Appendix A

1.Thermodynamic studies of piroxicam-CDs inclusion complexes in solution pH 5.5

Table 1 Solubility of piroxicam-BCD inclusion complex in distilled water at various temperatures

T,°C	BCD, mM	Prx, mM			
		Series 1	Series 1	Series 1	Mean±SD
25	0	0.0398	0.0413	0.0455	0.0422±0.0029
	3	0.0514	0.0583	0.0553	0.055±0.0035
	6	0.0675	0.0607	0.0617	0.0633±0.0037
	9	0.0704	0.0872	0.0758	0.0778±0.0086
	12	0.1023	0.1108	0.1049	0.106±0.0044
	15	0.1416	0.1406	0.1384	0.1402±0.0016
30	0	0.0462	0.0488	0.0508	0.0486±0.0029
	1.5	0.0569	0.0541	0.0495	0.0535±0.0037
	3	0.0652	0.0576	0.0554	0.0594±0.0051
	6	0.0923	0.0954	0.0844	0.0907±0.0057
	12	0.1368	0.1321	0.1343	0.1344±0.0024
	15	0.1564	0.1522	0.1537	0.1541±0.0021
37	0	0.0593	0.0526	0.0555	0.0558±0.0034
	3	0.0584	0.0611	0.0498	0.0564±0.0059
	6	0.0745	0.0798	0.0815	0.0786±0.0036
	9	0.1044	0.1069	0.0926	0.1013±0.0076
	12	0.1175	0.1185	0.1186	0.1182±0.0006
	15	0.1347	0.1328	0.1333	0.1336±0.0010
45	0	0.0688	0.0601	0.0631	0.064±0.0044
	1.5	0.0664	0.0715	0.0697	0.0692±0.0026
	3	0.0779	0.0733	0.0711	0.0741±0.0035
	6	0.1098	0.1126	0.1043	0.1089±0.0042
	12	0.1592	0.1556	0.1529	0.1559±0.0032
	15	0.1648	0.1632	0.1583	0.1621±0.0034

2. Thermodynamic studies of piroxicam-CDs inclusion complexes in solution pH 2.5 and pH 7.4

Table 4 Solubility of piroxicam-BCD inclusion complex in solution pH 2.5 at 37 °C

CDs	mM	Prx, mM			
		Series 1	Series 2	Series 3	Mean±SD
BCD	0	0.043	0.047	0.045	0.045±0.002
	3	0.057	0.059	0.061	0.059±0.002
	6	0.073	0.073	0.075	0.074±0.001
	9	0.103	0.102	0.107	0.104±0.003
	12	0.126	0.127	0.131	0.128±0.002
	15	0.156	0.152	0.157	0.155±0.002
GCD	0	0.043	0.047	0.045	0.045±0.002
	3	0.057	0.061	0.058	0.059±0.002
	6	0.067	0.068	0.071	0.069±0.002
	9	0.092	0.089	0.092	0.091±0.002
	12	0.105	0.107	0.107	0.106±0.001
	15	0.129	0.134	0.134	0.132±0.003
HPBCD	0	0.043	0.047	0.045	0.045±0.002
	5	0.072	0.069	0.078	0.073±0.005
	10	0.101	0.099	0.099	0.100±0.001
	20	0.143	0.143	0.140	0.142±0.002
	50	0.266	0.267	0.262	0.265±0.003
	100	0.514	0.521	0.523	0.519±0.004
MeBCD	0	0.043	0.047	0.045	0.045±0.002
	5	0.073	0.077	0.073	0.074±0.002
	10	0.121	0.120	0.119	0.120±0.001
	20	0.190	0.195	0.197	0.194±0.004
	50	0.609	0.617	0.624	0.616±0.007
	100	3.006	3.014	3.015	3.011±0.005

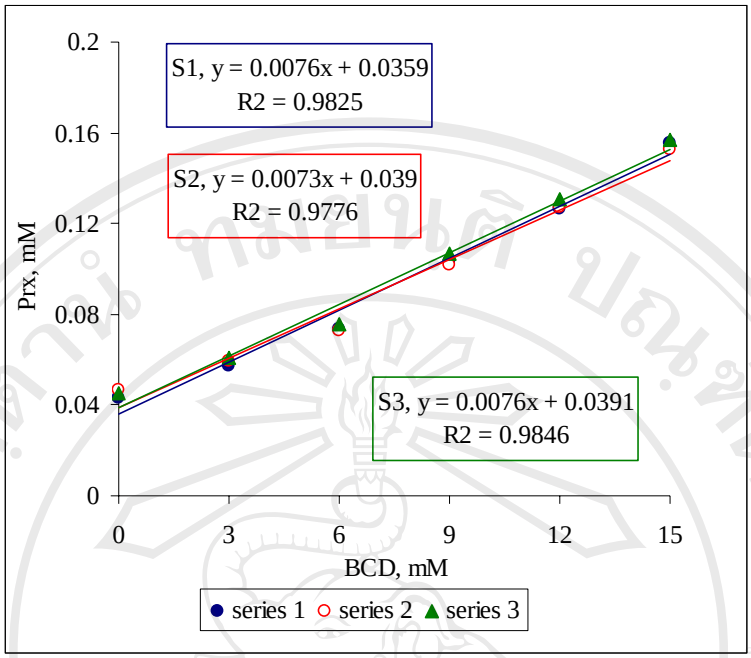

Figure 21 Phase solubility diagrams of piroxicam-BCD inclusion complexes in solution pH 2.5 at 37°C

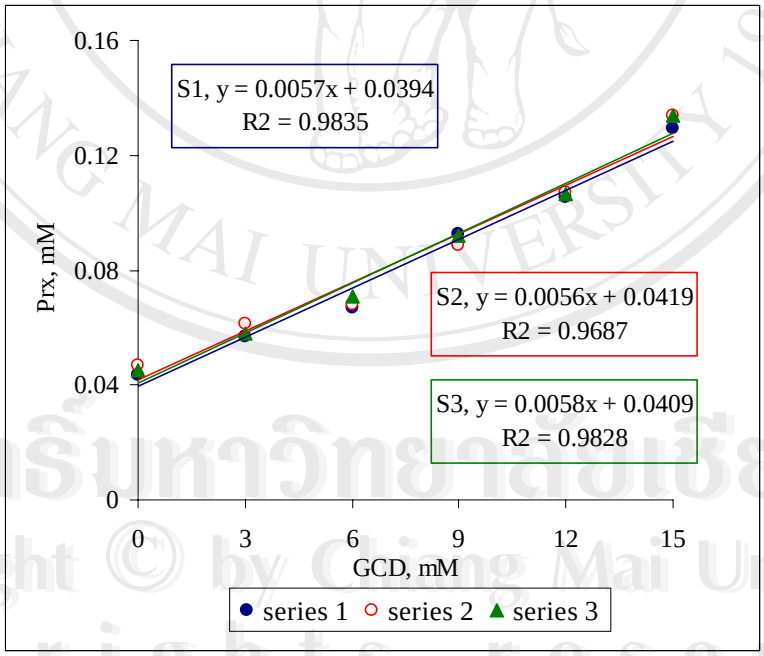

Figure 22 Phase solubility diagrams of piroxicam-GCD inclusion complexes in solution pH 2.5 at 37°C

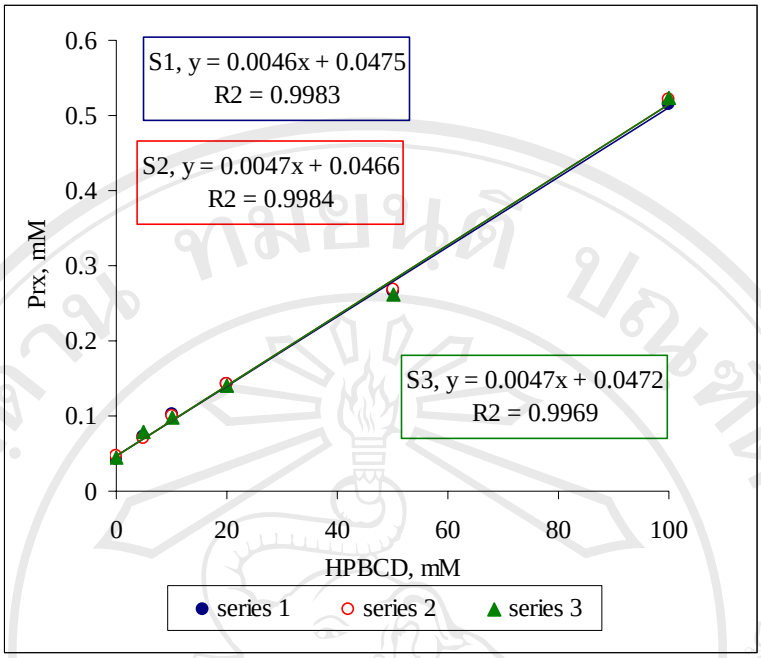

Figure 23 Phase solubility diagrams of piroxicam-HPBCD inclusion complexes in solution pH 2.5 at 37°C

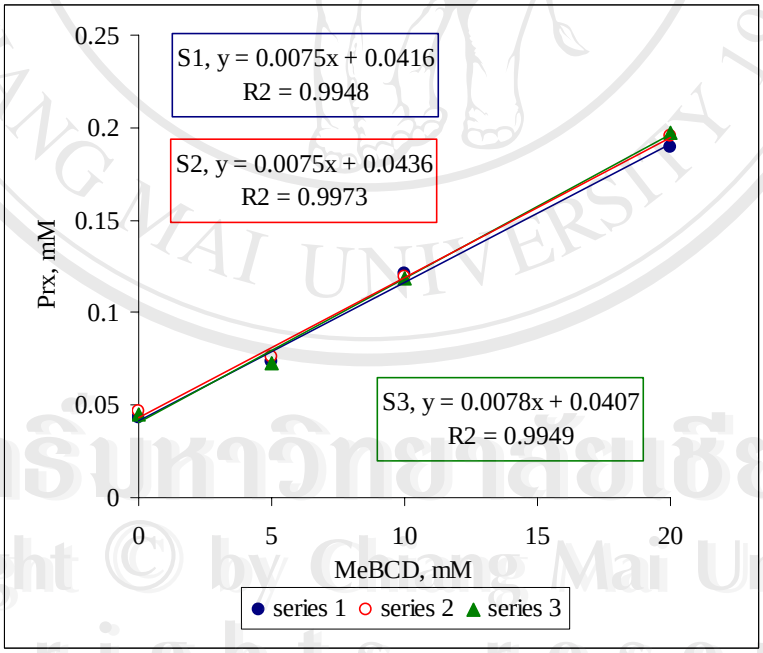

Figure 24 Phase solubility diagrams of piroxicam-MeBCD inclusion complexes in solution pH 2.5 at 37°C

Table 6 Solubility of piroxicam-BCD inclusion complex in solution pH 7.4 at 37 °C

CDs	mM	Prx, mM			
		Series 1	Series 2	Series 3	Mean±SD
BCD	0	1.556	1.577	1.600	1.578±0.022
	3	1.837	1.794	1.838	1.820±0.025
	6	2.059	2.082	2.086	2.075±0.015
	9	2.331	2.327	2.311	2.323±0.011
	12	2.664	2.642	2.685	2.663±0.021
	15	2.863	2.892	2.874	2.877±0.015
GCD	0	1.556	1.577	1.600	1.578±0.022
	3	1.601	1.579	1.604	1.595±0.014
	6	1.788	1.795	1.778	1.787±0.009
	9	2.027	2.036	2.059	2.040±0.017
	12	2.250	2.257	2.229	2.245±0.014
	15	2.261	2.243	2.253	2.253±0.009
HPBCD	0	1.556	1.577	1.600	1.578±0.022
	5	1.922	1.895	1.918	1.912±0.014
	10	2.479	2.493	2.487	2.486±0.007
	20	3.359	3.364	3.342	3.355±0.012
	50	5.549	5.555	5.562	5.555±0.007
	100	8.386	8.426	8.424	8.412±0.022
MeBCD	0	1.556	1.577	1.600	1.578±0.004
	5	1.818	1.829	1.823	1.823±0.005
	10	2.087	2.062	2.077	2.075±0.012
	20	2.325	2.324	2.319	2.323±0.003
	50	2.649	2.675	2.666	2.663±0.013
	100	2.901	2.846	2.882	2.877±0.028

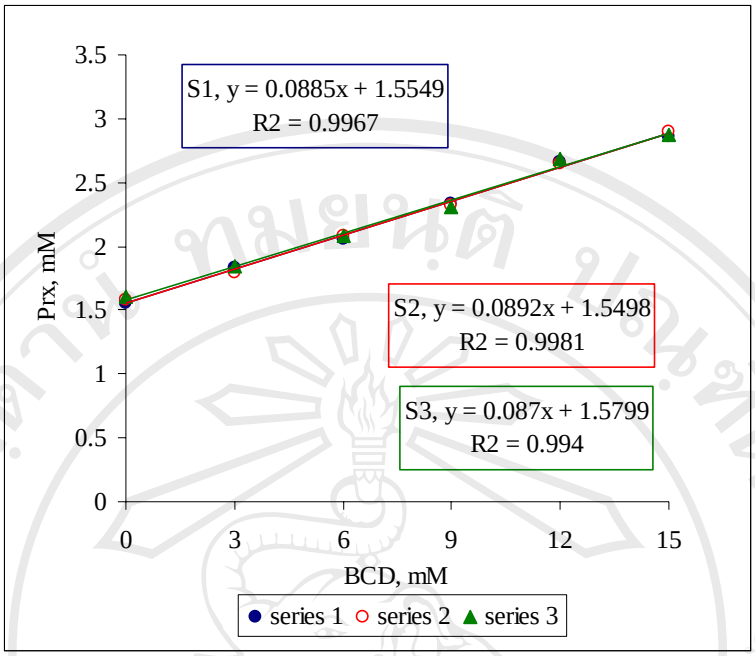

Figure 25 Phase solubility diagrams of piroxicam-BCD inclusion complexes in solution pH 7.4 at 37°C

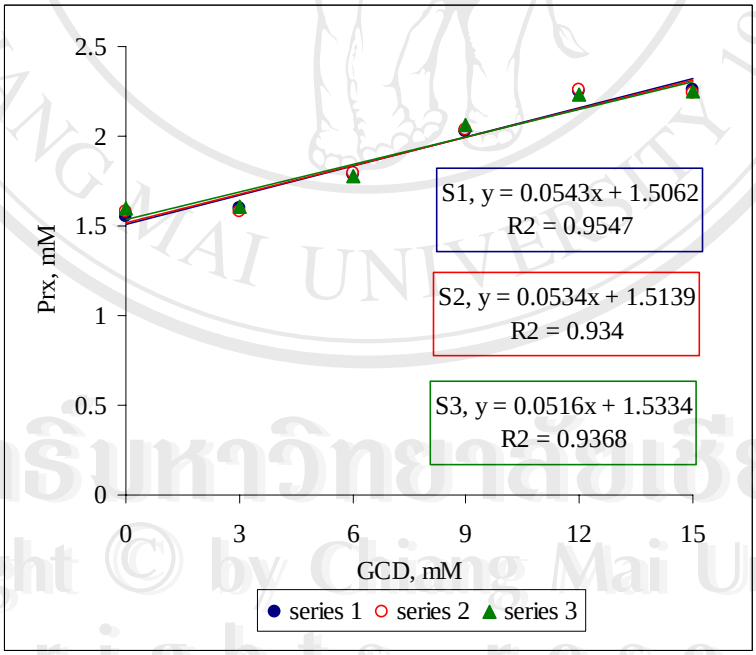

Figure 26 Phase solubility diagrams of piroxicam-GCD inclusion complexes in solution pH 7.4 at 37°C

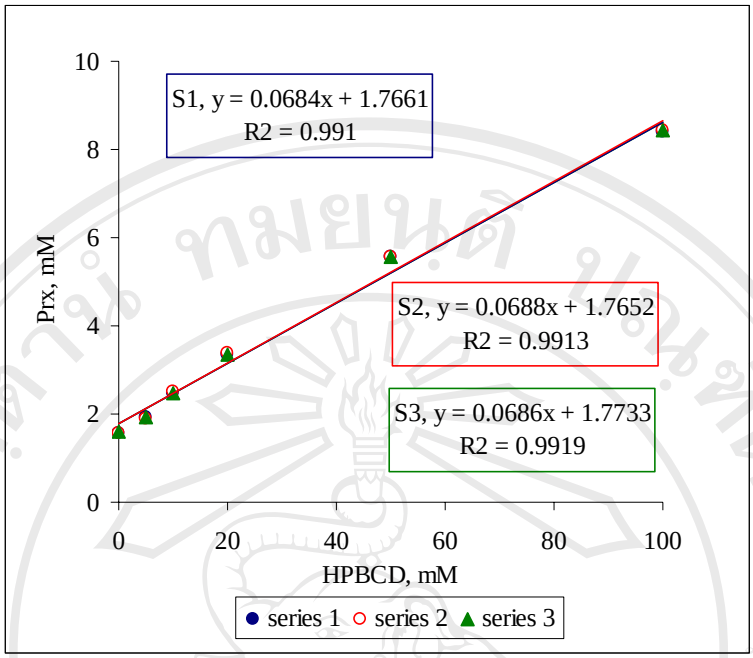

Figure 27 Phase solubility diagrams of piroxicam-HPBCD inclusion complexes in solution pH 7.4 at 37°C

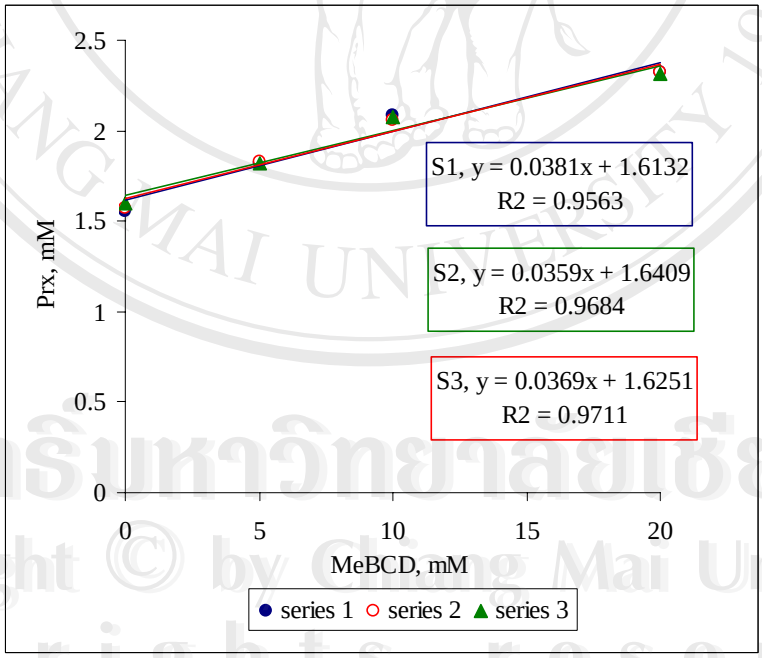

Figure 28 Phase solubility diagrams of piroxicam-MeBCD inclusion complexes in solution pH 7.4 at 37°C

Appendix B

1. Thermodynamic studies of meloxicam-CDs inclusion complexes in solution pH 3.0

Table 1 Solubility of meloxicam-BCD inclusion complex in pH 3.0 at different temperatures

T,°C	BCD, mM	Mlx, $x10^{-3}$ mM			
		Series 1	Series 1	Series 1	Mean±SD
25	0	1.343	1.326	1.352	1.343±0.013
	3	1.740	1.692	1.772	1.735±0.040
	6	3.133	3.051	2.879	3.021±0.130
	9	4.108	4.042	4.068	4.073±0.034
	12	5.696	5.828	6.121	5.882±0.218
	15	6.938	6.907	7.010	6.952±0.053
30	0	1.677	1.544	1.825	1.682±0.141
	3	2.596	2.694	2.746	2.679±0.076
	6	3.694	3.647	3.667	3.670±0.023
	9	5.395	5.297	5.267	5.320±0.067
	12	6.934	6.992	6.914	6.947±0.041
	15	8.861	8.898	8.995	8.918±0.069
37	0	2.216	2.208	2.146	2.190±0.038
	3	3.728	3..754	3.205	3.562±0.310
	6	4.456	4.740	4.926	4.707±0.237
	9	6.344	6.449	6.470	6.421±0.067
	12	8.444	8.373	8.450	8.422±0.043
	15	9.616	9.775	10.223	9.871±0.315
45	0	3.513	3.529	3.368	3.470±0.089
	3	5.625	5.565	5.531	5.574±0.047
	6	7.094	7.003	7.064	7.054±0.047
	9	8.811	8.751	8.606	8.723±0.105
	12	11.036	10.871	10.822	10.909±0.112
	15	13.521	13.360	13.217	13.366±0.152

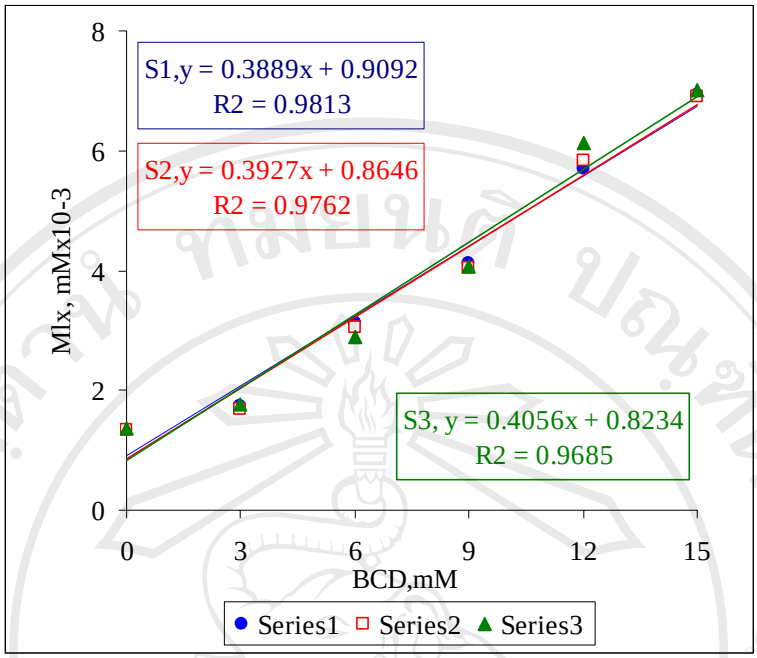

Figure 1 Phase solubility diagrams of meloxicam (Mlx)-BCD inclusion complex in pH 3.0 at 25°C

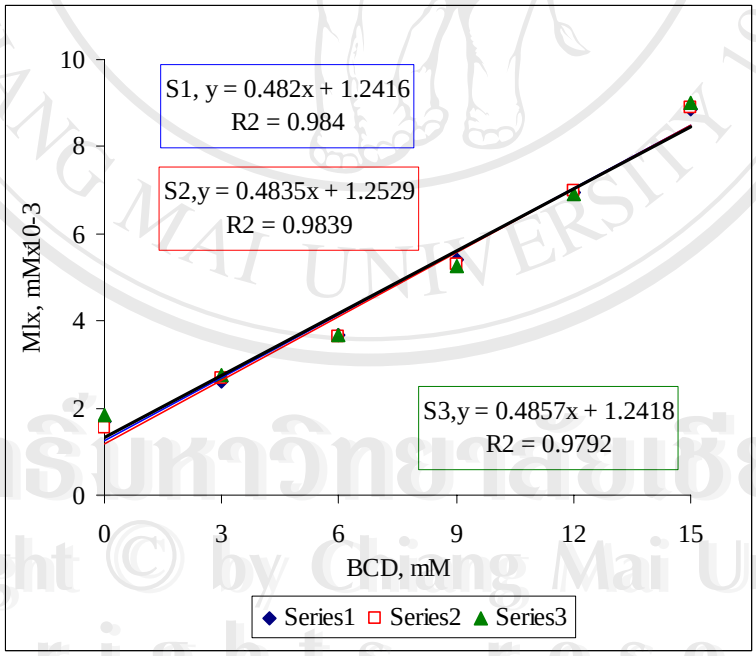

Figure 2 Phase solubility diagrams of meloxicam (Mlx)-BCD inclusion complex in pH 3.0 at 30°C

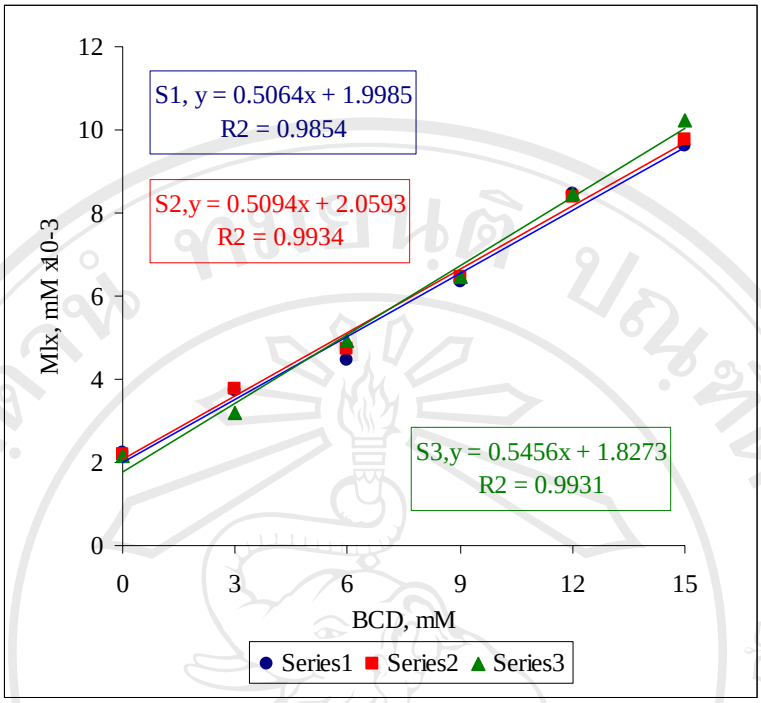

Figure 3 Phase solubility diagrams of meloxicam (Mlx)-BCD inclusion complex in pH 3.0 at 37°C

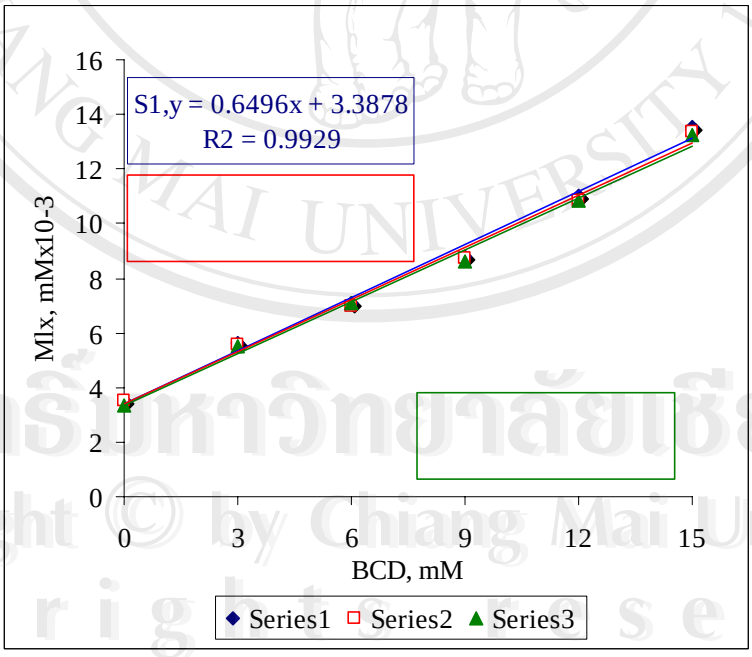

Figure 4 Phase solubility diagrams of meloxicam (Mlx)-BCD inclusion complex in pH 3.0 at 45°C

Table 2 Solubility of meloxicam-GCD inclusion complex in pH 3.0 at different temperatures

T,°C	BCD, mM	Mlx, $x10^{-3}$ mM			
		Series 1	Series 1	Series 1	Mean±SD
25	0	1.343	1.326	1.352	1.343±0.013
	3	3.450	3.431	3.483	3.455±0.026
	6	6.022	5.901	5.729	5.884±0.147
	9	7.732	7.738	7.502	7.657±0.135
	12	10.434	10.322	10.313	10.356±0.067
	15	11.991	12.031	12.073	12.032±0.041
30	0	1.677	1.544	1.825	1.682±0.141
	3	4.376	4.339	4.072	4.262±0.166
	6	7.072	6.884	6.513	6.823±0.284
	9	9.275	9.323	9.368	9.322±0.046
	12	12.361	12.261	12.118	12.247±0.122
	15	13.685	14.142	14.209	14.012±0.285
37	0	2.216	2.208	2.146	2.190±0.038
	3	5.752	5.816	5.896	5.821±0.073
	6	9.005	8.987	8.979	8.989±0.015
	9	11.857	12.122	12.120	12.033±0.152
	12	15.977	16.184	16.219	16.127±0.131
	15	19.616	19.479	19.393	19.496±0.113
45	0	3.513	3.529	3.368	3.470±0.089
	3	8.073	7.969	7.963	8.002±0.062
	6	12.048	11.937	11.815	11.933±0.116
	9	16.250	16.184	16.139	16.191±0.055
	12	20.945	20.844	20.775	20.855±0.085
	15	25.014	24.948	24.801	24.921±0.109

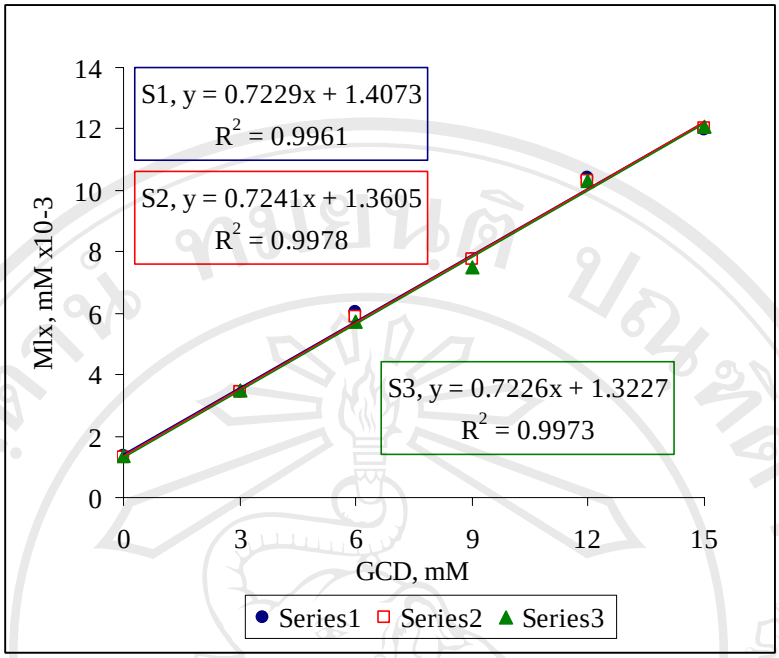

Figure 5 Phase solubility diagrams of meloxicam (Mlx)-GCD inclusion complex in pH 3.0 at 25°C

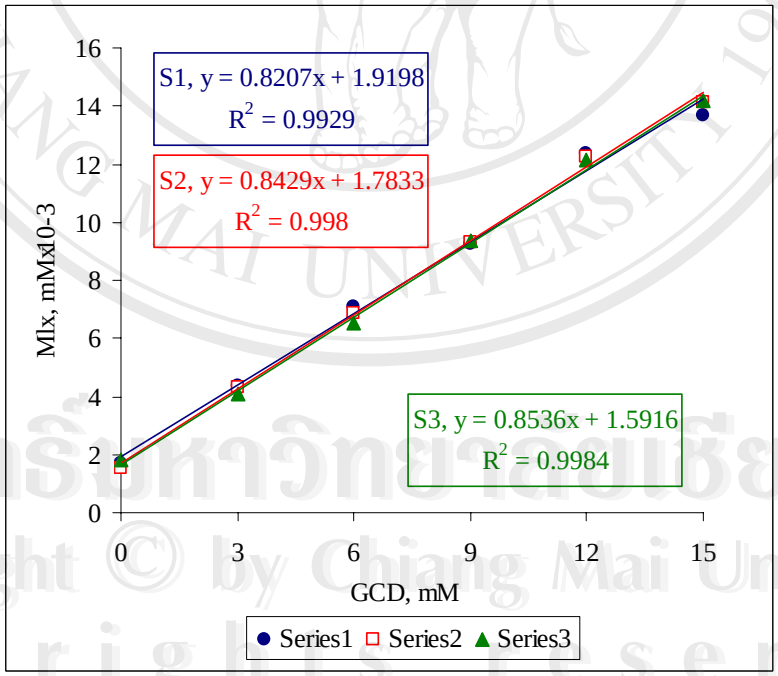

Figure 6 Phase solubility diagrams of meloxicam (Mlx)-GCD inclusion complex in pH 3.0 at 30°C

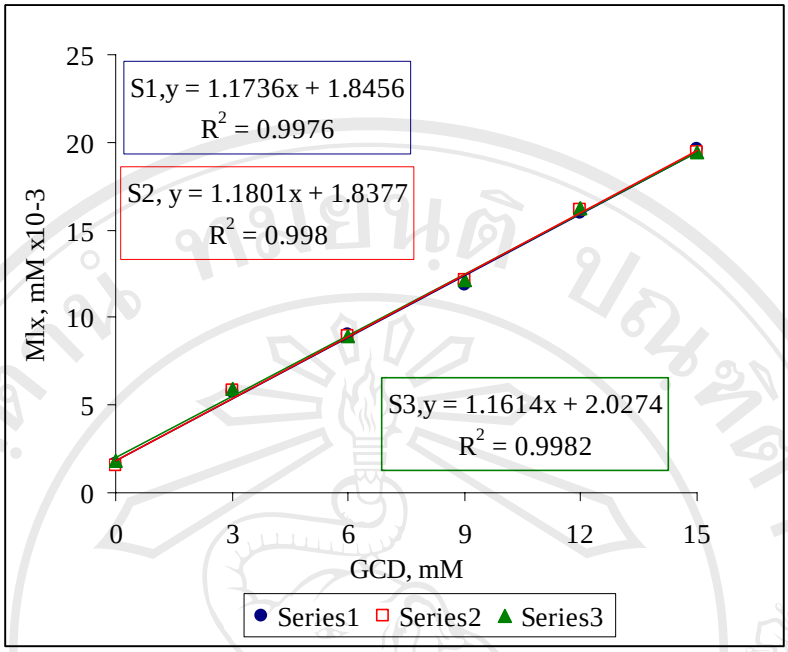

Figure 7 Phase solubility diagrams of meloxicam (Mlx)-GCD inclusion complex in pH 3.0 at 37°C

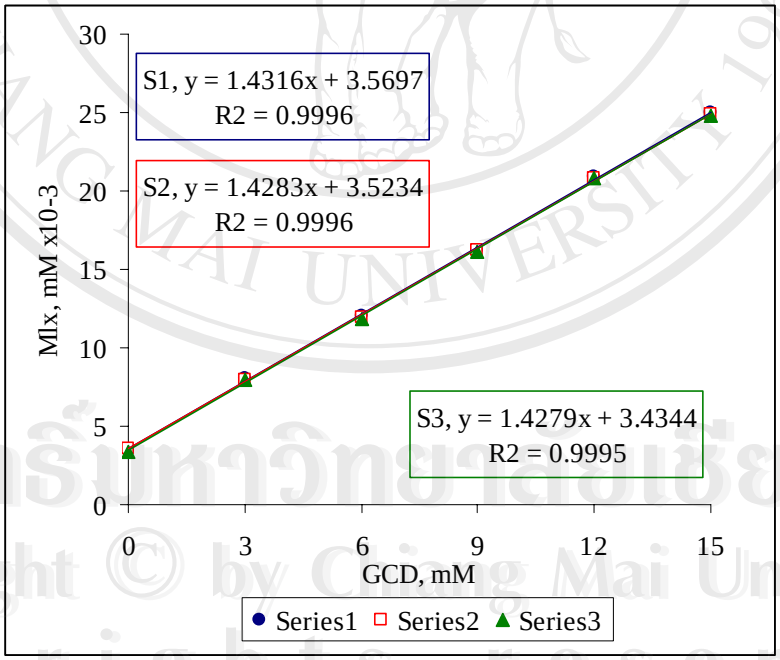

Figure 8 Phase solubility diagrams of meloxicam (Mlx)-GCD inclusion complex in pH 3.0 at 45°C

Table 3 Solubility of meloxicam-HPBCD inclusion complex in pH 3.0 at different temperatures

T,°C	HPBCD, mM	Mlx, $x10^{-3}$ mM			
		Series 1	Series 1	Series 1	Mean±SD
25	0	1.343	1.326	1.352	1.343±0.013
	5	4.920	5.959	6.917	5.932±0.999
	10	9.185	9.907	10.658	9.917±0.737
	25	21.928	21.627	21.420	21.658±0.255
	50	45.295	45.422	45.505	45.407±0.106
30	0	1.677	1.544	1.825	1.682±0.141
	5	6.557	6.520	6.451	6.509±0.054
	10	11.046	11.118	11.316	11.160±0.140
	20	19.817	20.061	20.481	20.120±0.336
	30	28.200	28.237	28.433	28.290±0.125
	50	46.878	46.632	46.641	46.717±0.140
37	0	2.216	2.208	2.146	2.190±0.038
	5	7.849	8.023	8.161	8.011±0.156
	10	14.519	14.200	13.962	14.227±0.280
	20	26.721	26.482	26.191	26.465±0.265
	30	38.320	39.215	39.690	39.075±0.696
	50	62.226	63.471	65.599	63.765±1.706
45	0	3.513	3.529	3.368	3.470±0.089
	5	10.829	11.056	11.198	11.028±0.186
	10	18.658	18.845	18.942	18.815±0.144
	20	34.276	34.327	34.165	34.165±0.083
	30	50.066	50.556	51.093	50.572±0.514
	50	81.799	81.826	82.629	82.085±0.472

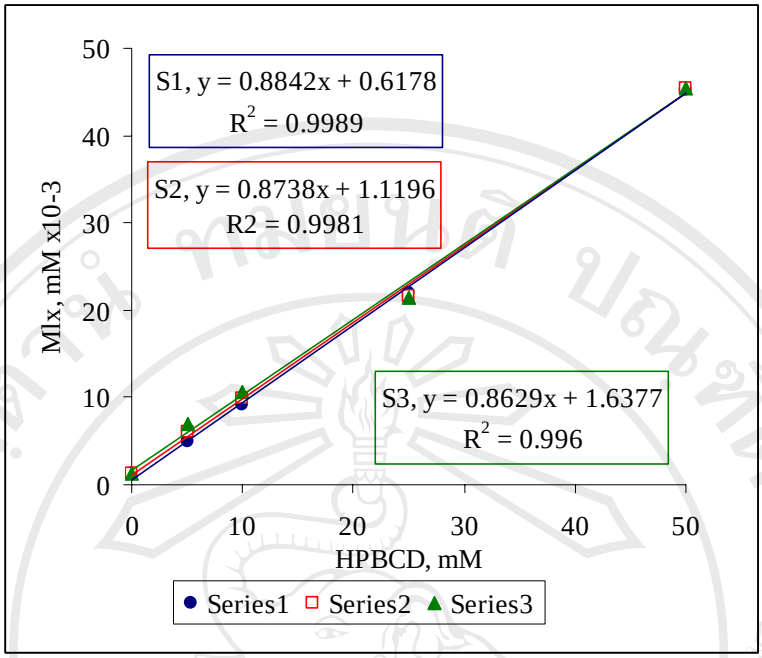

Figure 9 Phase solubility diagrams of meloxicam (Mlx)-HPBCD inclusion complex in pH 3.0 at 25°C

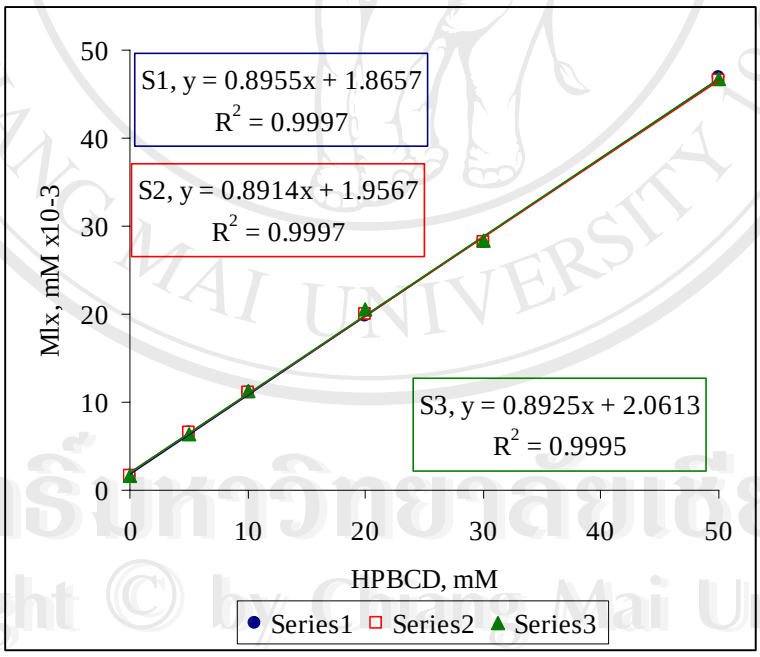

Figure 10 Phase solubility diagrams of meloxicam (Mlx)-HPBCD inclusion complex in pH 3.0 at 30°C

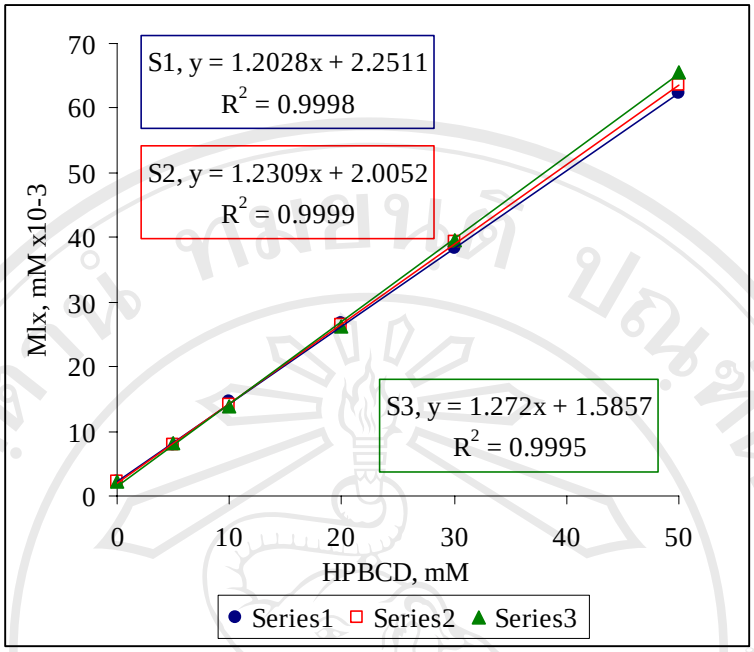

Figure 11 Phase solubility diagrams of meloxicam (Mlx)-HPBCD inclusion complex in pH 3.0 at 37°C

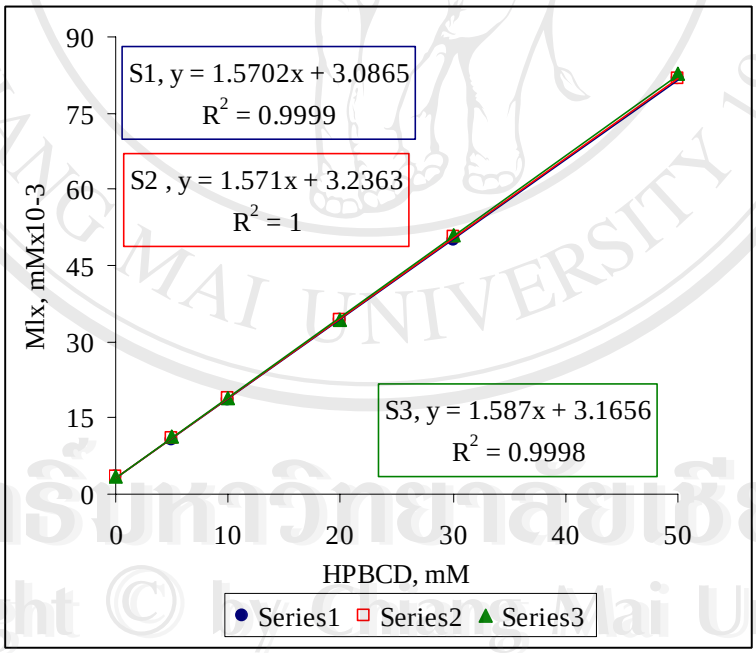

Figure 12 Phase solubility diagrams of meloxicam (Mlx)-HPBCD inclusion complex in pH 3.0 at 45°C

Table 4 Solubility of meloxicam-HPGCD inclusion complex in pH 3.0 at different temperatures

T,°C	HPGCD, mM	Mlx, $x10^{-3}$ mM			
		Series 1	Series 1	Series 1	Mean±SD
25	0	1.343	1.326	1.352	1.343±0.013
	5	4.058	4.224	4.543	4.275±0.246
	10	7.537	7.491	7.488	7.506±0.028
	20	14.987	14.451	13.583	14.341±0.709
	30	20.724	21.025	21.039	20.929±0.178
	50	35.298	35.492	35.737	35.509±0.220
30	0	1.677	1.544	1.825	1.682±0.141
	5	5.458	5.155	4.422	5.012±0.532
	10	9.199	9.212	8.978	9.130±0.131
	20	17.108	17.110	17.004	17.074±0.060
	30	25.251	25.211	25.173	25.212±0.039
	50	42.384	42.977	43.725	43.029±0.672
37	0	2.216	2.208	2.146	2.190±0.038
	5	7.402	7.495	7.653	7.517±0.127
	10	12.757	12.695	12.789	12.747±0.048
	20	23.263	24.055	24.289	23.869±0.538
	30	34.790	35.087	35.372	35.083±0.291
	50	58.572	58.777	58.933	58.760±0.181
45	0	3.513	3.529	3.368	3.470±0.089
	5	10.735	10.797	10.869	10.800±0.066
	10	18.074	17.916	17.910	17.967±0.093
	20	32.903	32.982	33.029	32.972±0.064
	30	48.255	48.547	48.498	48.484±0.156
	50	83.509	83.244	82.400	83.051±0.579

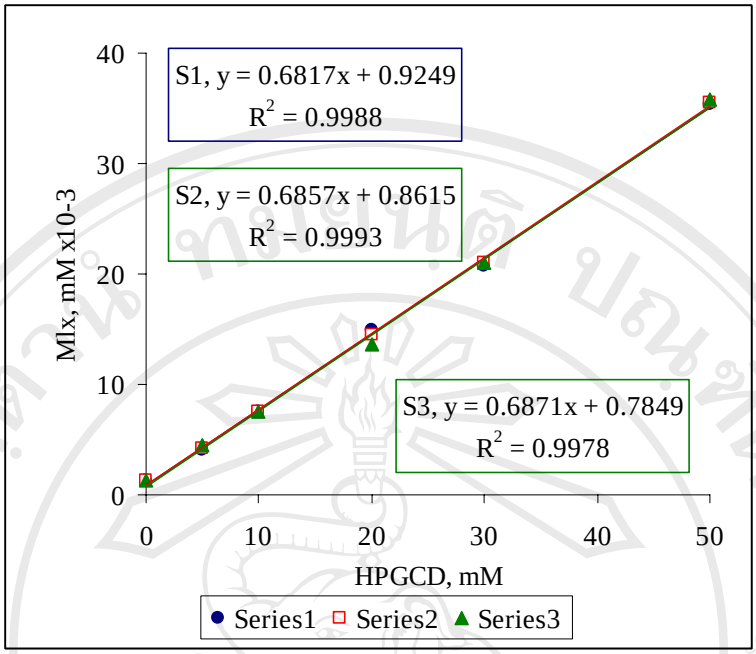

Figure 13 Phase solubility diagrams of meloxicam (Mlx)-HPGCD inclusion complex in pH 3.0 at 25°C

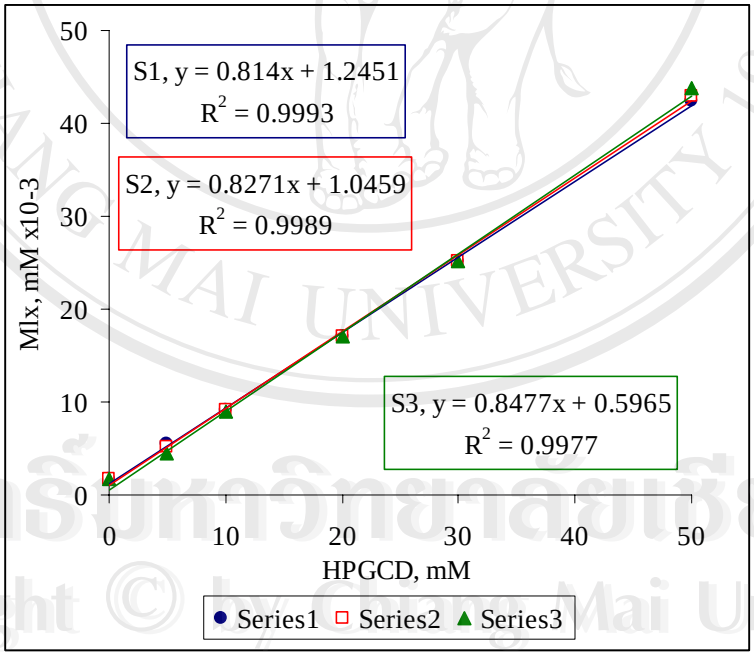

Figure 14 Phase solubility diagrams of meloxicam (Mlx)-HPGCD inclusion complex in pH 3.0 at 30°C

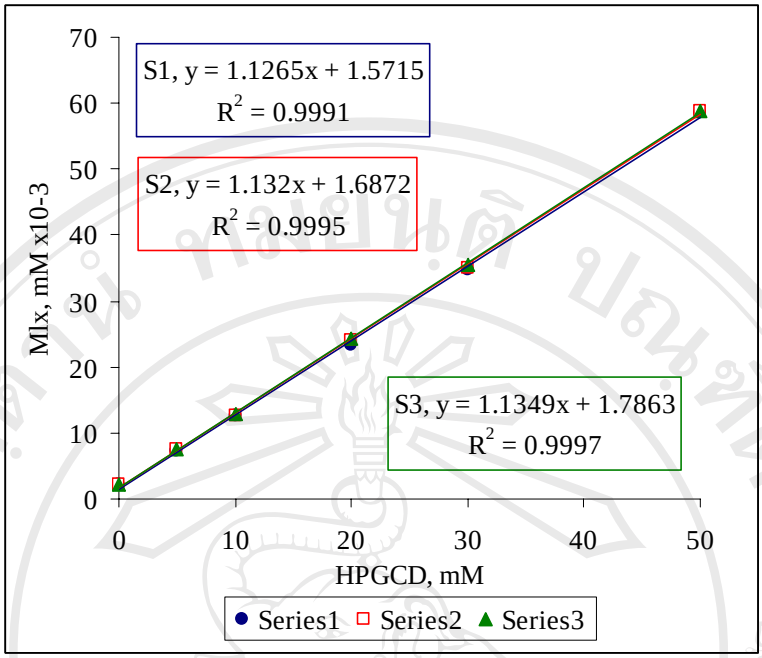

Figure 15 Phase solubility diagrams of meloxicam (Mlx)-HPGCD inclusion complex in pH 3.0 at 37°C

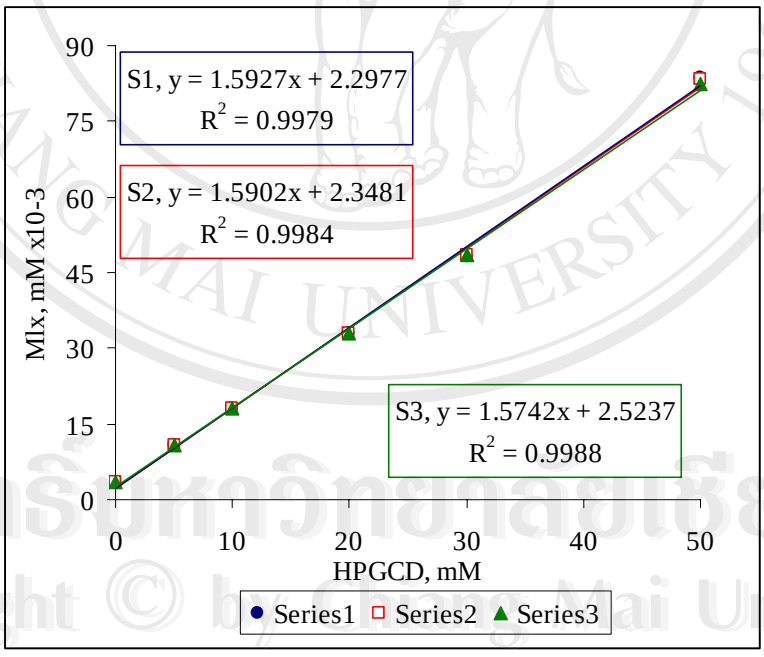

Figure 16 Phase solubility diagrams of meloxicam (Mlx)-HPGCD inclusion complex in pH 3.0 at 45°C

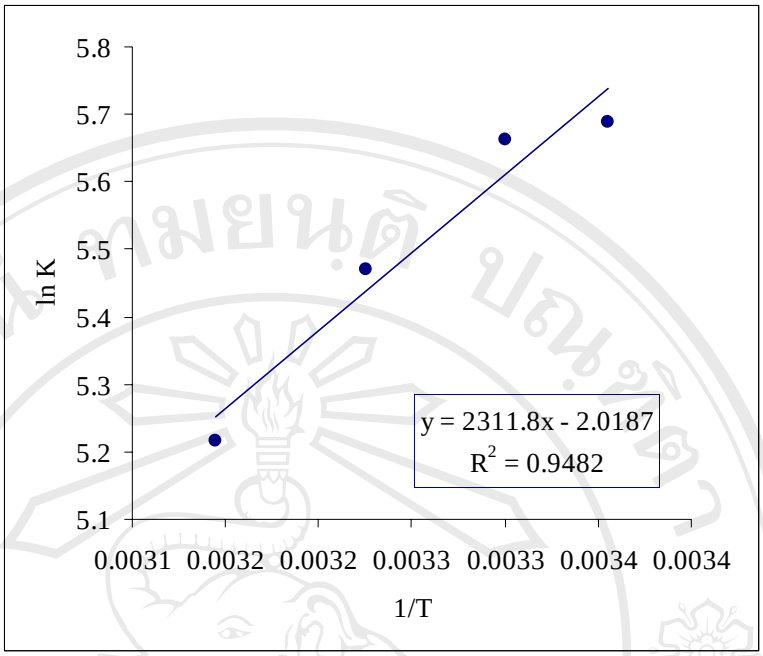

Figure 17 Van't Hoff plot of meloxicam-BCD inclusion complex in solution pH 3.0

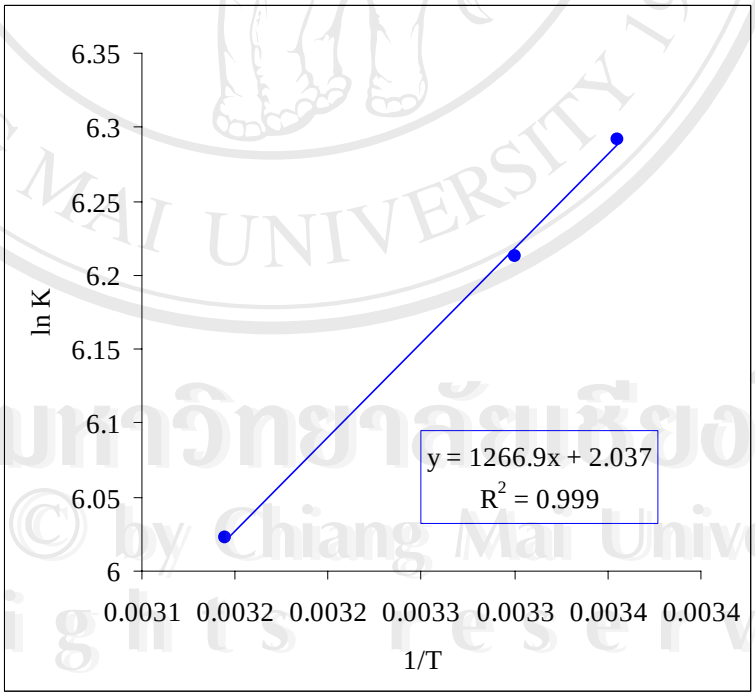

Figure 18 Van't Hoff plot of meloxicam-GCD inclusion complex in solution pH 3.0

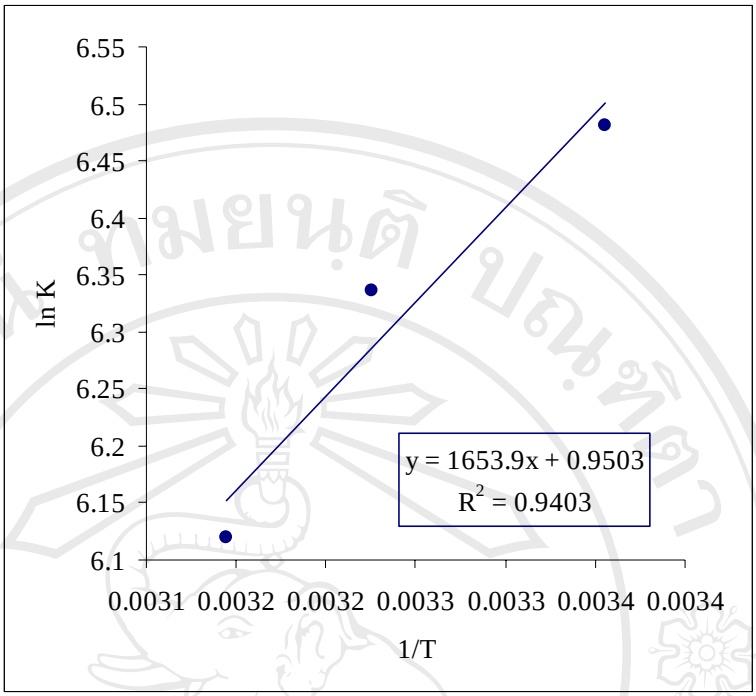

Figure 19 Van't Hoff plot of meloxicam-HPBCD inclusion complex in solution pH 3.0

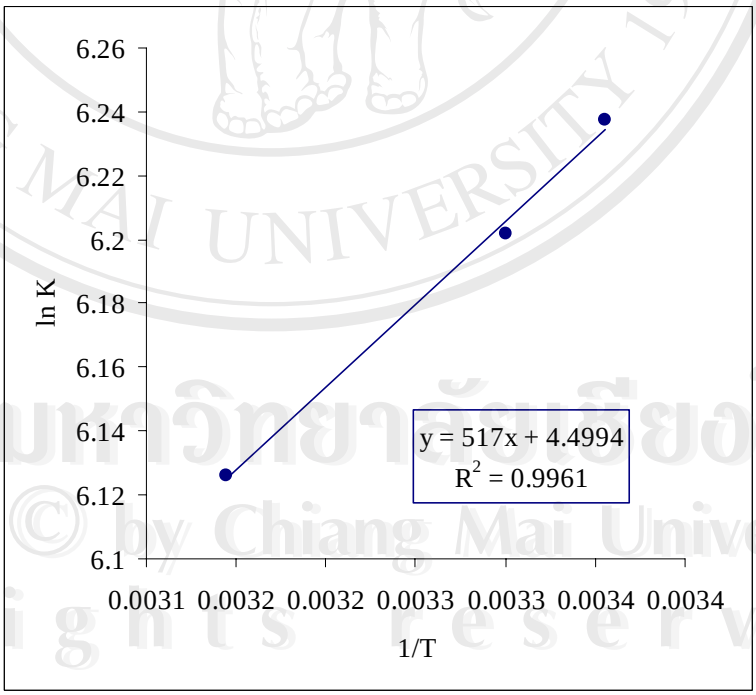

Figure 20 Van't Hoff plot of meloxicam-HPGCD inclusion complex in solution pH 3.0

2. Thermodynamic studies of meloxicam-CDs inclusion complexes in solution pH 6.0

Table 5 Solubility of meloxicam-BCD inclusion complex in solution pH 6.0 at various temperatures

T,°C	BCD, mM	Meloxicam, mM			
		Series 1	Series 1	Series 1	Mean±SD
25	0	0.066	0.065	0.060	0.064±0.003
	3	0.131	0.133	0.135	0.133±0.002
	6	0.177	0.175	0.172	0.175±0.003
	9	0.222	0.223	0.224	0.223±0.001
	12	0.271	0.270	0.272	0.272±0.002
	15	0.324	0.326	0.327	0.325±0.001
30	0	0.096	0.087	0.098	0.094±0.006
	3	0.141	0.141	0.141	0.141±0.000
	6	0.186	0.186	0.186	0.186±0.000
	9	0.235	0.235	0.235	0.235±0.000
	12	0.289	0.288	0.289	0.289±0.000
	15	0.321	0.321	0.321	0.321±0.000
37	0	0.144	0.160	0.159	0.154±0.009
	3	0.222	0.222	0.223	0.222±0.001
	6	0.280	0.280	0.280	0.280±0.000
	9	0.367	0.367	0.367	0.367±5E-05
	12	0.438	0.439	0.440	0.439±0.009
	15	0.495	0.496	0.496	0.495±0.001
45	0	0.283	0.290	0.275	0.283±0.008
	3	0.352	0.351	0.353	0.352±0.001
	6	0.438	0.436	0.435	0.436±0.001
	9	0.522	0.522	0.524	0.523±0.001
	12	0.635	0.633	0.634	0.634±0.001
	15	0.705	0.710	0.715	0.710±0.005

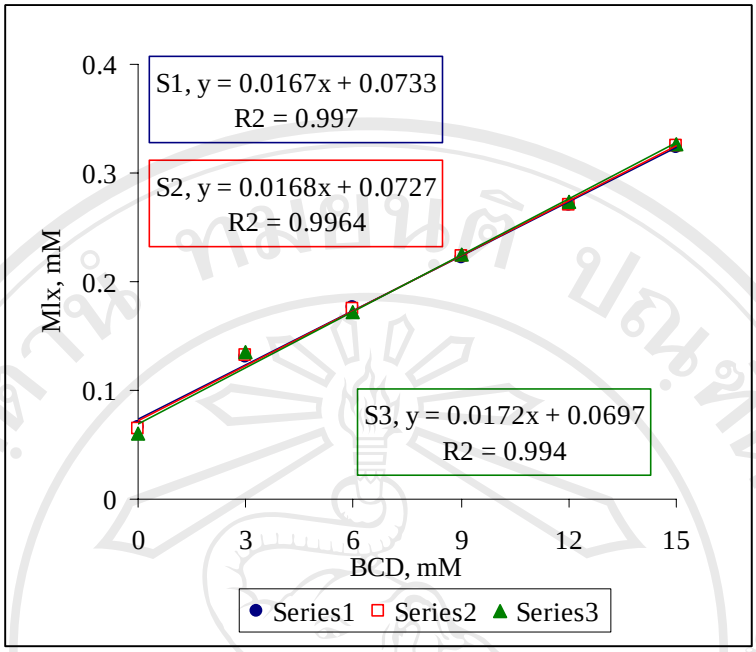

Figure 21 Phase solubility diagrams of meloxicam (Mlx)-BCD inclusion complex in pH 6.0 at 25°C

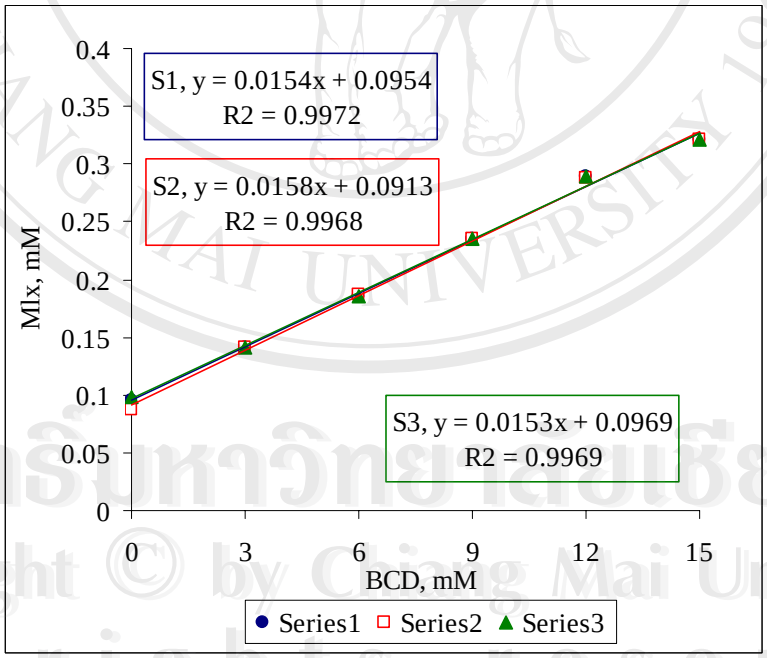

Figure 23 Phase solubility diagrams of meloxicam (Mlx)-BCD inclusion complex in pH 6.0 at 30°C

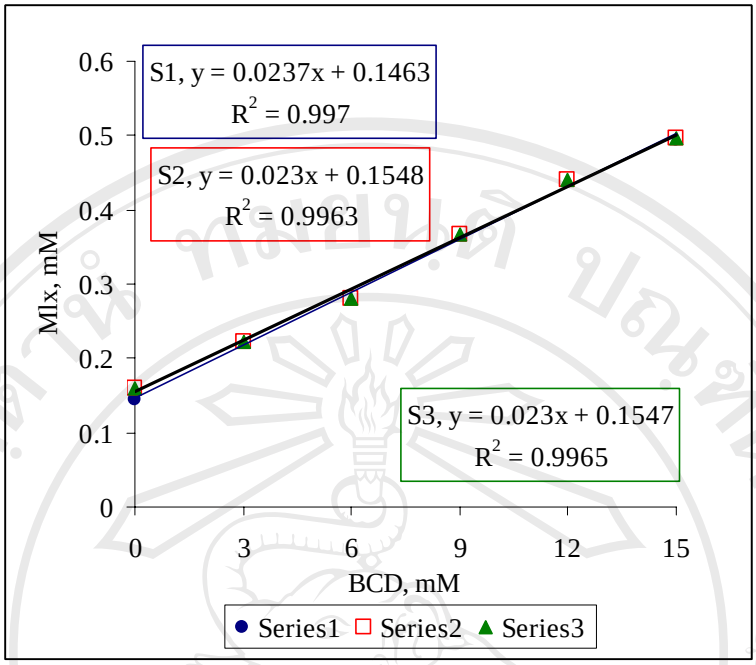

Figure 24 Phase solubility diagrams of meloxicam (Mlx)-BCD inclusion complex in pH 6.0 at 37°C

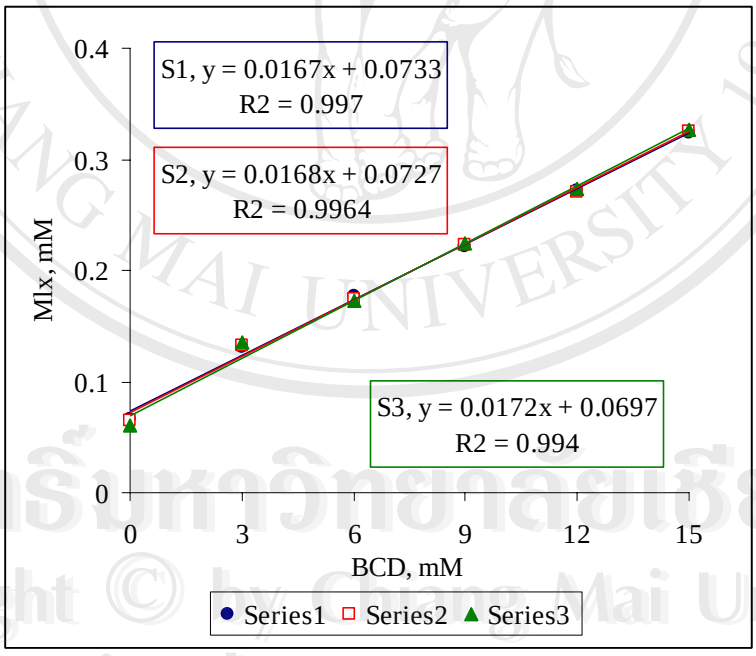

Figure 25 Phase solubility diagrams of meloxicam (Mlx)-BCD inclusion complex in pH 6.0 at 45°C

Table 6 Solubility of meloxicam-GCD inclusion complex in pH 6.0 at different temperatures

T,°C	GCD, mM	Meloxicam, mM			
		Series 1	Series 1	Series 1	Mean±SD
25	0	0.066	0.065	0.060	0.064±0.003
	3	0.078	0.081	0.084	0.081±0.000
	6	0.109	0.112	0.114	0.112±0.002
	9	0.138	0.135	0.130	0.135±0.004
	12	0.152	0.150	0.151	0.151±0.001
	15	0.174	0.171	0.164	0.170±0.005
30	0	0.096	0.087	0.098	0.094±0.006
	3	0.125	0.125	0.125	0.125±0.000
	6	0.150	0.153	0.154	0.152±0.002
	9	0.181	0.181	0.183	0.182±0.001
	12	0.206	0.205	0.206	0.206±0.000
	15	0.235	0.230	0.231	0.231±0.003
37	0	0.144	0.160	0.159	0.154±0.009
	3	0.189	0.190	0.192	0.191±0.001
	6	0.236	0.237	0.238	0.237±0.001
	9	0.272	0.273	0275	0.273±0.001
	12	0.311	0.308	0.307	0.309±0.002
	15	0.342	0.347	0.358	0.349±0.008
45	0	0.283	0.290	0.275	0.283±0.008
	3	0.340	0.339	0.336	0.338±0.002
	6	0.386	0.392	0.401	0.393±0.007
	9	0.446	0.445	0.438	0.443±0.005
	12	0.507	0.504	0.502	0.504±0.002
	15	0.557	0.557	0.558	0.558±0.001

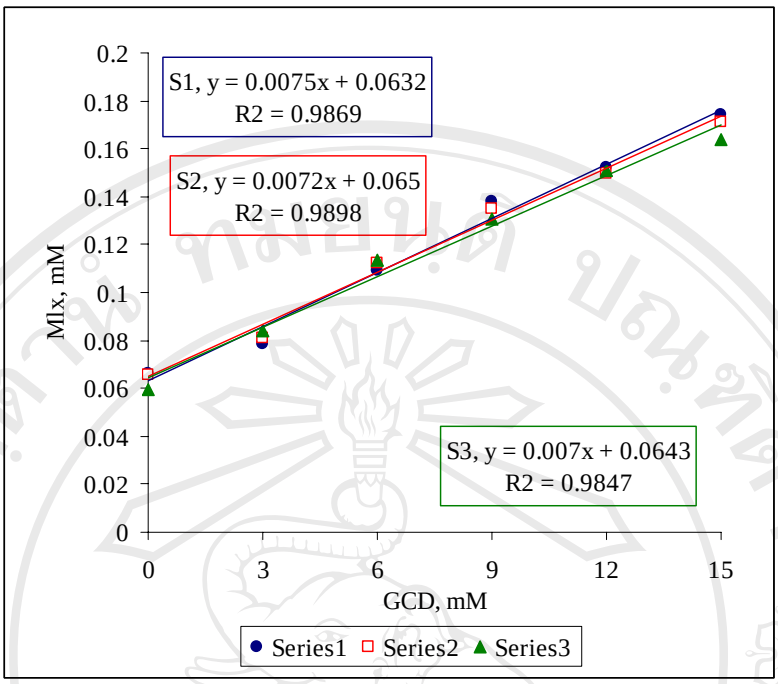

Figure 26 Phase solubility diagrams of meloxicam (Mlx)-GCD inclusion complex in pH 6.0 at 25°C

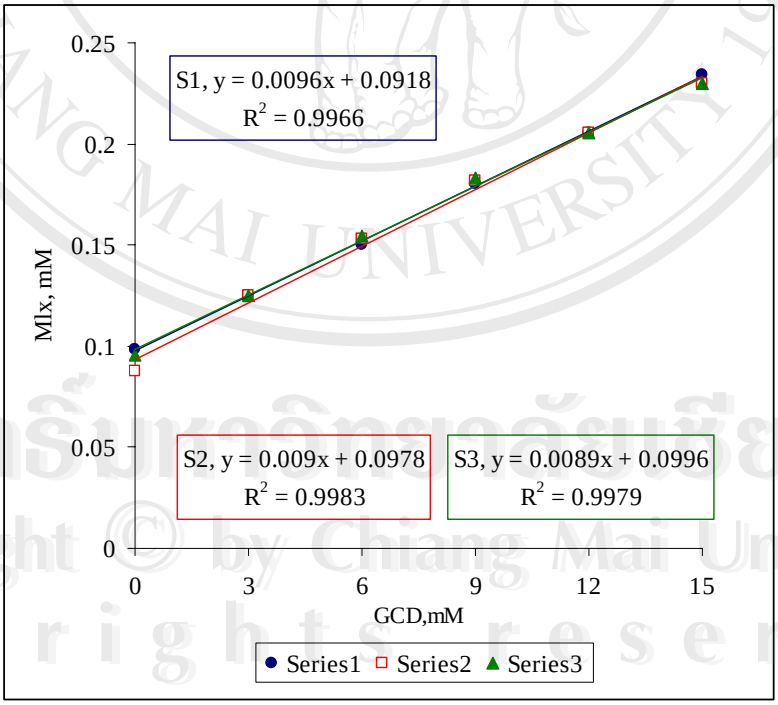

Figure 27 Phase solubility diagrams of meloxicam (Mlx)-GCD inclusion complex in pH 6.0 at 30°C

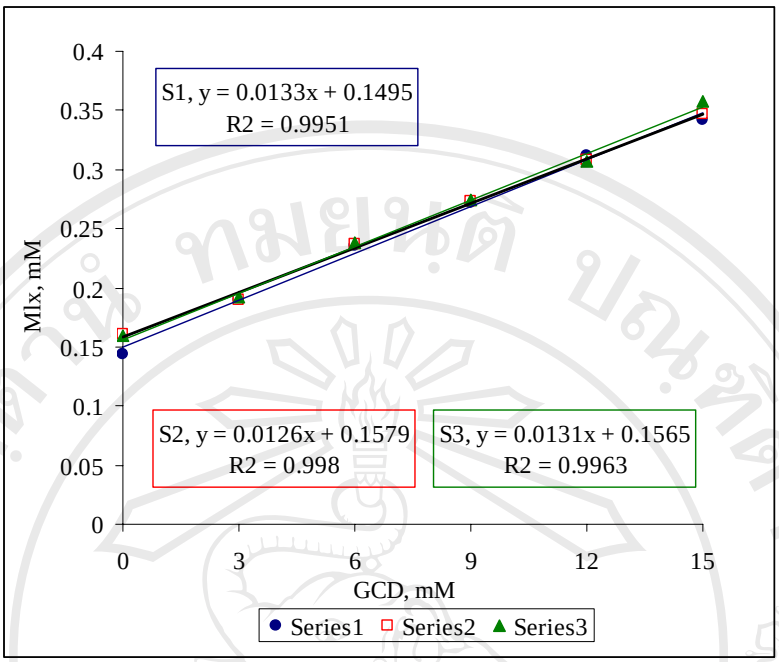

Figure 28 Phase solubility diagrams of meloxicam (Mlx)-GCD inclusion complex in pH 6.0 at 37°C

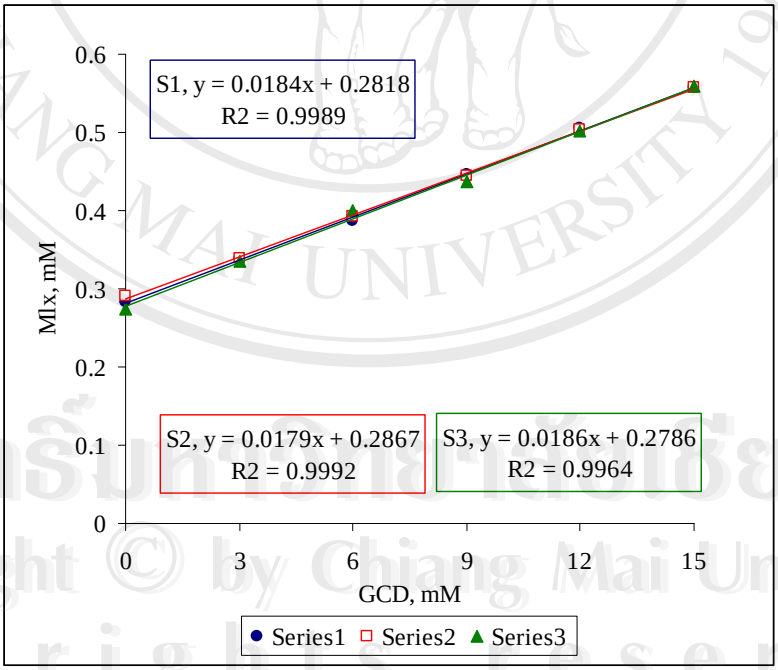

Figure 29 Phase solubility diagrams of meloxicam (Mlx)-GCD inclusion complex in pH 6.0 at 45°C

Table 7 Solubility of meloxicam-HPBCD inclusion complex in solution pH 6.0 at various temperatures

T,°C	HPBCD, mM	Meloxicam, mM			
		Series 1	Series 1	Series 1	Mean±SD
25	0	0.066	0.065	0.060	0.064±0.003
	5	0.185	0.187	0.190	0.187±0.002
	10	0.267	0.269	0.272	0.269±0.002
	20	0.415	0.423	0.440	0.426±0.012
	30	0.625	0.633	0.631	0.630±0.004
	50	0.920	0.986	1.018	0.975±0.050
30	0	0.096	0.087	0.098	0.094±0.006
	5	0.218	0.217	0.216	0.217±0.001
	10	0.309	0.324	0.331	0.321±0.011
	20	0.591	0.578	0.553	0.574±0.019
	30	0.757	0.747	0.744	0.749±0.007
	50	1.129	1.152	1.159	1.147±0.016
37	0	0.144	0.160	0.159	0.154±0.009
	5	0.315	0.316	0.320	0.317±0.003
	10	0.469	0.476	0.474	0.472±0.002
	20	0.803	0.807	0.812	0.807±0.004
	30	1.082	1.095	1.104	1.093±0.011
	50	1.546	1.567	1.608	1.574±0.031
45	0	0.283	0.290	0.275	0.283±0.008
	5	0.505	0.508	0.514	0.509±0.004
	10	0.707	0.720	0.727	0.718±0.010
	20	1.121	1.121	1.124	1.122±0.002
	30	1.470	1.470	1.467	1.469±0.002
	50	2.052	2.047	2.039	2.046±0.007

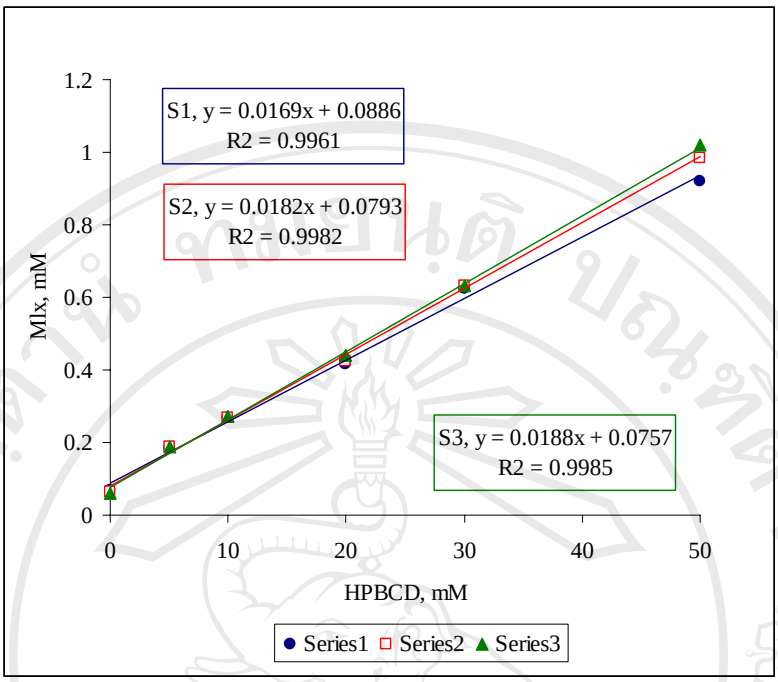

Figure 30 Phase solubility diagrams of meloxicam (Mlx)-HPBCD inclusion complex in pH 6.0 at 25°C

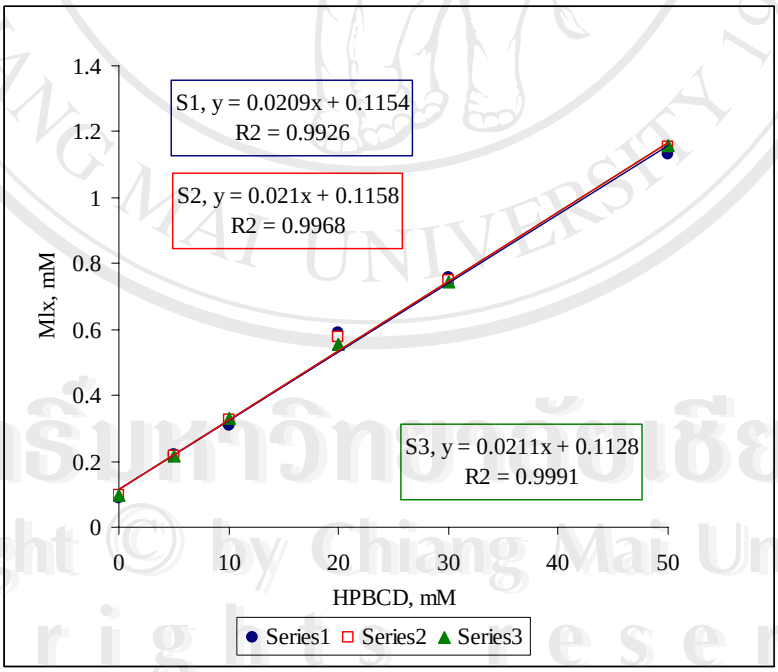

Figure 31 Phase solubility diagrams of meloxicam (Mlx)-HPBCD inclusion complex in pH 6.0 at 30°C

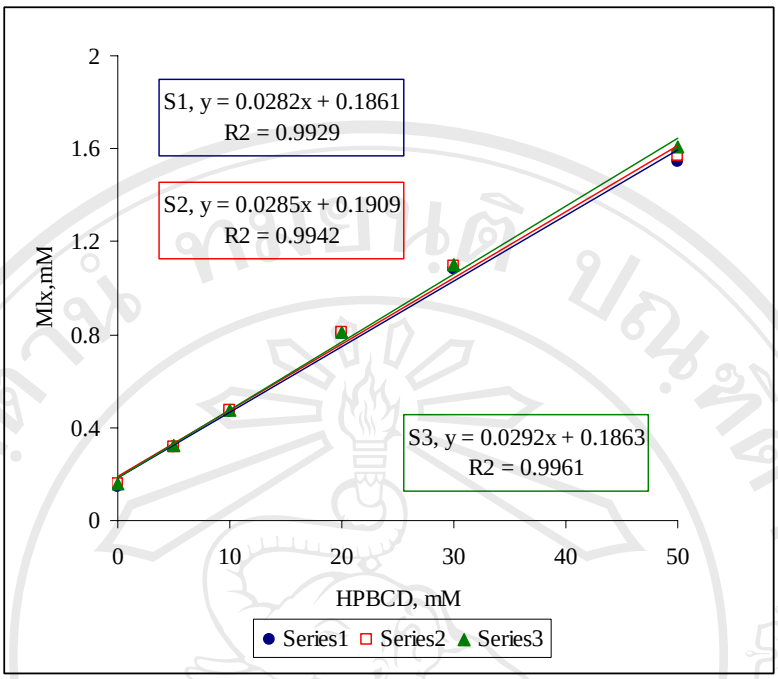

Figure 32 Phase solubility diagrams of meloxicam (Mlx)-HPBCD inclusion complex in pH 6.0 at 37°C

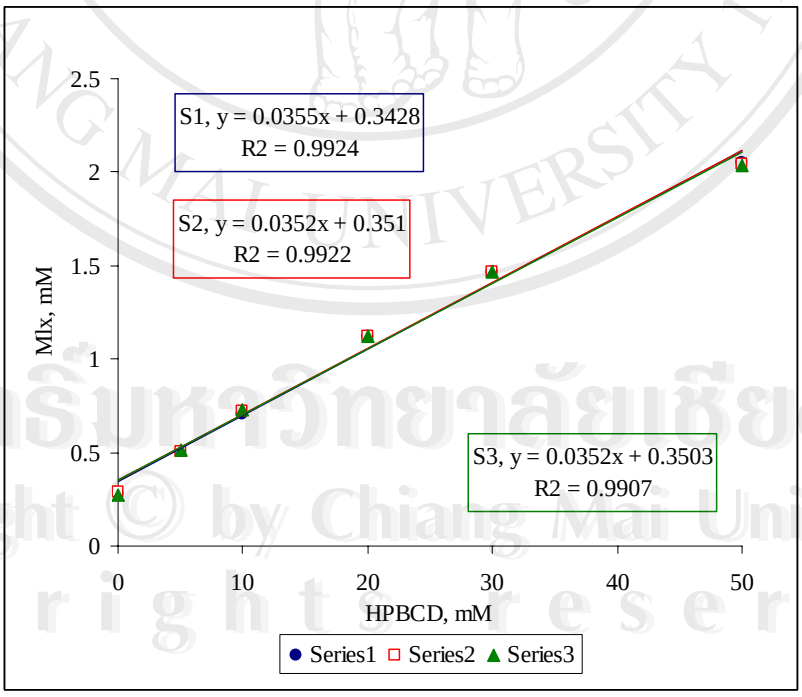

Figure 33 Phase solubility diagrams of meloxicam (Mlx)-HPBCD inclusion complex in pH 6.0 at 45°C

Table 8 Solubility of meloxicam-HPGCD inclusion complex in pH 6.0 at different temperatures

T,°C	HPBCD, mM	Meloxicam, mM			
		Series 1	Series 1	Series 1	Mean±SD
25	0	0.066	0.065	0.060	0.064±0.003
	5	0.125	0.127	0.129	0.127±0.002
	10	0.174	0.175	0.176	0.175±0.001
	20	0.244	0.246	0.250	0.247±0.003
	30	0.356	0.355	0.355	0.355±0.000
	50	0.512	0.507	0.502	0.507±0.005
30	0	0.087	0.096	0.098	0.094±0.006
	5	0.157	0.159	0.164	0.160±0.004
	10	0.210	0.209	0.209	0.209±0.001
	20	0.318	0.321	0.327	0.322±0.004
	30	0.415	0.411	0.410	0.412±0.003
	50	0.637	0.641	0.646	0.642±0.005
37	0	0.144	0.160	0.159	0.154±0.009
	5	0.246	0.245	0.244	0.245±0.001
	10	0.315	0.324	0.329	0.323±0.007
	20	0.485	0.486	0.489	0.486±0.002
	30	0.633	0.644	0.649	0.642±0.008
	50	0.914	0.923	0.937	0.925±0.011
45	0	0.283	0.290	0.275	0.283±0.008
	5	0.412	0.416	0.423	0.417±0.005
	10	0.519	0.511	0.508	0.512±0.006
	20	0.747	0.749	0.755	0.750±0.004
	30	0.944	0.938	0.935	0.939±0.004
	50	1.323	1.330	1.349	1.334±0.013

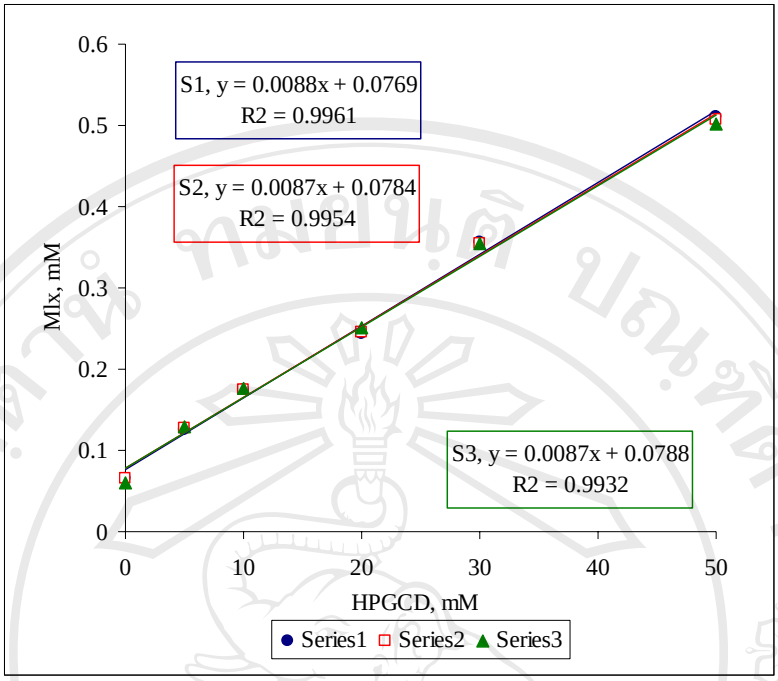

Figure 34 Phase solubility diagrams of meloxicam (Mlx)-HPGCD inclusion complex in pH 6.0 at 25°C

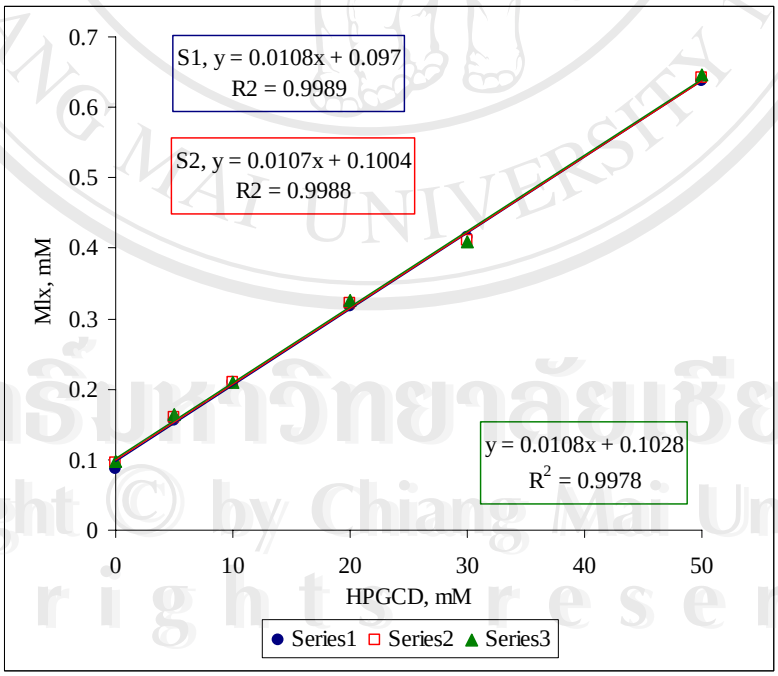

Figure 35 Phase solubility diagrams of meloxicam (Mlx)-HPGCD inclusion complex in pH 6.0 at 30°C

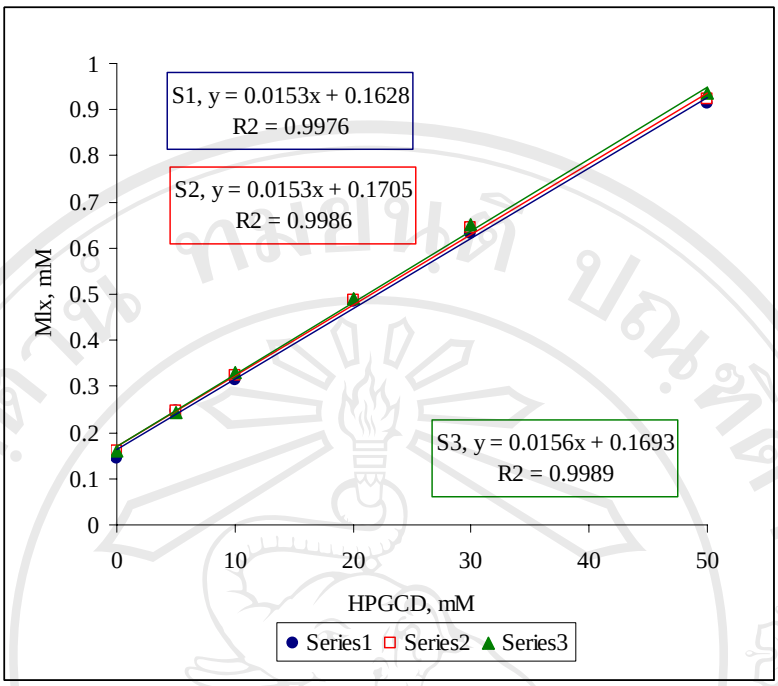

Figure 36 Phase solubility diagrams of meloxicam (Mlx)-HPGCD inclusion complex in pH 6.0 at 37°C

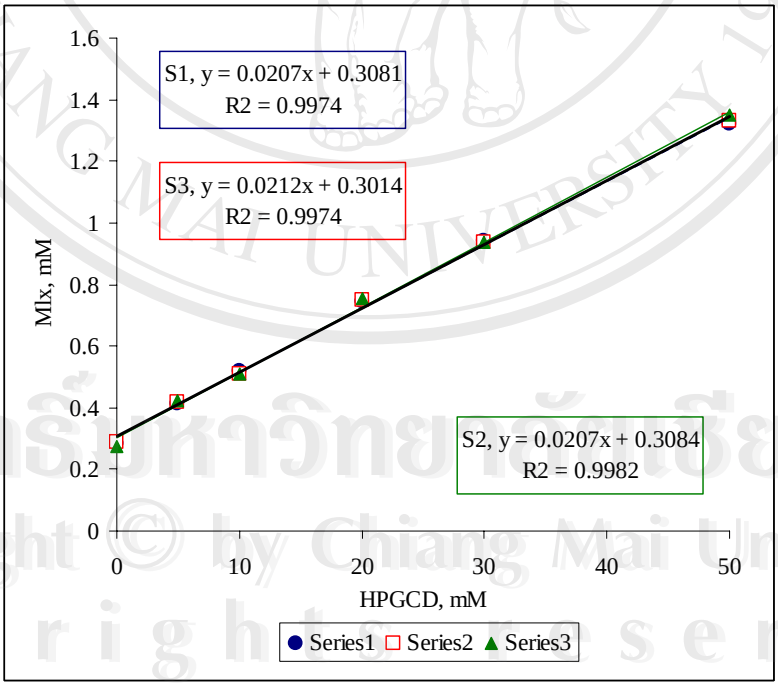

Figure 37 Phase solubility diagrams of meloxicam (Mlx)-HPGCD inclusion complex in pH 6.0 at 45°C

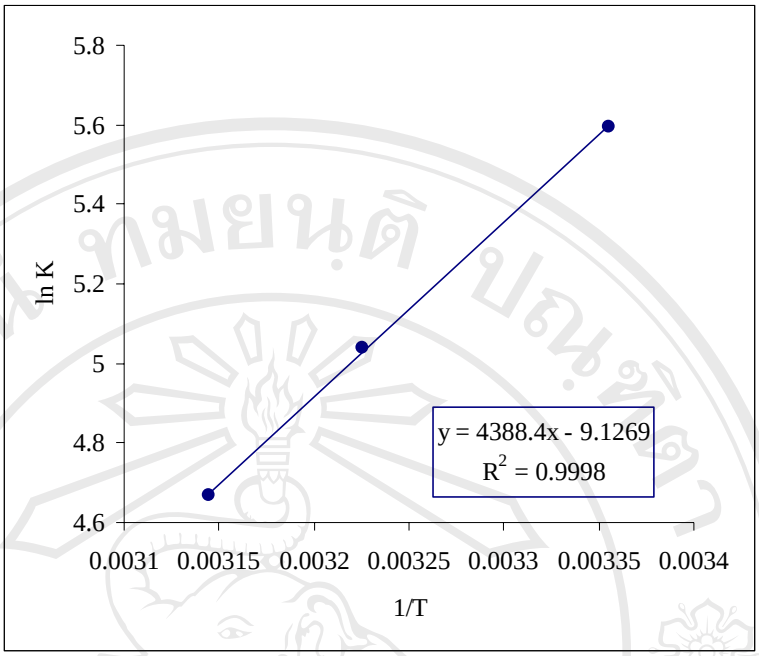

Figure 38 Van't Hoff plot of meloxicam-BCD inclusion complex in solution pH 6.0

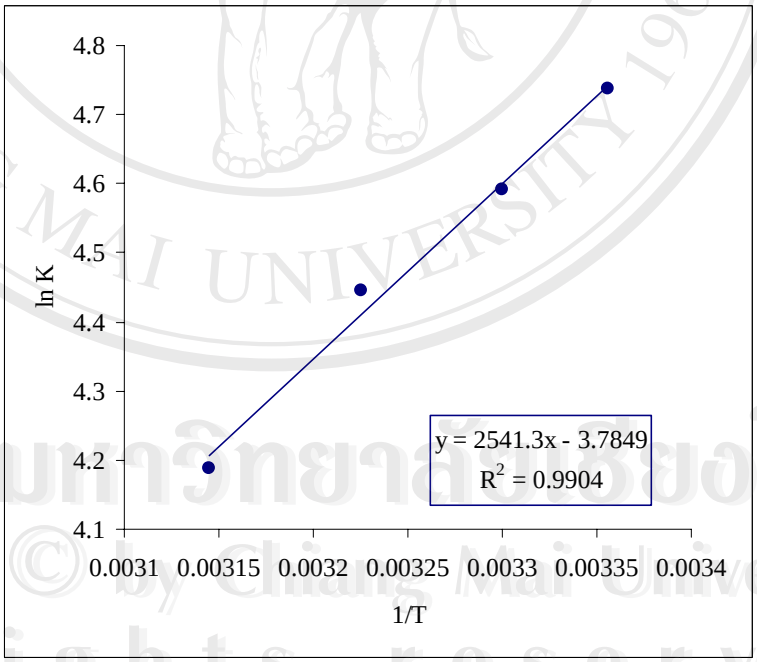

Figure 39 Van't Hoff plot of meloxicam-GCD inclusion complex in solution pH 6.0

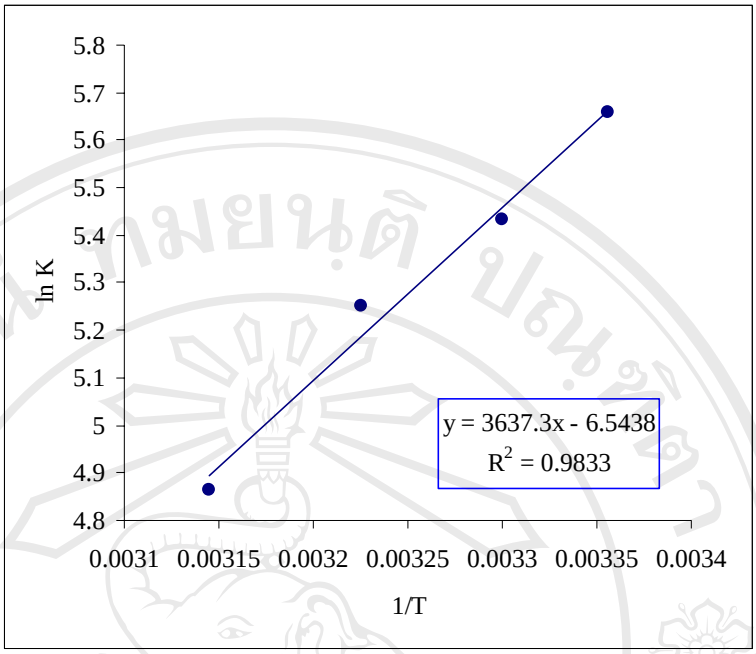

Figure 40 Van't Hoff plot of meloxicam-HPBCD inclusion complex in solution pH 6.0

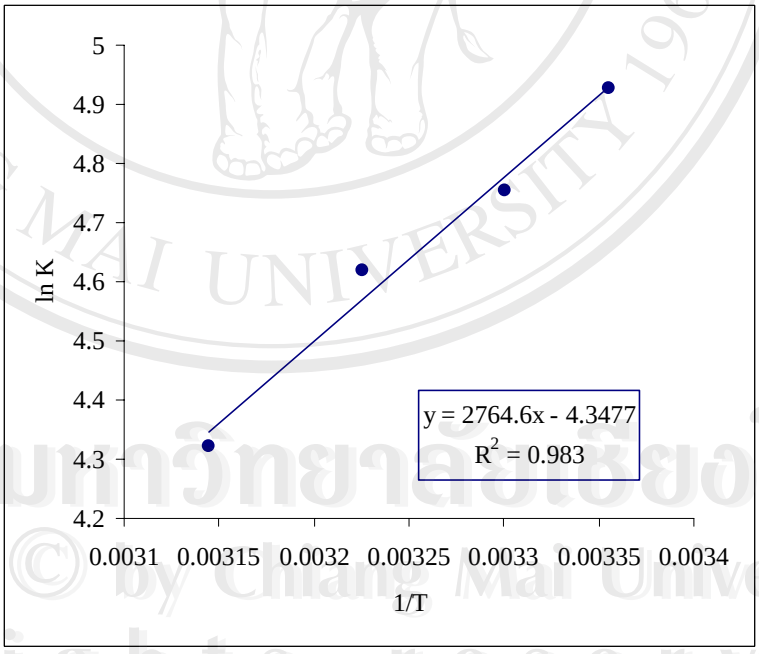

Figure 41 Van't Hoff plot of meloxicam-HPGCD inclusion complex in solution pH 6.0

Appendix C

Table 1 Mean concentration (mcg/ml) of piroxicam (n=6) from the intact drug and the physical mixtures of piroxicam- beta-cyclodextrin at various molar ratios(initially prepared)

Time,min	Concentration,mcg/ml			
	Prx	PM1:1	PM1:2	PM2:1
0	0	0	0	0
5	0.734	1.283	2.026	1.651
10	0.940	2.863	3.089	2.274
15	1.541	4.566	3.930	2.876
30	3.198	8.298	5.849	4.191
45	4.557	11.403	7.202	5.307
60	5.767	13.616	8.223	6.188
90	7.579	15.956	9.611	7.751

Table 2 Mean concentration (mcg/ml) of piroxicam (n=6) from the inclusion complex of piroxicam- beta-cyclodextrin at various molar ratios prepared by kneading method (initially prepared)

Time,min.	Concentration, mcg/ml		
	KN 1:1	KN 1:2	KN 2:1
0	0	0	0
3	6.958	8.840	2.540
5	10.933	10.944	4.588
10	14.413	12.942	8.044
15	15.514	15.660	10.171
30	18.166	18.216	13.451
45	19.103	18.570	15.043
60	19.828	18.878	16.094
90	20.574	19.237	17.347

Table 3 Mean concentration (mcg/ml) of piroxicam (n=6) from the inclusion complex of piroxicam- beta-cyclodextrin at various molar ratios prepared by co-evaporation method (initially prepared)

Time,min	Concentration,mcg/ml		
	COE1:1	COE1:2	COE2:1
0	0	0	0
5	2.144	2.848	1.555
10	3.320	7.537	2.920
15	4.411	10.581	4.384
30	7.023	15.166	9.342
45	8.787	17.405	12.623
60	10.014	17.91	14.574
90	11.585	19.256	16.898

Table 4 Mean concentration (mcg/ml) of piroxicam (n=6) from the inclusion complex of piroxicam-beta-cyclodextrin at various molar ratios prepared by lyophilization method (initially prepared)

Time,min	Concentration,mcg/ml		
	COL 1:1	COL 1:2	COL 2:1
0	0	0	0
3	22.257	21.985	18.545
6	21.910	21.256	19.622
9	21.890	21.275	20.305
15	21.006	20.933	20.996
30	21.025	21.047	21.011

Table 5 Mean concentration (mcg/ml) of piroxicam (n=6) from the physical mixtures of piroxicam-gamma-cyclodextrin at various molar ratios(initially prepared)

Time, min	Concentration,mcg/ml		
	PM1:1	PM1:2	PM2:1
0	0	0	0
5	2.129	6.114	2.186
10	4.648	8.823	4.685
15	6.939	10.604	7.010
30	11.246	14.679	11.065
45	14.041	17.069	13.583
60	15.667	18.418	14.941
90	17.664	19.714	16.411

Table 6 Mean concentration (mcg/ml) of piroxicam (n=6) from the inclusion complex of piroxicam-gamma-cyclodextrin at various molar ratios prepared by kneading method (initially prepared)

Time,min	Concentration,mcg/ml		
	KN1:1	KN1:2	KN2:1
0	0	0	0
3	20.647	20.910	7.237
5	21.413	21.391	10.743
10	21.555	21.051	15.599
15	21.737	21.651	17.631
30	21.617	21.716	19.838
45	21.467	21.655	20.827
60	21.577	22.200	21.405
90	21.597	20.758	22.200

Table 7 Mean concentration (mcg/ml) of piroxicam (n=6) from the inclusion complex of piroxicam-gamma-cyclodextrin at various molar ratios prepared by co-evaporation method (initially prepared)

Time,min	Concentration,mcg/ml		
	COE1:1	COE1:2	COE2:1
0	0	0	0
5	18.964	20.900	10.437
10	19.945	20.969	11.516
15	19.971	20.766	12.550
30	20.643	21.127	14.393
45	21.123	21.058	15.843
60	21.043	20.675	16.980
90	21.410	20.501	18.511

Table 8 Mean concentration (mcg/ml) of piroxicam (n=6) from the inclusion complex of piroxicam-gamma-cyclodextrin at various molar ratios prepared by lyophilization method (initially prepared)

Time,min	Concentration,mcg/ml		
	COL 1:1	COL 1:2	COL 2:1
0	0	0	0
3	20.558	20.478	15.705
6	20.535	20.392	16.787
9	20.461	20.312	16.959
15	20.306	20.118	17.267
30	19.889	19.938	17.304

Table 9 Mean concentration (mcg/ml) of piroxicam (n=6) from the physical mixtures of piroxicam- hydroxypropyl-beta-cyclodextrin at various molar ratios(initially prepared)

Time,min	Concentration,mcg/ml		
	PM1:1	PM1:2	PM2:1
0	0	0	0
5	4.720	8.486	3.832
10	6.922	11.136	5.659
15	8.560	12.753	6.989
30	11.475	15.583	9.702
45	13.508	16.887	11.946
60	14.693	17.733	13.307
90	16.467	18.660	14.190

Table 10 Mean concentration (mcg/ml) of piroxicam (n=6) from the inclusion complex of piroxicam- hydroxypropyl-beta -cyclodextrin at various molar ratios prepared by kneading method (initially prepared)

Time,min	Concentration,mcg/ml		
	KN1:1	KN1:2	KN2:1
0	0	0	0
3	8.721	8.442	6.253
5	12.615	11.987	10.138
10	16.641	15.960	14.839
15	18.135	16.906	16.639
30	20.548	19.639	18.949
45	21.366	21.073	20.365
60	21.671	21.568	21.449
90	22.200	22.200	22.200

Table 11 Mean concentration (mcg/ml) of piroxicam (n=6) from the inclusion complex of piroxicam- hydroxypropyl-beta -cyclodextrin at various molar ratios prepared by co-evaporation method (initially prepared)

Time,min	Concentration,mcg/ml		
	COE1:1	COE1:2	COE2:1
0	0	0	0
5	3.631	5.308	4.740
10	7.539	10.683	9.150
15	10.304	13.395	12.642
30	15.985	17.378	18.638
45	18.852	19.419	19.487
60	20.423	20.185	20.187
90	21.755	20.815	20.421

Table 12 Mean concentration (mcg/ml) of piroxicam (n=6) from the inclusion complex of piroxicam- hydroxypropyl-beta -cyclodextrin at various molar ratios prepared by lyophilization method (initially prepared)

Time,min	Concentration,mcg/ml		
	COL 1:1	COL 1:2	COL 2:1
0	0	0	0
3	21.322	21.576	19.173
5	21.826	21.434	19.441
10	22.200	20.699	18.796
15	22.062	20.500	18.703
30	22.102	20.611	18.566

Table 13 Mean concentration (mcg/ml) of piroxicam (n=6) from the physical mixtures of piroxicam- methylated-beta-cyclodextrin at various molar ratios(initially prepared)

Time,min.	Concentration,mcg/ml		
	PM1:1	PM1:2	PM2:1
0	0	0	0
3	2.669	2.739	1.968
5	4.050	4.167	2.987
10	6.206	6.344	4.657
15	7.589	7.611	5.948
30	10.247	9.940	8.456
45	12.164	11.656	10.471
60	13.594	12.992	11.811
90	15.470	14.761	13.746

Table 14 Mean concentration (mcg/ml) of piroxicam (n=6) from the inclusion complex of piroxicam- methylated-beta -cyclodextrin at various molar ratios prepared by kneading method (initially prepared)

Time,min	Concentration,mcg/ml		
	KN1:1	KN1:2	KN2:1
0	0	0	0
3	8.445	9.727	7.321
5	10.457	11.827	9.834
10	12.635	13.858	12.431
15	13.828	14.202	13.745
30	14.821	15.993	14.780
45	15.914	16.673	15.925
60	16.479	17.133	16.455
90	17.109	17.690	17.260

Table 15 Mean concentration (mcg/ml) of piroxicam (n=6) from the inclusion complex of piroxicam- methylated-beta -cyclodextrin at various molar ratios prepared by co-evaporation method (initially prepared)

Time,min	Concentration,mcg/ml		
	COE1:1	COE1:2	COE2:1
0	0	0	0
5	5.395	9.802	5.730
10	12.006	12.990	9.630
15	15.781	15.819	13.072
30	19.618	19.480	17.509
45	21.235	20.483	18.877
60	22.024	21.035	19.335
90	22.200	21.058	19.289

Table 16 Mean concentration (mcg/ml) of piroxicam (n=6) from the inclusion complex of piroxicam- methylated-beta -cyclodextrin at various molar ratios prepared by lyophilization method (initially prepared)

Time,min	Concentration,mcg/ml		
	COL 1:1	COL 1:2	COL 2:1
0	0	0	0
3	19.058	20.107	15.312
6	19.115	20.709	16.403
9	19.282	20.646	17.099
15	19.142	20.420	17.438
30	19.113	20.315	17.784
45	19.204	20.095	18.062
60	19.046	20.039	17.984
90	19.053	20.045	18.266

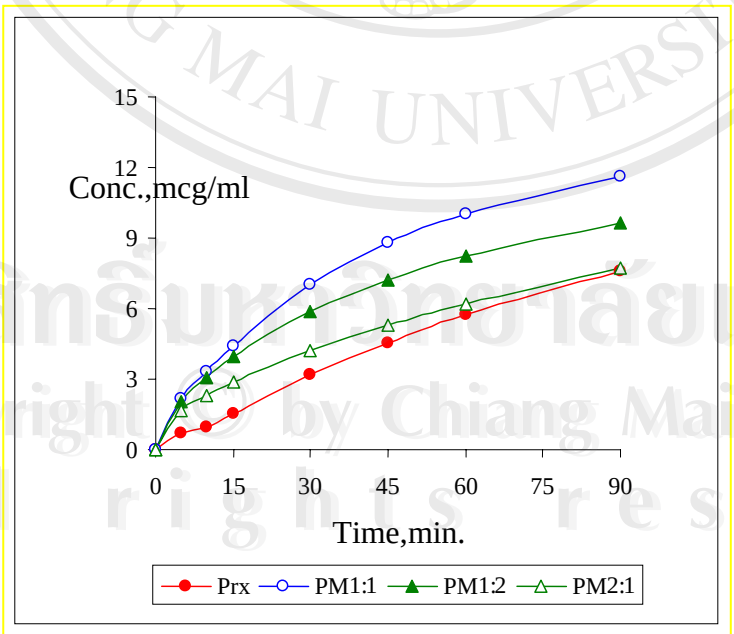

Figure 52 Dissolution profiles of piroxicam in distilled water from intact drug (Prx) and Prx:BCD physical mixture at 1:1 (PM 1:1), 1:2 (PM 1:2) and 2:1 (PM 2:1) molar ratios initially prepared.

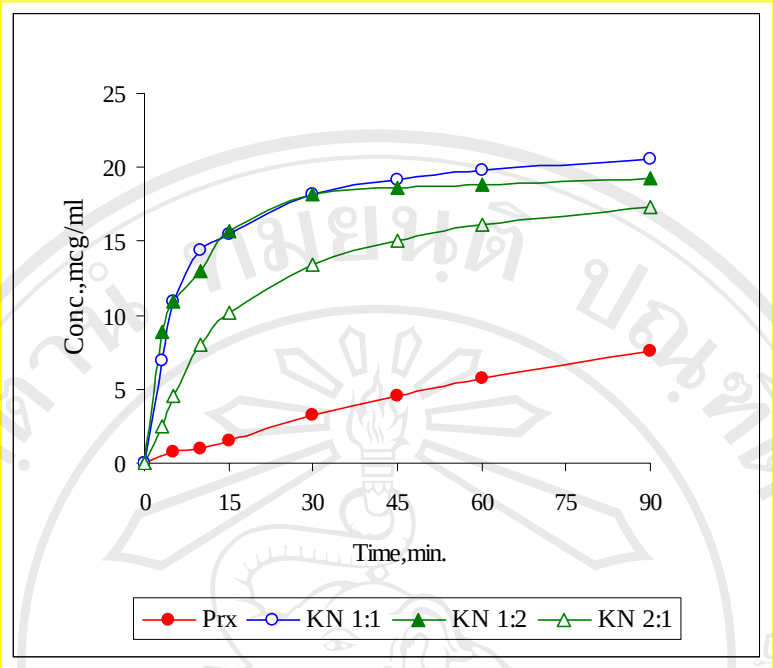

Figure 53 Dissolution profiles of piroxicam in distilled water from intact drug (Prx) and Prx:BCD inclusion complexes of 1:1 (KN 1:1), 1:2 (KN 1:2) and 2:1 (KN 2:1) molar ratios initially prepared by kneading method.

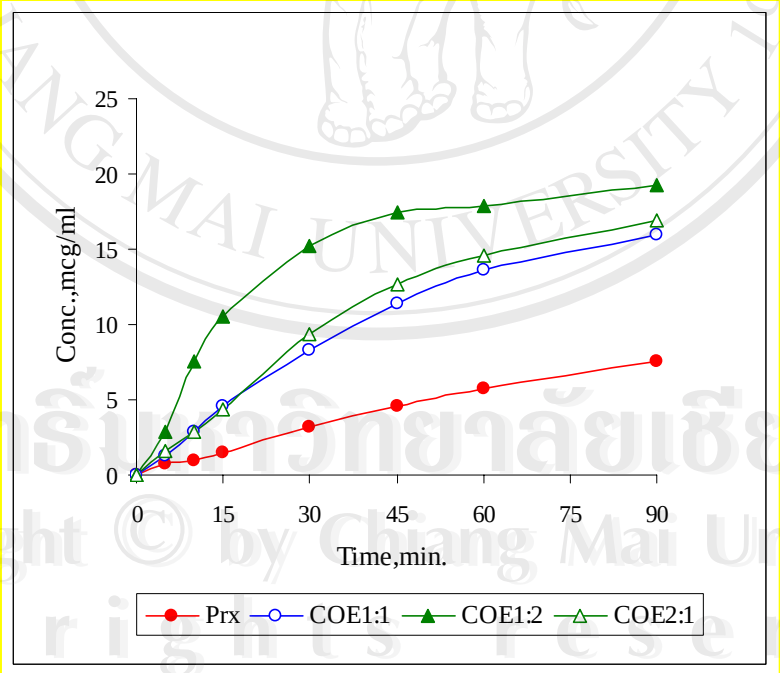

Figure 54 Dissolution profiles of piroxicam in distilled water from intact drug (Prx) and Prx:BCD inclusion complexes of 1:1 (COE 1:1), 1:2 (COE 1:2) and 2:1 (COE 2:1) molar ratios initially prepared by co-evaporation method.

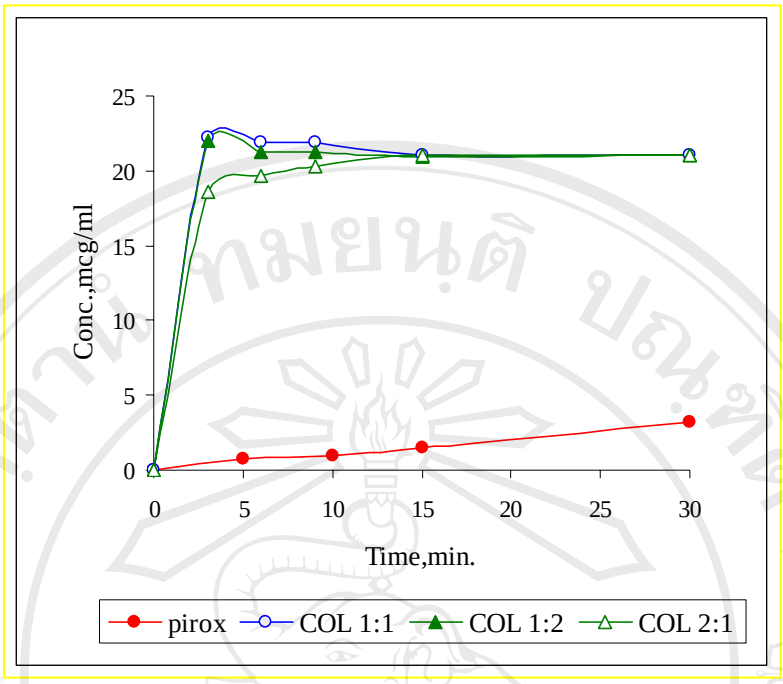

Figure 55 Dissolution profiles of piroxicam in distilled water from intact drug (Prx) and Prx:BCD inclusion complexes of 1:1 (COL 1:1), 1:2 (COL 1:2) and 2:1 (COL 2:1) molar ratios initially prepared by co-lyophilization method.

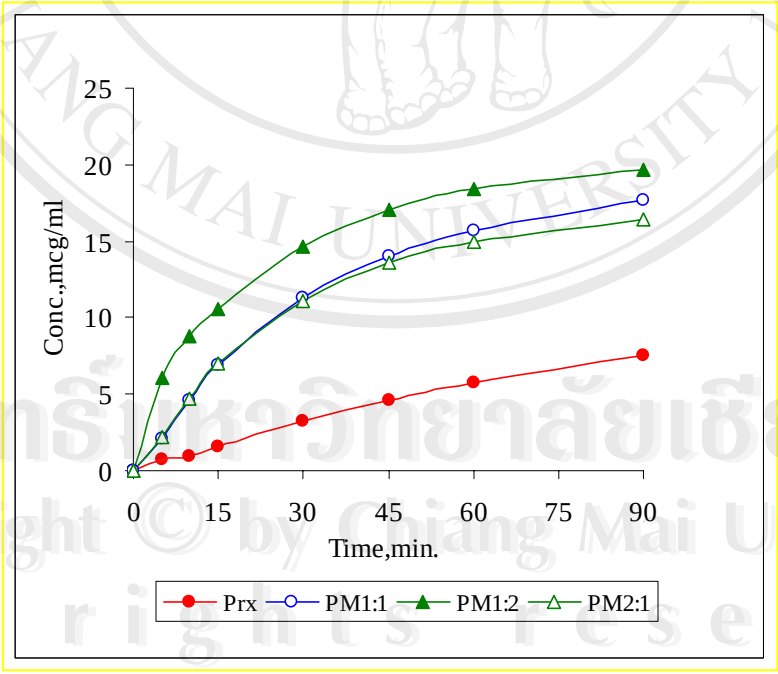

Figure 56 Dissolution profiles of piroxicam in distilled water from intact drug (Prx) and Prx:GCD physical mixture at 1:1 (PM 1:1), 1:2 (PM 1:2) and 2:1 (PM 2:1) molar ratios initially prepared.

Table 36 Dissolution parameters of piroxicam in distilled water from intact drug (Prx), Prx:BCD physical mixture and inclusion complexes initially prepared by kneading (KN), co-evaporation (COE) and lyophilization (COL) method at different molar ratios

	Prx : BCD	AUC 0-30min	%DE30	$t_{50\%}$ (min.)
Prx	1:0	214.980±7.567	7.17±0.252	>30
PM	1:1	577.220±21.036	19.24±0.701	>30
	1:2	489.400±18.799	16.31±0.627	>30
	2:1	359.250±19.641	11.98±0.655	>30
KN	1:1	1886.150±32.123	62.870±1.071	<30
	1:2	1882.680±24.643	62.760±0.821	<30
	2:1	1193.620±26.272	39.790±0.876	<30
COE	1:1	558.520±34.52	18.620±1.152	>30
	1:2	1221.780±31.796	40.730±1.059	<30
	2:1	613.320±27.734	20.440±0.924	>30
COL	1:1	2731.320±46.786	91.040±1.560	<30
	1:2	2713.410±36.914	90.450±1.231	<30
	2:1	2525.310±40.518	84.180±1.351	<30

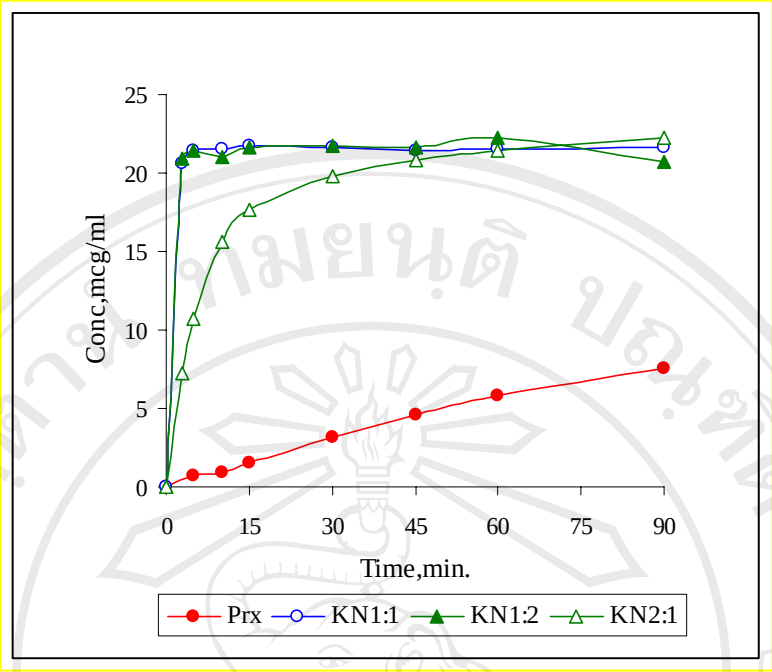

Figure 57 Dissolution profiles of piroxicam in distilled water from intact drug (Prx) and Prx:GCD inclusion complexes of 1:1 (KN 1:1), 1:2 (KN 1:2) and 2:1(KN 2:1) molar ratios initially prepared by kneading method.

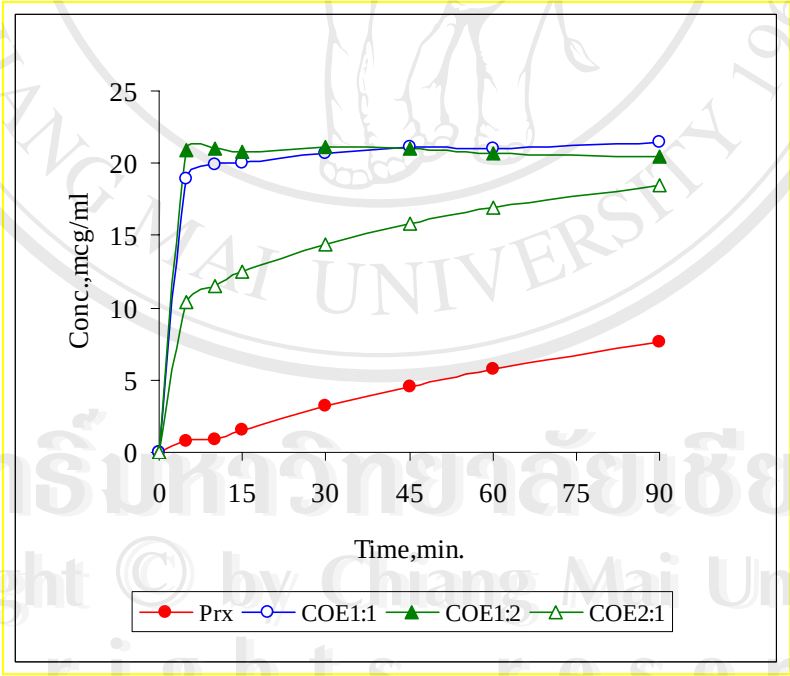

Figure 58 Dissolution profiles of piroxicam in distilled water from intact drug (Prx) and Prx:GCD inclusion complexes of 1:1 (COE 1:1), 1:2 (COE 1:2) and 2:1 (COE 2:1) molar ratios initially prepared by co-evaporation method.

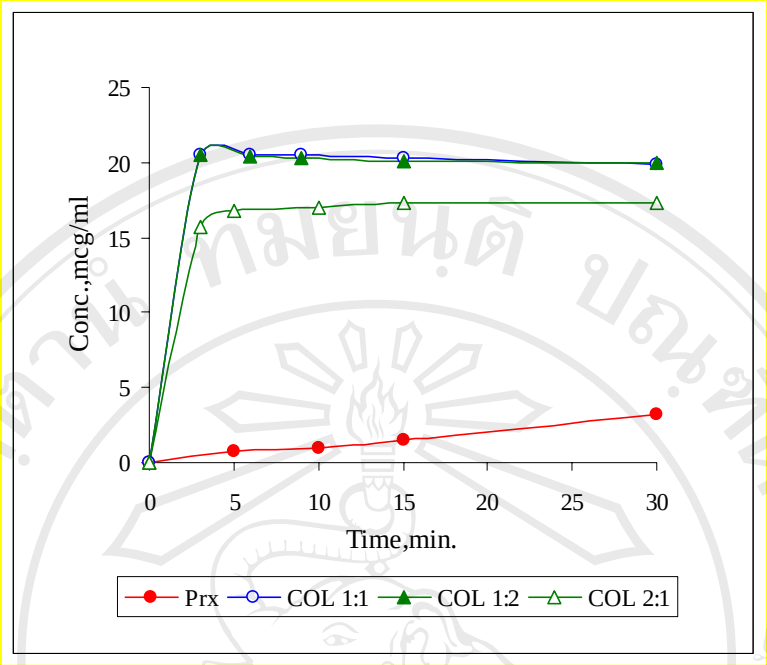

Figure 59 Dissolution profiles of piroxicam in distilled water from intact drug (Prx) and Prx:GCD inclusion complexes of 1:1 (COL 1:1), 1:2 (COL 1:2) and 2:1 (COL 2:1) molar ratios initially prepared by co-evaporation method.

Table 37 Dissolution parameters of piroxicam in distilled water from intact drug (Prx); Prx:GCDs physical mixture and inclusion complexes initially prepared by kneading (KN), co-evaporation (COE) and co-lyophilization (COL) method at different molar ratios

	Prx : GCD	AUC 0-30min	%DE30	$t_{50\%}$ (min.)
Prx	1:0	214.98±7.567	7.17±0.252	>30
PM	1:1	844.37±22.508	28.15±0.75	>30
	1:2	1308.81±33.037	43.63±1.101	<30
	2:1	843.58±20.774	28.12±0.692	>30
KN	1:1	2762.54±43.961	92.08±1.465	<30
	1:2	2753.28±37.812	91.78±1.261	<30
	2:1	2064.73±33.938	68.82±1.131	<30
COE	1:1	2471.09±37.452	82.37±1.248	<30
	1:2	2589.82±36.719	86.33±1.224	<30
	2:1	1544.61±30.021	51.49±1.00	>30
COL	1:1	2600.36±44.449	86.68±1.482	<30
	1:2	2587.05±41.696	86.24±1.389	<30
	2:1	2183.90±34.325	72.80±1.144	<30

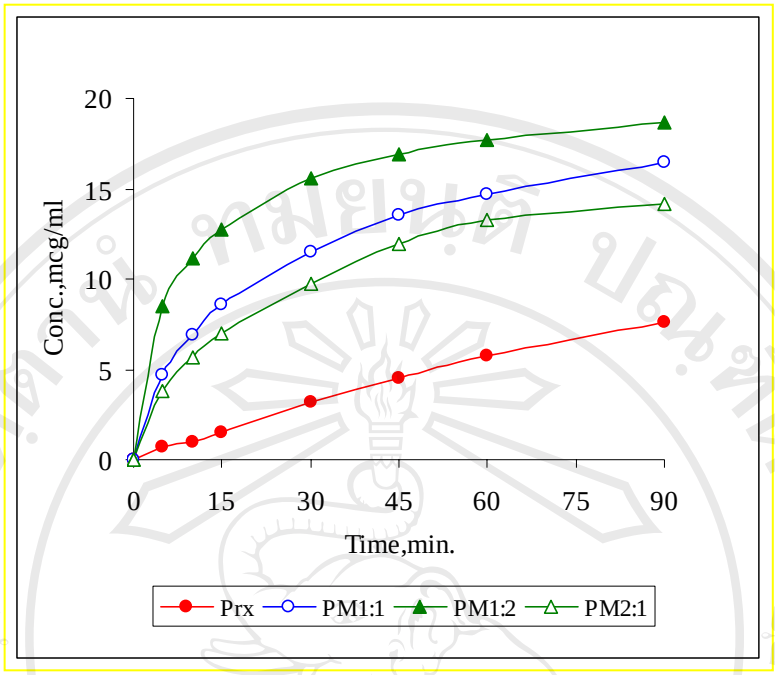

Figure 60 Dissolution profiles of piroxicam in distilled water from intact drug (Prx) and Prx:HPBCD physical mixture at 1:1 (PM 1:1), 1:2 (PM 1:2) and 2:1 (PM 2:1) molar ratios initially prepared

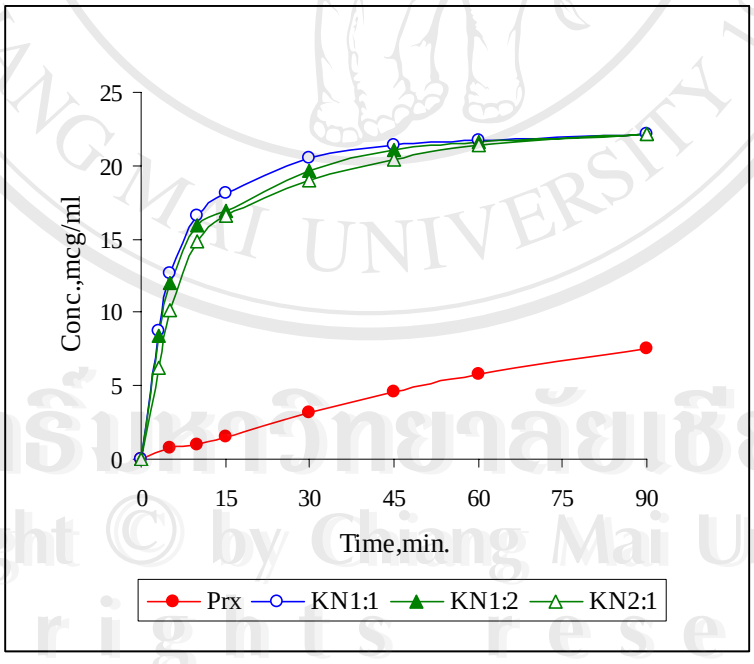

Figure 61 Dissolution profiles of piroxicam in distilled water from intact drug (Prx) and Prx:HPBCD inclusion complexes of 1:1 (KN 1:1), 1:2 (KN 1:2) and 2:1 (KN 2:1) molar ratios initially prepared by kneading method.

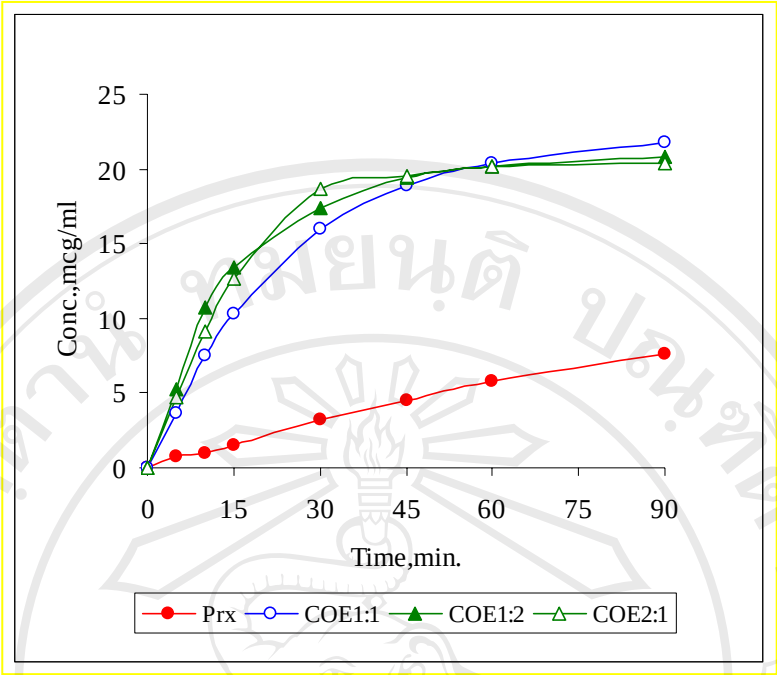

Figure 62 Dissolution profiles of piroxicam in distilled water from intact drug (Prx) and Prx:HPBCD inclusion complexes of 1:1 (COE 1:1), 1:2 (COE 1:2) and 2:1 (COE 2:1) molar ratios initially prepared by co-evaporation method.

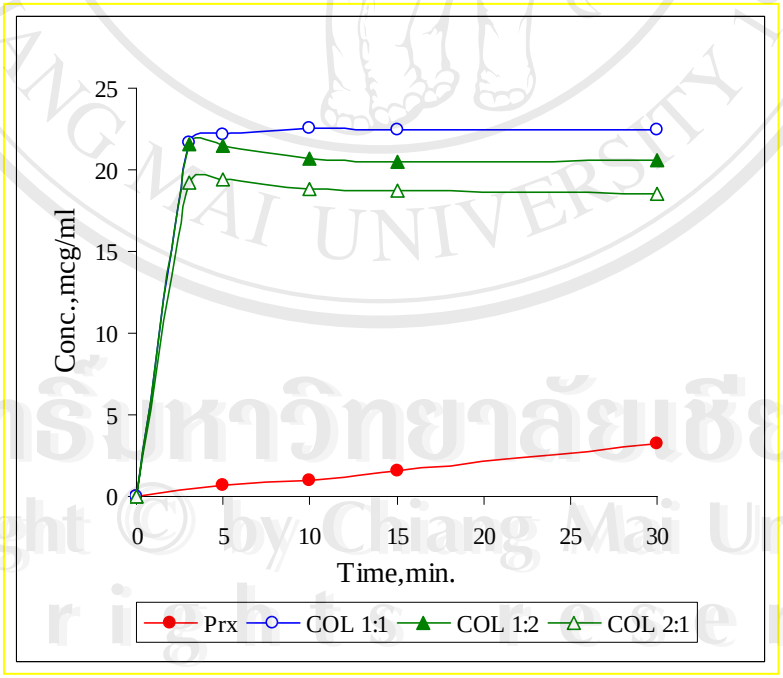

Figure 63 Dissolution profiles of piroxicam in distilled water from intact drug (Prx) and Prx:HPBCD inclusion complexes of 1:1 (COL 1:1), 1:2 (COL 1:2) and 2:1 (COL 2:1) molar ratios initially prepared by co-lyophilization method.

Table 38 Dissolution parameters of piroxicam in distilled water from intact drug (Prx), Prx:HPBCD physical mixture and inclusion complexes initially prepared by kneading (KN), co-evaporation (COE) and co-lyophilization (COL) method at different molar ratios

	Prx :HPBCD	AUC 0-30min	%DE30	$t_{50\%}$ (min.)
Prx	1:0	214.98±7.567	7.17±0.252	>30
PM	1:1	1034.53±29.892	34.48±0.996	<30
	1:2	1541.46±31.841	51.38±1.061	<30
	2:1	855.58±25.683	28.52±0.856	>30
KN	1:1	2181.01±38.942	72.70±1.298	<30
	1:2	1836.60±33.153	61.22±1.105	<30
	2:1	1952.38±32.947	65.08±1.098	<30
COE	1:1	1254.56±46.454	41.82±1.548	<30
	1:2	1549.24±33.254	51.64±1.108	<30
	2:1	1510.6±31.659	50.35±1.055	>30
COL	1:1	2822.15±38.545	94.07±1.285	<30
	1:2	2664.43±36.301	88.81±1.21	<30
	2:1	2413.28±36.83	80.44±1.228	<30

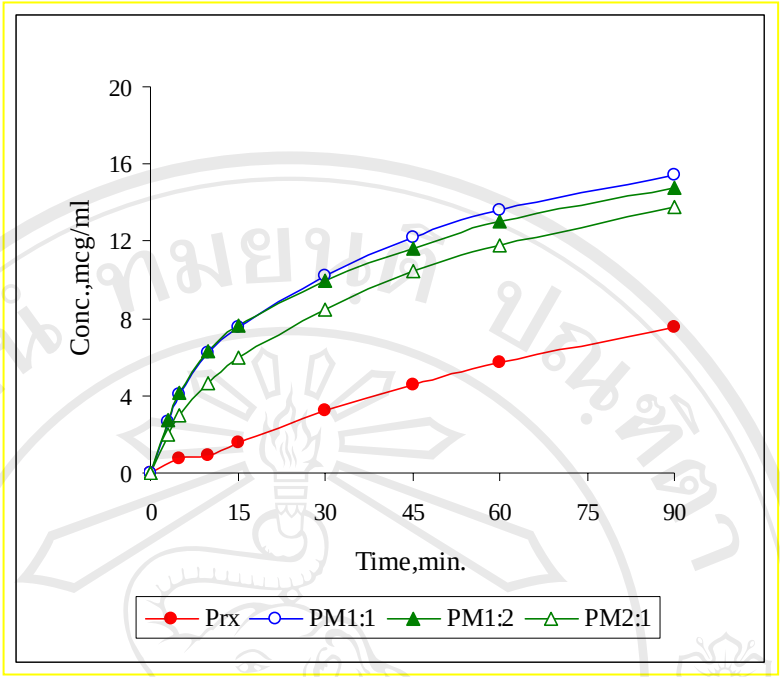

Figure 64 Dissolution profiles of piroxicam in distilled water from intact drug (Prx) and Prx:MeBCD physical mixture at 1:1 (PM 1:1), 1:2 (PM 1:2) and 2:1 (PM 2:1) molar ratios initially prepared

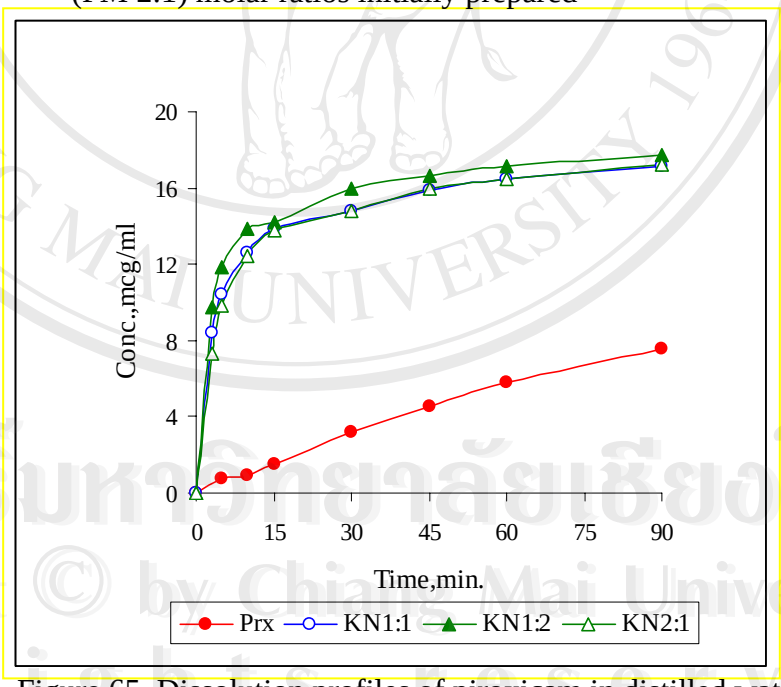

Figure 65 Dissolution profiles of piroxicam in distilled water from intact drug (Prx) and Prx:MeBCD inclusion complexes of 1:1 (KN 1:1), 1:2 (KN 1:2) and 2:1 (KN 2:1) molar ratios initially prepared by kneading method.

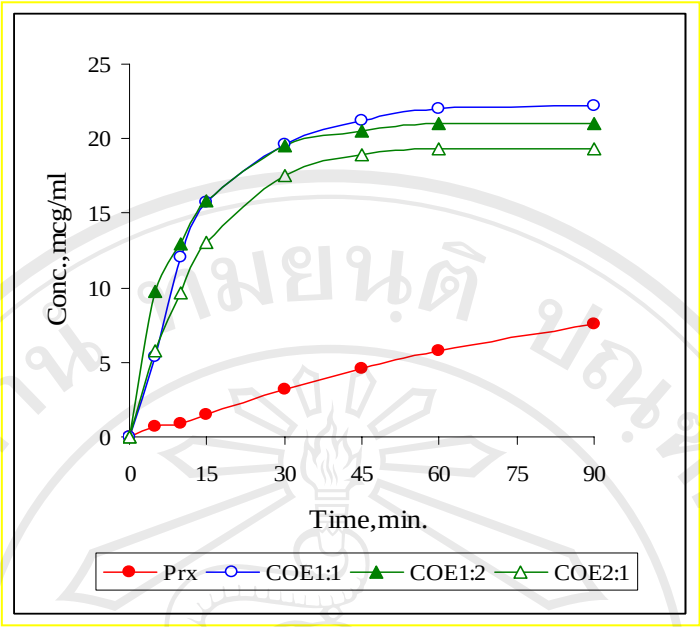

Figure 66 Dissolution profiles of piroxicam in distilled water from intact drug (Prx) and Prx:MeBCD inclusion complexes of 1:1 (COE 1:1), 1:2 (COE 1:2) and 2:1 (COE 2:1) molar ratios initially prepared by co-evaporation method.

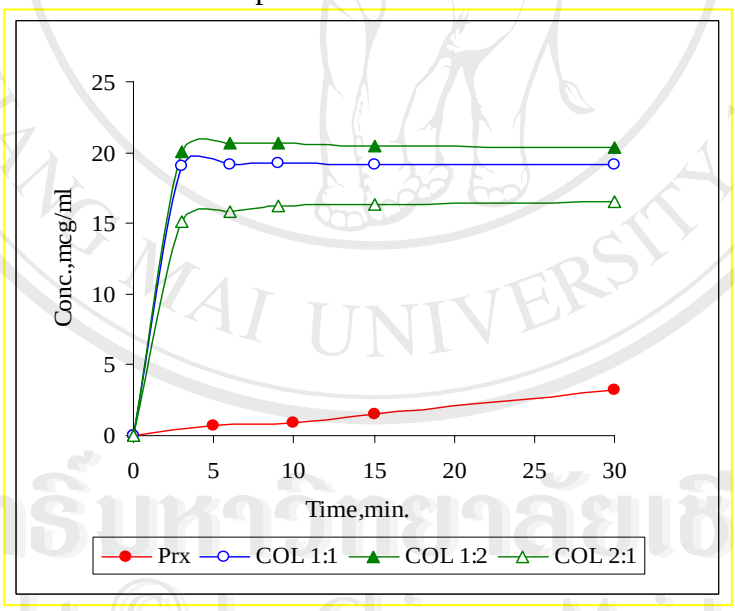

Figure 67 Dissolution profiles of piroxicam in distilled water from intact drug (Prx) and Prx:MeBCD inclusion complexes of 1:1 (COL 1:1), 1:2 (COL 1:2) and 2:1 (COL 2:1) molar ratios initially prepared by co-lyophilization method

Table 39 Dissolution parameters of piroxicam in distilled water from intact drug (Prx), Prx:MeBCD physical mixture and inclusion complexes initially prepared by kneading (KN), co-evaporation (COE) and lyophilization (COL) method at different molar ratios

	Prx : MeBCD	AUC 0-30min	%DE30	$t_{50\%}$ (min.)
Prx	1:0	214.98±7.567	7.17±0.252	>30
PM	1:1	920.88±31.878	30.70±1.063	>30
	1:2	917.24±29.905	30.57±1.00	>30
	2:1	727.09±28.657	24.24±0.955	>30
KN	1:1	1666.63±32.309	55.55±1.077	<30
	1:2	1786.54±45.269	59.55±1.51	<30
	2:1	1634.46±33.35	54.48±1.12	<30
COE	1:1	1763.95±30.369	58.80±1.012	<30
	1:2	1882.31±48.254	62.74±1.64	<30
	2:1	1524.92±38.658	50.83±1.289	<30
COL	1:1	2456.01±34.532	81.87±1.151	<30
	1:2	2621.70±57.865	87.39±1.929	<30
	2:1	2200.47±35.643	73.35±1.188	<30

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Appendix D

Table 1 Mean concentration (mcg/ml) of meloxicam (n=6) from the intact drug (Mlx) and 1:1 Mlx: β-cyclodextrin binary mixtures in simulated gastric fluid; PM, physical mixture, KN, COE and COL the inclusion complexes initially prepared by kneading, co-evaporation and lyophilization respectively.

Time,min	Concentration,mcg/ml				
	Mlx	PM	KN	COE	COL
0	0	0	0	0	0
3	0	0	0.591	0.353	2.824
5	0	0	0.885	0.813	3.703
10	0	0	1.298	1.557	6.025
15	0	0	1.508	2.271	7.310
30	0	0.087	1.742	3.503	8.479
45	0.094	0.130	1.852	4.068	8.801
60	0.153	0.185	1.884	4.327	8.926
90	0.220	0.271	2.086	4.581	9.383

Table 2 Mean concentration (mcg/ml) of meloxicam (n=6) from the intact drug (Mlx) and 1:1 Mlx: γ-cyclodextrin binary mixtures in simulated gastric fluid; PM, physical mixture, KN, COE and COL the inclusion complexes initially prepared by kneading, co-evaporation and lyophilization respectively.

Time,min	Concentration,mcg/ml				
	Mlx	PM	KN	COE	COL
0	0	0	0	0	0
3	0	0	1.185	3.426	3.169
5	0	0	1.527	4.155	4.747
10	0	0	1.680	5.121	5.142
15	0	0	1.733	5.447	5.132
30	0	0.092	1.875	5.921	5.405
45	0.094	0.150	2.014	6.368	5.511
60	0.153	0.197	2.118	6.642	5.714
90	0.220	0.286	2.203	6.885	5.986

Table 3 Mean concentration (mcg/ml) of meloxicam (n=6) from the intact drug (Mlx) and 1:1 Mlx : hydroxypropyl-β-cyclodextrin binary mixtures in simulated gastric fluid; PM, physical mixture, KN, COE and COL the inclusion complexes initially prepared by kneading, co-evaporation and lyophilization respectively.

Time,min	Concentration,mcg/ml				
	Mlx	PM	KN	COE	COL
0	0	0	0	0	0
3	0	0	1.451	2.757	4.676
5	0	0	1.545	3.135	6.225
10	0	0.019	1.623	4.401	7.717
15	0	0.068	1.648	5.343	8.369
30	0	0.189	1.757	5.917	8.536
45	0.094	0.282	1.791	6.240	8.566
60	0.153	0.350	1.811	6.220	8.426
90	0.22	0.440	1.826	6.274	8.499

Table 4 Mean concentration (mcg/ml) of meloxicam (n=6) from the intact drug (Mlx) and 1:1 Mlx : hydroxypropyl-γ-cyclodextrin binary mixtures in simulated gastric fluid; PM, physical mixture, KN, COE and COL the inclusion complexes initially prepared by kneading, co-evaporation and lyophilization respectively.

Time,min	Concentration,mcg/ml				
	Mlx	PM	KN	COE	COL
0	0	0	0	0	0
3	0	0	1.514	4.961	6.143
5	0	0	1.573	5.454	7.376
10	0	0.029	1.596	5.470	8.095
15	0	0.069	1.628	5.555	8.450
30	0	0.142	1.653	5.514	8.520
45	0.094	0.246	1.709	5.494	8.592
60	0.153	0.315	1.708	5.531	8.611
90	0.22	0.464	1.777	5.540	8.432

Table 5 Mean concentration (mcg/ml) of meloxicam (n=6) from the intact drug (Mlx) and 1:1 Mlx: β-cyclodextrin binary mixtures in simulated gastric fluid; PM, physical mixture, KN, COE and COL the inclusion complexes prepared by kneading, co-evaporation and lyophilization after stored at 45°C for 4 months.

Time,min	Concentration,mcg/ml				
	Mlx	PM	KN	COE	COL
0	0	0	0	0	0
3	0	0	0.579	0.541	2.666
5	0	0	0.864	0.722	4.346
10	0		1.261	1.446	6.484
15	0		1.487	2.116	7.669
30	0		1.716	3.283	8.558
45	0.094		1.818	3.850.	8.874
60	0.153		1.861	4.124	8.889
90	0.22		2.029	4.443	9.345

Table 6 Mean concentration (mcg/ml) of meloxicam (n=6) from the intact drug (Mlx) and 1:1 Mlx: γ-cyclodextrin binary mixtures in simulated gastric fluid; PM, physical mixture, KN, COE and COL the inclusion complexes prepared by kneading, co-evaporation and lyophilization after stored at 45°C for 4 months.

Time,min	Concentration,mcg/ml				
	Mlx	PM	KN	COE	COL
0	0	0	0	0	0
3	0	0	1.303	3.031	3.037
5	0	0	1.489	4.457	4.704
10	0	0	1.706	5.305	4.947
15	0	0	1.806	5.583	5.189
30	0	0.092	1.926	5.857	5.259
45	0.094	0.152	1.995	6.393	5.378
60	0.153	0.193	2.027	6.472	5.644
90	0.22	0.282	2.103	6.777	5.868

Table 7 Mean concentration (mcg/ml) of meloxicam (n=6) from the intact drug (Mlx) and 1:1 Mlx : hydroxypropyl-β-cyclodextrin binary mixtures in simulated gastric fluid; PM, physical mixture, KN, COE and COL the inclusion complexes prepared by kneading, co-evaporation and lyophilization after stored at 45°C for 4 months.

Time,min	Concentration,mcg/ml				
	Mlx	PM	KN	COE	COL
0	0	0	0	0	0
3	0	0.336	1.522	3.210	4.479
5	0	0.478	1.593	3.770	6.118
10	0	0.556	1.660	4.910	7.552
15	0	0.622	1.681	5.314	8.277
30	0	0.766	1.705	5.658	8.309
45	0.094	0.862	1.737	5.990	8.390
60	0.153	0.948	1.761	6.088	8.228
90	0.22	1.065	1.862	6.145	8.311

Table 8 Mean concentration (mcg/ml) of meloxicam (n=6) from the intact drug (Mlx) and 1:1 Mlx : hydroxypropyl-γ-cyclodextrin binary mixtures in simulated gastric fluid; PM, physical mixture, KN, COE and COL the inclusion complexes prepared by kneading, co-evaporation and lyophilization after stored at 45°C for 4 months.

Time,min	Concentration,mcg/ml				
	Mlx	PM	KN	COE	COL
0	0	0	0	0	0
3	0	0.644	1.414	5.351	6.282
5	0	0.757	1.468	5.372	7.431
10	0	0.835	1.561	5.354	8.108
15	0	0.925	1.604	5.365	8.344
30	0	1.169	1.690	5.394	8.525
45	0.094	1.333	1.695	5.371	8.526
60	0.153	1.437	1.760	5.363	8.390
90	0.22	1.545	1.799	5.334	8.493

Appendix E

Construction of Quantitative Structure Property Relationship

Table 1 Details of the training set

Drugs	Log k (observed)	$ PRED	$X PRED	Method	T °C
Barbituric acid	3.9395	3.8971	3.8381	Calorimetry	25
Barbital	3.9740	3.9186	3.9077	Calorimetry	25
Amobarbital	4.1246	4.2723	4.2818	Calorimetry	25
Pentobarbital	4.3228	3.9163	3.8615	Calorimetry	25
Secobarbital	4.6169	5.2031	5.4829	Calorimetry	25
Cyclobarbital	4.7773	4.1922	4.0912	Calorimetry	25
Phenobarbital	4.8600	4.7979	4.7785	Calorimetry	25
Lidocaine	1.2989	1.6428	1.7187	Solubility/Water	25
Ethidocaine	1.3838	1.6741	1.7620	Solubility/Water	25
Prilocaine	1.4771	1.5655	1.6303	Solubility/Water	25
Mepivacaine	1.5798	2.1202	2.2125	Solubility/Water	25
Bupivacaine	1.9782	1.6540	1.5737	Solubility/Water	25
Methyl paraben	2.9863	3.3598	3.4688	Solubility/PBS7.4	25
Ethyl paraben	2.9768	3.0425	3.0608	Solubility/PBS7.4	25
Propyl paraben	3.1898	3.1267	3.1131	Solubility/PBS7.4	25
Butyl paraben	3.5253	3.2250	3.1701	Solubility/PBS7.4	25
Amyl paraben	3.6776	3.4114	3.3630	Solubility/PBS7.4	25
Benzyl paraben	3.7810	3.7971	3.8031	Solubility/PBS7.4	25
Artemisinin	2.6767	3.0324	3.1252	Solubility/PBS7.4	28
Dihydroartemisinin	2.6075	2.8904	2.9883	Solubility/PBS7.4	28
Artether	2.5145	1.9597	1.7932	Solubility/PBS7.4	28
10-Deoxyartemisinin	2.1644	1.8236	1.7339	Solubility/PBS7.4	28

Table 2 Details of the test set

Drugs	log k (observed)	Logk (predicted)	Method	T,C°
Bupranolol	2.4687	2.3394	Solubility/Water	25
Harmine	2.5478	1.7979	Solubility/PBS 7.2	25
Tetracaine	3.1166	2.907	Solubility/Water	22
Diphenhydramine	2.6937	2.1919	Solubility/Water	23
Ibuprofen	3.7324	3.8978	Solubility/Water	25
Naproxen	3.8129	4.2276	Solubility/PBS9.0	30
Haloperodol	3.3247	3.0809	Solubility/Water	27
Flurbiprofen	4.2625	3.9816	Solubility/Water	25
Carbamazepine	2.8163	2.8486	Solubility/Water	37
DTT	2.3522	2.4667	Solubility/Water	37
DMDTT	2.8156	3.3268	Solubility/Water	37
5PDTT	3.4568	3.4152	Solubility/Water	37
ATT	3.7943	4.0477	Solubility/Water	37
Sertaconazole	3.8961	3.5444	Solubility/SGF	25
Neutral Red	2.0792	2.0684	Solubility/PBS5.5	20
Deltametrin	2.918	2.7915	Fluorescence/water	20
AR	3.3802	3.7394	Fluorescence/PBS7.2	25
Cryptotanshinone	3.5101	3.6259	UV/PBS 7.5	25
Oxazepam	2.6776	3.0548	UV/	25
Metoprolol	2.3222	2.6073	UV/PBS 7.4	25
Ephedrine prodrug	3.1111	3.0201	Stability/PBS 7.4	37
Oxybenzone	3.7663	3.7589	Solubility/Water	25

DTT = Dithiolethione
DMDTT = Dimethyldithiolethione
5PDTT = 5-Phenyldithiolethione
ATT = Anetholetrithione
AR = Acridine Red
Ephedrine prodrug = 2-(p-methoxyphenyl)-3,4-dimethyl-5- phenyloxazolidine

Definitions of some interesting descriptors

PEOE = The Partial Equalization of Orbital Electronegativity
(Method of calculating atomic partial charges)

qi = partial charge of atom i

vi = van der Waals surface area of atom i

PEOE_VSA_NEG = Total negative van der Waals surface area. The sum of vi such that qi is negative.

PEOE_VSA+1 = Sum of vi, where qi = 0.05-0.10

PEOE_VSA+5 = Sum of vi, where qi = 0.25-0.30

PEOE_VSA+6 = Sum of vi, where qi >0.30

PEOE_VSA-2 = Sum of vi, where qi = -0.15 to -0.10

PEOE_VSA-3 = Sum of vi, where qi = -0.20 to -0.15

PEOE_VSA-4 = Sum of vi, where qi = -0.25 to -0.20

PEOE_VSA-5 = Sum of vi, where qi = -0.30 to -0.25

ASA_P = Water accessible surface area of all polar atoms; |qi |>0.30

vdw.vol = van der Waals volume, calculated using a connection table approximation.

SlogP_VSA = subidivided surface area, based on an approximated accessible vdw surface area(vi) calculated for each atom; along with some other atomic properties, pi e.g.

SlogP : Li is contributor to SlogP

SMR : Ri is contributor to SMR

In model (24 compounds), there are 19 descriptors involved, however, they are belonged to three main groups: vdw.vol; surface area related to SlogP and surface area related to SMR at varying degree of contributing Li and Ri.

Curriculum Vitae

Name : Suporn Charumanee

Date of Birth : December 15, 1956

Education Background :

1984	Master Degree in Pharmacy (M.Pharm.), Chulalongkorn University, Bangkok, Thailand
1979	Bachalor of Pharmacy (B. Pharm.), Chiang Mai University, Chiang Mai, Thailand

Scholarship : Project on Faculty Development on Shortage area, The Commission of Higher Education, Thailand

Previous Employment :

2005	Associate Professor, Faculty of Pharmacy, Chiang Mai University, Chiang Mai, Thailand
1992	Assistance Professor, Faculty of Pharmacy, Chiang Mai University, Chiang Mai, Thailand
1979	Lecturer, Faculty of Pharmacy, Chiang Mai University, Chiang Mai, Thailand

Publications :

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