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APPENDICES

Appendix 1 UV Absorbance of Erythromycin Stearate Standard Solution in Ethanol:H2O 1:5 at 236 NM.

Concentration (mcg/ml)	Absorbance
18.92	0.004
37.84	0.007
47.30	0.008
94.60	0.016
189.20	0.035
227.04	0.040

Appendix 2 UV Absorption of Paracetamol Standard Solution in Phosphate Buffer pH 5.8 at 243.2 NM.

Concentration (mcg/ml)	Absorbance
1.22	0.083
2.44	0.157
3.66	0.234
4.88	0.035
6.10	0.394
7.32	0.476
9.76	0.635
12.20	0.791

Appendix 3 UV Transmission of Phosphorous Standard Solution at 460 NM.

Concentration (mg/100 ml)	% Transmission (% T)	log % T
0.025	98.6	1.9939
0.05	96.4	1.9841
0.10	95.3	1.9791
0.15	92.5	1.9661
0.20	90.8	1.9581
0.30	86.2	1.9355
0.40	82.0	1.9138
0.50	78.3	1.8937

Appendix 4 Dissolution of Erythromycin Stearate from Erythromycin Stearate Tablets Containing Various Native Starches as Disintegrant.

Time	% Drug Dissolved						
(min)	Blank	Tapioca	Rice	Corn	Glu.Rice	Wheat	Arrow Root
0	0	0	0	0	0	0	0
5	0.94	23.51	12.08	38.88	30.58	23.27	21.49
10	3.84	35.79	18.61	51.50	38.92	29.80	33.16
15	4.66	36.81	24.20	52.55	42.62	30.80	34.95
20	5.77	39.88	25.13	55.71	48.18	35.39	47.51
30	12.54	42.95	26.06	57.81	50.04	40.98	51.09
45	28.01	43.95	29.79	59.91	50.96	49.38	55.58
60	29.95	49.09	38.18	60.97	62.09	51.64	58.27

Glu.Rice = Glutinous Rice Starch

Appendix 5 Dissolution of Erythromycin Stearate from Erythromycin Stearate Tablets Containing Various Carboxymethyl Starches as Disintegrant.

Time	% Drug Dissolved					
(min)	CM Tapioca	CM Rice	CM Corn	CM Glu.Rice	CM Wheat	CM Arrow Root
0	0	0	0	0	0	0
5	57.75	37.98	46.83	46.85	48.74	40.48
10	73.86	53.58	52.45	57.35	57.70	55.15
15	78.59	58.46	56.20	66.95	60.69	57.19
20	79.54	64.31	62.76	79.39	62.68	59.24
30	82.38	69.18	64.64	80.35	67.65	66.39
45	85.23	68.20	72.13	83.21	68.65	71.49
60	88.07	69.18	72.13	83.21	70.64	76.61

CM = Carboxymethyl

Appendix 6 Disssolution of Erythromycin Stearate from Erythromycin Stearate tablets Containing Various Disintegrants.

Time	% Drug Dissolved				
(min)	Avicel	Explotab	Ac-Di-Sol	Polyplasdone XL	CM Tapioca
0	0	0	0	0	0
5	1.76	46.09	42.98	46.16	57.75
10	3.54	53.18	46.89	53.86	73.86
15	5.33	54.07	53.68	56.75	78.59
20	18.72	57.61	54.71	58.67	79.54
30	20.51	61.16	56.66	71.18	82.38
45	23.19	65.59	59.59	72.15	85.23
60	24.97	68.25	66.44	80.81	88.07

CM = Carboxymethyl

Appendix 7 Some Physical Properties of Carboxymethyl Tapioca Starch. (Factorial study)

	BULK Swelling (%)	Cold Water Soluble (g)	Hydration Capacity	
Tapioca	6.67	0.0073 (0.0001)	2.5797 (0.0491)	
(1)	13.00	0.0460 (0.0019)	2.2548 (0.0462)	
a	13.00	0.0902 (0.0005)	2.3323 (0.0184)	
b	26.00	0.0333 (0.0009)	3.1208 (0.2399)	
ab	116.00	0.9237 (0.0005)	86.7911 (0.8022)	gel
c	13.00	0.0637 (0.0004)	2.7056 (0.0890)	
ac	16.00	0.1231 (0.0003)	5.5457 (0.4554)	
bc	S	0.9221 (0.0009)	88.4479 (0.4471)	gel
abc	S	0.8723 (0.0046)	73.5175 (0.0474)	gel

S = Soluble

Standard deviations are in parentheses

Appendix 8 Some Physical Properties of Modified Tapioca Starch.

Sample No.	Bulk Swelling %	Cold Water Soluble (g)	Hydration Capacity	Viscosity (cp)
1	6.67	0.0073 (0.0001)	2.5797 (0.0491)	1.3517 (0.0000)
2	NV	0.7199 (0.0422)	69.1691 (0.1710)	46.1415 (4.2575)
3	NV	CG	94.0683 (0.2965)	66.6624 (3.3887)
4	NV	CG	81.1412 (0.0013)	3348.4800 (447.8910)
5	NS	0.0246 (0.0019)	2.5032 (0.0032)	1.4132 (0.0869)
6	833.33	0.0873 (0.0046)	22.3861 (0.0018)	1.7818 (0.0869)
7	633.33	0.0531 (0.0029)	19.5270 (0.0201)	2.5191 (0.0869)
8	1450.00	0.0746 (0.0007)	31.4117 (0.6129)	2.7648 (0.0869)
9	NS	0.0626 (0.0113)	2.4573 (0.0592)	1.2288 (0.0000)
10	450.00	0.0481 (0.0039)	14.5681 (0.0428)	1.5974 (0.0000)
11	1500.00	0.0474 (0.0014)	28.3717 (0.0607)	2.0276 (0.0869)
12	700.00	0.0797 (0.0008)	19.2840 (0.0278)	1.7818 (0.0869)
13	NS	0.0547 (0.0008)	2.2994 (0.0076)	1.2288 (0.0000)
14	400.00	0.0424 (0.0042)	13.3395 (0.1601)	1.5360 (0.0868)
15	500.00	0.0442 (0.0013)	14.4532 (0.0635)	1.5974 (0.0000)
16	500.00	0.0354 (0.0027)	14.4680 (0.0815)	1.5360 (0.0868)

NV = Non detectable due to forming viscous barrier

NS = Non swelling

CG = forming Clear gel

Standard deviations are in parentheses.

Appendix 9 Water Uptake of Tablets Containing Various Disintegrants.

Disintegrant	Dicalcium Phosphate Tablets (ml)	Lactose Tablets (ml)
Tapioca	0.3692 (0.0021)	0.0904 (0.0029)
MTS	13.2029 (0.5989)	0.3571 (0.0049)
Explotab	8.1082 (0.3433)	0.5131 (0.0044)
Primojel	13.0842 (0.3846)	0.4649 (0.0046)

Standard deviations are in parentheses.

Appendix 10 Physical Properties of Disintegrant Powders.

Disintegrant	SV (ml/g)		CWS (g)	HC	Viscosity
	H2O	0.1 N HCl			(cps)
Tapioca	1.60	1.40	0.0073	2.5797	1.3517
	(0.0000)	(0.0000)	(0.0001)	(0.0491)	(0.0000)
MTS	18.30	7.05	0.0474	28.3717	2.0276
	(0.1414)	(0.0707)	(0.0014)	(0.0607)	(0.0869)
Explotab	17.85	7.20	0.1133	18.3453	2.0889
	(0.1414)	(0.0000)	(0.0048)	(0.3857)	(0.1737)
Primojel	16.45	6.40	0.0879	22.5354	1.6588
	(0.0707)	(0.0000)	(0.0033)	(0.2518)	(0.0869)

SV = Sedimentation Volume

CWS = Cold Water Soluble Fraction

HC = Hydration Capacity

Standard deviations are in parentheses.

Appendix 11 Disintegration Times of Dicalcium Phosphate Tablets Containing 4% Various Disintegrants.

Disintegrant	Mean DT (sec)		Hardness
	H_2O	0.1 N HCl	(Kp)
Tapioca	25.83	15.33	9.46
	(1.4719)	(0.5164)	(0.4163)
MTS	6.50	6.66	12.80
	(0.5477)	(0.5164)	(0.2000)
Explotab	24.83	29.83	10.10
	(0.7528)	(1.1690)	(0.0957)
Primojel	21.33	26.83	9.00
	(1.0328)	(1.4719)	(0.2000)

Standard deviations are in parentheses.

Appendix 12 Disintegration Times of Lactose Tablets Containing 4% Various Disintegrants.

Disintegrant	Mean DT (sec)		Hardness
	H_2O	0.1 N HCl	(Kp)
Tapioca	37.83	35.50	7.03
	(1.3292)	(0.0488)	(0.1527)
MTS	39.66	35.67	7.57
	(1.0328)	(1.3662)	(0.4041)
Explotab	31.00	32.67	7.13
	(1.2649)	(1.0328)	(0.1155)
Primojel	31.33	33.17	7.60
	(0.8165)	(1.1696)	(0.6000)

Standard deviations are in parentheses.

Appendix 13 Effect of MTS Disintegrant on Disintegration Times of Erythromycin Stearate Tablets.

Conc.(%)	Mean DT (min)	Mean Hardness (Kp)
0	>120	16.02 (0.2639)
2	88.48 (1.0553)	16.07 (0.2160)
4	49.23 (2.4177)	16.80 (0.2608)
6	36.35 (0.6552)	17.13 (0.5888)
8	25.96 (0.5113)	15.60 (0.8854)
10	20.23 (0.6176)	15.67 (0.9004)

Appendix 14 Effect of Particle Size on Disintegration Times of Erythromycin Stearate Tablets Containing 8% MTS as Disintegrant.

Particle Size (mesh.)	Mean DT (min)	Mean Hardness (Kp)
30	95.48 (0.2898)	14.22 (0.5742)
60	62.27 (0.9331)	14.40 (0.4775)
80	26.05 (0.5098)	14.92 (0.2228)

Standard deviations are in parentheses.

Appendix 15 Disintegration Times of Erythromycin Stearate Tablets Containing 8% Various Disintegrants.

Disintegrant	Mean DT (min)	Mean Hardness (Kp)
Tapioca	>60.00	14.65 (0.4461)
MTS	21.72 (0.2519)	15.36 (0.4633)
Explotab	48.44 (0.3759)	14.86 (0.8454)
Primojel	42.05 (1.0743)	15.33 (0.9004)
Plyplasdone	34.28 (0.3508)	15.58 (0.8256)
Ac-Di-Sol	27.38 (0.5468)	15.00 (0.9466)

Standard deviations are in parentheses.

Appendix 16 Effect of Compressional Forces on Disintegration Times of Paracetamol (APAP) Tablets Containing 4% MTS as Disintegrant.

Compressional Force (lb.)	Mean DT (min)	Mean Hardness (Kp)
1680 (Low)	1.00 (0.0204)	12.50 (0.3742)
2240 (Medium)	0.73 (0.0293)	15.80 (0.5329)
2800 (High)	0.98 (0.0331)	19.30 (0.5307)

Appendix 17 Effect of Incorporating Methods of Disintegrant on Disintegration Times of Paracetamol Tablets Containing 4% MTS as Disintegrant.

Methods of Incorporation	Water		Ethanol	
	Mean DT (min)	Hardness (Kp)	Mean DT	Hardness (Kp)
Internal	1.17 (0.0417)	13.10 (0.6408)	1.00 (0.0350)	12.90 (0.5076)
50% Int.+50% Ext.	1.07 (0.0657)	12.00 (0.9502)	0.98 (0.0349)	11.50 (0.5366)
External	0.91 (0.0618)	12.60 (0.4131)	0.94 (0.1112)	12.90 (0.2168)

Standard deviations are in parentheses.

Appendix 18 Effect of Granulating Fluid on Disintegration Times of Paracetamol Tablets Containing 4% MTS as Tablet Disintegrant.

	Water		Alcohol	
	Mean DT (min)	Mean Hardness (Kp)	Mean DT (min)	Mean Hardness (K
Blank	> 30	10.7 (0.2000)	> 30	10.4 (0.2828)
Tapioca	6.47 (0.2143)	10.9 (0.2828)	5.38 (0.4007)	10.6 (0.5125)
MTS	1.17 (0.0417)	11.4 (0.3445)	1.00 (0.0350)	12.8 (0.4834)
Explotab	0.95 (0.0467)	12.1 (0.5125)	1.12 (0.0492)	10.1 (0.5154)
Primojel	0.99 (0.0216)	11.9 (0.2065)	1.00 (0.0268)	10.3 (0.4000)
Polyplasdone	0.84 (0.0989)	9.5 (0.3430)	3.76 (0.5071)	10.5 (0.5154)
Ac-Di-Sol	1.00 (0.0527)	10.4 (0.6022)	0.96 (0.5955)	10.3 (0.4926)

Standard deviation are in parentheses.

Appendix 19 DT of Paracetamol Tablets Containing 4% MTS as Tablet Disintegrant.

Weak	DT (min)		Hardness (Kp)	
	52.0% RH	71.3% RH	5.20% RH	71.3% RH
0	1.00 (0.0204)	1.00 (0.0204)	12.82 (0.4834)	12.82 (0.4834)
4	1.49 (0.0527)	1.47 (0.1194)	14.63 (0.4633)	14.21 (0.3656)
8	1.82 (0.0749)	1.50 (0.1158)	14.85 (0.4505)	14.35 (0.5612)
12	1.91 (0.0703)	1.84 (0.0537)	13.93 (0.2503)	13.58 (0.5307)

Standard deviations are in parentheses.

Appendix 20 DT. of Paracetamol Tablets Containing 4% Explotab as Tablet Disintegrant.

Week	DT		Hardness (Kp)	
	52.0% RH	71.3% RH	52.0% RH	71.3% RH
0	1.12 (0.0492)	1.12 (0.0492)	10.11 (0.5154)	10.11 (0.5154)
4	2.64 (0.1152)	2.40 (0.1415)	16.72 (0.9432)	12.46 (0.3724)
8	3.13 (0.0836)	3.51 (0.2461)	19.55 (0.4970)	15.95 (0.4889)
12	4.38 (0.0657)	4.97 (0.1061)	17.28 (0.6369)	13.51 (0.4708)

Standard deviations are in parentheses.

Appendix 21 DT. of Paracetamol Tablets Containing 4% Primojel as Tablet Disintegrant.

Week	DT		Hardness (Kp)	
	52.0% RH	71.3% RH	52.3% RH	71.3% RH
0	1.00 (0.0268)	1.00 (0.0268)	10.33 (0.4000)	10.33 (0.4000)
4	1.65 (0.0416)	2.50 (0.0546)	13.76 (0.3559)	14.11 (0.4167)
8	2.16 (0.0550)	3.19 (0.0557)	14.68 (0.4167)	19.05 (0.2345)
12	2.30 (0.1160)	3.29 (0.0543)	13.58 (0.4491)	17.50 (0.7694)

Standard deviations are in parentheses.

Appendix 22 Dissolution Profiles of Paracetamol Tablets Containing 4% MTS, After Aging (52.0% RH).

Time	% Drug Dissolved			
(min)	0 Week	4 Weeks	8 Weeks	12 Weeks
0	0	0	0	0
5	84.72	78.65	76.53	79.90
10	89.54	87.79	86.89	85.60
15	93.37	90.55	91.10	90.68
20	97.02	93.71	94.05	91.90
30	98.14	97.29	96.53	93.62
45	99.49	99.37	97.96	94.77
60	99.80	99.37	97.96	94.77

Appendix 23 Dissolution Profiles of Paracetamol Tablets Containing 4% MTS, After Aging (71.3% RH).

Time	% Drug Dissolved			
(min)	0 Week	4 Weeks	8 Weeks	12 Weeks
0	0	0	0	0
5	84.72	71.08	76.41	58.41
10	89.54	87.55	88.74	79.45
15	93.37	91.00	91.90	87.79
20	97.03	94.69	95.39	94.73
30	98.14	99.11	95.89	96.04
45	99.49	100.00	95.98	96.37
60	99.80	100.00	95.98	96.37

Appendix 24 Dissolutions Profiles of Paracetamol Tablets Containing 4% Various Disintegrants. After aging 12 weeks (52.0% RH).

Time	% Drug Dissoled		
(min)	MTS	Explotab	Primojel
0	0	0	0
5	79.90	64.85	72.40
10	85.60	80.50	84.46
15	90.68	83.13	86.42
20	91.90	87.30	87.16
30	93.62	88.06	87.74
45	94.77	88.57	88.15
60	94.77	88.57	88.15

Appendix 25 Disolution Profiles of Paracetamol Tablets Containing 4% Various Disintegrants. After Aging 12 weeks (71.3% RH).

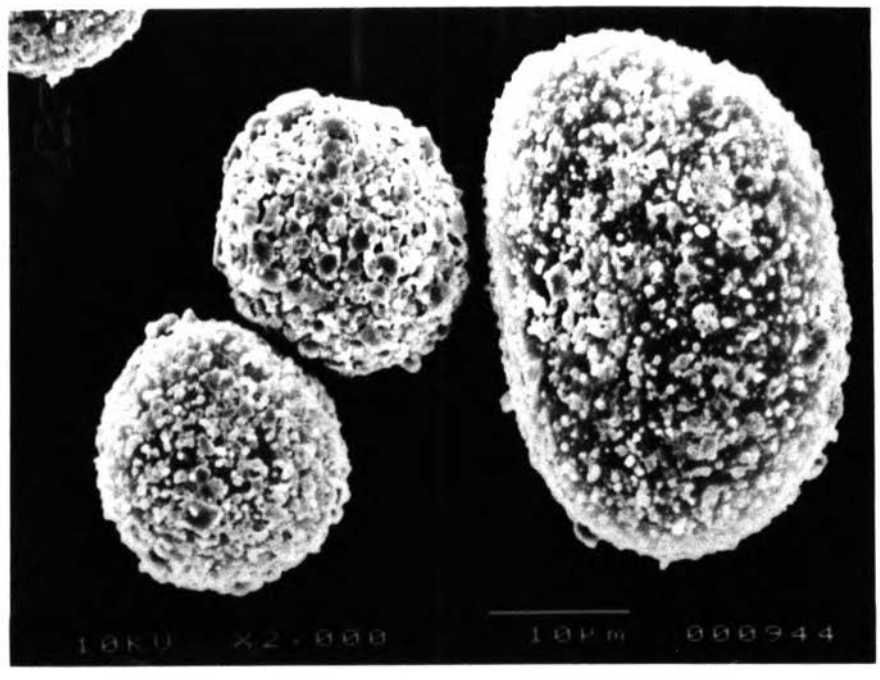
Time	% Drug Dissolved		
(min)	MTS	Explotab	Primojel
0	0	0	0
5	58.41	63.47	75.19
10	79.46	79.87	86.92
15	87.79	82.40	87.74
20	94.73	86.77	88.48
30	96.04	87.79	88.72
45	96.37	88.54	89.13
60	96.37	89.13	89.21

Appendix 26 Dissolution Profiles Paracetamol Tablets Using 4% MTS Powder After Aging At Various Time Intervals (52.0% RH).

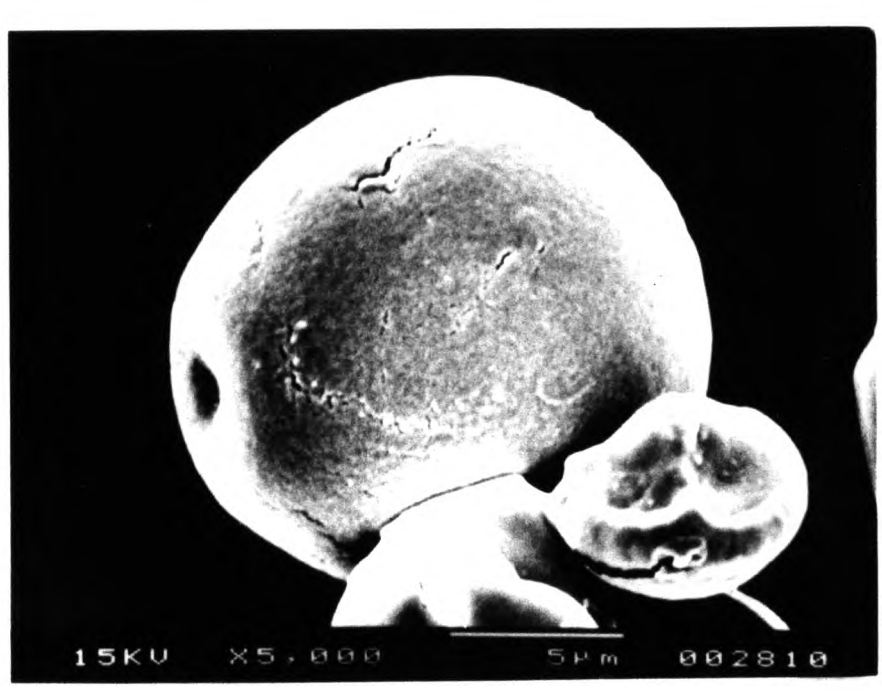
Time	% Drug Dissolved			
(min)	0 Week	4 Weeks	8 Weeks	12 Weeks
0	0	0	0	0
5	84.72	85.65	79.40	79.16
10	89.54	89.04	84.74	83.18
15	93.37	92.91	87.46	84.85
20	97.02	95.23	90.54	88.22
30	98.14	96.86	92.09	90.72
45	99.49	96.93	94.51	92.73
60	99.80	96.93	95.04	92.73

Appendix 27 Dissolution profiles of Paracetamol Tablets Using 4% MTS Powder After Aging At Various Time Intervals (71.3% RH)

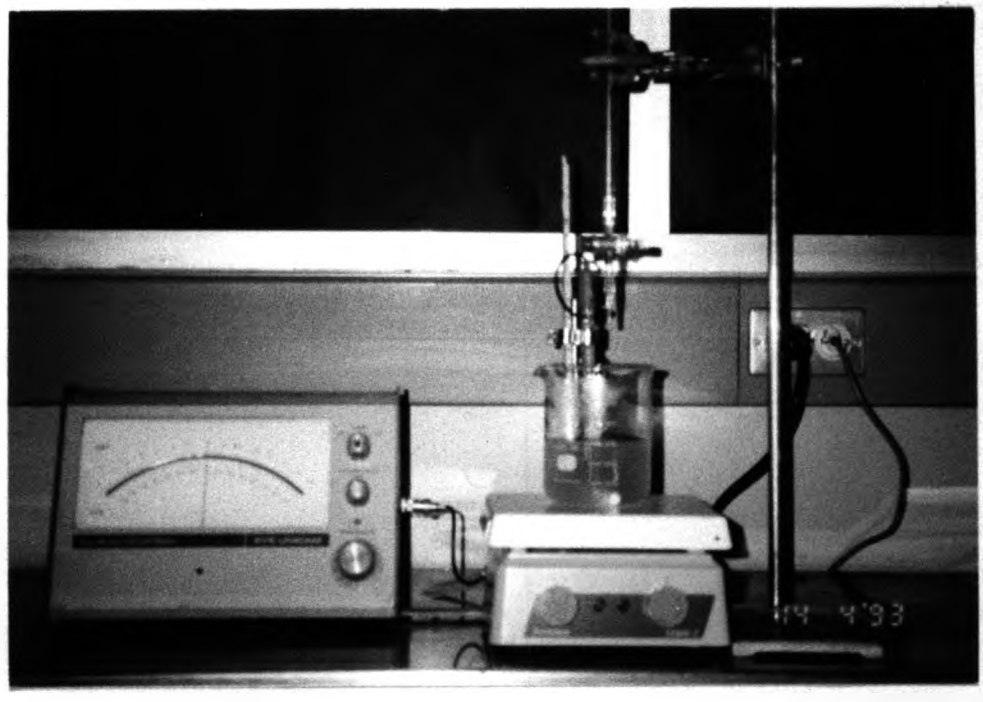
Time	% Drug Dissolved			
(min)	0 Week	4 Weeks	8 Weeks	12 Weeks
0	0	0	0	0
5	84.72	70.74	69.52	55.32
10	89.54	89.50	85.71	73.15
15	93.37	91.19	87.15	79.24
20	97.03	92.62	88.93	83.52
30	98.14	94.06	89.69	88.50
45	99.49	94.77	90.29	90.11
60	99.80	95.13	90.97	90.11



Appendix 28 Scanning Electron Micrograph of Explotab^{R}, 2000x



Appendix 29 Scanning Electron Micrograph of Modified Tapioca Starch from Experiment, 5000x



Appendix 30 Apparatus for Potentiometric Tritation to Determine Carboxyl Group in Modified Starches

Appendix 31 Apparatus for Determination of Viscosity of Modified Starches.

VITA

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