



REFERENCES

รายงานประจำปี 2532-2533 กรมวิทยาศาสตร์การแพทย์ กระทรวงสาธารณสุข

- Backenfeld, T., Muller, B.W., Wiese, M., and Seydel, J.K. 1990. Effect of cyclodextrin derivatives on indomethacin stability in aqueous solution. Pharm. Research. 7(5): 484-490.
- Borka, L. 1974. The polymorphism of indomethacin. Acta. Pharm.Suecica 11: 295-303.
- Chiou, W., and Riegelman, S. 1969. Preparation and dissolution characteristics of several fast releases solid dispersions of griseofulvin. J. Pharm. Sci. 58: 1505.
- Cipiciani, A., Eb rt, C., Linda, P., Rubessa, F., and Savelli, G. 1983. Kinetic and mechanism of the basic hydrolysis of indomethacin and related compounds. J. Pharm. Sci. 72: 1075-1076.
- Corrigan, O.I., Holohan, E.M., and Reilly, M.R. 1985. Physico-chemical properties of indomethacin and related compound co-spray dried with polyvinylpyrrolidone. Drug Devel. Indus. Pharm. 11(2-3): 677-695.
- _____, and Stanley, C.T. 1982. Mechanism of drug dissolution rate enhancement from β -cyclodextrin-drug systems. J. Pharm. Pharmacol. 34: 621-626.
- Duchene, D., Vaution, C., and Glomot, F. 1986. Cyclodextrins, their value in pharmaceutical technology. Drug Devel. Indus. Pharm. 12(11-13): 2193-2215.

- _____, and Wouessidjewe, D. 1990. Pharmaceutical uses of cyclodextrins and derivatives. Drug Devel. Indus. Pharm. (16-17): 2487-2499.
- Fini, A., Rabasco, A.M., Burson, J.L.S. 1992. Stability study of piroxicam in aqueous solution. Pharm. Acta. Helv. 67(2): 62-64.
- Ford, J.L., and Rubinstein, M.H. 1981. Investigation into some pharmaceutical interactions by differential scanning calorimetry. Drug. Devel. Indus. Pharm. 7(6): 675-682.
- _____, and Rubinstein, M.H. 1978. Phase equilibria and dissolution rate of indomethacin - polyethylene glycol 6000 solid dispersion. Pharm. Acta. Helv. 53(11): 327.
- Gergely, V., Sebestyen, G., and Virag, S. 1982. Toxicity studies of β -cyclodextrin. Proceedings of 1 st International symposium on cyclodextrins: 109-113.
- Goldbreg, A., Gibaldi, M, and Kanig, J. 1966 a. Increasing dissolution rate and gastrointestinal absorption of drugs via solid solution and eutectic mixture III, Experiment evaluation of griseofulvin-succinic acid solid solution. J. Pharm. Sci. 55: 487.
- _____, Gibaldi, M., and Kanig, J. 1966 b. Increasing dissolution rate and gastrointestinal absorption of drugs via solid solution and eutectic mixture II, Experiment evaluation of a eutectic mixture: urea acetaminophen system, J. Pharm. Sci. 55: 482.
- Hajratwala, B.R., and Dawson, J.E. 1977. Kinetics of indomethacin degradation 1: Presence of alkali. J. Pharm. Sci. 66: 27-29.
- Haleblian, J.K., and McCrone, W. 1969. Pharmaceutical applications of polymorphisms. J. Pharm. Sci. 58: 911-929.

- Hamada, Y., Nambu, N., and Nagai, T. 1975. Interactions of α - and β -cyclodextrin with several non-steroid anti-inflammatory drugs in aqueous solution. Chem. Pharm. Bull. 23: 1205-1211.
- Hamed, M.A. 1989. Dissolution, bioavailability and bioequivalence. Mack Printing Company, Easton, Pennsylvania. 265-284.
- Herzfeldt, C.D., and Kummel, R. 1983. Dissociation constants, solubilities and dissolution rates of some selected nonsteroidal antiinflammatories. Drug Devel. Indus. Pharm. 9(5): 767-793.
- Higuchi, T., and Connors, K.A. 1965. Phase solubility techniques. Adv. Anal. Chem. Instr. 4: 117-212.
- _____, Dayal, S., and Pitman, I. 1972. Effects of solute-solvent complexation reactions on dissolutions kinetics: Testing of a model by using a concentration jump technique. J. Pharm. Sci. 61: 965
- Hom, F., and Miskel, J. 1970. Oral dosage form design and its influence on dissolution rates for a series of drugs. J. Pharm. Sci. 59: 827.
- Javid, K., and Cadwallader, D. 1972. Dissolution of aspirin from tablets containing various buffering agents. J. Pharm. Sci. 61: 1370.
- Jones, S.P., Grant, J.W., Hadgraft, J., and Parr, G.D. 1984. Cyclodextrins in the pharmaceutical sciences, Part II. Acta Pharm. Technol. 30 : 263-277
- Khan, K.A. 1981. Application of techniques for improving efficacy of solid dosage forms. Drug Devel. Indus. Pharm. 7(4): 421-438.
- Krasowska, H. 1978. Solubilities of certain anti-inflammatory compounds in nonionic surfactant solution. Pharm. Ind. 40: 1381-1384.

- Kurozumi, M., Nambu, N., and Nagai, T. 1975. Inclusion compounds of non-steroidal antiinflammatory and other slightly water soluble drugs with α - and β -cyclodextrins in powdered form. Chem. Pharm. Bull. 23(2): 3062-3068.
- La Manna, A., Giornado, F., and Gazzaniga, A. 1990. Cyclodextrins as "Active" excipients in tableting technology. Minutes of the fifth international symposium on cyclodextrins. Paris. : 563-568.
- Lin, S.Y., and Kao, Y.H. 1989. Solid particulates of drugs- β -cyclodextrin inclusion complexes directly prepared by spray drying technique. Int. J. Pharm. 56: 249-259.
- _____, Kao, Y.H., and Yang, J.C. 1988. Grinding effect of some pharmaceutical properties of drugs by adding β -cyclodextrin. Drug Devel. Indus. Pharm. 14(1): 99-118.
- Luu, S.N., Chaperon, F., Leinot, M., and Pourrat, A. 1987. Enhancement of pharmaceutical activity of CERM 3726 with a ground mixture of β -cyclodextrin in mice. Pharm. Acta. Helv. 62(129): 335-336.
- Marlowe, E., and Shangraw, R.F. 1967. Dissolution of sodium salicylate from tablets matrices prepared by wet granulation and direct compression. J. Pharm. Sci. 56: 498
- Matthew, O brian., McCauley, J., and Cohen, E. 1984. Indomethacin. Analytical profiles of drug substances. Academic Press, New York. vol. 13: 211-238.
- McGinity, J., and Harris, M. 1980. Increasing dissolution rates of poorly soluble drugs by adsorption to montmorillonite. Drug Devel. Indus. Pharm. 6: 35.

- Mladen, M., Hrvoje, H., Josip, K., and Branka, K. 1986. Piroxicam. Analytical profiles of drug substances. Academic Press, New York. vol. 15: 511-531.
- Monkhouse, D., and Lach, J. 1972. Use of adsorbents in enhancement of drug dissolution 1. J. Pharm. Sci. 61: 1430.
- Najib, N.M., and Suleiman, M.S. 1985. The effect of hydrophilic polymer and surface active agents on the solubility of indomethacin. Int. J. Pharm. 24: 165-171.
- Nakai, Y. 1986. Molecular behavior of medicinals in ground mixtures with microcrystalline cellulose and cyclodextrins. Drug Devel. Indus. Pharm. 12 (7): 1017-1039.
- _____, Nakamishi, S., Yamamoto, K., Terada, K., and Konno, T. 1980. Effects of grinding on physical and chemical properties of the crystallines medicinals microcrystalline cellulose, Infrared spectra of medicinals in ground mixtures. Chem. Pharm. Bull. 28: 652-656.
- _____, Yamamoto, K., Terada, K., and Watanabe, D. 1987. New method for preparing cyclodextrin inclusion compound I. Heating in a sealed container. Chem. Pharm. Bull. 35: 4609-4615.
- _____, Yamamoto, K., Terada, K., Oguchi, T., Saito, H., and Watanabe, D. 1989. New method for preparing cyclodextrin inclusion compound II. Effect of heating temperature, water content and drug properties on the inclusion formation. Chem. Pharm. Bull. 37(4): 1055-1058.

- Nambu, N., Kikuchi, T., Takahashi, Y., and Ueda, H. 1978. Influence of inclusion of nonsteroidal antiinflammatory on the irritation to stomach of rats upon administration. Chem. Pharm. Bull. 26: 3609-3612.
- _____, Shimoda, M., Takahashi, Y., Ueda, H., and Nagai, T. 1978. Bioavailability of powdered inclusion compounds of Nonsteroidal antiinflammatory drugs with β -cyclodextrin in rabbits and dogs. Chem. Pharm. Bull. 26(10): 2952-2956.
- Newton, J., Rowley, G., and Tornblom, J. 1971. The effect of additives on the release of drugs from hard gelatin capsules. J. Pharm. Pharmacol. 23: 452.
- Nozawa, Y., and Yamamoto, A. 1989. Effects of roll mixing with β -cyclodextrin on enhancing solubilities of water insoluble drugs. Pharm. Acta. Helv. 64(1): 24-29.
- Pasini, M., Acerbi, D., Bovis, G., Peveri, T., Ventura, P., and Carli, F. 1990. Influence of inclusion process on biopharmaceutical properties of piroxicam/ β -cyclodextrin complexes Minutes of the fifth international symposium on cyclodextrins. Paris: 455-459
- Saenger, W. 1980. Cyclodextrin inclusion compounds in research and industry. Angew. Chem. Int. Ed. Engl. 19: 344-362.
- Serpelloni, M., and Mentink, L. 1990. Industrial preparation methods of β -cyclodextrin compounds. Minutes of the fifth international symposium on cyclodextrins. Paris: 288-293.
- Shangraw, R.F., Ande, G.P. and Gala, P. 1990. Characterization of the tableting properties of β -cyclodextrin and the effects of processing variables on inclusion complex formation,

- compactibility and dissolution. Minutes of the Fifth International Symposium on Cyclodextrins. Paris: 563.
- Stephen, P.T. Grant, D.J.W., Hadgraft, J. and Parr, G. 1984. Cyclodextrins in the pharmaceutical sciences, Part 1. Acta Pharm. Techno. 30(3): 213.
- Strattan, E. Charles. 1990. Cyclodextrin based drug delivery, Pharmaceutical Manufacturing International: 203-209.
- Szabo-Revesz, P., Pintye-Hod, K., Miseta, M., and Selmeczi, B. 1989. Chloramphenicol- β -cyclodextrin. Pharm. Ind. 51: 94-97
- Szejtli, J. 1982. Cyclodextrins and their inclusion complexes. Akademiai Kiado, Budapest.
- The United States Pharmacopoeia. 22nd revision. The National Formulary 17th ed. 1990. Mack publishing Company, Easton, Pa. 689-690, 1091-1092.
- Uekama, K., Oh, O., Otagiri, M., Seo, H., and Tsuruoka, M. 1983. Improving of some pharmaceutical properties of clofibrate by cyclodextrin complexation. Pharm. Acta. Helv. 58(12): 338-342.
- Vrečer, F., Srcić, S., and Smid-Korbar, J. 1991. Investigation of piroxicam polymorphism. Int. J. Pharm. 68: 5-41.
- Wurster, D., and Polli, G. 1961. Investigation of drug released from solids V, Simultaneous influence of absorption and viscosity on the dissolution rate. J. Pharm. Sci. 50: 403.
- Yamamoto, K., Hanawa, T., Yonemoshi, E., Oguchi, T., and Nagai, Y. 1991. Preparation of cyclodextrin inclusion compound by sealed heating method-benzoic acid and dimethyl β -cyclodextrin system. The second symposium Japan-Thai symposium on

powder technology application to environmental protection.

22-23 Aug. 1991. : IP 3-1 - IP 3-6.

Yoshinobu, N. 1986. Molecular behavior of medicinals in ground mixtures with microcrystalline cellulose and cyclodextrins.

Drug Devel. Indus. Pharm. 12(7): 1017-1039.

Zecchi, V., Orieti, I., and Fini, A. 1988. Controll of NSAID dissolution by β -cyclodextrin complexation. Pharm. Acta. Helv. 63(11): 299-302.

APPENDIX 1

Calibration curve of indomethacin

No.	conc. mcg/ml	Absorbance	Regression output	
			constant	0.003
			Std error of Y Est	0.003
			R Squared	1.000
			No. of observation	8.000
			Degrees of freedom	6.000
			X Coefficients	0.020
			Standard error of Coef.	0.000
1	0.000	0.000		
2	10.640	0.216		
3	15.960	0.326		
4	21.280	0.427		
5	26.600	0.537		
6	31.920	0.640		
7	37.240	0.745		
8	42.560	0.852		

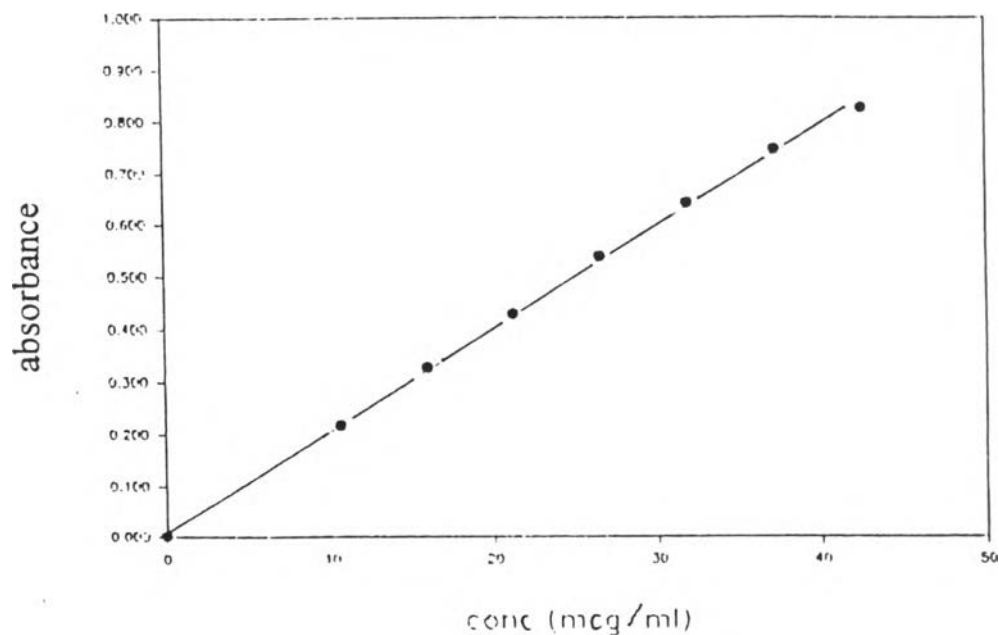


Fig 51 Standard curve of indomethacin

APPENDIX 2

Dissolution Profiles: Indomethacin 25 mg
 Volume of pipet 5.00 ml
 Volume of medium 750.00 ml
 mg per tablet 25.00 mg

Formulation 1-1

No	Time (min)	% Release						Average Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	54.52	55.12	49.86	47.01	43.40	55.57	50.91	5.00	2.04
2	10.00	97.70	98.16	93.76	93.29	90.11	96.96	95.00	3.14	1.28
3	15.00	102.86	103.77	98.90	97.52	93.57	102.41	99.84	3.92	1.60
4	20.00	105.95	107.31	101.06	100.42	96.30	105.05	102.68	4.15	1.70
5	25.00	107.41	109.08	102.33	102.30	98.14	106.50	104.29	4.08	1.66
6	30.00	108.57	110.11	103.46	103.43	99.70	107.81	105.51	3.95	1.61

Formulation 1-2

No	Time	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	63.38	80.66	82.46	69.09	80.21	78.56	75.73	7.67	3.13
2	10.00	100.61	99.08	96.08	94.79	101.93	101.92	99.07	3.03	1.24
3	15.00	104.14	101.84	98.68	98.13	104.11	104.55	101.91	2.88	1.18
4	20.00	105.73	104.02	100.69	100.29	105.25	106.15	103.69	2.58	1.05
5	25.00	106.74	105.17	101.21	101.25	106.26	106.86	104.58	2.66	1.09
6	30.00	107.60	105.87	101.58	101.93	106.81	107.27	105.18	2.72	1.11

Formulation 1-3

No	Time	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	67.44	73.30	59.03	51.52	57.07	56.32	60.78	8.04	3.28
2	10.00	94.78	94.52	97.28	93.62	90.06	93.06	93.89	2.37	0.97
3	15.00	100.37	99.06	102.89	99.51	95.76	98.48	99.34	2.34	0.95
4	20.00	103.59	101.67	105.68	102.27	99.11	101.24	102.26	2.23	0.91
5	25.00	105.19	104.00	107.13	104.31	100.52	103.57	104.12	2.17	0.89
6	30.00	106.49	105.44	108.15	105.30	101.64	104.86	105.31	2.15	0.88

Formulation		I-4								
No	Time (min)	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	27.78	41.75	36.79	21.17	17.86	37.09	30.41	9.63	3.93
2	10.00	75.44	85.90	96.68	87.56	89.64	95.63	88.48	7.71	3.15
3	15.00	96.67	96.54	105.74	100.01	100.31	100.33	99.93	3.35	1.37
4	20.00	103.03	100.18	107.80	102.48	102.48	101.90	102.98	2.56	1.04
5	25.00	104.61	101.60	108.81	103.47	103.61	103.03	104.19	2.47	1.01
6	30.00	105.31	102.28	109.54	104.16	104.30	103.56	104.86	2.50	1.02

Formulation		I-5								
No	Time	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	0.59	30.48	4.64	0.13	3.74	2.54	7.02	11.63	4.75
2	10.00	63.84	99.94	55.15	48.36	60.10	69.56	66.16	18.07	7.38
3	15.00	89.35	105.87	82.41	78.13	86.34	96.16	89.71	10.02	4.09
4	20.00	95.96	112.28	94.08	88.72	95.78	104.77	98.60	8.47	3.46
5	25.00	99.30	113.03	97.86	90.81	97.93	105.77	100.78	7.66	3.13
6	30.00	100.41	113.79	98.96	91.27	98.43	105.87	101.45	7.64	3.12

Formulation		I-6								
No	Time	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	28.53	51.36	46.71	44.45	45.51	58.28	45.81	9.88	4.03
2	10.00	86.41	98.58	98.55	102.29	87.42	99.98	95.54	6.82	2.79
3	15.00	98.70	103.29	101.46	105.23	93.72	102.15	100.76	4.07	1.66
4	20.00	99.96	104.13	102.14	105.78	95.09	102.68	101.63	3.75	1.53
5	25.00	100.33	104.53	102.37	106.33	96.03	103.21	102.13	3.61	1.47
6	30.00	100.55	104.62	102.45	106.59	96.22	103.30	102.29	3.60	1.47

Formulation		I-7								
No	Time	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	47.61	53.62	64.89	47.61	61.13	46.71	53.59	7.79	3.18
2	10.00	96.00	93.79	96.27	94.65	97.14	92.24	95.01	1.81	0.74
3	15.00	99.80	98.17	99.16	98.14	98.39	95.71	98.23	1.39	0.57
4	20.00	101.81	99.58	100.72	100.14	100.10	97.40	99.96	1.47	0.60
5	25.00	103.24	100.54	101.85	100.96	100.62	98.35	100.93	1.62	0.66
6	30.00	103.93	101.36	102.53	101.78	101.14	98.70	101.57	1.73	0.71

Formulation		I-8								
No	Time (min)	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	37.39	31.68	49.11	43.10	21.17	41.90	37.39	9.86	4.03
2	10.00	92.78	78.47	76.78	78.54	85.61	78.99	81.86	6.16	2.52
3	15.00	95.95	82.75	78.80	80.42	89.49	82.22	84.94	6.52	2.66
4	20.00	97.64	84.05	79.77	81.71	90.83	83.52	86.25	6.72	2.74
5	25.00	99.35	85.06	80.60	82.40	91.59	84.37	87.23	7.01	2.86
6	30.00	95.50	85.63	81.44	83.10	92.20	85.09	87.16	5.49	2.24

Formulation		I-9								
No	Time	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	15.61	22.52	11.40	7.80	22.67	6.59	14.43	7.06	2.88
2	10.00	76.86	69.69	62.86	64.79	86.82	72.59	72.27	8.76	3.58
3	15.00	106.07	99.60	97.68	95.27	106.18	96.81	100.27	4.75	1.94
4	20.00	108.73	108.38	102.39	105.82	109.59	109.63	107.42	2.83	1.16
5	25.00	109.15	109.25	103.52	108.18	110.32	110.51	108.49	2.58	1.05
6	30.00	109.13	109.23	103.31	108.60	110.31	110.64	108.54	2.67	1.09

Formulation		I-10								
No	Time	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	23.12	16.96	19.36	17.86	40.70	29.88	24.65	9.17	3.74
2	10.00	67.74	65.90	67.57	70.56	71.92	71.85	69.26	2.53	1.03
3	15.00	75.71	75.65	74.33	81.10	78.41	80.44	77.61	2.79	1.14
4	20.00	81.47	82.62	78.13	87.50	84.34	85.63	83.28	3.31	1.35
5	25.00	85.62	86.78	82.41	92.74	88.66	89.81	87.67	3.58	1.46
6	30.00	89.65	92.01	85.96	97.11	93.60	93.56	91.98	3.83	1.56

Formulation		I-11								
No	Time	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	4.04	10.05	10.35	5.54	19.21	11.55	10.13	5.34	2.18
2	10.00	68.22	54.74	71.72	54.71	58.40	44.38	58.69	9.97	4.07
3	15.00	86.10	78.39	87.22	78.51	79.38	76.23	80.97	4.54	1.85
4	20.00	91.63	89.13	98.32	87.44	89.52	88.30	90.72	3.98	1.62
5	25.00	94.05	94.23	99.57	90.43	92.67	93.55	94.08	3.03	1.24
6	30.00	94.82	95.61	99.78	91.79	93.44	94.92	95.06	2.69	1.10

Formulation		1-12								
No	Time (min)	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	58.58	50.31	63.83	57.52	46.86	55.12	55.37	6.08	2.48
2	10.00	89.76	95.27	85.59	85.25	92.69	94.10	90.44	4.30	1.76
3	15.00	94.42	100.86	90.52	89.73	99.32	99.38	95.70	4.85	1.98
4	20.00	97.60	104.54	92.93	91.98	102.38	102.30	98.62	5.30	2.16
5	25.00	99.16	105.54	94.75	93.64	103.97	103.58	100.11	5.06	2.06
6	30.00	100.42	106.99	96.28	95.17	105.56	105.02	101.57	5.05	2.06

Formulation		1-13								
No	Time	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	3.74	9.15	5.39	1.79	3.89	4.34	4.72	2.47	1.01
2	10.00	55.00	59.99	75.59	48.07	56.80	55.90	58.56	9.22	3.76
3	15.00	86.31	80.67	95.02	78.89	84.67	83.32	84.81	5.67	2.32
4	20.00	90.94	92.03	101.36	91.89	91.85	92.89	93.49	3.91	1.59
5	25.00	92.75	96.24	102.79	97.61	94.11	95.46	96.49	3.51	1.43
6	30.00	93.97	97.49	103.93	99.01	95.49	96.85	97.79	3.46	1.41

Formulation		1-14								
No	Time	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	32.74	29.88	14.71	17.41	18.31	18.16	21.87	7.48	3.05
2	10.00	81.93	78.76	82.41	77.47	68.01	77.48	77.68	5.20	2.12
3	15.00	87.28	86.49	87.02	87.45	81.99	83.70	85.66	2.27	0.93
4	20.00	90.12	89.32	89.55	89.54	84.49	86.36	88.23	2.27	0.93
5	25.00	91.77	90.97	91.20	91.19	86.55	87.99	89.95	2.14	0.87
6	30.00	93.44	92.33	92.56	91.94	87.88	89.03	91.20	2.21	0.90

Formulation		1-15								
No	Time	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	71.95	43.10	37.84	68.79	51.36	40.70	52.29	14.74	6.02
2	10.00	96.46	90.11	94.73	97.34	94.82	91.00	94.08	2.92	1.19
3	15.00	98.61	93.42	98.37	99.80	97.26	97.01	97.41	2.20	0.90
4	20.00	99.72	94.64	99.63	100.76	98.96	98.26	98.66	2.14	0.87
5	25.00	100.23	94.97	100.14	101.28	100.07	99.07	99.29	2.23	0.91
6	30.00	100.75	95.45	100.81	101.66	100.89	99.73	99.88	2.25	0.92

Formulation		I-16								
No	Time (min)	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	43.10	33.79	45.36	49.26	30.33	53.62	42.58	8.96	3.66
2	10.00	76.59	76.53	76.16	71.37	62.83	76.21	73.28	5.50	2.24
3	15.00	81.31	81.85	82.52	76.36	78.58	81.38	80.33	2.37	0.97
4	20.00	84.70	86.00	86.68	79.87	85.41	85.37	84.67	2.44	1.00
5	25.00	87.82	89.43	90.26	83.11	89.59	88.35	88.09	2.60	1.06
6	30.00	90.21	92.43	92.82	85.61	92.59	91.19	90.81	2.73	1.11

Formulation		I-17								
No	Time	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	60.83	56.47	62.03	60.23	61.73	53.02	59.05	3.57	1.46
2	10.00	93.99	91.40	91.59	88.87	97.30	88.98	92.02	3.21	1.31
3	15.00	96.87	93.67	94.15	91.27	97.04	91.07	94.01	2.59	1.06
4	20.00	97.96	94.89	95.08	91.88	98.44	92.28	95.09	2.75	1.12
5	25.00	98.62	95.37	95.72	92.64	98.95	92.59	95.65	2.76	1.13
6	30.00	98.82	95.56	95.75	93.26	99.31	92.61	95.89	2.76	1.13

Formulation		I-18								
No	Time	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	27.78	22.22	37.39	69.69	19.67	20.12	32.81	19.25	7.86
2	10.00	87.46	81.41	87.82	94.95	93.26	89.66	89.09	4.80	1.96
3	15.00	90.59	93.67	89.46	96.78	96.29	94.46	93.54	2.98	1.21
4	20.00	90.90	94.60	89.75	89.61	96.48	96.29	92.94	3.22	1.32
5	25.00	90.90	94.78	96.36	89.01	96.52	96.64	94.03	3.29	1.34
6	30.00	90.91	94.36	96.70	98.32	96.26	96.38	95.49	2.57	1.05

Formulation		I-19								
No	Time	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	58.43	57.52	38.74	46.71	57.37	76.75	55.92	12.84	5.24
2	10.00	91.87	90.06	89.03	88.03	88.40	85.83	88.87	2.03	0.83
3	15.00	95.18	93.51	97.59	91.02	93.65	90.61	93.59	2.61	1.06
4	20.00	95.97	93.39	98.54	92.08	94.58	91.51	94.34	2.62	1.07
5	25.00	96.61	93.86	99.20	92.70	94.91	92.12	94.90	2.65	1.08
6	30.00	96.65	94.03	99.41	93.01	95.24	92.29	95.10	2.62	1.07



Formulation I-20

No	Time (min)	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	15.46	16.06	32.59	30.63	7.20	26.43	21.39	10.01	4.09
2	10.00	72.50	80.02	83.28	77.86	67.64	77.68	76.50	5.59	2.28
3	15.00	81.25	84.91	86.39	84.24	80.41	86.91	84.02	2.67	1.09
4	20.00	84.19	86.98	88.02	86.45	82.90	89.15	86.28	2.35	0.96
5	25.00	85.96	88.16	89.81	88.23	84.95	90.79	87.98	2.22	0.91
6	30.00	87.43	89.34	91.46	89.27	87.62	92.15	89.55	1.93	0.79

Formulation I-21

No	Time	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	23.72	28.08	31.83	35.29	35.89	30.93	30.96	4.57	1.87
2	10.00	62.49	79.20	73.06	83.90	70.38	65.54	72.43	8.10	3.31
3	15.00	75.68	89.49	86.17	90.32	90.53	84.91	86.18	5.64	2.30
4	20.00	83.99	92.64	87.94	91.52	94.59	90.88	90.26	3.77	1.54
5	25.00	89.96	93.56	88.68	92.43	95.37	93.89	92.32	2.54	1.04
6	30.00	91.31	94.03	89.57	92.60	96.01	94.82	93.06	2.37	0.97

Formulation I-22

No	Time	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	19.36	26.73	33.94	36.94	24.17	41.75	30.48	8.46	3.46
2	10.00	74.18	84.90	76.08	84.81	81.12	87.25	81.39	5.26	2.15
3	15.00	87.74	89.22	89.81	92.29	90.53	93.99	90.60	2.24	0.91
4	20.00	90.43	90.56	91.16	93.81	91.73	96.12	92.30	2.24	0.91
5	25.00	91.79	91.92	92.97	94.88	93.24	97.36	93.69	2.12	0.86
6	30.00	93.15	92.98	93.44	95.66	93.87	98.31	94.57	2.07	0.85

Formulation I-23

No	Time	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	11.85	12.30	7.05	10.80	13.81	16.36	12.03	3.11	1.27
2	10.00	50.99	50.24	52.31	49.33	50.86	50.27	50.67	1.00	0.41
3	15.00	63.95	61.85	59.72	60.33	62.31	62.78	61.82	1.57	0.64
4	20.00	69.94	68.27	63.73	67.19	71.29	69.05	68.25	2.62	1.07
5	25.00	75.36	72.18	68.51	72.15	75.67	76.12	73.33	2.95	1.20
6	30.00	79.47	75.52	71.52	76.23	78.73	77.98	76.58	2.89	1.18

Formulation		I-24								
No	Time (min)	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	10.95	24.02	20.42	20.72	22.52	19.06	19.61	4.58	1.87
2	10.00	68.26	73.76	66.52	63.52	69.09	63.96	67.52	3.78	1.54
3	15.00	77.58	81.76	75.83	77.02	78.72	75.36	77.71	2.32	0.95
4	20.00	81.56	85.91	78.74	79.18	80.44	78.41	80.71	2.81	1.15
5	25.00	84.35	88.29	81.67	83.77	82.18	79.54	83.30	2.98	1.22
6	30.00	86.12	90.08	83.72	85.98	85.13	83.22	85.71	2.44	1.00

Formulation		I-25								
No	Time	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	30.63	27.78	26.58	25.52	18.76	25.07	25.72	3.95	1.61
2	10.00	75.61	77.99	76.48	68.81	64.56	77.97	73.57	5.57	2.28
3	15.00	86.78	85.57	81.95	82.19	79.56	83.45	83.25	2.62	1.07
4	20.00	89.01	88.10	84.90	86.65	81.45	86.26	86.06	2.68	1.09
5	25.00	90.95	89.73	86.97	88.57	85.29	88.49	88.34	2.00	0.82
6	30.00	92.01	90.48	89.35	90.37	88.72	90.13	90.18	1.12	0.46

Formulation		I-26								
No	Time	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	21.47	12.45	19.51	39.50	16.06	39.35	24.72	11.79	4.81
2	10.00	68.63	66.17	70.73	80.02	62.44	70.56	69.76	5.91	2.41
3	15.00	81.11	72.17	75.40	85.06	75.48	76.74	77.66	4.64	1.89
4	20.00	83.15	74.00	76.96	86.68	77.93	78.30	79.50	4.59	1.88
5	25.00	84.46	74.95	78.07	88.01	79.65	79.42	80.76	4.70	1.92
6	30.00	86.22	75.90	79.64	89.05	80.93	80.55	82.05	4.76	1.95

Formulation		I-27 POWDER								
No	Time	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	26.58	13.81	14.86	18.16	20.27	23.12	19.46	4.89	2.00
2	10.00	39.97	39.74	39.29	42.77	40.23	46.26	41.38	2.69	1.10
3	15.00	47.90	49.32	49.47	51.92	50.12	56.03	50.79	2.88	1.18
4	20.00	54.83	57.01	56.26	59.63	57.51	64.22	58.24	3.32	1.36
5	25.00	60.46	63.70	61.90	65.89	63.30	70.51	64.29	3.55	1.45
6	30.00	64.92	68.63	66.21	70.53	67.48	76.09	68.98	3.99	1.63

Formulation		I-27 SOLUTION								
No	Time (min)	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	25.37	31.83	40.10	42.50	22.67	36.19	33.11	7.96	3.25
2	10.00	44.77	52.33	59.59	60.81	50.16	51.46	53.19	6.05	2.47
3	15.00	52.13	60.19	67.80	70.83	56.51	59.01	61.08	7.02	2.87
4	20.00	57.59	66.00	74.72	76.71	61.39	64.96	66.90	7.47	3.05
5	25.00	62.03	70.49	79.87	81.58	64.81	70.05	71.47	7.87	3.21
6	30.00	65.30	74.27	83.86	86.63	67.79	74.13	75.33	8.49	3.47

Formulation		I-28								
No	Time	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	16.96	14.11	12.60	12.60	13.20	12.30	13.63	1.75	0.72
2	10.00	36.60	35.53	34.47	35.37	34.93	35.52	35.41	0.72	0.29
3	15.00	47.67	45.69	45.97	45.98	44.17	45.52	45.83	1.12	0.46
4	20.00	54.14	51.55	52.59	53.04	51.38	50.94	52.27	1.21	0.49
5	25.00	59.16	63.16	62.10	59.26	59.23	60.89	60.63	1.71	0.70
6	30.00	64.06	61.33	64.47	62.35	63.99	63.40	63.27	1.20	0.49

Formulation		I-29								
No	Time	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	22.22	14.26	16.21	19.21	17.86	20.57	18.39	2.91	1.19
2	10.00	47.46	39.44	39.90	47.74	41.57	43.39	43.25	3.64	1.49
3	15.00	56.79	49.02	50.09	53.61	50.56	52.54	52.10	2.84	1.16
4	20.00	63.48	56.56	57.48	65.09	62.16	60.70	60.91	3.36	1.37
5	25.00	69.01	63.39	63.87	68.38	66.33	63.96	65.82	2.45	1.00
6	30.00	73.52	67.87	69.11	73.04	70.08	69.50	70.52	2.26	0.92

Formulation		I-30								
No	Time	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	24.17	22.97	27.78	23.57	23.27	20.87	23.77	2.26	0.92
2	10.00	33.65	38.60	36.53	37.85	38.30	37.53	37.08	1.83	0.75
3	15.00	41.08	42.01	41.28	43.51	44.26	43.04	42.53	1.28	0.52
4	20.00	50.67	48.15	48.76	48.46	46.51	45.28	47.97	1.87	0.77
5	25.00	52.36	50.57	49.39	52.39	49.68	49.34	50.62	1.43	0.58
6	30.00	56.17	53.77	53.32	57.39	52.41	54.02	54.51	1.88	0.77

Formulation		1-31 Indomethacin powder								
No	Time (min)	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	0.28	0.13	0.13	0.43	0.43	0.59	0.33	0.18	0.07
2	10.00	3.89	4.79	5.69	5.10	5.40	6.45	5.22	0.86	0.35
3	15.00	8.88	9.18	11.44	9.19	12.19	11.90	10.46	1.54	0.63
4	20.00	11.49	11.95	14.67	12.25	17.38	16.94	14.11	2.61	1.06
5	25.00	13.82	13.68	17.47	14.29	20.80	20.35	16.74	3.29	1.34
6	30.00	15.71	15.12	19.39	16.18	23.34	22.74	18.75	3.65	1.49

Formulation		Indocid								
No	Time	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	18.76	40.40	43.70	39.65	40.46	42.35	37.57	9.33	3.81
2	10.00	67.72	69.81	77.35	79.72	81.38	85.85	76.96	6.95	2.84
3	15.00	77.30	91.31	95.59	96.48	99.65	102.25	93.72	8.98	3.67
4	20.00	100.53	101.69	96.38	97.42	100.32	102.78	99.85	2.47	1.01
5	25.00	102.10	102.06	96.42	97.29	100.84	103.16	100.42	2.66	1.09
6	30.00	102.33	102.44	96.76	98.13	100.91	103.40	100.66	2.65	1.08

Formulation I-1		ageing at 45°C 75% RH								
No	Time	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	3.29	7.20	3.89	7.05	5.69	4.79	5.32	1.62	0.66
2	10.00	59.50	68.09	71.22	56.37	68.68	69.43	65.55	6.07	2.48
3	15.00	89.94	91.23	93.03	88.45	91.37	91.67	90.95	1.57	0.64
4	20.00	97.60	96.04	97.41	95.95	95.14	96.34	96.41	0.94	0.38
5	25.00	101.56	98.94	99.86	100.19	98.78	98.93	99.71	1.07	0.44
6	30.00	103.89	101.25	101.73	104.01	101.09	100.95	102.15	1.42	0.58

Formulation		I-1 ageing at room temp.								
No	Time	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	2.39	6.74	7.05	10.80	11.70	7.20	7.65	3.33	1.36
2	10.00	22.08	40.59	31.13	39.42	42.73	41.35	36.22	8.05	3.28
3	15.00	54.98	79.32	64.99	74.54	61.79	78.13	68.96	9.85	4.02
4	20.00	76.83	95.78	80.60	79.09	73.17	94.13	83.27	9.41	3.84
5	25.00	91.17	103.18	89.55	93.29	94.69	99.26	95.19	5.14	2.10
6	30.00	99.59	106.42	98.11	99.77	99.08	107.13	101.68	3.99	1.63

Formulation		I-4 ageing at 45°C 75% RH.								
No	Time	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	0.28	0.28	-0.02	0.28	0.28	0.59	0.28	0.19	0.08
2	10.00	1.04	1.79	2.69	2.69	4.49	0.89	2.26	1.34	0.55
3	15.00	7.66	6.31	8.42	11.72	14.74	11.11	9.99	3.11	1.27
4	20.00	31.74	38.05	29.65	50.26	41.58	33.27	37.43	7.65	3.12
5	25.00	49.68	58.13	45.63	71.48	67.10	54.68	57.78	9.97	4.07
6	30.00	59.48	67.54	59.60	81.87	85.72	72.62	71.14	11.06	4.52

Formulation		I-4 ageing at room temp.								
No	Time	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	0.28	0.59	1.34	0.13	0.59	-0.02	0.48	0.48	0.20
2	10.00	4.34	4.50	5.10	2.54	2.69	5.69	4.14	1.28	0.52
3	15.00	11.73	13.24	11.90	12.62	12.78	10.84	12.18	0.87	0.35
4	20.00	22.48	25.80	27.75	25.93	27.28	26.09	25.89	1.85	0.75
5	25.00	42.76	41.14	45.51	46.98	48.35	42.94	44.61	2.78	1.14
6	30.00	46.95	50.58	51.07	51.80	52.73	54.64	51.30	2.57	1.05

Formulation		I-7 ageing at 45°C 75% RH								
No	Time	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	3.89	4.79	0.28	7.20	12.30	4.34	5.47	4.02	1.64
2	10.00	72.42	93.16	67.44	73.95	70.98	75.13	75.51	9.05	3.69
3	15.00	91.99	98.89	89.22	90.52	89.48	90.05	91.69	3.66	1.49
4	20.00	95.75	100.90	92.67	92.32	95.63	96.06	95.56	3.09	1.26
5	25.00	97.59	101.88	94.79	98.20	98.68	97.45	98.10	2.29	0.93
6	30.00	98.55	103.01	96.18	99.75	99.63	100.36	99.58	2.24	0.91

Formulation		I-7 ageing at room temp.								
No	Time	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	20.72	9.00	4.34	7.20	6.29	18.31	10.98	6.82	2.79
2	10.00	40.24	26.49	28.11	31.13	37.28	36.61	33.31	5.53	2.26
3	15.00	90.08	90.06	92.29	88.28	90.12	87.19	89.67	1.76	0.72
4	20.00	96.24	98.93	97.12	93.97	92.37	92.43	95.18	2.68	1.09
5	25.00	98.99	100.94	99.12	96.10	94.64	98.45	98.04	2.28	0.93
6	30.00	99.80	102.51	100.53	97.80	95.57	99.11	99.22	2.38	0.97

Formulation		I-13 ageing at 45°C 75% RH								
No	Time	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	-0.02	0.13	0.13	0.28	1.04	0.74	0.38	0.41	0.17
2	10.00	0.89	0.89	0.59	1.04	1.79	1.79	1.16	0.51	0.21
3	15.00	5.55	2.85	3.59	7.05	8.12	5.86	5.50	2.00	0.82
4	20.00	10.99	6.02	11.28	11.31	14.48	11.76	10.97	2.74	1.12
5	25.00	17.38	15.98	21.12	21.15	24.49	21.45	20.26	3.08	1.26
6	30.00	36.72	26.00	31.03	31.36	34.57	33.61	32.21	3.71	1.51

Formulation		I-13 ageing at room temp.								
No	Time	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	0.13	0.13	0.28	4.34	6.29	8.70	3.31	3.70	1.51
2	10.00	4.64	4.34	2.54	6.32	13.70	16.42	7.99	5.67	2.31
3	15.00	18.34	14.89	11.42	16.43	22.65	22.84	17.76	4.48	1.83
4	20.00	34.09	31.06	23.37	35.17	31.22	32.30	31.20	4.16	1.70
5	25.00	53.10	46.44	35.54	54.63	53.66	57.76	50.19	8.08	3.30
6	30.00	66.52	60.57	47.20	65.21	66.64	64.90	61.84	7.51	3.06

Formulation		I-14 ageing at 45°C 75% RH								
No	Time	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	-0.02	-0.02	0.89	0.74	0.59	1.04	0.54	0.45	0.18
2	10.00	36.79	4.79	10.36	36.35	14.26	19.37	20.32	13.46	5.50
3	15.00	75.35	27.96	63.01	76.40	46.51	43.39	55.43	19.36	7.90
4	20.00	82.31	47.68	72.89	80.67	53.13	47.88	64.09	16.35	6.67
5	25.00	86.46	69.93	79.84	86.91	70.16	60.67	75.66	10.47	4.28
6	30.00	88.84	83.02	84.73	88.54	82.19	81.96	84.88	3.11	1.27

Formulation		I-14 ageing at room temp.								
No	Time	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	4.94	8.55	7.80	8.70	6.29	8.70	7.50	1.55	0.63
2	10.00	26.46	52.92	70.35	70.65	13.70	57.28	48.56	23.50	9.59
3	15.00	85.23	80.47	85.84	84.34	22.65	84.71	73.87	25.16	10.27
4	20.00	88.50	87.02	88.82	89.56	31.22	89.03	79.02	23.44	9.57
5	25.00	91.04	90.15	90.76	90.61	53.66	90.52	84.46	15.09	6.16
6	30.00	91.80	92.40	91.66	91.67	66.64	91.43	87.60	10.27	4.19

Formulation		I-22 ageing at 45 °C 75% RH								
No	Time	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	2.99	14.86	0.13	15.31	12.00	10.80	9.35	6.33	2.58
2	10.00	68.66	80.76	57.98	58.23	60.91	62.85	64.90	8.70	3.55
3	15.00	85.50	87.31	89.31	83.10	77.39	81.45	84.01	4.30	1.75
4	20.00	88.02	89.24	92.31	88.92	86.47	90.86	89.30	2.06	0.84
5	25.00	89.51	90.44	93.83	92.06	89.45	92.07	91.23	1.73	0.70
6	30.00	90.55	91.49	95.05	93.88	91.10	93.73	92.63	1.82	0.74

Formulation		I-22 ageing at room temp.								
No	Time	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	52.12	60.53	72.85	55.87	58.73	63.83	60.65	7.19	2.93
2	10.00	86.42	89.63	91.96	87.19	89.77	90.25	89.20	2.05	0.84
3	15.00	92.55	93.68	94.98	93.03	92.47	92.50	93.20	0.99	0.40
4	20.00	93.92	95.06	95.91	93.95	93.23	93.57	94.27	1.01	0.41
5	25.00	94.55	95.54	96.40	94.58	94.16	94.50	94.95	0.85	0.35
6	30.00	95.03	95.88	96.75	95.21	94.78	94.83	95.41	0.76	0.31

Formulation		I-23 ageing at 45 °C 75% RH								
No	Time	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	0.13	0.13	-0.02	0.28	0.59	1.79	0.48	0.67	0.27
2	10.00	1.04	9.00	7.95	8.55	8.25	10.51	7.55	3.32	1.35
3	15.00	4.50	20.48	29.03	27.39	29.49	30.41	23.55	10.00	4.08
4	20.00	11.29	30.68	40.19	36.58	42.61	38.13	33.25	11.48	4.69
5	25.00	27.44	42.00	54.13	44.94	52.66	48.30	44.91	9.70	3.96
6	30.00	40.99	53.25	62.01	45.84	58.26	59.44	53.30	8.31	3.39

Formulation		I-23 ageing at room temp.								
No	Time	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	0.89	0.28	1.19	0.74	1.34	1.34	0.96	0.41	0.17
2	10.00	4.35	7.35	4.80	3.59	13.66	8.71	7.08	3.77	1.54
3	15.00	21.20	19.87	20.16	22.85	19.92	19.43	20.57	1.26	0.52
4	20.00	28.86	29.31	27.80	25.86	29.06	30.98	28.64	1.71	0.70
5	25.00	36.11	36.72	38.35	37.15	41.27	39.30	38.15	1.92	0.78
6	30.00	45.36	47.03	44.32	44.45	45.61	44.37	45.19	1.06	0.43

Formulation		I-27 ageing at 45 °C 75% RH								
No	Time	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	1.34	0.74	0.28	1.04	0.74	1.34	0.91	0.41	0.17
2	10.00	23.73	33.49	20.27	26.73	28.38	30.34	27.16	4.71	1.92
3	15.00	39.06	43.18	27.76	29.62	30.98	37.75	34.73	6.13	2.50
4	20.00	46.23	49.48	35.91	46.64	35.24	45.67	43.19	6.05	2.47
5	25.00	52.40	55.37	45.77	53.86	52.30	50.18	51.65	3.36	1.37
6	30.00	57.56	60.24	52.08	54.97	55.80	53.37	55.67	2.94	1.20

Formulation		I-27 ageing at room temp								
No	Time	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	23.72	11.70	11.55	22.67	17.86	19.82	17.89	5.27	2.15
2	10.00	43.86	42.43	43.48	42.65	41.12	41.43	42.49	1.09	0.44
3	15.00	52.27	51.43	52.78	50.60	51.76	52.67	51.92	0.83	0.34
4	20.00	59.38	57.03	59.90	58.75	57.96	57.68	58.45	1.09	0.44
5	25.00	64.58	62.66	65.85	65.15	65.41	64.23	64.65	1.13	0.46
6	30.00	69.22	67.74	70.80	70.54	68.70	69.61	69.43	1.15	0.47

Formulation		I-29 ageing at 45 °C 75% RH								
No	Time	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	4.34	3.29	0.28	1.34	2.54	2.24	2.34	1.43	0.58
2	10.00	33.82	41.02	38.30	37.70	38.01	32.60	36.91	3.12	1.28
3	15.00	47.41	50.91	49.22	48.02	49.38	47.84	48.80	1.30	0.53
4	20.00	54.94	64.92	57.21	56.45	57.22	56.42	57.86	3.56	1.45
5	25.00	61.02	70.31	63.45	64.34	63.61	63.86	64.43	3.10	1.27
6	30.00	66.38	54.10	67.78	65.67	67.94	69.99	65.31	5.69	2.32

Formulation		I-29 ageing at room temp.								
No	Time	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	3.44	7.35	6.44	7.20	6.90	9.30	6.77	1.90	0.78
2	10.00	33.06	35.19	38.04	36.39	36.54	34.75	35.66	1.72	0.70
3	15.00	49.66	48.34	50.76	50.60	50.60	48.65	49.77	1.06	0.43
4	20.00	58.85	55.28	57.86	58.60	56.50	57.54	57.44	1.35	0.55
5	25.00	65.10	61.20	64.10	65.00	65.29	65.44	64.36	1.61	0.66
6	30.00	71.24	66.72	68.74	70.39	67.38	69.48	68.99	1.74	0.71

Formulation		1-30 ageing at 45 C 75% RH								
No	Time	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	0.59	0.13	0.13	0.74	0.74	1.04	0.56	0.36	0.15
2	10.00	22.22	25.22	18.61	24.33	21.17	23.43	22.50	2.39	0.98
3	15.00	35.14	39.21	41.12	38.76	39.49	35.00	38.12	2.49	1.02
4	20.00	42.74	44.58	43.65	44.28	42.91	45.15	43.89	0.96	0.39
5	25.00	47.68	49.39	49.50	48.48	48.30	47.56	48.48	0.82	0.34
6	30.00	52.05	53.62	54.79	53.16	52.53	53.43	53.26	0.95	0.39

Formulation		1-30 ageing at room temp.								
No	Time	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	4.94	13.81	6.14	11.40	13.20	6.29	9.30	3.95	1.61
2	10.00	42.68	39.74	31.42	32.21	29.97	31.43	34.58	5.27	2.15
3	15.00	50.48	49.92	46.81	44.44	48.05	45.61	47.55	2.38	0.97
4	20.00	57.28	56.11	55.38	55.26	53.93	53.87	55.30	1.30	0.53
5	25.00	63.07	65.65	62.06	60.13	60.90	61.29	62.18	1.97	0.81
6	30.00	67.84	69.24	64.28	64.14	67.01	66.36	66.48	2.01	0.82

APPENDIX 3

Calibration curve of piroxicam

No.	conc. mcg/ml	Absorbance	Regression output	
			constant	-0.004
			Std error of Y Est	0.004
			R Squared	1.000
			No. of observation	9.000
			Degrees of freedom	7.000
			X Coefficients	0.080
			Standard error of Coef.	0.001
1	0.000	0.000		
2	2.160	0.172		
3	3.240	0.255		
4	4.320	0.337		
5	5.400	0.423		
6	6.480	0.520		
7	7.560	0.608		
8	8.640	0.691		
9	9.720	0.778		

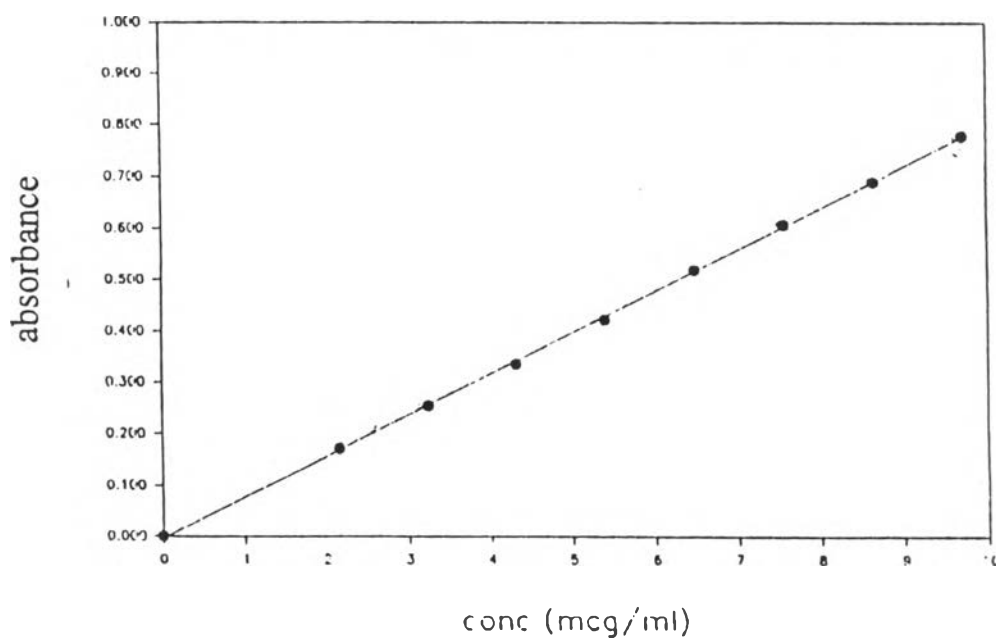


Fig 52 Standard curve of piroxicam

APPENDIX 4

Dissolution Profiles:	Piroxicam 20 mg	
Volume of pipet	5.00	ml
Volume of medium	900.00	ml
mg per tablet	20.00	mg
Dilution Factor	2.50	

Formulation		P-1								
No	Time min.	% Release						Average Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	50.38	53.74	48.70	44.92	43.80	57.52	49.84	5.22	2.13
2	10.00	81.88	81.06	80.75	74.43	73.44	78.70	78.38	3.61	1.47
3	15.00	91.85	90.89	90.30	83.66	87.57	90.34	89.10	3.02	1.23
4	25.00	93.20	93.21	91.92	91.27	92.40	93.22	92.54	0.82	0.34
5	35.00	93.86	93.87	93.27	92.47	93.75	95.69	93.82	1.06	0.43
6	45.00	94.80	94.25	94.07	93.13	94.27	94.69	94.20	0.60	0.24
7	55.00	95.33	96.18	94.31	93.50	94.09	94.37	94.63	0.96	0.39

Formulation		P-2								
No	Time min.	% Release						Average Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	47.58	51.64	57.94	48.00	49.54	56.12	51.80	4.33	1.77
2	10.00	74.44	74.32	75.34	74.72	74.59	75.75	74.86	0.56	0.23
3	15.00	85.50	83.70	85.56	85.08	84.25	85.69	84.96	0.81	0.33
4	25.00	86.11	86.68	86.45	87.79	86.96	86.87	86.81	0.57	0.23
5	35.00	88.55	89.96	87.21	90.10	90.52	90.01	89.39	1.26	0.51
6	45.00	88.76	90.46	90.64	90.88	90.74	91.63	90.52	0.95	0.39
7	55.00	90.09	90.55	91.28	91.39	91.25	91.30	90.98	0.53	0.22

Formulation		P-3								
No	Time min.	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	52.62	43.94	56.26	38.20	52.48	51.08	49.09	6.70	2.74
2	10.00	78.67	73.30	84.01	64.87	77.41	75.30	75.59	6.39	2.61
3	15.00	94.37	92.19	97.08	82.73	89.88	88.04	90.71	5.05	2.06
4	25.00	97.83	101.80	100.28	93.83	98.78	97.49	98.34	2.73	1.11
5	35.00	97.82	101.95	100.83	95.61	100.31	97.47	99.00	2.41	0.98
6	45.00	98.92	103.91	101.39	96.42	101.15	97.31	99.85	2.82	1.15
7	55.00	99.19	103.37	100.98	96.82	101.57	97.85	99.96	2.46	1.00

Formulation		P-4								
No	Time min	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	58.22	59.90	72.22	58.78	60.74	60.74	61.76	5.22	2.13
2	10.00	79.96	77.17	88.58	77.86	80.96	79.98	80.75	4.09	1.67
3	15.00	89.09	89.08	91.31	88.10	90.23	88.12	89.32	1.25	0.51
4	25.00	92.52	93.49	92.80	94.05	91.43	93.93	93.04	0.99	0.41
5	35.00	93.60	94.85	93.73	94.71	94.73	96.13	94.63	0.92	0.37
6	45.00	94.53	95.24	94.54	95.24	94.98	97.37	95.32	1.05	0.43
7	55.00	95.48	96.19	95.48	95.48	95.79	98.61	96.17	1.23	0.50

Formulation		P-5								
No	Time min	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	61.02	64.38	69.98	64.94	70.68	73.06	67.34	4.59	1.87
2	10.00	97.20	99.60	96.13	87.14	97.11	98.80	96.00	4.52	1.84
3	15.00	108.24	107.71	107.16	107.08	108.15	106.35	107.45	0.72	0.29
4	25.00	108.84	109.29	106.08	108.24	110.15	108.90	108.58	1.38	0.56
5	35.00	110.14	109.06	106.67	108.70	109.08	108.67	108.72	1.14	0.47
6	45.00	110.06	110.64	107.82	108.18	109.69	108.85	109.21	1.11	0.45
7	55.00	110.95	110.14	108.00	109.76	110.30	109.18	109.72	1.03	0.42

Formulation		P-6								
No	Time min	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	72.08	65.22	62.42	64.94	67.74	71.10	67.25	3.77	1.54
2	10.00	93.48	86.46	85.45	89.24	86.45	92.07	88.81	3.36	1.37
3	15.00	99.60	97.28	97.68	98.00	96.46	100.99	98.33	1.66	0.68
4	25.00	102.25	98.66	100.18	100.64	100.63	102.11	100.75	1.33	0.54
5	35.00	103.24	99.77	101.44	101.48	101.89	102.67	101.75	1.20	0.49
6	45.00	104.09	100.04	102.14	101.62	102.88	102.96	102.29	1.38	0.56
7	55.00	105.09	101.16	102.15	102.19	103.31	103.26	102.86	1.36	0.55

Formulation		P-7								
No	Time min	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	52.20	44.22	62.42	55.70	48.70	53.04	52.71	6.19	2.53
2	10.00	76.29	72.88	84.05	77.85	69.83	79.37	76.71	4.99	2.04
3	15.00	88.61	87.29	89.69	86.54	82.68	84.71	86.59	2.57	1.05
4	25.00	94.70	91.41	92.99	91.08	88.74	88.40	91.22	2.43	0.99
5	35.00	96.07	92.76	94.91	92.57	90.07	89.88	92.71	2.50	1.02
6	45.00	97.02	93.70	95.71	93.78	91.69	90.93	93.81	2.31	0.94
7	55.00	97.56	94.78	96.11	94.72	92.06	91.86	94.51	2.24	0.91

Formulation		P-8								
No	Time min	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	77.26	76.98	66.90	70.82	72.36	75.16	73.24	4.02	1.64
2	10.00	99.11	96.45	88.83	93.89	96.70	91.82	94.47	3.73	1.52
3	15.00	103.44	102.02	100.94	101.13	102.42	101.01	101.83	0.99	0.40
4	25.00	106.67	102.87	103.88	102.96	103.55	103.53	103.91	1.41	0.57
5	35.00	106.01	103.16	105.58	104.09	104.12	105.50	104.74	1.11	0.45
6	45.00	107.01	104.71	105.89	104.95	104.14	105.81	105.42	1.03	0.42
7	55.00	108.17	105.86	106.34	105.39	104.58	106.26	106.10	1.20	0.49

Formulation		P-9								
No	Time min	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	63.82	65.22	71.66	70.82	58.22	71.80	66.92	5.47	2.23
2	10.00	87.55	87.42	93.62	88.01	91.16	92.22	90.00	2.68	1.09
3	15.00	98.96	97.57	102.12	98.16	98.95	100.29	99.34	1.64	0.67
4	25.00	100.91	100.49	104.78	100.11	101.46	102.11	101.64	1.69	0.69
5	35.00	100.63	100.49	104.95	100.80	102.58	102.81	102.04	1.75	0.71
6	45.00	101.47	101.19	105.95	101.36	102.87	103.11	102.66	1.81	0.74
7	55.00	102.03	101.61	105.84	101.79	103.44	103.68	103.06	1.61	0.66

Formulation		P-10								
No	Time min	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	66.06	63.12	79.64	64.80	72.36	75.30	70.21	6.58	2.68
2	10.00	86.17	86.71	94.92	86.58	87.88	92.52	89.13	3.68	1.50
3	15.00	97.28	95.73	98.81	96.58	96.63	100.17	97.53	1.65	0.67
4	25.00	100.48	99.20	100.76	99.92	99.97	101.57	100.32	0.81	0.33
5	35.00	100.48	100.17	101.46	100.05	99.82	102.69	100.78	1.10	0.45
6	45.00	102.86	100.03	101.74	102.43	100.52	102.98	101.76	1.24	0.51
7	55.00	103.01	101.57	102.59	102.44	101.07	103.55	102.37	0.92	0.37

Formulation		P-11								
No	Time min	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	50.80	56.54	50.52	59.20	51.92	50.80	53.29	3.67	1.50
2	10.00	87.34	85.13	84.40	77.73	81.89	85.10	83.60	3.37	1.37
3	15.00	99.45	92.05	94.95	86.98	94.80	86.41	92.44	5.04	2.06
4	25.00	101.68	98.30	98.98	95.30	99.11	98.23	98.60	2.05	0.84
5	35.00	102.24	99.68	99.81	99.61	99.80	101.02	100.36	1.06	0.43
6	45.00	102.25	99.68	100.22	101.01	100.49	102.70	101.06	1.19	0.48
7	55.00	101.70	99.81	101.06	102.97	101.05	102.71	101.55	1.17	0.48

Formulation		P-12								
No	Time min	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	49.12	58.78	58.92	57.80	55.00	60.88	56.75	4.20	1.72
2	10.00	83.13	87.38	90.19	85.56	84.42	88.24	86.49	2.60	1.06
3	15.00	95.35	97.67	98.53	94.29	95.81	98.11	96.63	1.71	0.70
4	25.00	97.84	101.01	101.03	95.38	100.69	101.03	99.50	2.37	0.97
5	35.00	98.11	101.43	100.62	97.59	100.96	101.03	99.96	1.66	0.68
6	45.00	97.95	101.58	100.89	101.07	101.53	101.03	100.68	1.36	0.56
7	55.00	101.58	102.00	101.73	103.03	101.95	101.46	101.96	0.57	0.23

Formulation		P-13								
No	Time min	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	57.24	50.80	47.72	53.04	48.84	51.22	51.47	3.38	1.38
2	10.00	80.10	72.78	73.46	76.43	72.91	75.86	75.26	2.83	1.16
3	15.00	83.76	83.26	85.49	83.30	85.21	83.98	84.17	0.96	0.39
4	25.00	85.63	84.29	87.09	85.02	86.39	85.71	85.69	0.99	0.40
5	35.00	85.68	84.76	86.87	85.77	86.87	87.17	86.19	0.93	0.38
6	45.00	85.46	85.79	87.63	86.25	87.63	87.79	86.76	1.05	0.43
7	55.00	85.65	86.40	87.84	86.59	88.12	88.28	87.15	1.08	0.44

Formulation		P-14								
No	Time min	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	52.62	54.58	59.48	53.04	58.22	57.10	55.84	2.84	1.16
2	10.00	85.67	88.06	91.59	86.51	88.22	88.78	88.14	2.05	0.84
3	15.00	95.81	100.87	98.68	98.47	99.21	98.93	98.66	1.64	0.67
4	25.00	102.50	103.81	100.63	102.66	100.60	101.58	101.96	1.26	0.52
5	35.00	103.91	104.11	101.47	103.37	101.86	101.86	102.76	1.17	0.48
6	45.00	104.63	104.83	101.75	104.37	102.43	102.43	103.40	1.35	0.55
7	55.00	104.93	105.13	102.03	104.81	102.72	102.86	103.74	1.36	0.55

Formulation		P-15								
No	Time min	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	51.78	56.12	58.92	54.72	56.96	58.36	56.14	2.62	1.07
2	10.00	74.33	86.67	85.85	86.38	80.79	80.10	82.35	4.88	1.99
3	15.00	93.78	98.49	100.88	100.30	92.02	97.63	97.18	3.56	1.46
4	25.00	101.02	100.58	101.58	102.82	101.08	100.13	101.20	0.93	0.38
5	35.00	101.44	101.56	101.45	103.11	101.64	101.95	101.86	0.64	0.26
6	45.00	102.56	102.40	102.99	104.24	101.64	102.93	102.80	0.86	0.35
7	55.00	102.71	102.83	102.86	104.82	101.23	102.94	102.90	1.14	0.47

Formulation		P-16								
No	Time min	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	47.30	44.08	51.08	49.82	45.90	49.96	48.02	2.72	1.11
2	10.00	80.32	81.98	68.44	74.31	81.29	74.04	76.73	5.35	2.18
3	15.00	96.59	97.14	84.22	90.83	97.57	76.97	90.55	8.41	3.43
4	25.00	103.98	102.16	97.57	101.83	102.59	100.36	101.41	2.22	0.91
5	35.00	105.26	102.31	98.25	103.24	103.72	101.75	102.42	2.38	0.97
6	45.00	105.71	103.01	99.08	103.67	104.43	102.60	103.08	2.25	0.92
7	55.00	105.59	103.59	99.91	104.25	105.01	103.17	103.59	2.01	0.82

Formulation		P-17								
No	Time min	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	64.66	68.72	68.30	66.48	68.02	67.04	67.20	1.50	0.61
2	10.00	83.78	84.92	83.38	85.47	85.20	86.45	84.86	1.13	0.46
3	15.00	98.66	97.57	98.12	98.12	98.13	99.95	98.43	0.82	0.34
4	25.00	100.61	100.07	103.01	100.21	101.47	102.05	101.24	1.15	0.47
5	35.00	101.17	100.91	104.00	100.90	102.60	102.61	102.03	1.25	0.51
6	45.00	103.27	101.33	104.58	101.47	103.31	102.90	102.81	1.23	0.50
7	55.00	102.45	101.89	104.60	101.75	103.88	103.48	103.01	1.15	0.47

Formulation		P-18								
No	Time min	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	66.76	57.80	66.62	63.54	61.58	59.06	62.56	3.77	1.54
2	10.00	70.35	72.54	76.23	71.45	78.30	78.71	74.60	3.62	1.48
3	15.00	84.32	87.22	89.25	85.99	92.04	90.34	88.19	2.87	1.17
4	25.00	92.63	92.47	92.69	93.89	92.97	93.23	92.98	0.52	0.21
5	35.00	94.68	94.52	96.14	94.83	94.60	95.70	95.08	0.68	0.28
6	45.00	95.63	95.05	97.10	95.63	97.09	96.66	96.19	0.87	0.35
7	55.00	96.44	95.85	97.92	93.65	97.77	97.19	96.47	1.59	0.65

Formulation		P-19								
No	Time min	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	55.70	63.12	51.78	54.44	56.26	57.94	56.54	3.82	1.56
2	10.00	81.63	84.89	72.93	79.10	80.93	79.26	79.79	3.96	1.62
3	15.00	91.60	92.78	87.33	90.04	91.60	92.30	90.94	2.00	0.82
4	25.00	101.21	95.96	98.60	98.94	97.99	95.75	98.07	2.04	0.83
5	35.00	102.19	97.05	100.68	100.61	100.07	97.55	99.69	1.99	0.81
6	45.00	103.46	98.57	102.78	102.29	100.91	99.21	101.20	1.99	0.81
7	55.00	104.18	98.70	102.37	103.14	101.19	100.18	101.63	2.01	0.82



Formulation P-20

No	Time min	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	48.42	48.56	52.48	49.54	51.64	53.46	50.68	2.14	0.87
2	10.00	79.49	81.31	86.51	86.21	80.35	79.24	82.18	3.32	1.35
3	15.00	94.91	96.60	95.39	96.21	95.63	98.44	96.20	1.25	0.51
4	25.00	101.88	100.78	99.98	100.53	100.50	100.52	100.70	0.63	0.26
5	35.00	102.30	102.74	101.24	101.23	101.76	101.22	101.75	0.65	0.26
6	45.00	102.73	104.15	101.80	101.79	102.33	102.34	102.52	0.87	0.36
7	55.00	103.30	104.03	102.08	102.21	102.76	102.91	102.88	0.72	0.29

Formulation P-21

No	Time min	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	46.32	46.88	51.22	45.90	53.60	50.10	49.00	3.12	1.27
2	10.00	71.64	73.04	83.00	76.53	78.68	76.14	76.50	4.07	1.66
3	15.00	82.39	81.28	87.80	83.96	82.61	80.62	83.11	2.57	1.05
4	25.00	94.47	92.80	96.69	94.23	91.75	91.57	93.58	1.94	0.79
5	35.00	97.52	94.15	97.09	96.71	94.08	94.74	95.71	1.56	0.64
6	45.00	99.46	97.89	97.77	97.95	97.40	96.52	97.83	0.96	0.39
7	55.00	99.73	98.16	98.45	98.91	98.37	97.06	98.45	0.88	0.36

Formulation P-22

No	Time min	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	52.48	57.52	54.86	54.44	54.30	57.38	55.16	1.95	0.80
2	10.00	76.99	88.08	80.08	78.12	80.36	79.82	80.57	3.90	1.59
3	15.00	89.04	96.97	95.79	91.15	92.85	86.70	92.08	3.93	1.60
4	25.00	92.89	99.19	100.52	97.54	95.32	91.66	96.19	3.51	1.43
5	35.00	93.97	99.74	101.78	98.36	95.71	98.19	97.96	2.79	1.14
6	45.00	94.35	100.15	101.92	98.77	96.24	98.46	98.32	2.71	1.11
7	55.00	94.73	100.99	103.05	99.32	96.78	99.14	99.00	2.95	1.21

Formulation P-23

No	Time min	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	47.02	43.66	56.96	49.68	52.06	53.46	50.47	4.74	1.94
2	10.00	76.26	76.38	82.75	79.49	80.35	78.82	79.01	2.47	1.01
3	15.00	86.76	88.43	93.01	90.16	95.63	93.25	91.21	3.34	1.36
4	25.00	91.73	91.44	95.63	94.72	100.51	96.29	95.05	3.34	1.36
5	35.00	92.51	91.94	96.16	96.08	101.76	97.53	96.00	3.58	1.46
6	45.00	92.75	92.46	96.98	96.76	102.33	98.21	96.58	3.68	1.50
7	55.00	93.26	93.53	98.78	97.29	102.76	98.61	97.37	3.58	1.46

Formulation		P-24								
No	Time min	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	56.54	58.22	60.88	56.26	57.52	53.18	57.10	2.53	1.03
2	10.00	75.89	78.70	74.38	73.93	73.52	73.77	75.03	1.99	0.81
3	15.00	95.63	95.66	92.43	91.98	90.59	91.12	92.90	2.22	0.91
4	25.00	100.37	97.31	99.94	98.23	94.03	95.13	97.50	2.55	1.04
5	35.00	101.48	98.13	101.06	98.92	95.67	98.18	98.91	2.14	0.87
6	45.00	102.33	98.96	101.76	99.61	98.16	99.00	99.97	1.68	0.69
7	55.00	102.62	99.51	101.49	100.16	99.13	99.27	100.36	1.40	0.57

Formulation		P-25 physical mixture 1:1								
No	Time min	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	51.22	45.90	47.44	50.38	49.12	51.08	49.19	2.14	0.88
2	10.00	68.72	70.23	68.56	70.26	70.39	71.38	69.92	1.08	0.44
3	15.00	79.04	82.66	84.76	82.97	83.80	80.88	82.35	2.07	0.85
4	25.00	89.14	96.28	89.85	94.07	96.17	95.61	93.52	3.22	1.32
5	35.00	94.54	97.38	95.81	95.01	96.70	98.80	96.37	1.58	0.65
6	45.00	96.46	97.92	97.19	95.82	97.66	98.51	97.26	0.99	0.40
7	55.00	97.28	99.02	97.87	96.49	97.22	98.22	97.68	0.88	0.36

Formulation		P-26 physical mixture 1:1								
No	Time min	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	49.96	49.40	56.82	49.68	49.40	50.66	50.98	2.90	1.18
2	10.00	76.70	78.65	81.63	79.07	75.85	72.64	77.42	3.09	1.26
3	15.00	93.22	90.15	97.77	89.87	90.55	91.80	92.23	2.98	1.22
4	25.00	94.16	93.45	99.01	91.21	90.92	94.69	93.91	2.94	1.20
5	35.00	95.38	94.25	99.98	92.28	92.12	96.06	95.01	2.91	1.19
6	45.00	95.91	94.91	101.24	92.93	92.91	97.15	95.84	3.12	1.27
7	55.00	96.45	95.44	101.94	93.31	93.15	96.29	96.10	3.20	1.31

Formulation		P-27 sls								
No	Time min	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	33.16	35.26	28.82	34.70	35.82	32.74	33.41	2.55	1.04
2	10.00	56.44	57.43	52.92	59.25	56.04	50.14	55.37	3.29	1.35
3	15.00	71.60	73.15	70.71	72.46	69.65	69.04	71.10	1.60	0.65
4	25.00	86.83	82.52	82.87	84.76	89.36	87.48	85.64	2.71	1.11
5	35.00	93.76	88.44	88.65	89.99	90.69	88.95	90.08	2.00	0.82
6	45.00	95.54	89.21	89.70	86.43	91.20	89.86	90.32	3.00	1.22
7	55.00	96.07	89.98	90.20	91.53	92.12	90.36	91.71	2.29	0.94

Formulation P-28 lactose

No	Time min	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	28.68	27.70	30.36	31.90	32.46	32.04	30.52	1.97	0.80
2	10.00	48.16	46.05	50.13	49.15	49.02	50.56	48.84	1.61	0.66
3	15.00	66.90	67.87	66.09	67.07	66.93	67.64	67.08	0.63	0.26
4	25.00	72.88	71.04	69.39	74.44	71.08	71.51	71.72	1.74	0.71
5	35.00	77.06	75.78	78.04	81.71	74.84	74.01	76.91	2.77	1.13
6	45.00	78.61	76.48	80.57	83.85	77.91	76.66	79.01	2.80	1.14
7	55.00	79.61	77.33	81.72	84.87	79.47	77.93	80.15	2.77	1.13

Dissolution Piroxicam raw material manu. from Italy

No	Time min	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	7.61	6.65	5.65	6.09	6.54	6.88	6.57	0.67	0.27
2	10.00	20.75	20.24	21.02	21.75	21.92	20.69	21.06	0.65	0.27
3	15.00	30.61	24.89	24.28	27.42	27.09	27.42	26.95	2.25	0.92
4	25.00	36.72	30.46	31.13	31.55	32.67	32.55	32.51	2.23	0.91
5	35.00	40.90	34.27	33.54	33.23	34.98	35.70	35.44	2.83	1.15
6	45.00	42.47	36.31	35.69	35.21	35.90	36.80	37.06	2.70	1.10
7	55.00	44.55	37.58	37.62	36.97	37.33	39.13	38.86	2.88	1.18

Dissolution Piroxicam raw material ma Hong-Kong

No	Time min	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	4.81	4.92	4.25	5.14	4.58	5.20	4.82	0.36	0.15
2	10.00	12.11	13.35	13.45	12.84	13.12	12.79	12.94	0.49	0.20
3	15.00	15.20	16.78	15.88	15.38	15.66	14.93	15.64	0.65	0.27
4	25.00	17.03	17.15	17.43	17.09	16.36	17.25	17.05	0.37	0.15
5	35.00	18.63	19.49	18.70	19.20	18.80	18.97	18.97	0.33	0.13
6	45.00	20.42	20.27	19.70	20.82	20.20	19.75	20.19	0.42	0.17
7	55.00	21.43	21.95	20.70	21.55	21.09	21.20	21.32	0.43	0.17

Formulation Feldene

No	Time min	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	19.72	18.60	18.18	17.48	18.04	17.62	18.27	0.81	0.33
2	10.00	34.25	37.46	35.64	32.97	31.86	39.28	35.24	2.79	1.14
3	15.00	52.50	53.49	54.60	51.92	49.11	51.95	52.26	1.85	0.76
4	25.00	72.53	70.87	76.32	73.07	70.67	70.30	72.29	2.26	0.92
5	35.00	80.35	83.30	84.58	82.85	81.56	82.87	82.59	1.46	0.60
6	45.00	88.36	87.40	88.83	87.79	89.57	87.67	88.27	0.82	0.33
7	55.00	90.53	91.39	91.71	91.08	91.89	89.98	91.10	0.73	0.30

Formulation		P-1 used raw material manu. from Hongkong								
No	Time min	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	36.24	33.44	35.40	33.86	36.80	35.54	35.21	1.32	0.54
2	10.00	50.30	47.90	49.87	48.61	49.46	49.88	49.34	0.91	0.37
3	15.00	63.74	62.03	64.85	61.62	57.72	58.69	61.44	2.78	1.14
4	25.00	64.37	64.61	66.19	65.46	62.24	62.66	64.26	1.55	0.63
5	35.00	68.65	69.87	71.60	71.14	71.12	70.01	70.40	1.10	0.45
6	45.00	71.97	71.10	73.12	73.50	72.78	71.38	72.31	0.97	0.40
7	55.00	72.65	72.90	74.08	74.33	73.60	72.33	73.32	0.81	0.33

Formulation		P-13 used raw material manu. from Hongkong								
No	Time min	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	34.14	36.24	34.00	37.92	37.22	36.94	36.07	1.65	0.67
2	10.00	49.03	46.52	48.05	47.93	50.02	48.90	48.41	1.20	0.49
3	15.00	64.28	65.40	63.29	63.73	64.16	63.73	64.10	0.73	0.30
4	25.00	65.62	64.50	64.21	64.93	79.92	65.77	67.49	6.12	2.50
5	35.00	71.02	71.86	70.44	71.17	70.28	71.45	71.04	0.60	0.24
6	45.00	73.80	73.24	73.07	73.53	72.91	73.81	73.39	0.38	0.15
7	55.00	74.63	74.07	74.04	74.35	73.74	74.36	74.20	0.31	0.13

Formulation		P-25 used raw material manu. from Hongkong								
No	Time min	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	33.72	34.98	36.80	35.54	35.96	34.70	35.28	1.07	0.44
2	10.00	51.40	50.71	51.00	50.30	49.32	50.99	50.62	0.74	0.30
3	15.00	62.33	61.63	60.25	63.03	62.33	62.61	62.03	0.99	0.40
4	25.00	69.12	66.74	67.16	70.53	68.14	66.74	68.07	1.52	0.62
5	35.00	70.34	69.63	69.07	71.90	70.62	69.63	70.20	1.00	0.41
6	45.00	71.85	72.39	71.14	73.70	72.27	73.10	72.41	0.90	0.37
7	55.00	73.51	75.04	74.89	75.65	74.49	75.33	74.82	0.75	0.31

Formulation		P-27 used raw material manu. from Hongkong								
No	Time min	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	28.96	31.06	30.78	31.06	30.22	25.60	29.61	2.12	0.87
2	10.00	43.96	44.81	45.09	46.07	44.67	42.82	44.57	1.10	0.45
3	15.00	58.06	59.20	58.08	60.05	59.47	58.60	58.91	0.80	0.33
4	25.00	63.43	65.27	64.84	65.70	64.70	64.10	64.67	0.81	0.33
5	35.00	65.74	67.17	66.18	67.04	66.32	66.14	66.43	0.56	0.23
6	45.00	67.64	69.50	67.67	68.96	70.47	68.47	68.79	1.10	0.45
7	55.00	70.26	71.29	70.29	71.86	71.70	70.25	70.94	0.76	0.31

Formulation P-28 used raw material manu. from Hongkong

No	Time min	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	26.86	28.26	29.52	26.86	29.38	27.00	27.98	1.26	0.51
2	10.00	38.63	37.09	36.12	36.67	41.02	37.09	37.77	1.80	0.73
3	15.00	58.72	57.88	56.48	58.01	58.61	56.47	57.70	1.00	0.41
4	25.00	65.77	63.94	65.34	64.49	63.69	64.49	64.62	0.80	0.33
5	35.00	67.11	64.02	66.26	66.81	65.87	66.11	66.03	1.09	0.44
6	45.00	67.63	65.77	67.19	67.74	67.63	66.75	67.12	0.76	0.31
7	55.00	68.28	66.70	68.12	68.54	68.99	67.54	68.03	0.81	0.33

Formulation P-1 aging 45°C 75% RH.

No	Time min	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	53.04	44.64	50.38	48.70	49.12	51.50	49.56	2.89	1.18
2	10.00	70.27	68.41	69.70	68.99	67.59	68.30	68.88	0.98	0.40
3	15.00	81.16	82.23	82.55	82.11	80.57	82.26	81.81	0.77	0.31
4	25.00	84.27	87.58	85.94	86.21	84.93	88.46	86.23	1.57	0.64
5	35.00	85.72	88.63	87.68	86.69	86.53	88.67	87.32	1.20	0.49
6	45.00	87.32	89.96	86.91	87.31	87.15	89.02	87.94	1.24	0.51
7	55.00	87.94	90.60	87.53	87.79	87.63	89.52	88.50	1.26	0.52

Formulation P-1 aging at room temp.

No	Time min	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	53.60	67.46	56.68	63.68	60.04	60.18	60.27	4.91	2.01
2	10.00	72.52	85.47	83.87	83.35	77.59	73.95	79.46	5.53	2.26
3	15.00	81.74	90.85	89.24	85.22	83.76	86.40	86.20	3.40	1.39
4	25.00	89.61	92.89	93.66	90.31	90.53	89.26	91.04	1.80	0.74
5	35.00	90.39	93.83	94.74	91.23	92.15	90.74	92.18	1.76	0.72
6	45.00	90.75	93.51	94.42	91.74	92.66	92.08	92.53	1.31	0.53
7	55.00	91.82	95.43	94.95	92.11	93.46	92.87	93.44	1.48	0.60

Formulation P-4 aging 45°C 75% RH.

No	Time min	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	56.54	53.04	57.66	54.72	56.96	56.26	55.86	1.69	0.69
2	10.00	73.37	74.61	75.62	73.78	75.19	74.49	74.51	0.84	0.34
3	15.00	83.02	81.05	84.30	83.01	81.91	83.02	82.72	1.11	0.45
4	25.00	86.42	85.00	87.99	86.27	84.19	84.61	85.75	1.42	0.58
5	35.00	88.02	86.87	88.90	86.47	86.76	86.34	87.23	1.01	0.41
6	45.00	88.93	88.19	90.65	87.09	87.24	86.96	88.18	1.43	0.58
7	55.00	90.12	89.38	91.57	87.58	87.72	87.16	88.92	1.73	0.71

Formulation P-4 aging at room temp.

No	Time min	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	50.80	48.98	55.28	51.36	53.60	51.64	51.94	2.21	0.90
2	10.00	76.98	77.39	75.19	77.12	76.58	76.99	76.71	0.79	0.32
3	15.00	87.77	88.04	85.54	88.61	86.94	87.21	87.35	1.07	0.44
4	25.00	93.02	91.47	93.86	91.62	90.64	92.46	92.18	1.16	0.47
5	35.00	91.85	91.84	94.38	92.55	91.71	93.81	92.69	1.14	0.47
6	45.00	92.92	93.33	94.76	93.21	92.50	94.89	93.60	0.99	0.41
7	55.00	95.96	94.97	96.41	93.73	93.57	95.42	95.01	1.16	0.47

Formulation P-7 aging 45 C 75 % RH

No	Time min	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	48.98	50.80	58.50	46.04	46.46	46.04	49.47	4.82	1.97
2	10.00	74.31	62.00	74.50	70.93	72.76	74.57	71.51	4.87	1.99
3	15.00	81.72	76.34	79.26	79.73	77.64	76.67	78.56	2.06	0.84
4	25.00	85.82	84.33	83.06	85.35	83.81	83.39	84.29	1.10	0.45
5	35.00	86.85	86.48	84.64	86.67	87.50	85.68	86.30	1.01	0.41
6	45.00	87.48	88.22	85.81	87.29	88.12	87.13	87.34	0.87	0.36
7	55.00	88.24	89.27	87.97	87.77	88.61	87.76	88.27	0.59	0.24

Formulation P-7 aging at room temp

No	Time min	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	62.00	63.96	66.34	62.98	66.06	63.12	64.07	1.76	0.72
2	10.00	78.16	84.33	83.51	82.65	79.73	79.43	81.30	2.52	1.03
3	15.00	85.46	89.56	88.87	88.29	87.31	86.59	87.68	1.52	0.62
4	25.00	89.71	91.88	92.44	90.74	89.89	90.99	90.94	1.08	0.44
5	35.00	90.49	93.79	93.66	91.52	92.21	91.92	92.27	1.27	0.52
6	45.00	90.99	94.45	94.32	92.59	92.86	92.99	93.03	1.27	0.52
7	55.00	92.20	95.82	95.26	93.10	93.38	93.64	93.90	1.37	0.56

Formulation P-13 aging 45 C 75 % RH

No	Time min	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	55.42	52.34	49.96	54.30	56.12	56.68	54.13	2.56	1.04
2	10.00	65.67	76.15	76.14	71.40	73.23	67.91	71.75	4.30	1.76
3	15.00	70.65	80.07	81.60	76.84	81.48	82.57	78.87	4.50	1.84
4	25.00	80.56	81.22	84.57	82.86	83.47	83.87	82.76	1.56	0.64
5	35.00	85.63	81.81	85.32	83.46	85.05	86.44	84.62	1.69	0.69
6	45.00	85.83	81.98	85.66	85.19	86.51	87.20	85.39	1.81	0.74
7	55.00	87.28	82.16	86.27	87.20	87.27	87.68	86.31	2.09	0.85

Formulation P13 aging at room temp

No	Time min	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	62.42	51.92	61.86	56.82	55.84	60.88	58.29	4.13	1.69
2	10.00	70.88	65.65	79.42	68.75	70.57	76.76	72.01	5.14	2.10
3	15.00	85.00	74.83	86.44	81.18	82.16	77.74	81.23	4.37	1.78
4	25.00	87.43	88.97	88.32	87.51	88.78	89.65	88.44	0.87	0.35
5	35.00	89.18	85.12	90.07	89.39	89.69	90.57	89.00	1.97	0.80
6	45.00	89.81	85.17	90.99	90.03	90.05	90.94	89.50	2.18	0.89
7	55.00	90.31	86.49	91.64	90.53	90.69	91.44	90.18	1.88	0.77

Formulation P-18 aging 45 C 75 % RH

No	Time min	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	50.24	52.06	50.66	49.82	50.38	50.80	50.66	0.77	0.31
2	10.00	64.80	75.03	76.84	69.27	68.16	73.34	71.24	4.58	1.87
3	15.00	80.84	89.72	88.47	82.40	85.48	81.87	84.80	3.69	1.51
4	25.00	94.03	93.72	91.90	95.04	95.47	92.68	93.81	1.36	0.56
5	35.00	95.95	94.80	94.51	95.99	96.14	95.16	95.42	0.69	0.28
6	45.00	96.90	96.31	95.31	96.66	96.82	95.69	96.28	0.65	0.26
7	55.00	97.44	97.27	95.84	97.34	97.35	96.22	96.91	0.69	0.28

Formulation P-18 aging at room temp

No	Time min	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	48.70	51.92	44.50	45.90	53.18	45.48	48.28	3.61	1.47
2	10.00	74.73	79.23	68.83	71.07	75.87	75.13	74.14	3.68	1.50
3	15.00	88.58	91.85	84.19	83.65	88.20	84.51	86.83	3.24	1.32
4	25.00	95.24	94.32	90.26	94.19	90.37	89.60	92.33	2.51	1.02
5	35.00	97.03	95.82	91.88	97.10	91.99	90.52	94.05	2.92	1.19
6	45.00	97.70	97.19	92.53	97.08	92.92	91.16	94.76	2.87	1.17
7	55.00	98.11	96.89	93.46	97.61	93.57	91.66	95.22	2.66	1.08

Formulation P-25 aging at 45 C 75 % RH

No	Time min	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	48.42	50.10	46.32	48.42	44.78	48.42	47.74	1.88	0.77
2	10.00	66.61	70.96	68.84	67.45	66.87	67.87	68.10	1.61	0.66
3	15.00	75.94	80.87	83.64	83.92	87.68	85.04	82.85	4.04	1.65
4	25.00	91.90	93.08	94.18	93.07	93.91	91.54	92.95	1.06	0.43
5	35.00	93.39	93.88	95.13	93.87	95.55	95.83	94.61	1.02	0.42
6	45.00	94.05	94.68	95.79	94.39	96.64	96.64	95.36	1.15	0.47
7	55.00	94.85	95.20	96.61	95.05	97.18	97.73	96.10	1.23	0.50

Formulation P-25 aging at room temp

No	Time min	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	62.14	61.58	64.52	59.90	61.02	59.90	61.51	1.73	0.70
2	10.00	83.34	85.16	83.08	81.09	84.60	79.55	82.80	2.13	0.87
3	15.00	90.81	87.03	88.30	89.66	88.29	88.39	88.75	1.31	0.53
4	25.00	91.59	92.70	93.69	92.96	90.74	89.72	91.90	1.49	0.61
5	35.00	92.66	93.49	96.31	94.74	92.08	90.64	93.32	2.01	0.82
6	45.00	95.13	95.97	97.26	95.82	92.73	91.71	94.77	2.12	0.86
7	55.00	95.80	97.20	97.80	96.35	93.53	92.36	95.51	2.14	0.87

Formulation P-27 aging 45 C 75 % RH

No	Time min	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	28.96	31.06	28.82	30.50	32.60	32.74	30.78	1.70	0.69
2	10.00	36.82	41.17	44.52	46.49	42.86	47.62	43.25	3.92	1.60
3	15.00	68.24	67.16	70.67	67.89	69.56	69.02	68.76	1.26	0.51
4	25.00	75.62	76.49	79.46	71.48	77.36	79.21	76.60	2.92	1.19
5	35.00	81.22	80.00	84.38	83.92	87.73	88.89	84.36	3.49	1.43
6	45.00	83.77	81.98	86.39	85.79	88.64	89.80	86.06	2.92	1.19
7	55.00	87.18	85.38	88.13	88.50	90.53	90.30	88.34	1.94	0.79

Formulation P-27 aging at room temp.

No	Time min	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	42.68	50.80	42.68	46.88	45.90	47.02	45.99	3.06	1.25
2	10.00	64.33	78.10	61.95	70.10	68.27	63.52	67.71	5.93	2.42
3	15.00	74.63	90.71	74.34	85.75	82.93	80.25	81.44	6.40	2.61
4	25.00	86.11	98.22	88.61	91.40	90.39	90.08	90.80	4.07	1.66
5	35.00	91.63	100.86	98.91	97.93	91.46	90.86	95.27	4.45	1.82
6	45.00	97.60	101.56	101.27	99.18	90.70	91.50	96.97	4.78	1.95
7	55.00	100.66	102.27	102.68	99.87	91.35	92.01	98.14	5.11	2.09

Formulation P-28 aging 45 C 75 % RH

No	Time min	% Release						Average % Release	SD	SEM
		1	2	3	4	5	6			
1	5.00	28.12	27.70	30.08	28.40	30.64	31.76	29.45	1.62	0.66
2	10.00	45.77	47.45	44.94	41.44	44.67	46.07	45.06	2.03	0.83
3	15.00	64.09	62.42	62.55	64.21	64.24	64.25	63.63	0.89	0.36
4	25.00	71.86	71.02	67.80	70.86	69.63	71.47	70.44	1.50	0.61
5	35.00	75.34	74.22	76.44	74.62	75.90	73.54	75.01	1.08	0.44
6	45.00	76.74	74.91	80.22	80.91	77.86	76.61	77.88	2.30	0.94
7	55.00	77.59	75.75	77.87	84.72	79.55	77.88	78.89	3.10	1.27

Formulation		P-28 ageing at room temp								
No	Time min	1	2	3	% Release			Average % Release	SD	SEM
					4	5	6			
1	5.00	27.00	26.86	30.36	29.10	31.48	28.68	28.91	1.82	0.74
2	10.00	44.23	45.91	47.61	49.00	49.15	50.40	47.71	2.30	0.94
3	15.00	65.33	67.30	68.17	66.77	65.11	66.92	66.60	1.18	0.48
4	25.00	72.98	71.32	74.43	74.56	73.03	73.31	73.27	1.18	0.48
5	35.00	75.34	75.63	75.96	76.80	77.21	77.50	76.41	0.89	0.36
6	45.00	77.02	77.87	77.09	77.92	76.94	79.19	77.67	0.86	0.35
7	55.00	78.15	78.73	78.35	79.62	78.77	80.61	79.04	0.92	0.38



VITA

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