

REFERENCES

- American Pharmaceutical Association Staff. 1986. Handbook of Pharmaceutical Excipients. Washington : The American Pharmaceutical Association.
- Aungst, B.J. 1988. Nicotine skin penetration characteristics using aqueous & non-aqueous vehicles, anionic polymers and silicone matrices. Drug Dev. Ind. Pharm. 14 : 1484-1494.
- Baker, R.W., et al. 1989. Novel transdermal nicotine patch. US. Patent 4,839,174.
- _____. 1990. Prolonged activity nicotine patch. US. Patent 4,943,435.
- Benowitz, N.L. 1987 Pharmacokinetics and pharmacodynamics of nicotine. In M.J. Rand and K. Thurau (eds.) The Pharmacology of Nicotine. pp 3-19. Paris : International Council of Scientific Unions Press.
- Berba, J. and Banakar, U. 1990. Clinical effect of current transdermal drug delivery systems : A retrospective evaluation. American Pharmacy. NS30 (11) : 33-41.
- Berner, B, Mazzenga, G.C., Gargiulo, P.M., and Steffen, R. 1992. A transdermal nicotine system : feasibility studies. J. Controlled Release. 20 : 13-20.
- Bidout, G., Santus, G.C., and Guy, R.H. 1988. Pharmacokinetic consideration in the use of newer transdermal formulations. Clin. Pharmacol. 15 : 114-131.
- Chandrasekaran, S.K. 1983. Controlled release of scopolamine for prophylaxis of motion sickness. Drug Dev. Ind. Pharm. 9(64) : 627-646.
- Chien, Y.W. 1987. Transdermal rate-controlled drug delivery : Theory and practice. Drug of Today. 23 : 625-646.
- _____, and Valia, K.H. 1984. Development of a dynamic skin permeation system for long-term permeation studies. Drug Dev. Ind. Pharm. 10 : 575-599.

- Christen, A., et al. 1991. Transdermal nicotine for smoking cessation. JAMA. 266 (22) : 3133-3138.
- Cocaba, S.C., and Kin, P.T. 1993. TIMS. A MIMS publication.
- Connors, K.A., Amidon, G.L., and Stella, V.J. 1986. Chemical Stability of Pharmaceuticals : A Hand Book for Pharmacists. 2 nd ed. New York : John Wiley.
- Cordell, G.A. 1981. Introduction to Alkaloid : A Biogenic Approach. New York : Weley.
- Etscorn, F.T. 1986. Transcutaneous application of nicotine U.S.Patent 4,597,961.
- Fiore, M.C., Jorenby, D.E., Baker, T.B., and Kenford, S.L. 1992. Tobacco dependence and the nicotine patch. JAMA. 19:2687-2894.
- Fox, C. 1984. Gel and sticks review and update. Cosm. & Toilet. 99 : 19-54.
- Gont, S.K. 1990. Transdermal delivery of nicotine. U.S. Patent 4,908,213.
- Ho, H. and Chien, Y.W. 1993. Kinetic evaluation of transdermal nicotine delivery systems. Drug Dev. Ind. Pharm. 19 (3) : 295-313.
- Irwin, W.J., and Li Wan Po, A. 1979. The dependence of amitriptylene partition coefficient on lipid phase. Int. J. Pharm. 4 : 47-56.
- Jarvis, M. 1992. Addiction experts urge wider use of nicotine replacement. The Pharmaceutical Journal. 248 : 322.
- Keshary, P.R., and Chien, Y.W. 1984. Mechanisms of transdermal controlled nitroglycerin administration (I) : Development of a finite-dosing skin permeation system. Drug Dev. Ind. Pharm. 10 : 883-913.
- _____. 1985. Mechanism of transdermal controlled nitroglycerin administration (III) : Control of skin permeation rate and optimization. Drug Dev. Ind. Pharm. 11 : 1213-1253.

- Kochak, G.M., Sun, J.X., Chai, R.L., and Piraino, A.J. 1992. Pharmacokinetic disposition of multiple dose transdermal nicotine in healthy adult smokers. J. Pharm. Res. 9 : 1451-1455.
- Kydonieus, A.F., and Berner, B. 1987. Transdermal Delivery of Drugs. vol 1-3. Florida : CRC Press.
- Lachman, L. 1968. Antioxidants and chelating agents as stabilizers in liquid dosage forms. Drug Cosmetic Ind. 43 : 36-40.
- Lane, J.D., et al. 1993. Pharmacokinetics of a transdermal nicotine patch compared to nicotine gum. Drug Dev. Ind. Pharm. 19 : 1992-2010.
- Langer, R. 1990. New methods of drug delivery. Science. 249 : 1527-1532.
- Lin, S., and Chein, Y.W. 1993. Transdermal nicotine delivery systems : Multi-institutional cooperative bioequivalence studies. Drug Dev. Ind. Pharm. 19 (20) : 2765-2793.
- Lochhead, K.Y., and William, K. 1993. Encyclopedia of polymers and thickeners of cosmetics. Cosm.&Toilet. 108 : 15-135.
- Martin, A. 1993. Physical Pharmacy : Physical Chemical principles Pharmaceutical Sciences. 4 th ed. Philadelphia : Lea & Febiger.
- Mcevoy, G.K., and Litvak, K. 1989. American Hospital Formulary Service. 89 th ed. Bethesda : American society of hospital pharmacists.
- Mueller, K.R., Roberts, M.E., and Scott, L.A. 1990. Automated *in-vitro* nitroglycerin delivery systems with or without skin. Drug Dev, Ind. Pharm. 16 : 1857-1880.
- Mulligan, S.C., et al. 1990. Clinical and pharmacokinetic properties of a transdermal nicotine patch. Clin. Pharmacol. Ther. 43 (3) : 331-336.
- Myers, J.A. 1990. The hazards of smoking. The Pharmaceutical Journal. 244 : 291-292.

- Norris, A.J. 1992. How pharmacists can help patients to stop smoking. The Pharmaceutical Journal. 248 : 320-321.
- Nunn-Thompson, C.L., and Simon, P.A. 1989. Therapy review : Pharmacotherapy for smoking cessation. Clin. Pharmacy. 8 : 710-719.
- Oakley, D.M., and Swarbrick, J. 1987. Effects of ionization on the percutaneous absorption of drug : partitioning of nicotine into organic liquids and hydrated stratum corneum. J. Pharm. Sciences. 76 : 866-870.
- Palmer, K.J., Buckley, M.M., and Faulds, D. 1992. Transdermal nicotine : A review of its pharmacodynamic and pharmacokinetic properties, and therapeutic efficacy as an aid to smoking cessation. Drug. 44 : 498-529.
- Reynolds, J.E.F. 1993. Martindale the Extra Pharmacopoeia. 30 th ed. London : The Pharmaceutical Press.
- Robinson, D.E., Balter, N.J., and Schwartz, S.L. 1992. A physiologically based pharmacokinetic model for nicotine and cotinine in man. J. Pharmacol. biopharm. 20 (6) : 591-607.
- Rolland, A. 1993. Particulate carriers in dermal and transdermal drug delivery myth or reality. In A Rolland (ed.), Pharmaceutical Particulate Carriers Therapeutic Applications. pp 367-375. New York : Marcel Dekker.
- Ross, H.D., Chan, K.H., Piraino, A.J., and John, V.A. 1991. Pharmacokinetics of multiple daily transdermal doses of nicotine in healthy smokers. J. Pharm. Res. 8 : 385-388.
- Rose, J.E., et al. 1985. Transdermal nicotine reduces cigarette craving and nicotine preference. Clin. Pharmacol. Ther. 38(40) : 450-455.
- _____. 1990. Method and apparatus for aiding in the reduction of incidence of tobacco smoking. U.S. Patent 4,920,989.

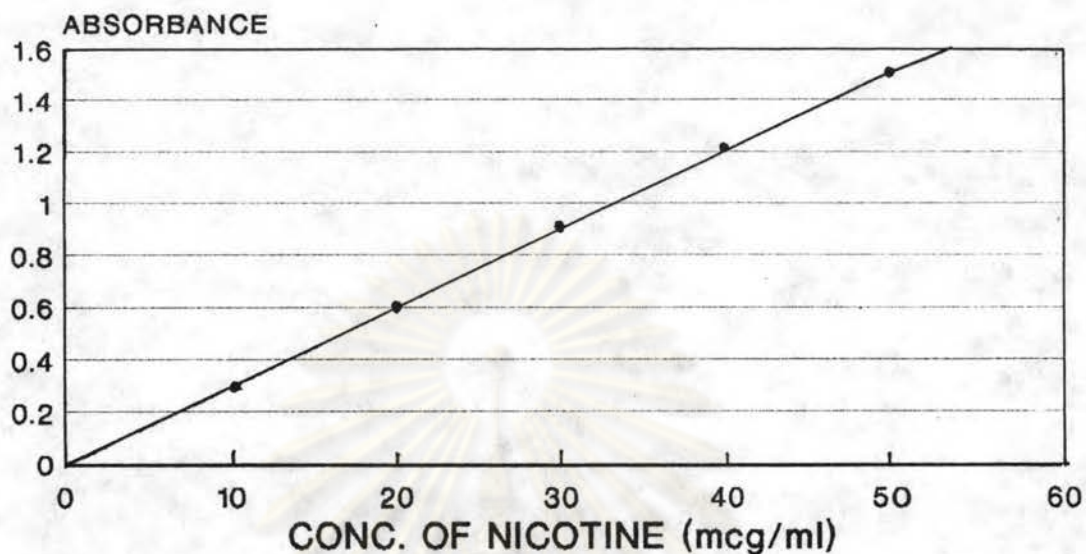
- _____. 1990. Transdermal nicotine facilitates smoking cessation. Clin. Pharmacol. Ther. 47 (3) : 323-330.
- Rotenberg, K.S. 1982. The pharmacokinetics of nicotine. Pharm. Int. 2 : 91-93.
- Santi, P., et al. 1991. Partition and transport of verapanil and nicotine through artificial membranes. Int. J Pharm. 68 : 43-49.
- Schmolka, I.R. 1984. Gel cosmetics. Cosm. & Toilet. 99 : 69-76.
- Schroeter, L.C. 1961. Sulfurous acid salts as pharmaceutical antioxidants. J Pharm. Sci. 50 : 891 - 900.
- Sherritt, M., and Enever, R.P. 1979. Rheological and drug release properties of oil gels containing colloid silicon dioxide. J. Pharm. Sci. 68 : 842-845.
- Sifton, D.W. 1994. Physicians' Desk Reference. 48 th ed. Montvale : Medical economics data.
- Silverman, R.B. 1992. The Organic Chemistry of Drug Design and Drug Action. California : Academic Press.
- Sugibayashi, K., and Morimoto, Y. 1994. Polymer for transdermal drug delivery systems. J. Controlled Release. 29 : 177-185.
- Swarbrick, J., and Boylan, J.C. 1990. Encyclopedia of Pharmaceutical Technology. V.2. Biodegradable polyester, polymer as drug, carriers to clinical pharmacokinetics and pharmacodynamics. New York : Marcel dekker.
- Thassu, D., and Vyas, S.P. 1993. Controlled transdermal occlusive delivery device of primaquine. Drug Dev. Ind. Pharm. 19 : 1343 - 1356.



APPENDICES

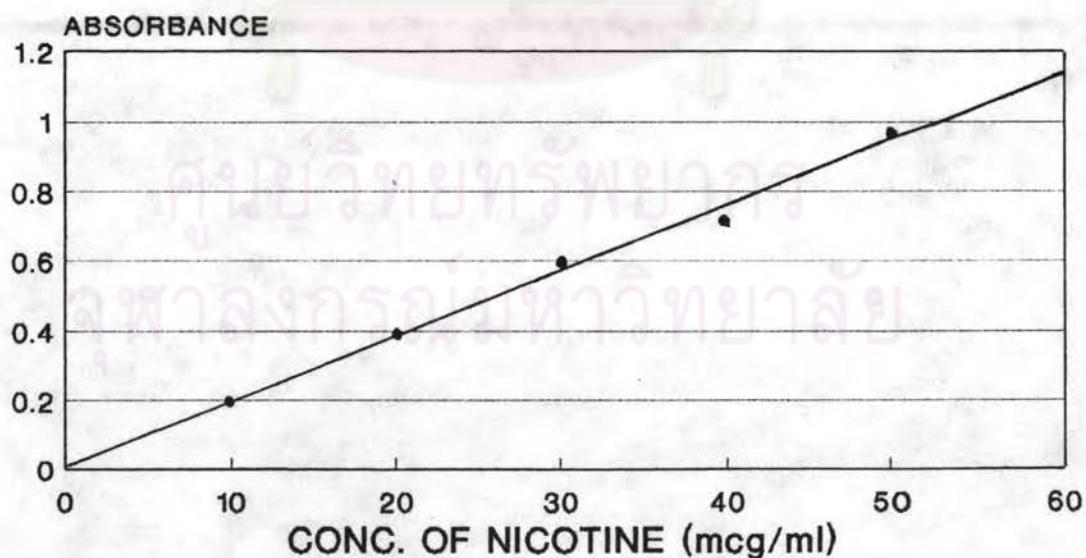
ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

Appendix I



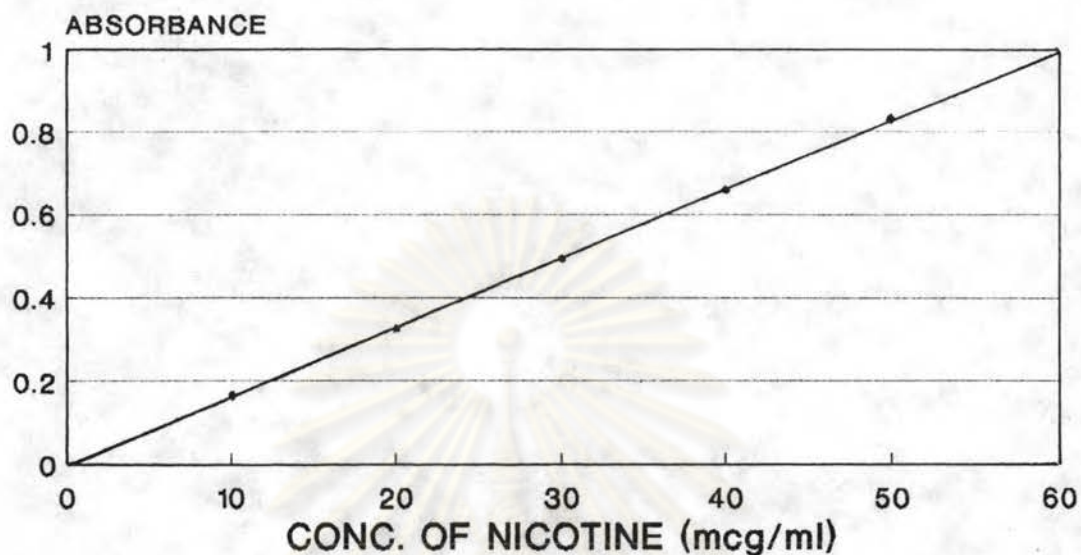
Calibration curve of nicotine in pH 2 phosphate buffer determined by UV at 260 nm ($Y = 0.0303X - 0.01$, $r^2 = 0.99996$).

Appendix II



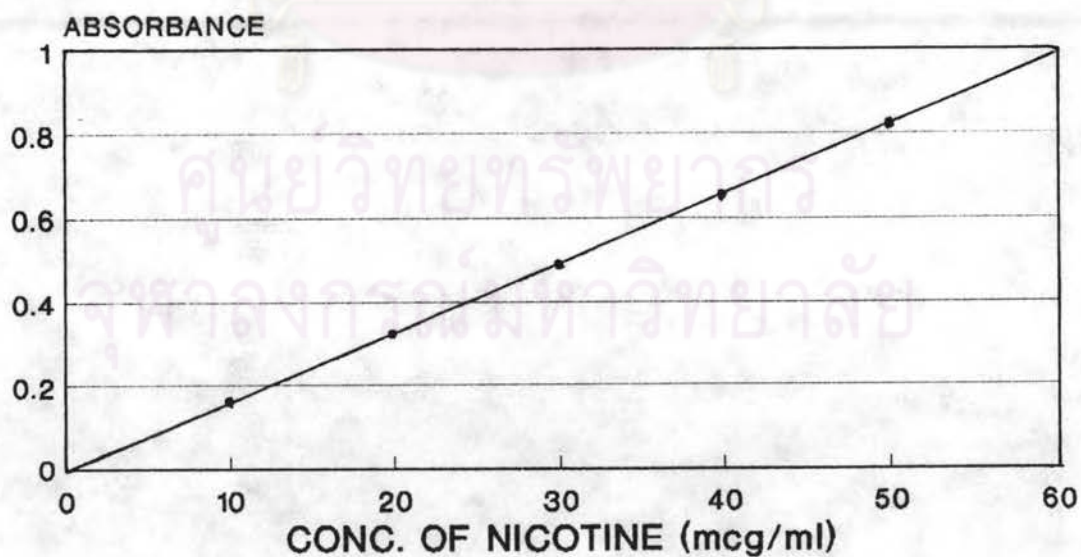
Calibration curve of nicotine in pH 4 phosphate buffer determined by UV at 260 nm ($Y = 0.01953X - 0.0005$, $r^2 = 0.9993$).

Appendix III



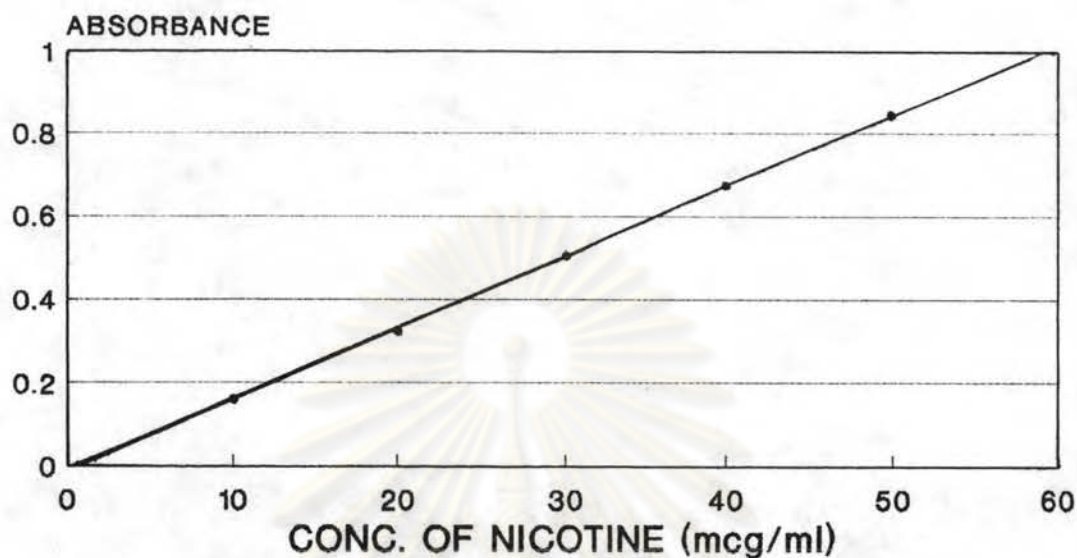
Calibration curve of nicotine in pH 6 phosphate buffer determined by UV at 260 nm ($Y = 0.01633X - 0.0006$, $r^2 = 0.9996$).

Appendix IV



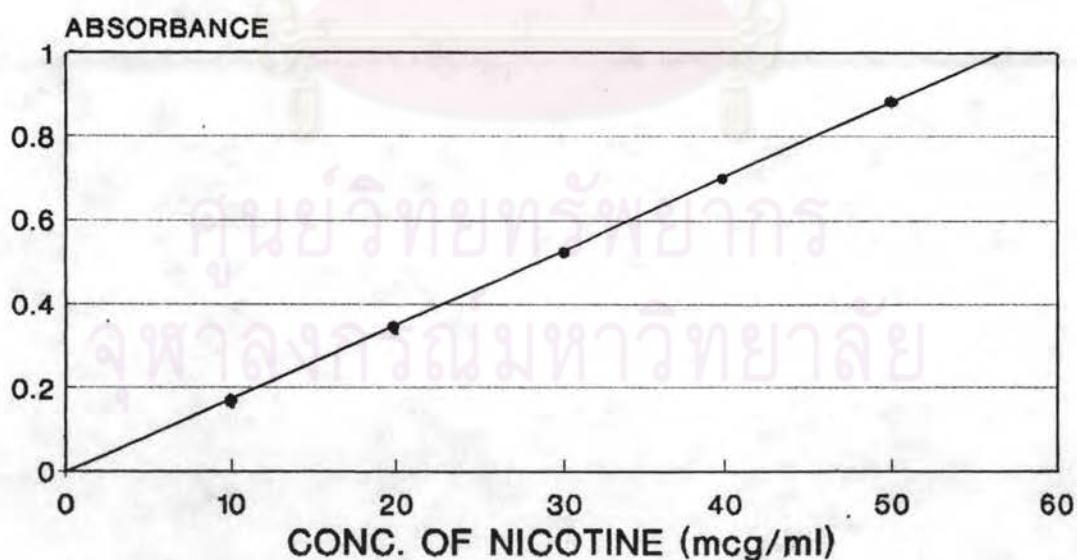
Calibration curve of nicotine in pH 7 phosphate buffer determined by UV at 260 nm ($Y = 0.01665X - 0.0085$, $r^2 = 0.9991$).

Appendix V



Calibration curve of nicotine in pH 8 phosphate buffer determined by UV at 260 nm ($Y = 0.01695X - 0.0006$, $r^2 = 0.9998$).

Appendix VI



Calibration curve of nicotine in pH 10 phosphate buffer determined by UV at 260 nm ($Y = 0.01825X - 0.0331$, $r^2 = 0.99992$).

Appendix VII

Cumulative release and skin permeation of nicotine-TDS : 5%w/w
nicotine in pH 6.5 aqueous vehicle (N=3).

Time (hrs)	Cumulative released (mg/cm ²)				Cumulative skin permeation (mg/cm ²)			
	A	B	C	X ± SD	A	B	C	X ± SD
0	0	0	0	0	0	0	0	0
1	0.0385	0.0343	0.0482	0.0403 ± 0.0071	0.0204	0.0248	0.0182	0.0211 ± 0.0034
2	0.1418	0.1184	0.1739	0.1447 ± 0.0279	0.0549	0.0554	0.0489	0.0531 ± 0.0036
3	0.2795	0.2844	0.3151	0.2930 ± 0.0190	0.1032	0.0898	0.1021	0.0984 ± 0.0074
4	0.3375	0.3997	0.3975	0.3782 ± 0.0350	0.1585	0.1459	0.1444	0.1496 ± 0.0077
6	0.7157	0.6451	0.6377	0.6661 ± 0.0431	0.2797	0.2127	0.2362	0.2429 ± 0.0339
8	0.8366	0.9140	0.8234	0.8580 ± 0.0489	0.3735	0.3481	0.3474	0.3563 ± 0.0149
10	1.0473	1.0873	1.0283	1.0540 ± 0.0301	0.4772	0.4788	0.4214	0.4591 ± 0.0327
12	1.1872	1.2255	1.2212	1.2113 ± 0.0209	0.5779	0.5869	0.5682	0.5777 ± 0.0094

Appendix VIII

Cumulative release and skin permeation of nicotine-TDS : 5%w/w
nicotine in pH 8.5 aqueous vehicle (N=3).

Time (hrs)	Cumulative released (mg/cm ²)				Cumulative skin permeation (mg/cm ²)			
	A	B	C	X ± SD	A	B	C	X ± SD
0	0	0	0	0	0	0	0	0
1	0.0266	0.0292	0.0315	0.0291 ± 0.0024	0.0333	0.0134	0.0419	0.0295 ± 0.0146
2	0.1252	0.1464	0.1394	0.1370 ± 0.0108	0.1123	0.0887	0.1215	0.1075 ± 0.0169
3	0.2434	0.2996	0.2771	0.2742 ± 0.0262	0.1899	0.1559	0.2162	0.1873 ± 0.0302
4	0.3930	0.4064	0.4033	0.4009 ± 0.0069	0.2693	0.2224	0.2815	0.2577 ± 0.0312
6	0.6374	0.6256	0.6176	0.6268 ± 0.0099	0.4281	0.3701	0.4653	0.4212 ± 0.0479
8	0.8183	0.7745	0.8001	0.7977 ± 0.0220	0.6014	0.5672	0.6296	0.5994 ± 0.0312
10	1.0278	1.0475	1.0413	1.0389 ± 0.0100	0.7293	0.7258	0.8079	0.7543 ± 0.0464
12	1.3314	1.2311	1.2848	1.2825 ± 0.0502	0.9096	0.9162	0.9236	0.9164 ± 0.0070

Appendix IX

Cumulative release and skin permeation of nicotine-TDS : 5%w/w
nicotine in pH 10.5 aqueous vehicle (N=3).

Time (hrs)	Cumulative released (mg/cm ²)				Cumulative skin permeation (mg/cm ²)			
	A	B	C	X ± SD	A	B	C	X ± SD
0	0	0	0	0	0	0	0	0
1	0.0385	0.0343	0.0482	0.0403 ± 0.0071	0.1254	0.0965	0.1257	0.1151 ± 0.0168
2	0.1418	0.1184	0.1739	0.1447 ± 0.0279	0.2229	0.2429	0.2436	0.2365 ± 0.0118
3	0.2795	0.2844	0.3151	0.2930 ± 0.0193	0.3187	0.3330	0.3254	0.3257 ± 0.0072
4	0.3375	0.3997	0.3975	0.3782 ± 0.0353	0.4013	0.4289	0.4587	0.4296 ± 0.0287
6	0.7157	0.6451	0.6377	0.6661 ± 0.0489	0.6408	0.5775	0.5698	0.5960 ± 0.0389
8	0.8366	0.9140	0.8234	0.8580 ± 0.0489	0.7200	0.7419	0.7696	0.7438 ± 0.0249
10	1.0473	1.0873	1.0283	1.0540 ± 0.0301	0.8231	0.9048	0.9417	0.8899 ± 0.0607
12	1.1872	1.2255	1.2212	1.2113 ± 0.0209	1.0811	1.1492	1.0509	1.0937 ± 0.0504

Appendix X

Cumulative release and skin permeation of nicotine-TDS : 5%w/w
nicotine in propylene glycol vehicle (N=3).

Time (hrs)	Cumulative released (mg/cm ²)				Cumulative skin permeation (mg/cm ²)			
	A	B	C	X ± SD	A	B	C	X ± SD
0	0	0	0	0	0	0	0	0
1	0.0360	0.0384	0.0412	0.0385 ± 0.0026	0.0042	0.0021	0.0042	0.0035 ± 0.0012
2	0.0598	0.0571	0.0617	0.0595 ± 0.0023	0.0059	0.0052	0.0075	0.0662 ± 0.0012
3	0.0745	0.0833	0.0794	0.0791 ± 0.0044	0.0128	0.0122	0.013	0.0127 ± 0.0004
4	0.0903	0.0966	0.0982	0.0950 ± 0.0042	0.2260	0.0213	0.0189	0.0209 ± 0.0019
6	0.1262	0.1278	0.1429	0.1323 ± 0.0092	0.0358	0.0386	0.0331	0.0358 ± 0.0028
8	0.1622	0.166	0.1746	0.1676 ± 0.0064	0.0625	0.0631	0.0588	0.0615 ± 0.0023
10	0.1904	0.1931	0.2097	0.1977 ± 0.0105	0.0758	0.0823	0.0779	0.0786 ± 0.0038
12	0.2188	0.2377	0.2385	0.2317 ± 0.0111	0.0955	0.1045	0.0958	0.0986 ± 0.0051

Appendix XI

Cumulative release and skin permeation of nicotine-TDS : 5%w/w
nicotine in PEG 400 vehicle (N=3).

Time (hrs)	Cumulative released (mg/cm ²)				Cumulative skin permeation (mg/cm ²)			
	A	B	C	X ± SD	A	B	C	X ± SD
0	0	0	0	0	0	0	0	0
1	0.1706	0.1718	0.1598	0.1674 ± 0.0066	0.0139	0.0142	0.02	0.0161 ± 0.0034
2	0.2360	0.2337	0.2192	0.2296 ± 0.0091	0.0483	0.0496	0.0567	0.0515 ± 0.0045
3	0.2683	0.3088	0.2832	0.2828 ± 0.0205	0.0762	0.0703	0.0936	0.0800 ± 0.0121
4	0.3543	0.3327	0.3098	0.3323 ± 0.0223	0.1012	0.0949	0.1148	0.1036 ± 0.0102
6	0.4289	0.4248	0.4155	0.4231 ± 0.0069	0.1581	0.1593	0.1764	0.1646 ± 0.0102
8	0.5074	0.5307	0.4886	0.5089 ± 0.0211	0.2069	0.1910	0.2195	0.2058 ± 0.0143
10	0.6230	0.2876	0.5719	0.5942 ± 0.0262	0.2448	0.2575	0.2475	0.2499 ± 0.0067
12	0.6619	0.6482	0.6403	0.6501 ± 0.0109	0.3262	0.3411	0.3262	0.3312 ± 0.0086

Appendix XI I

Cumulative release and skin permeation of nicotine-TDS : 5%w/w
nicotine in glycerin vehicle (N=3).

Time (hrs)	Cumulative released (mg/cm ²)				Cumulative skin permeation (mg/cm ²)			
	A	B	C	X ± SD	A	B	C	X ± SD
0	0	0	0	0	0	0	0	0
1	0.4421	0.3395	0.3649	0.3822 ± 0.0534	0.0118	0.0122	0.012	0.0119 ± 0.0002
2	0.4844	0.4403	0.5211	0.4819 ± 0.0405	0.025	0.0236	0.0281	0.0256 ± 0.0024
3	0.5151	0.5299	0.5763	0.5404 ± 0.0319	0.0419	0.0827	0.0584	0.0609 ± 0.0205
4	0.6021	0.5968	0.6764	0.6251 ± 0.0445	0.0801	0.1244	0.0991	0.1012 ± 0.0222
6	0.6718	0.6784	0.7555	0.7091 ± 0.0465	0.1562	0.1578	0.1699	0.1613 ± 0.0075
8	0.7787	0.7491	0.8268	0.7849 ± 0.0392	0.2399	0.2319	0.2494	0.2405 ± 0.0088
10	0.8580	0.8024	0.9124	0.8576 ± 0.0550	0.3031	0.3043	0.3099	0.3057 ± 0.0036
12	0.9571	0.8930	0.9987	0.9496 ± 0.0532	0.3708	0.3743	0.3776	0.3742 ± 0.0034

Appendix XIII

Cumulative release and skin permeation of nicotine-TDS : 5%w/w
nicotine in mineral oil vehicle (N=3).

Time (hrs)	Cumulative released (mg/cm ²)				Cumulative skin permeation (mg/cm ²)			
	A	B	C	X ± SD	A	B	C	X ± SD
0	0	0	0	0	0	0	0	0
1	0.5930	0.5477	0.5324	0.5579 ± 0.0313	0.0643	0.0504	0.0495	0.0557 ± 0.0100
2	0.8210	0.7649	0.7489	0.7783 ± 0.0379	0.1499	0.1163	0.1038	0.1233 ± 0.0138
3	0.8899	0.8668	0.8592	0.8719 ± 0.0159	0.2212	0.1979	0.1959	0.2050 ± 0.0141
4	1.0413	1.0498	1.0437	1.0449 ± 0.0044	0.2863	0.2953	0.2593	0.2803 ± 0.01870
6	1.3296	1.1707	1.1912	1.2305 ± 0.0864	0.3709	0.3683	0.4050	0.3814 ± 0.0205
8	1.5187	1.4819	1.4476	1.4827 ± 0.0356	0.5229	0.6294	0.5065	0.5529 ± 0.0662
10	1.7624	1.6624	1.6892	1.7047 ± 0.0518	0.7644	0.7725	0.7717	0.7695 ± 0.0045
12	1.8121	1.6826	1.7715	1.7474 ± 0.0916	0.8834	0.9169	0.9079	0.9027 ± 0.0173

Appendix XIV

Cumulative release and skin permeation of nicotine-TDS : 5%w/w
nicotine in silicone oil vehicle (N=3).

Time (hrs)	Cumulative released (mg/cm ²)				Cumulative skin permeation (mg/cm ²)			
	A	B	C	X ± SD	A	B	C	X ± SD
0	0	0	0	0	0	0	0	0
1	0.8987	0.8605	0.7801	0.8464 ± 0.0605	0.1503	0.1603	0.1551	0.1552 ± 0.0050
2	1.0085	1.0094	0.9588	0.9922 ± 0.0289	0.2700	0.3067	0.2527	0.2779 ± 0.0260
3	1.1195	1.1596	1.1649	1.1480 ± 0.0248	0.4409	0.4379	0.3845	0.4211 ± 0.0317
4	1.3806	1.3388	1.3867	1.3687 ± 0.0261	0.5426	0.5486	0.5431	0.5448 ± 0.0033
6	1.5645	1.5716	1.5977	1.5779 ± 0.0175	0.6967	0.7563	0.6398	0.6976 ± 0.0583
8	1.7298	1.7768	1.8063	1.7709 ± 0.0386	0.8250	0.8034	0.7687	0.799 ± 0.0284
10	1.8419	1.8982	1.9394	1.8932 ± 0.0489	0.9035	0.8568	0.8568	0.8724 ± 0.0269
12	2.0203	2.0505	2.0038	2.0249 ± 0.0237	0.9627	0.9492	0.9115	0.9411 ± 0.0265



Appendix XV

Cumulative release and skin permeation of nicotine-TDS : 5%w/w
nicotine in simethicone vehicle (N=3).

Time (hrs)	Cumulative released (mg/cm ²)				Cumulative skin permeation (mg/cm ²)			
	A	B	C	X ± SD	A	B	C	X ± SD
0	0	0	0	0	0	0	0	0
1	0.8123	0.8214	0.9014	0.8169 ± 0.0065	0.0825	0.0808	0.0782	0.0805 ± 0.0022
2	1.0339	1.0662	1.0904	1.0635 ± 0.0283	0.1884	0.1906	0.1913	0.1901 ± 0.0015
3	1.1341	1.2041	1.1668	1.1683 ± 0.0350	0.3073	0.3121	0.3131	0.3108 ± 0.0031
4	1.2699	1.3355	1.3592	1.3215 ± 0.0463	0.3817	0.3752	0.3735	0.3768 ± 0.0043
6	1.5006	1.5832	1.5786	1.5541 ± 0.0464	0.4968	0.5072	0.4931	0.4990 ± 0.0073
8	1.7058	1.7234	1.7866	1.7395 ± 0.0415	0.6893	0.6969	0.7254	0.7039 ± 0.0190
10	1.9117	1.1632	1.9813	1.9521 ± 0.0361	0.8112	0.8168	0.8102	0.8127 ± 0.0036
12	2.0251	2.0758	2.0408	2.0472 ± 0.0259	0.9156	0.9133	0.9279	0.9189 ± 0.0079

Appendix XVI

Cumulative release and skin permeation of Nicotinell®-TTS (N=3).

Time (hrs)	Cumulative released (mg/cm ²)				Cumulative skin permeation (mg/cm ²)			
	A	B	C	X ± SD	A	B	C	X ± SD
0	0	0	0	0	0	0	0	0
0.5	0.4117	0.4056	0.4212	0.4145 ± 0.0080	0.0803	0.0838	0.0837	0.0826 ± .0019
1	0.5907	0.5803	0.5983	0.5898 ± 0.0090	0.1607	0.1559	0.1607	0.1519 ± .0027
2	0.7678	0.7778	0.8009	0.7822 ± 0.0169	0.3120	0.3259	0.3223	0.3201 ± .0072
3	0.9544	0.9521	0.9588	0.9549 ± 0.0031	0.4496	0.4446	0.4401	0.4448 ± .0047
4	1.0681	1.0665	1.0835	1.0727 ± 0.0094	0.5161	0.5473	0.5422	0.5352 ± .0167
6	1.3293	1.3151	1.3139	1.3195 ± 0.0086	0.7519	0.7571	0.7868	0.7653 ± .0188
8	1.4211	1.4217	1.4318	1.4249 ± 0.0059	0.9437	0.9763	0.9507	0.9566 ± .0176
10	1.4932	1.5508	1.5160	1.5200 ± 0.0290	1.1085	1.0824	1.0962	1.0957 ± .0131
12	1.5858	1.5912	1.5960	1.5910 ± .00510	1.2955	1.2463	1.5491	1.2636 ± .0276
14	1.6469	1.6508	1.6664	1.6540 ± 0.0111	1.4099	1.3503	1.3420	1.4074 ± .0370
16	1.4572	1.7616	1.7459	1.7550 ± 0.0081	1.5215	1.5654	1.6061	1.5640 ± .0423
20	1.8328	1.8345	1.4806	1.8359 ± 0.0041	1.7289	1.6949	1.7786	1.7341 ± .0421
24	1.9313	1.9295	1.9302	1.9303 ± 0.0080	1.8653	1.8685	1.8009	1.8449 ± .0381

Appendix XVII

Cumulative release and skin permeation of nicotine-TDS : Formula #1
(5%w/w nicotine-mineral oil) (N=3).

Time (hrs)	Cumulative released (mg/cm ²)				Cumulative skin permeation (mg/cm ²)			
	A	B	C	X ± SD	A	B	C	X ± SD
0	0	0	0	0	0	0	0	0
0.5	0.5741	0.5883	0.6496	0.6031 ± .0386	0.0780	0.0789	0.0809	0.0793 ± 0.0015
1	0.7484	0.7589	0.8401	0.7742 ± .0443	0.1476	0.1598	0.1601	0.1599 ± 0.0071
2	0.9687	1.0258	1.0967	1.0304 ± .0641	0.2988	0.3041	0.2791	0.2939 ± 0.0312
3	1.0832	1.1655	1.2228	1.1572 ± .0702	0.4307	0.4081	0.4499	0.4308 ± 0.0211
4	1.1696	1.3055	1.3985	1.2919 ± .1151	0.5417	0.5069	0.5331	0.5272 ± 0.0181
6	1.3689	1.4826	1.5951	1.4822 ± .1131	0.7322	0.6735	0.6813	0.6957 ± 0.0319
8	1.5179	1.5994	1.9115	1.6459 ± .1565	0.8712	0.8435	0.8725	0.8624 ± 0.0164
10	1.6632	1.7029	2.0147	1.7292 ± .1334	1.0538	1.0386	1.0249	1.0391 ± 0.0145
12	1.7728	1.7859	2.1558	1.8578 ± .1360	1.1913	1.1668	1.1569	1.1717 ± 0.0177
14	1.8514	1.9568	2.1983	1.988 ± .1546	1.2539	1.2295	1.2583	1.3072 ± 0.0155
16	1.9212	1.996	2.2674	2.0385 ± .1436	1.5146	1.4788	1.5111	1.5014 ± 0.0199
20	1.9722	2.0637	2.4736	2.1011 ± .1511	1.6762	1.6335	1.7034	1.6710 ± 0.0352
24	2.0971	2.3753	1.9302	2.3153 ± .1953	1.9125	1.8717	1.9131	1.8991 ± 0.0238

Appendix XVIII

Cumulative release and skin permeation of nicotine-TDS : Formula #3 (20
%w/w nicotine-mineral oil) (N=3).

Time (hrs)	Cumulative released (mg/cm ²)				Cumulative skin permeation (mg/cm ²)			
	A	B	C	X ± SD	A	B	C	X ± SD
0	0	0	0	0	0	0	0	0
0.5	0.1455	0.128	0.1353	0.1364 ± 0.008	0.1053	0.1021	0.1056	0.1044 ± 0.0019
1	0.2766	0.2374	0.2825	0.2655 ± 0.0245	0.1994	0.2109	0.2289	0.2130 ± 0.0149
2	0.3937	0.358	0.4236	0.3918 ± 0.0328	0.3449	0.3639	0.3516	0.3557 ± 0.0089
3	0.5132	0.4886	0.4876	0.4965 ± 0.0145	0.4828	0.5109	0.4702	0.4878 ± 0.0209
4	0.6779	0.6992	0.6731	0.6834 ± 0.0139	0.6037	0.5934	0.5663	0.5878 ± 0.0193
6	0.8558	0.8764	0.8522	0.8615 ± 0.0130	0.7429	0.7859	0.7685	0.7658 ± 0.0216
8	1.1618	0.9959	1.0231	1.0603 ± 0.0889	0.933	0.9949	0.9294	0.9524 ± 0.0368
10	1.3456	1.1847	1.2375	1.2559 ± 0.0819	1.1164	1.1659	1.1034	1.1286 ± 0.033
12	1.5849	1.3732	1.4698	1.4759 ± 0.1059	1.3131	1.345	1.3136	1.5788 ± 0.176
14	1.6959	1.4829	1.5779	1.5856 ± 0.1067	1.4903	1.497	1.437	1.4748 ± 0.0329
16	1.7825	1.5839	1.6603	1.6755 ± 0.1001	1.5794	1.5961	1.5609	1.5788 ± 0.0176
20	1.9114	1.7173	1.8556	1.8281 ± 0.0995	1.6512	1.6947	1.6498	1.6636 ± 0.0272
24	2.1301	1.9246	2.0039	2.0195 ± 0.1036	1.8267	1.8046	1.8416	1.8243 ± 0.0186

Appendix XIX

Cumulative release and skin permeation of nicotine-TDS : Formula #4
(5%w/w nicotine -0.3 % w/w carbomer 934) (N=3).

Time (hrs)	Cumulative released (mg/cm ²)				Cumulative skin permeation (mg/cm ²)			
	A	B	C	X ± SD	A	B	C	X ± SD
0	0	0	0	0	0	0	0	0
0.5	0.398	0.4143	0.4115	0.4079 ± 0.0087	0.1088	0.1411	0.1304	0.1268 ± 0.0165
1	0.5288	0.5075	0.5505	0.5289 ± 0.0215	0.2438	0.2483	0.2662	0.2528 ± 0.0118
2	0.6952	0.6652	0.688	0.6828 ± 0.0157	0.4035	0.4318	0.4529	0.4249 ± 0.0248
3	0.7801	0.7569	0.7654	0.7675 ± 0.0117	0.5372	0.5874	0.5536	0.5594 ± 0.0256
4	0.8588	0.8499	0.8249	0.8445 ± 0.0176	0.6527	0.6843	0.6857	0.5352 ± 0.0167
6	1.0418	1.0164	1.0467	1.0349 ± 0.0163	0.8661	0.8949	0.8913	0.6742 ± 0.0187
8	1.2037	1.1847	1.1759	1.1881 ± 0.0142	1.0507	1.0848	1.0488	0.8841 ± 0.0157
10	1.3103	1.2713	1.3249	1.3021 ± 0.0277	1.1859	1.2572	1.1738	1.0614 ± 0.0203
12	1.4689	1.4508	1.4658	1.4618 ± 0.0097	1.3083	1.3586	1.2987	1.2056 ± 0.0451
14	1.552	1.5693	1.5477	1.5564 ± 0.0114	1.4313	1.5388	1.4615	1.3219 ± 0.0322
16	1.6607	1.6789	1.6177	1.6524 ± 0.0315	1.5198	1.672	1.6338	1.4772 ± 0.0554
20	1.8372	1.7519	1.8116	1.8003 ± 0.0438	1.7902	1.8456	1.7173	1.7844 ± 0.0643
24	1.9842	1.9748	1.9424	1.9672 ± 0.0219	1.9207	1.9297	1.8779	1.9094 ± 0.0277

Appendix XX

Cumulative release and skin permeation of nicotine-TDS : Formula #5
(5%w/w nicotine-0.5 % w/w carbomer 934) (N=3).

Time (hrs)	Cumulative released (mg/cm ²)				Cumulative skin permeation (mg/cm ²)			
	A	B	C	X ± SD	A	B	C	X ± SD
0	0	0	0	0	0	0	0	0
0.5	0.2638	0.2688	0.3042	0.2788 ± 0.0222	0.1383	0.1241	0.142	0.1344 ± 0.0095
1	0.4088	0.4227	0.4255	0.4189 ± 0.0089	0.2139	0.2064	0.2023	0.2076 ± 0.0059
2	0.5408	0.5391	0.5493	0.5431 ± 0.0055	0.3687	0.3559	0.3422	0.3556 ± 0.0545
3	0.6936	0.7431	0.6951	0.7106 ± 0.0281	0.4649	0.4072	0.4311	0.4358 ± 0.0312
4	0.7846	0.7942	0.7803	0.7862 ± 0.0071	0.5155	0.5095	0.5508	0.5253 ± 0.0223
6	0.9125	0.9421	0.936	0.9302 ± 0.0156	0.6562	0.6607	0.6391	0.6519 ± 0.0114
8	1.066	1.0372	0.9959	1.0330 ± 0.0353	0.7874	0.7395	0.7962	0.7743 ± 0.0305
10	1.1928	1.2175	1.2064	1.2056 ± 0.0124	0.9481	0.9085	0.9489	0.9352 ± 0.0231
12	1.3202	1.3592	1.3172	1.3322 ± 0.0234	1.1218	1.0465	1.1051	1.0911 ± 0.0395
14	1.5069	1.5683	1.476	1.5171 ± 0.0469	1.236	1.144	1.2019	1.1939 ± 0.0465
16	1.6412	1.7326	1.6336	1.6691 ± 0.05851	1.4011	1.2849	1.4299	1.3719 ± 0.0767
20	1.8119	1.8662	1.7608	1.8129 ± 0.0527	1.5279	1.4771	1.5454	1.5168 ± 0.0355
24	1.9591	2.0356	1.936	1.9769 ± 0.0521	1.7182	1.6126	1.6973	1.6760 ± 0.0559

Appendix XXI

Cumulative release and skin permeation of nicotine-TDS
: Formula #6 (5%w/w nicotine -1.0 % w/w carbomer 934) (N=3).

Time (hrs)	Cumulative released (mg/cm ²)				Cumulative skin permeation (mg/cm ²)			
	A	B	C	X ± SD	A	B	C	X ± SD
0	0	0	0	0	0	0	0	0
0.5	0.1033	0.111	0.3042	0.1055 ± 0.0048	0.0302	0.0271	0.03303	0.0292 ± 0.0018
1	0.1565	0.1727	0.4255	0.1701 ± 0.0125	0.0667	0.0609	0.0693	0.0656 ± 0.0043
2	0.273	0.2715	0.5493	0.2678 ± 0.0078	0.1439	0.1503	0.1581	0.1508 ± 0.0071
3	0.3359	0.3316	0.6951	0.3282 ± 0.0099	0.2158	0.2221	0.2406	0.2262 ± 0.0129
4	0.3922	0.3751	0.7803	0.3805 ± 0.0102	0.2865	0.2894	0.315	0.2969 ± 0.0157
6	0.5251	0.5572	0.936	0.5318 ± 0.0227	0.412	0.4232	0.4661	0.4338 ± 0.0286
8	0.6714	0.7289	0.9959	0.6819 ± 0.0426	0.5246	0.5294	0.58	0.5447 ± 0.0307
10	0.8359	0.9264	1.2064	0.8684 ± 0.0503	0.6302	0.65516	0.6966	0.6594 ± 0.0339
12	0.9227	0.9687	1.3172	0.9298 ± 0.0358	0.7226	0.7449	0.8028	0.7568 ± 0.0414
14	1.0429	1.1201	1.476	1.0582 ± 0.0558	0.7946	0.8202	0.8831	0.8831 ± 0.0455
16	1.1219	1.2007	1.6336	1.1317 ± 0.0646	0.9283	0.9596	1.032	0.9733 ± 0.0532
20	1.3397	1.4077	1.7608	1.3378 ± 0.0709	1.0034	1.0276	1.1157	1.0489 ± 0.0591
24	1.5136	1.5606	1.936	1.5027 ± 0.0640	1.0795	1.1176	1.2004	1.1325 ± 0.0618

Appendix XXII

Cumulative release and skin permeation of nicotine-TDS
: Formula #7 (5%w/w nicotine-1.5 % w/w carbomer 934) (N=3).

Time (hrs)	Cumulative released (mg/cm ²)				Cumulative skin permeation (mg/cm ²)			
	A	B	C	X ± SD	A	B	C	X ± SD
0	0	0	0	0	0	0	0	0
0.5	0.1695	0.0182	0.1882	0.1798 ± 0.0095	0.0274	0.0242	0.0244	0.0253 ± 0.0017
1	0.2463	0.2564	0.2622	0.2549 ± 0.0008	0.0579	0.0504	0.0464	0.0515 ± 0.0058
2	0.3296	0.3645	0.3544	0.3495 ± 0.0179	0.1094	0.1054	0.0964	0.1039 ± 0.0068
3	0.3767	0.4278	0.4092	0.4045 ± 0.0258	0.1807	0.1572	0.1437	0.1605 ± 0.0187
4	0.4732	0.5072	0.4898	0.4901 ± 0.0170	0.2228	0.2141	0.0271	0.2147 ± 0.0079
6	0.6435	0.6363	0.6644	0.6481 ± 0.0146	0.3217	0.3337	0.3295	0.3285 ± 0.0061
8	0.7509	0.7333	0.7326	0.7389 ± 0.0104	0.4294	0.4191	0.426	0.4238 ± 0.0052
10	0.8386	0.8169	0.8389	0.8315 ± 0.0126	0.4934	0.5084	0.4959	0.4993 ± 0.0080
12	0.8828	0.8959	0.8732	0.8839 ± 0.0114	0.5784	0.5917	0.6086	0.5929 ± 0.0150
14	0.9954	0.9456	0.9601	0.9670 ± 0.0256	0.6518	0.6513	0.6624	0.6552 ± 0.0063
16	1.0625	1.0041	1.0396	1.0354 ± 0.0294	0.6797	0.7011	0.7404	0.7071 ± 0.0308
20	1.1443	1.1652	1.1065	1.1386 ± 0.0298	0.8244	0.7961	0.8299	0.8168 ± 0.0181
24	1.2642	1.2307	1.1796	1.2248 ± 0.0426	0.9122	0.9153	0.9174	0.9149 ± 0.0027

Appendix XXIII

Cumulative release and skin permeation of nicotine-TDS
: Formula #8 (5%w/w nicotine-1.0 % w/w pluronic F 127) (N=3).

Time (hrs)	Cumulative released (mg/cm ²)			
	A	B	C	X ± SD
0	0	0	0	0
0.5	0.1507	0.1606	0.1593	0.1569 ± 0.005
1	0.1903	0.2074	0.199	0.1989 ± 0.0008
2	0.2841	0.2854	0.3021	0.2905 ± 0.010
3	0.3471	0.3218	0.3479	0.3389 ± 0.0148
4	0.3776	0.377	0.3946	0.3831 ± 0.010
6	0.4503	0.4869	0.4864	0.4745 ± 0.0209
8	0.5706	0.5851	0.5179	0.5579 ± 0.0353
10	0.6209	0.6432	0.6499	0.6380 ± 0.0152
12	0.7175	0.7429	0.6983	0.7196 ± 0.0223
14	0.7509	0.7799	0.7397	0.7569 ± 0.0207
16	0.7938	0.8599	0.7865	0.7852 ± 0.0423
20	0.9045	0.9289	0.9677	0.9337 ± 0.0318
24	1.0156	1.0472	0.9931	1.0186 ± 0.0272

Appendix XXIV

Cumulative release and skin permeation of nicotine-TDS
: Formula #9 (5%w/w nicotine-5.0 % w/w pluronic F 127) (N=3).

Time (hrs)	Cumulative released (mg/cm ²)			
	A	B	C	X ± SD
0	0	0	0	0
0.5	0.0695	0.0949	0.0931	0.0858 ± 0.0142
1	0.1273	0.15	0.1391	0.1388 ± 0.0114
2	0.1907	0.227	0.2211	0.2129 ± 0.0195
3	0.2473	0.2794	0.2945	0.2737 ± 0.0241
4	0.2898	0.3692	0.3669	0.3419 ± 0.0452
6	0.4569	0.5138	0.4951	0.4886 ± 0.0289
8	0.5391	0.5436	0.5468	0.5432 ± 0.0039
10	0.6276	0.6942	0.6575	0.6598 ± 0.0334
12	0.7303	0.7333	0.7068	0.7234 ± 0.0145
14	0.8266	0.7778	0.7867	0.7970 ± 0.0259
16	0.8783	0.8514	0.8915	0.8737 ± 0.0204
20	1.0224	0.9621	0.942	0.9755 ± 0.0418
24	1.0971	1.0267	1.0297	1.0512 ± 0.0398

Appendix XXV

Cumulative release and skin permeation of nicotine-TDS
: Formula #10 (5%w/w nicotine-10 % w/w pluronic F 127) (N=3).

Time (hrs)	Cumulative released (mg/cm ²)			
	A	B	C	X ± SD
0	0	0	0	0
0.5	0	0	0	0
1	0.0347	0.0416	0.0369	0.0378 ± 0.0035
2	0.0869	0.0796	0.0872	0.0846 ± 0.0043
3	0.1442	0.1319	0.1385	0.1382 ± 0.0062
4	0.1865	0.1845	0.1878	0.1863 ± 0.0016
6	0.2453	0.2653	0.2282	0.2463 ± 0.0186
8	0.3797	0.3393	0.3461	0.355 ± 0.216
10	0.4472	0.4679	0.4942	0.4698 ± 0.0236
12	0.548	0.4905	0.5541	0.5003 ± 0.0428
14	0.5962	0.5671	0.593	0.5855 ± 0.0159
16	0.6345	0.6136	0.6193	0.6224 ± 0.0108
20	0.7034	0.6991	0.7119	0.7048 ± 0.0065
24	0.7707	0.747	0.7405	0.7527 ± 0.0159

Appendix XXVI

Cumulative release and skin permeation of nicotine-TDS
: Formula #11 (5%w/w nicotine-5.0 % w/w EVAco) (N=3).

Time (hrs)	Cumulative released (mg/cm ²)				Cumulative skin permeation (mg/cm ²)			
	A	B	C	X ± SD	A	B	C	X ± SD
0	0	0	0	0	0	0	0	0
0.5	0.0537	0.4774	0.5108	0.4973 ± 0.0176	0.0683	0.0991	0.0789	0.0615 ± 0.0429
1	0.6611	0.6102	0.63306	0.63339 ± 0.0256	0.3121	0.3302	0.2892	0.3105 ± 0.0206
2	0.8504	0.8629	0.8594	0.8559 ± 0.0064	0.4579	0.4709	0.4598	0.4629 ± 0.0071
3	1.0162	0.9608	0.9859	0.9877 ± 0.0278	0.5892	0.6255	0.6049	0.6065 ± 0.0182
4	1.1136	1.0639	1.0841	1.0872 ± 0.025	0.6606	0.7286	0.6867	0.6919 ± 0.0343
6	1.2405	1.2374	1.2272	1.2350 ± 0.0069	0.7648	0.831	0.7692	0.7789 ± 0.0210
8	1.3127	1.3361	1.3232	1.3239 ± 0.012	1.0849	1.0643	1.0082	1.0525 ± 0.0397
10	1.4134	1.3727	1.3849	1.3904 ± 0.021	1.2788	1.3127	1.3337	1.3084 ± 0.0277
12	1.466	1.5075	1.4716	1.48817 ± 0.0225	1.4604	1.4424	1.4302	1.4443 ± 0.0152
14	1.5256	1.5536	1.5619	1.5471 ± 0.0190	1.5462	1.5522	1.5753	1.5579 ± 0.0154
16	1.7203	1.7023	1.7146	1.7124 ± 0.009	1.7522	1.7422	1.6849	1.7264 ± 0.0363
20	1.7703	1.7851	1.756	1.7705 ± 0.0145	1.8258	1.8921	1.704	1.8073 ± 0.0954
24	1.7997	1.8203	1.8216	1.8139 ± 0.0123	1.9144	1.9649	1.9295	1.9363 ± 0.0259

Appendix XXVII

Cumulative release and skin permeation of nicotine-TDS
: Formula #12 (5%w/w nicotine-10 % w/w EVAco) (N=3).

Time (hrs)	Cumulative released (mg/cm ²)				Cumulative skin permeation (mg/cm ²)			
	A	B	C	X ± SD	A	B	C	X ± SD
0	0	0	0	0	0	0	0	0
0.5	0.2784	0.3141	0.2814	0.2913 ± 0.0198	0.0408	0.0366	0.0437	0.04404 ± 0.0036
1	0.3924	0.4339	0.3869	0.1044 ± 0.0257	0.0819	0.0689	0.0682	0.0730 ± 0.0078
2	0.469	0.4885	0.4748	0.4758 ± 0.0123	0.1628	0.1631	0.1511	0.1589 ± 0.0068
3	0.5902	0.5958	0.5569	0.5809 ± 0.0210	0.2693	0.2468	0.2499	0.2553 ± 0.0122
4	0.6613	0.6451	0.6062	0.6376 ± 0.0283	0.3291	0.2929	0.3164	0.3128 ± 0.0183
6	0.6868	0.6701	0.6707	0.6756 ± 0.0095	0.4495	0.4669	0.4689	0.46689 ± 0.0107
8	0.7685	0.7954	0.7548	0.7729 ± 0.0207	0.5024	0.5791	0.5528	0.5581 ± 0.0189
10	0.8529	0.8373	0.8362	0.8422 ± 0.0094	0.645	0.6539	0.6845	0.6612 ± 0.0207
12	0.9002	0.9443	0.9126	0.9190 ± 0.0227	0.7738	0.7598	0.7503	0.7626 ± 0.0101
14	0.9986	1.0163	0.9916	1.0022 ± 0.0127	0.8997	0.8885	0.9153	0.9012 ± 0.0134
16	1.09533	1.1051	1.0735	1.0912 ± 0.0162	0.9524	0.9331	0.9417	0.9424 ± 0.0096
20	1.2051	1.1819	1.1961	1.1944 ± 0.0117	1.1299	1.0963	1.1152	1.1138 ± 0.0168
24	1.3165	1.3396	1.3407	1.3323 ± 0.0137	1.2422	1.2047	1.2198	1.2222 ± 0.0188

Appendix XXVIII

Cumulative release and skin permeation of nicotine-TDS
: Formula #13 (5%w/w nicotine-15 % w/w EVAco) (N=3).

Time (hrs)	Cumulative released (mg/cm ²)				Cumulative skin permeation (mg/cm ²)			
	A	B	C	X ± SD	A	B	C	X ± SD
0	0	0	0	0	0	0	0	0
0.5	0.13376	0.1403	0.1281	0.1354 ± 0.0064	0.0452	0.0392	0.0408	0.0595 ± 0.0196
1	0.1863	0.1725	0.1648	0.1745 ± 0.0109	0.0814	0.0788	0.0802	0.0802 ± 0.0013
2	0.2195	0.2443	0.2327	0.2322 ± 0.0124	0.1164	0.1039	0.1147	0.1117 ± 0.0068
3	0.3156	0.3386	0.3229	0.3257 ± 0.0117	0.1939	0.2026	0.2061	0.2009 ± 0.0062
4	0.385	0.4043	0.3881	0.3925 ± 0.0103	0.2999	0.2837	0.2883	0.2906 ± 0.0084
6	0.4269	0.4546	0.435	0.4389 ± 0.0142	0.4674	0.4583	0.4583	0.4613 ± 0.0052
8	0.5278	0.5504	0.5413	0.5398 ± 0.0114	0.5546	0.569	0.5652	0.5629 ± 0.0075
10	0.5966	0.5805	0.5732	0.5834 ± 0.0119	0.6312	0.6492	0.6399	0.6401 ± 0.0089
12	0.6546	0.6533	0.6331	0.6469 ± 0.0121	0.7261	0.7552	0.7176	0.7329 ± 0.0197
14	0.7345	0.7797	0.7564	0.7569 ± 0.0226	0.8138	0.8186	0.7977	0.8100 ± 0.0109
16	0.8605	0.8559	0.8271	0.8479 ± 0.0181	0.9004	0.9068	0.8868	0.8979 ± 0.0102
20	0.9802	0.9503	1.0063	0.9789 ± 0.0280	0.9925	1.003	0.9801	0.9919 ± 0.0115
24	1.1694	1.1512	1.1294	1.1500 ± 0.0200	1.1532	1.1471	1.1303	1.1435 ± 0.0118

Appendix XXIX

Cumulative release and skin permeation of nicotine-TDS
: Formula #14 (5%w/w nicotine-20 % w/w EVAco) (N=3).

Time (hrs)	Cumulative released (mg/cm ²)				Cumulative skin permeation (mg/cm ²)			
	A	B	C	X ± SD	A	B	C	X ± SD
0	0	0	0	0	0	0	0	0
0.5	0.0242	0.2052	0.2439	0.2178 ± 0.0227	0.0526	0.0446	0.0445	0.0472 ± 0.0046
1	0.2965	0.3257	0.3191	0.3137 ± 0.0153	0.0767	0.0855	0.0765	0.00796 ± 0.0051
2	0.3729	0.3537	0.3795	0.3687 ± 0.0134	0.1173	0.1309	0.1265	0.1249 ± 0.0069
3	0.4178	0.4273	0.4386	0.4279 ± 0.0104	0.1686	0.1698	0.1699	0.1694 ± 0.007
4	0.4581	0.467	0.4599	0.4617 ± 0.0047	0.2068	0.2083	0.2178	0.2109 ± 0.0059
6	0.4968	0.4997	0.5006	0.4989 ± 0.0019	0.4475	0.4058	0.4419	0.4318 ± 0.0226
8	0.5389	0.5473	0.5544	0.5469 ± 0.0078	0.5122	0.54473	0.5084	0.5226 ± 0.0214
10	0.58855	0.5784	0.5961	0.5867 ± 0.0089	0.586	0.6197	0.6028	0.6002 ± 0.0130
12	0.6432	0.6597	0.6517	0.6515 ± 0.0082	0.6507	0.6718	0.6589	0.6605 ± 0.0106
14	0.6799	0.6994	0.6883	0.6892 ± 0.0098	0.7071	0.7249	0.7227	0.7183 ± 0.0097
16	0.7282	0.7332	0.7519	0.7377 ± 0.0125	0.8175	0.8035	0.8531	0.8247 ± 0.02255
20	0.8394	0.8321	0.8572	0.8429 ± 0.0129	0.9568	0.9465	0.9731	0.9588 ± 0.0134
24	0.8993	0.8799	0.9137	0.8976 ± 0.0169	1.0792	1.0317	1.1237	1.0782 ± 0.0459

Appendix XXX

Cumulative release and skin permeation of nicotine-TDS : Formula #15
(5%w/w nicotine-10 % w/w EVAco-10 % w/w mineral oil) (N=3).

Time (hrs)	Cumulative released (mg/cm ²)				Cumulative skin permeation (mg/cm ²)			
	A	B	C	X ± SD	A	B	C	X ± SD
0	0	0	0	0	0	0	0	0
0.5	0.3331	0.3189	0.2875	0.3132 ± 0.023	0.0568	0.0642	0.0649	0.1619 ± 0.0045
1	0.6464	0.608	0.5857	0.6134 ± 0.0307	0.1318	0.1408	0.1355	0.1360 ± 0.0045
2	0.7839	0.8356	0.7293	0.7829 ± 0.0532	0.2547	0.2809	0.2843	0.2733 ± 0.0162
3	0.9603	1.0188	0.9916	0.9902 ± 0.0293	0.4047	0.4018	0.3982	0.4016 ± 0.0033
4	1.1286	1.1463	1.1534	1.1428 ± 0.0128	0.516	0.533	0.5409	0.5300 ± 0.0127
6	1.4219	1.4304	1.4005	1.4176 ± 0.0154	0.6868	0.7123	0.7019	0.7003 ± 0.0128
8	1.5039	1.5117	1.5862	1.5006 ± 0.0131	0.9478	0.9492	0.933	0.9485 ± 0.0011
10	1.5763	1.5672	1.5739	1.5125 ± 0.0047	1.0344	1.1004	1.1129	1.0826 ± 0.0422
12	1.7849	1.7548	1.7413	1.7603 ± 0.0223	1.2991	1.305	1.3255	1.3099 ± 0.0139
14	1.9108	1.8953	1.912	1.9060 ± 0.0093	1.406	1.4694	1.4856	1.4537 ± 0.0421
16	1.9961	1.9903	1.9863	1.9809 ± 0.0130	1.505	1.5835	1.5178	1.5354 ± 0.0420
20	2.0345	2.0403	2.0172	2.0307 ± 0.0119	1.6546	1.6895	1.6685	1.6769 ± 0.0176
24	2.122	2.1353	2.1135	2.1236 ± 0.0109	1.823	1.8443	1.8656	1.8443 ± 0.0213

Appendix XXXI
 Diffusional exponent (n) and mechanism of diffusional release
 form various non-swellable controlled released systems.

Diffusional exponent, n			Drug release mechanism
Thin film	Cylindrical	Spherical	
0.5	0.45	0.43	Fickian diffusion
$0.5 < n < 1.00$	$0.45 < n < 1.00$	$0.43 < n < 1.00$	Anomalous transport
1	1	1	Zero-order release

ศูนย์วิทยทรัพยากร
 จุฬาลงกรณ์มหาวิทยาลัย



VITAE

Miss Praneet Opanasopit was born on July 23, 1968 in Petchaburi Province. She got her Bachelor degree of Science in Pharmacy with second honors in 1992 from Faculty of Pharmaceutical Sciences, Silpakorn University, Thailand.



ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย