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# **APPENDIX**

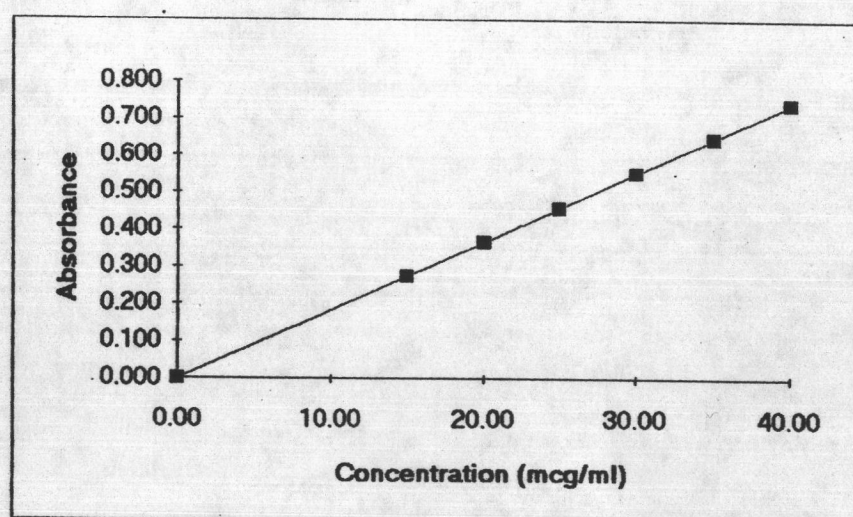


**Table 17 : Absorbance of indomethacin in the mixture of methanol and pH 7.5 phosphate buffer (1:1) at 322 nm**

| Concentration (mcg/ml) | Absorbance |
|------------------------|------------|
| 0.00                   | 0.000      |
| 15.00                  | 0.273      |
| 20.00                  | 0.365      |
| 25.00                  | 0.458      |
| 30.00                  | 0.551      |
| 35.00                  | 0.644      |
| 40.00                  | 0.738      |

Correlation coefficient = 0.999977

$$Y = 0.01846X - 0.0023$$



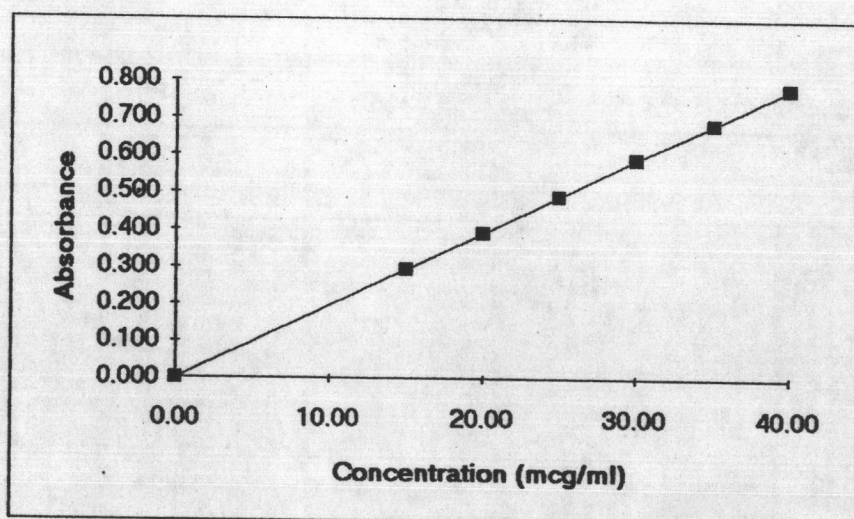
**Figure 67 : Calibration curve of indomethacin in the mixture of methanol and pH 7.5 phosphate buffer (1:1) at 322 nm**

**Table 18 : Absorbance of indomethacin in the pH 6.2 phosphate at 320 nm**

| Concentration (mcg/ml) | Absorbance |
|------------------------|------------|
| 0.00                   | 0.000      |
| 15.00                  | 0.295      |
| 20.00                  | 0.392      |
| 25.00                  | 0.487      |
| 30.00                  | 0.587      |
| 35.00                  | 0.681      |
| 40.00                  | 0.778      |

Correlation coefficient = 0.999981

$$Y = 0.01944 X + 0.0018$$

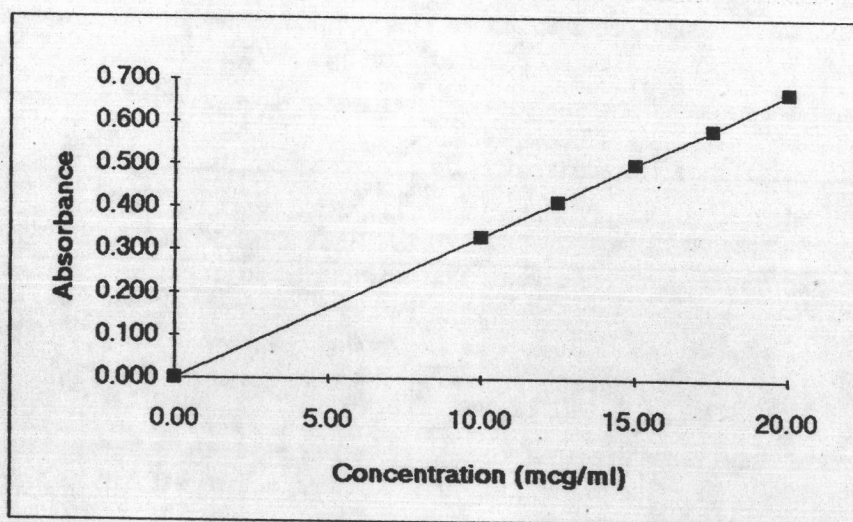
**Figure 68 : Absorbance of indomethacin in the pH 6.2 phosphate at 320 nm**

**Table 19 : Absorbance of pindolol in the mixture of methanol and chloroform (1:1) at 266 nm**

| Concentration (mcg/ml) | Absorbance |
|------------------------|------------|
| 0.00                   | 0.000      |
| 10.00                  | 0.329      |
| 12.50                  | 0.412      |
| 15.00                  | 0.502      |
| 17.50                  | 0.583      |
| 20.00                  | 0.670      |

Correlation coefficient = 0.999916

$$Y = 0.03349X - 0.0026$$



**Figure 69 : Absorbance of pindolol in the mixture of methanol and chloroform (1:1) at 266 nm**

**Table 20 : Number of size distribution of indomethacin microcapsule prepared from various preparations**

| Size range<br>(um) | Number of microcapsules |        |        |        |        |        |        |        |        |        |        |        |
|--------------------|-------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
|                    | Rx1                     | Rx2    | Rx3    | Rx4    | Rx5    | Rx6    | Rx7    | Rx8    | Rx11   | Rx13   | Rx14   | Rx15   |
| 32-63              | 0.00                    | 1.00   | 0.00   | 0.00   | 0.00   | 13.00  | 1.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   |
| 63-94              | 36.00                   | 63.00  | 41.00  | 32.00  | 63.00  | 29.00  | 8.00   | 90.00  | 23.00  | 34.00  | 40.00  | 37.00  |
| 94-125             | 86.00                   | 113.00 | 102.00 | 103.00 | 100.00 | 82.00  | 91.00  | 120.00 | 80.00  | 64.00  | 118.00 | 72.00  |
| 125-156            | 95.00                   | 99.00  | 112.00 | 102.00 | 84.00  | 89.00  | 120.00 | 76.00  | 109.00 | 103.00 | 98.00  | 76.00  |
| 156-187            | 58.00                   | 45.00  | 52.00  | 74.00  | 44.00  | 64.00  | 86.00  | 34.00  | 55.00  | 70.00  | 61.00  | 76.00  |
| 187-218            | 31.00                   | 18.00  | 29.00  | 29.00  | 24.00  | 40.00  | 21.00  | 11.00  | 30.00  | 38.00  | 21.00  | 40.00  |
| 218-249            | 14.00                   | 10.00  | 12.00  | 10.00  | 13.00  | 14.00  | 7.00   | 7.00   | 18.00  | 15.00  | 10.00  | 33.00  |
| 249-280            | 5.00                    | 4.00   | 5.00   | 2.00   | 7.00   | 4.00   | 9.00   | 4.00   | 7.00   | 10.00  | 2.00   | 8.00   |
| 280-311            | 7.00                    | 2.00   | 2.00   | 1.00   | 4.00   | 1.00   | 5.00   | 4.00   | 6.00   | 3.00   | 0.00   | 4.00   |
| 311-342            | 3.00                    | 0.00   | 2.00   | 0.00   | 1.00   | 2.00   | 2.00   | 0.00   | 4.00   | 2.00   | 0.00   | 6.00   |
| 342-373            | 2.00                    | 0.00   | 1.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 3.00   | 0.00   | 0.00   | 3.00   |
| 373-404            | 0.00                    | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 2.00   |
| total              | 337.00                  | 355.00 | 358.00 | 353.00 | 340.00 | 338.00 | 350.00 | 346.00 | 335.00 | 339.00 | 350.00 | 357.00 |

| Size range<br>(um) | Number of microcapsules |        |        |        |        |        |        |        |        |        |        |
|--------------------|-------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
|                    | Rx16                    | Rx17   | Rx18   | Rx19   | Rx21   | Rx22'  | Rx24   | Rx25   | Rx28   | Rx29   | Rx30   |
| 32-63              | 10.00                   | 0.00   | 0.00   | 0.00   | 0.00   | 10.00  | 0.00   | 0.00   | 0.00   | 0.00   | 3.00   |
| 63-94              | 97.00                   | 62.00  | 42.00  | 40.00  | 43.00  | 96.00  | 74.00  | 48.00  | 34.00  | 91.00  | 107.00 |
| 94-125             | 133.00                  | 120.00 | 82.00  | 53.00  | 75.00  | 127.00 | 110.00 | 76.00  | 120.00 | 104.00 | 120.00 |
| 125-156            | 75.00                   | 89.00  | 89.00  | 74.00  | 88.00  | 77.00  | 90.00  | 85.00  | 95.00  | 90.00  | 74.00  |
| 156-187            | 22.00                   | 47.00  | 79.00  | 54.00  | 61.00  | 23.00  | 48.00  | 82.00  | 41.00  | 39.00  | 19.00  |
| 187-218            | 9.00                    | 17.00  | 27.00  | 56.00  | 33.00  | 8.00   | 19.00  | 29.00  | 18.00  | 18.00  | 4.00   |
| 218-249            | 5.00                    | 6.00   | 21.00  | 24.00  | 21.00  | 4.00   | 3.00   | 17.00  | 12.00  | 5.00   | 6.00   |
| 249-280            | 0.00                    | 2.00   | 5.00   | 17.00  | 9.00   | 0.00   | 1.00   | 7.00   | 5.00   | 4.00   | 3.00   |
| 280-311            | 0.00                    | 1.00   | 5.00   | 6.00   | 7.00   | 0.00   | 2.00   | 5.00   | 4.00   | 3.00   | 2.00   |
| 311-342            | 0.00                    | 0.00   | 3.00   | 9.00   | 3.00   | 0.00   | 1.00   | 1.00   | 4.00   | 2.00   | 1.00   |
| 342-373            | 0.00                    | 0.00   | 2.00   | 3.00   | 2.00   | 0.00   | 0.00   | 1.00   | 2.00   | 0.00   | 0.00   |
| 373-404            | 0.00                    | 0.00   | 0.00   | 2.00   | 2.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   |
| total              | 351.00                  | 344.00 | 355.00 | 338.00 | 344.00 | 345.00 | 348.00 | 351.00 | 335.00 | 356.00 | 339.00 |

| Size range<br>(um) | Number of microcapsules |          |           |         |          |           |
|--------------------|-------------------------|----------|-----------|---------|----------|-----------|
|                    | Rx 4                    |          |           | Rx 16   |          |           |
|                    | batch I                 | batch II | batch III | batch I | batch II | batch III |
| 32-63              | 0.00                    | 0.00     | 0.00      | 10.00   | 24.00    | 3.00      |
| 63-94              | 32.00                   | 38.00    | 70.00     | 97.00   | 135.00   | 87.00     |
| 94-125             | 103.00                  | 143.00   | 114.00    | 133.00  | 111.00   | 132.00    |
| 125-156            | 102.00                  | 92.00    | 103.00    | 75.00   | 43.00    | 79.00     |
| 156-187            | 74.00                   | 66.00    | 30.00     | 22.00   | 22.00    | 27.00     |
| 187-218            | 29.00                   | 11.00    | 17.00     | 9.00    | 9.00     | 10.00     |
| 218-249            | 10.00                   | 4.00     | 7.00      | 5.00    | 4.00     | 3.00      |
| 249-280            | 2.00                    | 2.00     | 3.00      | 0.00    | 2.00     | 1.00      |
| 280-311            | 1.00                    | 1.00     | 1.00      | 0.00    | 2.00     | 1.00      |
| 311-342            | 0.00                    | 1.00     | 1.00      | 0.00    | 1.00     | 0.00      |
| 342-373            | 0.00                    | 0.00     | 0.00      | 0.00    | 0.00     | 0.00      |
| 373-404            | 0.00                    | 0.00     | 0.00      | 0.00    | 0.00     | 0.00      |
| total              | 353.00                  | 358.00   | 346.00    | 351.00  | 353.00   | 343.00    |

Rx = Preparation

**Table 21 : %Weight distribution of indomethacin microcapsule prepared from various preparations**

| Size range<br>(um) | % Weight of microcapsules |       |       |       |       |       |       |       |       |       |       |       |
|--------------------|---------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                    | Rx1                       | Rx2   | Rx3   | Rx4   | Rx5   | Rx6   | Rx7   | Rx8   | Rx11  | Rx13  | Rx14  | Rx15  |
| 32-63              | 0.00                      | 0.01  | 0.00  | 0.00  | 0.00  | 0.10  | 0.01  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| 63-94              | 1.09                      | 2.81  | 1.44  | 1.25  | 2.44  | 1.02  | 0.25  | 4.63  | 0.64  | 1.04  | 1.77  | 0.82  |
| 94-125             | 7.10                      | 13.56 | 9.71  | 10.93 | 10.51 | 7.84  | 7.87  | 16.74 | 6.05  | 5.33  | 14.18 | 4.35  |
| 125-156            | 16.56                     | 25.36 | 22.51 | 22.85 | 18.65 | 17.98 | 21.91 | 22.40 | 17.43 | 18.11 | 24.88 | 9.70  |
| 156-187            | 18.39                     | 20.96 | 19.01 | 30.16 | 17.77 | 23.52 | 28.56 | 18.22 | 15.99 | 22.38 | 28.17 | 17.64 |
| 187-218            | 16.18                     | 13.80 | 17.45 | 19.45 | 15.96 | 24.20 | 11.48 | 9.71  | 14.36 | 20.00 | 15.96 | 15.28 |
| 218-249            | 11.20                     | 11.76 | 11.07 | 10.29 | 13.25 | 12.99 | 5.87  | 9.47  | 13.21 | 12.10 | 11.65 | 19.33 |
| 249-280            | 5.82                      | 6.84  | 6.71  | 2.99  | 10.37 | 5.39  | 10.97 | 7.87  | 7.47  | 11.73 | 3.39  | 6.81  |
| 280-311            | 11.35                     | 4.77  | 3.74  | 2.08  | 8.26  | 1.88  | 8.49  | 10.97 | 8.92  | 4.91  | 0.00  | 4.75  |
| 311-342            | 6.56                      | 0.00  | 5.05  | 0.00  | 2.79  | 5.07  | 4.58  | 0.00  | 8.03  | 4.41  | 0.00  | 9.61  |
| 342-373            | 5.74                      | 0.00  | 3.31  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 7.90  | 0.00  | 0.00  | 6.31  |
| 373-404            | 0.00                      | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 5.40  |
| total              | 100.0                     | 99.9  | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

| Size range<br>(um) | % Weight of microcapsules |       |       |       |       |       |       |       |       |       |       |
|--------------------|---------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                    | Rx16                      | Rx17  | Rx18  | Rx19  | Rx21  | Rx22  | Rx24  | Rx25  | Rx28  | Rx29  | Rx30  |
| 32-63              | 0.16                      | 0.00  | 0.00  | 0.00  | 0.00  | 0.16  | 0.00  | 0.00  | 0.00  | 0.00  | 0.04  |
| 63-94              | 6.90                      | 3.15  | 1.21  | 0.82  | 1.11  | 7.02  | 3.68  | 1.48  | 1.20  | 4.15  | 6.79  |
| 94-125             | 25.68                     | 16.55 | 6.40  | 2.93  | 5.26  | 25.22 | 14.85 | 6.36  | 11.48 | 12.87 | 20.67 |
| 125-156            | 30.59                     | 25.93 | 14.67 | 8.64  | 13.03 | 32.30 | 25.66 | 15.03 | 19.19 | 23.52 | 26.93 |
| 156-187            | 16.32                     | 24.91 | 23.69 | 11.47 | 16.43 | 17.55 | 24.89 | 26.37 | 15.06 | 18.54 | 12.57 |
| 187-218            | 10.99                     | 14.83 | 13.33 | 19.59 | 14.63 | 10.05 | 16.22 | 15.35 | 10.89 | 14.09 | 4.36  |
| 218-249            | 9.36                      | 8.03  | 15.89 | 12.87 | 14.28 | 7.70  | 3.93  | 13.80 | 11.13 | 6.00  | 10.02 |
| 249-280            | 0.00                      | 3.89  | 5.50  | 13.25 | 8.89  | 0.00  | 1.90  | 8.26  | 6.74  | 6.98  | 7.28  |
| 280-311            | 0.00                      | 2.71  | 7.67  | 6.52  | 9.65  | 0.00  | 5.30  | 8.22  | 7.52  | 7.30  | 6.77  |
| 311-342            | 0.00                      | 0.00  | 6.21  | 13.19 | 5.58  | 0.00  | 3.58  | 2.22  | 10.14 | 6.56  | 4.57  |
| 342-373            | 0.00                      | 0.00  | 5.43  | 5.77  | 4.88  | 0.00  | 0.00  | 2.91  | 6.66  | 0.00  | 0.00  |
| 373-404            | 0.00                      | 0.00  | 0.00  | 4.94  | 6.26  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| total              | 100.0                     | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

| Size range<br>(um) | % Weight of microcapsules |          |           |         |          |           |
|--------------------|---------------------------|----------|-----------|---------|----------|-----------|
|                    | Rx 4                      |          |           | Rx 16   |          |           |
|                    | batch I                   | batch II | batch III | batch I | batch II | batch III |
| 32-63              | 0.00                      | 0.00     | 0.00      | 0.16    | 0.37     | 0.04      |
| 63-94              | 1.25                      | 1.78     | 3.50      | 6.90    | 9.42     | 5.71      |
| 94-125             | 10.93                     | 18.16    | 15.48     | 25.68   | 21.03    | 23.53     |
| 125-156            | 22.85                     | 24.67    | 29.54     | 30.59   | 17.21    | 29.75     |
| 156-187            | 30.16                     | 32.19    | 15.65     | 16.32   | 16.02    | 18.49     |
| 187-218            | 19.45                     | 8.83     | 14.60     | 10.99   | 10.79    | 11.27     |
| 218-249            | 10.29                     | 4.92     | 9.22      | 9.36    | 7.35     | 5.19      |
| 249-280            | 2.99                      | 3.58     | 5.74      | 0.00    | 5.34     | 2.51      |
| 280-311            | 2.08                      | 2.50     | 2.67      | 0.00    | 7.45     | 3.50      |
| 311-342            | 0.00                      | 3.37     | 3.60      | 0.00    | 5.02     | 0.00      |
| 342-373            | 0.00                      | 0.00     | 0.00      | 0.00    | 0.00     | 0.00      |
| 373-404            | 0.00                      | 0.00     | 0.00      | 0.00    | 0.00     | 0.00      |
| total              | 100.0                     | 100.0    | 100.0     | 100.0   | 100.0    | 100.0     |

Rx = Preparation.

**Table 22 : Cumulative % frequency undersize and Z value of indomethacin microcapsule prepared from various preparations**

| Size range<br>( $\mu\text{m}$ ) | Rx 1   |         | Rx 2   |         | Rx 3   |         | Rx 4   |         | Rx 5   |         |
|---------------------------------|--------|---------|--------|---------|--------|---------|--------|---------|--------|---------|
|                                 | CUM %  | Z       | CUM %  | Z       | CUM %  | Z       | CUM %  | Z       | CUM %  | Z       |
| 32-63                           | 0.00   | -       | 0.0100 | -2.9993 | 0.00   | -       | 0.00   | -       | 0.00   | -       |
| 63-94                           | 1.09   | -2.2933 | 2.82   | -1.9083 | 1.44   | -2.1867 | 1.25   | -2.2400 | 2.44   | -1.9700 |
| 94-125                          | 8.19   | -1.3927 | 16.52  | -0.9732 | 11.14  | -1.2189 | 12.18  | -1.1660 | 12.95  | -1.1286 |
| 125-156                         | 24.75  | -0.6825 | 41.88  | -0.2049 | 33.66  | -0.4217 | 35.03  | -0.3846 | 31.60  | -0.4789 |
| 156-187                         | 34.14  | -0.1728 | 62.84  | 0.3276  | 52.67  | 0.0068  | 65.19  | 0.3905  | 49.37  | -0.0158 |
| 187-218                         | 59.32  | 0.2358  | 76.64  | 0.7271  | 70.12  | 0.5285  | 84.64  | 1.0213  | 65.33  | 0.3943  |
| 218-249                         | 70.52  | 0.5394  | 88.40  | 1.1953  | 81.20  | 0.8852  | 94.93  | 1.6382  | 78.58  | 0.7928  |
| 249-280                         | 76.34  | 0.7174  | 95.23  | 1.6680  | 87.90  | 1.1700  | 97.92  | 2.0380  | 88.95  | 1.2237  |
| 280-311                         | 87.69  | 1.1595  | 100.00 | -       | 91.64  | 1.3813  | 100.00 | -       | 97.21  | 1.9129  |
| 311-342                         | 94.26  | 1.5773  | -      | -       | 96.69  | 1.8371  | -      | -       | 100.00 | -       |
| 342-373                         | 100.00 | -       | -      | -       | 100.00 | -       | -      | -       | -      | -       |
| 373-404                         | -      | -       | -      | -       | -      | -       | -      | -       | -      | -       |

| Size range<br>( $\mu\text{m}$ ) | Rx 6   |         | Rx 7   |         | Rx 8   |         | Rx 11  |         | Rx 13  |         |
|---------------------------------|--------|---------|--------|---------|--------|---------|--------|---------|--------|---------|
|                                 | CUM %  | Z       | CUM %  | Z       | CUM %  | Z       | CUM %  | Z       | CUM %  | Z       |
| 32-63                           | 0.10   | -2.9925 | 0.01   | -2.9993 | 0.00   | -       | 0.00   | -       | 0.00   | -       |
| 63-94                           | 1.12   | -2.2833 | 0.62   | -2.7900 | 4.63   | -1.6820 | 0.64   | -2.4900 | 1.04   | -2.3100 |
| 94-125                          | 8.97   | -1.3425 | 8.13   | -1.3967 | 21.37  | -0.7938 | 6.70   | -1.4985 | 6.37   | -1.5208 |
| 125-156                         | 26.95  | -0.6118 | 30.04  | -0.5232 | 43.77  | -0.1568 | 24.12  | -0.7026 | 24.47  | -0.6913 |
| 156-187                         | 50.87  | 0.0118  | 58.61  | 0.2174  | 61.99  | 0.3052  | 40.11  | -0.2505 | 46.85  | -0.0790 |
| 187-218                         | 74.67  | 0.6672  | 70.09  | 0.5271  | 71.70  | 0.5740  | 54.47  | 0.1123  | 66.85  | 0.4358  |
| 218-249                         | 87.66  | 1.1581  | 75.96  | 0.7052  | 81.17  | 0.8833  | 67.68  | 0.4589  | 78.95  | 0.8048  |
| 249-280                         | 93.05  | 1.4793  | 86.92  | 1.1227  | 89.03  | 1.2279  | 75.15  | 0.6794  | 90.68  | 1.3213  |
| 280-311                         | 94.93  | 1.6382  | 95.42  | 1.6870  | 100.00 | -       | 84.07  | 1.0225  | 95.59  | 1.7050  |
| 311-342                         | 100.00 | -       | 100.00 | -       | -      | -       | 92.10  | 1.4120  | 100.00 | -       |
| 342-373                         | -      | -       | -      | -       | -      | -       | 100.00 | -       | -      | -       |
| 373-404                         | -      | -       | -      | -       | -      | -       | -      | -       | -      | -       |

| Size range<br>( $\mu\text{m}$ ) | Rx 14  |         | Rx 15  |         | Rx 16  |         | Rx 17  |         | Rx 18  |         |
|---------------------------------|--------|---------|--------|---------|--------|---------|--------|---------|--------|---------|
|                                 | CUM %  | Z       | CUM %  | Z       | CUM %  | Z       | CUM %  | Z       | CUM %  | Z       |
| 32-63                           | 0.00   | -       | 0.00   | -       | 0.16   | -2.9500 | 0.00   | -       | 0.00   | -       |
| 63-94                           | 1.77   | -2.1020 | 0.82   | -2.4000 | 7.06   | -1.4714 | 3.15   | -1.8588 | 1.21   | -2.2533 |
| 94-125                          | 15.95  | -0.9967 | 5.17   | -1.6290 | 32.74  | -0.4472 | 19.70  | -0.8525 | 7.61   | -1.4333 |
| 125-156                         | 40.83  | -0.2318 | 14.87  | -1.0417 | 63.33  | 0.3405  | 45.64  | -0.1003 | 22.28  | -0.7627 |
| 156-187                         | 69.00  | 0.4958  | 32.51  | -0.4536 | 79.65  | 0.8293  | 70.54  | 0.5403  | 45.97  | -0.1013 |
| 187-218                         | 84.96  | 1.0348  | 47.80  | -0.0530 | 90.64  | 1.3188  | 85.38  | 1.0530  | 59.30  | 0.2353  |
| 218-249                         | 96.61  | 1.7070  | 67.13  | 0.4436  | 100.00 | -       | 93.40  | 1.5062  | 75.19  | 0.6806  |
| 249-280                         | 100.00 | -       | 73.94  | 0.6412  | -      | -       | 97.29  | 1.9250  | 80.69  | 0.8667  |
| 280-311                         | -      | -       | 78.69  | 0.7959  | -      | -       | 100.00 | -       | 88.36  | 1.1932  |
| 311-342                         | -      | -       | 88.30  | 1.1900  | -      | -       | -      | -       | 94.57  | 1.6045  |
| 342-373                         | -      | -       | 94.60  | 1.6073  | -      | -       | -      | -       | 100.00 | -       |
| 373-404                         | -      | -       | 100.00 | -       | -      | -       | -      | -       | -      | -       |

Rx = Preparation, CUM % = Cumulative % Frequency Undersize

**Table 22 : Cumulative % frequency undersize and Z value of indomethacin microcapsule prepared from various preparations (continue )**

| Size range<br>(um) | Rx 19  |         | Rx 21  |         | Rx 22  |         | Rx 24  |         | Rx 25  |         |
|--------------------|--------|---------|--------|---------|--------|---------|--------|---------|--------|---------|
|                    | CUM %  | Z       | CUM %  | Z       | CUM %  | Z       | CUM %  | Z       | CUM %  | Z       |
| 32-63              | 0.00   | -       | 0.00   | -       | 0.16   | -2.9500 | 0.00   | -       | 0.00   | -       |
| 63-94              | 0.82   | -2.4050 | 1.11   | -2.2900 | 7.19   | -1.4615 | 3.68   | -1.7888 | 1.48   | -2.1750 |
| 94-125             | 3.75   | -1.7800 | 6.37   | -1.5343 | 32.40  | -0.4567 | 18.53  | -0.8954 | 7.84   | -1.4160 |
| 125-156            | 12.39  | -1.1557 | 19.40  | -0.8634 | 64.70  | 0.3773  | 44.18  | -0.1461 | 22.87  | -0.7430 |
| 156-187            | 23.86  | -0.7106 | 35.83  | -0.3627 | 82.25  | 0.9250  | 69.07  | 0.4978  | 49.24  | -0.0190 |
| 187-218            | 43.45  | -0.1649 | 50.67  | 0.0118  | 92.30  | 1.4257  | 85.29  | 1.0487  | 64.59  | 0.3743  |
| 218-249            | 56.32  | 0.1590  | 64.74  | 0.3784  | 100.00 | -       | 89.22  | 1.2378  | 78.39  | 0.7855  |
| 249-280            | 69.57  | 0.5120  | 73.64  | 0.6322  | -      | -       | 91.12  | 1.3481  | 86.84  | 1.1095  |
| 280-311            | 76.09  | 0.7094  | 83.28  | 0.9652  | -      | -       | 96.42  | 1.8013  | 94.87  | 1.6327  |
| 311-342            | 89.29  | 1.2421  | 88.86  | 1.2189  | -      | -       | 100.00 | -       | 97.09  | 1.8929  |
| 342-373            | 95.06  | 1.6510  | 93.74  | 1.5325  | -      | -       | -      | -       | 100.00 | -       |
| 373-404            | 100.00 | -       | 100.00 | -       | -      | -       | -      | -       | -      | -       |

| Size range<br>(um) | Rx 28  |         | Rx 29  |         | Rx 30  |         |
|--------------------|--------|---------|--------|---------|--------|---------|
|                    | CUM %  | Z       | CUM %  | Z       | CUM %  | Z       |
| 32-63              | 0.00   | -       | 0.00   | -       | 0.04   | -2.9971 |
| 63-94              | 1.20   | -2.2567 | 4.15   | -1.7333 | 6.83   | -1.4885 |
| 94-125             | 12.67  | -1.1420 | 17.02  | -0.9535 | 27.50  | -0.5979 |
| 125-156            | 31.87  | -0.4715 | 40.54  | -0.2395 | 54.43  | 0.1113  |
| 156-187            | 46.93  | -0.0777 | 59.08  | 0.2295  | 67.00  | 0.4400  |
| 187-218            | 57.82  | 0.1973  | 73.17  | 0.6179  | 71.36  | 0.5638  |
| 218-249            | 68.95  | 0.4942  | 79.17  | 0.8124  | 81.38  | 0.8919  |
| 249-280            | 75.68  | 0.6961  | 86.14  | 1.0868  | 88.66  | 1.2085  |
| 280-311            | 83.20  | 0.9620  | 93.44  | 1.5091  | 98.43  | 1.6888  |
| 311-342            | 93.34  | 1.5015  | 100.00 | -       | 100.00 | -       |
| 342-373            | 100.00 | -       | -      | -       | -      | -       |
| 373-404            | -      | -       | -      | -       | -      | -       |

Rx = Preparation, CUM % = Cumulative% Frequency Undersize

**Table 22 : Cumulative % frequency undersize and Z value of indomethacin microcapsule prepared from various preparations (continue)**

| Size range<br>( $\mu\text{m}$ ) | Rx 4    |         |          |         |           |         |
|---------------------------------|---------|---------|----------|---------|-----------|---------|
|                                 | batch I |         | batch II |         | batch III |         |
|                                 | CUM %   | Z       | CUM %    | Z       | CUM %     | Z       |
| 32-63                           | -       | -       | -        | -       | -         | -       |
| 63-94                           | 1.25    | -2.2400 | 1.78     | -2.1020 | 3.50      | -1.8114 |
| 94-125                          | 12.18   | -1.1660 | 19.93    | -0.8441 | 18.98     | -0.8782 |
| 125-156                         | 35.03   | -0.3846 | 44.61    | -0.1355 | 48.53     | -0.0368 |
| 156-187                         | 65.19   | 0.3905  | 76.80    | 0.7326  | 64.18     | 0.3632  |
| 187-218                         | 84.64   | 1.0213  | 75.64    | 1.0643  | 78.77     | 0.7986  |
| 218-249                         | 94.93   | 1.6382  | 90.56    | 1.3144  | 87.99     | 1.1745  |
| 249-280                         | 97.92   | 2.0380  | 94.14    | 1.5667  | 93.73     | 1.5325  |
| 280-311                         | 100.00  | -       | 96.63    | 1.8288  | 96.40     | 1.7988  |
| 311-342                         | -       | -       | 100.00   | -       | 100.00    | -       |
| 342-373                         | -       | -       | -        | -       | -         | -       |
| 373-404                         | -       | -       | -        | -       | -         | -       |

| Size range<br>( $\mu\text{m}$ ) | Rx 16   |         |          |         |           |         |
|---------------------------------|---------|---------|----------|---------|-----------|---------|
|                                 | batch I |         | batch II |         | batch III |         |
|                                 | CUM %   | Z       | CUM %    | Z       | CUM %     | Z       |
| 32-63                           | 0.16    | -2.9500 | 0.37     | -2.6800 | 0.04      | -2.9971 |
| 63-94                           | 7.06    | -1.4714 | 9.80     | -1.2929 | 5.76      | -1.5755 |
| 94-125                          | 32.74   | -0.4472 | 30.83    | -0.5006 | 29.29     | -0.5450 |
| 125-156                         | 63.33   | 0.3405  | 48.04    | -0.0492 | 59.03     | 0.2282  |
| 156-187                         | 79.65   | 0.8293  | 64.05    | 0.3597  | 77.53     | 0.7563  |
| 187-218                         | 90.64   | 1.3188  | 74.84    | 0.6694  | 88.80     | 1.2158  |
| 218-249                         | 100.00  | -       | 82.10    | 0.9227  | 93.98     | 1.5433  |
| 249-280                         | -       | -       | 87.53    | 1.1519  | 96.50     | 1.8114  |
| 280-311                         | -       | -       | 94.98    | 1.6430  | 100.00    | -       |
| 311-342                         | -       | -       | 100.00   | -       | -         | -       |
| 342-373                         | -       | -       | -        | -       | -         | -       |
| 373-404                         | -       | -       | -        | -       | -         | -       |

Rx = Preparation, CUM % = Cumulative% Frequency Undersize



**Table 23 : Geometric mean diameter ( $D_{50}$ ) of indomethacin microcapsule prepared from various preparations**

| Preparation | D50 (micron) |
|-------------|--------------|
| 1           | 187.15       |
| 2           | 151.11       |
| 3           | 170.46       |
| 4           | 151.14       |
| 5           | 166.47       |
| 6           | 163.2        |
| 7           | 170.69       |
| 8           | 155.78       |
| 11          | 194.75       |
| 13          | 174.35       |
| 14          | 146.93       |
| 15          | 204.24       |
| 16          | 128.26       |
| 17          | 143.8        |
| 18          | 184.95       |
| 19          | 212.23       |
| 21          | 199.77       |
| 22          | 126.17       |
| 24          | 149.21       |
| 25          | 174.76       |
| 28          | 185.5        |
| 29          | 160.4        |
| 30          | 150.3        |

**Table 24 : Percentage amount of indomethacin release from microcapsule prepared from various preparations**

| Preparation | Time (hr) | Cumulative % of drug release |       |       | Mean  | SD   |
|-------------|-----------|------------------------------|-------|-------|-------|------|
|             |           | A                            | B     | C     |       |      |
| 1           | 0.00      | 0.00                         | 0.00  | 0.00  | 0.00  | 0.00 |
|             | 0.25      | 2.06                         | 2.43  | 2.25  | 2.25  | 0.19 |
|             | 0.50      | 2.72                         | 3.00  | 2.54  | 2.75  | 0.23 |
|             | 0.75      | 3.76                         | 3.67  | 3.02  | 3.48  | 0.40 |
|             | 1.00      | 4.61                         | 4.80  | 4.33  | 4.58  | 0.24 |
|             | 2.00      | 8.26                         | 8.36  | 6.40  | 7.67  | 1.10 |
|             | 3.00      | 11.64                        | 11.37 | 10.05 | 11.02 | 0.85 |
|             | 5.00      | 17.46                        | 16.91 | 15.58 | 16.65 | 0.97 |
|             | 7.00      | 22.11                        | 21.36 | 22.07 | 21.85 | 0.42 |
|             | 9.00      | 26.12                        | 24.26 | 26.55 | 25.64 | 1.22 |
|             | 12.00     | 31.18                        | 28.48 | 32.08 | 30.58 | 1.87 |
| 2           | 0.00      | 0.00                         | 0.00  | 0.00  | 0.00  | 0.00 |
|             | 0.25      | 2.80                         | 3.08  | 3.45  | 3.11  | 0.33 |
|             | 0.50      | 3.47                         | 3.75  | 3.66  | 3.63  | 0.14 |
|             | 0.75      | 4.79                         | 4.88  | 5.16  | 4.94  | 0.19 |
|             | 1.00      | 6.11                         | 6.12  | 6.49  | 6.24  | 0.22 |
|             | 2.00      | 10.32                        | 10.88 | 11.54 | 10.91 | 0.61 |
|             | 3.00      | 15.30                        | 15.77 | 16.61 | 15.89 | 0.66 |
|             | 5.00      | 22.62                        | 23.37 | 24.96 | 23.65 | 1.19 |
|             | 7.00      | 29.61                        | 29.81 | 31.59 | 30.34 | 1.09 |
|             | 9.00      | 34.78                        | 33.31 | 36.13 | 34.74 | 1.41 |
|             | 12.00     | 38.13                        | 37.67 | 41.33 | 39.04 | 1.99 |
| 3           | 0.00      | 0.00                         | 0.00  | 0.00  | 0.00  | 0.00 |
|             | 0.25      | 3.36                         | 3.08  | 3.08  | 3.17  | 0.16 |
|             | 0.50      | 4.40                         | 4.31  | 4.03  | 4.25  | 0.19 |
|             | 0.75      | 6.09                         | 5.54  | 5.53  | 5.72  | 0.32 |
|             | 1.00      | 7.89                         | 6.96  | 7.05  | 7.30  | 0.51 |
|             | 2.00      | 12.94                        | 12.19 | 13.21 | 12.78 | 0.53 |
|             | 3.00      | 17.10                        | 17.18 | 17.83 | 17.37 | 0.40 |
|             | 5.00      | 22.20                        | 21.54 | 24.79 | 22.84 | 1.72 |
|             | 7.00      | 28.91                        | 29.45 | 33.10 | 30.49 | 2.28 |
|             | 9.00      | 31.30                        | 32.86 | 38.84 | 34.33 | 3.98 |
|             | 12.00     | 37.41                        | 38.61 | 45.46 | 40.49 | 4.34 |
| 6           | 0.00      | 0.00                         | 0.00  | 0.00  | 0.00  | 0.00 |
|             | 0.25      | 2.53                         | 2.71  | 2.80  | 2.68  | 0.14 |
|             | 0.50      | 3.56                         | 4.12  | 4.40  | 4.03  | 0.43 |
|             | 0.75      | 4.69                         | 5.72  | 6.00  | 5.47  | 0.69 |
|             | 1.00      | 6.11                         | 6.96  | 7.33  | 6.80  | 0.63 |
|             | 2.00      | 9.76                         | 10.80 | 11.82 | 10.79 | 1.03 |
|             | 3.00      | 13.81                        | 14.94 | 15.69 | 14.81 | 0.95 |
|             | 5.00      | 19.17                        | 19.75 | 21.25 | 20.06 | 1.07 |
|             | 7.00      | 24.10                        | 24.13 | 25.82 | 24.68 | 0.98 |
|             | 9.00      | 27.85                        | 27.51 | 29.86 | 28.41 | 1.27 |
|             | 12.00     | 32.18                        | 31.74 | 34.66 | 32.86 | 1.57 |

SD = Standard deviation

**Table 24 : Percentage amount of indomethacin release from microcapsule prepared from various preparations (continue)**

| Preparation | Time (hr) | Cumulative % of drug release |       |       | Mean  | SD   |
|-------------|-----------|------------------------------|-------|-------|-------|------|
|             |           | A                            | B     | C     |       |      |
| 7           | 0.00      | 0.00                         | 0.00  | 0.00  | 0.00  | 0.00 |
|             | 0.25      | 3.92                         | 4.47  | 3.73  | 4.04  | 0.38 |
|             | 0.50      | 5.05                         | 5.15  | 4.68  | 4.96  | 0.25 |
|             | 0.75      | 6.47                         | 6.85  | 6.19  | 6.50  | 0.33 |
|             | 1.00      | 7.53                         | 8.18  | 7.34  | 7.68  | 0.44 |
|             | 2.00      | 11.75                        | 12.87 | 11.83 | 12.15 | 0.62 |
|             | 3.00      | 15.61                        | 17.39 | 16.26 | 16.42 | 0.90 |
|             | 5.00      | 20.62                        | 23.24 | 21.64 | 21.83 | 1.32 |
|             | 7.00      | 25.28                        | 28.93 | 28.25 | 27.49 | 1.94 |
|             | 9.00      | 28.20                        | 32.62 | 32.95 | 31.26 | 2.65 |
|             | 12.00     | 32.34                        | 37.62 | 39.53 | 36.50 | 3.72 |
| 8           | 0.00      | 0.00                         | 0.00  | 0.00  | 0.00  | 0.00 |
|             | 0.25      | 4.47                         | 4.94  | 4.47  | 4.63  | 0.27 |
|             | 0.50      | 6.45                         | 6.54  | 6.73  | 6.57  | 0.14 |
|             | 0.75      | 8.90                         | 8.34  | 8.80  | 8.68  | 0.30 |
|             | 1.00      | 11.36                        | 10.06 | 10.89 | 10.77 | 0.66 |
|             | 2.00      | 18.01                        | 15.40 | 16.52 | 16.64 | 1.31 |
|             | 3.00      | 23.49                        | 19.85 | 21.34 | 21.56 | 1.83 |
|             | 5.00      | 30.48                        | 26.36 | 28.88 | 28.57 | 2.08 |
|             | 7.00      | 36.31                        | 31.23 | 34.52 | 34.02 | 2.58 |
|             | 9.00      | 41.05                        | 35.12 | 40.46 | 38.88 | 3.27 |
|             | 12.00     | 43.97                        | 39.67 | 42.53 | 42.06 | 2.19 |
| 17          | 0.00      | 0.00                         | 0.00  | 0.00  | 0.00  | 0.00 |
|             | 0.25      | 13.38                        | 12.64 | 13.29 | 13.10 | 0.40 |
|             | 0.50      | 15.31                        | 15.21 | 16.52 | 15.68 | 0.73 |
|             | 0.75      | 16.51                        | 16.88 | 18.74 | 17.38 | 1.20 |
|             | 1.00      | 18.83                        | 18.36 | 20.24 | 19.14 | 0.98 |
|             | 2.00      | 23.01                        | 22.36 | 25.08 | 23.48 | 1.42 |
|             | 3.00      | 27.22                        | 25.36 | 28.74 | 27.11 | 1.69 |
|             | 5.00      | 33.31                        | 30.32 | 34.84 | 32.82 | 2.30 |
|             | 7.00      | 38.22                        | 34.66 | 37.63 | 36.84 | 1.91 |
|             | 9.00      | 42.60                        | 38.93 | 41.26 | 40.93 | 1.86 |
|             | 12.00     | 48.22                        | 43.50 | 44.46 | 45.39 | 2.49 |
| 25          | 0.00      | 0.00                         | 0.00  | 0.00  | 0.00  | 0.00 |
|             | 0.25      | 19.23                        | 15.14 | 15.70 | 16.69 | 2.22 |
|             | 0.50      | 24.16                        | 19.50 | 19.31 | 20.99 | 2.75 |
|             | 0.75      | 26.80                        | 21.92 | 21.55 | 23.42 | 2.93 |
|             | 1.00      | 28.43                        | 23.71 | 23.34 | 25.16 | 2.84 |
|             | 2.00      | 32.95                        | 28.76 | 27.65 | 29.79 | 2.80 |
|             | 3.00      | 36.09                        | 32.35 | 31.32 | 33.25 | 2.51 |
|             | 5.00      | 41.12                        | 37.45 | 37.34 | 38.64 | 2.15 |
|             | 7.00      | 45.51                        | 41.45 | 43.30 | 43.42 | 2.03 |
|             | 9.00      | 50.12                        | 46.04 | 48.91 | 48.36 | 2.10 |
|             | 12.00     | 54.38                        | 49.26 | 55.86 | 53.17 | 3.46 |

SD = Standard deviation

**Table 24 : Percentage amount of indomethacin release from microcapsule prepared from various preparations (continue)**

| Preparation | Time (hr) | Cumulative % of drug release |       |       | Mean  | SD   |
|-------------|-----------|------------------------------|-------|-------|-------|------|
|             |           | A                            | B     | C     |       |      |
| 4 batch I   | 0.00      | 0.00                         | 0.00  | 0.00  | 0.00  | 0.00 |
|             | 0.25      | 10.23                        | 10.32 | 10.97 | 10.51 | 0.40 |
|             | 0.50      | 15.94                        | 15.02 | 15.02 | 15.33 | 0.53 |
|             | 0.75      | 22.16                        | 20.20 | 20.30 | 20.89 | 1.10 |
|             | 1.00      | 27.75                        | 24.21 | 24.68 | 25.55 | 1.92 |
|             | 2.00      | 42.56                        | 36.78 | 36.60 | 38.65 | 3.39 |
|             | 3.00      | 52.63                        | 47.28 | 47.19 | 49.03 | 3.12 |
|             | 5.00      | 65.45                        | 60.81 | 60.35 | 62.20 | 2.82 |
|             | 7.00      | 72.39                        | 67.63 | 69.31 | 69.78 | 2.41 |
|             | 9.00      | 75.96                        | 72.48 | 74.71 | 74.38 | 1.76 |
|             | 12.00     | 85.28                        | 79.92 | 83.66 | 82.95 | 2.75 |
|             | 15.00     | 90.20                        | 85.55 | 88.75 | 88.17 | 2.38 |
|             | 18.00     | 94.77                        | 90.84 | 93.31 | 92.97 | 1.99 |
|             | 24.00     | 99.36                        | 95.97 | 96.78 | 97.37 | 1.77 |
| 4 batch II  | 0.00      | 0.00                         | 0.00  | 0.00  | 0.00  | 0.00 |
|             | 0.25      | 9.86                         | 8.93  | 11.43 | 10.07 | 1.26 |
|             | 0.50      | 14.55                        | 12.50 | 14.84 | 13.96 | 1.28 |
|             | 0.75      | 18.06                        | 16.10 | 18.63 | 17.60 | 1.33 |
|             | 1.00      | 21.04                        | 19.62 | 21.98 | 20.88 | 1.19 |
|             | 2.00      | 35.07                        | 31.23 | 33.23 | 33.18 | 1.92 |
|             | 3.00      | 42.87                        | 39.11 | 40.56 | 40.85 | 1.90 |
|             | 5.00      | 53.59                        | 49.34 | 50.25 | 51.06 | 2.24 |
|             | 7.00      | 60.84                        | 57.87 | 58.97 | 59.23 | 1.50 |
|             | 9.00      | 66.56                        | 64.59 | 65.60 | 65.58 | 0.99 |
|             | 12.00     | 73.23                        | 72.08 | 73.56 | 72.96 | 0.78 |
|             | 15.00     | 79.03                        | 79.82 | 79.73 | 79.53 | 0.43 |
|             | 18.00     | 84.65                        | 86.57 | 84.43 | 85.22 | 1.18 |
|             | 24.00     | 97.17                        | 97.80 | 95.84 | 96.94 | 1.00 |
| 4 batch III | 0.00      | 0.00                         | 0.00  | 0.00  | 0.00  | 0.00 |
|             | 0.25      | 17.37                        | 18.02 | 16.35 | 17.25 | 0.84 |
|             | 0.50      | 20.81                        | 21.09 | 19.97 | 20.62 | 0.58 |
|             | 0.75      | 23.61                        | 24.36 | 22.50 | 23.49 | 0.94 |
|             | 1.00      | 26.99                        | 27.46 | 26.23 | 26.89 | 0.62 |
|             | 2.00      | 40.31                        | 40.79 | 38.62 | 39.91 | 1.14 |
|             | 3.00      | 50.37                        | 51.50 | 48.67 | 50.18 | 1.42 |
|             | 5.00      | 62.99                        | 63.38 | 60.44 | 62.27 | 1.60 |
|             | 7.00      | 69.18                        | 69.57 | 66.90 | 68.55 | 1.44 |
|             | 9.00      | 73.45                        | 73.75 | 71.53 | 72.91 | 1.20 |
|             | 12.00     | 78.42                        | 78.63 | 76.67 | 77.91 | 1.08 |
|             | 15.00     | 83.29                        | 82.58 | 80.24 | 82.04 | 1.60 |
|             | 18.00     | 88.57                        | 88.22 | 85.31 | 87.37 | 1.79 |
|             | 24.00     | 100.90                       | 99.45 | 93.19 | 97.85 | 4.10 |

SD = Standard deviation

**Table 24 : Percentage amount of indomethacin release from microcapsule prepared from various preparations (continue)**

| Preparation | Time (hr) | Cumulative % of drug release |       |       | Mean  | SD   |
|-------------|-----------|------------------------------|-------|-------|-------|------|
|             |           | A                            | B     | C     |       |      |
| 5           | 0.00      | 0.00                         | 0.00  | 0.00  | 0.00  | 0.00 |
|             | 0.25      | 9.67                         | 11.06 | 11.06 | 10.60 | 0.80 |
|             | 0.50      | 10.93                        | 11.40 | 11.87 | 11.40 | 0.47 |
|             | 0.75      | 14.79                        | 14.80 | 16.48 | 15.36 | 0.97 |
|             | 1.00      | 18.68                        | 18.60 | 20.74 | 19.34 | 1.21 |
|             | 2.00      | 30.10                        | 29.28 | 31.53 | 30.30 | 1.14 |
|             | 3.00      | 37.97                        | 37.23 | 40.79 | 38.66 | 1.88 |
|             | 5.00      | 48.11                        | 46.25 | 50.30 | 48.22 | 2.03 |
|             | 7.00      | 58.20                        | 57.27 | 61.61 | 59.03 | 2.29 |
|             | 9.00      | 63.72                        | 61.66 | 66.59 | 63.99 | 2.48 |
|             | 12.00     | 68.89                        | 66.27 | 72.80 | 69.32 | 3.29 |
|             | 15.00     | 73.64                        | 69.15 | 76.37 | 73.05 | 3.65 |
|             | 18.00     | 79.42                        | 75.46 | 81.79 | 78.89 | 3.20 |
| 24.00       | 86.90     | 81.99                        | 86.68 | 85.19 | 2.77  |      |
| 11          | 0.00      | 0.00                         | 0.00  | 0.00  | 0.00  | 0.00 |
|             | 0.25      | 6.61                         | 7.07  | 6.70  | 6.79  | 0.24 |
|             | 0.50      | 11.47                        | 10.92 | 11.01 | 11.13 | 0.30 |
|             | 0.75      | 16.17                        | 15.61 | 15.06 | 15.61 | 0.56 |
|             | 1.00      | 20.53                        | 19.97 | 19.04 | 19.85 | 0.75 |
|             | 2.00      | 33.08                        | 31.77 | 30.74 | 31.86 | 1.17 |
|             | 3.00      | 42.44                        | 41.32 | 40.09 | 41.28 | 1.18 |
|             | 5.00      | 54.46                        | 53.23 | 53.12 | 53.60 | 0.74 |
|             | 7.00      | 61.72                        | 60.11 | 60.37 | 60.73 | 0.86 |
|             | 9.00      | 67.16                        | 65.54 | 66.27 | 66.32 | 0.81 |
|             | 12.00     | 72.63                        | 70.73 | 71.82 | 71.73 | 0.95 |
|             | 15.00     | 76.20                        | 72.99 | 74.46 | 74.55 | 1.61 |
|             | 18.00     | 81.80                        | 78.95 | 80.06 | 80.27 | 1.44 |
| 24.00       | 89.11     | 87.54                        | 89.77 | 88.81 | 1.15  |      |
| 13          | 0.00      | 0.00                         | 0.00  | 0.00  | 0.00  | 0.00 |
|             | 0.25      | 9.48                         | 9.39  | 10.50 | 9.79  | 0.62 |
|             | 0.50      | 11.58                        | 12.78 | 12.33 | 12.23 | 0.61 |
|             | 0.75      | 13.31                        | 14.99 | 14.06 | 14.12 | 0.84 |
|             | 1.00      | 14.59                        | 16.65 | 15.81 | 15.68 | 1.04 |
|             | 2.00      | 18.66                        | 21.38 | 19.80 | 19.95 | 1.37 |
|             | 3.00      | 21.45                        | 25.86 | 23.34 | 23.55 | 2.21 |
|             | 5.00      | 27.14                        | 31.75 | 33.67 | 30.85 | 3.36 |
|             | 7.00      | 33.04                        | 36.75 | 38.40 | 36.06 | 2.75 |
|             | 9.00      | 40.64                        | 41.59 | 41.30 | 41.18 | 0.49 |
|             | 12.00     | 54.22                        | 47.57 | 46.35 | 49.38 | 4.24 |
|             | 15.00     | 65.28                        | 52.83 | 52.73 | 56.95 | 7.22 |
|             | 18.00     | 72.69                        | 56.28 | 59.88 | 62.95 | 8.63 |
| 24.00       | 87.30     | 64.39                        | 71.63 | 74.44 | 11.71 |      |

SD = Standard deviation

**Table 24 : Percentage amount of indomethacin release from microcapsule prepared from various preparations (continue)**

| Preparation | Time (hr) | Cumulative % of drug release |       |       | Mean  | SD    |
|-------------|-----------|------------------------------|-------|-------|-------|-------|
|             |           | A                            | B     | C     |       |       |
| 14          | 0.00      | 0.00                         | 0.00  | 0.00  | 0.00  | 0.00  |
|             | 0.25      | 12.45                        | 12.27 | 14.40 | 13.04 | 1.18  |
|             | 0.50      | 12.99                        | 13.36 | 15.50 | 13.95 | 1.36  |
|             | 0.75      | 14.64                        | 14.73 | 17.63 | 15.67 | 1.70  |
|             | 1.00      | 16.39                        | 16.11 | 19.95 | 17.48 | 2.14  |
|             | 2.00      | 22.51                        | 20.47 | 25.17 | 22.72 | 2.36  |
|             | 3.00      | 27.55                        | 24.10 | 29.11 | 26.92 | 2.56  |
|             | 5.00      | 34.56                        | 29.80 | 34.28 | 32.88 | 2.67  |
|             | 7.00      | 39.58                        | 33.77 | 37.99 | 37.11 | 3.00  |
|             | 9.00      | 43.69                        | 37.20 | 41.81 | 40.90 | 3.34  |
|             | 12.00     | 55.71                        | 46.12 | 48.91 | 50.25 | 4.93  |
|             | 15.00     | 61.77                        | 51.29 | 54.65 | 55.90 | 5.35  |
|             | 18.00     | 74.35                        | 56.49 | 59.58 | 63.47 | 9.55  |
|             | 24.00     | 88.60                        | 71.56 | 69.38 | 76.51 | 10.52 |
| 15          | 0.00      | 0.00                         | 0.00  | 0.00  | 0.00  | 0.00  |
|             | 0.25      | 8.46                         | 10.13 | 8.74  | 9.11  | 0.89  |
|             | 0.50      | 10.27                        | 11.30 | 11.11 | 10.89 | 0.55  |
|             | 0.75      | 12.84                        | 13.59 | 13.31 | 13.25 | 0.38  |
|             | 1.00      | 15.32                        | 16.27 | 15.23 | 15.61 | 0.58  |
|             | 2.00      | 24.59                        | 24.61 | 21.72 | 23.64 | 1.66  |
|             | 3.00      | 32.52                        | 33.01 | 28.06 | 31.20 | 2.73  |
|             | 5.00      | 49.30                        | 52.21 | 39.53 | 47.01 | 6.64  |
|             | 7.00      | 60.43                        | 60.47 | 51.81 | 57.57 | 4.99  |
|             | 9.00      | 67.63                        | 67.67 | 63.04 | 66.11 | 2.66  |
|             | 12.00     | 76.37                        | 74.93 | 73.61 | 74.97 | 1.38  |
|             | 15.00     | 82.16                        | 80.71 | 81.43 | 81.43 | 0.73  |
|             | 18.00     | 85.95                        | 83.94 | 86.89 | 85.59 | 1.51  |
|             | 24.00     | 91.43                        | 90.33 | 92.37 | 91.38 | 1.02  |
| 16 batch I  | 0.00      | 0.00                         | 0.00  | 0.00  | 0.00  | 0.00  |
|             | 0.25      | 10.97                        | 12.08 | 12.45 | 11.83 | 0.77  |
|             | 0.50      | 13.26                        | 13.63 | 13.08 | 13.32 | 0.28  |
|             | 0.75      | 16.21                        | 16.68 | 15.38 | 16.09 | 0.66  |
|             | 1.00      | 19.26                        | 19.83 | 18.99 | 19.36 | 0.43  |
|             | 2.00      | 29.30                        | 29.96 | 28.37 | 29.21 | 0.80  |
|             | 3.00      | 36.79                        | 37.92 | 36.51 | 37.07 | 0.75  |
|             | 5.00      | 45.34                        | 48.24 | 47.19 | 46.92 | 1.47  |
|             | 7.00      | 55.42                        | 58.53 | 58.49 | 57.48 | 1.78  |
|             | 9.00      | 60.27                        | 63.58 | 64.01 | 62.62 | 2.05  |
|             | 12.00     | 67.84                        | 69.12 | 70.01 | 68.99 | 1.09  |
|             | 15.00     | 72.94                        | 72.83 | 74.85 | 73.54 | 1.14  |
|             | 18.00     | 77.90                        | 76.31 | 79.82 | 78.01 | 1.76  |
|             | 24.00     | 87.04                        | 84.33 | 88.23 | 86.53 | 2.00  |

SD = Standard deviation

**Table 24 : Percentage amount of indomethacin release from microcapsule prepared from various preparations (continue)**

| Preparation  | Time (hr) | Cumulative % of drug release |       |       | Mean  | SD   |
|--------------|-----------|------------------------------|-------|-------|-------|------|
|              |           | A                            | B     | C     |       |      |
| 16 batch II  | 0.00      | 0.00                         | 0.00  | 0.00  | 0.00  | 0.00 |
|              | 0.25      | 11.06                        | 9.86  | 9.11  | 10.01 | 0.98 |
|              | 0.50      | 11.49                        | 10.93 | 10.00 | 10.81 | 0.75 |
|              | 0.75      | 14.06                        | 13.03 | 12.28 | 13.12 | 0.89 |
|              | 1.00      | 16.55                        | 15.24 | 14.58 | 15.46 | 1.00 |
|              | 2.00      | 25.83                        | 24.23 | 22.45 | 24.17 | 1.69 |
|              | 3.00      | 31.54                        | 28.63 | 27.58 | 29.25 | 2.05 |
|              | 5.00      | 40.80                        | 36.67 | 35.81 | 37.76 | 2.67 |
|              | 7.00      | 48.08                        | 43.46 | 42.68 | 44.74 | 2.92 |
|              | 9.00      | 54.74                        | 48.99 | 48.11 | 50.61 | 3.60 |
|              | 12.00     | 62.09                        | 55.01 | 54.78 | 57.29 | 4.16 |
|              | 15.00     | 68.65                        | 60.50 | 60.73 | 63.29 | 4.64 |
|              | 18.00     | 73.66                        | 67.88 | 67.28 | 69.61 | 3.52 |
| 24.00        | 81.03     | 76.15                        | 76.66 | 77.95 | 2.68  |      |
| 16 batch III | 0.00      | 0.00                         | 0.00  | 0.00  | 0.00  | 0.00 |
|              | 0.25      | 11.99                        | 11.25 | 9.67  | 10.97 | 1.19 |
|              | 0.50      | 14.28                        | 13.63 | 12.79 | 13.57 | 0.75 |
|              | 0.75      | 16.96                        | 16.49 | 15.36 | 16.27 | 0.82 |
|              | 1.00      | 19.47                        | 19.18 | 18.42 | 19.02 | 0.54 |
|              | 2.00      | 28.39                        | 28.93 | 27.52 | 28.28 | 0.71 |
|              | 3.00      | 35.69                        | 36.79 | 33.98 | 35.49 | 1.42 |
|              | 5.00      | 44.14                        | 47.11 | 43.16 | 44.80 | 2.06 |
|              | 7.00      | 50.13                        | 54.04 | 50.82 | 51.66 | 2.09 |
|              | 9.00      | 54.68                        | 60.19 | 56.11 | 56.99 | 2.86 |
|              | 12.00     | 60.82                        | 67.66 | 62.45 | 63.64 | 3.57 |
|              | 15.00     | 66.62                        | 74.52 | 67.70 | 69.61 | 4.28 |
|              | 18.00     | 71.08                        | 79.58 | 71.61 | 74.09 | 4.76 |
| 24.00        | 79.82     | 89.29                        | 81.65 | 83.59 | 5.02  |      |
| 18           | 0.00      | 0.00                         | 0.00  | 0.00  | 0.00  | 0.00 |
|              | 0.25      | 17.83                        | 16.16 | 16.72 | 16.90 | 0.85 |
|              | 0.50      | 21.65                        | 18.85 | 19.13 | 19.88 | 1.54 |
|              | 0.75      | 24.08                        | 21.55 | 21.65 | 22.43 | 1.43 |
|              | 1.00      | 26.35                        | 23.99 | 24.00 | 24.78 | 1.36 |
|              | 2.00      | 33.55                        | 30.16 | 31.00 | 31.57 | 1.77 |
|              | 3.00      | 39.11                        | 35.98 | 38.31 | 37.80 | 1.63 |
|              | 5.00      | 47.03                        | 44.53 | 45.57 | 45.71 | 1.26 |
|              | 7.00      | 54.06                        | 52.75 | 53.33 | 53.38 | 0.66 |
|              | 9.00      | 58.99                        | 59.35 | 59.56 | 59.30 | 0.29 |
|              | 12.00     | 69.14                        | 71.08 | 70.28 | 70.17 | 0.97 |
|              | 15.00     | 73.44                        | 77.24 | 74.48 | 75.05 | 1.96 |
|              | 18.00     | 79.03                        | 81.93 | 80.08 | 80.35 | 1.47 |
| 24.00        | 86.69     | 88.68                        | 86.08 | 87.15 | 1.36  |      |

SD = Standard deviation

**Table 24 : Percentage amount of indomethacin release from microcapsule prepared from various preparations (continue)**

| Preparation | Time (hr) | Cumulative % of drug release |       |       | Mean  | SD   |
|-------------|-----------|------------------------------|-------|-------|-------|------|
|             |           | A                            | B     | C     |       |      |
| 19          | 0.00      | 0.00                         | 0.00  | 0.00  | 0.00  | 0.00 |
|             | 0.25      | 12.92                        | 10.97 | 11.90 | 11.93 | 0.98 |
|             | 0.50      | 15.40                        | 13.07 | 14.00 | 14.16 | 1.17 |
|             | 0.75      | 17.71                        | 15.18 | 16.31 | 16.40 | 1.27 |
|             | 1.00      | 20.22                        | 17.03 | 18.25 | 18.50 | 1.61 |
|             | 2.00      | 27.20                        | 23.16 | 23.92 | 24.76 | 2.15 |
|             | 3.00      | 32.82                        | 28.57 | 28.88 | 30.09 | 2.37 |
|             | 5.00      | 44.97                        | 41.90 | 40.26 | 42.38 | 2.39 |
|             | 7.00      | 53.10                        | 50.85 | 58.92 | 54.29 | 4.16 |
|             | 9.00      | 60.26                        | 58.18 | 57.36 | 58.60 | 1.49 |
|             | 12.00     | 68.20                        | 66.94 | 65.93 | 67.02 | 1.14 |
|             | 15.00     | 74.15                        | 73.45 | 70.48 | 72.69 | 1.95 |
|             | 18.00     | 79.57                        | 78.30 | 76.80 | 78.22 | 1.39 |
|             | 24.00     | 86.68                        | 85.78 | 84.45 | 85.64 | 1.12 |
| 21          | 0.00      | 0.00                         | 0.00  | 0.00  | 0.00  | 0.00 |
|             | 0.25      | 14.96                        | 14.22 | 12.55 | 13.91 | 1.23 |
|             | 0.50      | 20.42                        | 18.19 | 15.40 | 18.00 | 2.52 |
|             | 0.75      | 21.09                        | 20.06 | 17.34 | 19.50 | 1.94 |
|             | 1.00      | 22.42                        | 21.56 | 18.27 | 20.75 | 2.19 |
|             | 2.00      | 25.69                        | 25.02 | 21.90 | 24.20 | 2.02 |
|             | 3.00      | 28.43                        | 27.47 | 24.24 | 26.71 | 2.20 |
|             | 5.00      | 32.76                        | 31.61 | 28.18 | 30.85 | 2.38 |
|             | 7.00      | 36.19                        | 35.03 | 32.14 | 34.45 | 2.09 |
|             | 9.00      | 40.46                        | 39.21 | 36.49 | 38.72 | 2.03 |
|             | 12.00     | 50.98                        | 48.42 | 48.84 | 49.41 | 1.37 |
|             | 15.00     | 60.07                        | 57.03 | 58.94 | 58.68 | 1.54 |
|             | 18.00     | 66.52                        | 63.56 | 65.57 | 65.22 | 1.51 |
|             | 24.00     | 75.07                        | 73.29 | 74.85 | 74.40 | 0.97 |
| 22          | 0.00      | 0.00                         | 0.00  | 0.00  | 0.00  | 0.00 |
|             | 0.25      | 29.43                        | 29.99 | 29.71 | 29.71 | 0.28 |
|             | 0.50      | 31.08                        | 32.94 | 31.08 | 31.70 | 1.07 |
|             | 0.75      | 34.04                        | 36.83 | 34.50 | 35.12 | 1.50 |
|             | 1.00      | 36.36                        | 39.08 | 36.27 | 37.24 | 1.60 |
|             | 2.00      | 44.44                        | 47.36 | 44.82 | 45.54 | 1.59 |
|             | 3.00      | 48.77                        | 51.43 | 48.87 | 49.69 | 1.51 |
|             | 5.00      | 56.74                        | 58.02 | 56.74 | 57.17 | 0.74 |
|             | 7.00      | 60.57                        | 62.04 | 61.41 | 61.34 | 0.74 |
|             | 9.00      | 64.33                        | 64.98 | 64.16 | 64.49 | 0.43 |
|             | 12.00     | 69.04                        | 69.87 | 69.42 | 69.44 | 0.42 |
|             | 15.00     | 74.07                        | 76.39 | 74.45 | 74.97 | 1.24 |
|             | 18.00     | 78.18                        | 80.70 | 78.75 | 79.21 | 1.32 |
|             | 24.00     | 88.24                        | 88.55 | 91.23 | 89.34 | 1.64 |

SD = Standard deviation



**Table 24 : Percentage amount of indomethacin release from microcapsule prepared from various preparations (continue)**

| Preparation | Time (hr) | Cumulative % of drug release |       |       | Mean  | SD   |
|-------------|-----------|------------------------------|-------|-------|-------|------|
|             |           | A                            | B     | C     |       |      |
| 24          | 0.00      | 0.00                         | 0.00  | 0.00  | 0.00  | 0.00 |
|             | 0.25      | 27.30                        | 23.12 | 23.03 | 24.48 | 2.44 |
|             | 0.50      | 33.57                        | 28.26 | 28.54 | 30.12 | 2.99 |
|             | 0.75      | 37.01                        | 33.60 | 32.04 | 34.22 | 2.54 |
|             | 1.00      | 39.53                        | 39.72 | 34.44 | 37.90 | 3.00 |
|             | 2.00      | 45.78                        | 43.00 | 40.01 | 42.93 | 2.89 |
|             | 3.00      | 49.46                        | 39.08 | 43.85 | 44.13 | 5.20 |
|             | 5.00      | 54.74                        | 56.59 | 50.21 | 53.85 | 3.28 |
|             | 7.00      | 63.20                        | 62.28 | 58.19 | 61.22 | 2.67 |
|             | 9.00      | 69.20                        | 70.50 | 62.58 | 67.43 | 4.25 |
|             | 12.00     | 75.89                        | 75.17 | 69.23 | 73.43 | 3.66 |
|             | 15.00     | 80.86                        | 80.00 | 74.45 | 78.44 | 3.48 |
|             | 18.00     | 83.52                        | 87.51 | 81.16 | 84.06 | 3.21 |
|             | 24.00     | 92.69                        | 87.54 | 89.57 | 89.93 | 2.59 |
| 28          | 0.00      | 0.00                         | 0.00  | 0.00  | 0.00  | 0.00 |
|             | 0.25      | 19.60                        | 19.32 | 19.04 | 19.32 | 0.28 |
|             | 0.50      | 19.80                        | 20.82 | 20.35 | 20.32 | 0.51 |
|             | 0.75      | 22.69                        | 23.53 | 23.43 | 23.22 | 0.46 |
|             | 1.00      | 25.42                        | 26.72 | 26.07 | 26.07 | 0.65 |
|             | 2.00      | 34.55                        | 36.70 | 34.19 | 35.15 | 1.36 |
|             | 3.00      | 40.87                        | 43.96 | 39.11 | 41.31 | 2.46 |
|             | 5.00      | 48.61                        | 53.75 | 46.10 | 49.49 | 3.90 |
|             | 7.00      | 54.07                        | 60.17 | 51.36 | 55.20 | 4.51 |
|             | 9.00      | 56.96                        | 64.12 | 57.20 | 59.43 | 4.07 |
|             | 12.00     | 65.99                        | 69.57 | 65.68 | 67.08 | 2.16 |
|             | 15.00     | 68.41                        | 78.59 | 70.42 | 72.47 | 5.39 |
|             | 18.00     | 72.86                        | 84.03 | 77.29 | 78.06 | 5.62 |
|             | 24.00     | 82.34                        | 91.90 | 87.91 | 87.38 | 4.80 |
| 29          | 0.00      | 0.00                         | 0.00  | 0.00  | 0.00  | 0.00 |
|             | 0.25      | 12.64                        | 10.60 | 10.50 | 11.25 | 1.21 |
|             | 0.50      | 15.12                        | 14.09 | 13.53 | 14.25 | 0.81 |
|             | 0.75      | 18.36                        | 17.23 | 16.11 | 17.23 | 1.13 |
|             | 1.00      | 19.95                        | 19.92 | 18.52 | 19.46 | 0.82 |
|             | 2.00      | 27.66                        | 26.90 | 25.49 | 26.68 | 1.10 |
|             | 3.00      | 32.83                        | 31.68 | 30.45 | 31.65 | 1.19 |
|             | 5.00      | 40.71                        | 39.93 | 39.06 | 39.90 | 0.83 |
|             | 7.00      | 47.05                        | 46.74 | 46.14 | 46.64 | 0.46 |
|             | 9.00      | 52.60                        | 54.23 | 52.61 | 53.15 | 0.94 |
|             | 12.00     | 60.12                        | 65.84 | 60.60 | 62.19 | 3.17 |
|             | 15.00     | 71.79                        | 75.31 | 70.78 | 72.63 | 2.38 |
|             | 18.00     | 80.15                        | 82.77 | 78.96 | 80.63 | 1.95 |
|             | 24.00     | 94.69                        | 95.28 | 92.56 | 94.18 | 1.43 |

SD = Standard deviation

**Table 24 : Percentage amount of indomethacin release from microcapsule prepared from various preparations (continue)**

| Preparation | Time (hr) | Cumulative % of drug release |       |       | Mean  | SD   |
|-------------|-----------|------------------------------|-------|-------|-------|------|
|             |           | A                            | B     | C     |       |      |
| 30          | 0.00      | 0.00                         | 0.00  | 0.00  | 0.00  | 0.00 |
|             | 0.25      | 13.10                        | 11.90 | 11.62 | 12.21 | 0.79 |
|             | 0.50      | 13.83                        | 13.45 | 12.98 | 13.42 | 0.43 |
|             | 0.75      | 16.13                        | 15.10 | 15.19 | 15.47 | 0.57 |
|             | 1.00      | 18.44                        | 17.41 | 18.05 | 17.97 | 0.52 |
|             | 2.00      | 27.45                        | 25.76 | 26.88 | 26.70 | 0.86 |
|             | 3.00      | 33.36                        | 32.21 | 34.26 | 33.28 | 1.03 |
|             | 5.00      | 42.72                        | 42.50 | 45.77 | 43.66 | 1.83 |
|             | 7.00      | 48.80                        | 49.60 | 54.74 | 51.05 | 3.22 |
|             | 9.00      | 52.78                        | 55.35 | 57.64 | 55.26 | 2.43 |
|             | 12.00     | 67.08                        | 72.07 | 73.07 | 70.74 | 3.21 |
|             | 15.00     | 71.64                        | 78.14 | 78.22 | 76.00 | 3.78 |
|             | 18.00     | 77.96                        | 84.88 | 85.14 | 82.66 | 4.07 |
| 24.00       | 87.11     | 93.31                        | 92.47 | 90.96 | 3.36  |      |

SD = Standard deviation

**Table 25 : Percentage drug release of preparations which are conforming drug release of the USP specification**

| Time<br>(hr.) | Rx 4 batch I |      | Rx 4*batch II |      | Rx 4 batch III |      | Rx 5  |      |
|---------------|--------------|------|---------------|------|----------------|------|-------|------|
|               | Mean         | SD.  | Mean          | SD.  | Mean           | SD.  | Mean  | SD.  |
| 0.00          | 0.00         | 0.00 | 0.00          | 0.00 | 0.00           | 0.00 | 0.00  | 0.00 |
| 0.25          | 10.50        | 0.40 | 10.07         | 1.26 | 17.25          | 0.84 | 10.60 | 0.80 |
| 0.50          | 15.33        | 0.53 | 13.96         | 1.28 | 20.62          | 0.58 | 11.40 | 0.47 |
| 0.75          | 20.89        | 1.10 | 17.60         | 1.33 | 23.49          | 0.94 | 15.36 | 0.97 |
| 1.00          | 25.55        | 1.92 | 20.88         | 1.19 | 26.90          | 0.62 | 19.34 | 1.21 |
| 2.00          | 38.65        | 3.39 | 33.18         | 1.92 | 39.91          | 1.14 | 30.30 | 1.14 |
| 3.00          | 49.03        | 3.12 | 40.85         | 1.90 | 50.18          | 1.42 | 38.66 | 1.88 |
| 5.00          | 62.20        | 2.82 | 51.06         | 2.24 | 62.27          | 1.60 | 48.22 | 2.03 |
| 7.00          | 69.78        | 2.41 | 59.23         | 1.50 | 68.55          | 1.44 | 59.03 | 2.29 |
| 9.00          | 74.39        | 1.76 | 65.58         | 0.99 | 72.91          | 1.20 | 63.99 | 2.48 |
| 12.00         | 82.95        | 2.75 | 72.96         | 0.78 | 77.90          | 1.08 | 69.32 | 3.29 |
| 15.00         | 88.17        | 2.38 | 79.53         | 0.43 | 82.04          | 1.60 | 73.05 | 3.65 |
| 18.00         | 92.97        | 1.99 | 85.22         | 1.18 | 87.37          | 1.79 | 78.89 | 3.20 |
| 24.00         | 97.37        | 1.77 | 96.93         | 1.00 | 97.85          | 4.10 | 85.19 | 2.77 |

| Time<br>(hr.) | Rx 11 |      | Rx 15 |      | Rx 16 batch I |      | Rx 16 batch II |      |
|---------------|-------|------|-------|------|---------------|------|----------------|------|
|               | Mean  | SD.  | Mean  | SD.  | Mean          | SD.  | Mean           | SD.  |
| 0.00          | 0.00  | 0.00 | 0.00  | 0.00 | 0.00          | 0.00 | 0.00           | 0.00 |
| 0.25          | 6.79  | 0.24 | 9.11  | 0.89 | 11.83         | 0.77 | 10.01          | 0.98 |
| 0.50          | 11.13 | 0.30 | 10.90 | 0.55 | 13.32         | 0.28 | 10.81          | 0.75 |
| 0.75          | 15.69 | 0.56 | 13.24 | 0.38 | 16.09         | 0.66 | 13.13          | 0.89 |
| 1.00          | 19.85 | 0.75 | 15.61 | 0.58 | 19.36         | 0.43 | 15.46          | 1.00 |
| 2.00          | 31.86 | 1.17 | 23.64 | 1.66 | 29.21         | 0.80 | 24.17          | 1.69 |
| 3.00          | 41.28 | 1.18 | 31.19 | 2.73 | 37.07         | 0.75 | 29.25          | 2.05 |
| 5.00          | 53.60 | 0.74 | 47.01 | 6.64 | 46.92         | 1.47 | 37.76          | 2.67 |
| 7.00          | 60.73 | 0.86 | 57.57 | 4.99 | 57.48         | 1.78 | 44.74          | 2.92 |
| 9.00          | 66.32 | 0.81 | 66.11 | 2.66 | 62.62         | 2.05 | 50.61          | 3.60 |
| 12.00         | 71.72 | 0.95 | 74.97 | 1.38 | 68.99         | 1.09 | 57.29          | 4.16 |
| 15.00         | 74.55 | 1.61 | 81.44 | 0.73 | 73.54         | 1.14 | 63.29          | 4.64 |
| 18.00         | 80.27 | 1.44 | 85.89 | 1.51 | 78.01         | 1.76 | 69.61          | 3.52 |
| 24.00         | 88.80 | 1.15 | 91.37 | 1.02 | 86.53         | 2.00 | 77.95          | 2.68 |

Mean of three determination

Rx = Preparation

SD = Standard deviation

**Table 25 : Percentage drug release of preparations which are conforming drug release of the USP specification (continue)**

| Time<br>(hr.) | Rx 16 batch III |      | Rx 18 |       | Rx 19 |      | Rx 22 |      |
|---------------|-----------------|------|-------|-------|-------|------|-------|------|
|               | Mean            | SD.  | Mean  | SD.   | Mean  | SD.  | Mean  | SD.  |
| 0.00          | 0.00            | 0.00 | 0.00  | 0.00  | 0.00  | 0.00 | 0.00  | 0.00 |
| 0.25          | 10.97           | 1.19 | 16.91 | 0.85  | 11.93 | 0.98 | 29.71 | 0.28 |
| 0.50          | 13.57           | 0.75 | 19.88 | 1.54  | 14.16 | 1.17 | 31.70 | 1.07 |
| 0.75          | 16.27           | 0.82 | 22.43 | 1.43  | 16.40 | 1.27 | 35.12 | 1.50 |
| 1.00          | 19.02           | 0.54 | 24.78 | 1.36  | 18.50 | 1.61 | 37.23 | 1.60 |
| 2.00          | 28.28           | 0.71 | 31.57 | 1.77  | 24.76 | 2.15 | 45.54 | 1.59 |
| 3.00          | 35.49           | 1.42 | 37.80 | 1.63  | 30.09 | 2.37 | 49.69 | 1.51 |
| 5.00          | 44.80           | 2.06 | 45.71 | 1.26  | 42.38 | 2.39 | 57.16 | 0.74 |
| 7.00          | 51.67           | 2.09 | 53.38 | 0.66  | 50.96 | 4.16 | 61.34 | 0.74 |
| 9.00          | 56.99           | 2.86 | 59.30 | 0.29* | 58.60 | 1.49 | 64.49 | 0.43 |
| 12.00         | 63.64           | 3.57 | 70.17 | 0.97  | 67.02 | 1.14 | 69.44 | 0.42 |
| 15.00         | 69.61           | 4.28 | 75.05 | 1.96  | 72.70 | 1.95 | 74.97 | 1.24 |
| 18.00         | 74.09           | 4.76 | 80.34 | 1.47  | 78.22 | 1.39 | 79.21 | 1.32 |
| 24.00         | 83.59           | 5.02 | 87.15 | 1.36  | 85.64 | 1.12 | 89.34 | 1.64 |

| Time<br>(hr.) | Rx 24 |      | Rx 28 |      | Rx 29 |      | Rx 30 |      |
|---------------|-------|------|-------|------|-------|------|-------|------|
|               | Mean  | SD.  | Mean  | SD.  | Mean  | SD.  | Mean  | SD.  |
| 0.00          | 0.00  | 0.00 | 0.00  | 0.00 | 0.00  | 0.00 | 0.00  | 0.00 |
| 0.25          | 24.48 | 2.44 | 19.32 | 0.28 | 11.25 | 1.21 | 12.21 | 0.79 |
| 0.50          | 30.12 | 2.99 | 20.32 | 0.51 | 14.25 | 0.81 | 13.42 | 0.43 |
| 0.75          | 34.22 | 2.54 | 23.22 | 0.46 | 17.23 | 1.13 | 15.47 | 0.57 |
| 1.00          | 37.90 | 3.00 | 26.07 | 0.65 | 19.46 | 0.82 | 17.97 | 0.52 |
| 2.00          | 42.93 | 2.89 | 35.15 | 1.36 | 26.68 | 1.10 | 26.70 | 0.86 |
| 3.00          | 44.13 | 5.20 | 41.31 | 2.46 | 31.65 | 1.19 | 33.28 | 1.03 |
| 5.00          | 53.85 | 3.28 | 49.49 | 3.90 | 39.90 | 0.83 | 43.66 | 1.83 |
| 7.00          | 61.22 | 2.67 | 55.20 | 4.51 | 46.64 | 0.46 | 51.05 | 3.22 |
| 9.00          | 67.43 | 4.25 | 59.43 | 4.07 | 53.14 | 0.94 | 55.25 | 2.43 |
| 12.00         | 73.43 | 3.66 | 67.08 | 2.16 | 62.19 | 3.17 | 70.74 | 3.21 |
| 15.00         | 78.44 | 3.48 | 72.47 | 5.39 | 72.63 | 2.38 | 76.00 | 3.78 |
| 18.00         | 84.06 | 3.21 | 78.06 | 5.62 | 80.63 | 1.95 | 82.66 | 4.07 |
| 24.00         | 89.90 | 2.59 | 87.39 | 4.80 | 94.18 | 1.43 | 90.96 | 3.36 |

Mean of three determination

Rx = Preparation

SD = Standard deviation

**Table 26 : Percentage drug release of preparations which are not conforming drug release of the USP specification**

| Time<br>(hr.) | Rx 1  |      | Rx 2  |      | Rx 3  |      | Rx 6  |      |
|---------------|-------|------|-------|------|-------|------|-------|------|
|               | Mean  | SD.  | Mean  | SD.  | Mean  | SD.  | Mean  | SD.  |
| 0.00          | 0.00  | 0.00 | 0.00  | 0.00 | 0.00  | 0.00 | 0.00  | 0.00 |
| 0.25          | 2.25  | 0.19 | 3.11  | 0.33 | 3.18  | 0.16 | 2.68  | 0.14 |
| 0.50          | 2.76  | 0.23 | 3.63  | 0.14 | 4.24  | 0.19 | 4.03  | 0.43 |
| 0.75          | 3.48  | 0.40 | 4.94  | 0.19 | 5.72  | 0.32 | 5.47  | 0.69 |
| 1.00          | 4.58  | 0.24 | 6.24  | 0.22 | 7.30  | 0.51 | 6.80  | 0.63 |
| 2.00          | 7.67  | 1.10 | 10.91 | 0.61 | 12.78 | 0.53 | 10.79 | 1.03 |
| 3.00          | 11.02 | 0.85 | 15.89 | 0.66 | 17.37 | 0.40 | 14.81 | 0.95 |
| 5.00          | 16.65 | 0.97 | 23.65 | 1.19 | 22.85 | 1.72 | 20.06 | 1.07 |
| 7.00          | 21.84 | 0.42 | 30.33 | 1.09 | 30.49 | 2.28 | 24.68 | 0.98 |
| 9.00          | 25.64 | 1.22 | 34.74 | 1.41 | 34.33 | 3.98 | 28.41 | 1.27 |
| 12.00         | 30.58 | 1.87 | 39.04 | 1.99 | 40.49 | 4.34 | 32.86 | 1.57 |

| Time<br>(hr.) | Rx 7  |      | Rx 8  |      | Rx 17 |      | Rx 25 |      |
|---------------|-------|------|-------|------|-------|------|-------|------|
|               | Mean  | SD.  | Mean  | SD.  | Mean  | SD.  | Mean  | SD.  |
| 0.00          | 0.00  | 0.00 | 0.00  | 0.00 | 0.00  | 0.00 | 0.00  | 0.00 |
| 0.25          | 4.04  | 0.38 | 4.63  | 0.27 | 13.10 | 0.40 | 16.69 | 2.22 |
| 0.50          | 4.96  | 0.25 | 6.57  | 0.14 | 15.68 | 0.73 | 20.99 | 2.75 |
| 0.75          | 6.50  | 0.33 | 8.68  | 0.30 | 17.38 | 1.20 | 23.43 | 2.93 |
| 1.00          | 7.68  | 0.44 | 10.77 | 0.66 | 19.14 | 0.98 | 25.16 | 2.84 |
| 2.00          | 12.15 | 0.62 | 16.64 | 1.31 | 23.48 | 1.42 | 29.78 | 2.80 |
| 3.00          | 16.42 | 0.90 | 21.56 | 1.83 | 27.11 | 1.69 | 33.26 | 2.51 |
| 5.00          | 21.83 | 1.32 | 28.57 | 2.08 | 32.82 | 2.30 | 38.63 | 2.15 |
| 7.00          | 27.49 | 1.94 | 34.02 | 2.58 | 36.84 | 1.91 | 43.42 | 2.03 |
| 9.00          | 31.26 | 2.65 | 38.88 | 3.27 | 40.93 | 1.86 | 48.36 | 2.10 |
| 12.00         | 36.50 | 3.72 | 42.06 | 2.19 | 45.39 | 2.49 | 53.17 | 3.46 |

| Time<br>(hr.) | Rx 13 |       | Rx 14 |       | Rx 21 |      |
|---------------|-------|-------|-------|-------|-------|------|
|               | Mean  | SD.   | Mean  | SD.   | Mean  | SD.  |
| 0.00          | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00 |
| 0.25          | 9.79  | 0.62  | 13.04 | 1.18  | 13.91 | 1.23 |
| 0.50          | 12.23 | 0.61  | 13.95 | 1.36  | 18.00 | 2.52 |
| 0.75          | 14.12 | 0.84  | 15.66 | 1.70  | 19.50 | 1.94 |
| 1.00          | 15.68 | 1.04  | 17.48 | 2.14  | 20.75 | 2.19 |
| 2.00          | 19.95 | 1.37  | 22.71 | 2.36  | 24.20 | 2.02 |
| 3.00          | 23.55 | 2.21  | 26.92 | 2.56  | 26.72 | 2.20 |
| 5.00          | 30.85 | 3.36  | 32.88 | 2.67  | 30.85 | 2.38 |
| 7.00          | 36.06 | 2.75  | 37.11 | 3.00  | 34.45 | 2.09 |
| 9.00          | 41.18 | 0.49  | 40.90 | 3.34  | 38.72 | 2.03 |
| 12.00         | 49.38 | 4.24  | 50.25 | 4.93  | 49.41 | 1.37 |
| 15.00         | 56.95 | 7.22  | 55.90 | 5.35  | 58.68 | 1.54 |
| 18.00         | 62.95 | 8.63  | 63.47 | 9.55  | 65.22 | 1.51 |
| 24.00         | 74.44 | 11.71 | 76.51 | 10.52 | 74.40 | 0.97 |

Mean of three determination

Rx =Preparation

SD = standard deviation

**Table 27 : Slope of Higuchi's plot of indomethacin microcapsules prepared from different concentration of chitosan solutions**

| Preparation | Chitosan soln. conc. (%w/v) | Slope |       |       | SD   |
|-------------|-----------------------------|-------|-------|-------|------|
|             |                             | A     | B     | C     |      |
| 28          | 0.25                        | 18.14 | 21.94 | 17.42 | 2.43 |
| 16          | 0.50                        | 18.32 | 16.12 | 16.10 | 1.28 |
| 29          | 0.75                        | 17.11 | 17.43 | 16.92 | 0.26 |
| 30          | 1.00                        | 17.68 | 18.48 | 20.02 | 1.19 |

SD = Standard deviation

**Table 28 : Slope of Higuchi's plot of indomethacin microcapsules prepared from various batches of preparations 4 and 16**

| Preparation | Batch (no) | Slope |       |       | SD   |
|-------------|------------|-------|-------|-------|------|
|             |            | A     | B     | C     |      |
| 4           | I          | 31.67 | 27.73 | 27.54 | 2.33 |
|             | II         | 25.10 | 22.85 | 22.68 | 1.35 |
|             | III        | 28.19 | 28.66 | 27.26 | 0.71 |
| 16          | I          | 18.32 | 16.12 | 16.10 | 1.28 |
|             | II         | 20.99 | 22.14 | 21.89 | 0.60 |
|             | III        | 18.43 | 20.87 | 19.15 | 1.25 |

SD = Standard deviation

### **Biography**

**Miss Waree Tiyaboonchai was born on October 24, 1966. She got her degree in Bachelor of Science in Pharmacy in 1990 from Faculty of Pharmaceutical Science, Chulalongkorn University, Thailand.**

