

REFERENCES

- Ahuja, S., and Ashman, J. 1990. Terbutaline sulfate. In K. Florey, A. A. Al-Badr, and T.J. Woznoak (eds.), **Analytical profiles of drug substances** (Vol.19), pp. 601-625. New York: Academic Press.
- Aulton, M. E. 1982. Assessment of the mechanical properties of film coating materials. **Int. J. Pharm. Tech. & Prod. Mfr.** 3(1): 9-16.
- Baichwal, M. R., Deshpande, S. G., Singh, P. K., and Venkitachalam, P. 1987. Studies on polymeric films for transdermal use. **Indian J. Pharm. Sci.** 50(3): 153-156.
- Baker, R. 1987. **Controlled release of biologically active agents.** New York: John Wiley & Sons.
- Berthod, A., Cremer, K., and Kreuter, J. 1996. Preparation and characterization of chitosan microspheres as drug carrier for prednisolone sodium phosphate as model for anti-inflammatory drugs. **J. Controlled Release** 39: 17-25.
- Bhalla, H. L., and Bhate, A. S. 1994. Feasibility studies on transdermal films of ephedrine. **Indian Drugs** 31(7): 328-332.
- Bhalla, H. L., and Toddywala, R. D. 1988. Transdermal films of ephedrine. **Drug Dev. Ind. Pharm.** 14(1): 119-131.
- Bhattachar, S. N., Rytting, J. H., Itoh, T., and Nishihata, T. 1992. The effects of complexation with hydrogenated phospholipid on the transport of salicylic acid, diclofenac and indomethacin across snake stratum corneum. **Int. J. Pharm.** 79: 263-271.
- Blair, H. S., Guthrie, J., Law, T-K., and Turkington, P. 1987. Chitosan and modified chitosan membranes I. Preparation and characterisation. **J. Appl. Polym. Sci.** 33: 641-656.

- Chien, Y.W. 1987. **Transdermal controlled systemic medications**. Vol. 31. New York: Marcel-Dekker.
- Chien, Y. W. 1992. **Novel drug delivery systems**. 2nd ed. revised and expanded. Vol. 50. New York: Marcel Dekker.
- Chien, Y. W., and Valia, K. H. 1984. Development of a dynamic skin permeation system for long-term permeation studies. **Drug Dev. Ind. Pharm.** 10: 575-599.
- Davies, D. S., George, C. F., Blackwell, E., Conolly, M. E., and Dollery, C. T. 1974. Metabolism of terbutaline sulfate in man and dog. **Br. J. Clin. Pharmacol.** 1: 129-136. cited in Jain, S. K., Vyas, S. P., and Dixit, V. K. 1992. A new approach towards the development of a transdermal terbutaline releasing system. **J. Controlled Release** 22: 117-124.
- Dehghan, M. H., Parakh, S. R., and Deshpande, S. G. 1993. Studies on polymeric systems for transdermal drug delivery. **Indian drugs** 30(12): 616-621.
- Doolittle, A. K., ed. 1954. **The technology of solvents and plasticizers**. New York: John Wiley & Sons.
- Franz, T. J. 1975. Percutaneous absorption on the relevance of in-vitro data. **J. Invest. Dermatol.** T4: 190-193.
- Guy, R. H., and Hadgraft, J. 1986. Interpretation and prediction of the kinetics of transdermal drug delivery: oestradiol, hyoscine and timolol. **Int. J. Pharm.** 32: 159-163.
- Guo, J., Robertson, R. E., and Amidon, G. L. 1993. An investigation into the mechanical and transport properties of aqueous latex films: A new hypothesis for the film-forming mechanism of aqueous dispersion system. **Pharm. Res.** 10(3): 405-410.
- Hadgraft, J., and Guy, R. H. 1989. **Transdermal drug delivery: Development issues and research initiatives**. New York: Marcel Dekker.

- Hasegawa, M., Isogai, A., Onabe, F., Usuda, M., and Atalla, R. H. 1992. Characterization of cellulose-chitosan blend films. **J. Appl. Polym. Sci.** 45: 1873-1879.
- Hickok, S. 1994. Polyvinyl alcohol. In A. Wade, and P. J. Weller (eds.), **Handbook of pharmaceutical excipients** (2nd ed.), pp. 204-206. Washington: American Pharmaceutical Association.
- Higuchi, T. 1963. Mechanism of sustained-action medication. **J. Pharm. Sci.** 52(12): 1145-1149.
- Higuchi, W. I. 1962. Analysis of data on the medicament release from ointments. **J. Pharm. Sci.** 51(8): 802-804.
- Hou, W., Miyazaki, S., Takeda, M., and Komai, T. 1985. Sustained release of indomethacin chitosan granules. **Chem. Pharm. Bull.** 33(9): 3986-3992.
- Hyppola, R., Husson, I., and Sundholm, F. 1996. Evaluation of physical properties of plasticized ethyl cellulose films cast from ethanol solution Part I. **Int. J. Pharm.** 133: 161-170.
- Itoh, T., Magavi, R., Casady, R. L., Nishihata, T., and Rytting, J. H. 1990. A method to predict the percutaneous permeability of various compounds: Shed snake skin as a model membrane. **Pharm. Res.** 7(12): 1302-1306.
- Itoh, T., Wasinger, L., Turunen, T. M., and Rytting, J. H. 1992. Effects of transdermal penetration enhancers on the permeability of shed snake skin. **Pharm. Res.** 9 (9): 1168-1172.
- Itoh, T., Xia, J., Magavi, R., Nishihata, T., and Rytting, J. H. 1990. Use of shed snake skin as a model membrane for in vitro percutaneous penetration studies: Comparison with human skin. **Pharm. Res.** 7(10): 1042-1047.
- Jain, S. K., Vyas, S. P., and Dixit, V. K. 1992. A new approach towards the development of a transdermal terbutaline releasing system. **J. Controlled Release** 22: 117-124.

- Jarupa Viyoch. 1996. **Development of isosorbide dinitrate transdermal patch using crosslinked-chitosan as rate-controlling membranes.** Master's thesis, Department of Manufacturing Pharmacy, Graduate School, Chulalongkorn University.
- Kanig, J. L., and Goodman, H. 1962. Evaluative procedures for film-forming materials used in pharmaceutical applications. **J. Pharm. Sci.** 51(1): 77-83.
- Kanikkannan, N., Jayaswal, S. B., and Singh, J. 1993. Transdermal delivery of indomethacin: I. Release profile of drug from polymeric patches. **Indian drugs** 30(9): 441-445.
- Kawashima, Y., Lin, S., Kasai, A., Handa, T., and Takenaka, H. 1985. Preparation of a prolonged release tablet of aspirin with chitosan. **Chem. Pharm. Bull.** 33(5): 2107-2113.
- Keith, A. D. 1983. Polymer matrix considerations for transdermal devices. **Drug Dev. Ind. Pharm.** 9(4): 605-625.
- 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(6): 883-913.
- Kim, J. H., Kim, J. Y., Lee, Y. M., and Kim, K. Y. 1992. Properties and swelling characteristics of cross-linked poly (vinyl alcohol)/chitosan blend membrane. **J. Appl. Polym. Sci.** 45: 1711-1717.
- Kligman, A. M. 1983. A biological brief on percutaneous absorption. **Drug Dev. Ind. Pharm.** 9(4): 521-560.
- Koteshwar, K. B., Udupa, N., and Kumar, V. 1992. Design and evaluation of captopril transdermal preparations. **Indian drugs** 29(15): 680-685.
- Kristmundsdottir, T., Ingvarsdottir, K., and Saemundsdottir, G. 1995. Chitosan matrix tablets: The influence of excipients on drug release. **Drug Dev. Ind. Pharm.** 21(13): 1591-1598.

- Lachman, L., Lieberman, H. A., and Kanig, J. L. 1986. **The theory and practice of industrial pharmacy**. 3rd ed. Philadelphia: Lea and Febiger.
- Lim, L. Y., and Wan, L. S. C. 1994. The effect of plasticizers on the properties of polyvinyl alcohol films. **Drug Dev. Ind. Pharm.** 20(6): 1007-1020.
- Lin, S. Y., Lee, C. J., and Lin, Y. Y. 1991. The effect of plasticizers on compatibility, mechanical properties, and adhesion strength of drug-free Eudragit E films. **Pharm. Res.** 8(9): 1137-1143.
- Lin, S. Y., Lee, C. J., and Lin, Y. Y. 1995. Drug-polymer interaction affecting the mechanical properties, adhesion strength and release kinetics of piroxicam-loaded Eudragit E films plasticized with different plasticizers. **J. Controlled Release** 33: 375-281.
- Lower, E. S. 1984. Polymers from the sea chitin & chitosan. **Manuf. Chem.** 55(10): 47, 49, 52.
- Mandal, S. C., Bhattacharyya, M., and Ghosal, S. K. 1994. In-vitro release and permeation kinetics of pentazocine from matrix-dispersion type transdermal drug delivery systems. **Drug Dev. Ind. Pharm.** 20(11): 1933-1941.
- Martin, A., Swarbrick, J., and Cammarata, A. 1983. **Physical pharmacy: physical chemical principles in the pharmaceutical sciences**. 3rd ed. Philadelphia: Lea & Febiger.
- Misra, A., Raghuvanshi, R. S., Ganga, S., Diwan, M., Talwar, G. P., and Singh, O. 1996. Formulation of a transdermal system for biphasic delivery of testosterone. **J. Controlled Release** 39: 1-7.
- Miyazaki, S., Ishii, K., and Nadai, T. 1981. The use of chitin and chitosan as drug carriers. **Chem. Pharm. Bull.** 29(10): 3067-3069.
- Miyazaki, S., Yamaguchi, H., Yokouchi, C., Takada, M. and Hou, W. M. 1988. Sustained-release and intragastric-floating granules of indomethacin using chitosan in rabbits. **Chem. Pharm. Bull.** 36(10): 4033-4038.

- 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.
- Murthy, S. N., Hamsa, V., and Bhaskaran, S. 1995. Formulation and evaluation of transdermal films of terbutaline sulphate. **Indian J. Pharm. Sci.** 57(5): 207-209.
- Nakatsuka, S., and Andraday, A. L. 1992. Permeability of vitamin B-12 in chitosan membranes: Effect of crosslinking and blending with poly (vinyl alcohol) on permeability. **J. Appl. Polym. Sci.** 44: 17-28.
- Nigalaye, A. G., Adusumilli, P., and Bolton, S. 1990. Investigation of prolonged drug release from matrix formulations of chitosan. **Drug Dev. Ind. Pharm.** 16(3): 449-467.
- Ogawa, K. 1991. Effect of heating an aqueous suspension of chitosan on the crystallinity and polymorphs. **Agric. Biol. Chem.** 55(9): 2375-2379.
- Oungbho, K., and Muller, B. W. 1997. Chitosan sponges as sustained release drug carrier. **Int. J. Pharm.** 156: 229-237.
- Pai, R.M., Desai, M. S., Babtiwale, A. D., and Shrivastava, R. 1994. Adhesive matrix type transdermal drug delivery system for nitroglycerin. **Drug Dev. Ind. Pharm.** 20(11): 1905-1909.
- Price, J. 1994. Glycerin. In A. Wade, and P. J. Weller (eds.), **Handbook of pharmaceutical excipients** (2nd ed.), pp. 204-206. Washington: American Pharmaceutical Association.
- Qurashi, M. T., Blair, H. S., and Allen, S. J. 1992a. Studies on modified chitosan membranes I. Preparation and characterization. **J. Appl. Polym. Sci.** 46: 255-261.

- Qurashi, M. T., Blair, H. S., and Allen, S. J. 1992b. Studies on modified chitosan membranes II: Dialysis of low molecular weight metabolites. **J. Appl. Polym. Sci.** 46: 263-269.
- Rao, P. R., and Diwan, P. V. 1996. Drug diffusion from cellulose acetate-polyvinyl pyrrolidone free films for transdermal administration. **Indian J. Pharm. Sci.** 58(6): 246-250.
- Reynolds, J. E. F., Parfitt, K., Parsons, A. V., and Sweetman, S. C. 1989. **Martindale: The extra pharmacopoeia** (29th ed.), pp. 1483-1485. London: The Pharmaceutical Press.
- Ritthidej, G. C., Chomto, P., Pummangura, S., and Menasveta, P. 1994. Chitin and chitosan as disintegrants in paracetamol tablets. **Drug Dev. Ind. Pharm.** 20 (13): 2109-2134.
- Rowe, R. C., and Forse, S. F. 1980. The effect of polymer molecular weight on the incidence of film cracking and splitting on film coated tablets. **J. Pharm. Pharmacol.** 32: 583-584.
- Sandford, P. A. 1989. Chitosan: Commercial uses and potential applications. In T. Anthonsen et al. (eds.), **Chitin and chitosan: Source, chemistry, biochemistry physical properties and applications**, pp. 51-69. England: Elsevier Science.
- Sawayanagi, Y., Nambu, N., and Nagai, T. 1982a. Permeation of drugs through chitosan membranes. **Chem. Pharm. Bull.** 30(9): 3297-3301.
- Sawayanagi, Y., Nambu, N., and Nagai, T. 1982b. Use of chitosan for sustained-release preparations of water-soluble drugs. **Chem. Pharm. Bull.** 30(11): 4213-4215.
- Sawayanagi, Y., Nambu, N., and Nagai, T. 1982c. Directly compressed tablets containing chitin or chitosan in addition to lactose or potato starch. **Chem. Pharm. Bull.** 30(8): 2935-3301.

- Shiraishi, S., Imai, T., and Otagiri, M. 1993. Controlled release of indomethacin by chitosan-polyelectrolyte complex: Optimization and in vivo / in vitro evaluation. **J. Controlled Release** 25: 217-225.
- Skaugrud, O. 1991. Chitosan new biopolymer for cosmetics & drugs. **Drug Cosmet. Ind.** 48(5): 24,26,30.
- Sugibayashi, K., and Morimoto, Y. 1994. Polymer for transdermal drug delivery systems. **J. Controlled Release** 29: 177-185.
- Thacharodi, D., and Rao, K. P. 1993. Release of nifedipine through crosslinked chitosan membranes. **Int. J. Pharm.** 96: 33-39.
- Thacharodi, D., and Rao, K. P. 1995. Collagen-chitosan composite membranes for controlled release of propranolol hydrochloride. **Int. J. Pharm.** 120: 115-118.
- Thanoo, B. C., Sunny, M. C., and Jayakrishnan, A. 1992. Cross-linked chitosan microspheres: Preparation and evaluation as a matrix for the controlled release of pharmaceuticals. **J. Pharm. Pharmacol.** 44: 283-286.
- Thassu, D., and Vyas, S. P. 1991. Controlled transdermal mucolytic delivery system. **Drug Dev. Ind. Pharm.** 17(4): 561-576.
- Walkling, W. 1994. Povidone. In A. Wade, and P. J. Weller (eds.), **Handbook of pharmaceutical excipients** (2nd ed.), pp. 392-399. Washington: American Pharmaceutical Association.
- Warunee Leesajakul. 1995. **Application of chitosan as release rate-controlling membrane in isosorbide dinitrate transdermal patch.** Master's thesis, Department of Manufacturing Pharmacy, Graduate School, Chulalongkorn University.
- Worthington, H. 1994. Propylene glycol. In A. Wade, and P. J. Weller (eds.), **Handbook of pharmaceutical excipients** (2nd ed.), pp. 407-408. Washington: American Pharmaceutical Association.

Wu, S. T., Shiu, G. K., Simmons, J. E., Bronaugh, R. L., and Skelly, J. P. 1992. In vitro release of nitroglycerin from topical products by use of artificial membranes. **J. Pharm. Sci.** 81(12): 1153-1156.

APPENDICES

Appendix A

Calibration Curve

The concentration versus absorbance of terbutaline sulfate in 0.01 N hydrochloric acid at 550 nm is presented in Table 24 and showed a linear relationship with the correlation coefficient 0.9999. The calibration curve of terbutaline sulfate after regression analysis is illustrated in Figure 70.

Table 24 Absorbance of terbutaline sulfate in 0.01 N hydrochloric acid determined at 550 nm

| Concentration ($\mu\text{g/ml}$) | Absorbance |
|------------------------------------|------------|
| 0 | 0.000 |
| 4 | 0.193 |
| 6 | 0.288 |
| 8 | 0.385 |
| 10 | 0.482 |
| 12 | 0.585 |
| 16 | 0.771 |
| 20 | 0.971 |

The Construction of Calibration Curve in HPLC Method

The concentration versus ratio between peak area of terbutaline sulfate and internal standard (salicylic acid) with HPLC method at 278 nm is presented in Table 25 and showed a linear relationship with the correlation coefficient 0.9998.

The calibration curve of terbutaline sulfate after regression analysis and HPLC chromatograms of terbutaline sulfate and salicylic acid are illustrated in Figures 71 and 72 respectively.

Table 25 Ratio between peak area of terbutaline sulfate and internal standard with HPLC method at 278 nm

| Concentration ($\mu\text{g/ml}$) | Ratio |
|------------------------------------|-------|
| 0 | 0.000 |
| 0.50 | 0.328 |
| 0.75 | 0.477 |
| 1.00 | 0.645 |
| 1.25 | 0.818 |
| 1.50 | 0.984 |
| 1.75 | 1.130 |
| 2.00 | 1.294 |

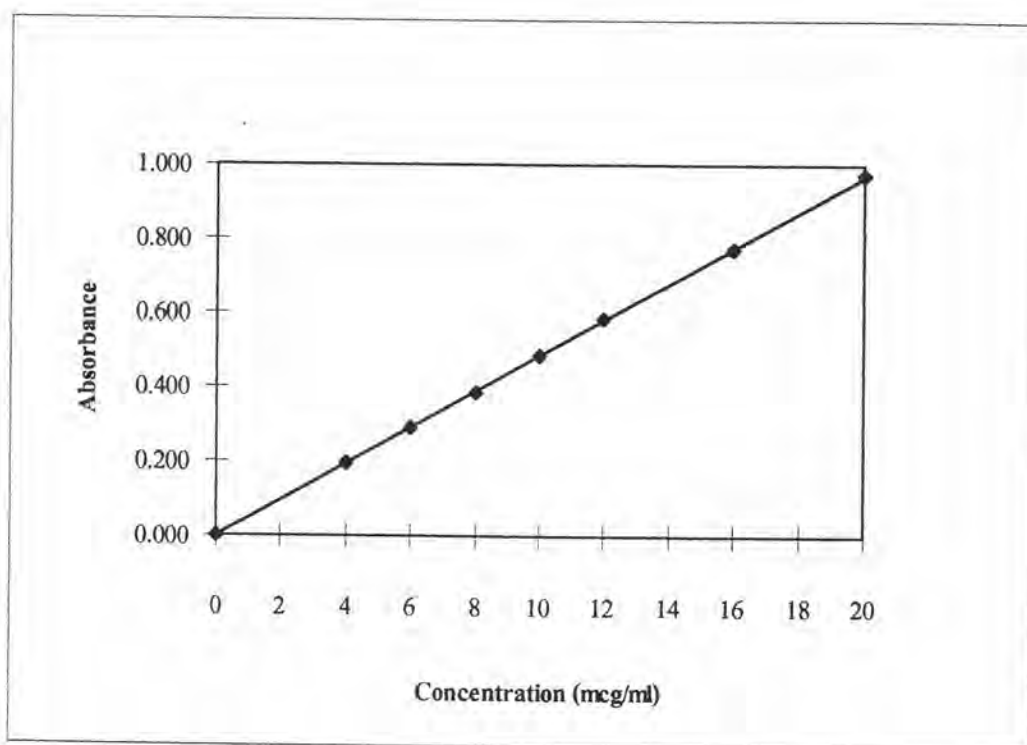


Figure 70 Calibration curve of terbutaline sulfate in 0.01 N hydrochloric acid

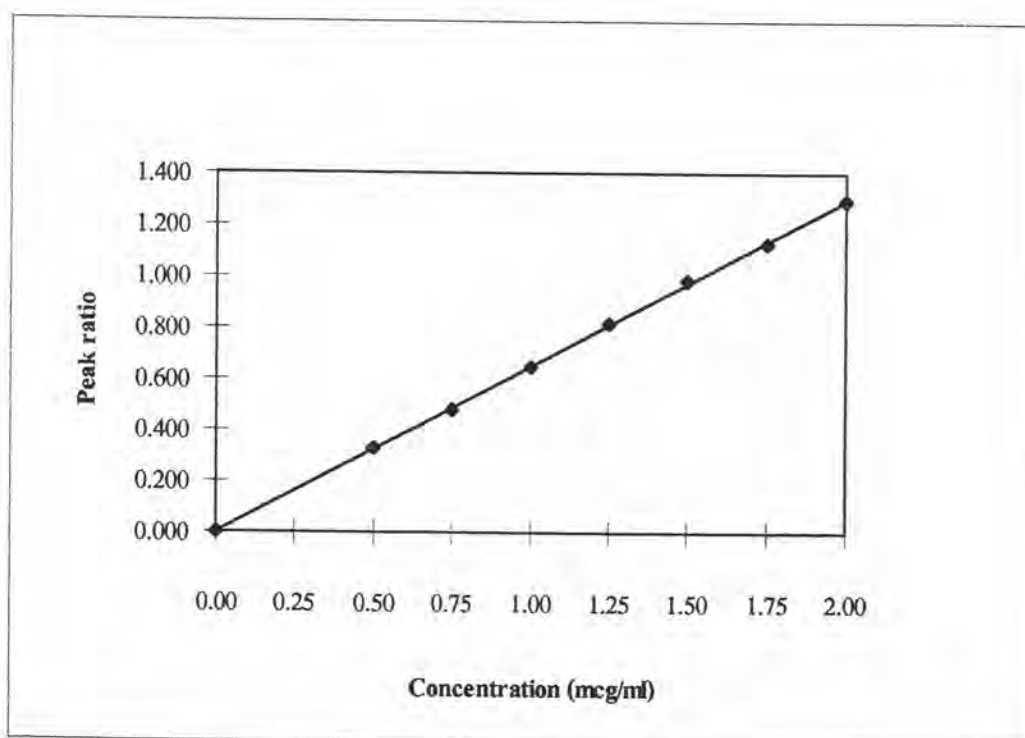


Figure 71 Calibration curve of terbutaline sulfate from HPLC method

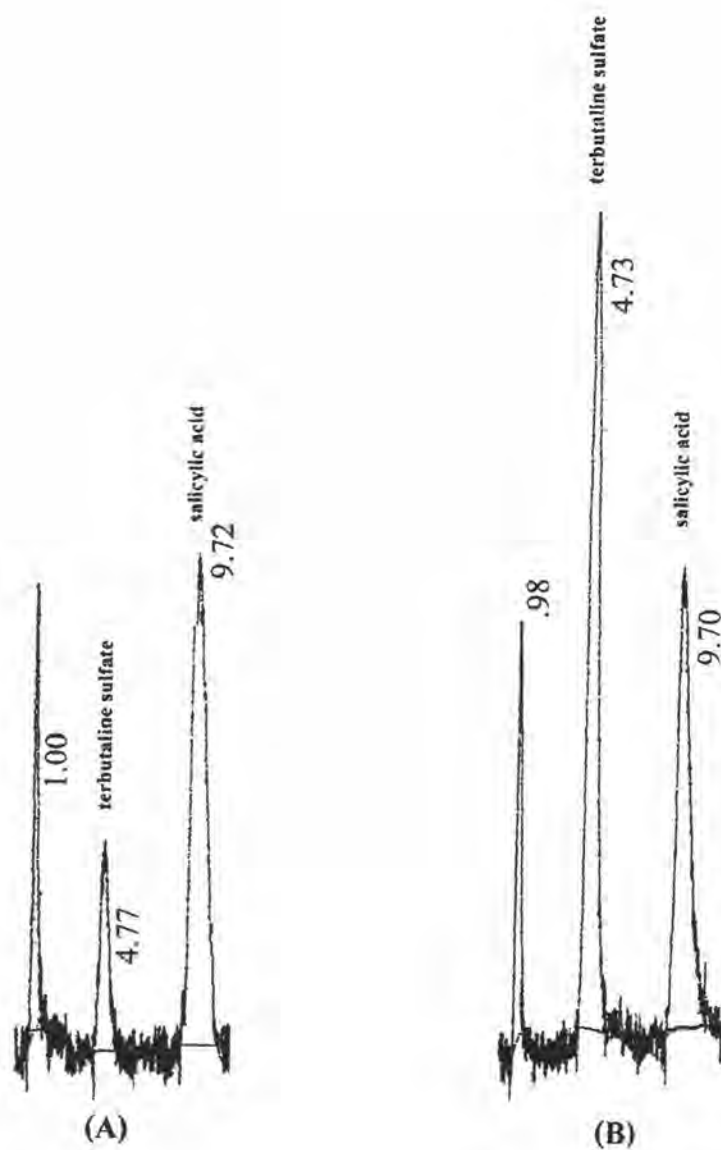


Figure 72 High performance liquid chromatograms of terbutaline sulfate and salicylic acid (internal standard) at 278 nm (terbutaline sulfate (A) 0.5 $\mu\text{g/ml}$ (B) 2.0 $\mu\text{g/ml}$; salicylic acid (A) and (B) 0.5 $\mu\text{g/ml}$)

Appendix B

Table 26 Thickness of terbutaline sulfate transdermal patches

| Formulation | Sample | Thickness (μm) | | | | |
|----------------|--------|-----------------------------|---------|---------|---------|---------|
| | | point 1 | point 2 | point 3 | point 4 | point 5 |
| A ₁ | 1 | 210 | 205 | 205 | 210 | 205 |
| | 2 | 210 | 210 | 210 | 210 | 200 |
| | 3 | 210 | 210 | 210 | 210 | 200 |
| A ₂ | 1 | 215 | 225 | 220 | 220 | 220 |
| | 2 | 220 | 220 | 220 | 220 | 215 |
| | 3 | 220 | 215 | 220 | 210 | 215 |
| A ₃ | 1 | 220 | 220 | 210 | 210 | 210 |
| | 2 | 215 | 220 | 220 | 220 | 215 |
| | 3 | 225 | 210 | 220 | 220 | 220 |
| A ₄ | 1 | 230 | 225 | 230 | 225 | 235 |
| | 2 | 230 | 220 | 230 | 230 | 225 |
| | 3 | 235 | 230 | 230 | 230 | 210 |
| B ₁ | 1 | 210 | 205 | 210 | 210 | 215 |
| | 2 | 210 | 210 | 215 | 210 | 220 |
| | 3 | 200 | 205 | 210 | 215 | 210 |
| B ₂ | 1 | 210 | 215 | 215 | 210 | 210 |
| | 2 | 200 | 210 | 215 | 210 | 200 |
| | 3 | 200 | 210 | 215 | 215 | 210 |
| B ₃ | 1 | 230 | 235 | 240 | 220 | 220 |
| | 2 | 240 | 240 | 230 | 220 | 220 |
| | 3 | 220 | 220 | 220 | 240 | 240 |
| B ₄ | 1 | 230 | 230 | 220 | 225 | 240 |
| | 2 | 225 | 230 | 240 | 225 | 230 |
| | 3 | 230 | 230 | 235 | 230 | 220 |
| C ₁ | 1 | 230 | 225 | 220 | 220 | 230 |
| | 2 | 230 | 220 | 220 | 225 | 230 |
| | 3 | 230 | 230 | 225 | 220 | 225 |
| C ₂ | 1 | 230 | 235 | 235 | 230 | 225 |
| | 2 | 230 | 220 | 220 | 230 | 225 |
| | 3 | 220 | 230 | 225 | 230 | 220 |
| C ₃ | 1 | 240 | 240 | 230 | 250 | 240 |
| | 2 | 240 | 235 | 240 | 240 | 250 |
| | 3 | 230 | 230 | 240 | 230 | 240 |

Table 26 (cont.) Thickness of terbutaline sulfate transdermal patches

| Formulation | Sample | Thickness (μm) | | | | |
|-------------|--------|-----------------------------|---------|---------|---------|---------|
| | | point 1 | point 2 | point 3 | point 4 | point 5 |
| C_4 | 1 | 245 | 230 | 245 | 240 | 230 |
| | 2 | 245 | 245 | 240 | 245 | 230 |
| | 3 | 240 | 245 | 240 | 250 | 255 |
| AA_1 | 1 | 240 | 240 | 250 | 250 | 250 |
| | 2 | 250 | 240 | 245 | 250 | 250 |
| | 3 | 260 | 250 | 250 | 250 | 255 |
| AA_2 | 1 | 250 | 240 | 240 | 260 | 250 |
| | 2 | 255 | 260 | 260 | 260 | 250 |
| | 3 | 240 | 250 | 240 | 250 | 250 |
| AA_3 | 1 | 250 | 250 | 250 | 240 | 245 |
| | 2 | 250 | 240 | 250 | 240 | 245 |
| | 3 | 240 | 250 | 260 | 240 | 250 |
| AA_4 | 1 | 260 | 260 | 260 | 260 | 240 |
| | 2 | 250 | 260 | 240 | 240 | 250 |
| | 3 | 255 | 250 | 240 | 260 | 260 |
| BB_1 | 1 | 270 | 265 | 270 | 260 | 260 |
| | 2 | 250 | 260 | 260 | 270 | 255 |
| | 3 | 260 | 260 | 270 | 260 | 270 |
| BB_2 | 1 | 260 | 250 | 270 | 270 | 270 |
| | 2 | 250 | 250 | 260 | 260 | 270 |
| | 3 | 260 | 250 | 260 | 250 | 250 |
| BB_3 | 1 | 260 | 270 | 270 | 265 | 260 |
| | 2 | 250 | 270 | 260 | 260 | 250 |
| | 3 | 260 | 270 | 260 | 275 | 260 |
| BB_4 | 1 | 260 | 270 | 265 | 270 | 270 |
| | 2 | 260 | 260 | 275 | 270 | 250 |
| | 3 | 260 | 260 | 265 | 250 | 270 |
| CC_1 | 1 | 235 | 240 | 245 | 240 | 240 |
| | 2 | 250 | 245 | 245 | 240 | 250 |
| | 3 | 250 | 240 | 250 | 240 | 240 |
| CC_2 | 1 | 250 | 260 | 250 | 260 | 260 |
| | 2 | 250 | 260 | 260 | 260 | 260 |
| | 3 | 265 | 260 | 260 | 260 | 260 |
| CC_3 | 1 | 275 | 275 | 260 | 270 | 270 |
| | 2 | 270 | 270 | 270 | 260 | 270 |
| | 3 | 260 | 260 | 260 | 270 | 275 |
| CC_4 | 1 | 265 | 270 | 270 | 270 | 260 |
| | 2 | 270 | 265 | 270 | 250 | 260 |
| | 3 | 270 | 260 | 275 | 270 | 265 |

Appendix C

Table 27 Percent moisture loss of terbutaline sulfate transdermal patches stored at 0 %RH for 1 week

| Sample | No. | wt of conditioned film (g) | wt of exposed film (g) | % moisture loss | Average | SD | Sample | No. | wt of conditioned film (g) | wt of exposed film (g) | % moisture loss | Average | SD |
|----------------|-----|----------------------------|------------------------|-----------------|---------|--------|-----------------|-----|----------------------------|------------------------|-----------------|---------|--------|
| A ₁ | 1 | 0.0777 | 0.0770 | 0.9009 | 0.8631 | 0.1013 | AA ₁ | 1 | 0.0905 | 0.0890 | 1.6575 | 1.2563 | 0.3474 |
| | 2 | 0.1069 | 0.1061 | 0.7484 | | | | 2 | 0.0852 | 0.0843 | 1.0563 | | |
| | 3 | 0.1170 | 0.1159 | 0.9402 | | | | 3 | 0.0853 | 0.0844 | 1.0551 | | |
| A ₂ | 1 | 0.0897 | 0.0888 | 1.0033 | 1.0494 | 0.5380 | AA ₂ | 1 | 0.0791 | 0.0751 | 5.0569 | 4.8588 | 0.3969 |
| | 2 | 0.0808 | 0.0795 | 1.6089 | | | | 2 | 0.0723 | 0.0686 | 5.1176 | | |
| | 3 | 0.0933 | 0.0928 | 0.5359 | | | | 3 | 0.0886 | 0.0847 | 4.4018 | | |
| A ₃ | 1 | 0.1065 | 0.1050 | 1.4085 | 1.2811 | 0.1166 | AA ₃ | 1 | 0.0782 | 0.0739 | 5.4987 | 5.3224 | 0.3168 |
| | 2 | 0.1195 | 0.1180 | 1.2552 | | | | 2 | 0.1016 | 0.0960 | 5.5118 | | |
| | 3 | 0.0763 | 0.0754 | 1.1796 | | | | 3 | 0.0807 | 0.0767 | 4.9566 | | |
| A ₄ | 1 | 0.1357 | 0.1334 | 1.6949 | 1.9937 | 0.7638 | AA ₄ | 1 | 0.0922 | 0.0868 | 5.8568 | 5.8095 | 0.4659 |
| | 2 | 0.1053 | 0.1038 | 1.4245 | | | | 2 | 0.0688 | 0.0645 | 6.2500 | | |
| | 3 | 0.1223 | 0.1188 | 2.8618 | | | | 3 | 0.0808 | 0.0765 | 5.3218 | | |
| B ₁ | 1 | 0.0877 | 0.0867 | 1.1403 | 0.8995 | 0.3529 | BB ₁ | 1 | 0.0981 | 0.0940 | 4.1794 | 3.9441 | 0.2111 |
| | 2 | 0.0809 | 0.0805 | 0.4944 | | | | 2 | 0.0875 | 0.0842 | 3.7714 | | |
| | 3 | 0.0846 | 0.0837 | 1.0638 | | | | 3 | 0.0979 | 0.0941 | 3.8815 | | |
| B ₂ | 1 | 0.0641 | 0.0635 | 0.9360 | 0.9437 | 0.2750 | BB ₂ | 1 | 0.1058 | 0.1013 | 4.2533 | 4.0574 | 1.1616 |
| | 2 | 0.0892 | 0.0886 | 0.6726 | | | | 2 | 0.0854 | 0.0830 | 2.8103 | | |
| | 3 | 0.0818 | 0.0808 | 1.2225 | | | | 3 | 0.0920 | 0.0873 | 5.1087 | | |
| B ₃ | 1 | 0.0907 | 0.0880 | 2.9768 | 2.8975 | 0.5200 | BB ₃ | 1 | 0.1089 | 0.1043 | 4.2241 | 4.2179 | 0.1252 |
| | 2 | 0.0555 | 0.0542 | 2.3423 | | | | 2 | 0.1106 | 0.1058 | 4.3400 | | |
| | 3 | 0.0919 | 0.0888 | 3.3732 | | | | 3 | 0.0758 | 0.0727 | 4.0897 | | |
| B ₄ | 1 | 0.0871 | 0.0837 | 3.9036 | 4.4603 | 0.4918 | BB ₄ | 1 | 0.0765 | 0.0728 | 4.8366 | 4.7574 | 0.0788 |
| | 2 | 0.0991 | 0.0945 | 4.6418 | | | | 2 | 0.0904 | 0.0861 | 4.7566 | | |
| | 3 | 0.1034 | 0.0984 | 4.8356 | | | | 3 | 0.0919 | 0.0876 | 4.6790 | | |
| C ₁ | 1 | 0.0862 | 0.0818 | 5.1044 | 5.6165 | 0.4565 | CC ₁ | 1 | 0.1014 | 0.0931 | 8.1854 | 8.4929 | 0.6113 |
| | 2 | 0.0719 | 0.0676 | 5.9805 | | | | 2 | 0.0772 | 0.0701 | 9.1969 | | |
| | 3 | 0.0850 | 0.0801 | 5.7647 | | | | 3 | 0.0914 | 0.0840 | 8.0963 | | |
| C ₂ | 1 | 0.1125 | 0.1059 | 5.8667 | 6.0319 | 0.1743 | CC ₂ | 1 | 0.1039 | 0.0952 | 8.3734 | 8.7456 | 0.5707 |
| | 2 | 0.0931 | 0.0875 | 6.0150 | | | | 2 | 0.0904 | 0.0819 | 9.4027 | | |
| | 3 | 0.0869 | 0.0815 | 6.2140 | | | | 3 | 0.0851 | 0.0779 | 8.4606 | | |
| C ₃ | 1 | 0.0799 | 0.0750 | 6.1327 | 6.4147 | 0.2683 | CC ₃ | 1 | 0.0850 | 0.0770 | 9.4118 | 9.2513 | 0.1950 |
| | 2 | 0.0931 | 0.0871 | 6.4447 | | | | 2 | 0.0963 | 0.0876 | 9.0343 | | |
| | 3 | 0.0930 | 0.0868 | 6.6667 | | | | 3 | 0.0838 | 0.0760 | 9.3079 | | |
| C ₄ | 1 | 0.0999 | 0.0927 | 7.2072 | 6.7580 | 0.4244 | CC ₄ | 1 | 0.0935 | 0.0836 | 10.5882 | 11.0926 | 1.0237 |
| | 2 | 0.0910 | 0.0849 | 6.7033 | | | | 2 | 0.0883 | 0.0791 | 10.4190 | | |
| | 3 | 0.0770 | 0.0721 | 6.3636 | | | | 3 | 0.0872 | 0.0765 | 12.2706 | | |

Table 28 Percent moisture loss of terbutaline sulfate transdermal patches stored at 20 %RH for 1 week

| Sample | No. | wt of conditioned film (g) | wt of exposed film (g) | % moisture loss | Average | SD | Sample | No. | wt of conditioned film (g) | wt of exposed film (g) | % moisture loss | Average | SD |
|----------------|-----|----------------------------|------------------------|-----------------|---------|--------|-----------------|-----|----------------------------|------------------------|-----------------|---------|--------|
| A ₁ | 1 | 0.0847 | 0.0846 | 0.1181 | 0.4152 | 0.3278 | AA ₁ | 1 | 0.0845 | 0.0829 | 1.8935 | 1.0423 | 0.8257 |
| | 2 | 0.0652 | 0.0647 | 0.7669 | | | | 2 | 0.0708 | 0.0701 | 0.9887 | | |
| | 3 | 0.1109 | 0.1105 | 0.3607 | | | | 3 | 0.0817 | 0.0815 | 0.2448 | | |
| A ₂ | 1 | 0.1016 | 0.1000 | 1.5748 | 0.8596 | 0.6950 | AA ₂ | 1 | 0.0985 | 0.0942 | 4.3655 | 2.8559 | 1.3079 |
| | 2 | 0.1071 | 0.1069 | 0.1867 | | | | 2 | 0.0608 | 0.0595 | 2.1382 | | |
| | 3 | 0.0979 | 0.0971 | 0.8172 | | | | 3 | 0.0969 | 0.0949 | 2.0640 | | |
| A ₃ | 1 | 0.1126 | 0.1125 | 0.0888 | 0.9409 | 1.1278 | AA ₃ | 1 | 0.0988 | 0.0956 | 3.2389 | 3.2565 | 0.4172 |
| | 2 | 0.1167 | 0.1161 | 0.5141 | | | | 2 | 0.0983 | 0.0955 | 2.8484 | | |
| | 3 | 0.0946 | 0.0925 | 2.2199 | | | | 3 | 0.1032 | 0.0994 | 3.6822 | | |
| A ₄ | 1 | 0.1258 | 0.1234 | 1.9078 | 1.9505 | 0.0371 | AA ₄ | 1 | 0.0975 | 0.0941 | 3.4872 | 4.2611 | 0.6706 |
| | 2 | 0.1117 | 0.1095 | 1.9696 | | | | 2 | 0.1049 | 0.1000 | 4.6711 | | |
| | 3 | 0.1165 | 0.1142 | 1.9742 | | | | 3 | 0.0973 | 0.0928 | 4.6249 | | |
| B ₁ | 1 | 0.0728 | 0.0720 | 1.0989 | 0.8386 | 0.5236 | BB ₁ | 1 | 0.0894 | 0.0879 | 1.6779 | 1.5006 | 0.7707 |
| | 2 | 0.0848 | 0.0846 | 0.2358 | | | | 2 | 0.1066 | 0.1059 | 0.6567 | | |
| | 3 | 0.1016 | 0.1004 | 1.1811 | | | | 3 | 0.0969 | 0.0948 | 2.1672 | | |
| B ₂ | 1 | 0.0805 | 0.0801 | 0.4969 | 0.8687 | 0.3873 | BB ₂ | 1 | 0.0755 | 0.0735 | 2.6490 | 2.8167 | 0.1746 |
| | 2 | 0.0834 | 0.0827 | 0.8393 | | | | 2 | 0.1201 | 0.1165 | 2.9975 | | |
| | 3 | 0.0630 | 0.0622 | 1.2698 | | | | 3 | 0.1177 | 0.1144 | 2.8037 | | |
| B ₃ | 1 | 0.0967 | 0.0956 | 1.1375 | 1.2300 | 1.0088 | BB ₃ | 1 | 0.0960 | 0.0928 | 3.3333 | 3.5374 | 0.5155 |
| | 2 | 0.0739 | 0.0737 | 0.2706 | | | | 2 | 0.1141 | 0.1105 | 3.1551 | | |
| | 3 | 0.0745 | 0.0728 | 2.2819 | | | | 3 | 0.0970 | 0.0930 | 4.1237 | | |
| B ₄ | 1 | 0.0986 | 0.0969 | 1.7241 | 3.6239 | 2.2637 | BB ₄ | 1 | 0.1065 | 0.1021 | 4.1315 | 4.7606 | 0.9497 |
| | 2 | 0.1060 | 0.1028 | 3.0189 | | | | 2 | 0.0861 | 0.0824 | 4.2973 | | |
| | 3 | 0.0669 | 0.0628 | 6.1286 | | | | 3 | 0.0803 | 0.0756 | 5.8531 | | |
| C ₁ | 1 | 0.0911 | 0.0879 | 3.5126 | 3.2410 | 0.8252 | CC ₁ | 1 | 0.0885 | 0.0832 | 5.9887 | 5.9518 | 0.0985 |
| | 2 | 0.0821 | 0.0802 | 2.3143 | | | | 2 | 0.0976 | 0.0919 | 5.8402 | | |
| | 3 | 0.0847 | 0.0814 | 3.8961 | | | | 3 | 0.0979 | 0.0920 | 6.0266 | | |
| C ₂ | 1 | 0.1051 | 0.1012 | 3.7108 | 3.2987 | 0.9177 | CC ₂ | 1 | 0.1063 | 0.0992 | 6.6792 | 6.6826 | 0.4586 |
| | 2 | 0.0890 | 0.0870 | 2.2472 | | | | 2 | 0.1022 | 0.0949 | 7.1429 | | |
| | 3 | 0.0711 | 0.0683 | 3.9381 | | | | 3 | 0.1028 | 0.0964 | 6.2257 | | |
| C ₃ | 1 | 0.0844 | 0.0810 | 4.0284 | 3.9844 | 0.2794 | CC ₃ | 1 | 0.1490 | 0.1395 | 6.3758 | 6.8711 | 0.4346 |
| | 2 | 0.0814 | 0.0784 | 3.6855 | | | | 2 | 0.1135 | 0.1055 | 7.0485 | | |
| | 3 | 0.0920 | 0.0881 | 4.2391 | | | | 3 | 0.1238 | 0.1149 | 7.1890 | | |
| C ₄ | 1 | 0.0654 | 0.0615 | 5.9633 | 6.1713 | 0.5436 | CC ₄ | 1 | 0.0848 | 0.0783 | 7.6651 | 8.8214 | 1.0279 |
| | 2 | 0.1128 | 0.1063 | 5.7624 | | | | 2 | 0.0829 | 0.0753 | 9.1677 | | |
| | 3 | 0.0987 | 0.0920 | 6.7882 | | | | 3 | 0.0841 | 0.0760 | 9.6314 | | |

Table 29 Percent moisture absorption of terbutaline sulfate transdermal patches stored at 52 %RH for 1 week

| Sample | No. | wt of conditioned film | wt of exposed film | % moisture absorption | Average | SD | Sample | No. | wt of conditioned film | wt of exposed film | % moisture absorption | Average | SD |
|----------------|-----|------------------------|--------------------|-----------------------|---------|--------|-----------------|-----|------------------------|--------------------|-----------------------|---------|--------|
| A ₁ | 1 | 0.0783 | 0.0822 | 4.9808 | 5.0571 | 0.6414 | AA ₁ | 1 | 0.0633 | 0.0659 | 4.1074 | 4.9954 | 0.9193 |
| | 2 | 0.0907 | 0.0959 | 5.7332 | | | | 2 | 0.1161 | 0.1230 | 5.9432 | | |
| | 3 | 0.0875 | 0.0914 | 4.4571 | | | | 3 | 0.0466 | 0.0489 | 4.9356 | | |
| A ₂ | 1 | 0.0820 | 0.0855 | 4.2683 | 3.3690 | 0.7813 | AA ₂ | 1 | 0.1073 | 0.1115 | 3.9143 | 2.9693 | 0.8398 |
| | 2 | 0.0872 | 0.0898 | 2.9817 | | | | 2 | 0.1083 | 0.1108 | 2.3084 | | |
| | 3 | 0.0840 | 0.0864 | 2.8571 | | | | 3 | 0.1229 | 0.1262 | 2.6851 | | |
| A ₃ | 1 | 0.0846 | 0.0866 | 2.3641 | 2.2788 | 0.2300 | AA ₃ | 1 | 0.0855 | 0.0871 | 1.8713 | 2.1490 | 0.2531 |
| | 2 | 0.0815 | 0.0835 | 2.4540 | | | | 2 | 0.0996 | 0.1018 | 2.2088 | | |
| | 3 | 0.1090 | 0.1112 | 2.0183 | | | | 3 | 0.1183 | 0.1211 | 2.3669 | | |
| A ₄ | 1 | 0.0893 | 0.0911 | 2.0157 | 1.9727 | 1.5690 | AA ₄ | 1 | 0.1215 | 0.1235 | 1.6461 | 1.5779 | 0.1590 |
| | 2 | 0.0966 | 0.1000 | 3.5197 | | | | 2 | 0.0946 | 0.0962 | 1.6913 | | |
| | 3 | 0.0784 | 0.0787 | 0.3827 | | | | 3 | 0.0573 | 0.0581 | 1.3962 | | |
| B ₁ | 1 | 0.0682 | 0.0737 | 8.0645 | 7.7687 | 0.2562 | BB ₁ | 1 | 0.0789 | 0.0855 | 8.3650 | 6.8992 | 1.2726 |
| | 2 | 0.0905 | 0.0974 | 7.6243 | | | | 2 | 0.1055 | 0.1121 | 6.2559 | | |
| | 3 | 0.1024 | 0.1102 | 7.6172 | | | | 3 | 0.0938 | 0.0995 | 6.0768 | | |
| B ₂ | 1 | 0.0908 | 0.0960 | 5.7269 | 6.9216 | 1.2633 | BB ₂ | 1 | 0.1163 | 0.1237 | 6.3629 | 6.3236 | 0.4620 |
| | 2 | 0.0837 | 0.0906 | 8.2437 | | | | 2 | 0.1020 | 0.1089 | 6.7647 | | |
| | 3 | 0.0942 | 0.1006 | 6.7941 | | | | 3 | 0.0753 | 0.0797 | 5.8433 | | |
| B ₃ | 1 | 0.0968 | 0.1018 | 5.1653 | 4.4811 | 1.3186 | BB ₃ | 1 | 0.1176 | 0.1229 | 4.5068 | 4.4665 | 0.0362 |
| | 2 | 0.0978 | 0.1030 | 5.3170 | | | | 2 | 0.1172 | 0.1224 | 4.4369 | | |
| | 3 | 0.0743 | 0.0765 | 2.9610 | | | | 3 | 0.0965 | 0.1008 | 4.4560 | | |
| B ₄ | 1 | 0.0978 | 0.1019 | 4.1922 | 2.7226 | 1.2894 | BB ₄ | 1 | 0.1003 | 0.1024 | 2.0937 | 2.5926 | 0.5950 |
| | 2 | 0.0957 | 0.0978 | 2.1944 | | | | 2 | 0.0892 | 0.0921 | 3.2511 | | |
| | 3 | 0.0786 | 0.0800 | 1.7812 | | | | 3 | 0.0822 | 0.0842 | 2.4331 | | |
| C ₁ | 1 | 0.0783 | 0.0816 | 4.2146 | 3.3215 | 1.0140 | CC ₁ | 1 | 0.0971 | 0.0999 | 2.8836 | 3.2859 | 0.7341 |
| | 2 | 0.0721 | 0.0737 | 2.2191 | | | | 2 | 0.0880 | 0.0905 | 2.8409 | | |
| | 3 | 0.0878 | 0.0909 | 3.5308 | | | | 3 | 0.0871 | 0.0907 | 4.1332 | | |
| C ₂ | 1 | 0.0691 | 0.0708 | 2.4602 | 3.3158 | 0.7543 | CC ₂ | 1 | 0.0964 | 0.1000 | 3.7344 | 3.1671 | 0.5757 |
| | 2 | 0.1027 | 0.1064 | 3.6027 | | | | 2 | 0.0929 | 0.0953 | 2.5834 | | |
| | 3 | 0.0901 | 0.0936 | 3.8846 | | | | 3 | 0.0911 | 0.0940 | 3.1833 | | |
| C ₃ | 1 | 0.0915 | 0.0926 | 1.2022 | 2.1556 | 0.8848 | CC ₃ | 1 | 0.1417 | 0.1451 | 2.3994 | 2.0697 | 0.2865 |
| | 2 | 0.1037 | 0.1061 | 2.3144 | | | | 2 | 0.0797 | 0.0812 | 1.8821 | | |
| | 3 | 0.0644 | 0.0663 | 2.9503 | | | | 3 | 0.1297 | 0.1322 | 1.9275 | | |
| C ₄ | 1 | 0.1084 | 0.1092 | 0.7380 | 1.0116 | 0.2595 | CC ₄ | 1 | 0.0592 | 0.0598 | 1.0135 | 0.9899 | 0.0290 |
| | 2 | 0.1055 | 0.1066 | 1.0427 | | | | 2 | 0.0731 | 0.0738 | 0.9576 | | |
| | 3 | 0.0877 | 0.0888 | 1.2543 | | | | 3 | 0.0701 | 0.0708 | 0.9986 | | |

Table 30 Percent moisture absorption of terbutaline sulfate transdermal patches stored at 93 %RH for 1 week

| Sample | No. | wt of conditioned film | wt of exposed film | % moisture absorption | Average | SD | Sample | No. | wt of conditioned film | wt of exposed film | % moisture absorption | Average | SD |
|----------------|-----|------------------------|--------------------|-----------------------|---------|--------|-----------------|-----|------------------------|--------------------|-----------------------|---------|--------|
| A ₁ | 1 | 0.0842 | 0.1232 | 46.3183 | 44.5499 | 2.7641 | AA ₁ | 1 | 0.0994 | 0.1423 | 43.1590 | 42.9606 | 0.5679 |
| | 2 | 0.0938 | 0.1326 | 41.3646 | | | | 2 | 0.1152 | 0.1652 | 43.4028 | | |
| | 3 | 0.0781 | 0.1140 | 45.9667 | | | | 3 | 0.0931 | 0.1325 | 42.3201 | | |
| A ₂ | 1 | 0.0970 | 0.1361 | 40.3093 | 42.0531 | 1.6815 | AA ₂ | 1 | 0.0856 | 0.1205 | 40.7710 | 40.6970 | 1.2549 |
| | 2 | 0.0584 | 0.0839 | 43.6644 | | | | 2 | 0.1014 | 0.1439 | 41.9132 | | |
| | 3 | 0.0787 | 0.1119 | 42.1855 | | | | 3 | 0.0708 | 0.0987 | 39.4068 | | |
| A ₃ | 1 | 0.0989 | 0.1355 | 37.0071 | 36.6554 | 0.4586 | AA ₃ | 1 | 0.0962 | 0.1281 | 33.1601 | 34.4650 | 1.8900 |
| | 2 | 0.0535 | 0.0732 | 36.8224 | | | | 2 | 0.0778 | 0.1063 | 36.6324 | | |
| | 3 | 0.0761 | 0.1036 | 36.1367 | | | | 3 | 0.0619 | 0.0827 | 33.6026 | | |
| A ₄ | 1 | 0.0929 | 0.1142 | 22.9279 | 28.6989 | 5.1518 | AA ₄ | 1 | 0.0872 | 0.1124 | 28.8991 | 28.1060 | 1.1141 |
| | 2 | 0.0867 | 0.1130 | 30.3345 | | | | 2 | 0.0805 | 0.1021 | 26.8323 | | |
| | 3 | 0.1069 | 0.1420 | 32.8344 | | | | 3 | 0.0941 | 0.1210 | 28.5866 | | |
| B ₁ | 1 | 0.0950 | 0.1502 | 58.1053 | 56.9332 | 2.8364 | BB ₁ | 1 | 0.1042 | 0.1554 | 49.1363 | 47.5331 | 1.3888 |
| | 2 | 0.0730 | 0.1122 | 53.6986 | | | | 2 | 0.0938 | 0.1376 | 46.6951 | | |
| | 3 | 0.0956 | 0.1520 | 58.9958 | | | | 3 | 0.1052 | 0.1544 | 46.7681 | | |
| B ₂ | 1 | 0.0937 | 0.1449 | 54.6425 | 51.0435 | 3.5823 | BB ₂ | 1 | 0.1148 | 0.1621 | 41.2021 | 40.5134 | 0.5974 |
| | 2 | 0.0990 | 0.1495 | 51.0101 | | | | 2 | 0.0897 | 0.1257 | 40.1338 | | |
| | 3 | 0.0912 | 0.1345 | 47.4781 | | | | 3 | 0.1174 | 0.1646 | 40.2044 | | |
| B ₃ | 1 | 0.0895 | 0.1275 | 42.4581 | 42.9787 | 2.0083 | BB ₃ | 1 | 0.1017 | 0.1394 | 37.0698 | 37.8070 | 3.3414 |
| | 2 | 0.0780 | 0.1102 | 41.2821 | | | | 2 | 0.1223 | 0.1730 | 41.4554 | | |
| | 3 | 0.1020 | 0.1481 | 45.1961 | | | | 3 | 0.0960 | 0.1295 | 34.8958 | | |
| B ₄ | 1 | 0.1033 | 0.1457 | 41.0455 | 39.2230 | 5.9126 | BB ₄ | 1 | 0.1183 | 0.1605 | 35.6720 | 32.2864 | 6.1738 |
| | 2 | 0.1227 | 0.1767 | 44.0098 | | | | 2 | 0.1349 | 0.1835 | 36.0267 | | |
| | 3 | 0.0880 | 0.1167 | 32.6136 | | | | 3 | 0.0779 | 0.0975 | 25.1605 | | |
| C ₁ | 1 | 0.0891 | 0.1285 | 44.2200 | 44.4805 | 1.9966 | CC ₁ | 1 | 0.0612 | 0.0878 | 43.4641 | 41.7803 | 2.3364 |
| | 2 | 0.0925 | 0.1356 | 46.5946 | | | | 2 | 0.0744 | 0.1035 | 39.1129 | | |
| | 3 | 0.0807 | 0.1151 | 42.6270 | | | | 3 | 0.0919 | 0.1312 | 42.7639 | | |
| C ₂ | 1 | 0.0967 | 0.1395 | 44.2606 | 41.9305 | 2.1445 | CC ₂ | 1 | 0.0707 | 0.0989 | 39.8868 | 39.9874 | 0.1507 |
| | 2 | 0.1009 | 0.1413 | 40.0396 | | | | 2 | 0.0937 | 0.1311 | 39.9146 | | |
| | 3 | 0.1046 | 0.1480 | 41.4914 | | | | 3 | 0.0996 | 0.1396 | 40.1606 | | |
| C ₃ | 1 | 0.1141 | 0.1552 | 36.0210 | 36.5930 | 1.4658 | CC ₃ | 1 | 0.1092 | 0.1458 | 33.5165 | 34.8419 | 2.6290 |
| | 2 | 0.1137 | 0.1572 | 38.2586 | | | | 2 | 0.0860 | 0.1145 | 33.1395 | | |
| | 3 | 0.1031 | 0.1397 | 35.4995 | | | | 3 | 0.1014 | 0.1398 | 37.8698 | | |
| C ₄ | 1 | 0.0988 | 0.1257 | 27.2267 | 25.2130 | 1.8964 | CC ₄ | 1 | 0.0889 | 0.1125 | 26.5467 | 25.6630 | 0.7669 |
| | 2 | 0.1022 | 0.1277 | 24.9511 | | | | 2 | 0.0740 | 0.0927 | 25.2703 | | |
| | 3 | 0.0861 | 0.1063 | 23.4611 | | | | 3 | 0.0727 | 0.0910 | 25.1719 | | |

Table 31 Percent moisture loss of terbutaline sulfate transdermal patches stored at 0 %RH for 4 weeks

| Sample | No. | wt of conditioned film (g) | wt of exposed film (g) | % moisture loss | Average | SD | Sample | No. | wt of conditioned film (g) | wt of exposed film (g) | % moisture loss | Average | SD |
|----------------|-----|----------------------------|------------------------|-----------------|---------|--------|-----------------|-----|----------------------------|------------------------|-----------------|---------|--------|
| A ₁ | 1 | 0.0777 | 0.0772 | 0.6435 | 0.5440 | 0.1091 | AA ₁ | 1 | 0.0905 | 0.0891 | 1.5470 | 1.2195 | 0.3071 |
| | 2 | 0.1069 | 0.1063 | 0.5613 | | | | 2 | 0.0852 | 0.0842 | 1.1737 | | |
| | 3 | 0.1170 | 0.1165 | 0.4274 | | | | 3 | 0.0853 | 0.0845 | 0.9379 | | |
| A ₂ | 1 | 0.0897 | 0.0890 | 0.7804 | 0.5681 | 0.1868 | AA ₂ | 1 | 0.0791 | 0.0753 | 4.8040 | 4.6907 | 0.3588 |
| | 2 | 0.0808 | 0.0804 | 0.4950 | | | | 2 | 0.0723 | 0.0687 | 4.9793 | | |
| | 3 | 0.0933 | 0.0929 | 0.4287 | | | | 3 | 0.0886 | 0.0848 | 4.2889 | | |
| A ₃ | 1 | 0.1065 | 0.1057 | 0.7512 | 0.7357 | 0.0600 | AA ₃ | 1 | 0.0782 | 0.0744 | 4.8593 | 5.1919 | 0.3264 |
| | 2 | 0.1195 | 0.1187 | 0.6695 | | | | 2 | 0.1016 | 0.0960 | 5.5118 | | |
| | 3 | 0.0763 | 0.0757 | 0.7864 | | | | 3 | 0.0807 | 0.0765 | 5.2045 | | |
| A ₄ | 1 | 0.1357 | 0.1339 | 1.3265 | 1.5298 | 0.1926 | AA ₄ | 1 | 0.0922 | 0.0871 | 5.5315 | 5.7836 | 0.4044 |
| | 2 | 0.1053 | 0.1035 | 1.7094 | | | | 2 | 0.0688 | 0.0645 | 6.2500 | | |
| | 3 | 0.1223 | 0.1204 | 1.5536 | | | | 3 | 0.0808 | 0.0763 | 5.5693 | | |
| B ₁ | 1 | 0.0877 | 0.0866 | 1.2543 | 0.8569 | 0.4484 | BB ₁ | 1 | 0.0981 | 0.0941 | 4.0775 | 2.8920 | 1.0867 |
| | 2 | 0.0809 | 0.0806 | 0.3708 | | | | 2 | 0.0875 | 0.0858 | 1.9429 | | |
| | 3 | 0.0846 | 0.0838 | 0.9456 | | | | 3 | 0.0979 | 0.0953 | 2.6558 | | |
| B ₂ | 1 | 0.0641 | 0.0634 | 1.0920 | 0.8701 | 0.1939 | BB ₂ | 1 | 0.1058 | 0.1026 | 3.0246 | 3.1294 | 0.8448 |
| | 2 | 0.0892 | 0.0885 | 0.7848 | | | | 2 | 0.0854 | 0.0834 | 2.3419 | | |
| | 3 | 0.0818 | 0.0812 | 0.7335 | | | | 3 | 0.0920 | 0.0883 | 4.0217 | | |
| B ₃ | 1 | 0.0907 | 0.0889 | 1.9846 | 2.6981 | 0.6180 | BB ₃ | 1 | 0.1089 | 0.1052 | 3.3976 | 3.4790 | 0.1880 |
| | 2 | 0.0555 | 0.0538 | 3.0631 | | | | 2 | 0.1106 | 0.1069 | 3.3454 | | |
| | 3 | 0.0919 | 0.0891 | 3.0468 | | | | 3 | 0.0758 | 0.0730 | 3.6939 | | |
| B ₄ | 1 | 0.0871 | 0.0838 | 3.7887 | 3.9848 | 0.7717 | BB ₄ | 1 | 0.0765 | 0.0739 | 3.3987 | 3.5104 | 0.1282 |
| | 2 | 0.0991 | 0.0958 | 3.3300 | | | | 2 | 0.0904 | 0.0871 | 3.6504 | | |
| | 3 | 0.1034 | 0.0984 | 4.8356 | | | | 3 | 0.0919 | 0.0887 | 3.4820 | | |
| C ₁ | 1 | 0.0862 | 0.0817 | 5.2204 | 5.6017 | 0.3423 | CC ₁ | 1 | 0.1014 | 0.0931 | 8.1854 | 8.0342 | 0.5900 |
| | 2 | 0.0719 | 0.0678 | 5.7024 | | | | 2 | 0.0772 | 0.0715 | 7.3834 | | |
| | 3 | 0.0850 | 0.0800 | 5.8824 | | | | 3 | 0.0914 | 0.0836 | 8.5339 | | |
| C ₂ | 1 | 0.1125 | 0.1065 | 5.3333 | 5.7902 | 0.6700 | CC ₂ | 1 | 0.1039 | 0.0960 | 7.6035 | 8.1639 | 0.6097 |
| | 2 | 0.0931 | 0.0880 | 5.4780 | | | | 2 | 0.0904 | 0.0831 | 8.0752 | | |
| | 3 | 0.0869 | 0.0812 | 6.5593 | | | | 3 | 0.0851 | 0.0776 | 8.8132 | | |
| C ₃ | 1 | 0.0799 | 0.0755 | 5.5069 | 5.9194 | 0.3721 | CC ₃ | 1 | 0.0850 | 0.0778 | 8.4706 | 8.2732 | 0.2473 |
| | 2 | 0.0931 | 0.0873 | 6.2299 | | | | 2 | 0.0963 | 0.0886 | 7.9958 | | |
| | 3 | 0.0930 | 0.0874 | 6.0215 | | | | 3 | 0.0838 | 0.0768 | 8.3532 | | |
| C ₄ | 1 | 0.0999 | 0.0937 | 6.2062 | 6.2612 | 0.4670 | CC ₄ | 1 | 0.0935 | 0.0843 | 9.8396 | 10.0795 | 0.2079 |
| | 2 | 0.0910 | 0.0857 | 5.8242 | | | | 2 | 0.0883 | 0.0793 | 10.1925 | | |
| | 3 | 0.0770 | 0.0718 | 6.7532 | | | | 3 | 0.0872 | 0.0783 | 10.2064 | | |

Table 32 Percent moisture loss of terbutaline sulfate transdermal patches stored at 20 %RH for 4 weeks

| Sample | No. | wt of conditioned film (g) | wt of exposed film (g) | % moisture loss | Average | SD | Sample | No. | wt of conditioned film (g) | wt of exposed film (g) | % moisture loss | Average | SD |
|----------------|-----|----------------------------|------------------------|-----------------|---------|--------|-----------------|-----|----------------------------|------------------------|-----------------|---------|--------|
| A ₁ | 1 | 0.0847 | 0.0846 | 0.1181 | 0.1506 | 0.0312 | AA ₁ | 1 | 0.0845 | 0.0832 | 1.5385 | 1.0056 | 0.5246 |
| | 2 | 0.0652 | 0.0651 | 0.1534 | | | | 2 | 0.0708 | 0.0701 | 0.9887 | | |
| | 3 | 0.1109 | 0.1107 | 0.1803 | | | | 3 | 0.0817 | 0.0813 | 0.4896 | | |
| A ₂ | 1 | 0.1016 | 0.1010 | 0.5906 | 0.4176 | 0.2736 | AA ₂ | 1 | 0.0985 | 0.0959 | 2.6396 | 2.4730 | 0.1685 |
| | 2 | 0.1071 | 0.1065 | 0.5602 | | | | 2 | 0.0608 | 0.0594 | 2.3026 | | |
| | 3 | 0.0979 | 0.0978 | 0.1021 | | | | 3 | 0.0969 | 0.0945 | 2.4768 | | |
| A ₃ | 1 | 0.1126 | 0.1122 | 0.3552 | 0.4374 | 0.0870 | AA ₃ | 1 | 0.0988 | 0.0963 | 2.5304 | 2.9427 | 0.9871 |
| | 2 | 0.1167 | 0.1162 | 0.4284 | | | | 2 | 0.0983 | 0.0943 | 4.0692 | | |
| | 3 | 0.0946 | 0.0941 | 0.5285 | | | | 3 | 0.1032 | 0.1009 | 2.2287 | | |
| A ₄ | 1 | 0.1258 | 0.1243 | 1.1924 | 1.5093 | 0.3007 | AA ₄ | 1 | 0.0975 | 0.0940 | 3.5897 | 3.5763 | 0.2334 |
| | 2 | 0.1117 | 0.1097 | 1.7905 | | | | 2 | 0.1049 | 0.1014 | 3.3365 | | |
| | 3 | 0.1165 | 0.1147 | 1.5451 | | | | 3 | 0.0973 | 0.0936 | 3.8027 | | |
| B ₁ | 1 | 0.0728 | 0.0725 | 0.4121 | 0.7802 | 0.6887 | BB ₁ | 1 | 0.0894 | 0.0888 | 0.6711 | 0.9367 | 0.8210 |
| | 2 | 0.0848 | 0.0845 | 0.3538 | | | | 2 | 0.1066 | 0.1063 | 0.2814 | | |
| | 3 | 0.1016 | 0.1000 | 1.5748 | | | | 3 | 0.0969 | 0.0951 | 1.8576 | | |
| B ₂ | 1 | 0.0805 | 0.0794 | 1.3665 | 0.8529 | 0.5699 | BB ₂ | 1 | 0.0755 | 0.0724 | 4.1060 | 2.4324 | 1.4685 |
| | 2 | 0.0834 | 0.0832 | 0.2398 | | | | 2 | 0.1201 | 0.1179 | 1.8318 | | |
| | 3 | 0.0630 | 0.0624 | 0.9524 | | | | 3 | 0.1177 | 0.1161 | 1.3594 | | |
| B ₃ | 1 | 0.0967 | 0.0956 | 1.1375 | 1.1871 | 0.2681 | BB ₃ | 1 | 0.0960 | 0.0933 | 2.8125 | 3.0167 | 0.5204 |
| | 2 | 0.0739 | 0.0732 | 0.9472 | | | | 2 | 0.1141 | 0.1111 | 2.6293 | | |
| | 3 | 0.0745 | 0.0734 | 1.4765 | | | | 3 | 0.0970 | 0.0935 | 3.6082 | | |
| B ₄ | 1 | 0.0986 | 0.0981 | 0.5071 | 2.5966 | 1.8261 | BB ₄ | 1 | 0.1065 | 0.1034 | 2.9108 | 3.4102 | 0.4657 |
| | 2 | 0.1060 | 0.1024 | 3.3962 | | | | 2 | 0.0861 | 0.0828 | 3.8328 | | |
| | 3 | 0.0669 | 0.0643 | 3.8864 | | | | 3 | 0.0803 | 0.0775 | 3.4869 | | |
| C ₁ | 1 | 0.0911 | 0.0879 | 3.5126 | 3.2041 | 0.5599 | CC ₁ | 1 | 0.0885 | 0.0829 | 6.3277 | 5.5182 | 1.2337 |
| | 2 | 0.0821 | 0.0800 | 2.5579 | | | | 2 | 0.0976 | 0.0936 | 4.0984 | | |
| | 3 | 0.0847 | 0.0817 | 3.5419 | | | | 3 | 0.0979 | 0.0919 | 6.1287 | | |
| C ₂ | 1 | 0.1051 | 0.1016 | 3.3302 | 3.4714 | 0.4145 | CC ₂ | 1 | 0.1063 | 0.0995 | 6.3970 | 6.2314 | 0.8113 |
| | 2 | 0.0890 | 0.0862 | 3.1461 | | | | 2 | 0.1022 | 0.0951 | 6.9472 | | |
| | 3 | 0.0711 | 0.0683 | 3.9381 | | | | 3 | 0.1028 | 0.0973 | 5.3502 | | |
| C ₃ | 1 | 0.0844 | 0.0814 | 3.5545 | 3.8626 | 0.4253 | CC ₃ | 1 | 0.1490 | 0.1400 | 6.0403 | 6.2575 | 0.1992 |
| | 2 | 0.0814 | 0.0784 | 3.6855 | | | | 2 | 0.1135 | 0.1062 | 6.4317 | | |
| | 3 | 0.0920 | 0.0880 | 4.3478 | | | | 3 | 0.1238 | 0.1160 | 6.3005 | | |
| C ₄ | 1 | 0.0654 | 0.0614 | 6.1162 | 5.8803 | 0.6533 | CC ₄ | 1 | 0.0848 | 0.0794 | 6.3679 | 7.3568 | 1.2824 |
| | 2 | 0.1128 | 0.1070 | 5.1418 | | | | 2 | 0.0829 | 0.0756 | 8.8058 | | |
| | 3 | 0.0987 | 0.0924 | 6.3830 | | | | 3 | 0.0841 | 0.0783 | 6.8966 | | |

Table 33 Percent moisture absorption of terbutaline sulfate transdermal patches stored at 52 %RH for 4 weeks

| Sample | No. | wt of conditioned film (g) | wt of exposed film (g) | % moisture absorption | Average | SD | Sample | No. | wt of conditioned film (g) | wt of exposed film (g) | % moisture absorption | Average | SD |
|----------------|-----|----------------------------|------------------------|-----------------------|---------|--------|-----------------|-----|----------------------------|------------------------|-----------------------|---------|--------|
| A ₁ | 1 | 0.0783 | 0.0823 | 5.1086 | 5.1337 | 0.9179 | AA ₁ | 1 | 0.0633 | 0.0660 | 4.2654 | 5.1196 | 0.8393 |
| | 2 | 0.0907 | 0.0962 | 6.0639 | | | | 2 | 0.1161 | 0.1230 | 5.9432 | | |
| | 3 | 0.0875 | 0.0912 | 4.2286 | | | | 3 | 0.0466 | 0.0490 | 5.1502 | | |
| A ₂ | 1 | 0.0820 | 0.0851 | 3.7805 | 3.6768 | 0.2053 | AA ₂ | 1 | 0.1073 | 0.1118 | 4.1938 | 3.3212 | 0.7836 |
| | 2 | 0.0872 | 0.0902 | 3.4404 | | | | 2 | 0.1083 | 0.1112 | 2.6777 | | |
| | 3 | 0.0840 | 0.0872 | 3.8095 | | | | 3 | 0.1229 | 0.1267 | 3.0919 | | |
| A ₃ | 1 | 0.0846 | 0.0868 | 2.6005 | 2.7353 | 0.1839 | AA ₃ | 1 | 0.0855 | 0.0875 | 2.3392 | 2.5744 | 0.2732 |
| | 2 | 0.0815 | 0.0839 | 2.9448 | | | | 2 | 0.0996 | 0.1021 | 2.5100 | | |
| | 3 | 0.1090 | 0.1119 | 2.6606 | | | | 3 | 0.1183 | 0.1217 | 2.8740 | | |
| A ₄ | 1 | 0.0893 | 0.0911 | 2.0157 | 2.5303 | 1.8226 | AA ₄ | 1 | 0.1215 | 0.1239 | 1.9753 | 2.2481 | 0.2434 |
| | 2 | 0.0966 | 0.1010 | 4.5549 | | | | 2 | 0.0946 | 0.0968 | 2.3256 | | |
| | 3 | 0.0784 | 0.0792 | 1.0204 | | | | 3 | 0.0573 | 0.0587 | 2.4433 | | |
| B ₁ | 1 | 0.0682 | 0.0754 | 10.5572 | 9.2540 | 1.3776 | BB ₁ | 1 | 0.0789 | 0.0859 | 8.8720 | 7.3328 | 1.3433 |
| | 2 | 0.0905 | 0.0990 | 9.3923 | | | | 2 | 0.1055 | 0.1126 | 6.7299 | | |
| | 3 | 0.1024 | 0.1104 | 7.8125 | | | | 3 | 0.0938 | 0.0998 | 6.3966 | | |
| B ₂ | 1 | 0.0908 | 0.0970 | 6.8282 | 7.9567 | 1.1259 | BB ₂ | 1 | 0.1163 | 0.1245 | 7.0507 | 6.9608 | 0.1628 |
| | 2 | 0.0837 | 0.0913 | 9.0800 | | | | 2 | 0.1020 | 0.1092 | 7.0588 | | |
| | 3 | 0.0942 | 0.1017 | 7.9618 | | | | 3 | 0.0753 | 0.0804 | 6.7729 | | |
| B ₃ | 1 | 0.0968 | 0.1018 | 5.1653 | 5.0354 | 1.4755 | BB ₃ | 1 | 0.1176 | 0.1231 | 4.6769 | 4.7000 | 0.1533 |
| | 2 | 0.0978 | 0.1041 | 6.4417 | | | | 2 | 0.1172 | 0.1229 | 4.8635 | | |
| | 3 | 0.0743 | 0.0769 | 3.4993 | | | | 3 | 0.0965 | 0.1009 | 4.5596 | | |
| B ₄ | 1 | 0.0978 | 0.1023 | 4.6012 | 3.8327 | 0.8460 | BB ₄ | 1 | 0.1003 | 0.1028 | 2.4925 | 3.1088 | 0.8173 |
| | 2 | 0.0957 | 0.0995 | 3.9707 | | | | 2 | 0.0892 | 0.0928 | 4.0359 | | |
| | 3 | 0.0786 | 0.0809 | 2.9262 | | | | 3 | 0.0822 | 0.0845 | 2.7981 | | |
| C ₁ | 1 | 0.0783 | 0.0819 | 4.5977 | 3.6556 | 1.0672 | CC ₁ | 1 | 0.0971 | 0.1004 | 3.3986 | 3.6091 | 0.4568 |
| | 2 | 0.0721 | 0.0739 | 2.4965 | | | | 2 | 0.0880 | 0.0909 | 3.2955 | | |
| | 3 | 0.0878 | 0.0912 | 3.8724 | | | | 3 | 0.0871 | 0.0907 | 4.1332 | | |
| C ₂ | 1 | 0.0691 | 0.0710 | 2.7496 | 3.5142 | 0.6695 | CC ₂ | 1 | 0.0964 | 0.1003 | 4.0456 | 3.3806 | 0.7400 |
| | 2 | 0.1027 | 0.1066 | 3.7975 | | | | 2 | 0.0929 | 0.0953 | 2.5834 | | |
| | 3 | 0.0901 | 0.0937 | 3.9956 | | | | 3 | 0.0911 | 0.0943 | 3.5126 | | |
| C ₃ | 1 | 0.0915 | 0.0929 | 1.5301 | 2.3935 | 0.7581 | CC ₃ | 1 | 0.1417 | 0.1452 | 2.4700 | 2.2539 | 0.1876 |
| | 2 | 0.1037 | 0.1065 | 2.7001 | | | | 2 | 0.0797 | 0.0814 | 2.1330 | | |
| | 3 | 0.0644 | 0.0663 | 2.9503 | | | | 3 | 0.1297 | 0.1325 | 2.1588 | | |
| C ₄ | 1 | 0.1084 | 0.1092 | 0.7380 | 1.1573 | 0.4295 | CC ₄ | 1 | 0.0592 | 0.0602 | 1.6892 | 1.3995 | 0.2753 |
| | 2 | 0.1055 | 0.1067 | 1.1374 | | | | 2 | 0.0731 | 0.0741 | 1.3680 | | |
| | 3 | 0.0877 | 0.0891 | 1.5964 | | | | 3 | 0.0701 | 0.0709 | 1.1412 | | |

Table 34 Percent moisture absorption of terbutaline sulfate transdermal patches stored at 93 %RH for 4 weeks

| Sample | No. | wt of conditioned film (g) | wt of exposed film (g) | % moisture absorption | Average | SD | Sample | No. | wt of conditioned film (g) | wt of exposed film (g) | % moisture absorption | Average | SD |
|----------------|-----|----------------------------|------------------------|-----------------------|---------|--------|-----------------|-----|----------------------------|------------------------|-----------------------|---------|--------|
| A ₁ | 1 | 0.0842 | - | - | - | - | AA ₁ | 1 | 0.0994 | - | - | - | - |
| | 2 | 0.0938 | - | - | | | | 2 | 0.1152 | - | - | | |
| | 3 | 0.0781 | - | - | | | | 3 | 0.0931 | - | - | | |
| A ₂ | 1 | 0.0970 | 0.1378 | 42.0619 | 43.3940 | 2.3103 | AA ₂ | 1 | 0.0856 | 0.1245 | 45.4439 | 42.9556 | 2.3324 |
| | 2 | 0.0584 | 0.0853 | 46.0616 | | | | 2 | 0.1014 | 0.1446 | 42.6036 | | |
| | 3 | 0.0787 | 0.1118 | 42.0584 | | | | 3 | 0.0708 | 0.0997 | 40.8192 | | |
| A ₃ | 1 | 0.0989 | 0.1423 | 43.8827 | 41.5611 | 2.8569 | AA ₃ | 1 | 0.0962 | 0.1324 | 37.6299 | 38.9085 | 1.9321 |
| | 2 | 0.0535 | 0.0762 | 42.4299 | | | | 2 | 0.0778 | 0.1098 | 41.1311 | | |
| | 3 | 0.0761 | 0.1053 | 38.3706 | | | | 3 | 0.0619 | 0.0854 | 37.9645 | | |
| A ₄ | 1 | 0.0929 | 0.1247 | 34.2304 | 36.4304 | 5.0331 | AA ₄ | 1 | 0.0872 | 0.1186 | 36.0092 | 35.5009 | 1.8257 |
| | 2 | 0.0867 | 0.1152 | 32.8720 | | | | 2 | 0.0805 | 0.1103 | 37.0186 | | |
| | 3 | 0.1069 | 0.1520 | 42.1890 | | | | 3 | 0.0941 | 0.1256 | 33.4750 | | |
| B ₁ | 1 | 0.0950 | - | - | - | - | BB ₁ | 1 | 0.1042 | 0.1583 | 51.9194 | 51.7458 | 2.6228 |
| | 2 | 0.0730 | - | - | | | | 2 | 0.0938 | 0.1398 | 49.0405 | | |
| | 3 | 0.0956 | - | - | | | | 3 | 0.1052 | 0.1623 | 54.2776 | | |
| B ₂ | 1 | 0.0937 | 0.1462 | 56.0299 | 53.5355 | 2.2623 | BB ₂ | 1 | 0.1148 | 0.1689 | 47.1254 | 44.4482 | 2.6940 |
| | 2 | 0.0990 | 0.1501 | 51.6162 | | | | 2 | 0.0897 | 0.1296 | 44.4816 | | |
| | 3 | 0.0912 | 0.1395 | 52.9605 | | | | 3 | 0.1174 | 0.1664 | 41.7376 | | |
| B ₃ | 1 | 0.0895 | 0.1312 | 46.5922 | 47.3960 | 0.7123 | BB ₃ | 1 | 0.1017 | 0.1402 | 37.8564 | 41.9230 | 3.7739 |
| | 2 | 0.0780 | 0.1154 | 47.9487 | | | | 2 | 0.1223 | 0.1744 | 42.6002 | | |
| | 3 | 0.1020 | 0.1506 | 47.6471 | | | | 3 | 0.0960 | 0.1395 | 45.3125 | | |
| B ₄ | 1 | 0.1033 | 0.1523 | 47.4347 | 46.3416 | 2.2536 | BB ₄ | 1 | 0.1183 | 0.1635 | 38.2079 | 37.6047 | 3.5802 |
| | 2 | 0.1227 | 0.1814 | 47.8403 | | | | 2 | 0.1349 | 0.1900 | 40.8451 | | |
| | 3 | 0.0880 | 0.1265 | 43.7500 | | | | 3 | 0.0779 | 0.1042 | 33.7612 | | |
| C ₁ | 1 | 0.0891 | - | - | - | - | CC ₁ | 1 | 0.0612 | 0.0912 | 49.0196 | 48.0848 | 0.9520 |
| | 2 | 0.0925 | - | - | | | | 2 | 0.0744 | 0.1102 | 48.1183 | | |
| | 3 | 0.0807 | - | - | | | | 3 | 0.0919 | 0.1352 | 47.1164 | | |
| C ₂ | 1 | 0.0967 | 0.1428 | 47.6732 | 45.2558 | 2.1419 | CC ₂ | 1 | 0.0707 | 0.1023 | 44.6959 | 44.1618 | 0.9436 |
| | 2 | 0.1009 | 0.1458 | 44.4995 | | | | 2 | 0.0937 | 0.1356 | 44.7172 | | |
| | 3 | 0.1046 | 0.1502 | 43.5946 | | | | 3 | 0.0996 | 0.1425 | 43.0723 | | |
| C ₃ | 1 | 0.1141 | 0.1596 | 39.8773 | 38.9265 | 1.5411 | CC ₃ | 1 | 0.1092 | 0.1502 | 37.5458 | 36.5098 | 2.4353 |
| | 2 | 0.1137 | 0.1589 | 39.7537 | | | | 2 | 0.0860 | 0.1189 | 38.2558 | | |
| | 3 | 0.1031 | 0.1414 | 37.1484 | | | | 3 | 0.1014 | 0.1356 | 33.7278 | | |
| C ₄ | 1 | 0.0988 | 0.1309 | 32.4899 | 32.5229 | 0.4464 | CC ₄ | 1 | 0.0889 | 0.1189 | 33.7458 | 31.9647 | 1.8875 |
| | 2 | 0.1022 | 0.1350 | 32.0939 | | | | 2 | 0.0740 | 0.0978 | 32.1622 | | |
| | 3 | 0.0861 | 0.1145 | 32.9849 | | | | 3 | 0.0727 | 0.0945 | 29.9862 | | |

Appendix D

Table 35 Ultimate tensile strength of terbutaline sulfate transdermal patches

| Formulation | Ultimate tensile strength (kg/mm ²) | | | | | |
|-----------------|---|-------|-------|-------|-------|-------|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| A ₁ | 0.120 | 0.119 | 0.140 | 0.129 | 0.120 | 0.106 |
| A ₂ | 0.154 | 0.134 | 0.146 | 0.159 | 0.156 | 0.151 |
| A ₃ | 0.173 | 0.160 | 0.160 | 0.165 | 0.165 | 0.157 |
| A ₄ | 0.165 | 0.146 | 0.171 | 0.178 | 0.149 | 0.176 |
| B ₁ | 0.140 | 0.149 | 0.140 | 0.132 | 0.113 | 0.136 |
| B ₂ | 0.149 | 0.145 | 0.156 | 0.154 | 0.166 | 0.158 |
| B ₃ | 0.153 | 0.158 | 0.168 | 0.161 | 0.171 | 0.176 |
| B ₄ | 0.191 | 0.183 | 0.192 | 0.213 | 0.217 | 0.208 |
| C ₁ | 0.172 | 0.163 | 0.169 | 0.167 | 0.179 | 0.176 |
| C ₂ | 0.175 | 0.172 | 0.153 | 0.176 | 0.173 | 0.198 |
| C ₃ | 0.184 | 0.184 | 0.190 | 0.209 | 0.191 | 0.221 |
| C ₄ | 0.228 | 0.223 | 0.224 | 0.219 | 0.229 | 0.202 |
| AA ₁ | 0.134 | 0.134 | 0.171 | 0.113 | 0.178 | 0.172 |
| AA ₂ | 0.172 | 0.168 | 0.169 | 0.176 | 0.180 | 0.166 |
| AA ₃ | 0.195 | 0.187 | 0.185 | 0.196 | 0.191 | 0.188 |
| AA ₄ | 0.218 | 0.221 | 0.204 | 0.224 | 0.215 | 0.225 |
| BB ₁ | 0.141 | 0.148 | 0.158 | 0.171 | 0.142 | 0.172 |
| BB ₂ | 0.164 | 0.169 | 0.162 | 0.189 | 0.156 | 0.194 |
| BB ₃ | 0.218 | 0.232 | 0.228 | 0.229 | 0.212 | 0.214 |
| BB ₄ | 0.247 | 0.232 | 0.246 | 0.232 | 0.245 | 0.240 |
| CC ₁ | 0.148 | 0.180 | 0.181 | 0.178 | 0.176 | 0.218 |
| CC ₂ | 0.180 | 0.181 | 0.219 | 0.193 | 0.216 | 0.221 |
| CC ₃ | 0.238 | 0.242 | 0.248 | 0.228 | 0.241 | 0.245 |
| CC ₄ | 0.257 | 0.262 | 0.246 | 0.252 | 0.255 | 0.290 |

Table 36 Percent elongation at break of terbutaline sulfate transdermal patches

| Formulation | Percent elongation at break | | | | | |
|-----------------|-----------------------------|--------|--------|--------|--------|--------|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| A ₁ | 14.092 | 18.177 | 16.975 | 19.067 | 16.851 | 17.920 |
| A ₂ | 11.976 | 13.574 | 10.976 | 11.117 | 10.221 | 10.133 |
| A ₃ | 12.608 | 11.650 | 12.989 | 10.671 | 10.782 | 8.280 |
| A ₄ | 8.076 | 10.563 | 13.294 | 12.656 | 7.280 | 8.993 |
| B ₁ | 14.460 | 20.296 | 17.885 | 17.460 | 17.885 | 15.524 |
| B ₂ | 15.061 | 14.664 | 17.257 | 16.980 | 10.671 | 10.671 |
| B ₃ | 11.806 | 10.162 | 11.981 | 9.313 | 12.017 | 16.350 |
| B ₄ | 10.195 | 9.725 | 9.214 | 8.188 | 10.949 | 13.040 |
| C ₁ | 17.250 | 17.910 | 16.381 | 17.588 | 16.154 | 18.868 |
| C ₂ | 17.314 | 16.793 | 11.271 | 13.200 | 13.374 | 14.194 |
| C ₃ | 17.486 | 15.773 | 10.525 | 9.693 | 12.548 | 15.443 |
| C ₄ | 11.203 | 11.455 | 10.236 | 11.354 | 10.921 | 11.146 |
| AA ₁ | 19.236 | 18.656 | 15.695 | 18.868 | 19.982 | 15.035 |
| AA ₂ | 10.385 | 14.489 | 10.019 | 11.650 | 17.453 | 17.245 |
| AA ₃ | 10.646 | 12.365 | 13.060 | 11.222 | 12.304 | 10.819 |
| AA ₄ | 9.953 | 12.521 | 10.272 | 10.019 | 11.535 | 10.819 |
| BB ₁ | 18.281 | 19.196 | 16.798 | 18.563 | 17.393 | 17.582 |
| BB ₂ | 14.798 | 15.196 | 12.314 | 13.830 | 16.196 | 16.830 |
| BB ₃ | 16.177 | 14.092 | 13.071 | 6.595 | 18.045 | 15.588 |
| BB ₄ | 12.406 | 11.578 | 10.985 | 12.717 | 10.875 | 10.341 |
| CC ₁ | 22.406 | 19.578 | 19.884 | 20.717 | 18.505 | 17.341 |
| CC ₂ | 13.609 | 25.661 | 12.676 | 14.911 | 14.118 | 26.322 |
| CC ₃ | 15.022 | 13.120 | 17.909 | 10.119 | 17.164 | 17.924 |
| CC ₄ | 10.828 | 11.607 | 11.563 | 10.111 | 12.788 | 10.085 |

Appendix E

Table 37 Peel stress of terbutaline sulfate transdermal patches

| Formulation | Peel stress (g/mm) | | | | | |
|-----------------|--------------------|--------|--------|--------|--------|--------|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| A ₁ | 22.352 | 22.578 | 22.450 | 22.540 | 22.500 | 22.400 |
| A ₂ | 21.150 | 21.450 | 21.254 | 21.360 | 21.410 | 21.230 |
| A ₃ | 19.153 | 19.100 | 19.310 | 19.250 | 19.150 | 19.350 |
| A ₄ | 16.510 | 16.580 | 16.180 | 16.460 | 16.750 | 16.350 |
| B ₁ | 30.710 | 30.960 | 30.375 | 30.455 | 30.650 | 30.350 |
| B ₂ | 28.880 | 28.720 | 28.750 | 28.850 | 28.650 | 28.950 |
| B ₃ | 24.150 | 24.330 | 24.412 | 24.320 | 24.420 | 24.590 |
| B ₄ | 20.940 | 21.310 | 20.740 | 20.650 | 21.256 | 20.750 |
| C ₁ | 35.340 | 35.155 | 35.255 | 35.108 | 35.355 | 35.250 |
| C ₂ | 31.910 | 31.580 | 31.630 | 31.650 | 30.940 | 31.270 |
| C ₃ | 27.315 | 27.520 | 27.590 | 26.970 | 27.352 | 27.530 |
| C ₄ | 23.410 | 23.530 | 23.600 | 23.450 | 22.910 | 23.510 |
| AA ₁ | 14.250 | 15.110 | 14.230 | 14.330 | 14.380 | 14.325 |
| AA ₂ | 13.590 | 13.270 | 13.390 | 13.255 | 13.605 | 13.230 |
| AA ₃ | 12.720 | 12.820 | 13.155 | 12.980 | 12.910 | 12.856 |
| AA ₄ | 12.770 | 13.145 | 12.805 | 12.965 | 12.565 | 12.875 |
| BB ₁ | 18.910 | 18.963 | 19.012 | 19.630 | 18.360 | 18.650 |
| BB ₂ | 14.610 | 15.190 | 14.620 | 14.560 | 14.280 | 14.380 |
| BB ₃ | 12.860 | 13.560 | 12.980 | 12.650 | 12.985 | 13.125 |
| BB ₄ | 13.320 | 13.150 | 12.580 | 12.590 | 12.875 | 12.910 |
| CC ₁ | 19.750 | 19.600 | 19.850 | 19.390 | 19.560 | 19.650 |
| CC ₂ | 16.021 | 15.862 | 15.541 | 15.060 | 15.892 | 15.670 |
| CC ₃ | 13.130 | 13.520 | 13.240 | 13.320 | 13.550 | 13.120 |
| CC ₄ | 13.150 | 12.985 | 13.254 | 13.425 | 13.324 | 13.562 |

Appendix F

Table 38 Cumulative amount of terbutaline sulfate skin permeation per surface area ($\mu\text{g}/\text{cm}^2$) from terbutaline sulfate saturated solution

| Time (hr) | Cumulative skin permeation($\mu\text{g}/\text{cm}^2$) | | | Mean | SD |
|--------------|---|---------|---------|---------|-------|
| | 1 | 2 | 3 | | |
| 1 | 6.539 | 6.997 | 6.884 | 6.806 | 0.239 |
| 2 | 13.178 | 14.586 | 13.563 | 13.776 | 0.728 |
| 4 | 36.953 | 38.609 | 38.322 | 37.961 | 0.885 |
| 6 | 77.284 | 78.416 | 77.803 | 77.834 | 0.566 |
| 8 | 124.522 | 126.797 | 125.312 | 125.544 | 1.155 |
| 12 | 159.421 | 163.090 | 161.435 | 161.316 | 1.837 |
| 16 | 218.437 | 219.942 | 219.041 | 219.140 | 0.757 |
| 20 | 304.956 | 306.726 | 306.049 | 305.911 | 0.893 |
| 24 | 394.029 | 396.679 | 397.206 | 395.972 | 1.703 |

Table 39 Cumulative amount of terbutaline sulfate skin permeation per surface area ($\mu\text{g}/\text{cm}^2$) from terbutaline sulfate transdermal patches

| Formulation | Time (hr) | Cumulative skin permeation($\mu\text{g}/\text{cm}^2$) | | | | | Formulation | Cumulative skin permeation($\mu\text{g}/\text{cm}^2$) | | | | |
|----------------|--------------|---|--------|--------|--------|--------|----------------|---|--------|--------|--------|-------|
| | | 1 | 2 | 3 | Mean | SD | | 1 | 2 | 3 | Mean | SD |
| A ₁ | 1 | 8.413 | 8.982 | 8.461 | 8.619 | 0.316 | A ₄ | 3.005 | 2.989 | 3.042 | 3.012 | 0.027 |
| | 2 | 10.766 | 12.199 | 11.239 | 11.402 | 0.730 | | 4.130 | 4.033 | 3.927 | 4.030 | 0.102 |
| | 4 | 14.661 | 15.361 | 14.701 | 14.908 | 0.393 | | 5.225 | 5.221 | 5.043 | 5.163 | 0.104 |
| | 6 | 18.658 | 19.062 | 17.550 | 18.423 | 0.783 | | 7.333 | 7.862 | 7.821 | 7.672 | 0.294 |
| | 8 | 19.862 | 21.386 | 20.107 | 20.452 | 0.818 | | 9.778 | 10.093 | 10.376 | 10.082 | 0.299 |
| | 12 | 23.260 | 24.989 | 23.257 | 23.835 | 0.999 | | 12.215 | 13.337 | 12.549 | 12.701 | 0.576 |
| | 16 | 27.725 | 28.347 | 27.292 | 27.788 | 0.531 | | 15.991 | 16.506 | 16.963 | 16.487 | 0.486 |
| | 20 | 32.261 | 33.123 | 31.747 | 32.377 | 0.695 | | 18.986 | 19.686 | 19.678 | 19.450 | 0.402 |
| 24 | 38.885 | 39.265 | 38.524 | 38.891 | 0.370 | 22.410 | 23.213 | 22.131 | 22.585 | 0.562 | | |
| A ₂ | 1 | 6.956 | 6.430 | 7.329 | 6.905 | 0.452 | B ₁ | 7.501 | 8.307 | 7.027 | 7.612 | 0.647 |
| | 2 | 9.034 | 8.674 | 8.916 | 8.875 | 0.184 | | 10.064 | 9.567 | 9.636 | 9.756 | 0.269 |
| | 4 | 10.854 | 11.916 | 11.571 | 11.447 | 0.542 | | 12.111 | 12.700 | 11.652 | 12.154 | 0.525 |
| | 6 | 14.216 | 14.652 | 14.579 | 14.482 | 0.233 | | 14.822 | 15.354 | 14.600 | 14.925 | 0.387 |
| | 8 | 16.995 | 15.972 | 16.622 | 16.529 | 0.518 | | 18.150 | 17.401 | 18.173 | 17.908 | 0.439 |
| | 12 | 20.941 | 20.119 | 20.639 | 20.566 | 0.415 | | 22.344 | 22.069 | 22.169 | 22.194 | 0.139 |
| | 16 | 24.631 | 23.340 | 24.417 | 24.130 | 0.692 | | 25.605 | 25.669 | 25.547 | 25.607 | 0.061 |
| | 20 | 27.880 | 26.965 | 27.415 | 27.420 | 0.458 | | 30.046 | 29.499 | 29.422 | 29.656 | 0.340 |
| 24 | 32.501 | 31.120 | 31.621 | 31.747 | 0.699 | 34.003 | 33.460 | 32.871 | 33.444 | 0.566 | | |
| A ₃ | 1 | 5.126 | 4.590 | 5.612 | 5.109 | 0.511 | B ₂ | 6.992 | 6.688 | 7.190 | 6.957 | 0.253 |
| | 2 | 7.052 | 6.808 | 7.329 | 7.063 | 0.261 | | 8.122 | 8.039 | 7.989 | 8.050 | 0.067 |
| | 4 | 8.775 | 8.980 | 8.951 | 8.902 | 0.111 | | 10.392 | 10.134 | 10.420 | 10.315 | 0.158 |
| | 6 | 12.714 | 12.311 | 11.527 | 12.184 | 0.604 | | 12.986 | 12.510 | 12.646 | 12.714 | 0.245 |
| | 8 | 14.828 | 14.267 | 14.099 | 14.398 | 0.382 | | 15.837 | 15.755 | 16.255 | 15.949 | 0.268 |
| | 12 | 17.072 | 16.444 | 16.990 | 16.835 | 0.341 | | 18.677 | 19.303 | 19.507 | 19.162 | 0.433 |
| | 16 | 20.681 | 19.676 | 20.271 | 20.209 | 0.505 | | 22.470 | 23.036 | 23.770 | 22.759 | 0.283 |
| | 20 | 22.428 | 22.150 | 22.720 | 22.433 | 0.285 | | 26.429 | 25.012 | 26.632 | 25.691 | 0.711 |
| 24 | 27.985 | 27.750 | 28.196 | 27.977 | 0.223 | 30.214 | 29.248 | 29.555 | 29.673 | 0.494 | | |

Table 39 (cont.) Cumulative amount of terbutaline sulfate skin permeation per surface area ($\mu\text{g}/\text{cm}^2$) from terbutaline sulfate transdermal patches

| Formulation | Time (hr) | Cumulative skin permeation($\mu\text{g}/\text{cm}^2$) | | | | | Formulation | Cumulative skin permeation($\mu\text{g}/\text{cm}^2$) | | | | |
|----------------|--------------|---|--------|--------|--------|--------|----------------|---|--------|--------|--------|-------|
| | | 1 | 2 | 3 | Mean | SD | | 1 | 2 | 3 | Mean | SD |
| B ₃ | 1 | 3.237 | 2.953 | 2.846 | 3.012 | 0.202 | C ₂ | 5.413 | 5.274 | 4.595 | 5.094 | 0.438 |
| | 2 | 5.098 | 4.656 | 4.036 | 4.597 | 0.533 | | 6.987 | 7.157 | 6.570 | 6.905 | 0.302 |
| | 4 | 7.190 | 6.461 | 5.971 | 6.541 | 0.613 | | 8.950 | 9.466 | 8.400 | 8.938 | 0.533 |
| | 6 | 9.235 | 8.090 | 8.667 | 8.664 | 0.572 | | 11.904 | 11.716 | 11.690 | 11.770 | 0.117 |
| | 8 | 12.591 | 11.444 | 11.069 | 11.701 | 0.793 | | 14.219 | 13.588 | 13.625 | 13.811 | 0.354 |
| | 12 | 16.242 | 14.766 | 15.437 | 15.781 | 0.739 | | 17.130 | 17.290 | 16.945 | 17.122 | 0.172 |
| | 16 | 20.288 | 18.642 | 19.722 | 19.551 | 0.836 | | 21.249 | 21.308 | 20.871 | 21.143 | 0.237 |
| | 20 | 22.935 | 23.207 | 22.811 | 22.985 | 0.203 | | 24.271 | 24.977 | 23.897 | 24.382 | 0.549 |
| 24 | 25.759 | 26.390 | 25.335 | 25.828 | 0.531 | 27.342 | 27.900 | 26.795 | 27.346 | 0.552 | | |
| B ₄ | 1 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | C ₃ | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | 2 | 3.237 | 3.052 | 2.846 | 3.045 | 0.195 | | 2.846 | 3.293 | 2.898 | 3.012 | 0.244 |
| | 4 | 4.642 | 4.512 | 4.103 | 4.419 | 0.281 | | 4.161 | 5.010 | 4.731 | 4.634 | 0.433 |
| | 6 | 7.712 | 7.193 | 7.115 | 7.340 | 0.325 | | 6.776 | 7.065 | 6.956 | 6.932 | 0.146 |
| | 8 | 8.495 | 8.044 | 8.378 | 8.306 | 0.234 | | 9.785 | 10.536 | 10.394 | 10.238 | 0.399 |
| | 12 | 12.048 | 11.108 | 10.779 | 11.312 | 0.658 | | 12.887 | 14.122 | 14.267 | 13.759 | 0.758 |
| | 16 | 14.667 | 13.300 | 13.141 | 13.703 | 0.839 | | 16.711 | 17.233 | 17.238 | 17.061 | 0.303 |
| | 20 | 15.819 | 14.906 | 15.341 | 15.355 | 0.457 | | 21.062 | 21.751 | 21.736 | 21.516 | 0.393 |
| 24 | 20.107 | 19.622 | 18.738 | 19.489 | 0.694 | 23.199 | 23.831 | 24.467 | 23.832 | 0.634 | | |
| C ₁ | 1 | 7.134 | 7.723 | 6.429 | 7.095 | 0.648 | C ₄ | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | 2 | 9.354 | 8.694 | 8.125 | 8.724 | 0.615 | | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | 4 | 10.956 | 11.522 | 10.389 | 10.956 | 0.567 | | 3.893 | 4.215 | 3.855 | 3.987 | 0.198 |
| | 6 | 14.353 | 14.347 | 14.352 | 14.351 | 0.003 | | 6.356 | 6.978 | 6.388 | 6.574 | 0.350 |
| | 8 | 15.572 | 15.985 | 15.057 | 15.538 | 0.465 | | 7.210 | 7.662 | 6.948 | 7.273 | 0.361 |
| | 12 | 20.665 | 19.810 | 19.875 | 20.117 | 0.476 | | 9.779 | 9.302 | 9.314 | 9.465 | 0.272 |
| | 16 | 22.722 | 23.111 | 22.449 | 22.761 | 0.333 | | 10.884 | 11.393 | 9.672 | 10.650 | 0.884 |
| | 20 | 26.187 | 26.511 | 26.377 | 26.359 | 0.163 | | 12.181 | 13.758 | 12.531 | 12.823 | 0.828 |
| 24 | 30.695 | 30.735 | 30.318 | 30.583 | 0.230 | 14.348 | 15.480 | 13.750 | 14.526 | 0.878 | | |

Table 39 (cont.) Cumulative amount of terbutaline sulfate skin permeation per surface area ($\mu\text{g}/\text{cm}^2$) from terbutaline sulfate transdermal patches

| Formulation | Time (hr) | Cumulative skin permeation($\mu\text{g}/\text{cm}^2$) | | | | | Formulation | Cumulative skin permeation($\mu\text{g}/\text{cm}^2$) | | | | |
|-----------------|--------------|---|--------|--------|--------|--------|-----------------|---|--------|--------|--------|-------|
| | | 1 | 2 | 3 | Mean | SD | | 1 | 2 | 3 | Mean | SD |
| BB ₁ | 1 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | BB ₄ | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | 2 | 4.426 | 4.166 | 4.261 | 4.284 | 0.131 | | 4.093 | 4.093 | 3.855 | 4.014 | 0.137 |
| | 4 | 4.992 | 4.917 | 4.119 | 4.676 | 0.484 | | 4.506 | 4.443 | 4.631 | 4.527 | 0.096 |
| | 6 | 7.758 | 7.267 | 7.092 | 7.372 | 0.345 | | 6.601 | 6.608 | 6.981 | 6.730 | 0.217 |
| | 8 | 9.461 | 9.260 | 8.522 | 9.081 | 0.494 | | 7.504 | 8.064 | 7.800 | 7.789 | 0.280 |
| | 12 | 10.903 | 12.748 | 10.822 | 11.491 | 1.089 | | 10.377 | 10.881 | 10.501 | 10.587 | 0.263 |
| | 16 | 14.211 | 13.952 | 13.761 | 13.975 | 0.226 | | 12.253 | 13.212 | 12.198 | 12.554 | 0.570 |
| | 20 | 17.724 | 16.990 | 16.597 | 17.104 | 0.572 | | 15.472 | 16.141 | 14.889 | 15.501 | 0.626 |
| 24 | 18.748 | 18.272 | 17.686 | 18.235 | 0.532 | 16.198 | 16.603 | 15.941 | 16.247 | 0.333 | | |
| BB ₂ | 1 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | | | | | | |
| | 2 | 3.931 | 3.845 | 4.181 | 3.986 | 0.175 | | | | | | |
| | 4 | 4.446 | 4.482 | 4.583 | 4.504 | 0.071 | | | | | | |
| | 6 | 7.157 | 7.723 | 6.506 | 7.129 | 0.609 | | | | | | |
| | 8 | 8.313 | 8.124 | 7.487 | 7.975 | 0.433 | | | | | | |
| | 12 | 10.824 | 11.743 | 11.510 | 11.359 | 0.478 | | | | | | |
| | 16 | 12.553 | 13.246 | 13.008 | 12.936 | 0.352 | | | | | | |
| | 20 | 15.423 | 16.158 | 14.942 | 15.508 | 0.612 | | | | | | |
| 24 | 18.054 | 17.715 | 17.607 | 17.792 | 0.233 | | | | | | | |
| BB ₃ | 1 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | | | | | | |
| | 2 | 4.270 | 3.935 | 4.392 | 4.199 | 0.237 | | | | | | |
| | 4 | 4.659 | 4.449 | 4.795 | 4.634 | 0.174 | | | | | | |
| | 6 | 6.897 | 7.661 | 6.237 | 6.932 | 0.713 | | | | | | |
| | 8 | 10.954 | 11.676 | 12.084 | 11.571 | 0.572 | | | | | | |
| | 12 | 10.954 | 11.676 | 12.084 | 11.571 | 0.572 | | | | | | |
| | 16 | 12.471 | 13.397 | 12.086 | 12.651 | 0.674 | | | | | | |
| | 20 | 16.017 | 14.714 | 14.313 | 15.015 | 0.891 | | | | | | |
| 24 | 16.829 | 16.871 | 17.173 | 16.958 | 0.187 | | | | | | | |

Table 40 Correlation coefficient of the relationships between cumulative drug permeated against time (A), cumulative drug permeated against square root time (B) and log drug remained against time (C) from terbutaline sulfate transdermal patches and variance ratio from the analysis of variances of correlation coefficients from three kinetic patterns

| Formulation | Sample | Correlation coefficient | | | Variance Ratio (F) | P value | Significance Test |
|----------------|--------|-------------------------|--------|--------|--------------------|----------|-------------------|
| | | A | B | C | | | |
| A ₁ | 1 | 0.9824 | 0.9767 | 0.9824 | 3.299741 | 0.107993 | NS |
| | 2 | 0.9833 | 0.9835 | 0.9833 | | | |
| | 3 | 0.9859 | 0.9763 | 0.9860 | | | |
| A ₂ | 1 | 0.9870 | 0.9873 | 0.9871 | 0.004529 | 0.995485 | NS |
| | 2 | 0.9911 | 0.9912 | 0.9911 | | | |
| | 3 | 0.9912 | 0.9904 | 0.9912 | | | |
| A ₃ | 1 | 0.9777 | 0.9814 | 0.9777 | 0.109354 | 0.898159 | NS |
| | 2 | 0.9904 | 0.9800 | 0.9904 | | | |
| | 3 | 0.9759 | 0.9760 | 0.9759 | | | |
| A ₄ | 1 | 0.9912 | 0.9702 | 0.9912 | 0.109354 | 0.898159 | NS |
| | 2 | 0.9976 | 0.9764 | 0.9976 | | | |
| | 3 | 0.9967 | 0.9769 | 0.9967 | | | |
| B ₁ | 1 | 0.9915 | 0.9877 | 0.9915 | 0.798545 | 0.492620 | NS |
| | 2 | 0.9940 | 0.9880 | 0.9941 | | | |
| | 3 | 0.9855 | 0.9923 | 0.9056 | | | |
| B ₂ | 1 | 0.9953 | 0.9814 | 0.9953 | 2.210896 | 0.190821 | NS |
| | 2 | 0.9874 | 0.9872 | 0.9874 | | | |
| | 3 | 0.9888 | 0.9857 | 0.9888 | | | |
| B ₃ | 1 | 0.9865 | 0.9900 | 0.9866 | 1.903183 | 0.229050 | NS |
| | 2 | 0.9970 | 0.9738 | 0.9970 | | | |
| | 3 | 0.9910 | 0.9843 | 0.9910 | | | |
| B ₄ | 1 | 0.9818 | 0.9829 | 0.9819 | 0.542884 | 0.607146 | NS |
| | 2 | 0.9838 | 0.9737 | 0.9838 | | | |
| | 3 | 0.9869 | 0.9864 | 0.9869 | | | |
| C ₁ | 1 | 0.9883 | 0.9837 | 0.9883 | 2.924438 | 0.129844 | NS |
| | 2 | 0.9937 | 0.9853 | 0.9937 | | | |
| | 3 | 0.9880 | 0.9868 | 0.9880 | | | |
| C ₂ | 1 | 0.9909 | 0.9893 | 0.9909 | 0.431647 | 0.668122 | NS |
| | 2 | 0.9950 | 0.9861 | 0.9950 | | | |
| | 3 | 0.9880 | 0.9920 | 0.9881 | | | |

Table 40 (cont.) Correlation coefficient of the relationships between cumulative drug permeated against time (A), cumulative drug permeated against square root time (B) and log drug remained against time (C) from terbutaline sulfate transdermal patches and variance ratio from the analysis of variances of correlation coefficients from three kinetic patterns

| Formulation | Sample | Correlation coefficient | | | Variance Ratio (F) | P value | Significance Test |
|-----------------|--------|-------------------------|--------|--------|--------------------|----------|-------------------|
| | | A | B | C | | | |
| C ₃ | 1 | 0.9920 | 0.9900 | 0.9921 | 4.898912 | 0.054785 | NS |
| | 2 | 0.9918 | 0.9869 | 0.9918 | | | |
| | 3 | 0.9899 | 0.9881 | 0.9899 | | | |
| C ₄ | 1 | 0.9661 | 0.9868 | 0.9661 | 1.544703 | 0.287639 | NS |
| | 2 | 0.9626 | 0.9856 | 0.9626 | | | |
| | 3 | 0.9818 | 0.9737 | 0.9818 | | | |
| BB ₁ | 1 | 0.9834 | 0.9751 | 0.9834 | 0.045580 | 0.955771 | NS |
| | 2 | 0.9820 | 0.9865 | 0.9820 | | | |
| | 3 | 0.9752 | 0.9757 | 0.9752 | | | |
| BB ₂ | 1 | 0.9909 | 0.9792 | 1.0000 | 4.402822 | 0.066554 | NS |
| | 2 | 0.9869 | 0.9844 | 0.9913 | | | |
| | 3 | 0.9798 | 0.9753 | 0.9878 | | | |
| BB ₃ | 1 | 0.9684 | 0.9721 | 0.9684 | 0.088024 | 0.916900 | NS |
| | 2 | 0.9687 | 0.9836 | 0.9687 | | | |
| | 3 | 0.9845 | 0.9562 | 0.9846 | | | |
| BB ₄ | 1 | 0.9866 | 0.9763 | 0.9866 | 0.384043 | 0.696717 | NS |
| | 2 | 0.9801 | 0.9792 | 0.9801 | | | |
| | 3 | 0.9855 | 0.9882 | 0.9855 | | | |

Remark: Critical Value (F) = 5.1432; $\alpha = 0.05$; NS = non significance

VITA

Miss Sirikarn Prisawong was born on July 30, 1972. She received her Bachelor of Science in Pharmacy degree in 1993 from Faculty of Pharmaceutical Sciences, Chulalongkorn University, Bangkok, Thailand. After graduation, she worked at National Blood Center, Thai Red Cross Society for two years before entering the Master's degree program in manufacturing pharmacy at Chulalongkorn University.