

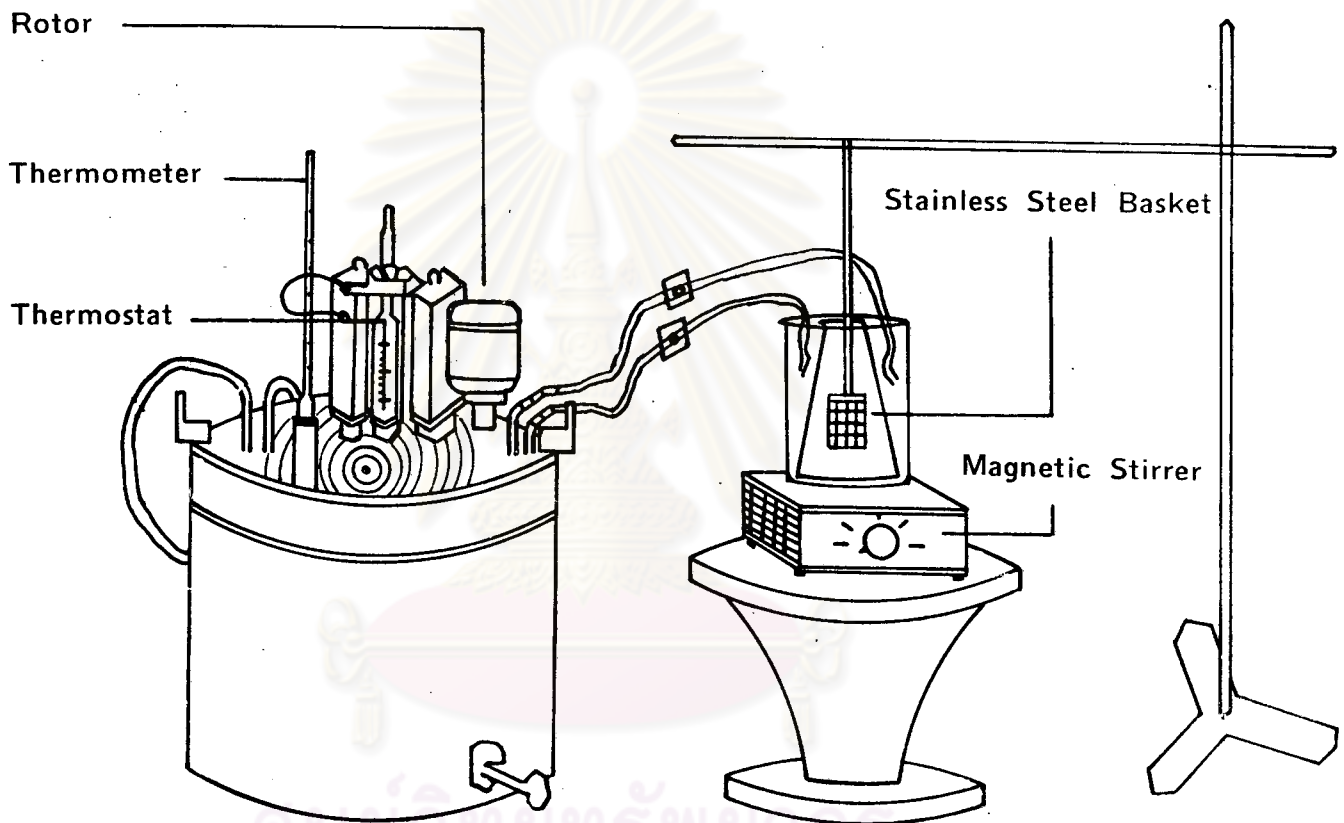
CHAPTER II

MATERIALS AND EXPERIMENTALApparatus and Accessories

1. Magnetic stirrer
2. Spectrophotometer Model 1800 Pye UNICAM
3. Sauter Analytical Balance
4. Torsion Balance
5. Erlenmeyer flask, 300 ml
6. Volumetric flask, 100 ml
7. Pipettes
8. Stainless Steel Basket
9. Metal Suppository Mold
10. PH paper
11. Centrifuge (Beta - Fuge Model - A - Z)
12. Constant Temperature Bath (colora - Ultra - Thermostat Type N.B)



ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย



Constant Temperature bath
(Colora Ultra Thermostat)

REAGENTS

1. PEG 4000	Siam Instrument
2. PEG 1500	" "
3. PEG 400	" "
4. Phenobarbital	The British Drug House Ltd. (BDH)
5. Sodium Borate	Searle Company
6. Sodium Hydroxide	RIEDEL - DE HAENAG A.G.
7. Witepsol E 85	The Pharmaceutical Hall Co. Ltd.
8. Witepsol S 55	" "
9. Theobroma oil	Evans Medical Ltd.
10. White Beeswax	The Pharmaceutical Hall Co. Ltd.
11. Tween 20	Groda
12. Tween 40	Groda
13. Tween 60	Groda
14. Tween 80	Groda
15. Myrj 52	สีลมการแพทย์

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

EXPERIMENTAL

Method of Preparation

All suppositories were prepared by fusion method. The metal suppository molds were calibrated for each base. One suppository will contain 250 mg of phenobarbital.

The method of mixing bases with phenobarbital

Suppository bases were fused on the water bath, until completely melted, then mixed thoroughly with phenobarbital on a slab and remelted in the casserole. Poured the melted mixture to the mold previously lubricated with mineral oil and cooled in the refrigerator until congealed, then removed suppositories from the mold. Used the same procedure for the polyethylene glycol and Witepsol suppositories. Cocoa butter and 10% white beeswax base was prepared by heating white beeswax on a water bath, until completely melted, then added cocoa butter. When the cocoa butter was about half melted, removed from the water bath, and stirred well with glass rod, until it was thoroughly melted. Poured the melted base on to the mixed medication into dispersion as quickly as possible by levigating with the spatula. When the base solidifies it was softened by holding casserole over the water bath for a few seconds, then poured back into the mold. This procedure was necessary, because it can prevent the cocoa butter from over heating which might be changed from stable into unstable form.

Surfactants

These surfactants were Tween 20, 40, 60, 80 and Myrj 52. Each surfactant must be mixed with the suppository base before melting on the water bath. Then incorporated drug into the melted base.

Determination of Phenobarbital Released from Suppository Bases

I Witepsols and cocoa butter plus 10% white beeswax base.

Inserted one of the prepared phenobarbital suppository to the basket. Suspended in the 300 ml Erlenmeyer flask containing 250 ml borate buffer pH 10.0 (See Appendix) and magnetic stirrer at the bottom.

Stirred with magnetic stirrer at medium speed. The temperature was kept constant at 37°C. One ml of sample was transferred to 100 ml volumetric flask each at 10, 20, 30 min interval respectively, diluting with borate buffer to 100 ml and mixed well. The fourth sample was taken after complete dissolution of suppository. The diluted was centrifuged at 16,000 r.p.m. for 90 minutes until clear supernatant - was obtained. Transfer ^{the} clear liquid into a quartz cell and the absorbance 240 nm was determined by using UNICAM model 1800 Spectrophotometer.

II. For Polyethylene Glycol Base

The same procedure as in I. was used except the sample were not centrifuge.

CALIBRATION FOR VARIOUS SUPPOSITORY BASES

50% PEG 4000, + 40% PEG 1500

Phenobarbital	=	0.250 g.
Base + Phenobarbital	=	2.547 g.
PEG 4000	=	1.378 g
PEG 1500	=	1.019 g.

Witepsol S 55

Phenobarbital	=	0.250 g.
Base + Phenobarbital	=	1.99 g.
Witepsol S 55	=	1.74 g.

Witepsol E 85

Phenobarbital	=	0.250 g.
Base + Phenobarbital	=	1.95 g.
Witepsol E 85	=	1.70 g.

90% Cocoa butter + 10% White beeswax

Phenobarbital	=	0.250 g.
Base + Phenobarbital	=	2.0219 g.
Cocoa butter	=	1.594 g.
White beeswax	=	0.177 g.

25% PEG 4000, + 75% PEG 1500

Phenobarbital	=	0.250 g.
Base + Phenobarbital	=	2.419 g.
PEG 4000	=	0.542 g.
PEG 1500	=	1.617 g.

30% PEG 4000, + 70% PEG 1500

Phenobarbital	=	0.250 g.
Base + Phenobarbital	=	2.511 g.
PEG 4000	=	0.678 g.
PEG 1500	=	1.582 g.

40% PEG 4000, + 60% PEG 1500

Phenobarbital	=	0.250 g.
Base + Phenobarbital	=	2.503 g.
PEG 4000	=	0.902 g.
PEG 1500	=	1.353 g.

50% PEG 4000, + 50% PEG 1500

Phenobarbital	=	0.250 g.
Base + Phenobarbital	=	2.533 g.
PEG 4000	=	1.141 g.
PEG 1500	=	1.141 g.

70% PEG 4000, + 30% PEG 1500

Phenobarbital	=	0.250 g.
Base + Phenobarbital	=	2.505 g.
PEG 4000	=	1.578 g.
PEG 1500	=	0.678 g.

47% PEG 4000, + 33% PEG 1500 + 20% PEG 400,

Phenobarbital	=	0.250 g.
Base + Phenobarbital	=	2.510 g.
PEG 4000	=	1.062 g.
PEG 1500	=	0.746 g.
PEG 400	=	0.452 g.

58% PEG 4000, + 40% PEG 1500, + 2% Tween 20

Phenobarbital	=	0.250 g.
Base + Phenobarbital	=	2.547 g.
PEG 4000	=	1.332 g.
PEG 1500	=	0.918 g.
Tween 20	=	0.046 g.

55% PEG 4000, + 40% PEG 1500 + 5% Tween 20

Phenobarbital	=	0.250 g.
Base + Phenobarbital	=	2.506 g.
PEG 4000	=	1.241 g.
PEG 1500	=	0.903 g.
Tween 20	=	0.112 g.

55% PEG 4000, + 40% PEG 1500, + 5% Tween 40

Phenobarbital	=	0.250 g.
Base + Phenobarbital	=	2.524 g.
PEG 4000	=	1.250 g.
PEG 1500	=	0.909 g.
Tween 40	=	0.114 g.

50% PEG 4000, + 40% PEG 1500, + 10% Tween 40

Phenobarbital	=	0.250 g.
Base + Phenobarbital	=	2.535 g.
PEG 4000	=	1.143 g.
PEG 1500	=	0.914 g.
Tween 40	=	0.228 g.

45% PEG 4000, + 40% PEG 1500, + 15% Tween 40

Phenobarbital	=	0.250 g.
Base + Phenobarbital	=	2.501 g.
PEG 4000	=	1.013 g.
PEG 1500	=	0.901 g.
Tween 40	=	0.338 g.

60% PEG 4000, + 35% PEG 1500, + 5% Tween 40

Phenobarbital	=	0.250 g.
Base + Phenobarbital	=	2.504 g.
PEG 4000	=	1.353 g.
PEG 1500	=	0.789 g.
Tween 40	=	0.113 g.

60% PEG 4000, + 30% PEG 1500, + 10% Tween 40

Phenobarbital	=	0.250 g.
Base + Phenobarbital	=	2.49 g.
PEG 4000	=	1.344 g.
PEG 1500	=	0.672 g.
Tween 40	=	0.224 g.

60% PEG 4000, + 25% PEG 1500, + 15% Tween 40

Phenobarbital	=	0.250 g.
Base + Phenobarbital	=	2.499 g.
PEG 4000	=	1.349 g.
PEG 1500	=	0.562 g.
Tween 40	=	0.337 g.

55% PEG 4000, + 40% PEG 1500, + 5% Tween 60

Phenobarbital	=	0.250 g.
Base + Phenobarbital	=	2.535 g.
PEG 4000	=	1.257 g.
PEG 1500	=	0.914 g.
Tween 60	=	0.114 g.

50% PEG 4000, + 40% PEG 1500, + 10% Tween 60

Phenobarbital	=	0.250 g.
Base + Phenobarbital	=	2.531 g.
PEG 4000	=	1.141 g.
PEG 1500	=	0.913 g.
Tween 60	=	0.228 g.

45% PEG 4000, + 40% PEG 1500, + 15% Tween 60

Phenobarbital	=	0.250 g.
Base + Phenobarbital	=	2.521 g.
PEG 4000	=	1.022 g.
PEG 1500	=	0.908 g.
Tween 60	=	0.341 g.

60% PEG 4000, + 35% PEG 1500, + 5% Tween 60

Phenobarbital	=	0.250 g.
Base + Phenobarbital	=	2.521 g.
PEG 4000	=	1.363 g.
PEG 1500	=	0.795 g.
Tween 60	=	0.114 g.

60% PEG 4000, + 30% PEG 1500, + 10% Tween 60

Phenobarbital	=	0.250 g.
Base + Phenobarbital	=	2.519 g.
PEG 4000	=	1.360 g.
PEG 1500	=	0.681 g.
Tween 60	=	0.227 g.

60% PEG 4000, + 25% PEG 1500, + 15% Tween 60

Phenobarbital	=	0.250 g.
Base + Phenobarbital	=	2.492 g.
PEG 4000	=	1.345 g.
PEG 1500	=	0.561 g.
Tween 60	=	0.336 g.

55% PEG 4000, + 40% PEG 1500 + 5% Tween 80

Phenobarbital	=	0.250 g.
Base + Phenobarbital	=	2.515 g.
PEG 4000	=	1.246 g.
PEG 1500	=	0.906 g.
Tween 80	=	0.113 g.

50% PEG 4000, + 40% PEG 1500, + 10% Tween 80

Phenobarbital	=	0.250 g.
Base + Phenobarbital	=	2.508 g.
PEG 4000	=	1.129 g.
PEG 1500	=	0.903 g.
Tween 80	=	0.225 g.

45% PEG 4000, + 40% PEG 1500, + 15% Tween 80

Phenobarbital	=	0.250 g.
Base + Phenobarbital	=	2.514 g.
PEG 4000	=	1.019 g.
PEG 1500	=	0.906 g.
Tween 80	=	0.339 g.

60% PEG 4000, + 35% PEG 1500, + 5% Tween 80

Phenobarbital	=	0.250 g.
Base + Phenobarbital	=	2.532 g.
PEG 4000	=	1.369 g.
PEG 1500	=	0.798 g.
Tween 80	=	0.114 g.

60% PEG 4000, + 30% PEG 1500, + 10% Tween 80

Phenobarbital	=	0.250 g.
Base + Phenobarbital	=	2.509 g.
PEG 4000	=	1.355 g.
PEG 1500	=	0.678 g.
Tween 80	=	0.226 g.

60% PEG 4000, + 25% PEG 1500, + 15% Tween 80

Phenobarbital	=	0.250 g.
Base + Phenobarbital	=	2.502 g.
PEG 4000	=	1.351 g.
PEG 1500	=	0.563 g.
Tween 80	=	0.338 g.

59% PEG 4000, + 40% PEG 1500 , + 1% Myrj 52

Phenobarbital	=	0.250 g.
Base + Phenobarbital	=	2.546 g.
PEG 4000	=	1.355 g.
PEG 1500	=	0.918 g.
Myrj 52	=	0.023 g.

58% PEG 4000 + 40% PEG 1500 , + 2% Myrj 52

Phenobarbital	=	0.250 g.
Base + Phenobarbital	=	2.554 g.
PEG 4000	=	1.336 g.
PEG 1500	=	0.922 g.
Myrj 52	=	0.046 g.

55% PEG 4000, + 40% PEG 1500, + 5% Myrj 52

Phenobarbital	=	0.250 g.
Base + Phenobarbital	=	2.533 g.
PEG 4000	=	1.256 g.
PEG 1500	=	0.913 g.
Myrj 52	=	0.114 g.

50% PEG 4000, + 40% PEG 1500, + 10% Myrj 52

Phenobarbital	=	0.250 g.
Base + Phenobarbital	=	2.523 g.
PEG 4000	=	1.136 g.
PEG 1500	=	0.909 g.
Myrj 52	=	0.227 g.

60% PEG 4000, + 35% PEG 1500, + 5% Myrj 52

Phenobarbital	=	0.250 g.
Base + Phenobarbital	=	2.51 g.
PEG 4000	=	1.356 g.
PEG 1500	=	0.791 g.
Myrj 52	=	0.113 g.

60% PEG 4000, + 30% PEG 1500, + 10% Myrj 52

Phenobarbital	=	0.250 g.
Base + Phenobarbital	=	2.516 g.
PEG 4000	=	1.359 g.
PEG 1500	=	0.679 g.
Myrj 52	=	0.226 g.

60% PEG 4000, + 25% PEG 1500, + 15% Myrj 52

Phenobarbital	=	0.250 g.
Base + Phenobarbital	=	2.495 g.
PEG 4000	=	1.347 g.
PEG 1500	=	0.561 g.
Myrj 52	=	0.337 g.

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย