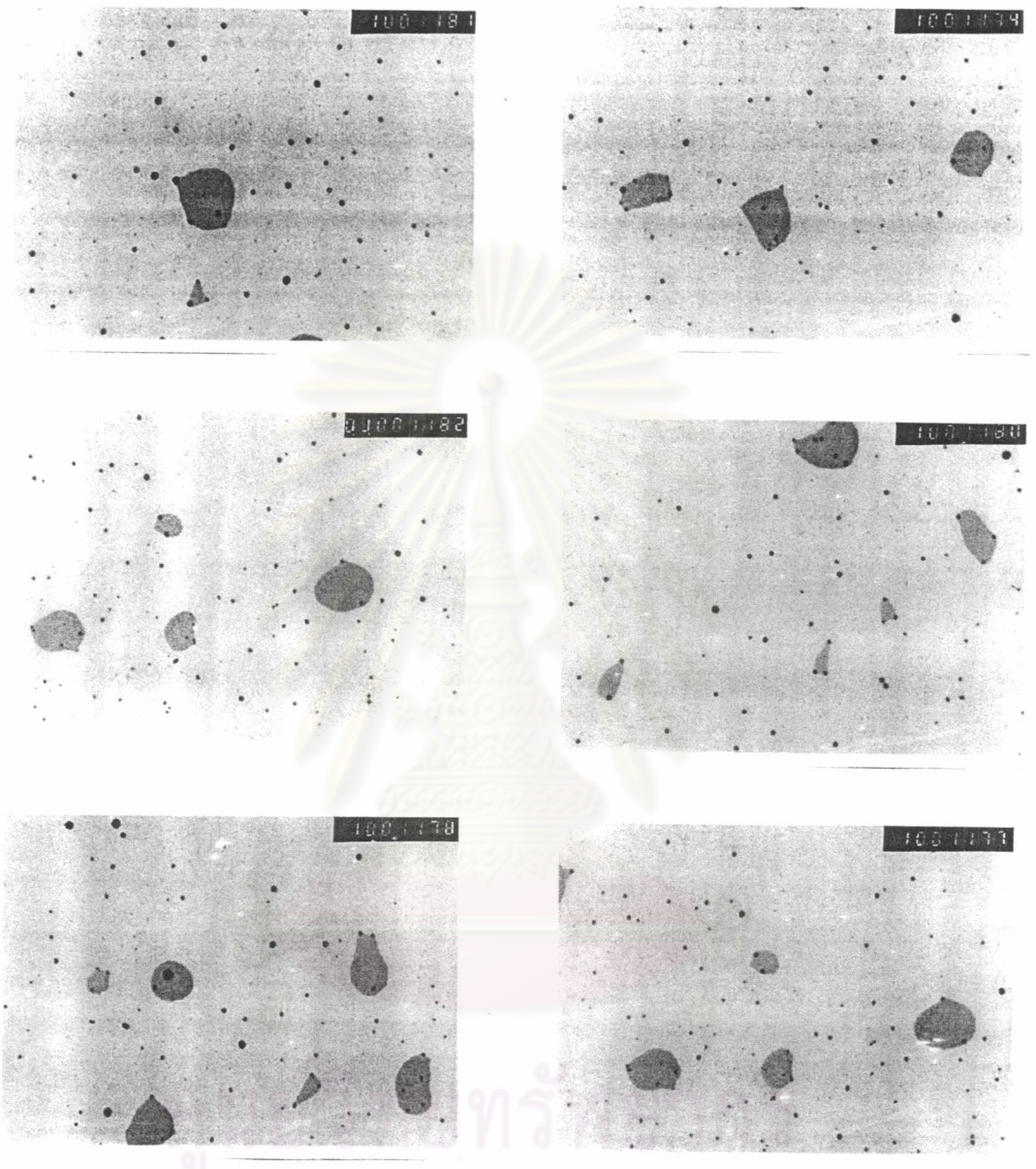


Figure d12 The TEM photomicrographs of Formulation T1 G1 O6 after autoclaving (× 16,500).

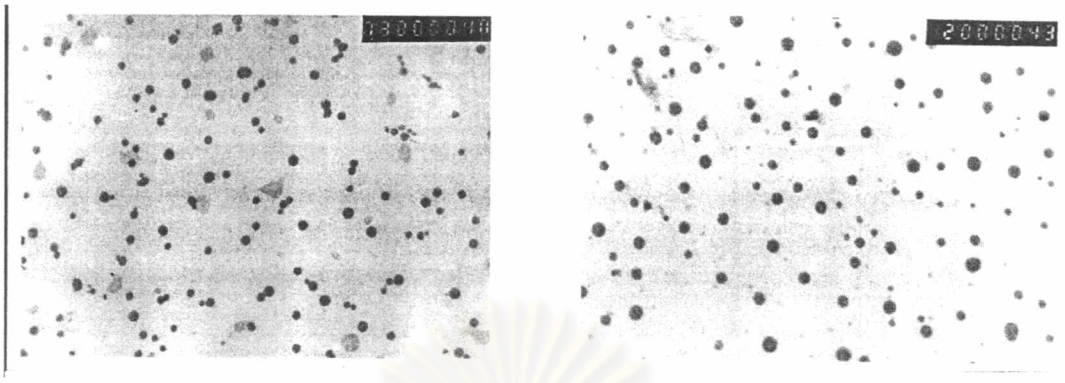


Figure d13 The TEM photomicrographs of Formulation T1 G1 O4 before autoclaving (× 30,000).

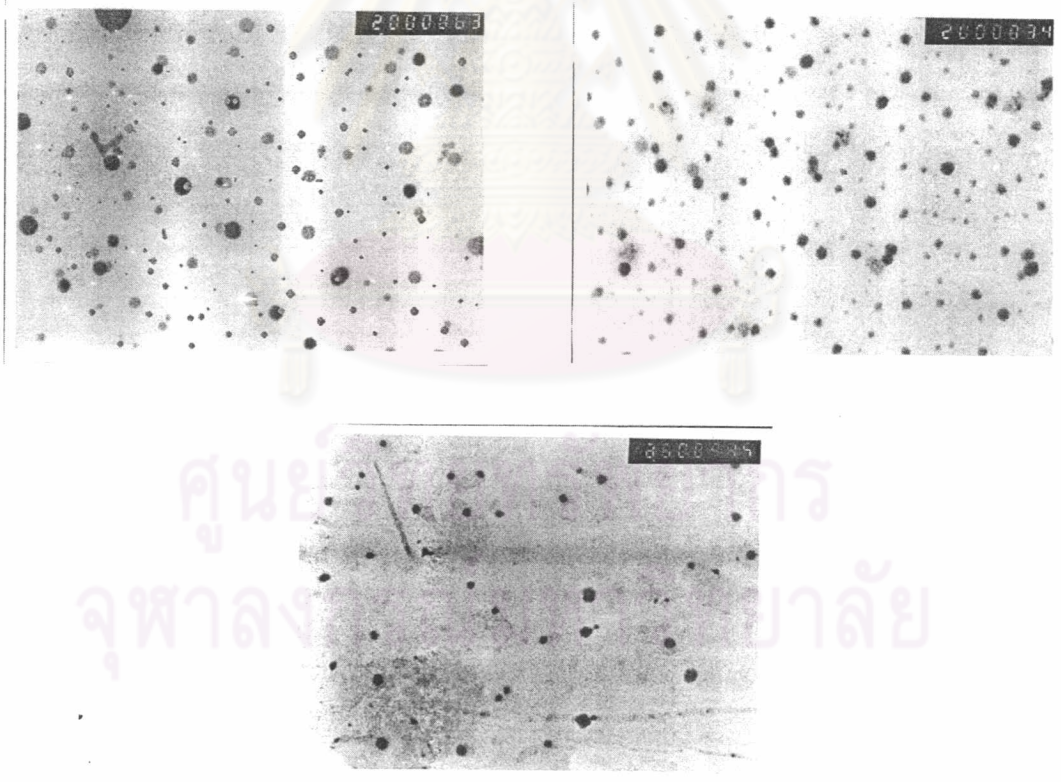


Figure d14 The TEM photomicrographs of Formulation T1 G1 O4 after autoclaving (× 30,000).

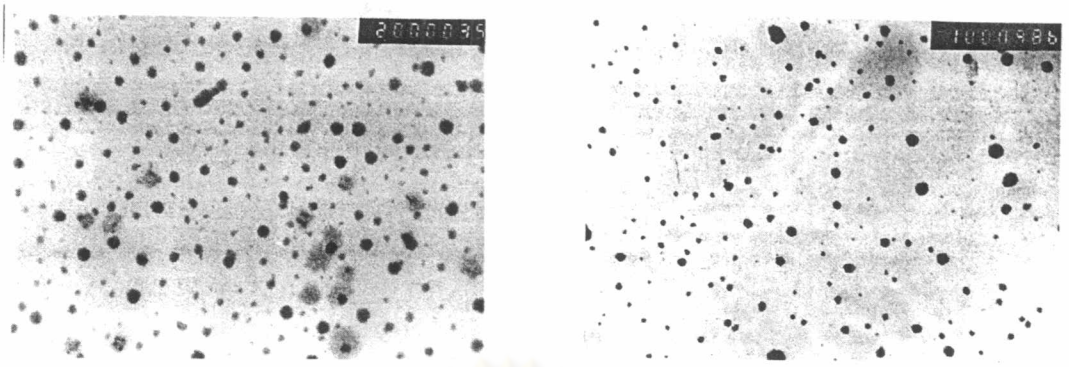


Figure d15 The TEM photomicrographs of Formulation T1 G1 O4 D5 after autoclaving (× 30,000).

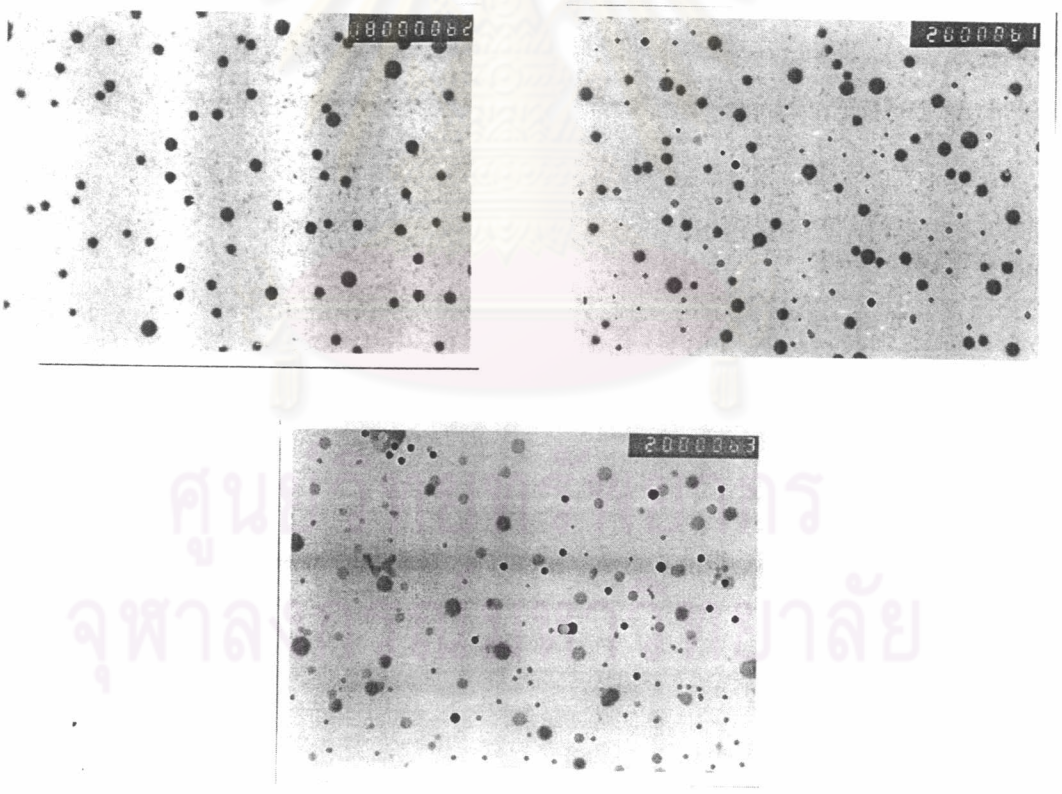


Figure d16 The TEM photomicrographs of Formulation T1 G1 O4 D10 after autoclaving (× 30,000).

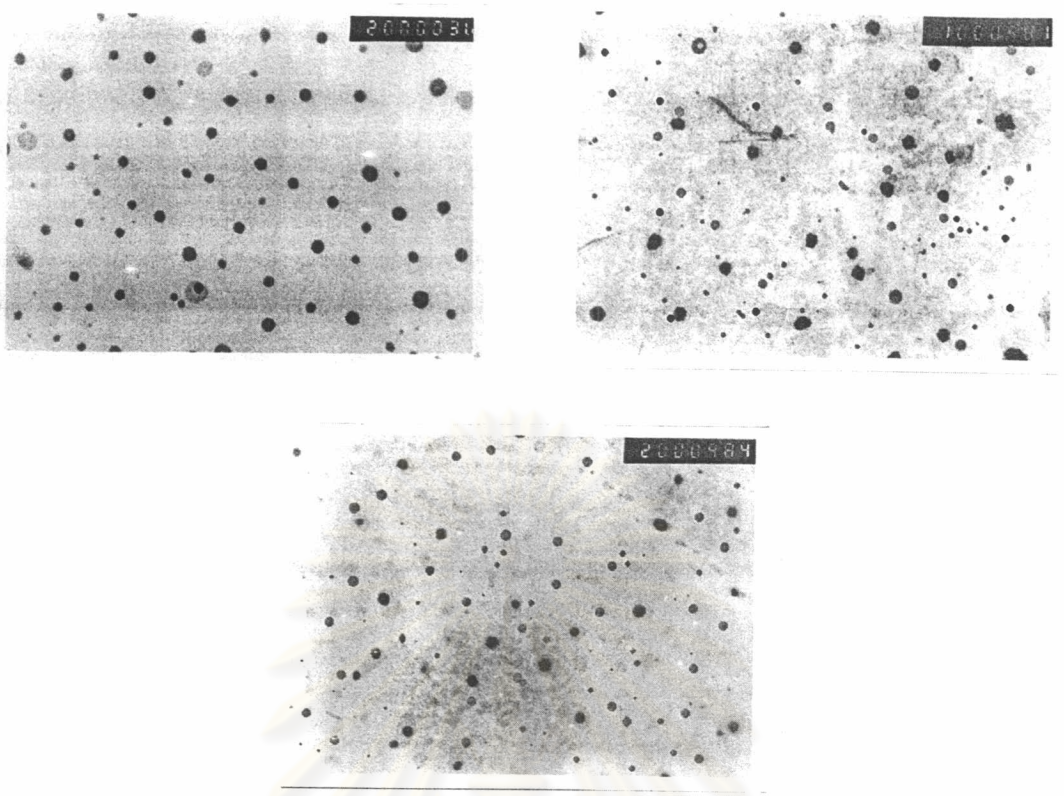


Figure d17 The TEM photomicrographs of Formulation T1 P0.7 O8 before autoclaving (× 30,000).

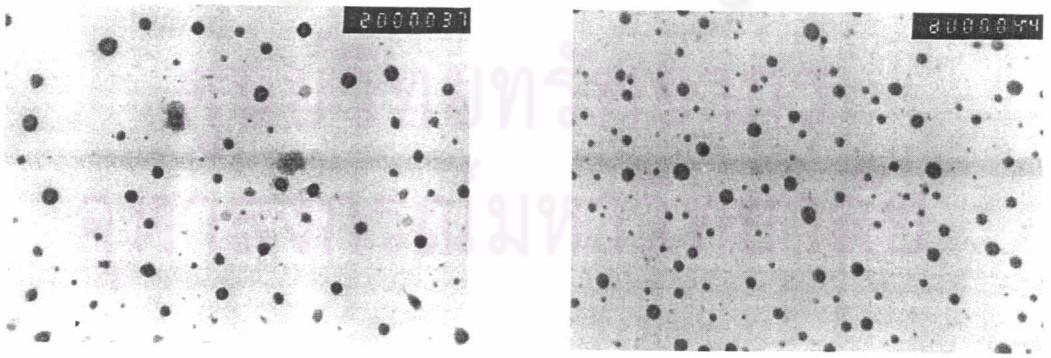


Figure d18 The TEM photomicrographs of Formulation T1 P0.7 O8 after autoclaving (× 30,000).

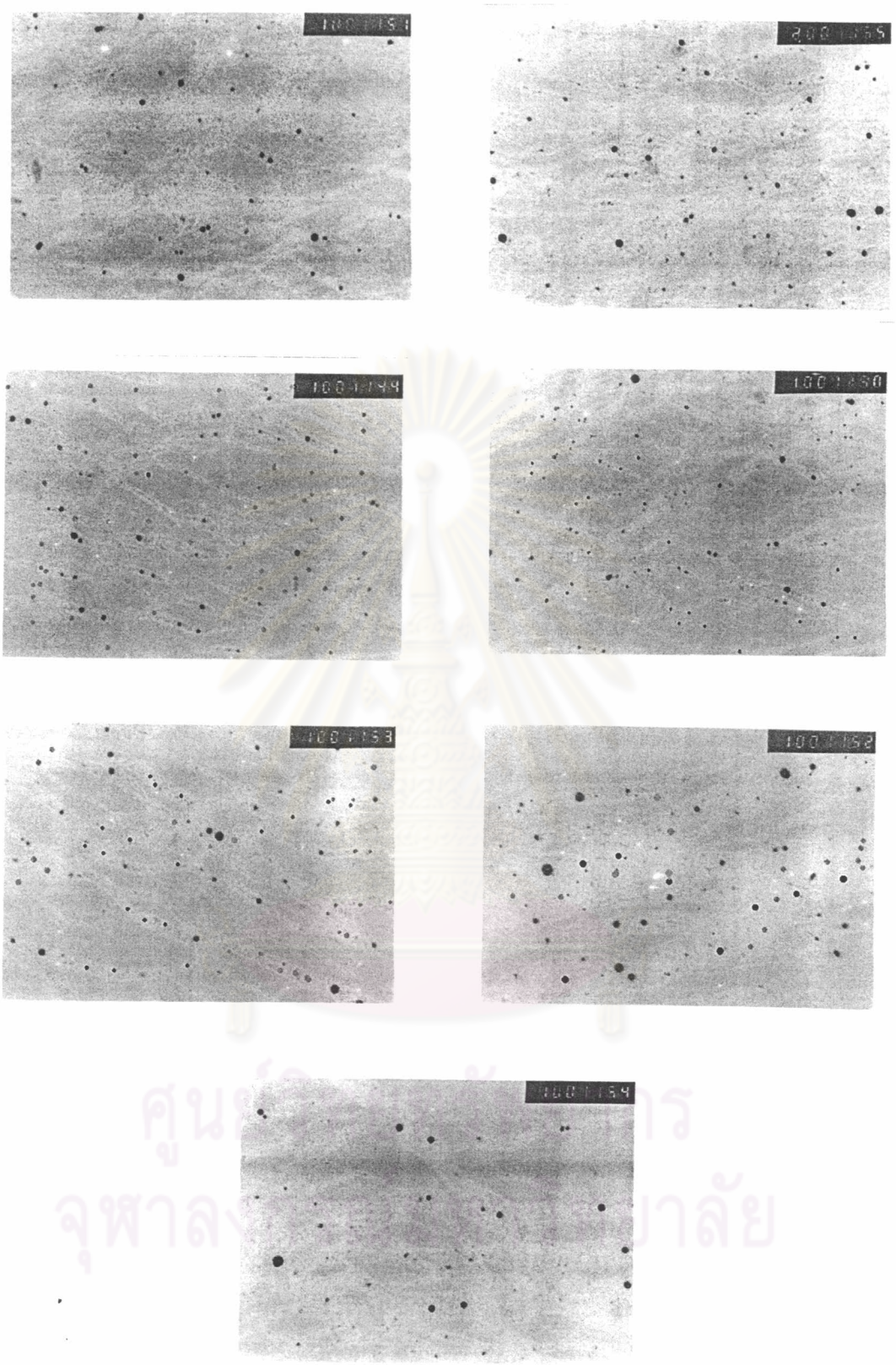


Figure d19 The TEM photomicrographs of Formulation T1 P0.7 O6 before autoclaving (× 16,500).

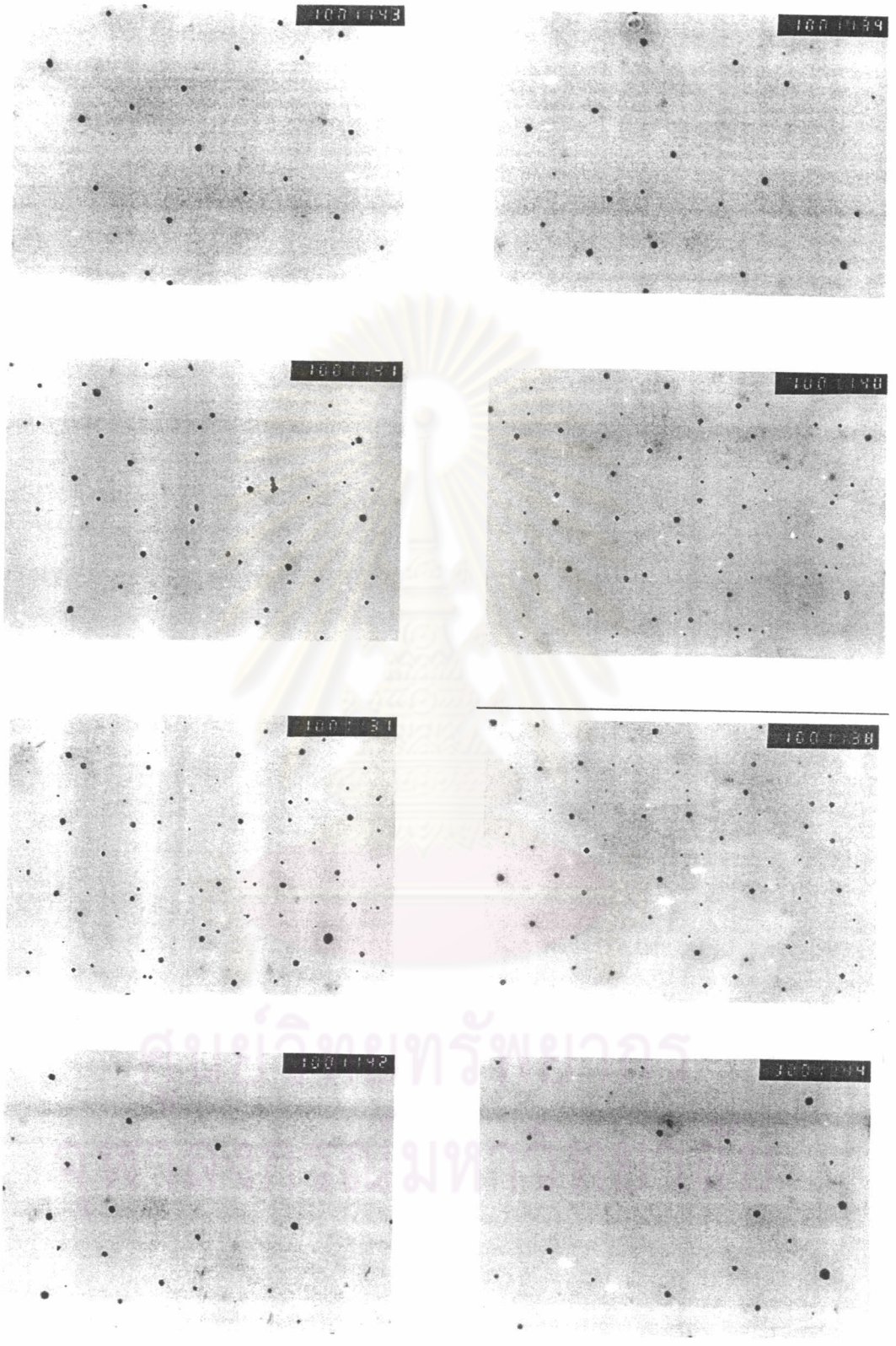


Figure d20 The TEM photomicrographs of Formulation T1 P0.7 O6 after autoclaving (× 16,500).

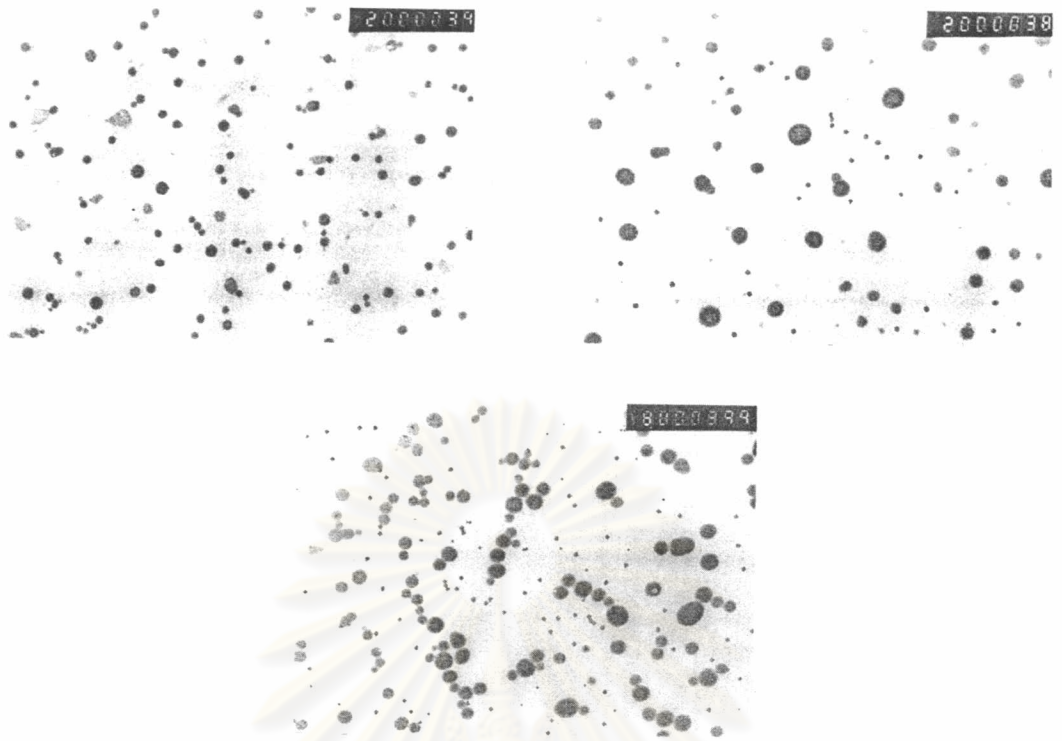


Figure d21 The TEM photomicrographs of Formulation T1 P0.7 O4 before autoclaving (× 30,000).

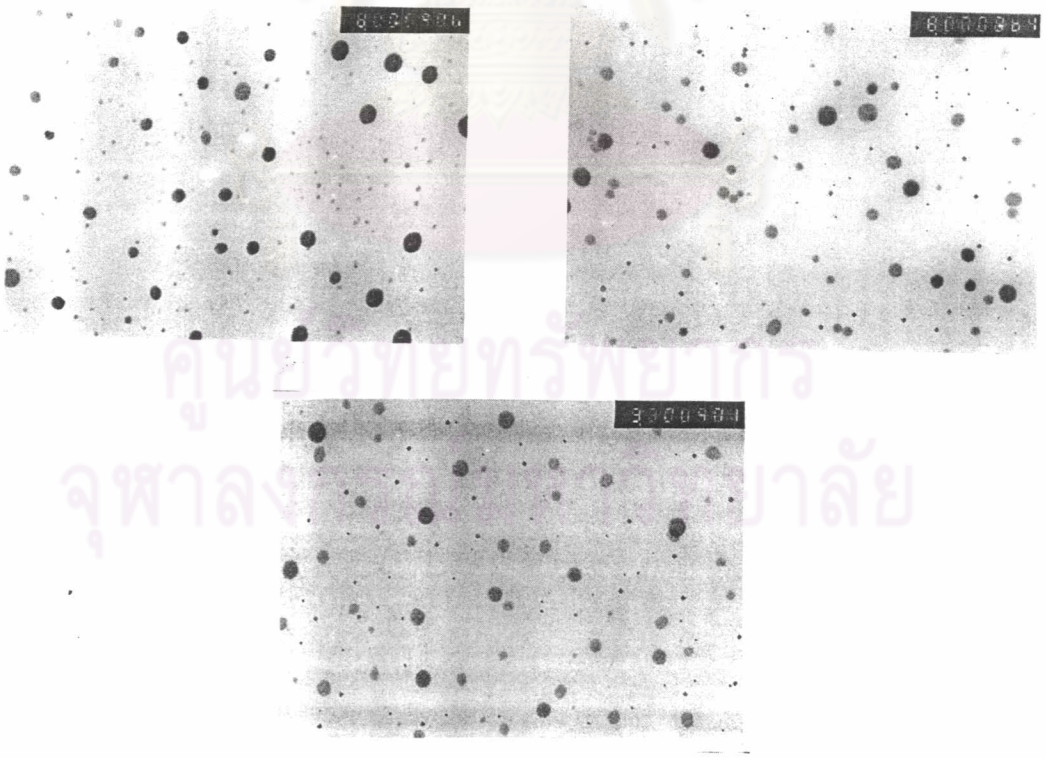


Figure d22 The TEM photomicrographs of Formulation T1 P0.7 O4 after autoclaving (× 30,000).

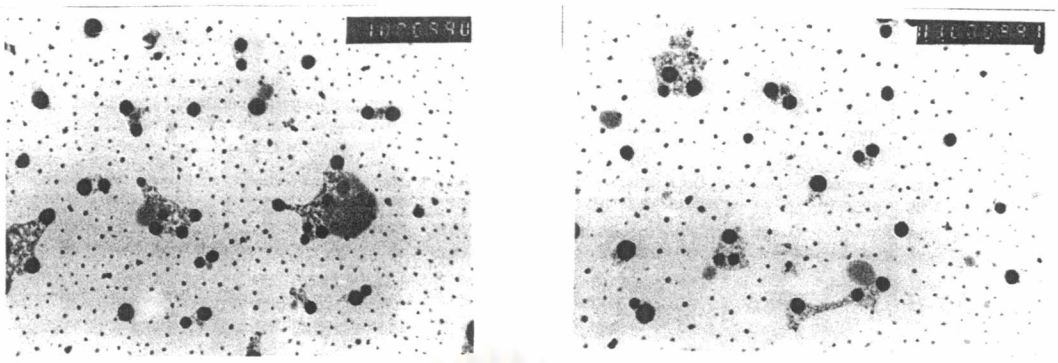


Figure d23 The TEM photomicrographs of Formulation T1 P0.7 O4 D5 after autoclaving (× 30,000).

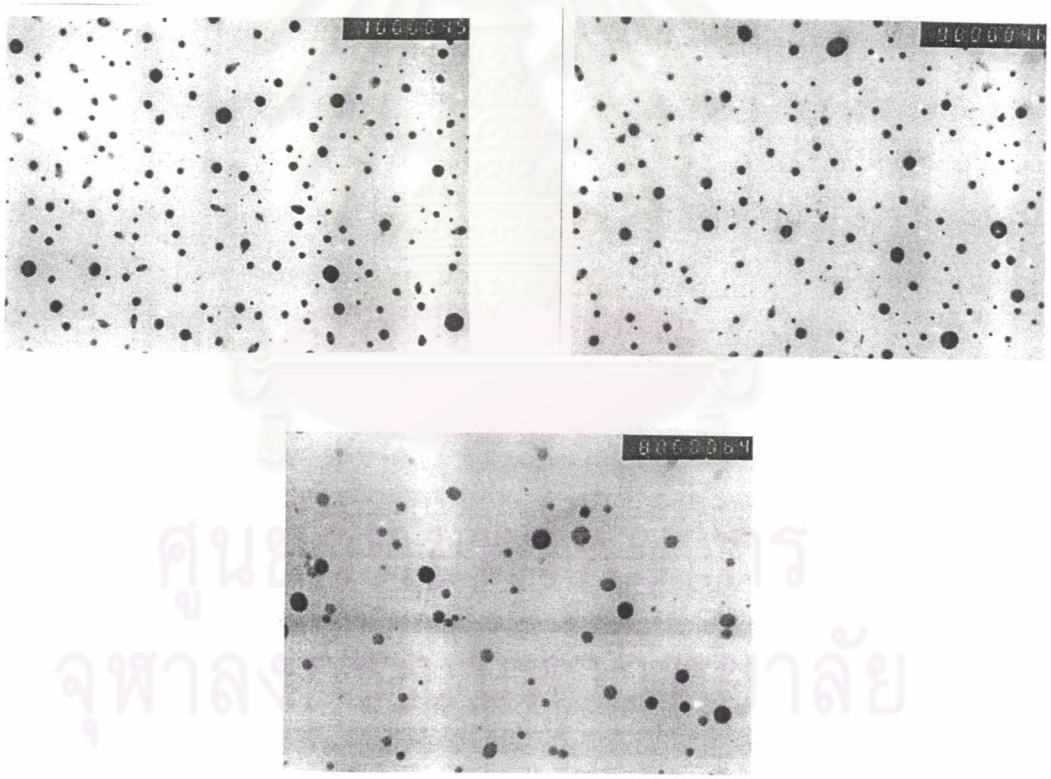


Figure d24 The TEM photomicrographs of Formulation T1 P0.7 O4 D10 after autoclaving (× 30,000).

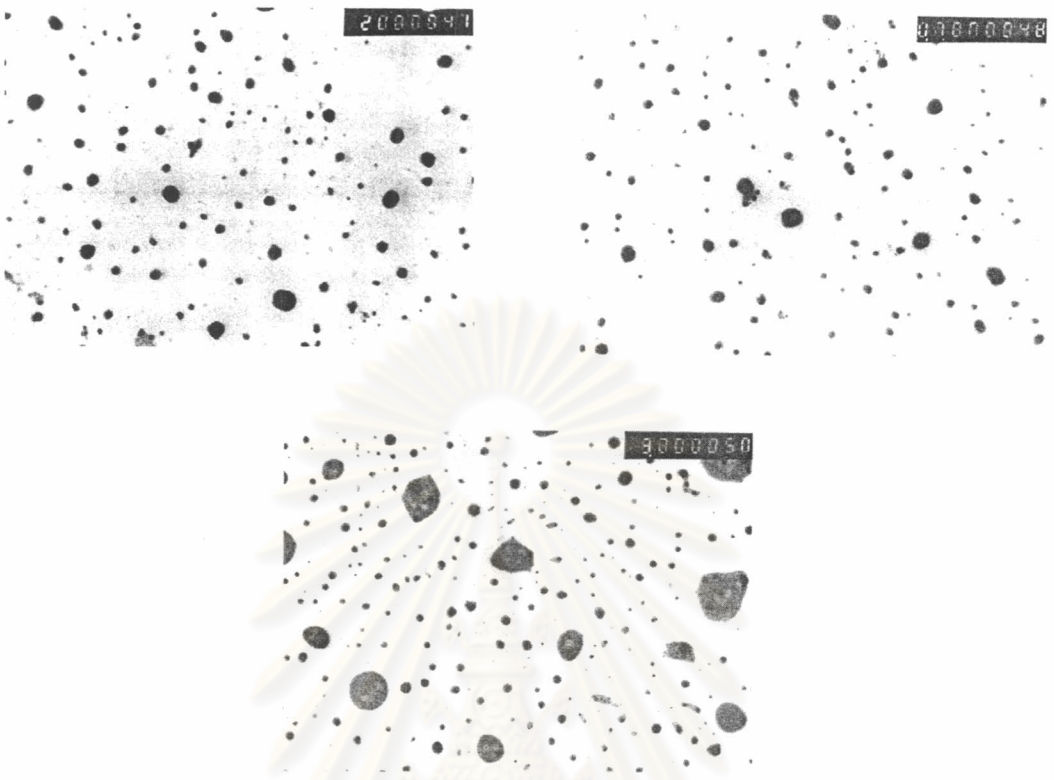


Figure d25 The TEM photomicrographs of Formulation T1 P0.5 O8 before autoclaving (× 30,000).

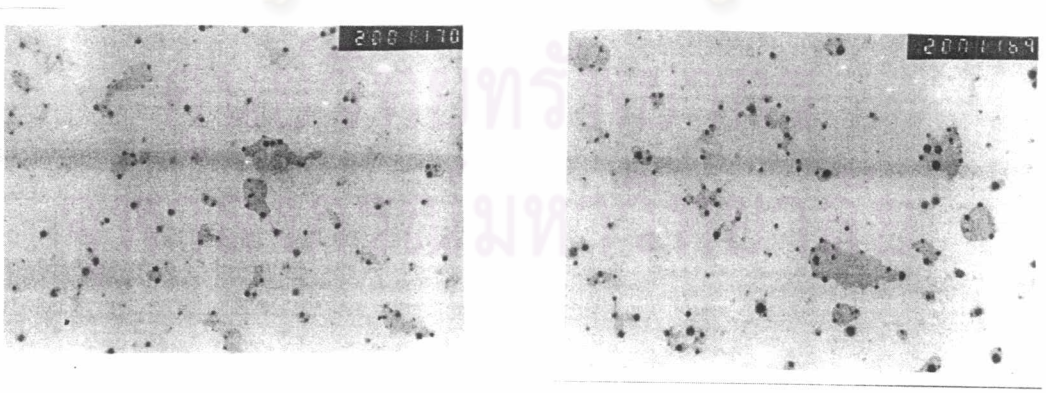


Figure d26 The TEM photomicrographs of Formulation T1 P0.5 O8 after autoclaving (× 16,500).

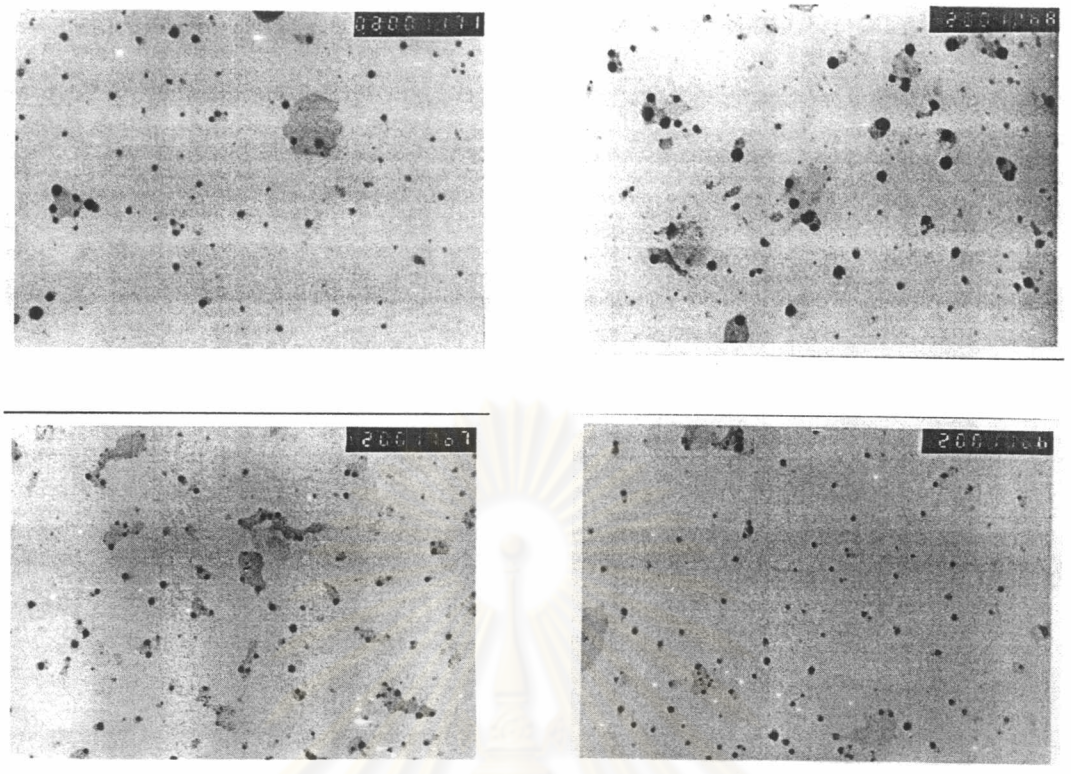


Figure d26 (Cont.) The TEM photomicrographs of Formulation T1 P0.5 O8 after autoclaving (× 16,500).

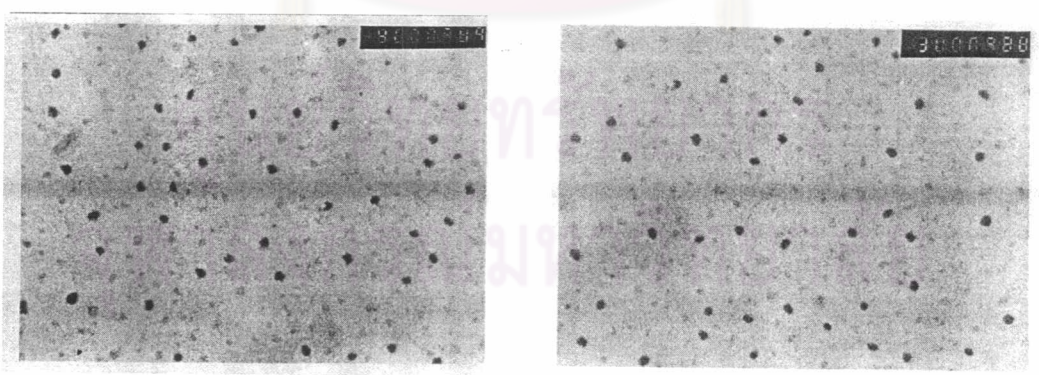


Figure d27 The TEM photomicrographs of Formulation T1 P0.5 O6 before autoclaving (× 30,000).

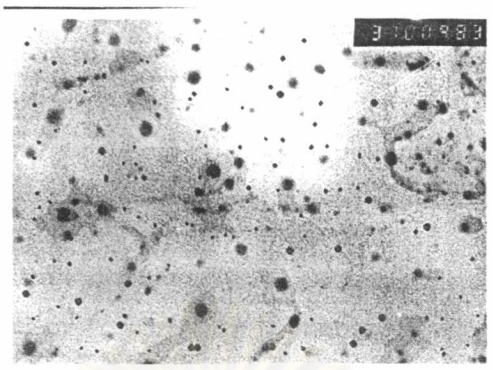


Figure d27 (Cont.) The TEM photomicrographs of Formulation T1 P0.5 O6 before autoclaving (× 30,000).

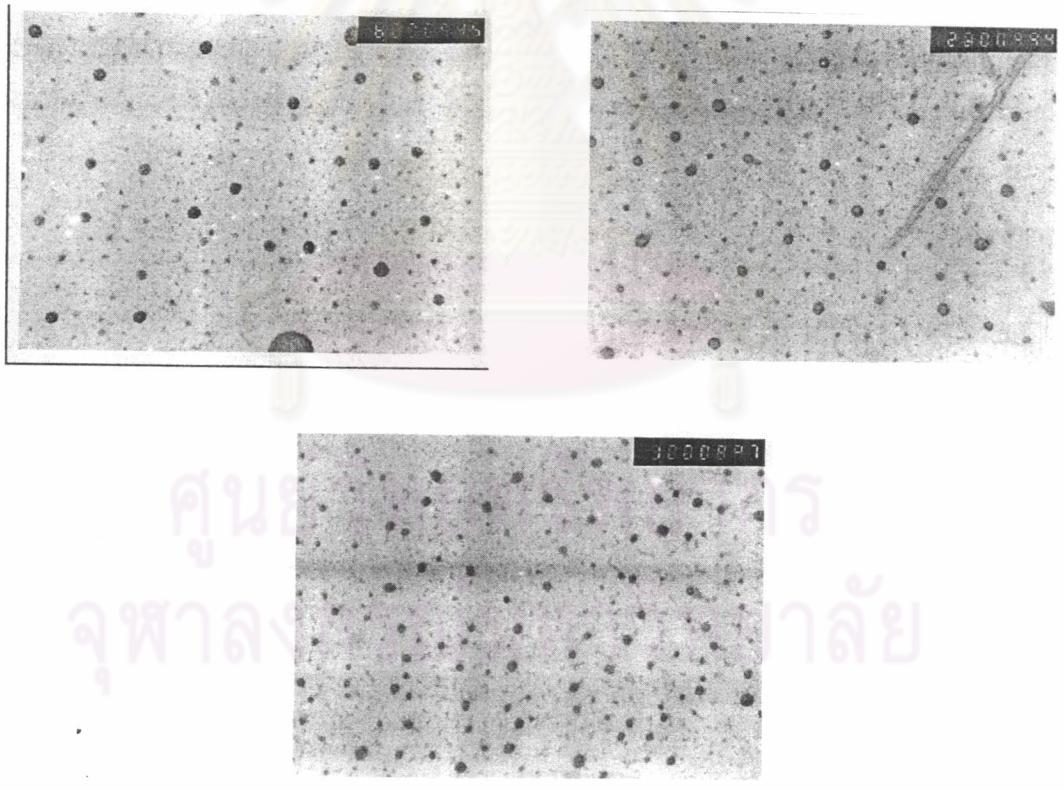


Figure d28 The TEM photomicrographs of Formulation T1 P0.5 O6 after autoclaving (× 30,000).

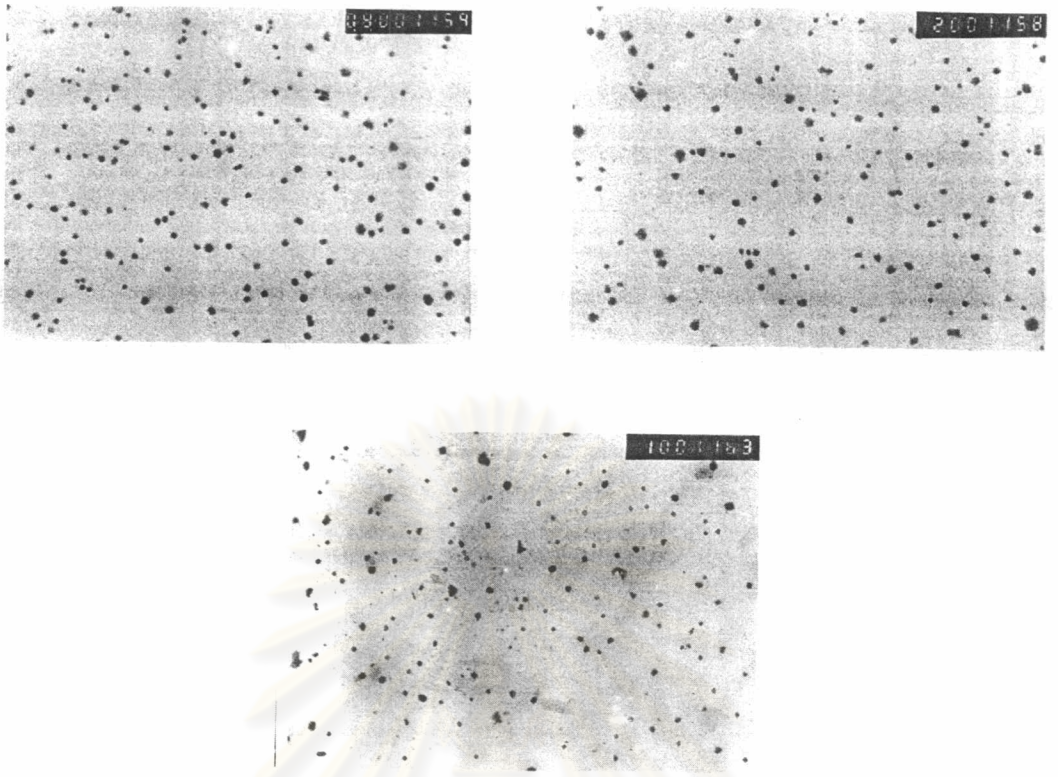


Figure d29 The TEM photomicrographs of Formulation T1 P0.5 O4 before autoclaving (× 30,000).

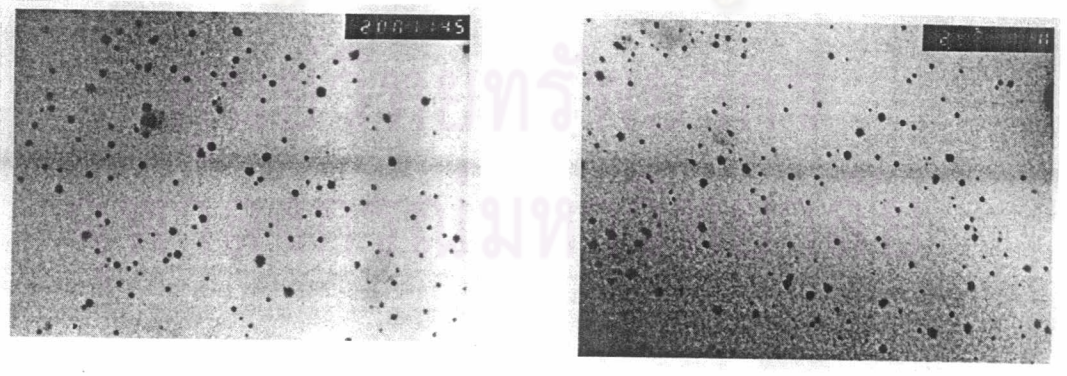


Figure d30 The TEM photomicrographs of Formulation T1 P0.5 O4 after autoclaving (× 30,000).

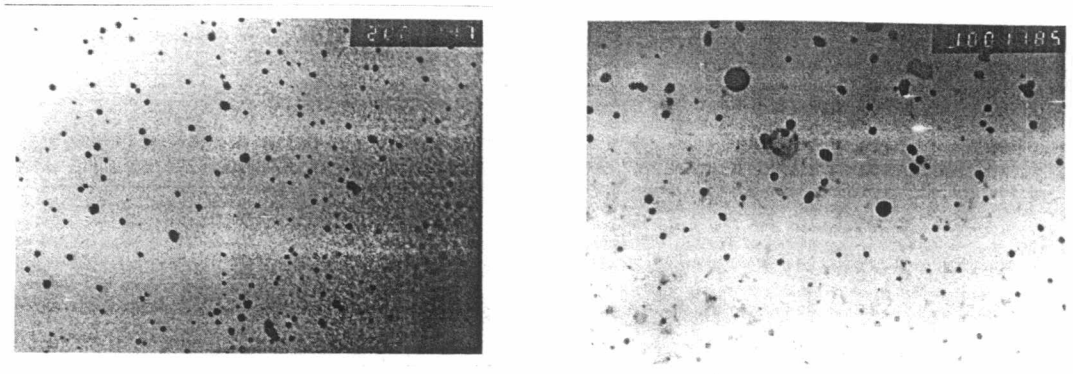


Figure d30 (Cont.) The TEM photomicrographs of Formulation T1 P0.5 O4 after autoclaving (× 30,000).

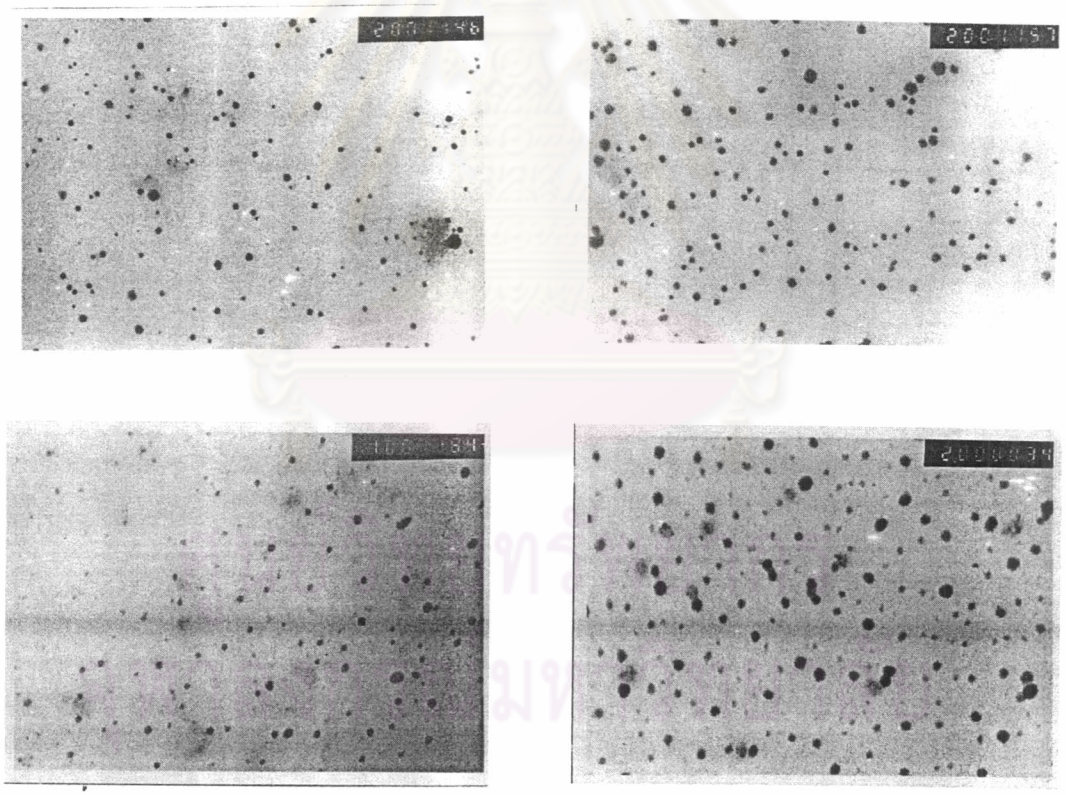


Figure d31 The TEM photomicrographs of Formulation T1 P0.5 O4 D5 after autoclaving (× 30,000).

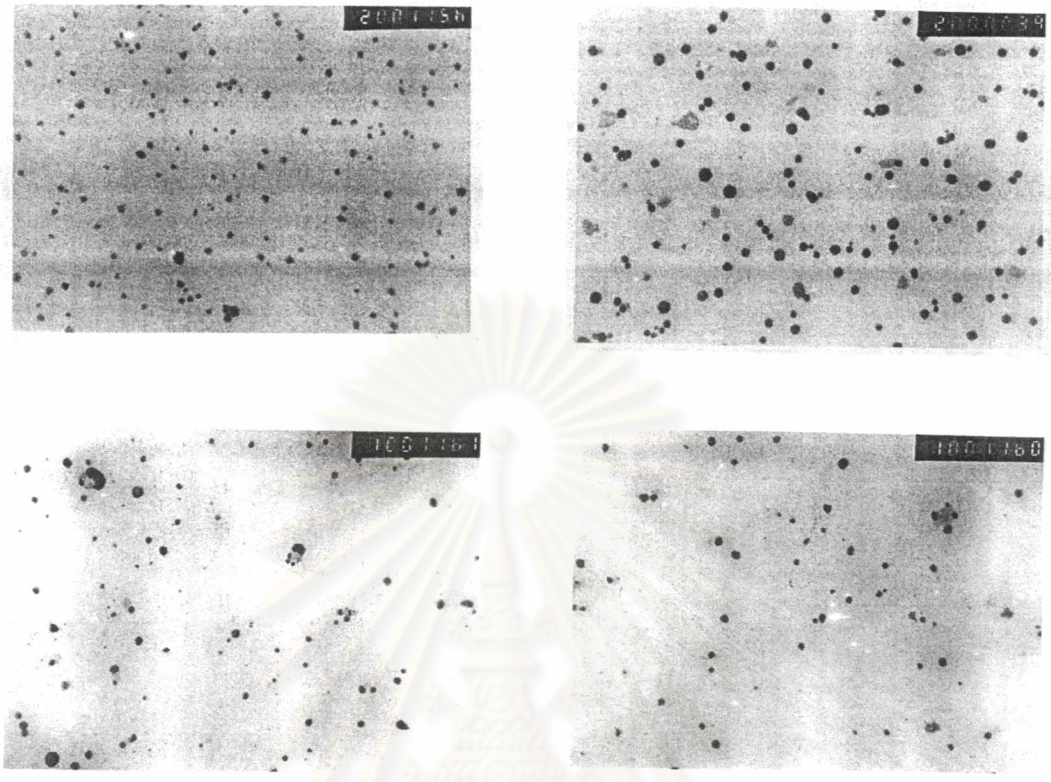


Figure d32 The TEM photomicrographs of Formulation T1 P0.5 O4 D10 after autoclaving (× 30,000).

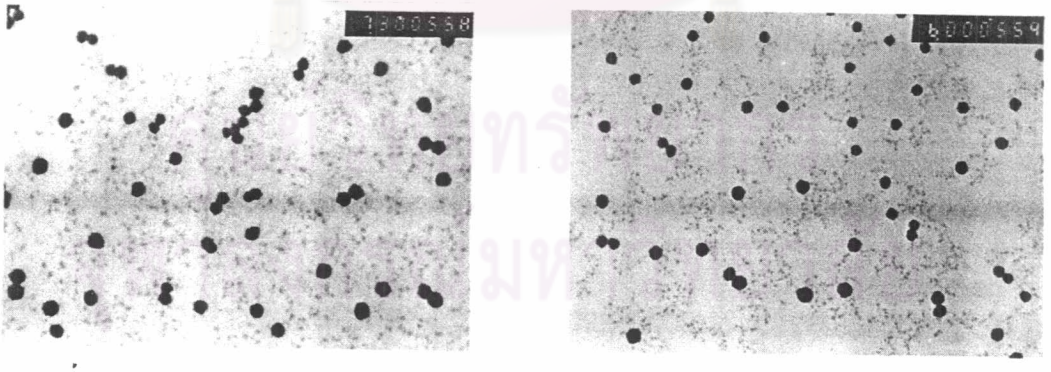


Figure d33 The TEM photomicrographs of Formulation T1 G1.5 O4 D5 after stability testing (× 30,000).

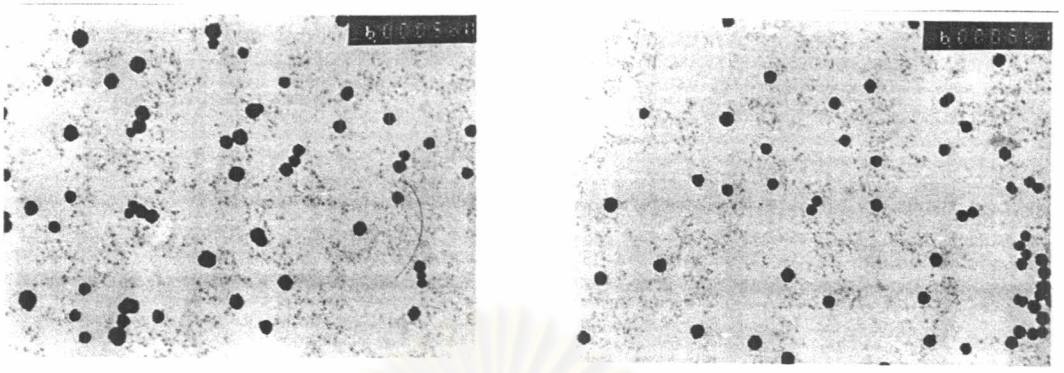


Figure d33 (Cont.) The TEM photomicrographs of Formulation T1 G1.5 O4 D5 after stability testing (× 30,000).

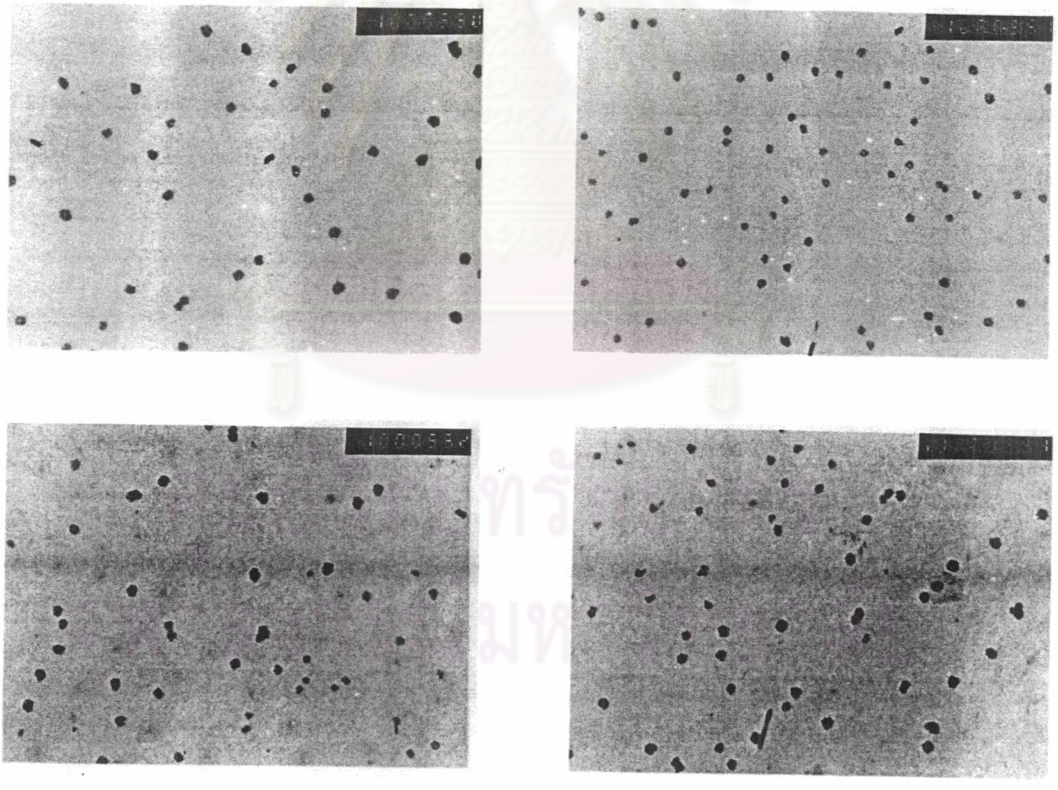


Figure d34 The TEM photomicrographs of Formulation T1 G1.5 O4 D10 after stability testing (× 16,500).

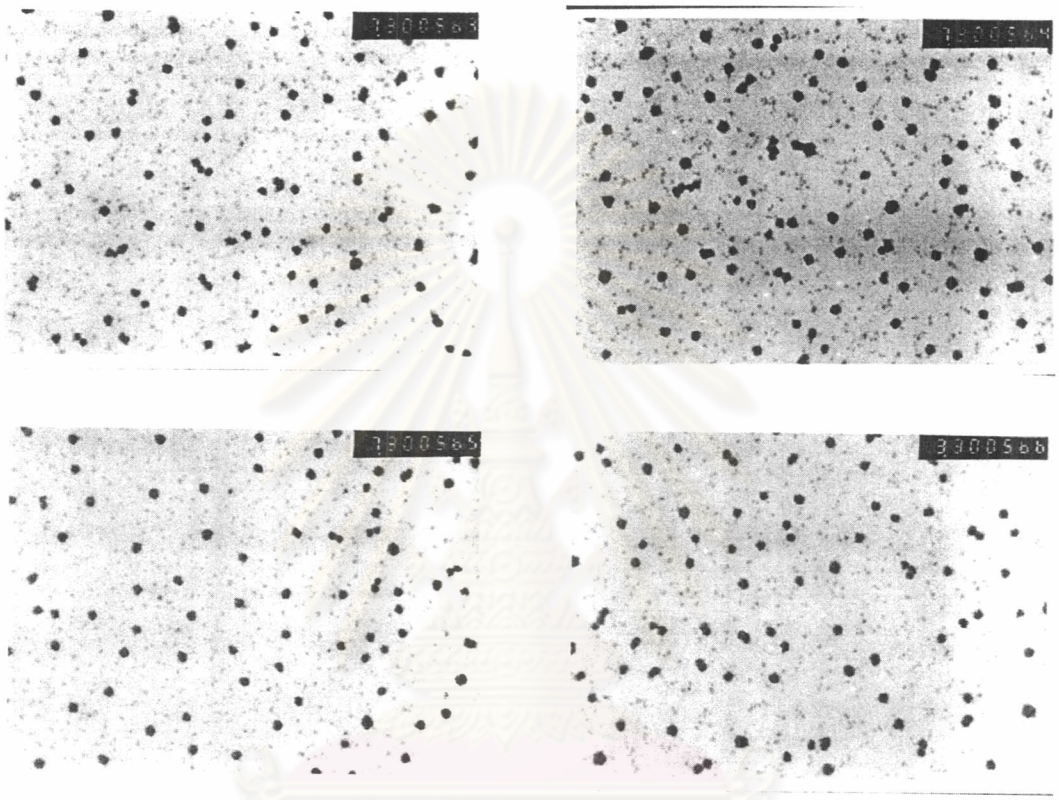


Figure d35 The TEM photomicrographs of Formulation T1 G1 O4 D5 after stability testing (× 30,000).

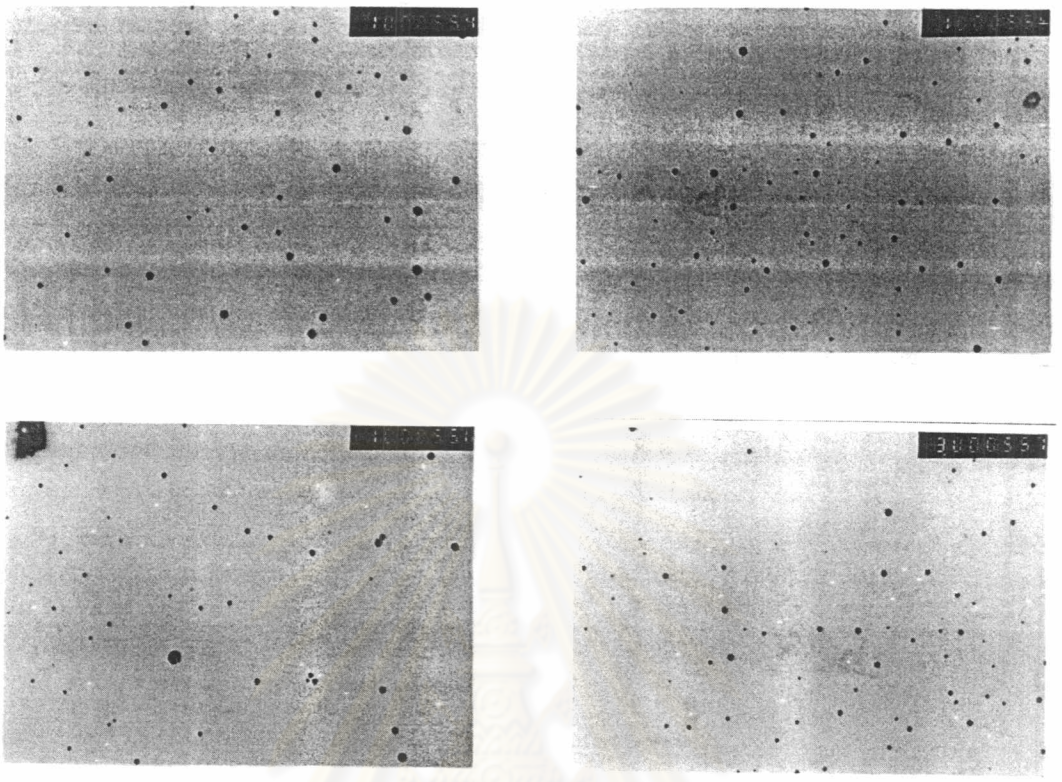


Figure d36 The TEM photomicrographs of Formulation T1 G1 O4 D10 after stability testing (× 30,000).

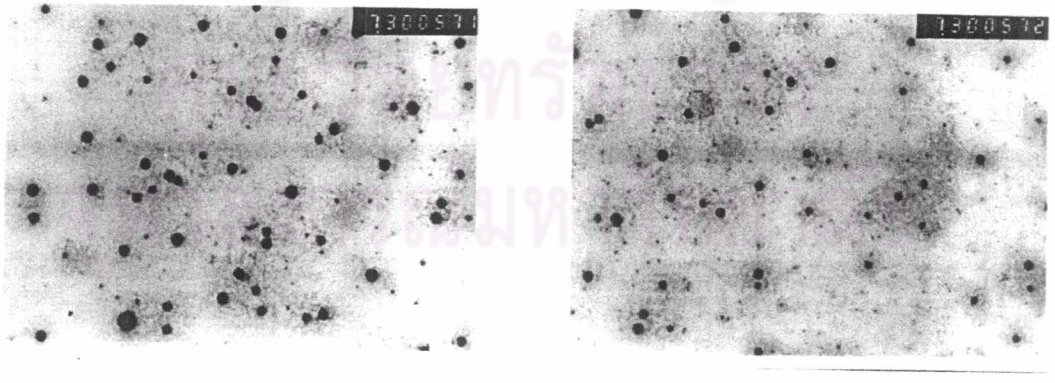


Figure d37 The TEM photomicrographs of Formulation T1 P0.7 O4 D5 after stability testing (× 30,000).

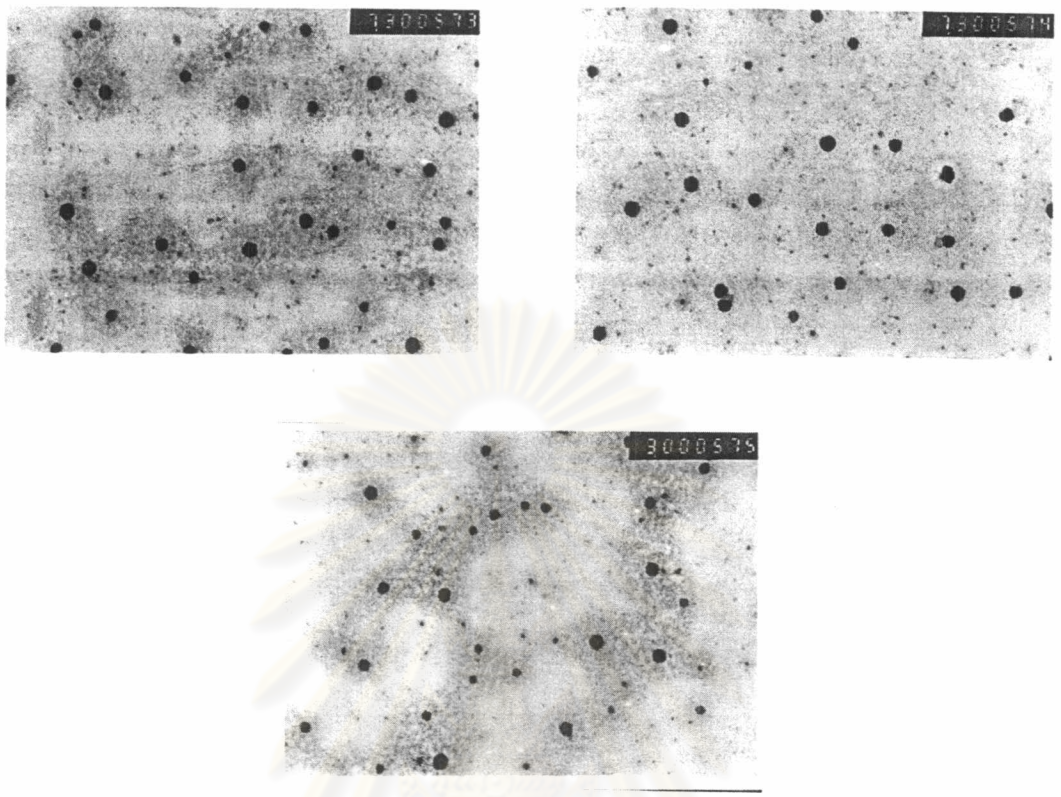


Figure d37 (Cont.) The TEM photomicrographs of Formulation T1 P0.7 O4 D5 after stability testing (× 30,000).

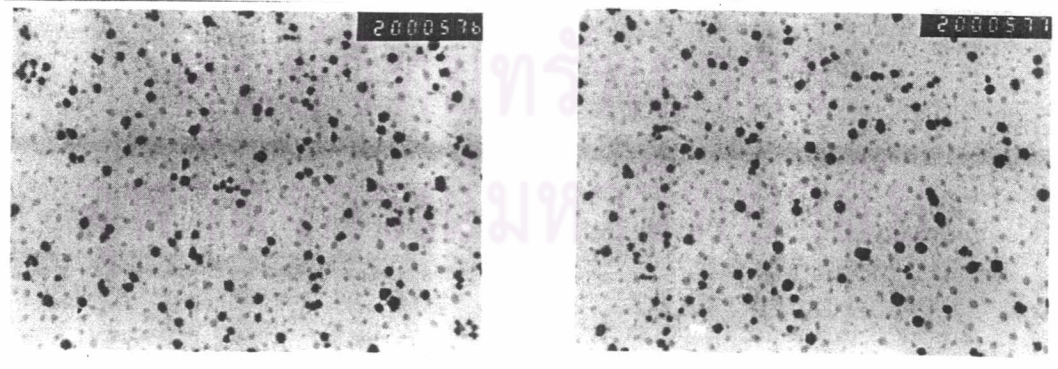


Figure d38 The TEM photomicrographs of Formulation T1 P0.7 O4 D10 after stability testing (× 30,000).

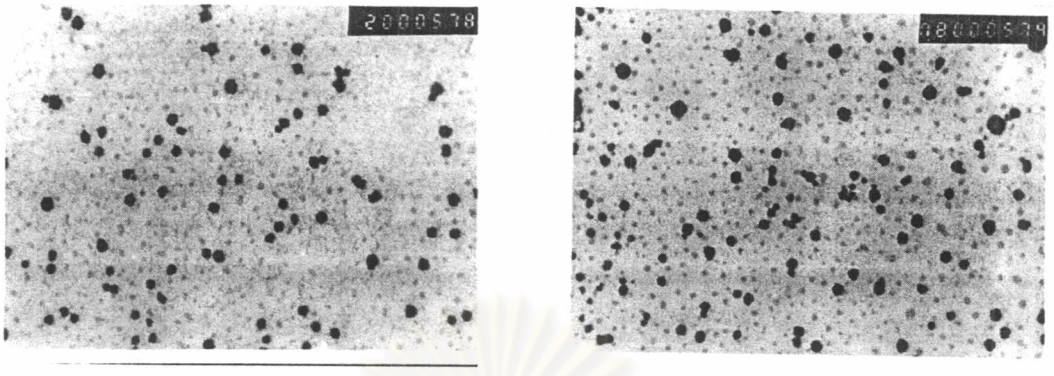


Figure d38 (Cont.) The TEM photomicrographs of Formulation T1 P0.7 O4 D10 after stability testing (× 30,000).

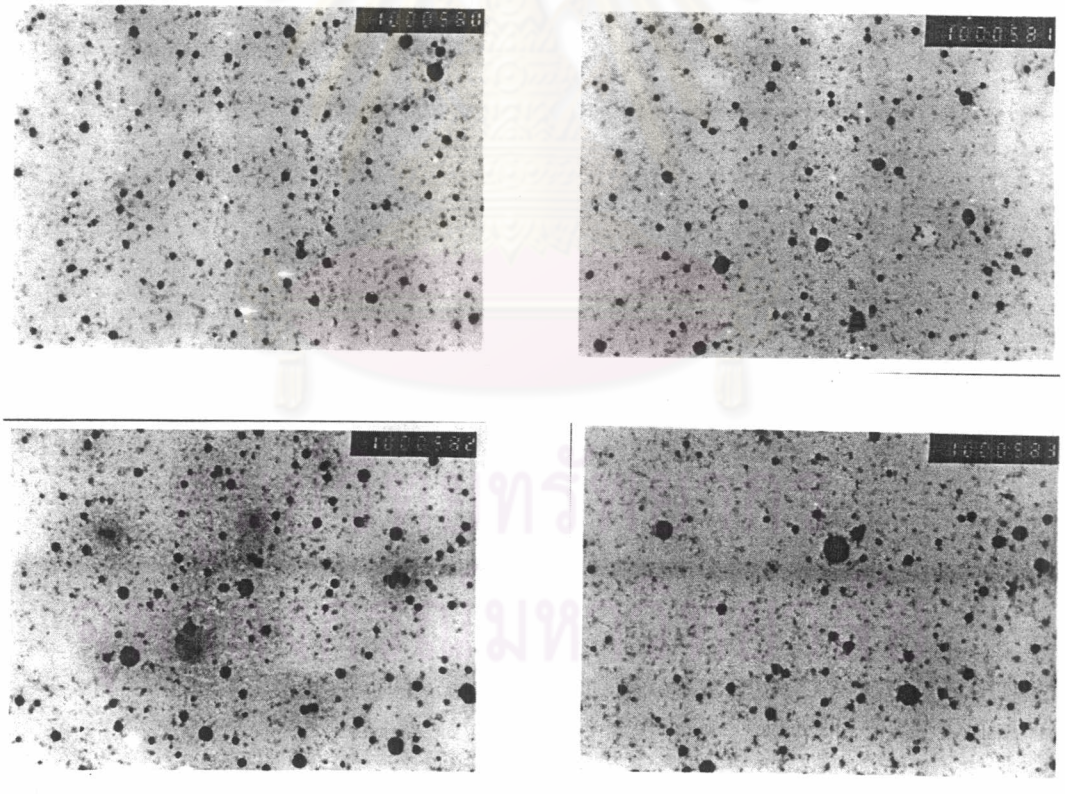


Figure d39 The TEM photomicrographs of Formulation T1 P0.5 O4 D5 after stability testing (× 30,000).

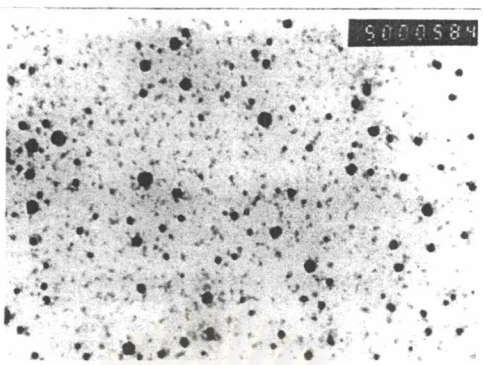


Figure d39 (Cont.) The TEM photomicrographs of Formulation T1 P0.5 O4 D5 after stability testing (× 30,000).

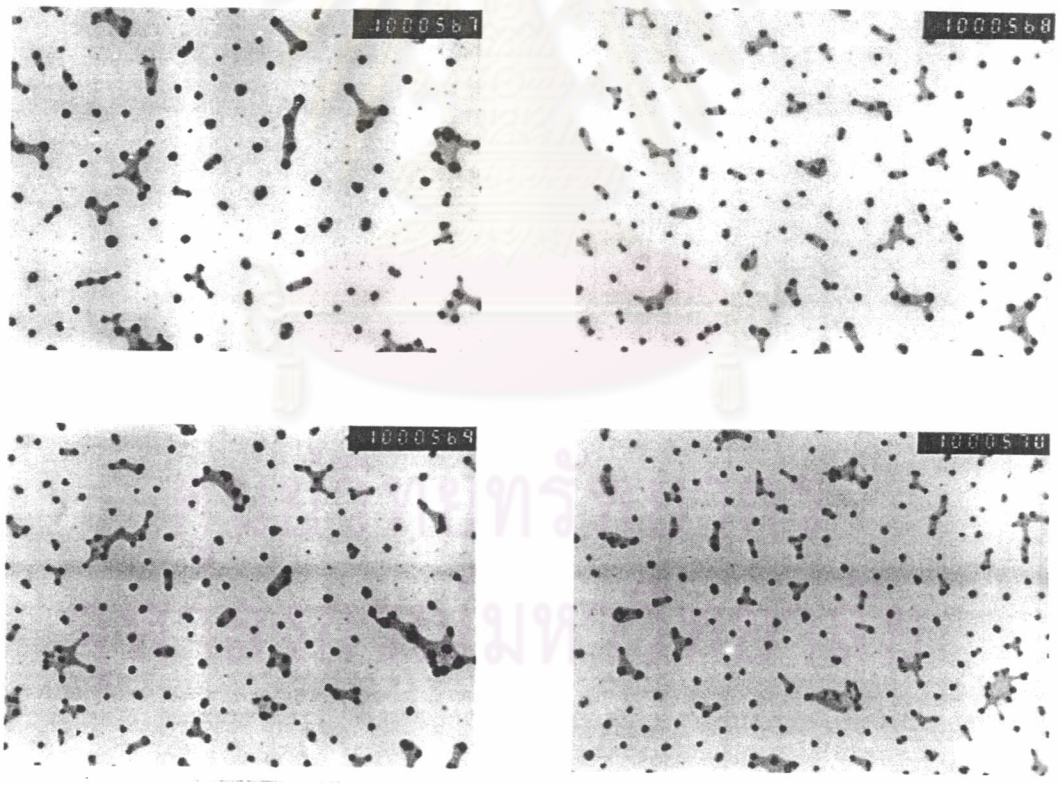


Figure d40 The TEM photomicrographs of Formulation T1 P0.5 O4 D10 after stability testing (× 30,000).

APPENDIX E

The diffusion of drug from microemulsions

Table e1 The diffusion of diazepam from commercial diazepam injection (10mg/2ml).

Time (hr)	Amount of drug diffusion (mcg)					% Drug diffusion				
	n1	n2	n3	mean	SD	n1	n2	n3	mean	SD
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	585.38	609.68	536.79	577.28	37.11	11.71	12.19	10.74	11.55	0.74
4	1,013.93	1,060.21	887.82	987.32	89.22	20.28	21.20	17.76	19.75	1.78
8	1,302.98	1,411.56	1,087.28	1,267.27	165.06	26.06	28.23	21.75	25.35	3.30
12	1,496.82	1,618.80	1,285.26	1,466.96	168.76	29.94	32.38	25.71	29.34	3.38
24	1,969.66	2,031.14	1,818.43	1,939.74	109.47	39.39	40.62	36.37	38.79	2.19
30	2,188.63	2,209.12	2,043.35	2,147.03	90.38	43.77	44.18	40.87	42.94	1.81
36	2,433.88	2,430.90	2,158.85	2,341.21	157.93	48.68	48.62	43.18	46.82	3.16
48	2,892.67	2,819.94	2,723.59	2,812.07	84.82	57.85	56.40	54.47	56.24	1.70

Table e2 The diffusion of diazepam from Formulation T1 G1.5 O8 D5.

Time (hr)	Amount of drug diffusion (mcg)					% Drug diffusion				
	n1	n2	n3	mean	SD	n1	n2	n3	mean	SD
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	31.23	45.23	40.14	38.87	7.09	0.62	0.90	0.80	0.78	0.14
4	61.76	65.86	74.72	67.44	6.62	1.24	1.32	1.49	1.35	0.13
8	126.84	128.00	127.97	127.60	0.66	2.54	2.56	2.56	2.55	0.01
12	191.91	180.62	188.59	187.04	5.80	3.84	3.61	3.77	3.74	0.12
24	359.70	330.36	386.23	358.77	27.94	7.19	6.61	7.72	7.18	0.56
30	447.54	409.16	474.24	443.65	32.71	8.95	8.18	9.48	8.87	0.65
36	528.48	483.78	554.89	522.38	35.95	10.57	9.68	11.10	10.45	0.72
48	673.58	614.00	716.18	667.92	51.33	13.47	12.28	14.32	13.36	1.03

Table e3 The diffusion of diazepam from Formulation T1 G1.5 O8 D10.

Time (hr)	Amount of drug diffusion (mcg)					% Drug diffusion				
	n1	n2	n3	mean	SD	n1	n2	n3	mean	SD
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	61.78	52.52	69.41	61.24	8.46	0.62	0.53	0.69	0.61	0.08
4	117.94	117.00	145.14	126.69	15.99	1.18	1.17	1.45	1.27	0.16
8	213.23	239.36	252.04	234.88	19.79	2.13	2.39	2.52	2.35	0.20
12	351.49	405.87	393.59	383.65	28.52	3.51	4.06	3.94	3.84	0.29
24	672.68	701.60	721.64	698.64	24.62	6.73	7.02	7.22	6.99	0.25
30	858.44	879.51	920.38	886.11	31.49	8.58	8.80	9.20	8.86	0.31
36	1,021.56	1,029.33	1,090.03	1,046.97	37.49	10.22	10.29	10.90	10.47	0.37
48	1,329.44	1,314.24	1,416.75	1,353.48	55.32	13.29	13.14	14.17	13.53	0.55

Table e4 The diffusion of diazepam from Formulation T1 G1.5 O6 D5.

Time (hr)	Amount of drug diffusion (mcg)					% Drug diffusion				
	n1	n2	n3	mean	SD	n1	n2	n3	mean	SD
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	14.57	31.12	24.87	23.52	8.35	0.29	0.62	0.50	0.47	0.17
4	47.89	77.29	72.60	65.93	15.80	0.96	1.55	1.45	1.32	0.32
8	115.04	148.21	139.77	134.34	17.24	2.30	2.96	2.80	2.69	0.34
12	166.25	245.22	213.57	208.35	39.74	3.33	4.90	4.27	4.17	0.79
24	361.58	453.35	412.44	409.12	45.98	7.23	9.07	8.25	8.18	0.92
30	444.38	556.31	511.36	504.01	56.33	8.89	11.13	10.23	10.08	1.13
36	534.36	671.33	603.40	603.03	68.49	10.69	13.43	12.07	12.06	1.37
48	703.90	833.77	791.62	776.43	66.25	14.08	16.68	15.83	15.53	1.33

Table e5 The diffusion of diazepam from Formulation T1 G1.5 O6 D10.

Time (hr)	Amount of drug diffusion (mcg)					% Drug diffusion				
	n1	n2	n3	mean	SD	n1	n2	n3	mean	SD
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	59.12	50.79	68.95	59.62	9.09	0.59	0.51	0.69	0.60	0.09
4	131.08	113.21	129.54	124.61	9.90	1.31	1.13	1.30	1.25	0.10
8	277.49	272.57	303.27	284.45	16.49	2.77	2.73	3.03	2.84	0.16
12	372.73	406.15	423.51	400.80	25.81	3.73	4.06	4.24	4.01	0.26
24	804.65	738.41	871.71	804.93	66.65	8.05	7.38	8.72	8.05	0.67
30	964.47	895.59	1,031.20	963.75	67.81	9.64	8.96	10.31	9.64	0.68
36	1,155.52	1,080.11	1,212.75	1,149.46	66.53	11.56	10.80	12.13	11.49	0.67
48	1,537.28	1,400.06	1,626.74	1,521.36	114.18	15.37	14.00	16.27	15.21	1.14

Table e6 The diffusion of diazepam from Formulation T1 G1.5 O4 D5.

Time (hr)	Amount of drug diffusion(mcg)					% Drug diffusion				
	n1	n2	n3	mean	SD	n1	n2	n3	mean	SD
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	31.81	39.22	47.55	39.53	7.87	0.64	0.78	0.95	0.79	0.16
4	69.92	71.28	90.19	77.13	11.33	1.40	1.43	1.80	1.54	0.23
8	137.19	169.40	173.62	160.07	19.93	2.74	3.39	3.47	3.20	0.40
12	211.41	249.25	254.06	238.24	23.36	4.23	4.98	5.08	4.76	0.47
24	408.03	533.23	522.57	487.94	69.41	8.16	10.66	10.45	9.76	1.39
30	537.68	677.84	684.53	633.35	82.92	10.75	13.56	13.69	12.67	1.66
36	636.75	800.46	794.84	744.02	92.94	12.74	16.01	15.90	14.88	1.86
48	871.42	1011.16	1028.85	970.48	86.24	17.43	20.22	20.58	19.41	1.72

Table e7 The diffusion of diazepam from Formulation T1 G1.5 O4 D10.

Time (hr)	Amount of drug diffusion(mcg)					% Drug diffusion				
	n1	n2	n3	mean	SD	n1	n2	n3	mean	SD
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	64.67	72.76	73.12	70.18	4.78	0.65	0.73	0.73	0.70	0.05
4	135.28	147.69	144.89	142.62	6.51	1.35	1.48	1.45	1.43	0.07
8	276.77	310.69	319.26	302.24	22.47	2.77	3.11	3.19	3.02	0.22
12	471.44	548.63	542.72	520.93	42.96	4.71	5.49	5.43	5.21	0.43
24	868.41	1,004.58	979.60	950.86	72.49	8.68	10.05	9.80	9.51	0.72
30	1,046.41	1,237.75	1,221.15	1,168.44	106.00	10.46	12.38	12.21	11.68	1.06
36	1,221.26	1,450.27	1,451.79	1,374.44	132.66	12.21	14.50	14.52	13.74	1.33
48	1,565.84	1,809.26	1,786.78	1,720.62	134.52	15.66	18.09	17.87	17.21	1.35

Table e8 The diffusion of diazepam from Formulation T1 G1 O8 D5.

Time (hr)	Amount of drug diffusion(mcg)					% Drug diffusion				
	n1	n2	n3	mean	SD	n1	n2	n3	mean	SD
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	31.58	34.59	38.99	35.05	3.72	0.63	0.69	0.78	0.70	0.07
4	61.54	64.97	72.73	66.41	5.73	1.23	1.30	1.45	1.33	0.11
8	127.34	127.62	140.54	131.83	7.54	2.55	2.55	2.81	2.64	0.15
12	188.66	184.29	203.00	191.98	9.79	3.77	3.69	4.06	3.84	0.20
24	338.36	320.51	419.18	359.35	52.58	6.77	6.41	8.38	7.19	1.05
30	432.82	410.30	504.01	449.05	48.92	8.66	8.21	10.08	8.98	0.98
36	514.01	481.61	594.62	530.08	58.19	10.28	9.63	11.89	10.60	1.16
48	628.26	613.31	735.49	659.02	66.65	12.57	12.27	14.71	13.18	1.33

Table e9 The diffusion of diazepam from Formulation T1 G1 O8 D10.

Time (hr)	Amount of drug diffusion(mcg)					% Drug diffusion				
	n1	n2	n3	mean	SD	n1	n2	n3	mean	SD
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	49.86	62.93	57.38	56.73	6.56	0.50	0.63	0.57	0.57	0.07
4	108.27	115.52	124.17	115.99	7.96	1.08	1.16	1.24	1.16	0.08
8	238.77	236.79	261.79	245.78	13.90	2.39	2.37	2.62	2.46	0.14
12	367.64	355.45	354.21	359.10	7.42	3.68	3.55	3.54	3.59	0.07
24	716.43	668.62	727.63	704.23	31.34	7.16	6.69	7.28	7.04	0.31
30	935.92	858.85	914.47	903.08	39.77	9.36	8.59	9.14	9.03	0.40
36	1,109.69	1,021.64	1,061.64	1,064.32	44.09	11.10	10.22	10.62	10.64	0.44
48	1,484.02	1,334.15	1,436.63	1,418.27	76.60	14.84	13.34	14.37	14.18	0.77

Table e10 The diffusion of diazepam from Formulation T1 G1 O6 D5.

Time (hr)	Amount of drug diffusion(mcg)					% Drug diffusion				
	n1	n2	n3	mean	SD	n1	n2	n3	mean	SD
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	42.69	44.42	48.24	45.12	2.84	0.85	0.89	0.96	0.90	0.06
4	78.85	79.28	86.98	81.70	4.58	1.58	1.59	1.74	1.63	0.09
8	153.65	151.07	164.18	156.30	6.94	3.07	3.02	3.28	3.13	0.14
12	224.24	215.99	238.72	226.32	11.50	4.48	4.32	4.77	4.53	0.23
24	386.54	374.39	472.49	411.14	53.47	7.73	7.49	9.45	8.22	1.07
30	489.97	472.24	564.05	508.75	48.70	9.80	9.44	11.28	10.18	0.97
36	579.42	555.95	657.59	597.65	53.22	11.59	11.12	13.15	11.95	1.06
48	715.65	680.53	818.54	738.24	71.72	14.31	13.61	16.37	14.76	1.43

Table e11 The diffusion of diazepam from Formulation T1 G1 O6 D10.

Time (hr)	Amount of drug diffusion(mcg)					% Drug diffusion				
	n1	n2	n3	mean	SD	n1	n2	n3	mean	SD
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	56.80	52.75	65.25	58.27	6.38	0.57	0.53	0.65	0.58	0.06
4	125.03	116.70	121.80	121.18	4.20	1.25	1.17	1.22	1.21	0.04
8	270.96	250.01	281.66	267.55	16.10	2.71	2.50	2.82	2.68	0.16
12	407.77	372.64	426.24	402.21	27.22	4.08	3.73	4.26	4.02	0.27
24	812.91	704.32	903.45	806.89	99.70	8.13	7.04	9.03	8.07	1.00
30	1,005.95	881.66	1,076.73	988.12	98.75	10.06	8.82	10.77	9.88	0.99
36	1,182.95	1,045.28	1,267.70	1,165.31	112.26	11.83	10.45	12.68	11.65	1.12
48	1,605.71	1,422.91	1,640.04	1,556.22	116.72	16.06	14.23	16.40	15.56	1.17

Table e12 The diffusion of diazepam from Formulation T1 G1 O4 D5.

Time (hr)	Amount of drug diffusion(mcg)					% Drug diffusion				
	n1	n2	n3	mean	SD	n1	n2	n3	mean	SD
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	31.00	24.76	37.48	31.08	6.36	0.62	0.50	0.75	0.62	0.13
4	75.25	71.01	91.67	79.31	10.91	1.50	1.42	1.83	1.59	0.22
8	178.31	164.64	181.53	174.83	8.97	3.57	3.29	3.63	3.50	0.18
12	276.41	244.89	298.35	273.22	26.88	5.53	4.90	5.97	5.46	0.54
24	455.05	509.22	538.39	500.88	42.29	9.10	10.18	10.77	10.02	0.85
30	608.42	634.57	692.59	645.19	43.08	12.17	12.69	13.85	12.90	0.86
36	731.45	751.00	826.78	769.74	50.35	14.63	15.02	16.54	15.39	1.01
48	957.52	965.50	1,086.24	1,003.09	72.12	19.15	19.31	21.72	20.06	1.44

Table e13 The diffusion of diazepam from Formulation T1 G1 O4 D10.

Time (hr)	Amount of drug diffusion(mcg)					% Drug diffusion				
	n1	n2	n3	mean	SD	n1	n2	n3	mean	SD
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	68.95	60.16	64.67	64.59	4.40	0.69	0.60	0.65	0.65	0.04
4	158.70	143.16	162.12	154.66	10.10	1.59	1.43	1.62	1.55	0.10
8	363.73	328.27	371.95	354.65	23.21	3.64	3.28	3.72	3.55	0.23
12	558.25	510.16	585.69	551.37	38.23	5.58	5.10	5.86	5.51	0.38
24	1,058.35	997.20	1,075.13	1,043.56	41.02	10.58	9.97	10.75	10.44	0.41
30	1,329.08	1,242.55	1,352.38	1,308.00	57.87	13.29	12.43	13.52	13.08	0.58
36	1,577.31	1,407.57	1,597.39	1,527.43	104.28	15.77	14.08	15.97	15.27	1.04
48	2,026.18	1,848.01	2,075.68	1,983.29	119.74	20.26	18.48	20.76	19.83	1.20

Table e14 The diffusion of diazepam from Formulation T1 P0.7 O8 D5.

Time (hr)	Amount of drug diffusion(mcg)					% Drug diffusion				
	n1	n2	n3	mean	SD	n1	n2	n3	mean	SD
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	30.42	44.42	33.43	36.09	7.37	0.61	0.89	0.67	0.72	0.15
4	61.53	82.05	75.82	73.14	10.52	1.23	1.64	1.52	1.46	0.21
8	118.12	146.05	166.55	143.57	24.31	2.36	2.92	3.33	2.87	0.49
12	170.13	226.91	223.73	206.92	31.90	3.40	4.54	4.47	4.14	0.64
24	349.84	421.82	406.99	392.88	38.01	7.00	8.44	8.14	7.86	0.76
30	404.29	487.84	500.20	464.11	52.17	8.09	9.76	10.00	9.28	1.04
36	466.09	587.74	565.30	539.71	64.73	9.32	11.75	11.31	10.79	1.29
48	618.61	764.89	708.90	697.47	73.80	12.37	15.30	14.18	13.95	1.48

Table e15 The diffusion of diazepam from Formulation T1 P0.7 O8 D10.

Time (hr)	Amount of drug diffusion(mcg)					% Drug diffusion				
	n1	n2	n3	mean	SD	n1	n2	n3	mean	SD
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	66.06	54.49	83.30	67.95	14.50	0.66	0.54	0.83	0.68	0.14
4	129.56	126.85	159.11	138.50	17.90	1.30	1.27	1.59	1.39	0.18
8	259.60	289.43	361.45	303.49	52.36	2.60	2.89	3.61	3.03	0.52
12	395.33	502.18	495.07	464.19	59.75	3.95	5.02	4.95	4.64	0.60
24	633.21	898.07	963.28	831.52	174.81	6.33	8.98	9.63	8.32	1.75
30	805.10	1,073.84	1,039.38	972.77	146.23	8.05	10.74	10.39	9.73	1.46
36	941.19	1,149.94	1,218.86	1,103.33	144.58	9.41	11.50	12.19	11.03	1.45
48	1,166.10	1,360.80	1,474.19	1,333.70	155.82	11.66	13.61	14.74	13.34	1.56

Table e16 The diffusion of diazepam from Formulation T. P0.7 O6 D5.

Time (hr)	Amount of drug diffusion(mcg)					% Drug diffusion				
	n1	n2	n3	mean	SD	n1	n2	n3	mean	SD
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	36.67	44.42	47.55	42.88	5.60	0.73	0.89	0.95	0.86	0.11
4	75.36	93.51	88.57	85.81	9.38	1.51	1.87	1.77	1.72	0.19
8	145.47	189.52	181.42	172.14	23.45	2.91	3.79	3.63	3.44	0.47
12	219.47	275.91	277.40	257.59	33.03	4.39	5.52	5.55	5.15	0.66
24	403.14	496.44	510.66	470.08	58.40	8.06	9.93	10.21	9.40	1.17
30	477.43	556.18	586.35	539.99	56.24	9.55	11.12	11.73	10.80	1.12
36	535.51	619.56	665.34	606.80	65.85	10.71	12.39	13.31	12.14	1.32
48	699.93	747.95	804.97	750.95	52.58	14.00	14.96	16.10	15.02	1.05

Table e17 The diffusion of diazepam from Formulation T1 P0.7 O6 D10.

Time (hr)	Amount of drug diffusion(mcg)					% Drug diffusion				
	n1	n2	n3	mean	SD	n1	n2	n3	mean	SD
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	78.21	69.99	83.30	77.17	6.71	0.78	0.70	0.83	0.77	0.07
4	149.46	136.18	151.01	145.55	8.15	1.49	1.36	1.51	1.46	0.08
8	320.55	296.37	334.55	317.16	19.31	3.21	2.96	3.35	3.17	0.19
12	514.50	488.26	539.58	514.11	25.66	5.14	4.88	5.40	5.14	0.26
24	967.00	870.68	1,019.18	952.29	75.34	9.67	8.71	10.19	9.52	0.75
30	1,137.14	976.86	1,194.29	1,102.77	112.72	11.37	9.77	11.94	11.03	1.13
36	1,313.57	1,112.63	1,347.08	1,257.76	126.80	13.14	11.13	13.47	12.58	1.27
48	1,626.90	1,417.87	1,552.65	1,532.47	105.97	16.27	14.18	15.53	15.32	1.06

Table e18 The diffusion of diazepam from Formulation T1 P0.7 O4 D5.

Time (hr)	Amount of drug diffusion(mcg)					% Drug diffusion				
	n1	n2	n3	mean	SD	n1	n2	n3	mean	SD
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	33.43	30.54	39.10	34.36	4.36	0.67	0.61	0.78	0.69	0.09
4	79.18	80.93	89.48	83.20	5.51	1.58	1.62	1.79	1.66	0.11
8	178.15	192.81	178.33	183.09	8.41	3.56	3.86	3.57	3.66	0.17
12	265.96	307.57	307.86	293.80	24.11	5.32	6.15	6.16	5.88	0.48
24	474.42	582.39	599.95	552.26	67.97	9.49	11.65	12.00	11.05	1.36
30	568.71	718.25	706.47	664.47	83.14	11.37	14.36	14.13	13.29	1.66
36	664.23	846.65	819.09	776.66	98.34	13.28	16.93	16.38	15.53	1.97
48	810.96	992.73	1,002.85	935.51	107.98	16.22	19.85	20.06	18.71	2.16

Table e19 The diffusion of diazepam from Formulation T1 P0.7 O4 D10.

Time (hr)	Amount of drug diffusion(mcg)					% Drug diffusion				
	n1	n2	n3	mean	SD	n1	n2	n3	mean	SD
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	84.11	86.54	94.06	88.23	5.19	0.84	0.87	0.94	0.88	0.05
4	171.72	193.12	173.85	179.56	11.79	1.72	1.93	1.74	1.80	0.12
8	320.88	417.36	374.47	370.90	48.34	3.21	4.17	3.74	3.71	0.48
12	470.16	642.50	571.64	561.43	86.63	4.70	6.43	5.72	5.61	0.87
24	814.15	1,182.69	1,118.85	1,038.56	196.95	8.14	11.83	11.19	10.39	1.97
30	1,006.04	1,370.60	1,279.41	1,218.68	189.72	10.06	13.71	12.79	12.19	1.90
36	1,181.63	1,568.35	1,512.44	1,420.81	209.01	11.82	15.68	15.12	14.21	2.09
48	1,605.05	2,091.59	1,982.79	1,893.14	255.36	16.05	20.92	19.83	18.93	2.55

Table e20 The diffusion of diazepam from Formulation T1 P0.5 O8 D5.

Time (hr)	Amount of drug diffusion(mcg)					% Drug diffusion				
	n1	n2	n3	mean	SD	n1	n2	n3	mean	SD
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	22.21	25.10	29.38	25.56	3.61	0.44	0.50	0.59	0.51	0.07
4	53.23	53.10	61.71	56.01	4.93	1.06	1.06	1.23	1.12	0.10
8	121.22	130.97	145.22	132.47	12.07	2.42	2.62	2.90	2.65	0.24
12	191.00	191.46	220.42	200.96	16.86	3.82	3.83	4.41	4.02	0.34
24	372.86	412.23	438.72	407.94	33.14	7.46	8.24	8.77	8.16	0.66
30	455.07	507.01	549.04	503.71	47.07	9.10	10.14	10.98	10.07	0.94
36	552.25	609.72	656.95	606.31	52.44	11.04	12.19	13.14	12.13	1.05
48	676.01	743.90	828.81	749.57	76.56	13.52	14.88	16.58	14.99	1.53

Table e21 The diffusion of diazepam from Formulation T1 P0.5 O8 D10.

Time (hr)	Amount of drug diffusion(mcg)					% Drug diffusion				
	n1	n2	n3	mean	SD	n1	n2	n3	mean	SD
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	53.68	46.27	61.43	53.79	7.58	0.54	0.46	0.61	0.54	0.08
4	116.43	97.26	113.06	108.92	10.24	1.16	0.97	1.13	1.09	0.10
8	286.17	234.52	287.37	269.35	30.17	2.86	2.35	2.87	2.69	0.30
12	442.72	374.87	435.24	417.61	37.20	4.43	3.75	4.35	4.18	0.37
24	868.20	724.65	851.47	814.77	78.49	8.68	7.25	8.51	8.15	0.78
30	1,057.35	889.02	1,067.07	1,004.48	100.11	10.57	8.89	10.67	10.04	1.00
36	1,284.11	1,077.59	1,284.89	1,215.53	119.46	12.84	10.78	12.85	12.16	1.19
48	1,578.93	1,356.05	1,583.85	1,506.28	130.12	15.79	13.56	15.84	15.06	1.30

Table e22 The diffusion of diazepam from Formulation T1 P0.5 O6 D5.

Time (hr)	Amount of drug diffusion(mcg)					% Drug diffusion				
	n1	n2	n3	mean	SD	n1	n2	n3	mean	SD
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	36.44	41.53	40.72	39.56	2.74	0.73	0.83	0.81	0.79	0.05
4	65.82	78.48	71.66	71.99	6.34	1.32	1.57	1.43	1.44	0.13
8	159.15	181.09	161.59	167.28	12.03	3.18	3.62	3.23	3.35	0.24
12	235.67	257.40	229.88	240.98	14.51	4.71	5.15	4.60	4.82	0.29
24	473.64	546.52	420.66	480.27	63.19	9.47	10.93	8.41	9.61	1.26
30	587.26	638.91	490.65	572.27	75.26	11.75	12.78	9.81	11.45	1.51
36	707.57	733.27	575.43	672.09	84.69	14.15	14.67	11.51	13.44	1.69
48	848.52	921.49	755.55	841.85	83.17	16.97	18.43	15.11	16.84	1.66

Table e23 The diffusion of diazepam from Formulation T1 P0.5 O6 D10.

Time (hr)	Amount of drug diffusion(mcg)					% Drug diffusion				
	n1	n2	n3	mean	SD	n1	n2	n3	mean	SD
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	54.14	48.70	60.62	54.49	5.97	0.54	0.49	0.61	0.54	0.06
4	111.44	102.35	115.84	109.88	6.88	1.11	1.02	1.16	1.10	0.07
8	278.36	251.09	297.57	275.67	23.36	2.78	2.51	2.98	2.76	0.23
12	445.99	409.29	428.30	427.86	18.35	4.46	4.09	4.28	4.28	0.18
24	920.72	977.41	879.98	926.03	48.93	9.21	9.77	8.80	9.26	0.49
30	1,169.62	1,253.50	1,069.87	1,164.33	91.93	11.70	12.54	10.70	11.64	0.92
36	1,427.11	1,536.45	1,301.17	1,421.58	117.74	14.27	15.36	13.01	14.22	1.18
48	1,805.41	1,935.57	1,609.22	1,783.40	164.28	18.05	19.36	16.09	17.83	1.64

Table e24 The diffusion of diazepam from Formulation T1 P0.5 O4 D5.

Time (hr)	Amount of drug diffusion(mcg)					% Drug diffusion				
	n1	n2	n3	mean	SD	n1	n2	n3	mean	SD
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	47.78	47.89	50.79	48.82	1.70	0.96	0.96	1.02	0.98	0.03
4	108.75	126.76	126.05	120.52	10.20	2.17	2.54	2.52	2.41	0.20
8	211.79	239.15	250.22	233.72	19.78	4.24	4.78	5.00	4.67	0.40
12	309.30	349.30	349.71	336.10	23.21	6.19	6.99	6.99	6.72	0.46
24	513.05	557.51	575.12	548.56	31.99	10.26	11.15	11.50	10.97	0.64
30	663.78	635.02	663.95	654.25	16.65	13.28	12.70	13.28	13.09	0.33
36	769.30	707.48	762.61	746.46	33.92	15.39	14.15	15.25	14.93	0.68
48	968.76	909.42	999.75	959.31	45.90	19.38	18.19	19.99	19.19	0.92

Table e25 The diffusion of diazepam from Formulation T1 P0.5 O4 D10.

Time (hr)	Amount of drug diffusion(mcg)					% Drug diffusion				
	n1	n2	n3	mean	SD	n1	n2	n3	mean	SD
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	76.70	83.07	87.00	82.26	5.20	0.77	0.83	0.87	0.82	0.05
4	177.31	190.41	166.84	178.19	11.81	1.77	1.90	1.67	1.78	0.12
8	400.58	401.99	407.36	403.31	3.58	4.01	4.02	4.07	4.03	0.04
12	596.93	635.40	592.42	608.25	23.62	5.97	6.35	5.92	6.08	0.24
24	1,061.16	1,126.82	1,119.05	1,102.35	35.88	10.61	11.27	11.19	11.02	0.36
30	1,322.96	1,400.60	1,446.38	1,389.98	62.39	13.23	14.01	14.46	13.90	0.62
36	1,504.75	1,586.36	1,646.19	1,579.10	71.00	15.05	15.86	16.46	15.79	0.71
48	1,954.45	2,078.20	2,103.66	2,045.44	79.82	19.54	20.78	21.04	20.45	0.80

APPENDIX F

Statistical Evaluation

Table f1 The result of 2 tailed paired-sample T test of pH between before and after autoclaving.

Paired Differences					t	df	p value
			95% Confidence Interval of the Difference				
Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
0.2511	0.1504	0.0251	0.2002	0.3020	10.019	35	0.000*

* The mean difference is significant at the .05 level.

Table f2 The result of 2 tailed paired-sample T test of validation of mean particle diameter between computerized program and manual observation (50 particles).

Paired Differences					t	df	p value
			95% Confidence Interval of the Difference				
Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
0.0146	0.0766	0.0108	-0.0072	0.0363	1.347	49	0.184

* The mean difference is significant at the .05 level.

Table f3 The result of 2 tailed paired-sample T test of validation of mean particle diameter between computerized program and manual observation (50 particles).

Paired Differences					t	df	p value
			95% Confidence Interval of the Difference				
Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
0.0154	0.09930	0.0140	-0.0128	0.0436	1.097	49	0.278

* The mean difference is significant at the .05 level.

Table f4 The result of 2 tailed paired-sample T test of validation of mean particle diameter between computerized program and manual observation (50 particles).

Paired Differences					t	df	p value
			95% Confidence Interval of the Difference				
Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
0.0126	0.0600	0.0085	-0.0045	0.0297	1.848	49	0.144

* The mean difference is significant at the .05 level.

Table f5 The result of 2 tailed paired-sample T test of mean particle diameter between before and after autoclaving of microemulsion without drug.

Paired Differences					t	df	p value
			95% Confidence Interval of the Difference				
Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
-5.0950	2.9475	0.8509	-6.9678	-3.2222	-5.988	11	0.000*

* The mean difference is significant at the .05 level.

Table f6 The result of ANOVA test of mean particle diameter after autoclaving of drug-loaded microemulsions.

(I) Formula	(J) Formula	Mean different (I-J)	Std. Error	Sig	95% Confidential Interval	
					Lower Bound	Upper Bound
T1 G1.5 O4	T1 G1.5 O4 D5	3.6048	2.1197	0.236	-1.5925	8.820
	T1 G1.5 O4 D10	4.9393	2.1197	0.067	-0.2579	10.136
T1 G1.5 O4 D5	T1 G1.5 O4	-3.6048	2.1197	0.236	-8.8020	1.5925
	T1 G1.5 O4 D10	1.3345	2.1197	0.820	-.38627	6.5318
T1 G1.5 O4 D10	T1 G1.5 O4	-4.9393	2.1197	0.067	-10.136	0.2578
	T1 G1.5 O4 D5	-1.3345	2.1197	0.820	-6.5318	3.8627

* The mean difference is significant at the .05 level.

Table f7 The result of ANOVA test of mean particle diameter after autoclaving of drug-loaded microemulsions.

(I) Formula	(J) Formula	Mean different (I-J)	Std. Error	Sig	95% Confidential Interval	
					Lower Bound	Upper Bound
T1 G1 O4	T1 G1 O4 D5	1.6671	1.8410	0.664	-2.8467	6.1809
	T1 G1 O4 D10	-1.5791	1.8410	0.692	-6.9029	2.9347
T1 G1O4 D5	T1 G1 O4	-1.6671	1.8410	0.664	-6.1809	2.8467
	T1 G1 O4 D10	-3.2462	1.8410	0.212	-7.7600	1.2676
T1 G1 O4 D10	T1 G1 O4	1.5791	1.8410	0.692	-2.9347	6.0929
	T1 G1 O4 D5	3.2462	1.8410	0.212	-1.2676	7.7600

* The mean difference is significant at the .05 level.

Table f8 The result of ANOVA test of mean particle diameter after autoclaving of drug-loaded microemulsions.

(I) Formula	(J) Formula	Mean different (I-J)	Std. Error	Sig	95% Confidential Interval	
					Lower Bound	Upper Bound
T1 P0.7 O4	T1 P0.7 O4 D5	11.9455	1.4499	0.000*	8.3906	15.5005
	T1 P0.7 O4 D10	7.6259	1.4499	0.000*	4.0710	11.1809
T1 P0.7 O4 D5	T1 P0.7 O4	-11.9455	1.4499	0.000*	-15.500	-8.3906
	T1 P0.7 O4 D10	-4.3196	1.4499	0.012*	-7.8745	-0.7647
T1 P0.7 O4 D10	T1 P0.7 O4	-7.6259	1.4499	0.000*	-11.180	-4.0710
	T1 P0.7 O4 D5	4.3196	1.4499	0.012*	0.7647	7.8745

* The mean difference is significant at the .05 level.

Table f9 The result of ANOVA test of mean particle diameter after autoclaving of drug-loaded microemulsions.

(I) Formula	(J) Formula	Mean different (I-J)	Std. Error	Sig	95% Confidential Interval	
					Lower Bound	Upper Bound
T1 P0.5 O4	T1 P0.5 O4 D5	13.2429	1.4140	0.000*	9.7760	16.7098
	T1 P0.5 O4 D10	5.7881	1.4140	0.000*	2.3212	9.2550
T1 P0.5 O4 D5	T1 P0.5 O4	-13.2429	1.4140	0.000*	-16.709	-9.7760
	T1 P0.5 O4 D10	-7.4548	1.4140	0.000*	-10.922	-3.9879
T1 P0.5 O4 D10	T1 P0.5 O4	-5.7881	1.4140	0.000*	-9.2550	-2.3212
	T1 P0.5 O4 D5	7.4548	1.4140	0.000*	3.9879	10.9217

* The mean difference is significant at the .05 level.

Table f10 The result of 2 tailed paired-sample T test of diffusion profile between Formulations T1 G1.5 O8 D5 and T1 G1.5 O8 D10.

Paired Differences					t	df	p value
			95% Confidence Interval of the Difference				
Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
0.0400	0.1306	0.0435	-0.0603	0.1404	0.919	8	0.385

* The mean difference is significant at the .05 level.

Table f11 The result of 2 tailed paired-sample T test of diffusion profile between Formulations T1 G1.5 O6 D5 and T1 G1.5 O6 D10.

Paired Differences					t	df	p value
			95% Confidence Interval of the Difference				
Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
0.1567	0.2467	0.0822	-0.0329	0.3463	1.905	8	0.093

* The mean difference is significant at the .05 level.

Table f12 The result of 2 tailed paired-sample T test of diffusion profile between Formulations T1 G1.5 O4 D5 and T1 G1.5 O4 D10.

Paired Differences					t	df	p value
			95% Confidence Interval of the Difference				
Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
0.5011	0.8045	0.2682	-0.1173	1.1195	1.869	8	0.099

* The mean difference is significant at the .05 level.

Table f13 The result of 2 tailed paired-sample T test of diffusion profile between Formulations T1 G1 O8 D5 and T1 G1 O8 D10.

Paired Differences					t	df	p value
			95% Confidence Interval of the Difference				
Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
0.0233	0.3812	0.1271	-0.3163	0.2697	-0.184	8	0.859

* The mean difference is significant at the .05 level.

Table f14 The result of 2 tailed paired-sample T test of diffusion profile between Formulations T1 G1 O6 D5 and T1 G1 O6 D10.

Paired Differences					t	df	p value
			95% Confidence Interval of the Difference				
Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
0.1833	0.4002	0.1334	-0.1243	0.4910	1.374	8	0.207

* The mean difference is significant at the .05 level.

Table f15 The result of 2 tailed paired-sample T test of diffusion profile between Formulations T1 G1 O4 D5 and T1 G1 O4 D10.

Paired Differences					t	df	p value
			95% Confidence Interval of the Difference				
Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
0.0377	0.1840	0.0613	-0.1792	0.1036	-0.616	8	0.555

* The mean difference is significant at the .05 level.

Table f16 The result of 2 tailed paired-sample T test of diffusion profile between Formulations T1 P0.7 O8 D5 and T1 P0.7 O8 D10.

Paired Differences					t	df	p value
			95% Confidence Interval of the Difference				
Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
-0.1211	0.3525	0.1175	-0.3920	0.1498	-1.031	8	0.333

* The mean difference is significant at the .05 level.

Table f17 The result of 2 tailed paired-sample T test of diffusion profile between Formulations T1 P0.7 O6 D5 and T1 P0.7 O6 D10.

Paired Differences					t	df	p value
			95% Confidence Interval of the Difference				
Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
-0.0511	0.2439	0.0813	-0.2386	0.1364	-0.629	8	0.547

* The mean difference is significant at the .05 level.

Table f18 The result of 2 tailed paired-sample T test of diffusion profile between Formulations T1 P0.7 O4 D5 and T1 P0.7 O4 D10.

Paired Differences					t	df	p value
			95% Confidence Interval of the Difference				
Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
0.3056	0.5839	0.1946	-0.1432	0.7544	1.570	8	0.155

* The mean difference is significant at the .05 level.

Table f19 The result of 2 tailed paired-sample T test of diffusion profile between Formulations T1 P0.5 O8 D5 and T1 P0.5 O8 D10.

Paired Differences					t	df	p value
			95% Confidence Interval of the Difference				
Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
-0.0288	0.0594	0.0198	-0.0746	0.0168	-1.457	8	0.183

* The mean difference is significant at the .05 level.

Table f20 The result of 2 tailed paired-sample T test of diffusion profile between Formulations T1 P0.5 O6 D5 and T1 P0.5 O6 D10.

Paired Differences					t	df	p value
			95% Confidence Interval of the Difference				
Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
0.0122	0.5661	0.1887	-0.4229	0.4473	0.065	8	0.950

* The mean difference is significant at the .05 level.

Table f21 The result of 2 tailed paired-sample T test of diffusion profile between Formulations T1 P0.5 O4 D5 and T1 P0.5 O4 D10.

Paired Differences					t	df	p value
			95% Confidence Interval of the Difference				
Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
-0.1011	0.7190	0.2397	-0.6538	0.4515	-0.422	8	0.684

* The mean difference is significant at the .05 level.

Table f22 The result of 2 tailed paired-sample T test of pH between before and after stability testing.

Paired Differences					t	df	p value
			95% Confidence Interval of the Difference				
Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
0.0237	0.0838	0.0171	-0.0116	0.0591	1.389	23	0.178

* The mean difference is significant at the .05 level.

Table f23 The result of 2 tailed paired-sample T test of refractive index between before and after stability testing.

Paired Differences					t	df	p value
			95% Confidence Interval of the Difference				
Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
2.083E-5	1.693E-4	3.457E-5	-9.234E-5	5.067E-5	-0.603	23	0.553

* The mean difference is significant at the .05 level.

Table f24 The result of 2 tailed paired-sample T test of mean particle diameter between before and after stability testing.

Paired Differences					t	df	p value
			95% Confidence Interval of the Difference				
Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
-11.3187	5.6008	1.9802	-16.0011	-6.6364	-5.716	7	0.001*

* The mean difference is significant at the .05 level.

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