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APPENDIX I

Details of Ranitidine HCl

Details of Ranitidine HCI

(Mcevoy, 1988)

Chemistry

Ranitidine hydrochloride has solubilities of 660 mg/ml in water and 190 mg/ml in alcohol. The drug has pK_a's of 8.2 and 2.7. Ranitidine HCI occurs as white to pale yellow granular substance having slightly bitter taste and sulfur-like odor.

Ranitidine hydrochloride (N-(2-(((5(dimethylamino) methyl)-2-furfuryl)-thiol)-4-ethyl)-N-Methyl-2-nitro-1, 1-ethenediamine hydrochloride)

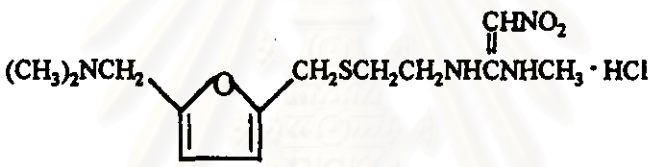


Figure 28 Chemical structure of ranitidine HCI.

Pharmacology

Ranitidine competitively inhibits the action of histamine on the H_2 receptors of parietal cells reducing gastric acid secretion under daytime and nocturnal basal condition and also when stimulated by food, insulin, amino acid, histamine, or pentagastrin.

Pharmacokinetics

Ranitidine is rapidly absorbed from GI tract following an oral administration and from parenteral sites following IM injection. Following the oral administration, the drug undergoes extensive first-pass metabolism. The absolute bioavailabilities of orally administered ranitidine has been reported to be about 50 %. Following the IM administration, the absolute bioavailability of ranitidine is 90-100 %.

Ranitidine is widely distributed throughout the body and is 10-19 % protein bound. The apparent volume of distribution of ranitidine is reported to be 1.2-1.9 l/kg.

The elimination half-life of ranitidine in adult is 1.7-3.2 hours and may be positively correlated with age. The elimination half-life prolongs in patients with renal impairment. Ranitidine is metabolized in the liver to ranitidine N-oxide, desmethyl and ranitidine-s-oxide. And it is excreted principally in urine via glomerular filtration and tubular secretion.

Adverse Effects

Adverse effects of ranitidine are generally infrequent and minor. Headache (sometimes severe) occurs in approximately 3% of patients receiving the drug. Malaise, dizziness, somnolence, insomnia, and vertigo have been reported less frequently. Reversible mental confusion, agitation, mental depression, and hallucinations have occurred, mainly in debilitated geriatric patients. Constipation, nausia, vomiting and abdonimal discomfort or pain have occurred in patients receiving ranitidine. Rash, which may be urticaria, maculopapular, and/or puritic, has been reported during rantidine therapy.

Analysis of Ranitidine HCI

The ultraviolet spectrum of ranitidine HCI in an aqueous solution was recorded and shown in figure 21. The spectrum shows two absorption maxima at 229 and at 315 nm. The measurement at 313 nm is very convenient for quantitative determination of ranitidine HCI (Cholerton et al., 1988)

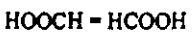
Several HPLC analysis were reported such as the method of Beaulieu et al. (1988), the method of Gupta (1988) and the method of Teraoka Otsuka and Matsuda (1993). The HPLC conditions of Gupta are as follows: the apparatus used was

ALC 202, Water Associates, with a multiple wavelength detector (Spectroflow monitor SF 770) and a recorder (Omiscribe 5213-12). A column used was microbondapack C_{18} (theoretical plates of 3000) with 30 cm long and 9 mm. i.d. The mobile phase was 10% V/V of methanol, 7% V/V acetonitrile and 0.01 M phosphate buffer in water having pH of 5.8 ± 0.05. The flow rate was 2.0 ml/min and the sensitivity was set at 0.04 AUFS. The wavelength was set at 262 nm. The chart speed was 30.5 cm/hr and the temperature was ambient. The internal standard was caffeine.

Ranitidine and its related compounds observed from eight samples of ranitidine HCl raw material from three manufacturers are shown in Figure 29 (Beaulieu, 1988). Compounds 11, 12, and 13 are degradation products; 4 is an intermediate and a degradation product; all other compounds are synthetic intermediates.

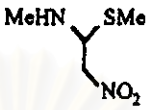
1
Furfury alcohol

2
(5-Dimethylaminomethyl) furfuryl alcohol

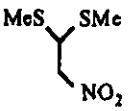


3
Fumaric acid

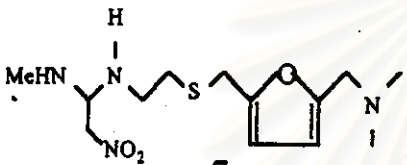
4
2-(2-Aminoethylthio)methyl 5-(dimethylaminomethyl) furane



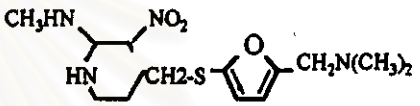
5
N-Methyl-1-methylthio -2-nitro-1-etheneamine



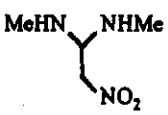
6
1,1-Bis-(methylthio) -2-nitroethene



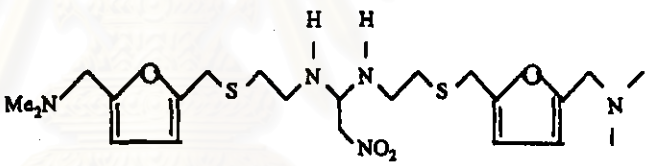
7
Ranitidine (N-[2-[[5-[(dimethylamino)methyl] furfuryl]thio]ethyl]-N-methyl-2-nitro -1,1-ethenediamine)



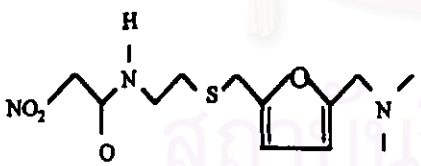
8
Ranitidine



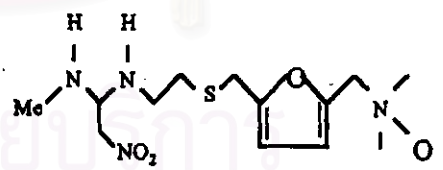
9
N,N-Dimethyl-2-nitro-1,1-ethenediamine



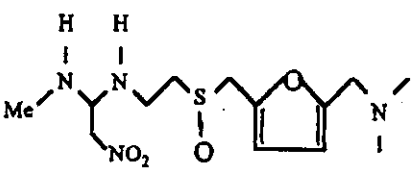
10
Bis-2,2-[[[5-[(dimethylamino)methyl] -2-furanyl]methyl]thio]ethylamino-1-nitroethene



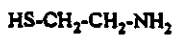
11
N-[2-[5-(Dimethylaminomethyl) -2-furanylmethyl]-thioethyl] nitroacetamide



12
Ranitidine-N-oxide



13
Ranitidine-S-oxide



14
2-Aminoethanethiol

Figure 29 Ranitidine HCl and its related compounds (Beaulieu, 1988)

APPENDIX II

Calibration Curve Data of Ranitidine HCl

Calibration curve data A

Ranitidine HCl concentration (μg/ml)	Peak area ratio (PAR)		
	Set No. 1	Set No. 2	Set No. 3
4.08	0.1819	0.1809	0.1782
8.15	0.3893	0.3853	0.3898
16.30	0.7832	0.7944	0.7905
24.46	1.1891	1.1969	1.2006
32.61	1.6285	1.6165	1.6438
40.76	2.0706	1.9295	1.9901

PAR = 0.0499Conc. - 0.0209

r^2 = 0.9997

Calibration curve data B

Ranitidine HCl concentration (μg/ml)	Peak area ratio (PAR)		
	Set No. 1	Set No. 2	Set No. 3
4.14	0.1979	0.1932	0.1953
8.28	0.3965	0.3977	0.4047
16.56	0.8208	0.8319	0.8286
24.84	1.2733	1.2558	1.2682
33.12	1.7400	1.7752	1.7099
41.40	2.1846	2.2352	2.2244

PAR = 0.0542Conc. - 0.0518

r^2 = 0.9993

Calibration curve data C

Ranitidine HCl concentration (μg/ml)	Peak area ratio (PAR)		
	Set No. 1	Set No. 2	Set No. 3
4.14	0.2069	0.2086	0.2088
8.28	0.4464	0.4629	0.4450
16.56	0.8856	0.9043	0.9249
24.84	1.3834	1.3874	1.4278
33.12	1.8946	1.9036	1.8537
41.40	2.3783	2.3708	2.3992

PAR = 0.0582Conc. - 0.0407

r^2 = 0.9998

Calibration curve data D

Ranitidine HCl concentration (μg/ml)	Peak area ratio (PAR)		
	Set No. 1	Set No. 2	Set No. 3
4.14	0.2039	0.2088	0.2052
8.28	0.4410	0.4456	0.4361
16.56	0.9200	0.9137	0.9523
24.84	1.4420	1.4146	1.3828
33.12	1.9227	1.9238	1.9257
41.40	2.3729	2.3980	2.4168

PAR = 0.0590Conc. - 0.0450

r^2 = 0.9999

Calibration curve data E

Ranitidine HCl concentration (μg/ml)	Peak area ratio (PAR)		
	Set No. 1	Set No. 2	Set No. 3
3.96	0.1769	0.1741	0.1831
7.92	0.4275	0.3790	0.4360
15.84	0.8009	0.7596	0.7797
23.76	1.1626	1.1572	1.1727
31.68	1.7390	1.6058	1.7979
39.60	2.0338	2.0068	2.0303

PAR = 0.0525Conc. - 0.0282

r^2 = 0.9957

Calibration curve data F

Ranitidine HCl concentration (μg/ml)	Peak area ratio (PAR)		
	Set No. 1	Set No. 2	Set No. 3
3.98	0.1403	0.1332	0.1341
7.96	0.3597	0.3661	0.3559
15.92	0.7868	0.7357	0.7809
23.88	1.2116	1.2119	1.2055
31.84	1.6825	1.5558	1.6852
39.80	2.0944	2.9696	2.9877

PAR = 0.0529Conc. - 0.0654

r^2 = 0.9995

Calibration curve data G

Ranitidine HCl concentration (μg/ml)	Peak area ratio (PAR)		
	Set No. 1	Set No. 2	Set No. 3
3.98	0.1440	0.1414	0.1384
7.96	0.3875	0.3777	0.3718
15.92	0.8145	0.8288	0.7754
23.88	1.3724	1.2251	1.2934
31.84	1.7164	1.6707	1.7596
39.80	2.1818	2.0633	2.0813

PAR = 0.0554Conc. - 0.0639

r^2 = 0.9990

Calibration curve data H

Ranitidine HCl concentration (μg/ml)	Peak area ratio (PAR)		
	Set No. 1	Set No. 2	Set No. 3
4.02	0.1879	0.1900	0.2091
8.04	0.4018	0.4060	0.4042
16.08	0.8541	0.8478	0.8522
24.12	1.2423	1.2652	1.2893
32.16	1.7290	1.7424	1.7965
40.20	2.1322	2.1563	2.1507

PAR = 0.0545Conc. - 0.0278

r^2 = 0.9994

Calibration curve data I

Ranitidine HCl concentration (μg/ml)	Peak area ratio (PAR)		
	Set No. 1	Set No. 2	Set No. 3
4.06	0.1174	0.1256	0.1273
8.12	0.2564	0.2726	0.2667
16.24	0.6413	0.7026	0.6867
24.36	1.0823	1.0468	1.0990
32.48	1.5274	1.5528	1.4597
40.60	1.9278	1.9017	1.8569

PAR = 0.0494Conc. - 0.11113

r^2 = 0.9989

Calibration curve data J

Ranitidine HCl concentration (μg/ml)	Peak area ratio (PAR)		
	Set No. 1	Set No. 2	Set No. 3
4.03	0.1833	0.1871	0.2105
8.07	0.3772	0.4062	0.4114
16.14	0.9328	0.9314	0.9260
24.20	1.4605	1.4550	1.5037
32.27	2.0868	2.0679	2.0459
40.34	2.5648	2.5930	2.5955

PAR = 0.0669Conc. - 0.1204

r^2 = 0.9989

Calibration curve data K

Ranitidine HCl concentration (μg/ml)	Peak area ratio (PAR)		
	Set No. 1	Set No. 2	Set No. 3
4.08	0.1877	0.1873	0.1833
8.15	0.3656	0.3715	0.3734
16.30	0.8347	0.8955	0.8153
24.46	1.3148	1.3120	1.2940
32.61	1.7961	1.8137	1.8384
4076	2.2743	2.5137	2.2895

PAR = 0.0593Conc. - 0.1006

r^2 = 0.9982

Calibration curve data L

Ranitidine HCl concentration (μg/ml)	Peak area ratio (PAR)		
	Set No. 1	Set No. 2	Set No. 3
4.08	0.1733	0.1713	0.1723
8.17	0.3887	0.3542	0.4080
16.33	0.8420	0.8400	0.8886
24.50	1.3753	1.2625	1.4147
32.66	1.9188	1.9011	1.8064
40.83	2.4095	2.4247	2.2591

PAR = 0.0601Conc. - 0.1012

r^2 = 0.9994

Calibration curve data M

Ranitidine HCl concentration (μg/ml)	Peak area ratio (PAR)		
	Set No. 1	Set No. 2	Set No. 3
4.01	0.1811	0.1773	0.1804
8.02	0.3734	0.3638	0.3553
16.04	0.7970	0.8456	0.8462
24.06	1.3372	1.2858	1.3154
32.08	1.8189	1.7253	1.8474
40.10	2.2777	2.2967	2.1638

PAR = 0.0581Conc. - 0.0821

r^2 = 0.9994

Calibration curve data N

Ranitidine HCl concentration (μg/ml)	Peak area ratio (PAR)		
	Set No. 1	Set No. 2	Set No. 3
4.04	0.1692	0.1699	0.1697
8.08	0.3897	0.3885	0.3888
16.16	0.8678	0.8676	0.8672
24.23	1.3381	1.3370	1.3374
32.31	1.9005	1.8999	1.9001
40.39	2.4217	2.4195	2.4202

PAR = 0.0621Conc. - 0.1145

r^2 = 0.9987

Calibration curve data O

Ranitidine HCl concentration (μg/ml)	Peak area ratio (PAR)		
	Set No. 1	Set No. 2	Set No. 3
4.05	0.1726	0.1736	0.1783
8.10	0.3874	0.3781	0.3872
16.20	0.8561	0.9095	0.9973
24.30	1.4197	1.4048	1.4544
32.40	1.9100	1.8145	2.0268
40.50	2.6423	2.1704	2.3705

PAR = 0.0611Conc. - 0.0799

r^2 = 0.9993

Calibration curve data P

Ranitidine HCl concentration (μg/ml)	Peak area ratio (PAR)		
	Set No. 1	Set No. 2	Set No. 3
4.00	0.1746	0.1707	0.1735
8.00	0.3910	0.3858	0.3851
16.02	0.8083	0.8089	0.8002
24.02	1.2391	1.2569	1.2538
32.03	1.7453	1.7371	1.7363
40.04	2.1423	2.1505	2.1596

PAR = 0.0549Conc. - 0.0453

r^2 = 0.9990

APPENDIX III

Stability Data of Ranitidine HCl

Stability Data of Ranitidine HCl
pH 8 PHOSPHATE BUFFER

Presence of oxygen and light

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	26.32	26.03	28.32	29.05	27.43 ± 1.43
178	B	25.68	25.60	25.24	25.53	25.51 ± 0.19
366	E	25.67	23.76	24.59	24.24	24.56 ± 0.81
1018	I	20.08	20.20	19.74	19.87	19.97 ± 0.21
1381	J	17.61	17.78	17.77	17.89	17.76 ± 0.11
2176	L	18.07	17.30	17.63	16.52	17.38 ± 0.65
2643	M	15.92	15.78	16.91	16.02	16.16 ± 0.51
3176	N	15.36	14.04	15.53	17.70	15.66 ± 1.51
4194	O	10.72	14.27	13.33	14.69	13.25 ± 1.78

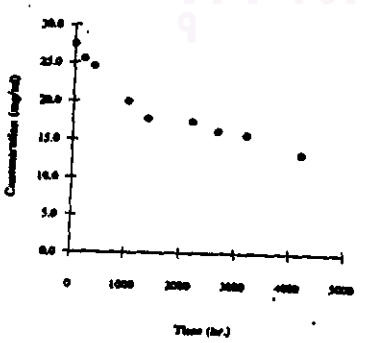
*calibration curves used.

Zero-order : conc = 25.00 - 0.0032 time r = 0.9408

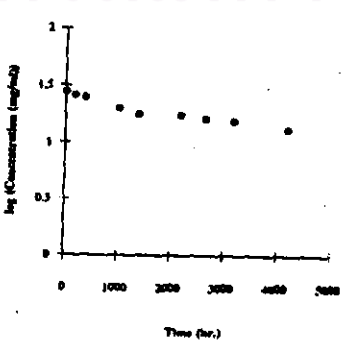
First-order : log conc = 1.4000 - 7.10×10^{-5} time r = 0.9652

Second-order : 1/conc = 0.0388 + 8.74×10^{-6} time r = 0.9811

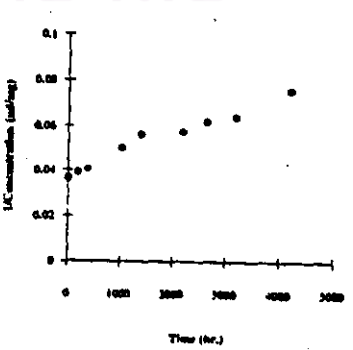
Zero-order plot



First-order plot



Second-order plot



Stability Data of Ranitidine HCl
pH 8 PHOSPHATE BUFFER

Presence of oxygen but absence of light

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	26.32	26.03	28.32	29.05	27.43± 1.48
219	C	26.62	27.78	26.12	27.34	26.96 ± 0.74
402	F	29.23	28.28	25.22	24.77	26.87 ± 2.21
1089	I	22.68	22.81	21.91	22.82	22.56 ± 0.44
1448	J	18.90	18.32	18.10	21.16	19.10 ± 1.43
2197	L	17.40	16.37	16.39	18.37	17.13 ± 0.96
3187	N	16.48	18.80	17.03	17.62	17.48 ± 0.99
4137	O	15.25	15.69	16.94	15.58	15.86 ± 0.74
4827	P	13.95	13.97	13.96	13.89	13.94 ± 0.03

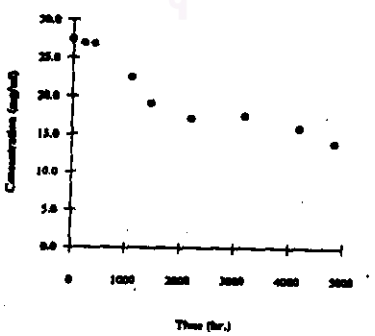
*calibration curves used.

Zero-order : conc = 26.23 - 0.0028 time r = 0.9346

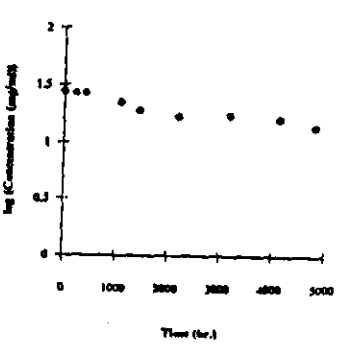
First-order : log conc = 1.4223 - 6.00 × 10^{-5} time r = 0.9537

Second-order : 1/conc = 0.0372 + 7.01 × 10^{-6} time r = 0.9664

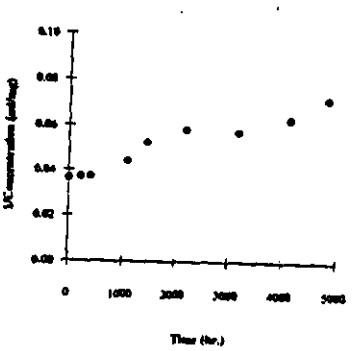
Zero-order plot



First-order plot



Second-order plot



Stability Data of Ranitidine HCl
pH 8 PHOSPHATE BUFFER

presence of light but absence of oxygen

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	26.32	26.03	28.32	29.05	27.43 ± 1.48
207	C	29.44	26.37	28.03	25.61	27.37 ± 1.71
375	E	27.04	25.36	26.31	22.68	25.35 ± 1.91
1070	I	22.74	23.31	24.30	23.65	23.50 ± 0.65
1448	J	19.96	22.66	21.15	20.14	20.98 ± 1.24
2643	M	20.13	20.20	21.64	19.65	20.40 ± 0.86
3211	N	19.81	17.56	18.81	18.45	19.13 ± 0.93
4194	O	14.67	16.71	15.03	16.92	15.79 ± 1.15

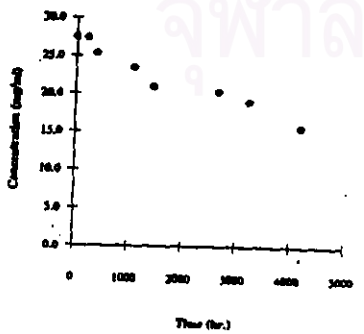
*calibration curves used.

Zero-order : conc = 26.78 - 0.0026 time r = 0.9702

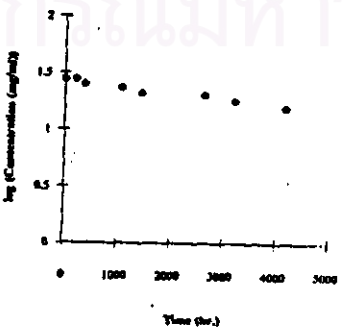
First-order : log conc = 1.4324 - 5.00×10^{-5} time r = 0.9809

Second-order : 1/conc = 0.0364 + 5.97×10^{-6} time r = 0.9795

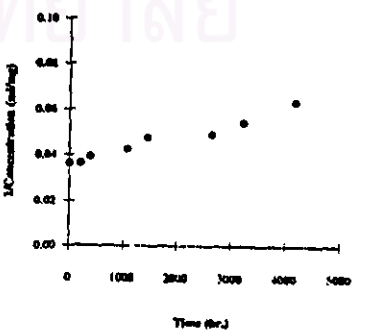
Zero-order plot



First-order plot



Second-order plot



Stability Data of Ranitidine HCl
pH 8 PHOSPHATE BUFFER

Absence of oxygen and light

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	26.32	26.03	28.32	29.05	27.43 ± 1.48
241	D	29.45	28.12	25.30	27.43	27.56 ± 1.73
402	G	26.54	27.21	26.44	25.93	26.53 ± 0.53
1108	I	23.74	24.37	26.04	22.24	24.10 ± 1.57
1549	K	21.24	22.76	21.71	23.33	22.26 ± 0.96
2643	M	21.47	20.38	20.10	22.53	21.12 ± 1.11
3187	N	18.18	20.92	18.02	19.48	19.15 ± 1.35
4137	O	17.82	17.82	17.38	19.4	18.11 ± 0.89
4839	P	17.72	17.42	16.66	18.47	17.57 ± 0.65

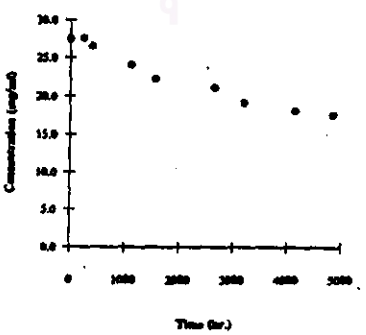
*calibration curves used.

Zero-order : conc = 27.04 - 0.0022 time r = 0.9769

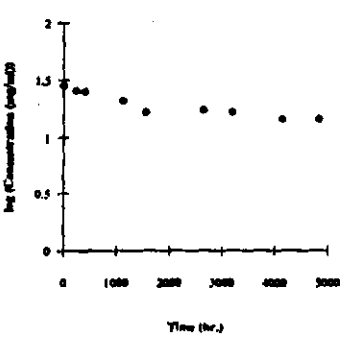
First-order : log conc = 1.4326 - 4.00×10^{-5} time r = 0.9727

Second-order : 1/conc = 0.03667 + 4.18×10^{-6} time r = 0.9783

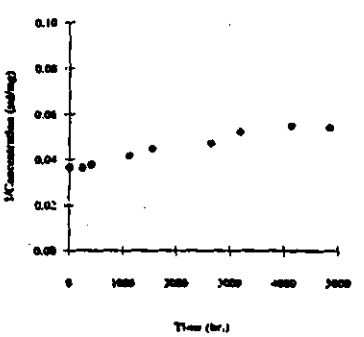
Zero-order plot



First-order plot



Second-order plot



Stability Data of Ranitidine HCl
0.5 % CREMOPHOR EL®

Presence of oxygen and light

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	26.06	28.14	26.59	28.45	27.31 ± 1.16
178	B	25.11	25.80	26.30	24.56	25.45 ± 0.76
366	E	19.20	21.69	21.70	23.17	21.44 ± 1.65
617	H	20.50	20.22	19.90	20.36	20.24 ± 0.26
1018	I	20.20	19.48	20.92	19.12	19.93 ± 0.80
1381	J	16.35	16.80	16.89	16.25	16.57 ± 0.32
2176	L	15.63	15.03	15.72	17.53	15.98 ± 1.08
4194	O	13.08	11.57	12.58	13.67	12.72 ± 0.78

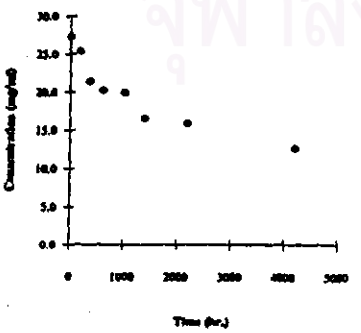
*calibration curves used.

Zero-order : conc = 24.00 - 0.0031 time r = 0.8870

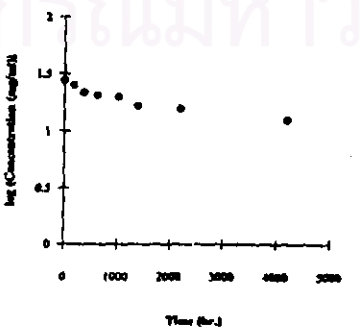
First-order : log conc = 1.4000 - 7.30 × 10^{-5} time r = 0.9330

Second-order : 1/conc = 0.0411 + 9.56 × 10^{-6} time r = 0.9670

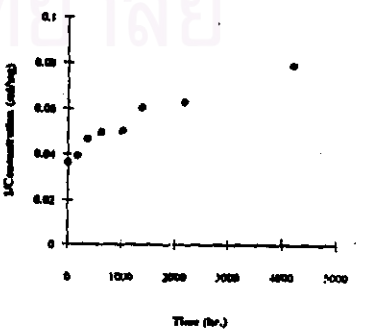
Zero-order plot



First-order plot



Second-order plot



Stability Data of Ranitidine HCl
0.5 % CREMOPHOR EL®

Presence of oxygen but absence of light

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	26.06	28.14	26.59	28.45	27.31 ± 1.16
219	C	27.01	25.78	27.34	27.45	26.90 ± 0.76
402	F	26.56	29.56	23.36	27.71	26.80 ± 2.60
1089	I	21.41	19.15	21.83	24.37	21.69 ± 2.14
1448	K	19.66	18.86	19.45	20.02	19.50 ± 0.48
2197	L	15.76	17.49	17.49	16.39	16.78 ± 0.86
3187	N	17.10	17.39	15.99	17.74	17.06 ± 0.75
4137	O	16.10	16.74	15.56	14.54	15.73 ± 0.93
4827	P	12.90	11.79	14.15	12.44	12.82 ± 0.86

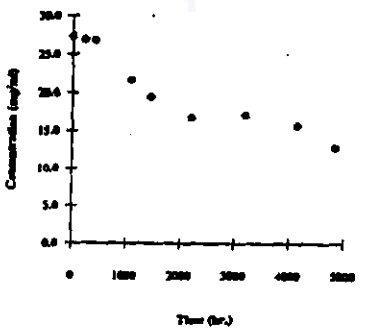
*calibration curves used.

Zero-order : conc = 26.1724 - 0.0029 time r = 0.9431

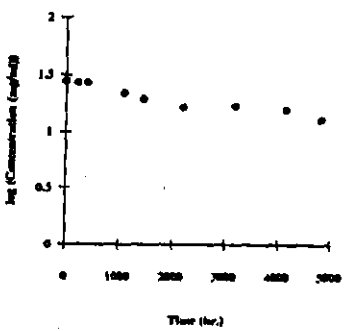
First-order : log conc = 1.4230 - 6.00×10^{-5} time r = 0.9610

Second-order : 1/conc = 0.0368 + 7.81×10^{-6} time r = 0.9675

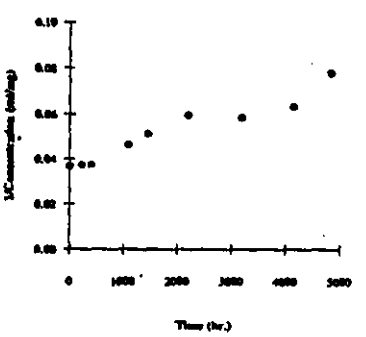
Zero-order plot



First-order plot



Second-order plot



Stability Data of Ranitidine HCl
0.5 % CREMOPHOR EL®

Presence of light but absence of oxygen

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	26.06	28.14	26.59	28.45	27.31 ± 1.16
207	C	29.83	25.28	28.57	26.01	27.42 ± 2.14
375	E	22.26	22.27	26.11	24.27	23.73 ± 1.85
617	H	19.44	22.69	22.95	23.02	22.02 ± 1.73
1070	I	21.45	20.46	18.07	21.85	20.46 ± 1.70
1448	J	17.96	19.73	19.31	18.55	18.89 ± 0.79
2643	M	18.95	16.62	19.20	16.72	17.87 ± 1.39
4162	O	15.74	16.64	14.41	14.90	14.92 ± 1.11

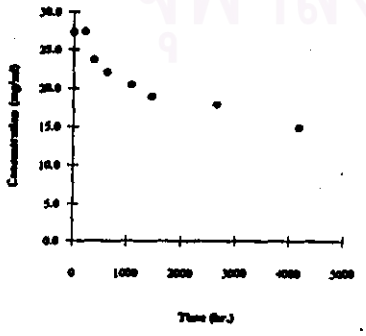
*calibration curves used.

Zero-order : conc = 25.29 - 0.0028 time r = 0.9068

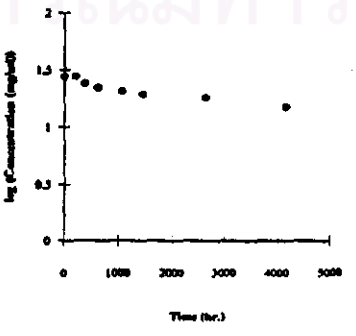
First-order : log conc = 1.4051 - 6.00×10^{-5} time r = 0.9406

Second-order : 1/conc = 7.02 + 0.0390×10^{-6} time r = 0.9336

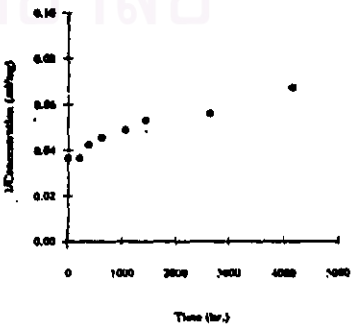
Zero-order plot



First-order plot



Second-order plot



Stability Data of Ranitidine HCl
0.5 % CREMOPHOR EL®

Absence of oxygen and light

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	26.06	28.14	26.59	28.45	27.31 ± 1.16
241	D	28.96	24.62	29.20	26.63	27.35 ± 2.16
419	G	23.33	26.72	26.08	29.17	26.32 ± 2.40
1108	()	25.19	23.27	26.54	24.30	24.82 ± 1.38
1573	K	22.12	21.15	21.40	23.91	22.14 ± 1.25
2643	M	20.26	19.07	19.83	17.73	19.22 ± 1.11
3187	N	19.60	19.79	17.63	19.38	18.93 ± 0.99
4137	O	18.68	17.59	16.99	17.57	17.38 ± 0.71
4839	P	16.56	17.54	16.93	17.30	17.08 ± 0.37

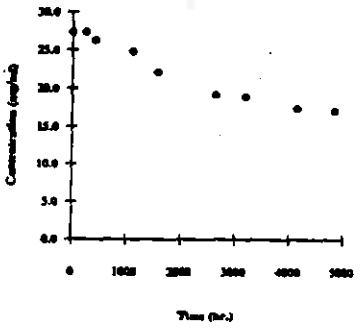
*calibration curves used.

Zero-order : conc = 27.02 - 0.0023 time r = 0.9740

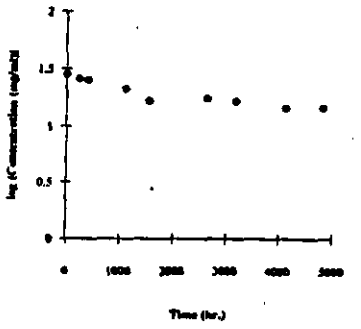
First-order : log conc = 1.4352 - 5.00 × 10^{-5} time r = 0.9821

Second-order : 1/conc = 0.0363 + 5.01 × 10^{-6} time r = 0.9882

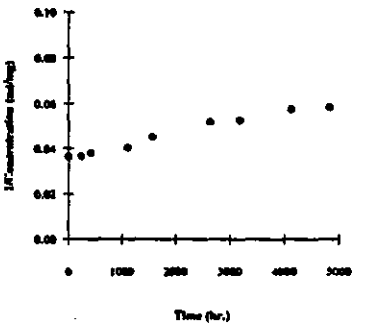
Zero-order plot



First-order plot



Second-order plot



Stability Data of Ranitidine HCl
0.001 % BHT

Presence of oxygen and light

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	25.77	25.46	27.53	25.39	26.04 ± 1.01
178	B	24.98	25.68	26.41	25.44	25.63 ± 0.60
366	E	22.48	23.30	23.58	19.81	22.29 ± 1.72
617	H	19.50	20.69	20.01	19.93	20.03 ± 0.49
1018	()	16.13	15.95	19.32	20.02	17.86 ± 2.11
1381	J	16.01	16.88	16.28	16.32	16.37 ± 0.45
2222	L	15.47	14.98	15.62	15.72	15.45 ± 0.33
4194	O	13.32	9.53	13.22	12.69	11.94 ± 1.64

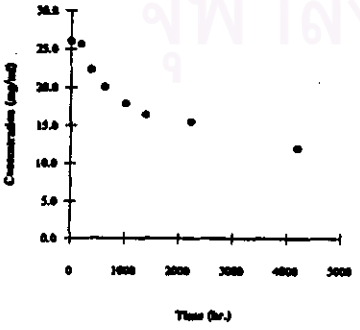
*calibration curves used.

Zero-order : conc = 23.47 - 0.0032 time r = 0.8995

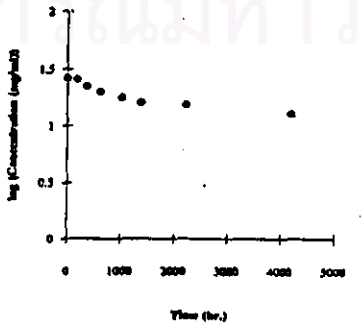
First-order : log conc = 1.3740 - 8.00 × 10^{-5} time r = 0.9441

Second-order : 1/conc = 0.0414 + 1.07 × 10^{-5} time r = 0.9729

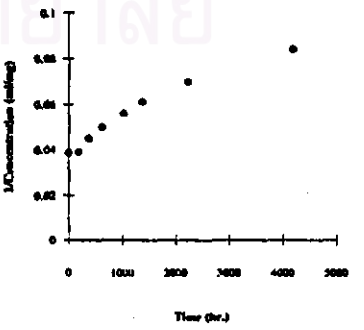
Zero-order plot



First-order plot



Second-order plot



Stability Data of Ranitidine HCl
0.001 % BHT

Presence of oxygen but absence of light

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	25.77	25.46	27.53	25.39	26.04 ± 1.01
219	C	26.42	25.29	25.11	26.18	25.75 ± 0.65
402	F	26.19	27.67	23.86	25.56	25.82 ± 1.58
1089	I	22.67	19.26	23.25	22.91	22.02 ± 1.86
1448	J	16.86	18.70	17.97	18.02	17.88 ± 0.76
2197	L	17.78	17.03	16.58	16.05	16.86 ± 0.73
3187	N	13.28	15.23	16.94	17.24	15.67 ± 1.83
4194	O	17.33	12.43	12.74	12.70	13.80 ± 2.36

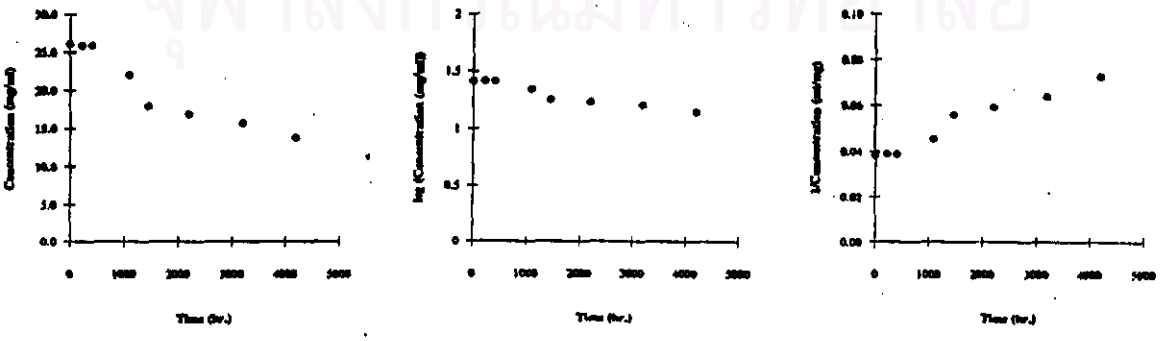
*calibration curves used.

Zero-order : conc = 25.53 - 0.0032 time r = 0.9469

First-order : log conc = 1.4116 - 7.00 × 10^{-5} time r = 0.9643

Second-order : 1/conc = 0.0380 + 8.54 × 10^{-6} time r = 0.9777

Zero-order plot **First-order plot** **Second-order plot**



Stability Data of Ranitidine HCl
0.001 % BHT

Presence of light but absence of oxygen

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	25.77	25.46	27.53	25.39	26.31 ± 1.01
207	C	26.42	23.00	26.55	25.74	25.43 ± 1.66
375	E	24.69	23.67	25.30	26.96	25.15 ± 1.38
617	H	22.28	20.20	22.39	21.17	21.51 ± 1.04
1070	I	21.65	20.40	23.39	20.94	21.60 ± 1.30
1573	K	20.86	21.04	20.68	21.03	20.90 ± 0.17
2643	M	18.57	15.31	16.22	17.77	16.97 ± 1.47
4839	O	14.31	13.60	13.61	15.10	13.90 ± 0.71

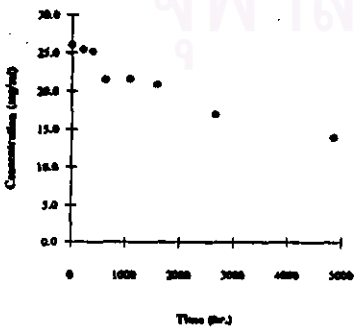
*calibration curves used.

Zero-order : conc = 25.00 - 0.0025 time r = 0.9580

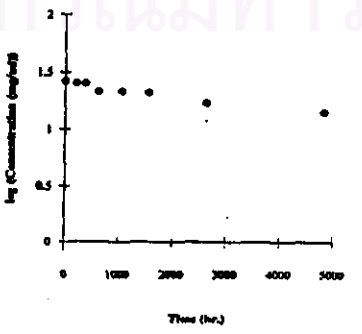
First-order : log conc = 1.4031 - 6.00×10^{-5} time r = 0.9772

Second-order : 1/conc = 0.0387 + 7.00×10^{-6} time r = 0.9880

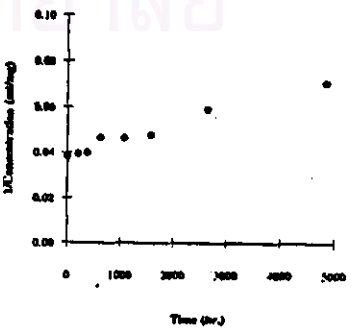
Zero-order plot



First-order plot



Second-order plot



Stability Data of Ranitidine HCl
0.005 % BHT

Presence of oxygen and light

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	26.79	27.84	27.38	27.94	27.49 ± 0.52
178	B	23.79	24.74	24.38	24.89	24.45 ± 0.49
366	E	21.80	22.48	22.32	21.94	22.13 ± 0.32
617	H	19.92	19.33	20.89	18.27	19.60 ± 1.09
1018	I	19.16	19.04	16.27	18.93	18.35 ± 1.39
1381	J	16.71	16.80	15.89	16.25	16.41 ± 0.43
2222	L	15.57	13.78	14.60	13.80	14.44 ± 0.84
3176	N	14.24	13.88	12.84	14.02	13.75 ± 0.62
4194	O	12.64	12.27	12.44	9.07	11.60 ± 1.70

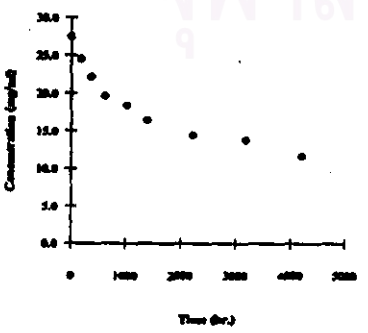
*calibration curves used.

Zero-order : conc = 23.50 - 0.0033 time r = 0.9085

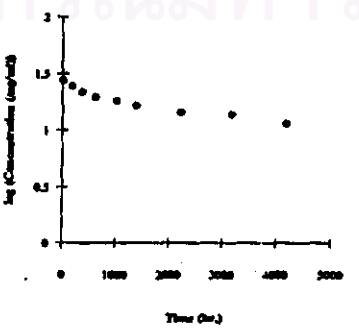
First-order : log conc = 1.3743 - 8.00×10^{-5} time r = 0.9511

Second-order : 1/conc = 0.0414 + 1.10×10^{-5} time r = 0.9791

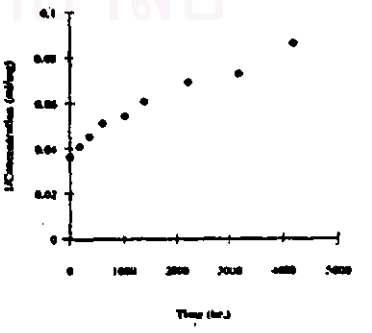
Zero-order plot



First-order plot



Second-order plot



Stability Data of Ranitidine HCl
0.001 % BHT

Absence of oxygen and light

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	25.77	25.46	27.53	25.39	26.04 ± 1.01
241	D	26.19	25.97	25.08	23.80	25.26 ± 1.08
419	G	24.80	25.72	25.20	25.15	25.22 ± 0.38
1108	I	22.14	22.36	20.60	21.67	21.69 ± 0.78
1448	J	18.32	18.46	22.47	20.78	20.01 ± 1.99
2643	M	17.50	19.97	20.51	17.46	18.86 ± 1.60
3187	N	17.42	18.15	18.50	17.03	17.77 ± 0.67
4137	O	16.17	17.94	17.59	19.04	17.69 ± 1.19

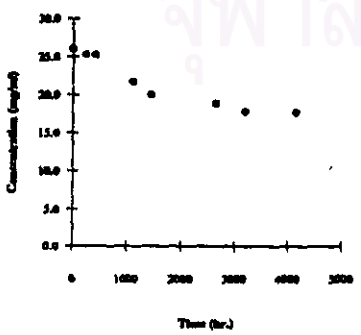
*calibration curves used.

Zero-order : conc = 25.15 - 0.0022 time r = 0.9398

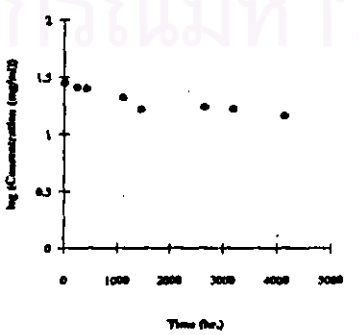
First-order : log conc = 1.4016 - 4.00×10^{-5} time r = 0.9512

Second-order : 1/conc = 0.0395 + 4.82×10^{-6} time r = 0.9611

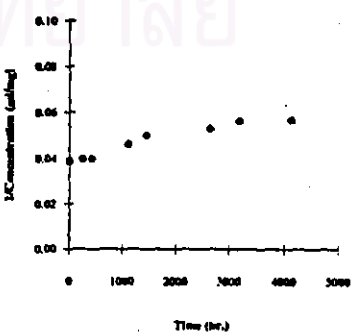
Zero-order plot



First-order plot



Second-order plot



Stability Data of Ranitidine HCl
0.005 % BHT

Presence of oxygen but absence of light

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	26.79	27.84	27.38	27.94	27.49 ± 0.52
219	C	25.37	26.02	27.12	25.88	26.10 ± 0.74
402	F	26.52	26.53	25.39	26.58	26.26 ± 0.58
1089	I	17.38	21.04	21.22	20.22	19.97 ± 1.78
1448	J	16.85	16.58	17.74	17.88	17.26 ± 0.64
2197	L	16.09	16.18	16.07	16.23	16.14 ± 0.07
3187	N	15.56	14.52	15.56	15.39	15.26 ± 0.50
4194	O	10.33	15.78	15.75	17.17	14.76 ± 3.02

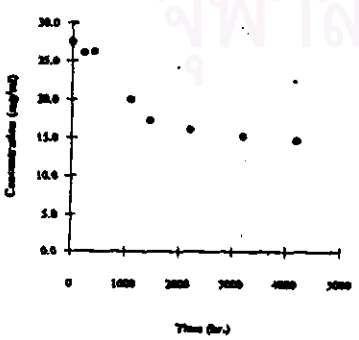
*calibration curves used.

Zero-order : conc = 25.53 - 0.0032 time r = 0.8974

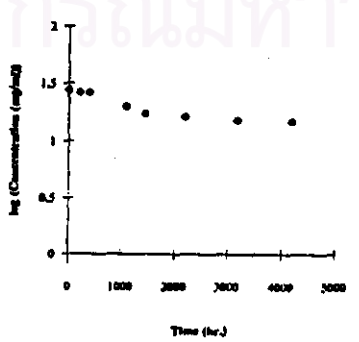
First-order : log conc = 1.4072 - 7.00 × 10^{-5} time r = 0.9189

Second-order : 1/conc = 0.0390 + 8.16 × 10^{-6} time r = 0.9389

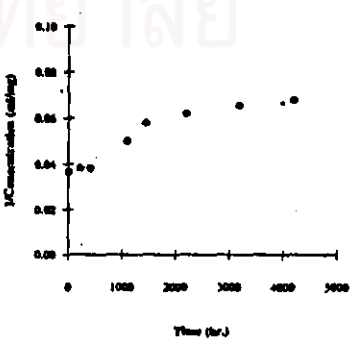
Zero-order plot



First-order plot



Second-order plot



Stability Data of Ranitidine HCl
0.005 % BHT

Presence of light but absence of oxygen

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	26.79	27.84	27.38	27.94	27.72 ± 0.52
207	C	25.92	20.10	24.98	24.56	24.14 ± 2.72
375	E	23.34	19.97	22.79	22.14	22.06 ± 1.47
617	H	23.40	20.14	22.25	21.90	21.92 ± 1.35
1070	I	22.24	23.59	22.05	20.55	22.11 ± 1.24
1549	K	21.54	19.69	19.54	20.01	20.20 ± 0.92
2643	M	17.12	16.79	19.88	18.08	18.00 ± 1.39
4169	O	16.32	13.30	13.44	14.07	14.28 ± 1.40
4815	P	13.57	13.63	13.44	13.36	13.50 ± 0.11

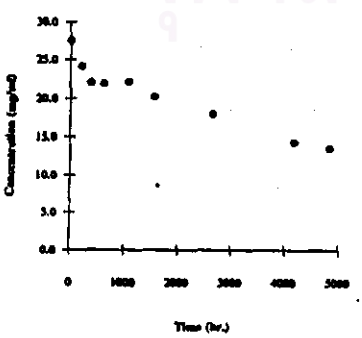
*calibration curves used.

Zero-order : conc = 24.60 - 0.0024 time r = 0.9586

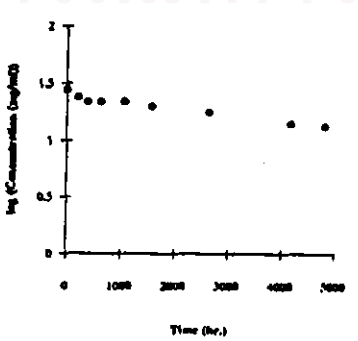
First-order : log conc = 1.3973 - 6.00 × 10^{-5} time r = 0.9773

Second-order : 1/conc = 0.0391 + 7.10 × 10^{-6} time r = 0.9863

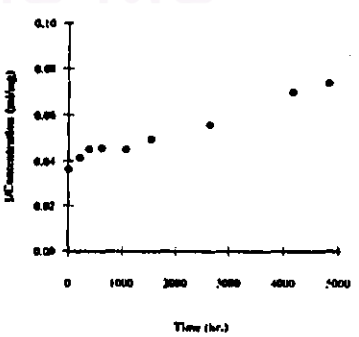
Zero-order plot



First-order plot



Second-order plot



Stability Data of Ranitidine HCl
0.005 % BHT

Absence of oxygen and of light

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	26.79	27.84	27.38	27.94	27.49 ± 0.53
241	D	26.94	27.33	27.39	26.83	27.12 ± 0.28
419	G	24.94	27.13	24.44	24.97	25.37 ± 1.20
1108	I	23.92	22.00	22.05	22.20	22.54 ± 0.92
1549	K	21.11	19.77	21.07	19.88	20.46 ± 0.73
2222	L	19.39	18.72	18.54	19.46	19.03 ± 0.46
4137	O	18.50	18.56	19.43	17.47	18.49 ± 0.52
4839	P	15.17	15.17	17.51	16.34	15.55 ± 0.48

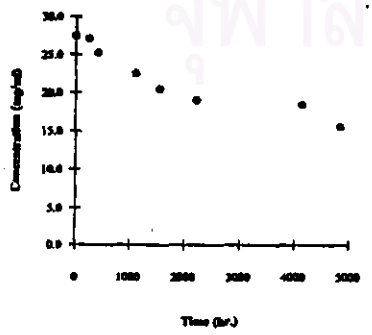
*calibration curves used.

Zero-order : conc = 26.07 - 0.0022 time r = 0.9319

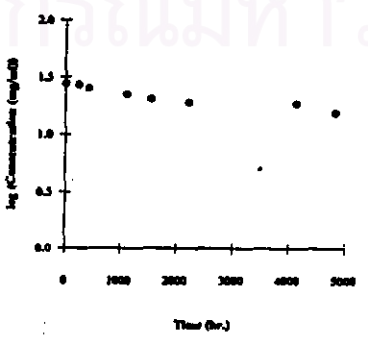
First-order : log conc = 1.4186 - 5.00×10^{-5} time r = 0.9478

Second-order : 1/conc = 0.00378 + 5.14×10^{-6} time r = 0.9828

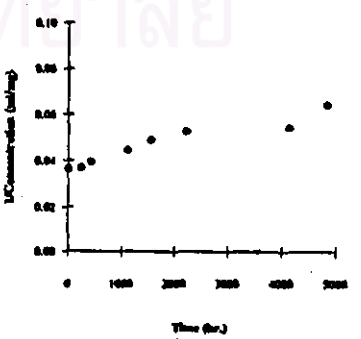
Zero-order plot



First-order plot



Second-order plot



Stability Data of Ranitidine HCl
0.5 % TWEEN 20®

Prebsence of oxygen and of light

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	26.52	28.67	27.57	26.68	27.36 ± 0.99
178	B	25.50	25.15	25.00	24.48	25.03 ± 0.42
366	E	21.38	20.05	23.93	21.82	21.80 ± 1.61
617	H	18.22	19.92	19.05	19.61	19.20 ± 0.75
1018	I	17.95	18.05	18.53	17.38	17.98 ± 0.47
1381	J	16.42	17.14	16.91	16.87	16.84 ± 0.30
2222	L	15.30	15.06	14.08	17.15	15.40 ± 1.28
3176	N	13.32	14.00	12.79	12.18	13.07 ± 0.77
4194	O	12.54	8.89	7.54	11.67	10.16 ± 2.34

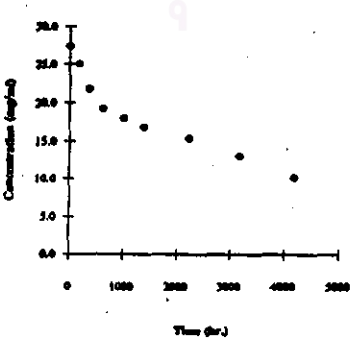
*calibration curves used.

Zero-order : conc = 23.70 - 0.0035 time r = 0.9285

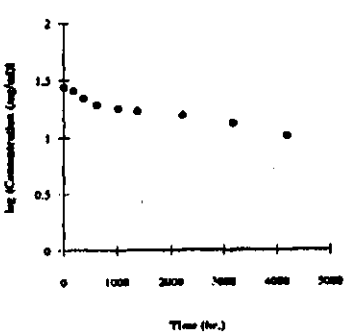
First-order : log conc = 1.3823 - 9.00 × 10^{-5} time r = 0.9698

Second-order : 1/conc = 0.040 + 1.31 × 10^{-5} time r = 0.9837

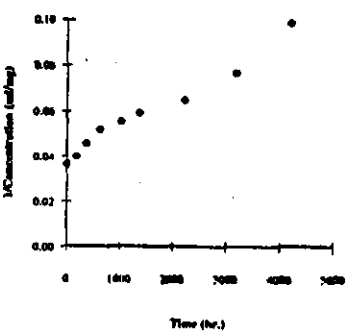
Zero-order plot



First-order plot



Second-order plot



Stability Data of Ranitidine HCl
0.5 % TWEEN 20®

Presence of oxygen but absence of light

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	26.52	28.67	27.57	26.68	27.39 ± 0.99
219	C	25.22	28.27	26.73	26.88	26.76 ± 1.25
402	F	27.90	28.37	23.63	27.24	26.78 ± 2.15
1089	I	23.22	23.31	23.40	22.67	23.15 ± 0.33
1448	J	14.89	16.07	16.34	17.55	16.21 ± 1.09
2197	L	16.02	16.52	16.61	15.76	16.22 ± 0.40
3187	N	16.00	15.38	15.73	15.78	15.72 ± 0.26
4194	O	11.53	14.71	12.09	15.59	13.49 ± 1.77

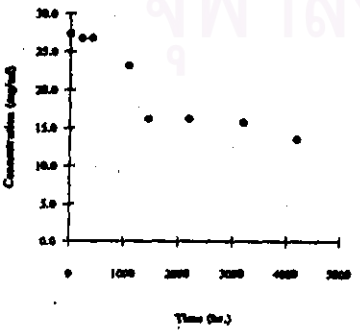
*calibration curves used.

Zero-order : conc = 26.38 - 0.0036 time r = 0.9105

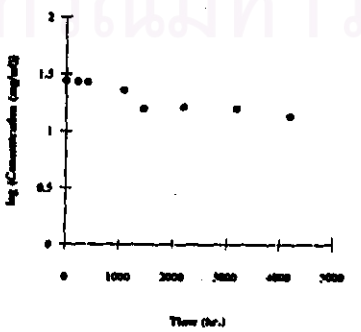
First-order : log conc = 1.5692 - 3.00×10^{-4} time r = 0.8314

Second-order : 1/conc = 0.0371 + 9.33×10^{-6} time r = 0.9384

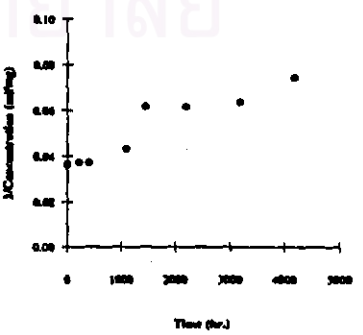
Zero-order plot



First-order plot



Second-order plot



Stability Data of Ranitidine HCl
0.5 % TWEEN 20®

Presence of light but absence of oxygen

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	26.52	28.67	27.57	26.68	27.36 ± 0.99
207	C	25.44	25.74	23.74	27.32	25.56 ± 1.47
375	E	24.14	20.94	22.61	26.43	23.53 ± 2.33
617	H	23.79	22.21	22.95	21.25	22.55 ± 1.08
1070	I	22.84	22.35	21.48	17.38	21.01 ± 2.49
1549	K	21.46	22.18	20.23	20.20	21.02 ± 0.97
2643	M	16.80	17.83	18.21	17.46	17.78 ± 0.6
4839	O	13.07	12.97	12.76	13.48	13.07 ± 0.30

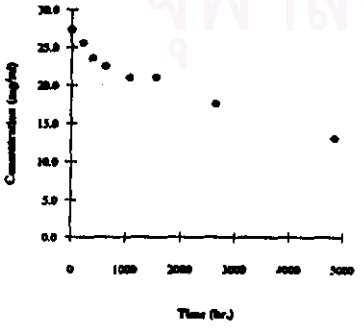
*calibration curves used.

Zero-order : conc = 25.2459 - 0.0027 time r = 0.9656

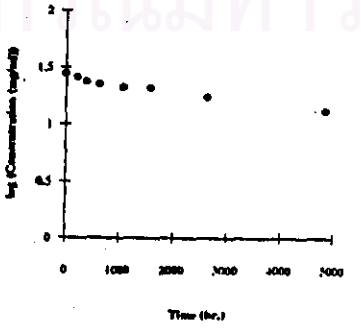
First-order : log conc = 1.4089 - 6.00 × 10^{-5} time r = 0.9862

Second-order : 1/conc = 0.0378 + 7.78 × 10^{-6} time r = 0.9920

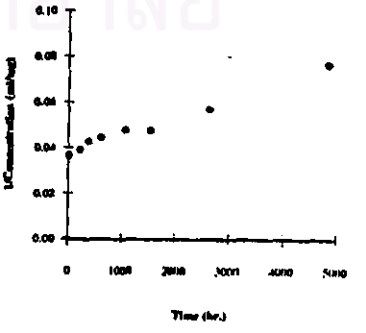
Zero-order plot



First-order plot



Second-order plot



Stability Data of Ranitidine HCl
0.5 % TWEEN 20®

Absence of oxygen and light

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	26.52	28.68	27.57	26.68	27.36 ± 0.99
241	D	26.08	29.81	27.51	27.56	27.74 ± 1.54
419	G	24.76	26.19	24.97	24.34	25.06 ± 0.80
1108	I	24.58	26.37	25.48	25.32	25.44 ± 0.73
1549	K	24.22	23.18	23.53	23.82	23.69 ± 0.44
2643	M	21.17	18.73	20.66	21.11	20.42 ± 1.15
3187	N	17.67	19.52	20.47	18.63	19.07 ± 1.20
4137	O	16.60	16.80	19.24	17.70	17.58 ± 1.20
4839	P	15.35	18.32	17.44	18.24	17.34 ± 1.20

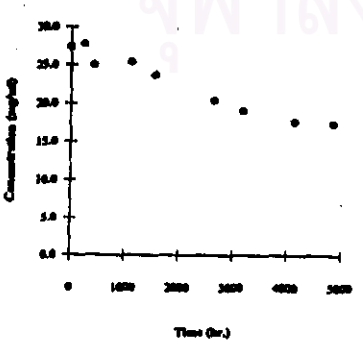
*calibration curves used.

Zero-order : conc = 27.20 - 0.0023 time r = 0.9778

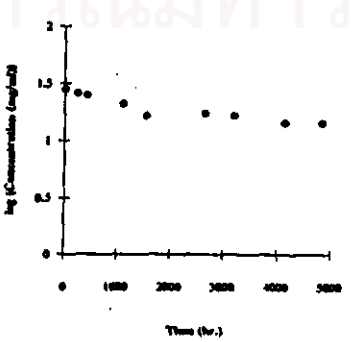
First-order : log conc = 1.4086 - 4.00 × 10^{-5} time r = 0.9838

Second-order : 1/conc = 0.059 + 4.79 × 10^{-6} time r = 0.9869

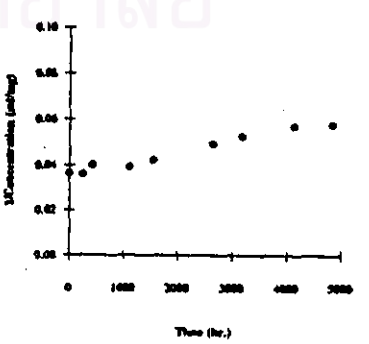
Zero-order plot



First-order plot



Second-order plot



Stability Data of Ranitidine HCl
0.001 % ALPHA TOCOPHEROL

Presence of oxygen and light

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	28.98	26.66	28.52	29.50	28.15 ± 1.23
178	B	25.00	25.94	26.67	26.00	25.90 ± 0.69
366	E	25.41	25.89	24.18	25.59	25.27 ± 0.75
1018	I	18.52	18.88	19.68	18.83	18.98 ± 0.49
1381	J	17.38	17.08	16.94	16.54	16.98 ± 0.35
2197	L	15.40	14.17	15.63	16.02	15.30 ± 0.80
2662	U	14.63	14.50	14.96	14.71	14.70 ± 0.19
4815	O	9.76	10.88	10.05	12.14	10.71 ± 0.96

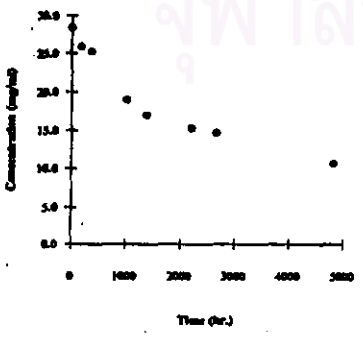
*calibration curves used.

Zero-order : conc = 26.58 - 0.0052 time r = 0.9175

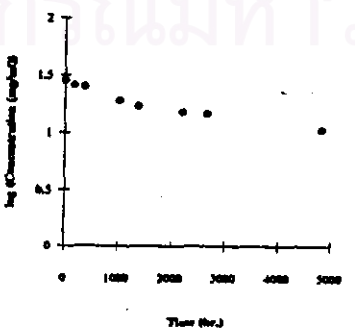
First-order : log conc = 1.4277 - 1.00×10^{-4} time r = 0.9623

Second-order : 1/conc = 0.0368 + 1.19×10^{-5} time r = 0.9902

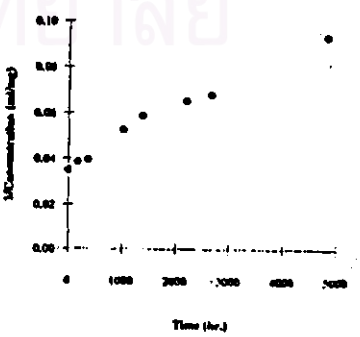
Zero-order plot



First-order plot



Second-order plot



Stability Data of Ranitidine HCl
0.001 % ALPHA TOCOPHEROL

Presence of oxygen but absence of light

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	28.98	26.66	28.52	29.50	28.42 ± 1.23
219	C	27.69	28.12	26.54	26.06	27.10 ± 0.93
402	F	27.53	25.98	28.40	27.18	27.27 ± 1.00
1089	I	24.60	21.41	23.53	23.99	23.38 ± 1.39
1573	K	20.91	19.65	20.40	22.01	20.74 ± 0.99
2222	L	16.76	15.13	18.08	15.72	16.42 ± 1.30
3187	N	14.43	14.36	15.66	15.11	14.89 ± 0.61
4137	O	15.07	15.78	15.46	15.50	15.45 ± 0.29

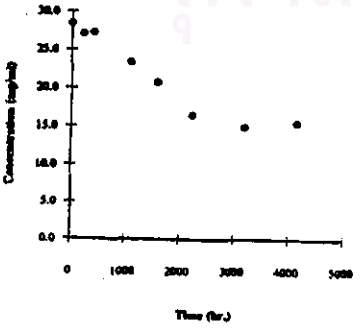
*calibration curves used.

Zero-order : conc = 26.93 - 0.0031 time r = 0.9478

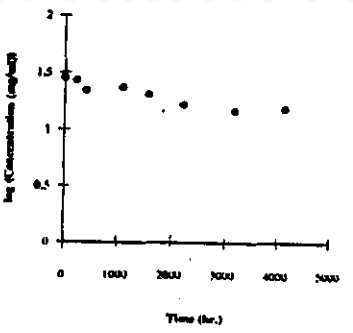
First-order : log conc = 1.4335 - 6.00×10^{-5} time r = 0.9540

Second-order : 1/conc = 0.0364 + 8.56×10^{-6} time r = 0.9557

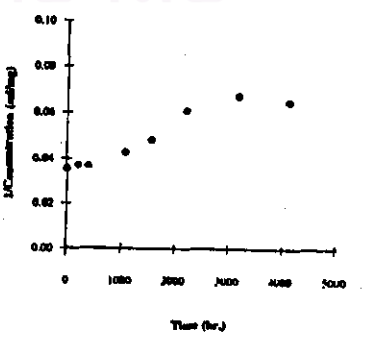
Zero-order plot



First-order plot



Second-order plot



Stability Data of Ranitidine HCl
0.001 % ALPHA TOCOPHEROL

Presence of light but absence of oxygen

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	28.98	26.66	28.52	29.50	28.42 ± 1.23
207	C	26.02	26.33	27.43	24.03	25.95 ± 1.41
375	E	26.09	26.12	24.51	23.02	24.94 ± 1.48
1070	I	22.73	22.55	22.67	22.08	22.51 ± 0.30
1448	J	18.20	20.66	18.48	19.26	19.15 ± 1.10
2197	L	18.70	18.51	18.34	18.40	18.49 ± 0.16
3211	N	17.82	17.21	17.32	16.42	17.19 ± 0.58
4815	P	14.95	13.84	13.30	14.71	14.20 ± 0.77

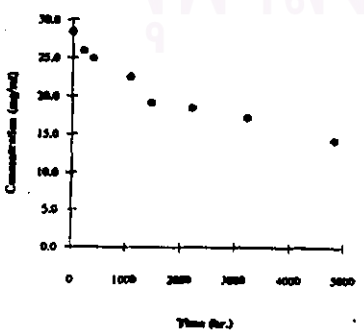
*calibration curves used.

Zero-order : conc = 26.52 - 0.0034 time r = 0.9417

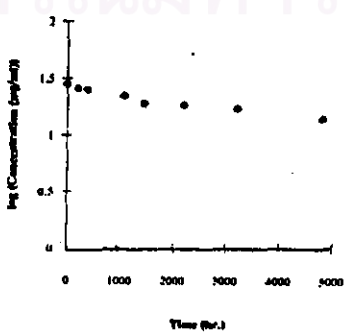
First-order : log conc = 1.4253 - 7.00×10^{-5} time r = 0.9671

Second-order : 1/conc = 0.0373 + 6.96×10^{-6} time r = 0.9836

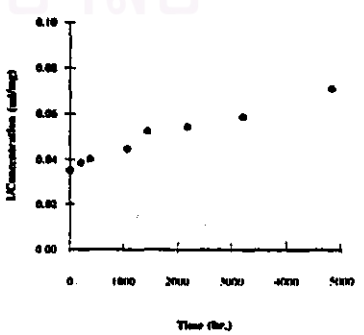
Zero-order plot



First-order plot



Second-order plot



Stability Data of Ranitidine HCl
0.001 % ALPHA TOCOPHEROL

Absence of oxygen and light

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	28.98	26.66	28.52	29.50	28.42 ± 1.23
241	D	26.31	27.52	26.72	29.15	27.43 ±1.25
419	G	24.29	23.69	25.19	28.00	25.29 ± 1.91
1108	I	23.64	23.36	25.08	22.90	23.74 ±0.94
1573	K	23.88	23.14	19.31	21.24	21.98 ±2.05
2222	L	18.79	19.14	20.38	19.24	19.38 ±0.69
3187	N	19.33	18.00	18.38	19.52	18.81 ±0.74
4169	O	15.64	17.32	17.85	17.79	17.15 ±1.04
4839	P	17.55	17.08	17.76	17.65	17.51 ± 0.30

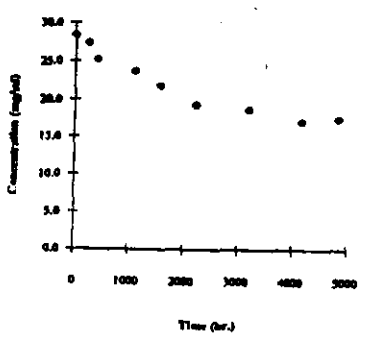
*calibration curves used.

Zero-order : conc = 27.46 - 0.0031 time r = 0.9458

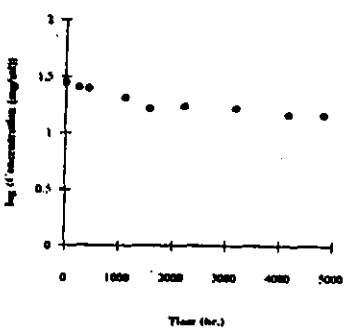
First-order : log conc = 1.4411 - 6.00×10^{-5} time r = 0.9604

Second-order : 1/conc = 0.0359 + 4.85×10^{-6} time r = 0.9713

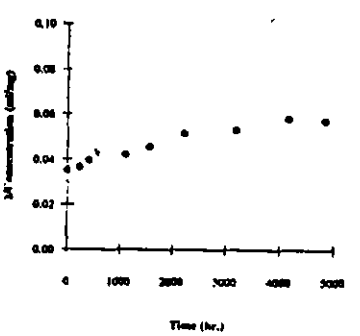
Zero-order plot



First-order plot



Second-order plot



Stability Data of Ranitidine HCl
0.02 % ALPHA TOCOPHEROL

Presence of oxygen and light

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	27.87	28.87	26.85	27.97	27.89 ± 0.83
178	C	27.48	27.86	28.40	27.79	27.88 ± 0.38
366	E	24.00	24.58	20.91	20.83	22.58 ± 2.00
617	H	19.91	21.46	19.54	20.19	20.27 ± 0.83
1018	I	19.82	20.14	18.98	19.31	19.56 ± 0.52
1381	J	16.19	16.39	16.54	17.85	16.74 ± 0.75
2197	L	17.23	16.73	16.84	15.59	16.60 ± 0.71
3176	N	12.78	14.05	12.78	13.40	13.25 ± 0.60
4194	O	12.22	12.64	8.46	12.54	11.47 ± 2.01

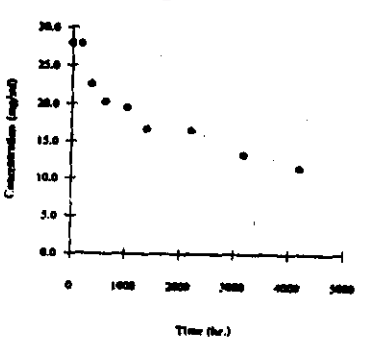
*calibration curves used.

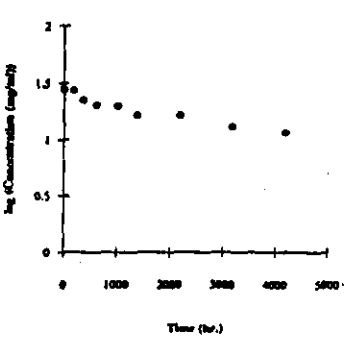
Zero-order : conc = 26.10 - 0.0054 time r = 0.9136

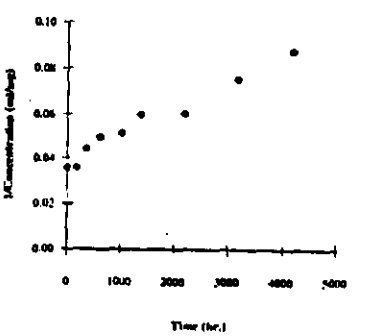
First-order : log conc = 1.4170 - 1.00×10^{-4} time r = 0.9574

Second-order : 1/conc = 0.0382 + 1.17×10^{-5} time r = 0.9819

Zero-order plot **First-order plot** **Second-order plot**







Stability Data of Ranitidine HCl
0.02 % ALPHA TOCOPHEROL

Presence of oxygen but absence of light

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	27.87	28.87	26.85	27.97	27.89 ± 0.83
219	C	25.66	27.53	25.38	25.35	25.98 ± 1.05
402	F	27.09	27.47	26.66	25.17	26.60 ± 1.01
1089	I	23.79	22.28	22.38	21.75	22.55 ± 0.87
1448	J	18.89	16.64	16.00	18.24	17.44 ± 1.35
2197	L	16.53	16.67	16.14	15.75	16.27 ± 0.41
3187	N	16.63	16.80	16.33	15.43	16.30 ± 0.61
4137	O	13.76	14.50	15.11	14.15	14.38 ± 0.57

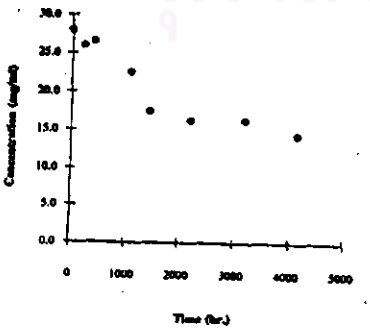
*calibration curves used.

Zero-order : conc = 26.84 - 0.0041 time r = 0.9174

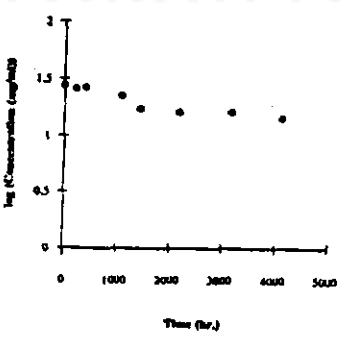
First-order : log conc = 1.4312 - 8.00×10^{-5} time r = 0.9334

Second-order : 1/conc = 0.0367 + 8.37×10^{-6} time r = 0.9472

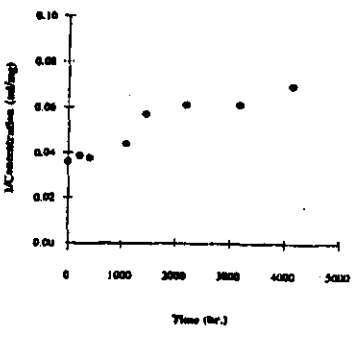
Zero-order plot



First-order plot



Second-order plot



Stability Data of Ranitidine HCl
0.02 % ALPHA TOCOPHEROL

Presence of light but absence of oxygen

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	27.87	28.87	26.85	27.97	27.89 ± 0.83
207	C	26.76	27.92	26.93	27.17	27.20 ± 0.51
366	E	25.02	24.74	24.73	23.54	24.51 ± 0.66
617	H	22.31	23.12	23.25	23.83	23.13 ± 0.63
1070	I	20.20	19.89	18.31	22.50	20.23 ± 1.73
1448	J	21.35	19.07	20.03	16.95	19.35 ± 1.85
2643	M	19.16	17.99	18.10	17.14	18.10 ± 0.83
4839	O	15.42	14.05	12.97	15.51	14.49 ± 1.49

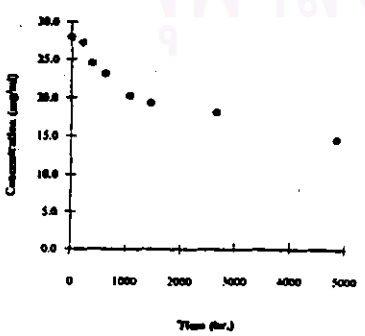
*calibration curves used.

Zero-order : conc = 26.38 - 0.0038 time r = 0.9100

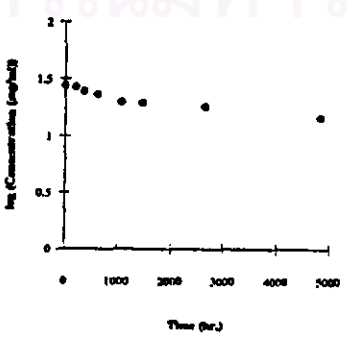
First-order : log conc = 1.4222 - 7.00×10^{-5} time r = 0.9454

Second-order : 1/conc = 0.0377 + 6.61×10^{-6} time r = 0.9722

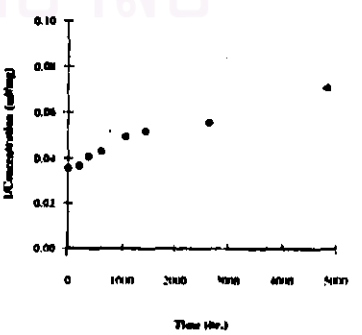
Zero-order plot



First-order plot



Second-order plot



Stability Data of Ranitidine HCl
0.02 % ALPHA TOCOPHEROL

Absence of oxygen and light

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	27.87	28.87	26.85	27.97	27.89 ± 0.83
241	D	26.01	26.54	26.02	27.46	26.51 ± 0.68
419	G	27.16	25.63	25.21	25.28	25.82 ± 0.91
1108	I	23.96	24.07	22.94	23.23	23.55 ± 0.55
1573	K	22.17	24.30	24.17	21.88	23.13 ± 1.28
2643	M	21.86	19.82	21.66	21.09	21.11 ± 0.92
3187	N	18.76	18.10	20.53	19.10	19.12 ± 1.02
4839	P	15.48	17.49	17.02	15.21	16.30 ± 1.12

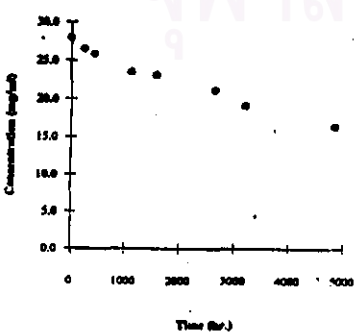
*calibration curves used.

Zero-order : conc = 27.14 - 0.0025 time r = 0.9896

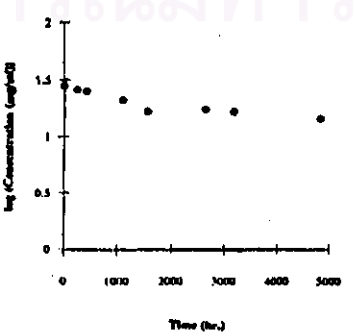
First-order : log conc = 1.4357 - 5.00×10^{-5} time r = 0.9948

Second-order : 1/conc = 0.0364 + 5.03×10^{-6} time r = 0.9935

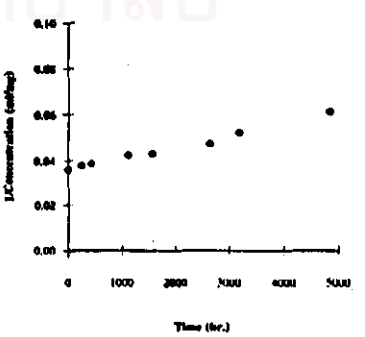
Zero-order plot



First-order plot



Second-order plot



Stability Data of Ranitidine HCl
0.01 % SODIUM BISULFITE

Presence of oxygen and light

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	29.46	27.31	27.7	28.3	28.20 ± 0.94
178	B	25.49	24.72	26.62	26.40	25.81 ± 0.88
366	E	25.76	26.10	23.32	22.82	24.50 ± 1.67
617	H	20.69	20.74	20.61	21.95	21.00 ± 0.64
1018	I	20.26	21.42	18.70	22.19	20.64 ± 1.52
1549	K	19.24	18.72	20.94	18.44	19.33 ± 1.12
2243	L	15.65	15.27	13.46	13.53	14.48 ± 1.15
3176	N	17.42	16.24	14.9	15.92	16.12 ± 1.03
4194	O	15.32	14.30	16.91	15.91	15.61 ±1.09

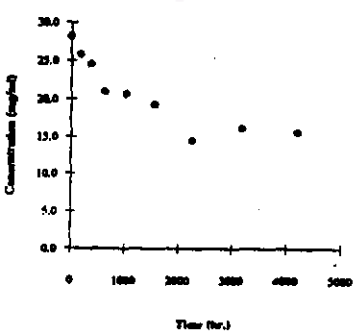
*calibration curves used.

Zero-order : conc = 25.60 - 0.0034 time r = 0.8711

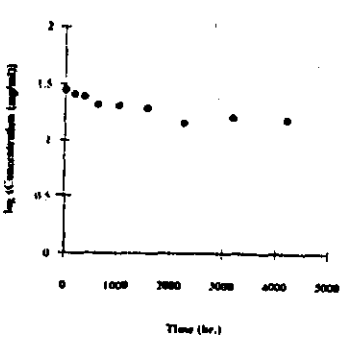
First-order : log conc = 1.4098 - 7.00 × 10^{-5} time r = 0.9355

Second-order : 1/conc = 0.0386 + 6.58 × 10^{-6} time r = 0.9612

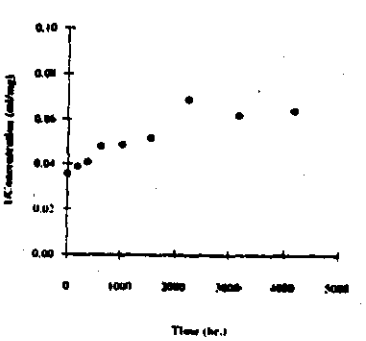
Zero-order plot



First-order plot



Second-order plot



Stability Data of Ranitidine HCl
0.01 % SODIUM BISULFITE

Presence of oxygen but absence of light

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	29.46	27.31	27.70	28.33	28.20 ± 0.94
219	C	25.37	26.61	24.48	26.14	25.65 ± 0.93
402	F	25.06	23.12	27.64	24.73	25.14 ± 1.87
1089	I	21.06	20.45	20.69	21.03	20.81 ± 0.29
1448	J	16.33	16.23	15.86	18.86	16.67 ± 1.09
2197	L	17.96	15.83	17.26	18.21	17.31 ± 1.07
3187	N	16.82	17.18	17.21	15.68	16.72 ± 0.72
4137	O	13.75	14.57	14.55	14.90	14.44 ± 0.49
4827	P	14.77	14.70	14.50	14.23	14.56 ± 0.24

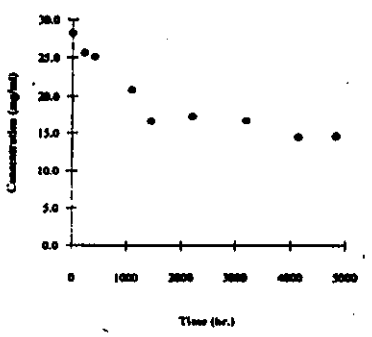
*calibration curves used.

Zero-order : conc = 26.02 - 0.0037 time r = 0.8920

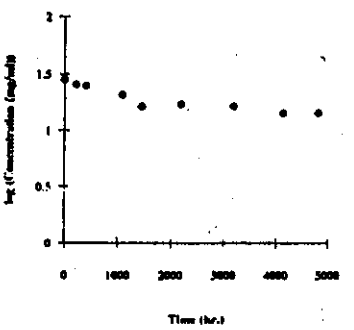
First-order : log conc = 1.4149 - 8.00×10^{-5} time r = 0.9156

Second-order : 1/conc = 0.0385 + 6.84×10^{-6} time r = 0.9346

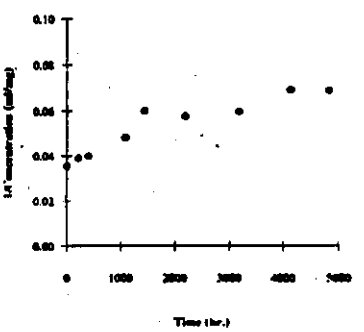
Zero-order plot



First-order plot



Second-order plot



Stability Data of Ranitidine HCl
0.01 % SODIUM BISULFITE

Presence of light but absence of oxygen

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	29.46	27.31	27.70	28.33	28.20 ± 0.94
207	C	28.46	22.99	26.89	26.70	26.26 ± 2.32
375	E	22.96	26.72	23.51	20.51	23.43 ± 2.55
617	H	23.73	22.83	22.62	22.07	22.81 ± 0.69
1070	I	22.24	22.99	21.68	20.89	21.95 ± 0.89
1549	K	21.82	20.21	19.50	19.523	20.26 ± 1.09
2643	M	19.21	17.72	19.41	18.46	18.70 ± 0.77
4162	O	17.84	14.88	15.87	13.12	15.43 ± 1.97

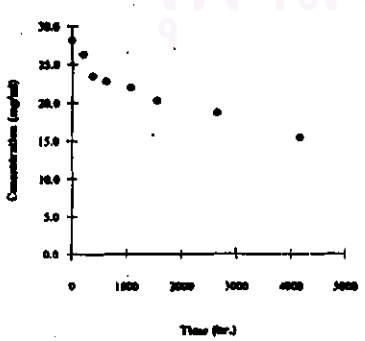
*calibration curves used.

Zero-order : conc = 25.50 - 0.0024 time r = 0.9386

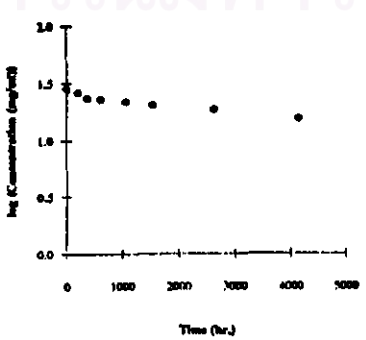
First-order : log conc = 1.4078 - 5.00 × 10^{-5} time r = 0.9659

Second-order : 1/conc = 0.0389 + 5.37 × 10^{-6} time r = 0.9824

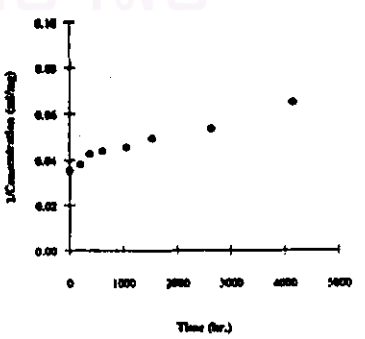
Zero-order plot



First-order plot



Second-order plot



Stability Data of Ranitidine HCl
0.01 % SOUDIM BISULFITE

Absence of oxygen and light

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	29.46	27.31	27.70	28.33	28.20 ± 0.94
241	D	26.30	24.74	26.23	24.72	25.50 ± 0.89
419	G	23.53	23.50	24.50	27.13	24.66 ± 1.71
1108	I	25.96	24.90	24.48	23.38	24.68 ± 1.06
1549	K	21.43	21.77	22.53	18.35	21.02 ± 1.84
2197	L	18.52	18.96	19.31	19.05	18.96 ± 0.33
3187	N	18.71	16.82	18.64	19.00	18.29. ± 1.00
4137	O	17.92	17.95	16.46	17.84	17.54 ± 0.49
4839	P	17.45	16.81	16.85	16.97	17.02 ± 0.30

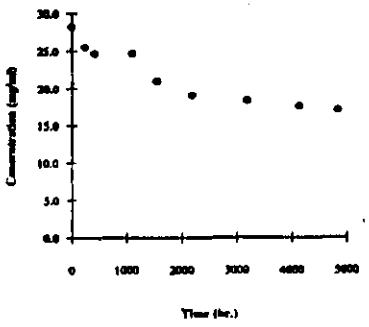
*calibration curves used.

Zero-order : conc = 27.18 - 0.0036 time r = 0.9332

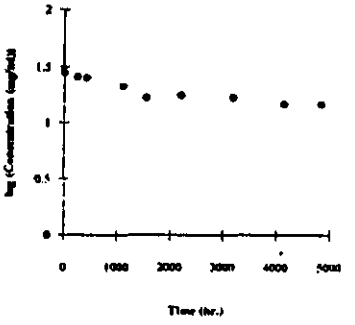
First-order : log conc = 1.4351 - 6.00×10^{-5} time r = 0.9490

Second-order : 1/conc = 0.0366 + 4.77×10^{-6} time r = 0.9620

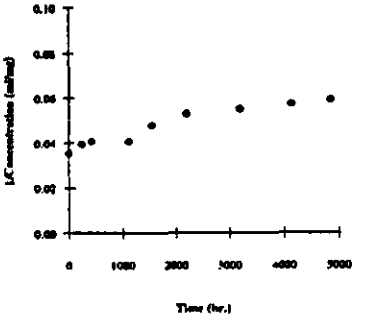
Zero-order plot



First-order plot



Second-order plot



Stability Data of Ranitidine HCl
0.1 % SODIUM BISULFITE

Presence of oxygen and light

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	25.69	26.18	25.41	25.11	25.60 ± 0.46
178	B	22.60	22.14	22.03	21.86	22.16 ± 0.32
366	E	20.83	22.34	19.55	19.73	20.52 ± 1.38
617	H	20.46	18.8	20.36	17.92	19.40 ± 1.23
1018	I	17.98	19.43	17.77	15.14	17.58 ± 1.79
1381	J	16.17	15.93	16.25	16.24	16.13 ± 0.15
2222	L	13.67	14.32	14.75	14.21	14.42 ± 0.44
4169	O	12.62	9.61	12.10	10.79	11.68 ± 1.47

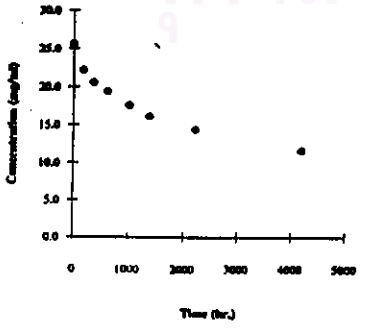
*calibration curves used.

Zero-order : conc = 22.06 - 0.0029 time r = 0.9081

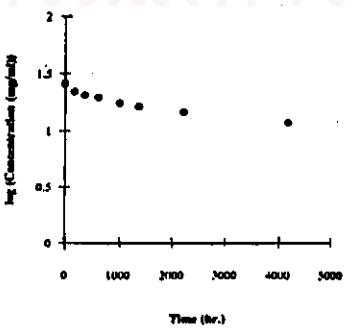
First-order : log conc = 1.3472 - 7.00×10^{-5} time r = 0.9532

Second-order : 1/conc = 0.0441 + 1.06×10^{-5} time r = 0.9835

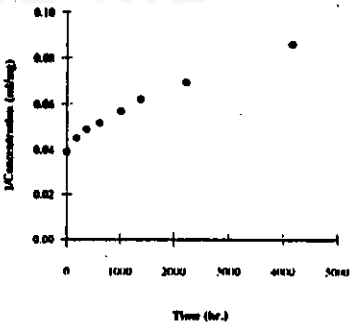
Zero-order plot



First-order plot



Second-order plot



Stability Data of Ranitidine HCl
0.1 % SODIUM BISULFITE

Presence of oxygen but absence of light

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	25.69	26.18	25.41	25.11	25.6 ± 0.46
219	C	23.01	21.83	21.52	23.03	22.35 ± 0.79
402	F	20.68	21.75	20.47	22.57	21.37 ± 0.98
617	H	20.69	22.03	21.25	20.96	21.23 ± 0.58
1089	I	18.00	18.67	18.50	18.63	18.45 ± 0.31
1448	J	16.83	15.90	15.68	14.54	15.74 ± 0.94
2222	L	15.74	15.76	14.84	14.88	15.31 ± 0.51
4194	O	13.98	11.05	12.66	11.09	12.20 ± 1.41

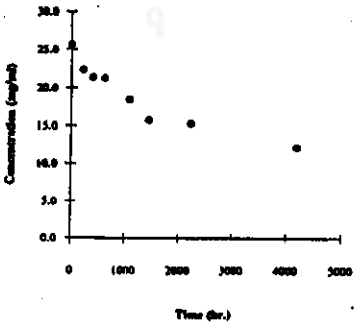
*calibration curves used.

Zero-order : conc = 22.76 - 0.0029 time r = 0.9195

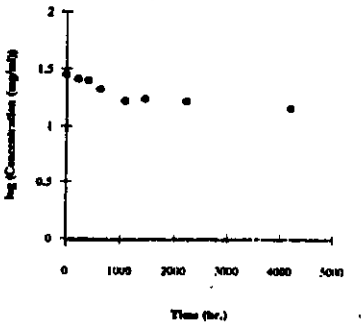
First-order : log conc = 1.3615 - 7.00×10^{-5} time r = 0.9532

Second-order : 1/conc = 0.0426 + 9.96×10^{-6} time r = 0.9770

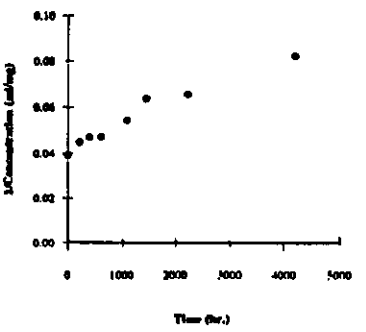
Zero-order plot



First-order plot



Second-order plot



Stability Data of Ranitidine HCl
0.1 % SODIUM BISULFITE

Presence of light but absence of oxygen

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	25.69	26.18	25.41	25.11	25.60 ± 0.46
207	C	20.98	23.90	22.01	21.66	22.14 ± 1.25
375	E	21.86	22.58	20.73	24.48	22.41 ± 1.57
617	H	22.64	19.82	22.36	22.10	21.73 ± 1.29
1070	I	19.22	19.51	22.15	18.20	19.77 ± 1.68
1616	K	18.52	20.12	20.03	18.92	19.40 ± 0.80
2643	M	17.26	16.72	16.27	16.23	16.62 ± 0.48
4162	O	13.68	13.00	13.49	9.88	12.51 ± 1.78

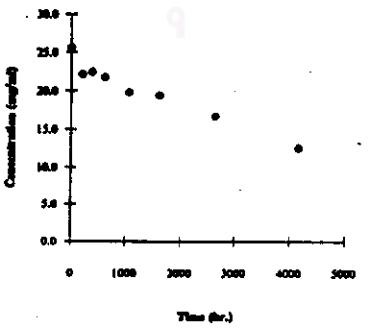
*calibration curves used.

Zero-order : conc = 23.75 - 0.0029 time r = 0.9738

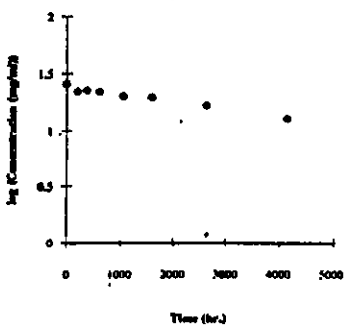
First-order : log conc = 1.3776 - 6.00 × 10^{-5} time r = 0.9849

Second-order : 1/conc = 0.0416 + 8.79 × 10^{-6} time r = 0.9816

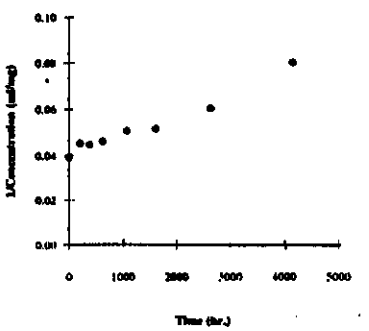
Zero-order plot



First-order plot



Second-order plot



Stability Data of Ranitidine HCl
0.1 % SODIUM BISULFITE

Absence of oxygen and light.

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	25.69	26.18	25.41	25.11	25.60 ± 0.46
241	D	22.85	24.54	23.83	22.77	23.50 ± 0.84
419	G	23.06	23.58	23.25	20.60	22.62 ± 1.37
617	H	23.59	21.30	22.72	21.96	22.39 ± 0.99
1108	I	23.55	25.44	21.05	21.90	22.98 ± 1.94
1549	K	21.15	17.46	20.36	18.43	19.35 ± 1.70
2643	M	17.92	17.90	18.43	18.67	18.23 ± 0.38
3187	N	15.97	15.26	17.50	18.05	16.67 ± 1.30
4839	P	14.00	14.80	14.38	17.13	15.08 ± 1.41

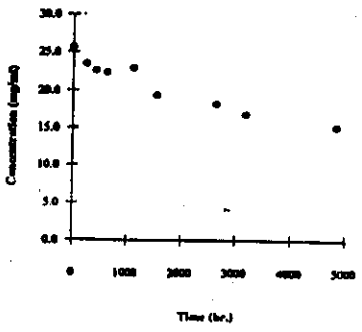
*calibration curves used.

Zero-order : conc = 24.43 - 0.0025 time r = 0.9569

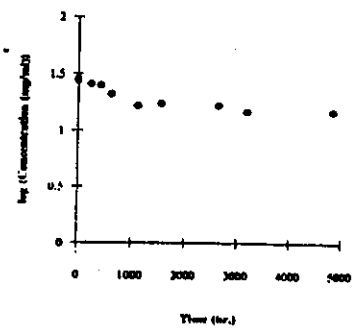
First-order : log conc = 1.3907 - 5.00×10^{-5} time r = 0.9711

Second-order : 1/conc = 0.0403 + 5.52×10^{-6} time r = 0.9807

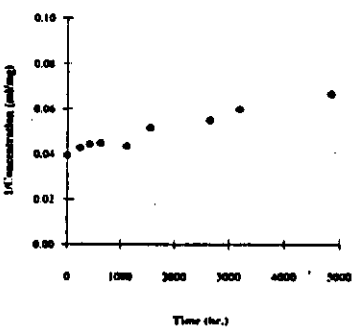
Zero-order plot



First-order plot



Second-order plot



Stability Data of Ranitidine HCl
0.01 % ASCORBIC ACID

Presence of oxygen and light

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	24.7860	24.0873	27.3797	28.9787	26.3079 ± 2.28
178	B	25.8946	23.9419	25.5416	25.4908	25.2172 ± 0.87
366	E	20.6749	19.8532	19.7049	21.5050	20.4345 ± 0.83
617	H	20.5742	20.5136	19.9396	18.7859	19.9533 ± 0.83
1018	I	18.1170	16.5255	20.3219	16.0935	17.7645 ± 1.91
1381	J	17.5102	14.8152	14.5295	17.2889	16.0360 ± 1.58
2222	L	13.8123	13.7613	13.5529	13.9851	13.7779 ± 0.18
3176	N	12.6746	11.8759	14.0620	11.9690	12.6454 ± 1.01
4194	O	12.4463	10.6962	11.2043	11.2878	11.4087 ± 0.74

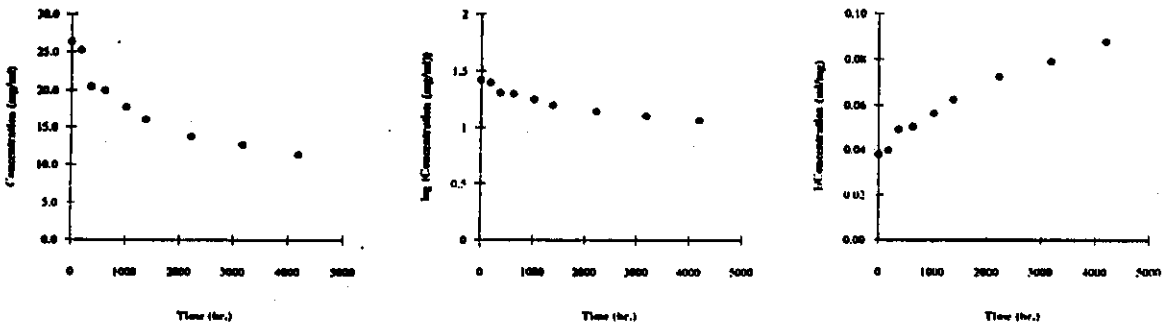
*calibration curves used.

Zero-order : conc = 23.01 - 0.0033 time r = 0.9074

First-order : log conc = 1.3651 - 8.00×10^{-5} time r = 0.9499

Second-order : 1/conc = 0.0423 + 1.17×10^{-5} time r = 0.9795

Zero-order plot **First-order plot** **Second-order plot**



Stability Data of Ranitidine HCl
0.01 % ASCORBIC ACID

Presence of oxygen but absence of light

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	24.79	24.09	27.38	28.98	26.31 ± 2.28
219	C	25.34	23.87	24.44	24.81	24.61 ± 0.62
402	F	25.26	24.59	23.16	25.37	24.59 ± 1.02
1089	I	17.88	18.19	20.28	18.07	18.61 ± 1.12
1448	J	17.75	18.65	16.00	18.30	17.67 ± 1.17
2222	L	16.79	17.40	16.48	16.73	16.85 ± 0.39
3187	N	16.04	15.52	17.63	15.86	16.26 ± 0.93
4137	O	11.42	13.44	14.32	12.98	13.04 ± 1.21
4827	P	11.98	14.66	14.22	15.02	13.97 ± 1.37

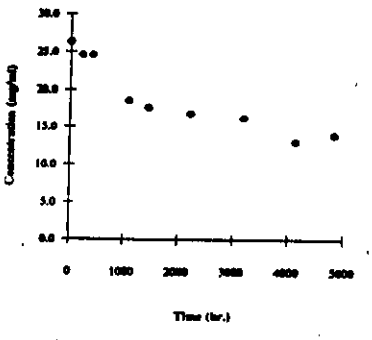
*calibration curves used.

Zero-order : conc = 24.77 - 0.0033 time r = 0.9159

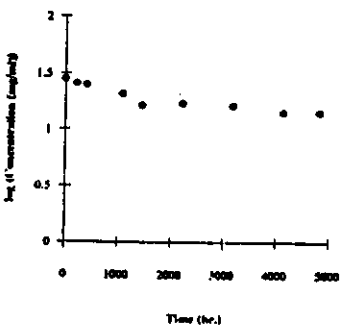
First-order : log conc = 1.3940 - 7.00 × 10^{-5} time r = 0.9394

Second-order : 1/conc = 0.0403 + 7.44 × 10^{-6} time r = 0.9541

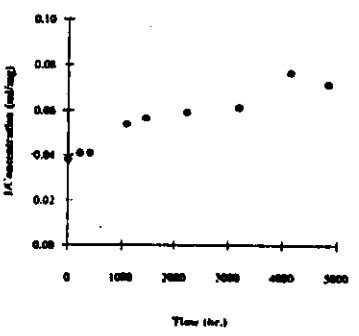
Zero-order plot



First-order plot



Second-order plot



Stability Data of Ranitidine HCl
0.01 % ASCORBIC ACID

Presence of light but absence of oxygen

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	24.79	24.09	27.38	28.98	26.1 ± 2.28
207	C	27.17	26.04	24.89	24.25	25.57 ± 1.30
375	E	24.49	24.58	24.78	24.16	24.74 ± 0.28
617	H	23.72	21.58	22.84	23.67	22.95 ± 1.00
1070	I	21.90	21.13	21.24	21.12	21.35 ± 0.37
1549	K	17.85	16.73	17.04	17.51	17.28 ± 0.50
2222	L	16.68	15.28	16.92	16.69	16.39 ± 0.75
3211	N	17.99	17.34	16.51	19.36	17.80 ± 1.20
4227	O	16.51	17.21	12.51	18.29	16.13 ± 2.52

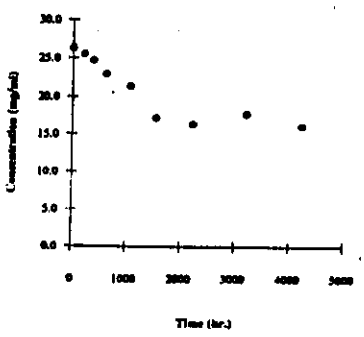
*calibration curves used.

Zero-order : conc = 24.66 - 0.0033 time r = 0.8771

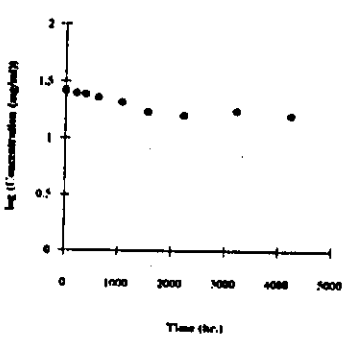
First-order : log conc = 1.3920 - 5.00×10^{-5} time r = 0.8832

Second-order : 1/conc = 0.0405 + 5.96×10^{-6} time r = 0.8869

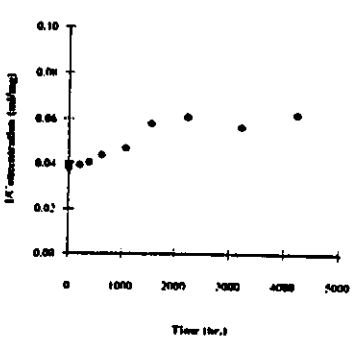
Zero-order plot



First-order plot



Second-order plot



Stability Data of Ranitidine HCl
0.01 % ASCORBIC ACID

Asence of oxygen and of light.

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	24.79	24.09	27.38	28.98	26.30 ± 2.28
241	D	28.36	23.84	26.78	24.84	25.96 ± 2.02
419	G	24.10	24.40	25.47	24.65	24.68 ± 0.58
1108	I	24.63	23.76	24.70	24.46	24.40 ± 0.44
1549	K	20.77	20.74	20.95	21.39	20.96 ± 0.30
2643	R	20.25	20.30	20.30	20.72	20.40 ± 0.22
3187	N	20.20	19.00	19.31	19.43	19.48 ± 0.51
4137	O	17.09	16.53	19382	17.54	17.74 ± 1.45
4839	P	18.19	18.61	13.80	18.23	17.21 ± 2.28

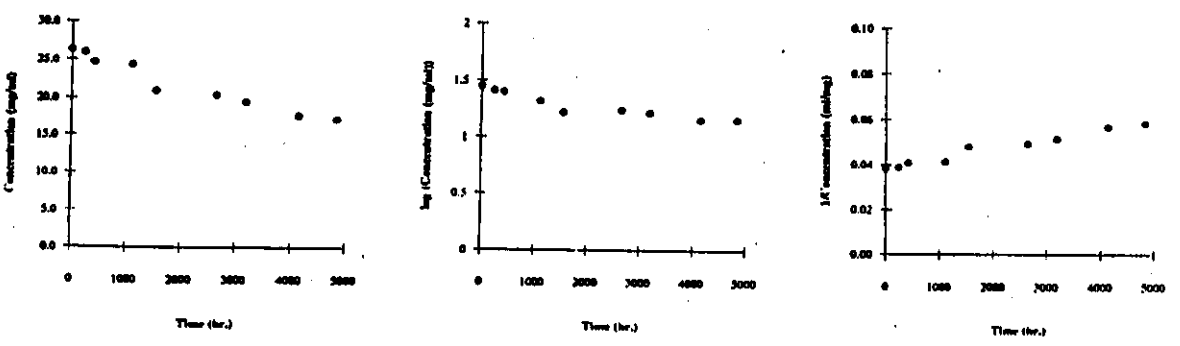
*calibration curves used.

Zero-order : conc = 26.03 - 0.0022 time r = 0.9722

First-order : log conc = 1.4169 - 4.00 × 10^{-5} time r = 0.9797

Second-order : 1/conc = 0.0381 + 4.25 × 10^{-6} time r = 0.9849

Zero-order plot **First-order plot** **Second-order plot**



Stability Data of Ranitidine HCl
0.1 % ASCORBIC ACID

Presence of oxygen and light

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	28.47	29.06	28.80	25.45	27.95 ± 1.68
178	B	27.92	25.78	22.93	22.3	24.75 ± 2.59
366	E	22.76	20.57	23.17	20.93	21.85 ± 1.30
617	H	19.34	20.81	22.65	21.22	21.01 ± 1.36
1018	I	18.39	19.41	20.16	19.82	19.44 ± 0.76
1381	J	17.05	19.01	18.08	15.39	17.38 ± 1.55
2197	L	16.91	14.96	17.52	16.41	16.45 ± 1.09
3176	N	14.20	15.02	14.65	15.04	14.73 ± 0.40
4169	O	15.21	15.23	10.42	15.11	13.99 ± 2.38

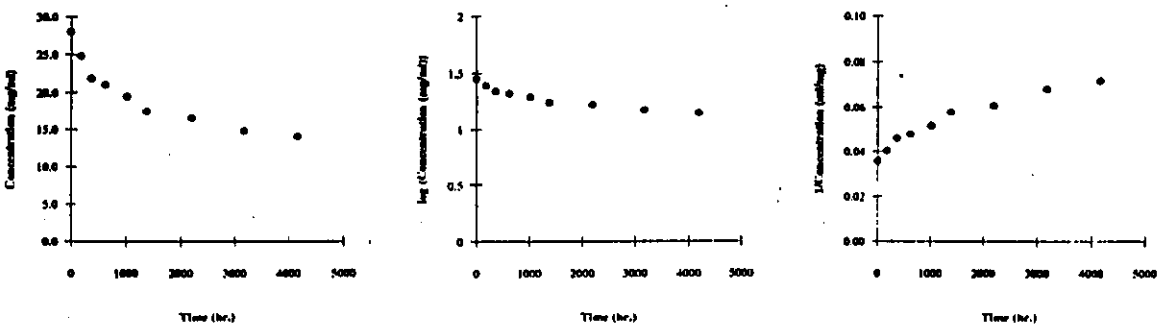
*calibration curves used.

Zero-order : conc = 23.92 - 0.0029 time r = 0.8939

First-order : log conc = 1.3797 - 7.00 × 10^{-5} time r = 0.9333

Second-order : 1/conc = 0.0414 + 8.11 × 10^{-6} time r = 0.9636

Zero-order plot **First-order plot** **Second-order plot**



Stability Data of Ranitidine HCl
0.1 % ASCORBIC ACID

Presence of light but absence of oxygen

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	28.47	29.06	28.80	25.45	27.95 ± 1.68
207	C	25.02	24.79	24.79	25.95	25.14 ± 0.55
375	F	23.66	24.44	24.39	25.86	24.59 ± 0.92
617	H	21.37	23.23	22.08	23.01	22.42 ± 0.86
1070	I	21.80	21.49	21.47	20.85	21.40 ± 0.40
1549	K	19.90	21.09	20.98	21.02	20.75 ± 0.56
2643	M	20.85	21.08	21.30	19.89	20.78 ± 0.62
4162	O	18.33	18.28	17.73	17.09	17.86 ± 0.58

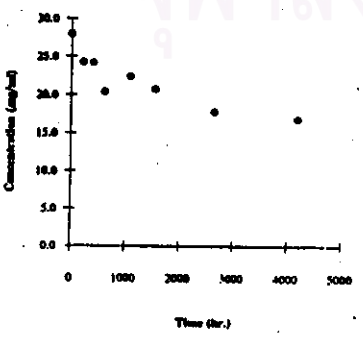
*calibration curves used.

Zero-order : conc = 25.18 - 0.0019 time r = 0.8755

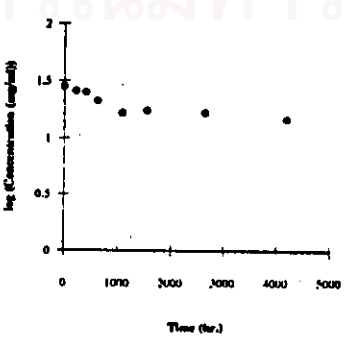
First-order : log conc = 1.4013 - 4.00 × 10^{-5} time r = 0.9027

Second-order : 1/conc = 0.0396 + 4.05 × 10^{-6} time r = 0.9253

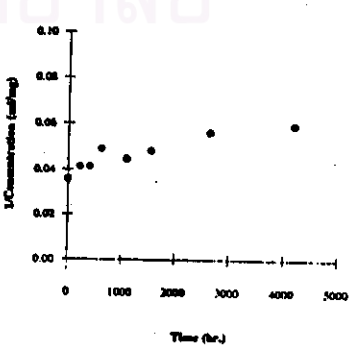
Zero-order plot



First-order plot



Second-order plot



Stability Data of Ranitidine HCl
0.1 % ASCORBIC ACID

Presence of oxygen but absence of light

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	28.47	29.06	28.80	25.45	27.95 ± 1.68
219	C	23.80	25.09	24.24	23.90	24.26 ± 0.59
402	F	25.11	22.01	25.25	24.34	24.18 ± 1.50
617	H	21.69	19.19	19.65	21.13	20.42 ± 1.19
1089	I	19.63	23.64	23.81	22.50	22.40 ± 1.93
1549	K	21.51	21.06	20.64	19.70	20.73 ± 0.77
2643	M	17.88	16.79	18.97	17.54	17.79 ± 0.91
4194	O	16.86	17.45	17.40	15.62	16.83 ± 0.85

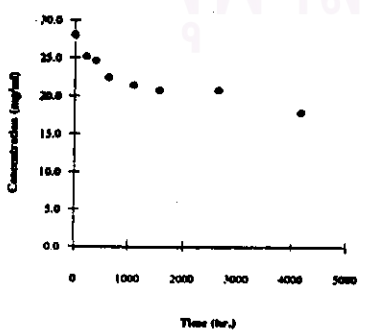
*calibration curves used.

Zero-order : conc = 25.18 - 0.0019 time r = 0.8755

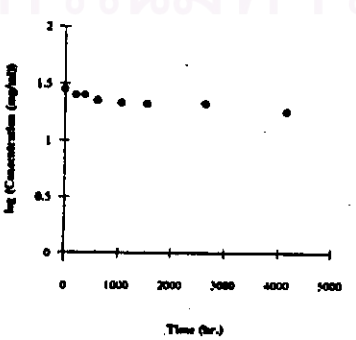
First-order : log conc = 1.4013 - 4.00×10^{-5} time r = 0.9027

Second-order : 1/conc = 0.0396 + 4.05×10^{-6} time r = 0.9253

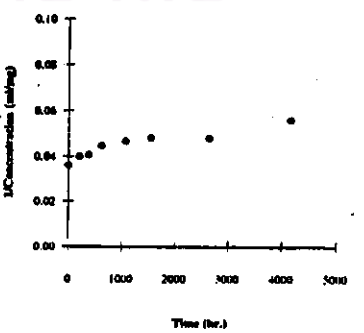
Zero-order plot



First-order plot



Second-order plot



Stability Data of Ranitidine HCl
0.1 % ASCORBIC ACID

Absence of oxygen and light

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	28.47	29.06	28.80	25.45	27.95 ± 1.68
241	D	25.11	24.97	25.08	23.40	24.64 ± 0.83
419	G	22.98	22.79	23.25	24.45	23.37 ± 0.75
617	H	23.38	23.99	23.69	23.82	23.72 ± 0.26
1108	I	20.53	23.04	22.39	22.40	22.09 ± 1.08
1549	J	22.88	20.79	21.79	19.53	21.24 ± 1.43
2643	M	22.18	20.73	18.24	19.11	20.06 ± 1.74
4227	O	19.54	18.81	18.22	18.49	18.77 ± 0.57

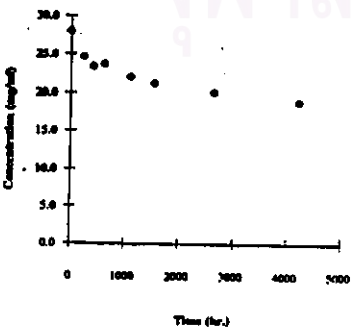
*calibration curves used.

Zero-order : conc = 25.10 - 0.0018 time r = 0.8807

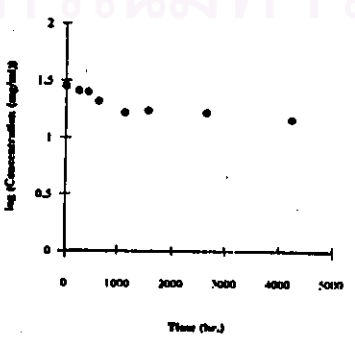
First-order : log conc = 1.3999 - 3.00 × 10^{-5} time r = 0.9100

Second-order : 1/conc = 0.0398 + 3.57 × 10^{-6} time r = 0.9349

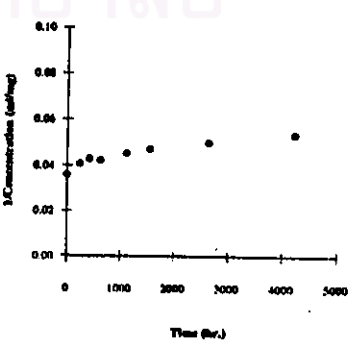
Zero-order plot



First-order plot



Second-order plot



Stability Data of Ranitidine HCl
0.01 % EDTA

Presence of oxygen and light

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	26.64	24.77	25.66	28.69	26.44 ± 1.68
178	C	25.51	25.46	24.71	25.10	25.20 ± 0.37
366	E	23.63	24.80	20.56	20.42	22.35 ± 2.20
617	H	20.77	18.02	20.51	21.03	20.08 ± 1.39
1018	I	18.66	15.41	17.45	18.52	17.51 ± 1.50
1381	J	17.13	15.15	14.87	1710	16.06 ± 1.22
2222	L	14.27	13.10	13.14	15.30	13.95 ± 1.05
3176	N	14.49	12.36	15.30	13.88	14.06 ± 1.30
4194	O	13.73	13.36	13.91	11.87	13.22 ± 0.93

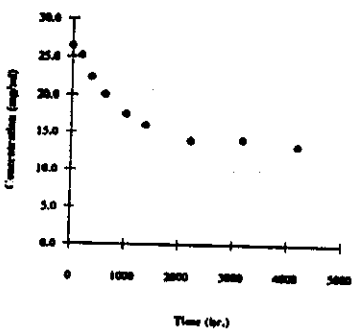
*calibration curves used.

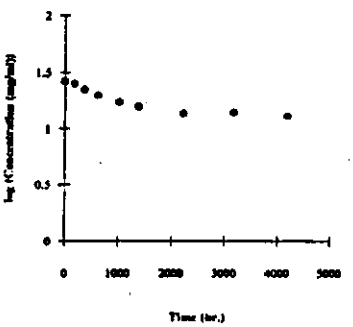
Zero-order : conc = 25.87 - 0.0077 time r = 0.8715

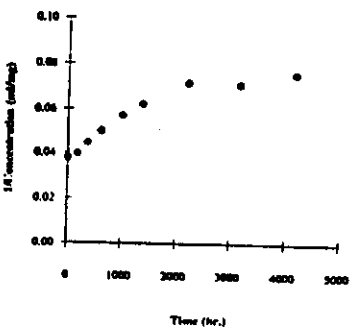
First-order : log conc = 1.4173 - 2.00 × 10^{-4} time r = 0.9034

Second-order : 1/conc = 0.0376 + 9.21 × 10^{-6} time r = 0.9293

Zero-order plot **First-order plot** **Second-order plot**







Stability Data of Ranitidine HCl
0.01 % EDTA

Presence of oxygen but absence of light

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	26.64	24.77	25.66	28.69	26.44 ± 1.68
219	D	25.09	28.51	26.88	28.08	27.14 ± 1.53
402	F	25.73	25.86	23.93	27.14	25.66 ± 1.32
1089	I	20.17	19.36	20.95	20.65	20.28 ± 0.70
1448	J	17.19	15.79	16.19	17.27	16.61 ± 0.73
2197	L	16.92	16.70	18.70	16.97	17.32 ± 0.92
4194	O	15.59	17.33	12.31	16.22	15.36 ± 2.87

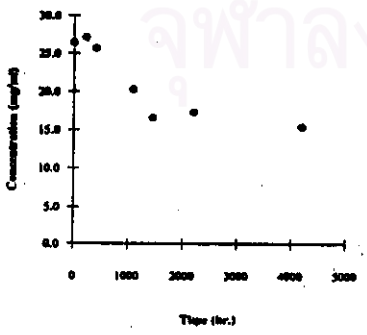
*calibration curves used.

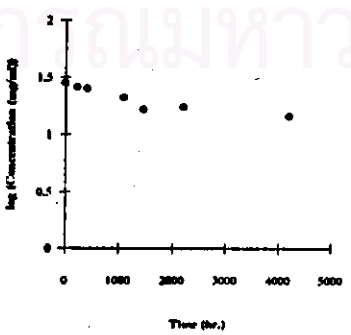
Zero-order : conc = 26.18 - 0.0041 time r = 0.8570

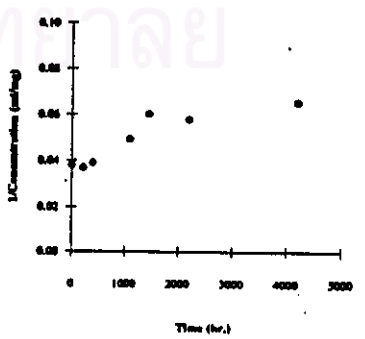
First-order : log conc = 1.4203 - 9.00×10^{-5} time r = 0.8754

Second-order : 1/conc = 0.0376 + 7.18×10^{-6} time r = 0.8930

Zero-order plot **First-order plot** **Second-order plot**







Stability Data of Ranitidine HCl
0.01 % EDTA

Presence of light but absence of oxygen

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	26.64	24.77	25.66	28.69	26.44 ± 1.68
207	C	26.30	26.26	26.61	27.41	26.64 ± 0.53
375	F	27.04	23.43	25.25	26.28	25.50 ± 1.57
617	H	24.84	22.81	24.48	23.15	23.82 ± 0.99
1070	I	21.42	17.78	20.28	19.85	19.83 ± 1.52
1448	J	20.51	17.75	19.45	19.58	19.32 ± 1.15
2643	M	18.89	19.33	18.30	19.30	18.96 ± 0.48
4162	O	19.04	16.88	14.70	15.78	16.60 ± 1.85

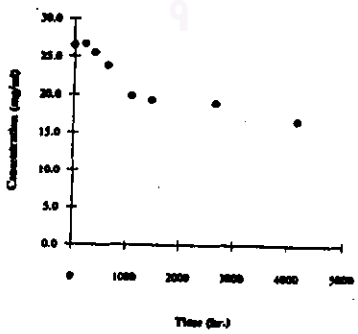
*calibration curves used.

Zero-order : conc = 25.97 - 0.0033 time r = 0.8903

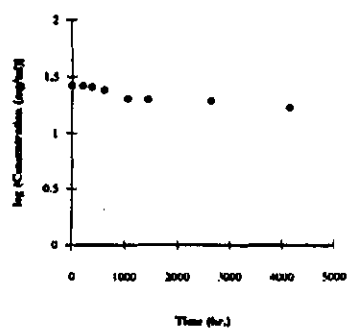
First-order : log conc = 1.4150 - 6.00 × 10^{-5} time r = 0.9106

Second-order : 1/conc = 0.0384 + 5.52 × 10^{-6} time r = 0.9304

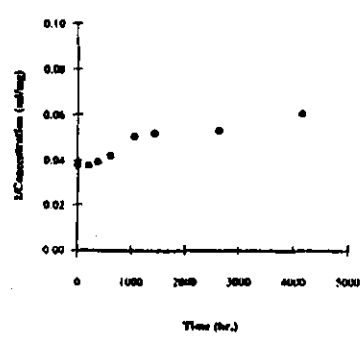
Zero-order plot



First-order plot



Second-order plot



Stability Data of Ranitidine HCl
0.01 % EDTA

Aresence of oxygen and light

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	26.64	24.77	25.66	28.69	26.44 ± 1.68
241	D	24.53	29.88	26.24	25.00	26.41 ± 2.42
419	G	24.38	25.46	27.87	21.89	24.90 ± 2.48
1108	I	22.12	20.76	24.02	23.58	22.62 ± 1.48
1549	K	19.33	18.87	23.77	22.50	21.12 ± 2.39
2643	M	19.06	18.98	20.17	21.41	19.91 ± 1.14
3187	N	19.49	18.36	20.08	17.60	18.88 ± 1.11
4839	P	17.92	17.29	15.58	18.28	17.27 ± 1.07

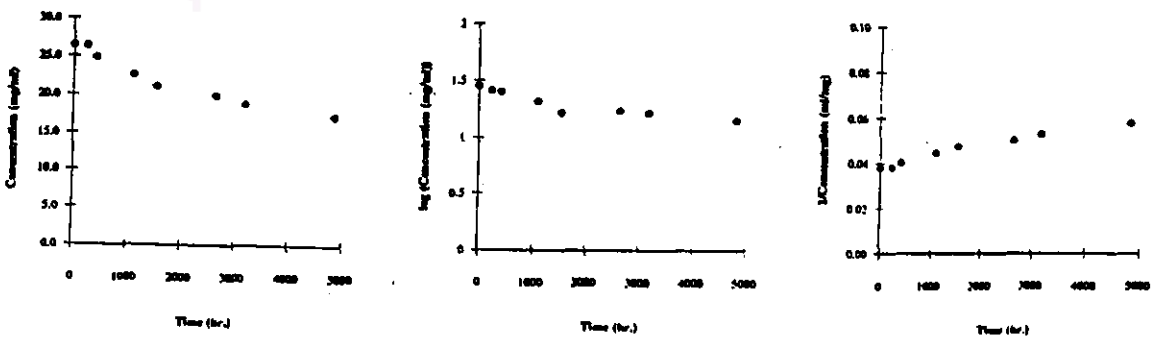
*calibration curves used.

Zero-order : conc = 26.08 - 0.0024 time r = 0.9584

First-order : log conc = 1.4179 - 5.00×10^{-5} time r = 0.9730

Second-order : 1/conc = 0.0380 + 4.30×10^{-6} time r = 0.9845

Zero-order plot **First-order plot** **Second-order plot**



Stability Data of Ranitidine HCl
0.075 % EDTA

Presence of oxygen and light

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	27.85	24.51	25.66	25.60	25.91 ± 1.39
178	C	25.85	25.03	25.27	26.37	25.63 ± 0.60
366	E	22.18	19.32	19.04	20.49	20.23 ± 1.42
617	H	20.79	20.37	17.53	21.26	19.99 ± 1.68
1018	I	15.51	15.63	17.61	16.24	16.25 ± 0.96
1381	J	14.88	13.50	13.88	14.51	14.19 ± 0.62
2222	L	12.51	13.06	13.33	12.56	12.86 ± 0.40
3176	N	13.76	12.50	13.29	13.21	13.19 ± 0.52
4194	O	9.96	12.98	9.81	9.81	10.64 ± 1.56

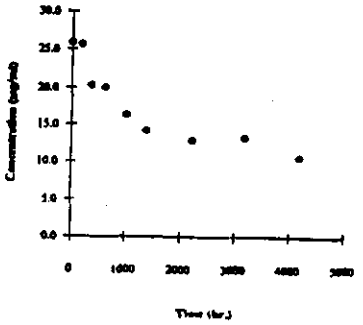
*calibration curves used.

Zero-order : conc = 22.56 - 0.0034 time r = 0.8724

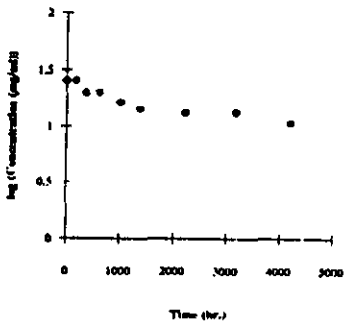
First-order : log conc = 1.3541 - 9.00×10^{-5} time r = 0.9160

Second-order : 1/conc = 0.0436 + 1.24×10^{-5} time r = 0.9481

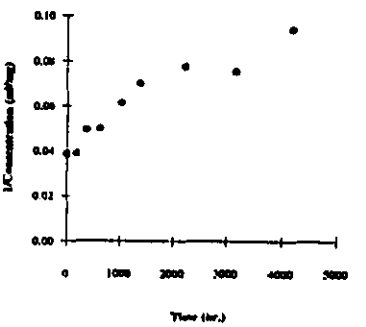
Zero-order plot



First-order plot



Second-order plot



Stability Data of Ranitidine HCl
0.075 % EDTA

Presence of oxygen but absence of light

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	27.85	24.51	25.66	25.60	25.91 ± 1.40
219	D	26.90	26.98	25.40	23.13	25.60 ± 1.80
419	G	23.40	24.51	25.04	24.00	24.24 ± 0.70
1089	I	19.49	20.95	21.54	20.46	20.99 ± 0.87
1448	J	15.14	14.71	13.76	15.26	14.72 ± 0.67
2197	L	15.53	15.97	17.52	17.66	16.67 ± 1.08
3187	N	15.34	16.11	15.94	15.80	15.80 ± 0.33
3662	U	11.01	12.08	16.05	15.01	13.54 ± 2.38
4194	O	11.95	12.68	11.28	11.71	11.91 ± 0.59

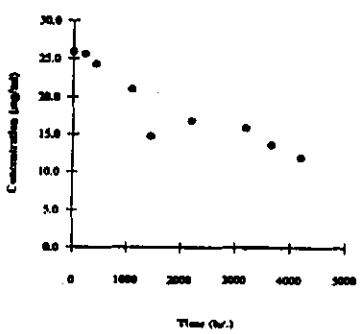
*calibration curves used.

Zero-order : conc = 24.65 - 0.0032 time r = 0.9188

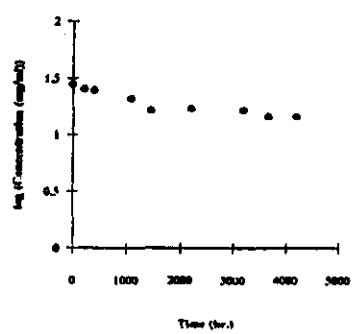
First-order : log conc = 1.3957 - 8.00 × 10^{-5} time r = 0.9283

Second-order : 1/conc = 0.0394 + 9.81 × 10^{-6} time r = 0.9299

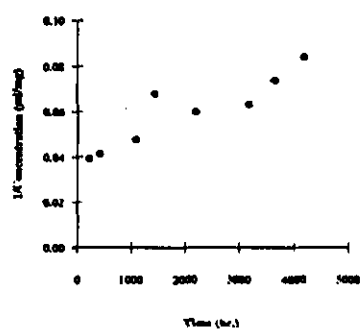
Zero-order plot



First-order plot



Second-order plot



Stability Data of Ranitidine HCl
0.075 % EDTA

Presence of light but absence of oxygen

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	27.85	24.51	25.66	25.60	25.91± 1.40
207	C	25.46	24.27	26.83	25.22	25.44 ± 1.06
375	F	25.40	22.22	21.70	26.68	24.00 ± 2.42
617	H	24.15	22.78	21.40	22.34	22.67 ± 1.14
1070	I	17.87	17.39	21.52	21.99	19.69 ± 2.40
1381	J	16.39	17.35	17.92	19.32	17.75 ± 1.23
2222	L	18.14	16.35	18.55	19.17	18.05 ± 1.22
3211	N	15.74	17.78	15.55	18.15	16.80 ± 1.35
4815	P	13.77	13.71	14.97	13.75	14.05 ± 0.62

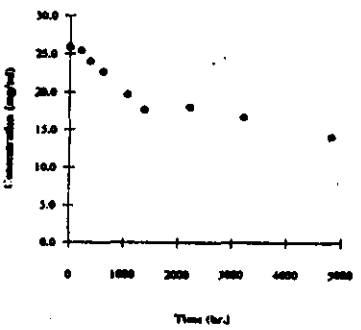
*calibration curves used.

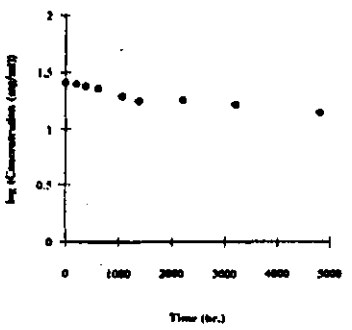
Zero-order : conc = 26.67 - 0.0030 time r = 0.9150

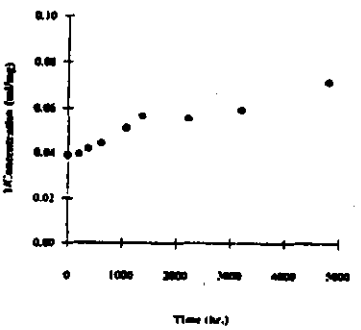
First-order : log conc = 1.3930 - 6.00 × 10^{-5} time r = 0.9407

Second-order : 1/conc = 0.0403 + 6.53 × 10^{-6} time r = 0.9607

Zero-order plot **First-order plot** **Second-order plot**







Stability Data of Ranitidine HCl
0.075 % EDTA

Absence of oxygen and light

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	27.85	24.51	25.66	25.60	25.91 ± 1.40
241	D	24.02	27.01	27.48	27.74	26.56 ± 1.72
419	G	25.86	25.26	22.03	23.58	24.18 ± 1.73
1108	I	21.54	21.70	23.28	21.34	21.97 ± 0.89
1549	K	18.13	19.06	18.12	17.43	18.19 ± 0.67
2197	L	18.46	21.42	20.72	21.03	20.41 ± 1.33
3187	N	20.10	18.36	19.48	18.81	19.19 ± 0.76
4137	O	18.32	18.40	17.05	18.91	18.17 ± 0.79

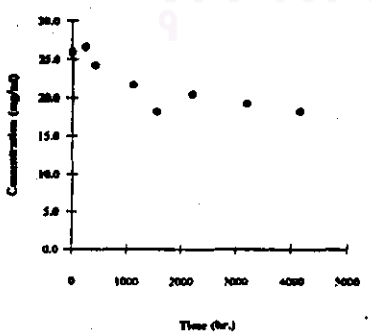
*calibration curves used.

Zero-order : conc = 24.95 - 0.0019 time r = 0.8530

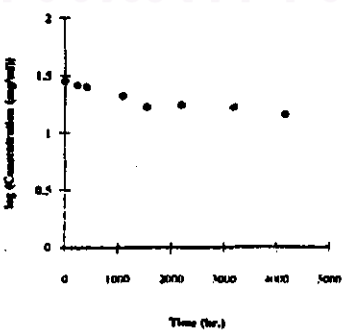
First-order : log conc = 1.3963 - 4.00×10^{-5} time r = 0.8562

Second-order : 1/conc = 0.0402 + 4.10×10^{-6} time r = 0.8564

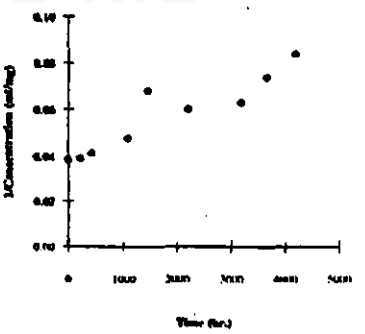
Zero-order plot



First-order plot



Second-order plot



Stability Data of Ranitidine HCl
0.3 % CITRIC ACID

Presence of oxygen and light

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	28.48	28.36	24.96	28.58	27.60 ± 1.76
178	C	27.77	27.40	27.16	28.17	27.62 ± 0.44
366	E	25.07	25.09	26.44	27.25	25.94 ± 1.09
1018	I	17.39	18.00	17.90	17.76	17.75 ± 0.29
1381	J	12.23	14.12	14.15	12.32	13.20 ± 1.08
2197	L	13.17	14.02	15.62	13.53	14.09 ± 1.07
3176	N	12.63	14.22	13.32	12.73	13.22 ± 0.73
4196	O	13.84	12.82	13.05	9.20	12.22 ± 2.07

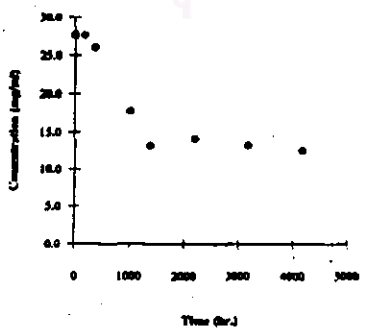
*calibration curves used.

Zero-order : conc = 26.04 - 0.0052 time r = 0.8495

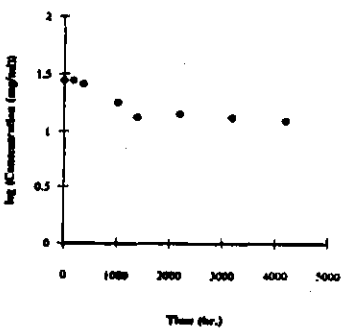
First-order : log conc = 1.4133 - 1.00 × 10^{-4} time r = 0.8702

Second-order : 1/conc = 0.0388 + 1.16 × 10^{-5} time r = 0.8892

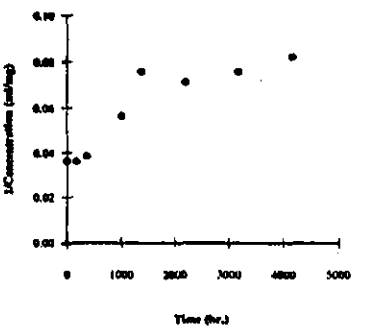
Zero-order plot



First-order plot



Second-order plot



Stability Data of Ranitidine HCl
0.3 % CITRIC ACID

Presence of oxygen but absence of light

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	28.48	28.36	24.96	28.58	27.60 ± 1.76
219	D	27.63	27.53	27.39	27.64	27.54 ± 0.12
402	F	27.62	27.02	27.53	27.68	27.46 ± 0.30
1089	I	23.57	23.02	24.36	24.18	23.78 ± 0.61
1549	K	22.33	20.50	22.40	19.44	21.17 ± 1.45
2197	L	15.76	17.38	17.12	16.05	16.58 ± 0.79
3187	N	15.03	18.62	16.44	15.74	16.46 ± 1.55
4137	O	15.19	14.39	16.83	13.45	14.97 ± 1.43
4839	P	14.88	14.08	13.85	13.82	14.16 ± 0.54

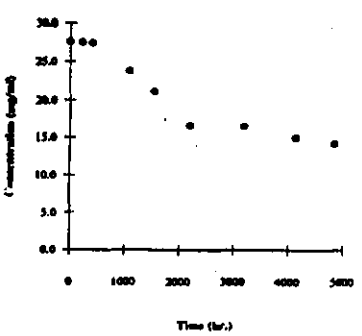
*calibration curves used.

Zero-order : conc = 28.07 - 0.0042 time r = 0.9517

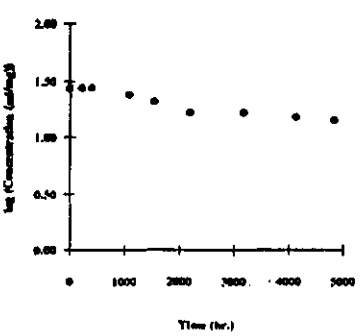
First-order : log conc = 1.4540 - 8.00 × 10^{-5} time r = 0.9652

Second-order : 1/conc = 0.0354 + 7.73 × 10^{-6} time r = 0.9750

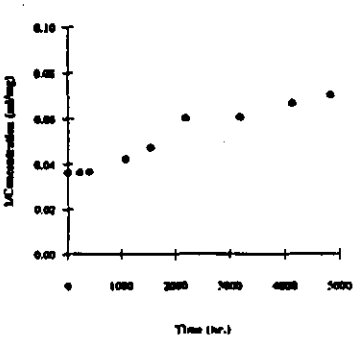
Zero-order plot



First-order plot



Second-order plot



Stability Data of Ranitidine HCl
0.3 % CITRIC ACID

Presence of light but absence of oxygen

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	28.48	28.36	24.97	28.58	27.60 ± 1.76
207	C	28.64	26.23	25.09	25.30	26.32 ± 1.63
375	F	25.10	25.03	29.67	22.71	25.62 ± 2.91
1070	I	20.21	20.23	18.96	20.25	19.91 ± 0.63
1448	J	18.87	18.70	18.10	20.29	18.99 ± 0.93
2197	L	16.33	18.58	19.29	18.80	18.25 ± 1.31
3211	N	18.60	18.46	17.96	18.80	18.46 ± 0.36
4169	O	14.03	18.05	17.51	16.01	16.40 ± 1.80
4815	P	15.44	16.53	16.58	17.44	16.50 ± 0.82

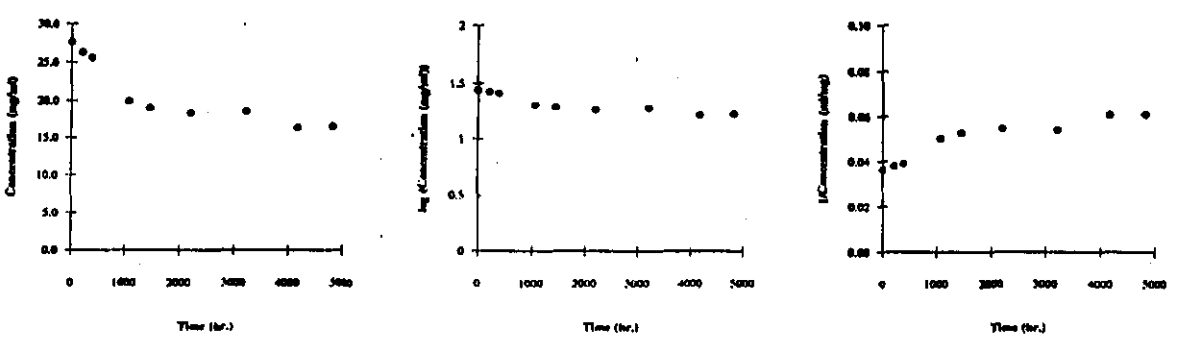
*calibration curves used.

Zero-order : conc = 25.91 - 0.0031 time r = 0.8760

First-order : log conc = 1.4124 - 6.00 × 10^{-5} time r = 0.8980

Second-order : 1/conc = 0.0388 + 4.97 × 10^{-6} time r = 0.9185

Zero-order plot **First-order plot** **Second-order plot**



Stability Data of Ranitidine HCl
0.3 % CITRIC ACID

Absence of oxygen and light

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	28.48	28.36	24.96	28.58	27.60 ± 1.76
241	D	28.42	26.84	27.06	29.42	27.94 ± 1.21
419	G	23.56	25.48	26.35	27.85	25.81 ± 1.79
1108	I	23.70	26.44	26.05	24.62	25.20 ± 1.27
1549	K	22.74	21.72	23.13	23.27	22.72 ± 0.70
2643	M	21.95	22.73	21.29	21.04	21.75 ± 0.76
3187	N	21602	22.64	22.01	21.17	21.76 ± 0.71
4137	O	17.24	17.72	19.34	19.35	18.51 ± 0.97

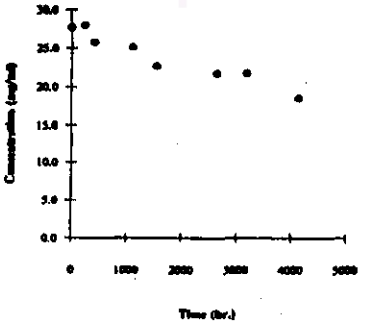
*calibration curves used.

Zero-order : conc = 27.32 - 0.0020 time r = 0.9672

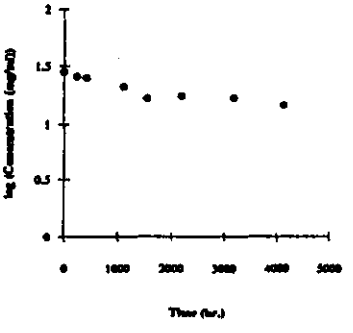
First-order : log conc = 1.4372 - 4.00 × 10^{-5} time r = 0.9699

Second-order : 1/conc = 0.0364 + 3.94 × 10^{-6} time r = 0.9692

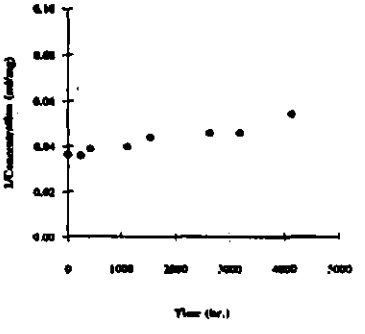
Zero-order plot



First-order plot



Second-order plot



Stability Data of Ranitidine HCl
2.0 % CITRIC ACID

Presence of oxygen and light

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	29.43	26.86	28.71	27.00	28.00 ± 1.27
178	B	26.28	26.58	25.80	28.36	26.75 ± 1.12
366	E	25.62	27.18	20.76	23.58	24.28 ± 2.78
1018	I	19.71	19.47	19.31	18.67	19.29 ± 0.45
1381	J	14.04	16.73	16.80	14.63	15.55 ± 1.42
2197	L	13.53	16.69	14.81	15.58	15.16 ± 1.33
3187	N	13.79	14.26	13.43	14.37	13.96 ± 0.44
4169	O	13.03	13.13	12.27	13.58	13.00 ± 0.54

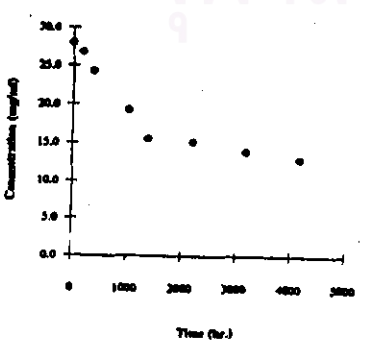
*calibration curves used.

Zero-order : conc = 25.89 - 0.0046 time r = 0.8918

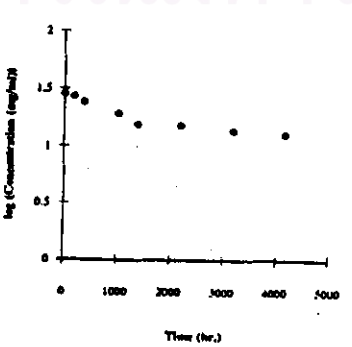
First-order : log conc = 1.4141 - 1.00 × 10^{-4} time r = 0.9204

Second-order : 1/conc = 0.0382 + 1.02 × 10^{-5} time r = 0.9455

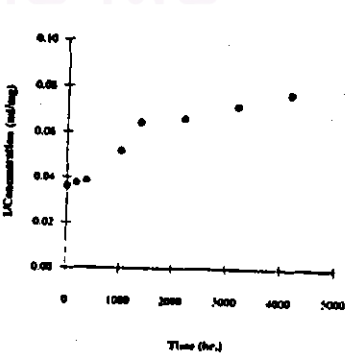
Zero-order plot



First-order plot



Second-order plot



Stability Data of Ranitidine HCl
2.0 % CITRIC ACID

Presence of oxygen but absence of light

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	29.43	26.86	28.71	27.00	28.00 ± 1.27
219	D	26.46	27.82	26.10	26.59	26.74 ± 0.75
402	F	25.12	25.31	26.74	24.69	25.46 ± 0.89
1089	I	24.73	22.69	23.29	23.58	23.57 ± 0.85
1549	K	22.60	22.76	23.98	21.68	22.75 ± 0.94
2197	M	19.11	21.48	17.54	18.19	19.08 ± 1.73
3187	N	16.01	16.00	15.26	15.63	15.73 ± 0.36
4815	P	15.25	15.26	14.38	14.65	14.89 ± 0.44

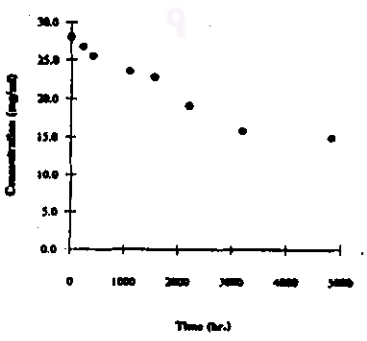
*calibration curves used.

Zero-order : conc = 26.88 - 0.0029 time r = 0.9666

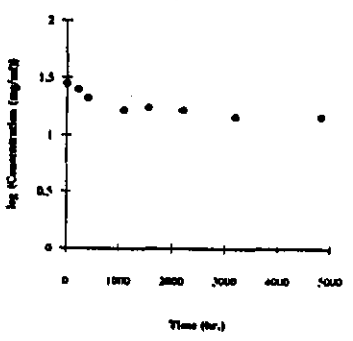
First-order : log conc = 1.4355 - 6.00 × 10^{-5} time r = 0.9746

Second-order : 1/conc = 0.0358 + 7.09 × 10^{-6} time r = 0.9775

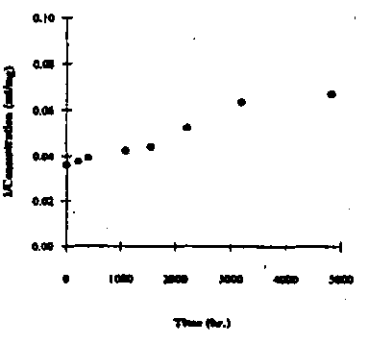
Zero-order plot



First-order plot



Second-order plot



Stability Data of Ranitidine HCl
2.0 % CITRIC ACID

Presence of light but absence of oxygen

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	29.43	26.86	28.71	27.00	28.00 ± 1.27
207	C	27.42	26.96	27.31	27.27	27.24 ± 0.20
375	F	25.57	26.44	26.19	28.62	26.71 ± 1.33
1070	I	22.79	22.24	25.06	23.15	23.31 ± 1.22
1448	J	18.09	19.24	18.54	23.17	19.76 ± 3.32
2197	L	18.50	16.86	18.67	18.78	18.20 ± 0.90
3211	N	17.96	17.04	18.62	17.89	17.88 ± 0.65
4169	O	15.21	16.23	19.68	17.64	17.19 ± 1.94
4815	P	17.44	16.06	15.71	16.26	16.37 ± 0.75

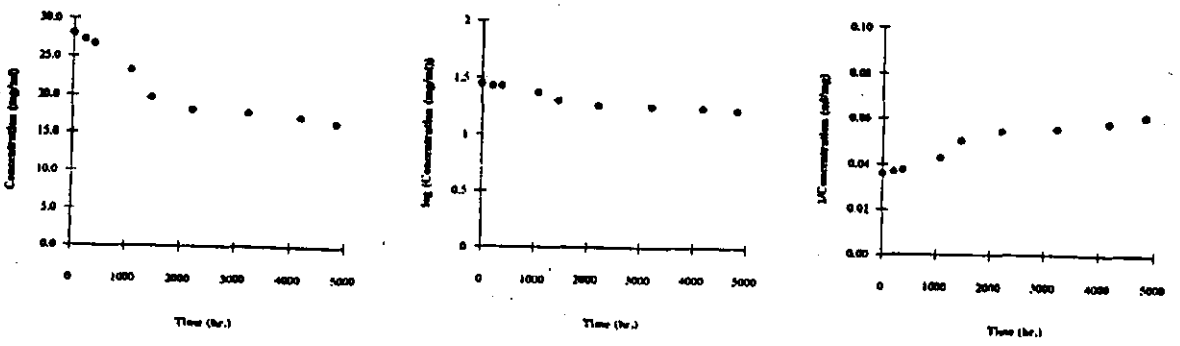
*calibration curves used.

Zero-order : conc = 26.36 - 0.0024 time r = 0.9173

First-order : log conc = 1.4217 - 5.00 × 10^{-5} time r = 0.9339

Second-order : 1/conc = 0.0377 + 4.36 × 10^{-6} time r = 0.9493

Zero-order plot **First-order plot** **Second-order plot**



Stability Data of Ranitidine HCl
2.0 % CITRIC ACID

Aresence of oxygen and light

Time (hr)	Cal.*	Concentration of ranitidine HCl remaining (mg/ml)				
		Inj.No. 1	Inj.No. 2	Inj.No. 3	Inj.No. 4	Average conc ± SD
0	A	29.43	26.86	28.71	27.00	28.00 ± 1.27
241	D	28.12	25.67	23.91	27.37	26.27 ± 1.88
419	G	24.07	27.52	27.38	24.37	25.84 ± 1.87
1108	I	24.06	22.20	24.73	23.14	23.53 ± 1.10
1549	K	22.76	20.57	22.46	20.38	21.54 ± 1.24
2197	L	22.32	22.05	18.78	20.53	20.92 ± 1.63
3187	N	19.63	21.29	19.59	21.40	20.48 ± 1.00
4137	O	17.84	19.59	18.96	17.57	18.49 ± 0.95
4839	P	16.43	19.75	18.81	18.91	18.47 ± 1.43

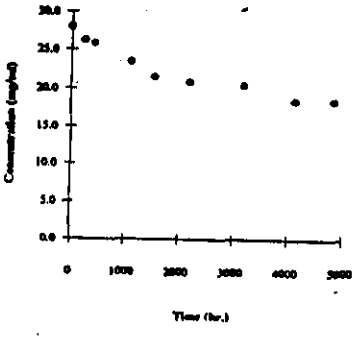
*calibration curves used.

Zero-order : conc = 26.28 - 0.0019 time r = 0.9453

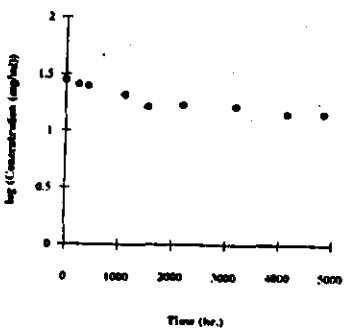
First-order : log conc = 1.4210 - 4.00 × 10^{-5} time r = 0.9595

Second-order : 1/conc = 0.0378 + 3.76 × 10^{-6} time r = 0.9709

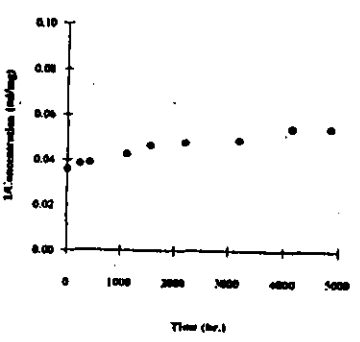
Zero-order plot



First-order plot



Second-order plot



APPENDIX IV

Statistically Data of Ranitidine HCl

Analysis of Covariance

BHT

Presence of oxygen and light

Dependent Variable: VAR00003

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Noncent. Parameter	Observed Power[a]
Corrected Model	4.905E-03[b]	5	9.810E-04	74.545	.000	372.727	1.000
Intercept	2.143E-02	1	2.143E-02	1628.565	.000	1628.565	1.000
VAR00001	2.696E-07	2	1.348E-07	.010	.990	.020	.051
VAR00002	4.707E-03	1	4.707E-03	357.708	.000	357.708	1.000
VAR00001 * VAR00002	1.642E-05	2	8.208E-06	.624	.547	1.247	.139
Error	2.500E-04	19	1.316E-05				
Total	8.117E-02	25					
Corrected Total	5.155E-03	24					

a. Computed using alpha = .05

b. R Squared = .951 (Adjusted R Squared = .939)

VAR 00001 = Formulation numbers
VAR 00002 = Sampling time (hr)
VAR 00003 = 1/ ranitidine HCl conc.(ml/mg)

Presence of oxygen but absence of light

Dependent Variable: VAR00006

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Noncent. Parameter	Observed Power[a]
Corrected Model	3.723E-03[b]	5	7.446E-04	47.529	.000	237.643	1.000
Intercept	1.553E-02	1	1.553E-02	991.609	.000	991.609	1.000
VAR00004	8.629E-06	2	4.314E-06	.275	.762	.551	.087
VAR00005	3.603E-03	1	3.603E-03	229.975	.000	229.975	1.000
VAR00004 * VAR00005	5.154E-06	2	2.577E-06	.164	.850	.329	.072
Error	2.976E-04	19	1.567E-05				
Total	7.134E-02	25					
Corrected Total	4.020E-03	24					

a. Computed using alpha = .05

b. R Squared = .926 (Adjusted R Squared = .906)

VAR 00004 = Formulation numbers
VAR 00005 = Sampling time (hr)
VAR 00006 = 1/ranitidine HCl conc. (ml/mg)

Analysis of Covariance

BHT

Presence of light but absence of oxygen

Dependent Variable: VAR00009

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Noncent. Parameter	Observed Power[a]
Corrected Model	2.896E-03[b]	5	5.792E-04	99.760	.000	498.801	1.000
Intercept	1.935E-02	1	1.935E-02	3332.756	.000	3332.756	1.000
VAR00007	1.466E-07	2	7.329E-08	.013	.987	.025	.052
VAR00008	2.677E-03	1	2.677E-03	461.151	.000	461.151	1.000
VAR00007 * VAR00008	1.745E-06	2	8.727E-07	.150	.861	.301	.070
Error	1.103E-04	19	5.806E-06				
Total	6.411E-02	25					
Corrected Total	3.006E-03	24					

a. Computed using alpha = .05

b. R Squared = .963 (Adjusted R Squared = .954)

VAR 00007 = Formulation numbers
VAR 00008 = Sampling time (hr)
VAR 00009 = 1/ranitidine HCl conc. (ml/mg)

Absence of oxygen and light

Dependent Variable: VAR00012

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Noncent. Parameter	Observed Power[a]
Corrected Model	1.615E-03[b]	5	3.229E-04	60.095	.000	300.474	1.000
Intercept	1.544E-02	1	1.544E-02	2874.150	.000	2874.150	1.000
VAR00010	1.837E-05	2	9.187E-06	1.710	.208	3.419	.314
VAR00011	1.539E-03	1	1.539E-03	286.407	.000	286.407	1.000
VAR00010 * VAR00011	9.905E-07	2	4.952E-07	.092	.912	.184	.062
Error	1.021E-04	19	5.373E-06				
Total	5.686E-02	25					
Corrected Total	1.717E-03	24					

a. Computed using alpha = .05

b. R Squared = .941 (Adjusted R Squared = .925)

VAR 00010 = Formulation numbers
VAR 00011 = Sampling time (hr)
VAR 00012 = 1/ranitidine HCl conc. (ml/mg)

Analysis of Covariance

ALPHA TOCOPHEROL

Presence of oxygen and light

Dependent Variable: VAR00015

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Noncent. Parameter	Observed Power[a]
Corrected Model	7.854E-03[b]	5	1.571E-03	134.056	.000	670.279	1.000
Intercept	1.819E-02	1	1.819E-02	1552.676	.000	1552.676	1.000
VAR00013	8.175E-06	2	4.088E-06	.349	.710	.698	.098
VAR00014	7.781E-03	1	7.781E-03	664.025	.000	664.025	1.000
VAR00013 * VAR00014	1.941E-05	2	9.706E-06	.828	.451	1.657	.172
Error	2.344E-04	20	1.172E-05				
Total	9.232E-02	26					
Corrected Total	8.089E-03	25					

a. Computed using alpha = .05

b. R Squared = .971 (Adjusted R Squared = .964)

VAR 00013 = Formulation numbers
VAR 00014 = Sampling time (hr)
VAR 00015 = 1/ranitidine HCl conc. (ml/mg)

Presence of oxygen but absence of light

Dependent Variable: VAR00018

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Noncent. Parameter	Observed Power[a]
Corrected Model	3.627E-03[b]	5	7.253E-04	31.215	.000	156.076	1.000
Intercept	1.399E-02	1	1.399E-02	602.282	.000	602.282	1.000
VAR00016	9.034E-06	2	4.517E-06	.194	.825	.389	.076
VAR00017	3.582E-03	1	3.582E-03	154.147	.000	154.147	1.000
VAR00016 * VAR00017	8.108E-06	2	4.054E-06	.174	.841	.349	.073
Error	4.182E-04	18	2.324E-05				
Total	6.546E-02	24					
Corrected Total	4.045E-03	23					

a. Computed using alpha = .05

b. R Squared = .897 (Adjusted R Squared = .868)

VAR 00016 = Formulation numbers
VAR 00017 = Sampling time (hr)
VAR 00018 = 1/ranitidine HCl conc. (ml/mg)

Analysis of Covariance

ALPHA TOCOPHEROL

Presence of light but absence of oxygen

Dependent Variable: VAR00021

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Noncent. Parameter	Observed Power[a]
Corrected Model	2.889E-03[b]	5	5.778E-04	107.007	.000	535.037	1.000
Intercept	1.779E-02	1	1.779E-02	3294.810	.000	3294.810	1.000
VAR00019	2.020E-06	2	1.010E-06	.187	.831	.374	.075
VAR00020	2.868E-03	1	2.868E-03	531.056	.000	531.056	1.000
VAR00019 * VAR00020	1.341E-05	2	6.703E-06	1.241	.313	2.483	.236
Error	9.720E-05	18	5.400E-06				
Total	5.966E-02	24					
Corrected Total	2.986E-03	23					

a. Computed using alpha = .05

b. R Squared = .967 (Adjusted R Squared = .958)

VAR 00019 = Formulation numbers
VAR 00020 = Sampling time (hr)
VAR 00021 = 1/ranitidine HCl conc. (ml/mg)

Absence of oxygen and light

Dependent Variable: VAR00024

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Noncent. Parameter	Observed Power[a]
Corrected Model	1.675E-03[b]	5	3.351E-04	117.429	.000	587.144	1.000
Intercept	1.448E-02	1	1.448E-02	5076.293	.000	5076.293	1.000
VAR00022	2.584E-06	2	1.292E-06	.453	.642	.906	.114
VAR00023	1.651E-03	1	1.651E-03	578.522	.000	578.522	1.000
VAR00022 * VAR00023	6.697E-07	2	3.349E-07	.117	.890	.235	.066
Error	5.707E-05	20	2.853E-06				
Total	5.602E-02	26					
Corrected Total	1.732E-03	25					

a. Computed using alpha = .05

b. R Squared = .967 (Adjusted R Squared = .959)

VAR 00022 = Formulation numbers
VAR 00023 = Sampling time (hr)
VAR 00024 = 1/ranitidine HCl conc. (ml/mg)

Analysis of Covariance

SODIUM BISULFITE

Presence of oxygen and light

Dependent Variable: VAR00027

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Noncent. Parameter	Observed Power[a]
Corrected Model	3.876E-03[b]	5	7.753E-04	44.454	.000	222.271	1.000
Intercept	1.998E-02	1	1.998E-02	1145.350	.000	1145.350	1.000
VAR00025	6.027E-05	2	3.013E-05	1.728	.203	3.456	.319
VAR00026	3.679E-03	1	3.679E-03	210.929	.000	210.929	1.000
VAR00025 * VAR00026	8.438E-05	2	4.219E-05	2.419	.115	4.838	.430
Error	3.488E-04	20	1.744E-05				
Total	7.937E-02	26					
Corrected Total	4.225E-03	25					

a. Computed using alpha = .05

b. R Squared = .917 (Adjusted R Squared = .897)

VAR 00025 = Formulation numbers
VAR 00026 = Sampling time (hr)
VAR 00027 = 1/ranitidine HCl conc. (ml/mg)

Presence of oxygen but absence of light

Dependent Variable: VAR00030

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Noncent. Parameter	Observed Power[a]
Corrected Model	3.436E-03[b]	5	6.872E-04	41.158	.000	205.791	1.000
Intercept	1.802E-02	1	1.802E-02	1079.598	.000	1079.598	1.000
VAR00028	5.272E-05	2	2.636E-05	1.579	.232	3.158	.293
VAR00029	3.127E-03	1	3.127E-03	187.285	.000	187.285	1.000
VAR00028 * VAR00029	9.751E-05	2	4.875E-05	2.920	.078	5.840	.502
Error	3.172E-04	19	1.670E-05				
Total	7.206E-02	25					
Corrected Total	3.753E-03	24					

a. Computed using alpha = .05

b. R Squared = .915 (Adjusted R Squared = .893)

VAR 00028 = Formulation numbers
VAR 00029 = Sampling time (hr)
VAR 00030 = 1/ranitidine HCl conc. (ml/mg)

Analysis of Covariance
SODIUM BISULFITE

Presence of light but absence of oxygen

Dependent Variable: VAR00033

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Noncent. Parameter	Observed Power[a]
Corrected Model	2.465E-03[b]	5	4.930E-04	100.910	.000	504.552	1.000
Intercept	1.683E-02	1	1.683E-02	3444.077	.000	3444.077	1.000
VAR00031	3.010E-05	2	1.505E-05	3.080	.071	6.160	.521
VAR00032	2.246E-03	1	2.246E-03	459.656	.000	459.656	1.000
VAR00031 * VAR00032	6.850E-05	2	3.425E-05	7.010	.006	14.020	.877
Error	8.795E-05	18	4.886E-06				
Total	5.863E-02	24					
Corrected Total	2.553E-03	23					

a. Computed using alpha = .05

b. R Squared = .966 (Adjusted R Squared = .956)

VAR 00031 = Formulation numbers
VAR 00032 = Sampling time (hr)
VAR 00033 = 1/ranitidine HCl conc. (ml/mg)

Absence of oxygen and light

Dependent Variable: VAR00036

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Noncent. Parameter	Observed Power[a]
Corrected Model	1.737E-03[b]	5	3.474E-04	80.672	.000	403.361	1.000
Intercept	1.716E-02	1	1.716E-02	3985.225	.000	3985.225	1.000
VAR00034	3.376E-05	2	1.688E-05	3.920	.036	7.839	.641
VAR00035	1.639E-03	1	1.639E-03	380.581	.000	380.581	1.000
VAR00034 * VAR00035	2.042E-05	2	1.021E-05	2.371	.118	4.742	.425
Error	9.043E-05	21	4.306E-06				
Total	6.243E-02	27					
Corrected Total	1.827E-03	26					

a. Computed using alpha = .05

b. R Squared = .951 (Adjusted R Squared = .939)

VAR 00034 = Formulation numbers
VAR 00035 = Sampling time (hr)
VAR 00036 = 1/ranitidine HCl conc. (ml/mg)

Analysis of Covariance

ASCORBIC ACID

Presence of oxygen and light

Dependent Variable: VAR00039

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Noncent. Parameter	Observed Power[a]
Corrected Model	4.951E-03[b]	5	9.903E-04	89.072	.000	445.361	1.000
Intercept	1.993E-02	1	1.993E-02	1792.999	.000	1792.999	1.000
VAR00037	2.465E-05	2	1.233E-05	1.109	.349	2.217	.218
VAR00038	4.601E-03	1	4.601E-03	413.808	.000	413.808	1.000
VAR00037 * VAR00038	1.266E-04	2	6.330E-05	5.694	.011	11.387	.809
Error	2.335E-04	21	1.112E-05				
Total	8.797E-02	27					
Corrected Total	5.185E-03	26					

a. Computed using alpha = .05

b. R Squared = .955 (Adjusted R Squared = .944)

VAR 00037 = Formulation numbers
VAR 00038 = Sampling time (hr)
VAR 00039 = 1/ranitidine HCl conc. (ml/mg)

Presence of oxygen but absence of light

Dependent Variable: VAR00042

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Noncent. Parameter	Observed Power[a]
Corrected Model	2.840E-03[b]	5	5.681E-04	37.820	.000	189.100	1.000
Intercept	1.753E-02	1	1.753E-02	1166.802	.000	1166.802	1.000
VAR00040	2.520E-05	2	1.260E-05	.839	.448	1.678	.172
VAR00041	2.166E-03	1	2.166E-03	144.213	.000	144.213	1.000
VAR00040 * VAR00041	5.077E-05	2	2.538E-05	1.690	.211	3.380	.311
Error	2.854E-04	19	1.502E-05				
Total	6.671E-02	25					
Corrected Total	3.126E-03	24					

a. Computed using alpha = .05

b. R Squared = .909 (Adjusted R Squared = .885)

VAR 00040 = Formulation numbers
VAR 00041 = Sampling time (hr)
VAR 00042 = 1/ranitidine HCl conc. (ml/mg)

Analysis of Covariance

ASCORBIC ACID

Presence of light but absence of oxygen

Dependent Variable: VAR00045

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Noncent. Parameter	Observed Power[a]
Corrected Model	1.521E-03[b]	5	3.041E-04	25.308	.000	126.542	1.000
Intercept	1.745E-02	1	1.745E-02	1451.648	.000	1451.648	1.000
VAR00043	3.468E-05	2	1.734E-05	1.443	.261	2.885	.270
VAR00044	1.351E-03	1	1.351E-03	112.385.	.000	112.385	1.000
VAR00043 * VAR00044	3.670E-05	2	1.835E-05	1.527	.243	3.054	.284
Error	2.283E-04	19	1.202E-05				
Total	5.691E-02	25					
Corrected Total	1.749E-03	24					

a. Computed using alpha = .05

b. R Squared = .869 (Adjusted R Squared = .835)

VAR 00043 = Formulation numbers
VAR 00044 = Sampling time (hr)
VAR 00045 = 1/ranitidine HCl conc. (ml/mg)

Absence of oxygen and light

Dependent Variable: VAR00048

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Noncent. Parameter	Observed Power[a]
Corrected Model	1.097E-03[b]	5	2.194E-04	72.478	.000	362.388	1.000
Intercept	1.650E-02	1	1.650E-02	5451.547	.000	5451.547	1.000
VAR00046	1.859E-05	2	9.295E-06	3.070	.069	6.141	.527
VAR00047	9.686E-04	1	9.686E-04	319.956	.000	319.956	1.000
VAR00046 * VAR00047	4.667E-06	2	2.333E-06	.771	.476	1.542	.163
Error	6.055E-05	20	3.027E-06				
Total	5.500E-02	26					
Corrected Total	1.158E-03	25					

a. Computed using alpha = .05

b. R Squared = .948 (Adjusted R Squared = .935)

VAR 00046 = Formulation numbers
VAR 00047 = Sampling time (hr)
VAR 00048 =1/ranitidine HCl conc. (ml/mg)

Analysis of Covariance

EDTA

Presence of oxygen and light

Dependent Variable: VAR00051

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Noncent. Parameter	Observed Power[a]
Corrected Model	5.672E-03[b]	5	1.134E-03	41.688	.000	208.441	1.000
Intercept	2.099E-02	1	2.099E-02	771.312	.000	771.312	1.000
VAR00049	5.391E-05	2	2.696E-05	.991	.388	1.981	.199
VAR00050	5.221E-03	1	5.221E-03	191.885	.000	191.885	1.000
VAR00049 * VAR00050	1.379E-04	2	6.895E-05	2.534	.103	5.067	.451
Error	5.714E-04	21	2.721E-05				
Total	9.498E-02	27					
Corrected Total	6.243E-03	26					

a. Computed using alpha = .05

b. R Squared = .908 (Adjusted R Squared = .887)

VAR 00049 = Formulation numbers
VAR 00050 = Sampling time (hr)
VAR 00051 = 1/ranitidine HCl conc. (ml/mg)

Presence of oxygen but absence of light

Dependent Variable: VAR00054

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Noncent. Parameter	Observed Power[a]
Corrected Model	3.702E-03[b]	5	7.404E-04	24.772	.000	123.862	1.000
Intercept	1.641E-02	1	1.641E-02	549.083	.000	549.083	1.000
VAR00052	1.693E-05	2	8.466E-06	.283	.757	.567	.088
VAR00053	2.847E-03	1	2.847E-03	95.260	.000	95.260	1.000
VAR00052 * VAR00053	3.929E-05	2	1.964E-05	.657	.530	1.314	.143
Error	5.380E-04	18	2.989E-05				
Total	6.911E-02	24					
Corrected Total	4.240E-03	23					

a. Computed using alpha = .05

b. R Squared = .873 (Adjusted R Squared = .838)

VAR 00052 = Formulation numbers
VAR 00053 = Sampling time (hr)
VAR 00054 = 1/ranitidine HCl conc. (ml/mg)

Analysis of Covariance
EDTA

Presence of light but absence of oxygen

Dependent Variable: VAR00057

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Noncent. Parameter	Observed Power[a]
Corrected Model	2.016E-03[b]	5	4.032E-04	46.263	.000	231.316	1.000
Intercept	1.778E-02	1	1.778E-02	2039.654	.000	2039.654	1.000
VAR00055	3.624E-05	2	1.812E-05	2.079	.153	4.158	.374
VAR00056	1.813E-03	1	1.813E-03	208.044	.000	208.044	1.000
VAR00055 * VAR00056	8.797E-06	2	4.398E-06	.505	.612	1.009	.121
Error	1.656E-04	19	8.716E-06				
Total	5.959E-02	25					
Corrected Total	2.182E-03	24					

a. Computed using alpha = .05

b. R Squared = .924 (Adjusted R Squared = .904)

VAR 00055 = Formulation numbers
VAR 00056 = Sampling time (hr)
VAR 00057 = 1/ranitidine HCl conc. (ml/mg)

Absence of oxygen and light

Dependent Variable: VAR00060

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Noncent. Parameter	Observed Power[a]
Corrected Model	1.078E-03[b]	5	2.156E-04	32.749	.000	163.743	1.000
Intercept	1.581E-02	1	1.581E-02	2401.354	.000	2401.354	1.000
VAR00058	2.217E-05	2	1.109E-05	1.684	.212	3.369	.310
VAR00059	1.020E-03	1	1.020E-03	154.982	.000	154.982	1.000
VAR00058 * VAR00059	3.552E-07	2	1.776E-07	.027	.973	.054	.053
Error	1.251E-04	19	6.582E-06				
Total	5.398E-02	25					
Corrected Total	1.203E-03	24					

a. Computed using alpha = .05

b. R Squared = .896 (Adjusted R Squared = .869)

VAR 00058 = Formulation numbers
VAR 00059 = Sampling time (hr)
VAR 00060 = 1/ranitidine HCl conc. (ml/mg)

Analysis of Covariance
CITRIC ACID

Presence of oxygen and light

Dependent Variable: VAR00063

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Noncent. Parameter	Observed Power[a]
Corrected Model	5.203E-03[b]	5	1.041E-03	24.446	.000	122.231	1.000
Intercept	1.713E-02	1	1.713E-02	402.457	.000	402.457	1.000
VAR00061	7.830E-06	2	3.915E-06	.092	.913	.184	.062
VAR00062	5.040E-03	1	5.040E-03	118.404	.000	118.404	1.000
VAR00061 * VAR00062	6.517E-05	2	3.259E-05	.766	.479	1.531	.161
Error	8.088E-04	19	4.257E-05				
Total	8.418E-02	25					
Corrected Total	6.012E-03	24					

a. Computed using alpha = .05

b. R Squared = .865 (Adjusted R Squared = .830)

VAR 00061 = Formulation numbers
VAR 00062 = Sampling time (hr)
VAR 00063 = 1/ranitidine HCl conc. (ml/mg)

Presence of oxygen but absence of light

Dependent Variable: VAR00066

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Noncent. Parameter	Observed Power[a]
Corrected Model	3.232E-03[b]	5	6.465E-04	59.069	.000	295.344	1.000
Intercept	1.436E-02	1	1.436E-02	1312.142	.000	1312.142	1.000
VAR00064	6.589E-06	2	3.295E-06	.301	.744	.602	.091
VAR00065	3.008E-03	1	3.008E-03	274.824	.000	274.824	1.000
VAR00064 * VAR00065	8.220E-06	2	4.110E-06	.376	.692	.751	.102
Error	2.079E-04	19	1.094E-05				
Total	6.344E-02	25					
Corrected Total	3.440E-03	24					

a. Computed using alpha = .05

b. R Squared = .940 (Adjusted R Squared = .924)

VAR 00064 = Formulation numbers
VAR 00065= Sampling time (hr)
VAR 00066 = 1/ranitidine HCl conc. (ml/mg)

Analysis of Covariance

CITRIC ACID

Presence of light but absence of oxygen

Dependent Variable: VAR00069

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Noncent. Parameter	Observed Power[a]
Corrected Model	1.991E-03[b]	5	3.982E-04	36.189	.000	180.944	1.000
Intercept	1.606E-02	1	1.606E-02	1459.004	.000	1459.004	1.000
VAR00067	2.425E-05	2	1.212E-05	1.102	.352	2.203	.216
VAR00068	1.905E-03	1	1.905E-03	173.086	.000	173.086	1.000
VAR00067 * VAR00068	9.903E-06	2	4.952E-06	.450	.644	.900	.113
Error	2.201E-04	20	1.100E-05				
Total	6.226E-02	26					
Corrected Total	2.211E-03	25					

a. Computed using alpha = .05

b. R Squared = .900 (Adjusted R Squared = .876)

VAR 00061 = Formulation numbers
VAR 00062 = Sampling time (hr)
VAR 00063 = 1/ranitidine HCl conc. (ml/mg)

Absence of oxygen and light

Dependent Variable: VAR00072

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Noncent. Parameter	Observed Power[a]
Corrected Model	1.074E-03[b]	5	2.149E-04	75.343	.000	376.717	1.000
Intercept	1.457E-02	1	1.457E-02	5110.357	.000	5110.357	1.000
VAR00070	5.543E-06	2	2.772E-06	.972	.396	1.944	.195
VAR00071	9.907E-04	1	9.907E-04	347.424	.000	347.424	1.000
VAR00070 * VAR00071	2.211E-06	2	1.105E-06	.388	.684	.775	.104
Error	5.703E-05	20	2.852E-06				
Total	5.221E-02	26					
Corrected Total	1.131E-03	25					

a. Computed using alpha = .05

b. R Squared = .950 (Adjusted R Squared = .937)

VAR 00064 = Formulation numbers
VAR 00065= Sampling time (hr)
VAR 00066 = 1/ranitidine HCl conc. (ml/mg)

Analysis of Covariance
CREMOPHOR EL®

Presence of oxygen and light

Dependent Variable: VAR00075

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Noncent. Parameter	Observed Power[a]
Corrected Model	2.538E-03[b]	3	8.459E-04	80.084	.000	240.253	1.000
Intercept	1.237E-02	1	1.237E-02	1171.447	.000	1171.447	1.000
VAR00073	1.013E-05	1	1.013E-05	.959	.345	.959	.149
VAR00074	2.523E-03	1	2.523E-03	238.851	.000	238.851	1.000
VAR00073 * VAR00074	4.965E-06	1	4.965E-06	.470	.505	.470	.098
Error	1.373E-04	13	1.056E-05				
Total	5.088E-02	17					
Corrected Total	2.675E-03	16					

a. Computed using alpha = .05

b. R Squared = .949 (Adjusted R Squared = .937)

VAR 00073 = Formulation numbers
VAR 00074 = Sampling time (hr)
VAR 00075 = 1/ranitidine HCl conc. (ml/mg)

Presence of oxygen but absence of light

Dependent Variable: VAR00078

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Noncent. Parameter	Observed Power[a]
Corrected Model	2.310E-03[b]	3	7.701E-04	52.876	.000	158.629	1.000
Intercept	1.000E-02	1	1.000E-02	686.714	.000	686.714	1.000
VAR00076	5.054E-07	1	5.054E-07	.035	.855	.035	.053
VAR00077	2.060E-03	1	2.060E-03	141.474	.000	141.474	1.000
VAR00076 * VAR00077	8.323E-06	1	8.323E-06	.571	.463	.571	.108
Error	1.893E-04	13	1.456E-05				
Total	4.545E-02	17					
Corrected Total	2.499E-03	16					

a. Computed using alpha = .05

b. R Squared = .924 (Adjusted R Squared = .907)

VAR 00076 = Formulation numbers
VAR 00077 = Sampling time (hr)
VAR 00078 = 1/ranitidine HCl conc. (ml/mg)

Analysis of Covariance

CREMOPHOR EL®

Presence of light but absence of oxygen

Dependent Variable: VAR00081

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Noncent. Parameter	Observed Power[a]
Corrected Model	1.309E-03[b]	3	4.363E-04	69.913	.000	209.740	1.000
Intercept	1.064E-02	1	1.064E-02	1704.836	.000	1704.836	1.000
VAR00079	1.228E-05	1	1.228E-05	1.968	.186	1.968	.253
VAR00080	1.293E-03	1	1.293E-03	207.159	.000	207.159	1.000
VAR00079 * VAR00080	8.481E-06	1	8.481E-06	1.359	.266	1.359	189
Error	7.489E-05	12	6.241E-06				
Total	3.700E-02	16					
Corrected Total	1.384E-03	15					

a. Computed using alpha = .05

b. R Squared = .946 (Adjusted R Squared = .932)

VAR 00079 = Formulation numbers
VAR 00080 = Sampling time (hr)
VAR 00081 = 1/ranitidine HCl conc. (ml/mg)

Absence of oxygen and light

Dependent Variable: VAR00084

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Noncent. Parameter	Observed Power[a]
Corrected Model	1.076E-03[b]	3	3.586E-04	144.330	.000	432.991	1.000
Intercept	9.747E-03	1	9.747E-03	3922.687	.000	3922.687	1.000
VAR00082	2.761E-07	1	2.761E-07	.111	.744	.111	.061
VAR00083	1.060E-03	1	1.060E-03	426.526	.000	426.526	1.000
VAR00082 * VAR00083	8.662E-06	1	8.662E-06	3.486	.083	3.486	.413
Error	3.479E-05	14	2.485E-06				
Total	3.877E-02	18					
Corrected Total	1.111E-03	17					

a. Computed using alpha = .05

b. R Squared = .969 (Adjusted R Squared = .962)

VAR 00082 = Formulation numbers
VAR 00083 = Sampling time (hr)
VAR 00084 = 1/ranitidine HCl conc. (ml/mg)

Analysis of Covariance
TWEEN 20®

Presence of oxygen and light

Dependent Variable: VAR00087

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Noncent. Parameter	Observed Power[a]
Corrected Model	4.329E-03[b]	3	1.443E-03	136.692	.000	410.077	1.000
Intercept	1.197E-02	1	1.197E-02	1133.945	.000	1133.945	1.000
VAR00085	1.390E-06	1	1.390E-06	.132	.722	.132	.063
VAR00086	4.050E-03	1	4.050E-03	383.689	.000	383.689	1.000
VAR00085 * VAR00086	1.611E-04	1	1.611E-04	15.264	.002	15.264	.952
Error	1.478E-04	14	1.056E-05				
Total	6.124E-02	18					
Corrected Total	4.476E-03	17					

a. Computed using alpha = .05

b. R Squared = .967 (Adjusted R Squared = .960)

VAR 00085 = Formulation numbers
VAR 00086 = Sampling time (hr)
VAR 00087 = 1/ranitidine HCl conc. (ml/mg)

Presence of oxygen but absence of light

Dependent Variable: VAR00090

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Noncent. Parameter	Observed Power[a]
Corrected Model	1.741E-03[b]	3	5.805E-04	161.328	.000	483.984	1.000
Intercept	1.061E-02	1	1.061E-02	2949.249	.000	2949.249	1.000
VAE00088	4.294E-06	1	4.294E-06	1.193	.296	1.193	.172
VAR00089	1.654E-03	1	1.654E-03	459.596	.000	459.596	1.000
VAE00088 * VAR00089	2.877E-05	1	2.877E-05	7.996	.015	7.996	.738
Error	4.318E-05	12	3.598E-06				
Total	3.792E-02	16					
Corrected Total	1.785E-03	15					

a. Computed using alpha = .05

b. R Squared = .976 (Adjusted R Squared = .970)

VAR 00088 = Formulation numbers
VAR 00089 = Sampling time (hr)
VAR 00090 = 1/ranitidine HCl conc. (ml/mg)

Analysis of Covariance
TWEEN 20®

Presence of light but absence of oxygen

Dependent Variable: VAR00093

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Noncent. Parameter	Observed Power[a]
Corrected Model	2.161E-03[b]	3	7.203E-04	31.801	.000	95.403	1.000
Intercept	9.682E-03	1	9.682E-03	427.475	.000	427.475	1.000
VAR00091	1.264E-07	1	1.264E-07	.006	.942	.006	.051
VAR00092	2.054E-03	1	2.054E-03	90.686	.000	90.686	1.000
VAR00091 * VAR00092	4.680E-05	1	4.680E-05	2.066	.176	2.066	.263
Error	2.718E-04	12	2.265E-05				
Total	4.260E-02	16					
Corrected Total	2.433E-03	15					

a. Computed using alpha = .05

b. R Squared = .888 (Adjusted R Squared = .860)

VAR 00091 = Formulation numbers
VAR 00092 = Sampling time (hr)
VAR 00093 = 1/ranitidine HCl conc. (ml/mg)

Absence of oxygen and light

Dependent Variable: VAR00096

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Noncent. Parameter	Observed Power[a]
Corrected Model	1.014E-03[b]	3	3.380E-04	134.797	.000	404.390	1.000
Intercept	9.655E-03	1	9.655E-03	3851.082	.000	3851.082	1.000
VAR00094	1.089E-06	1	1.089E-06	.434	.521	.434	.094
VAR00095	1.009E-03	1	1.009E-03	402.255	.000	402.255	1.000
VAR00094 * VAR00095	4.574E-06	1	4.574E-06	1.824	.198	1.824	.242
Error	3.510E-05	14	2.507E-06				
Total	3.801E-02	18					
Corrected Total	1.049E-03	17					

a. Computed using alpha = .05

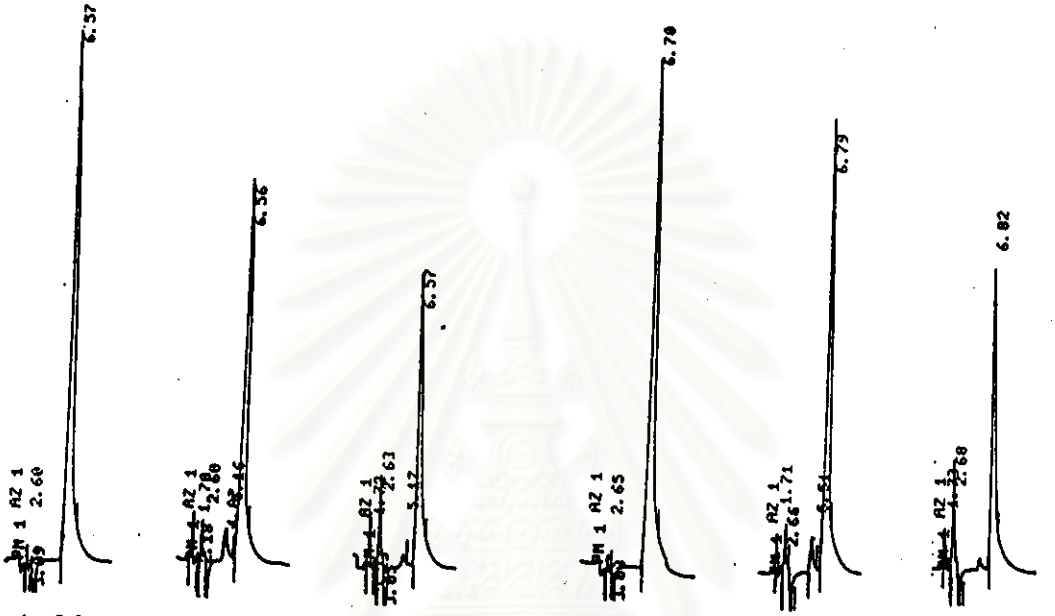
b. R Squared = .967 (Adjusted R Squared = .959)

VAR 00094 = Formulation numbers
VAR 00095 = Sampling time (hr)
VAR 00096 = 1/ranitidine HCl conc. (ml/mg)

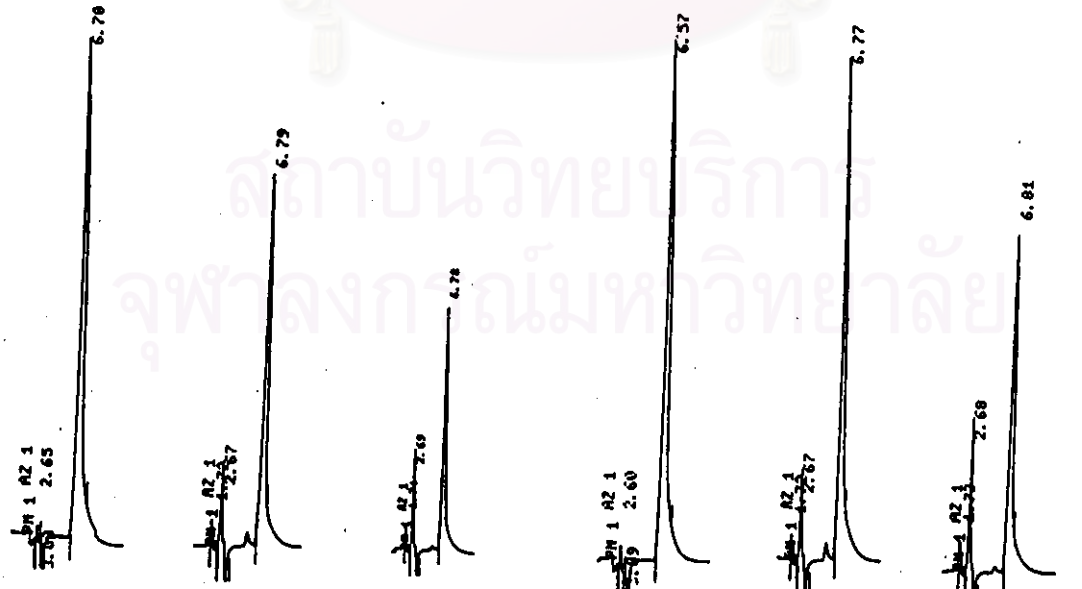
APPENDIX V

Chromatograms Detected at 229 nm of Ranitidine HCl

Chromatograms Detected at 229 nm of Ranitidine HCl
pH 8 PHOSPHATE BUFFER

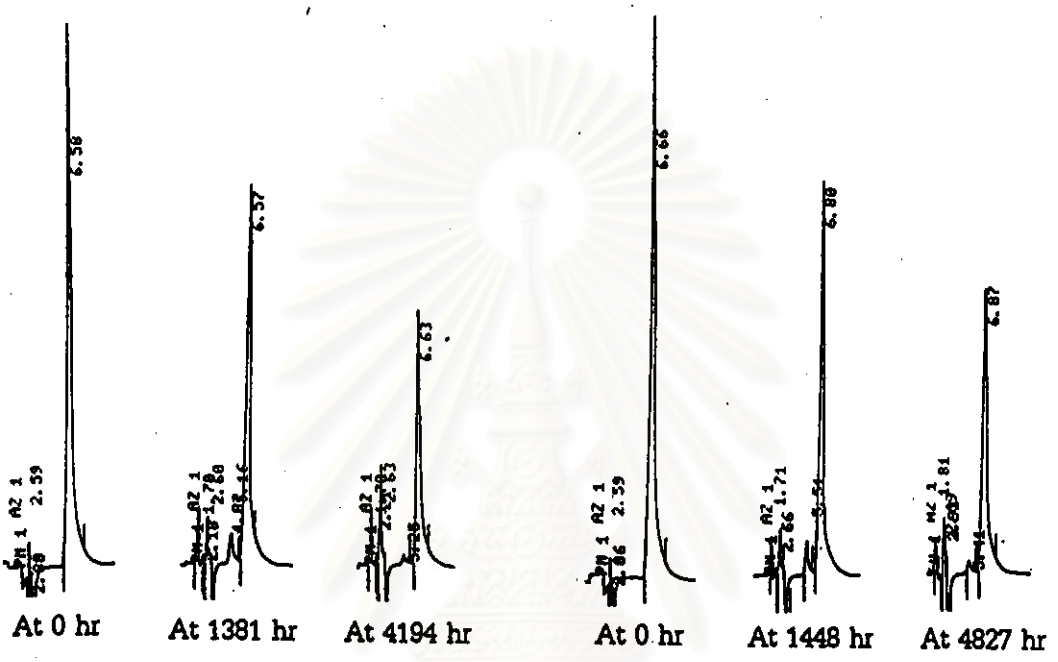


Presence of oxygen and light **Presence of oxygen but absence of light**



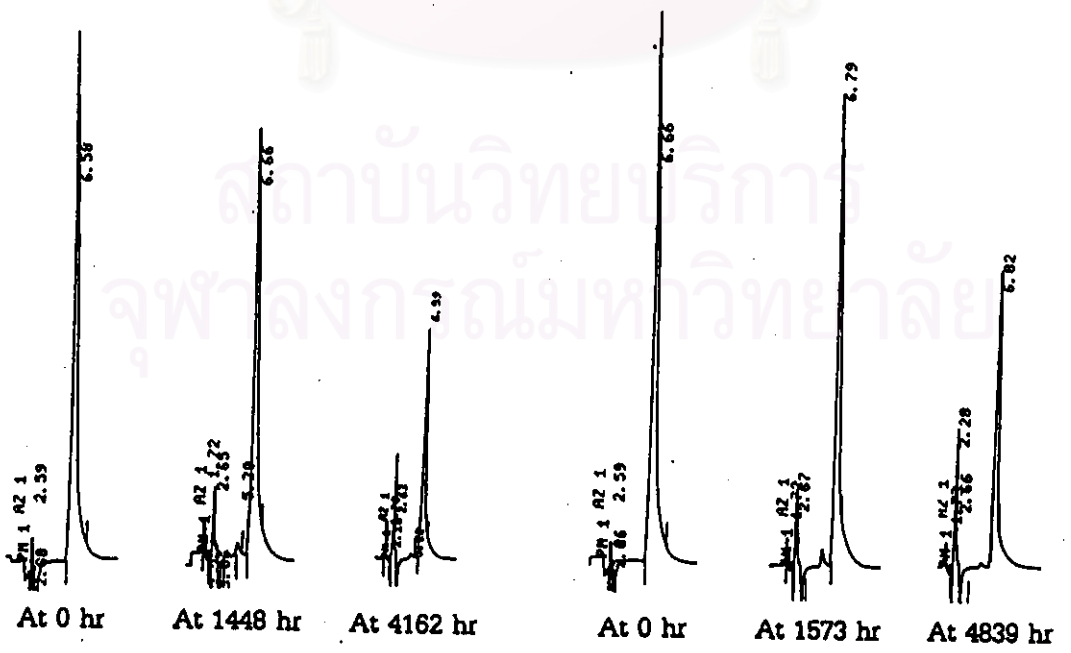
Presence of light but absence of oxygen **Absence of oxygen and light**

Chromatograms Detected at 229 nm of Ranitidine HCl
0.5 % CREMOPHOR EL®



Presence of oxygen and light

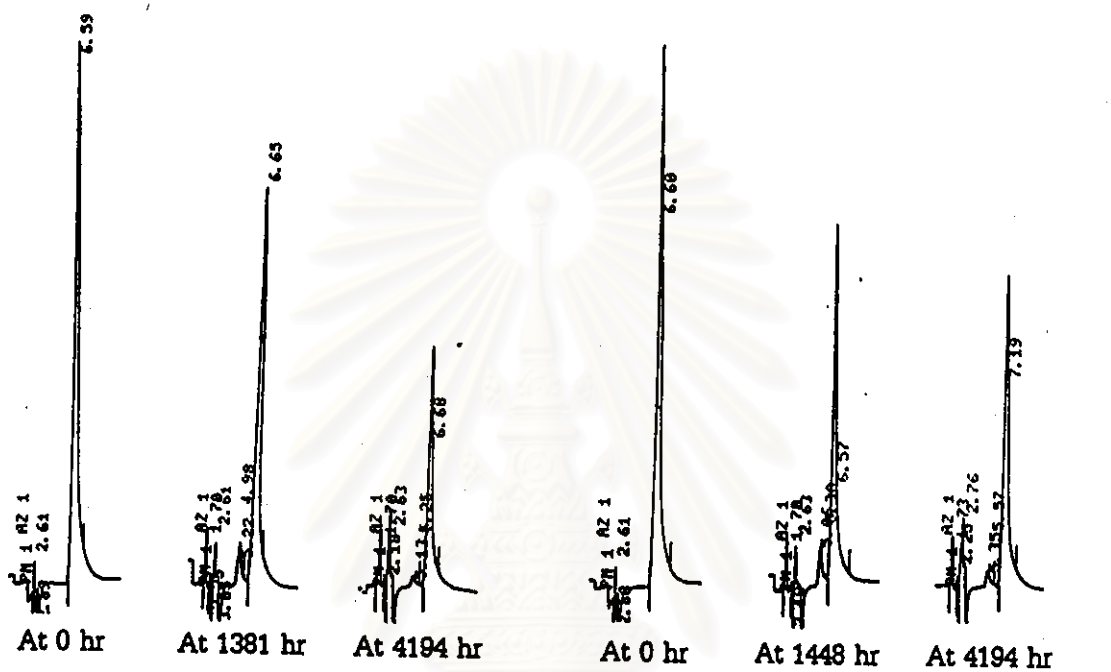
Presence of oxygen but absence of light



Presence of light but absence of oxygen

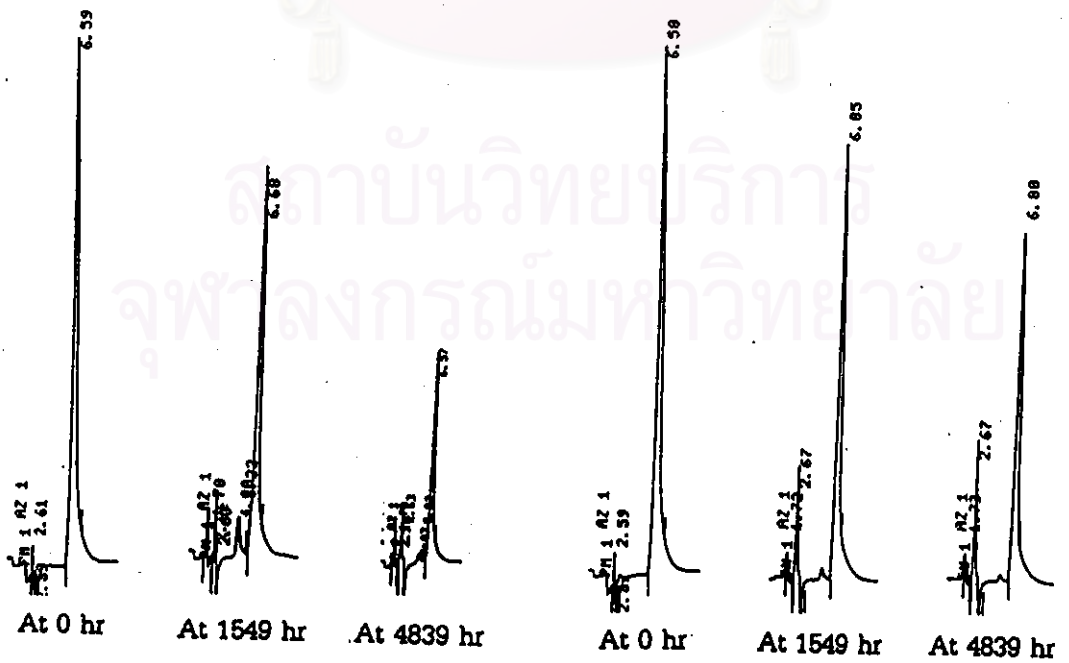
Absence of oxygen and light

Chromatograms Detected at 229 nm of Ranitidine HCl
0.5 % TWEEN 20®



Presence of oxygen and light

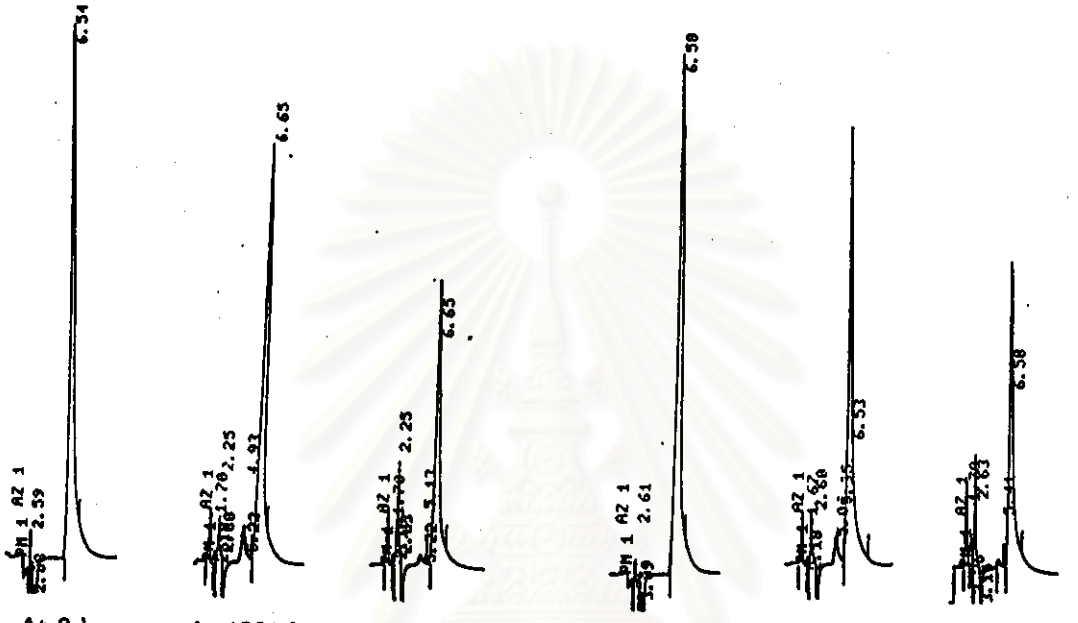
Presence of oxygen but absence of light



Presence of light but absence of oxygen

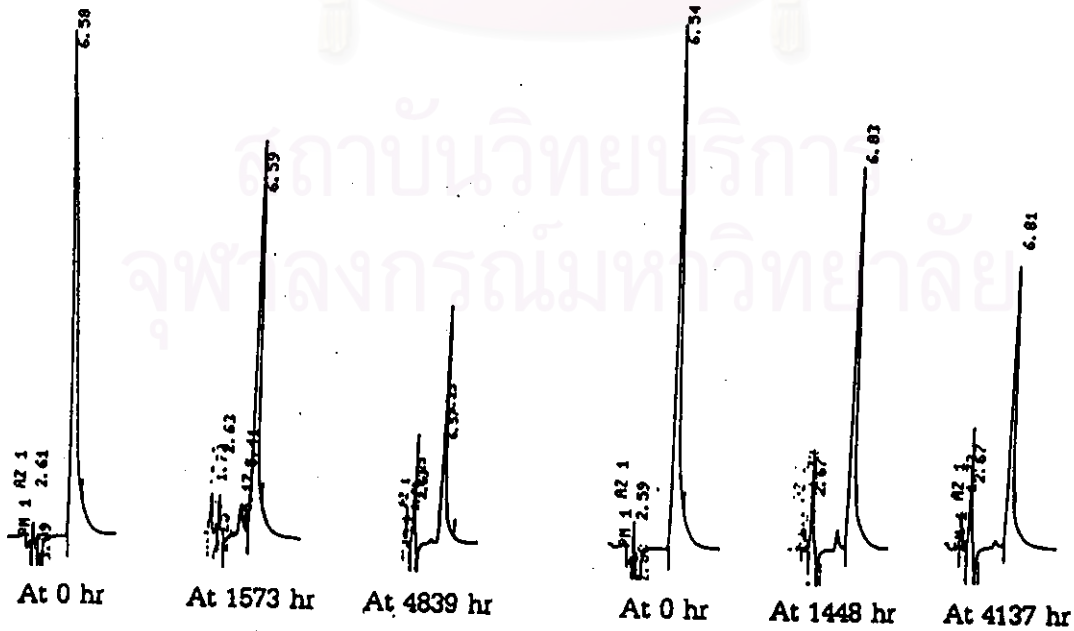
Absence of oxygen and light

Chromatograms Detected at 229 nm of Ranitidine HCl
0.001 % BHT



Presence of oxygen and light

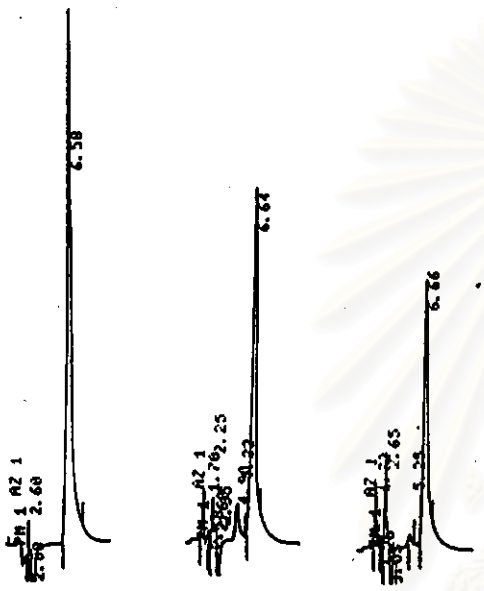
Presence of oxygen but absence of light



Presence of light but absence of oxygen

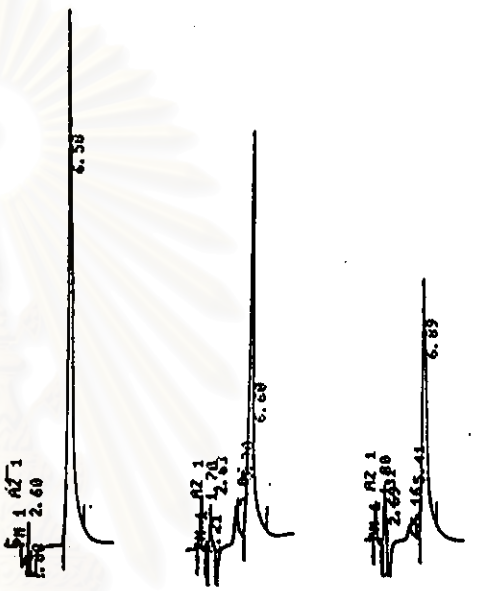
Absence of oxygen and light

Chromatograms Detected at 229 nm of Ranitidine HCl
0.005 % BHT



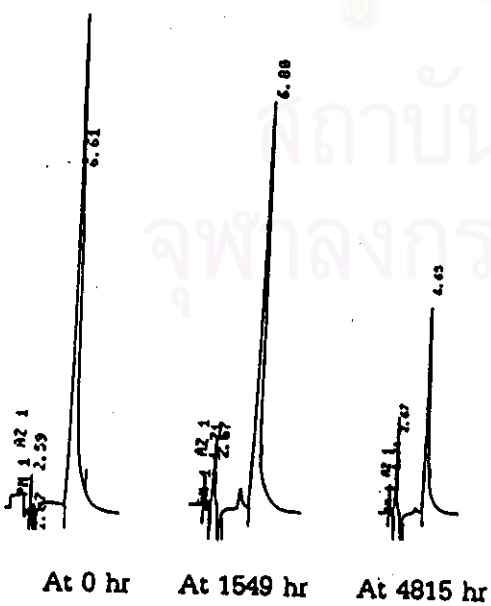
At 0 hr At 1381 hr At 4194 hr

Presence of oxygen and light



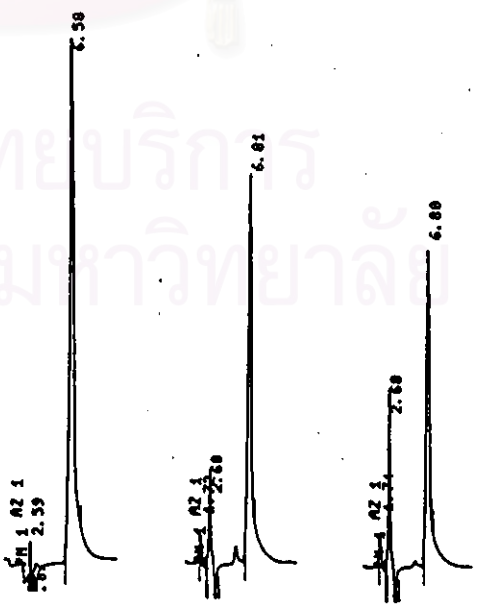
At 0 hr At 1448 hr At 4194 hr

Presence of oxygen but absence of light



At 0 hr At 1549 hr At 4815 hr

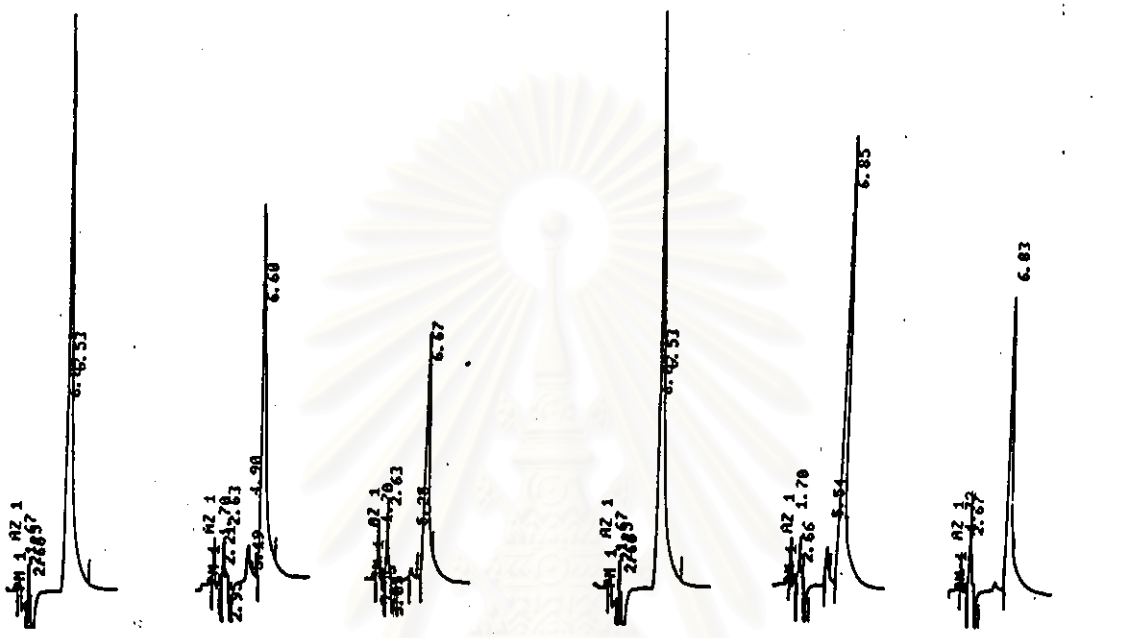
Presence of light but absence of oxygen



At 0 hr At 1537 hr At 4839 hr

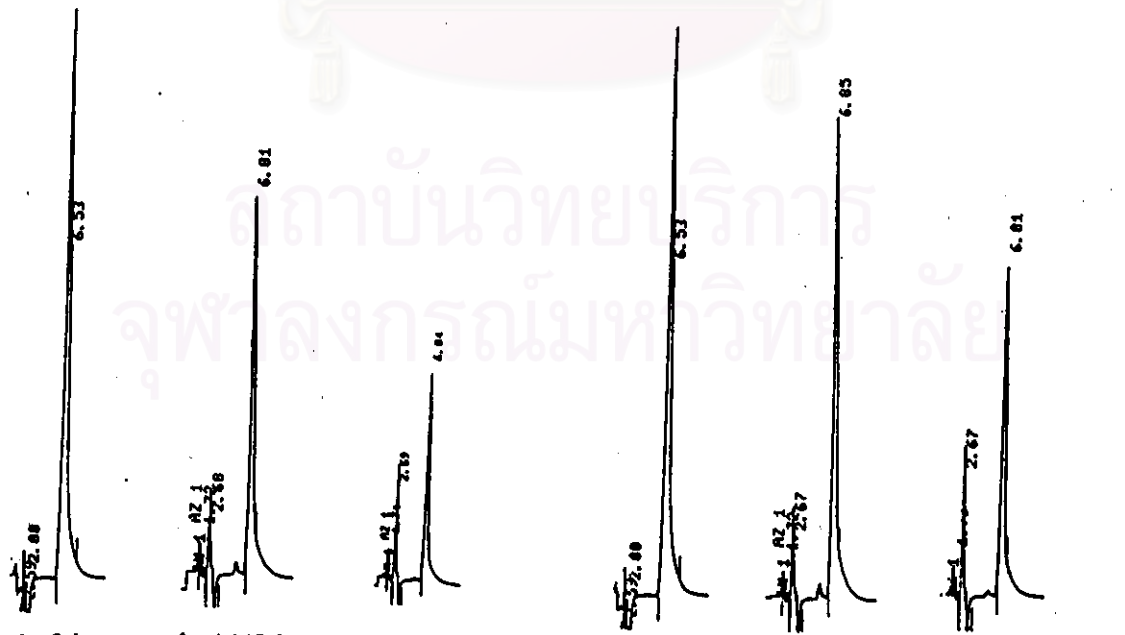
Absence of oxygen and light

Chromatograms Detected at 229 nm of Ranitidine HCl
0.001 % ALPHA TOCOPHEROL



At 0 hr At 1381 hr At 4815 hr At 0 hr At 1573 hr At 4137 hr

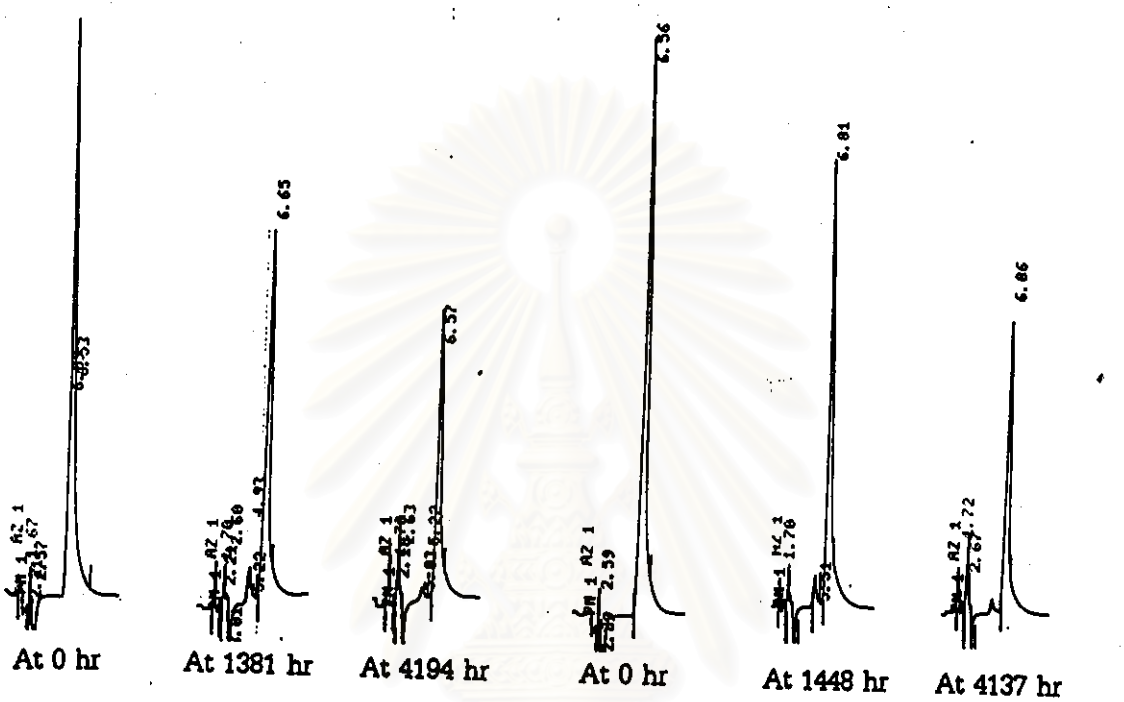
Presence of oxygen and light **Presence of oxygen but absence of light**



At 0 hr At 1448 hr At 4815 hr At 0 ht At 1537 hr At 4839 hr

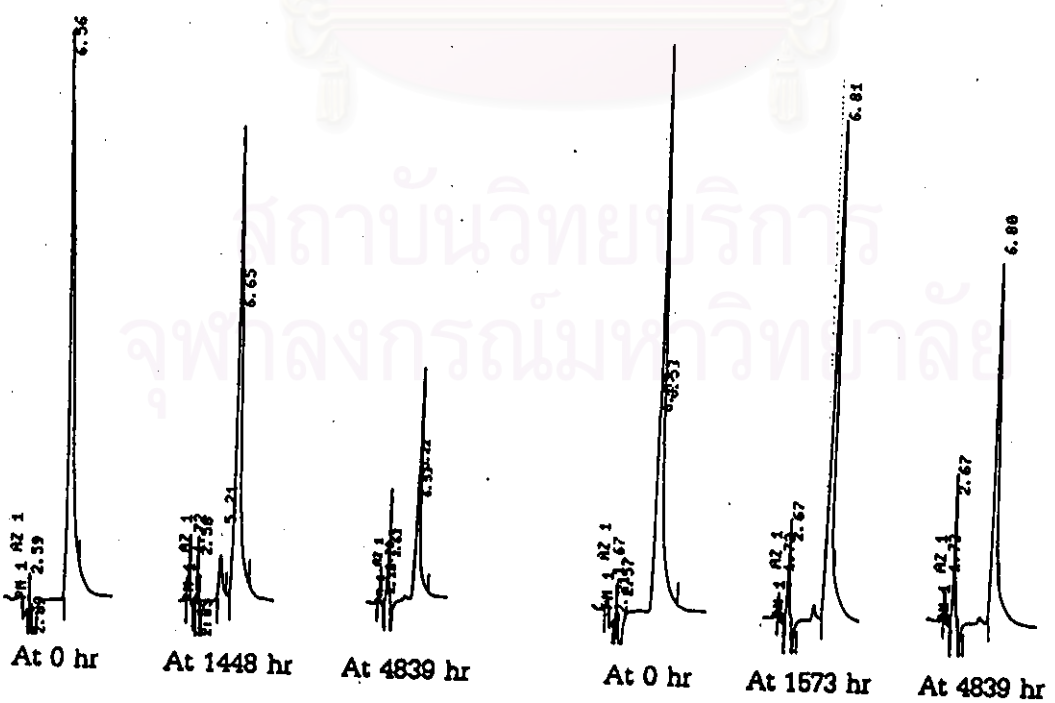
Presence of light but absence of oxygen **Absence of oxygen and light**

Chromatograms Detected at 229 nm of Ranitidine HCl
0.02 % ALPHA TOCOPHEROL



Presence of oxygen and light

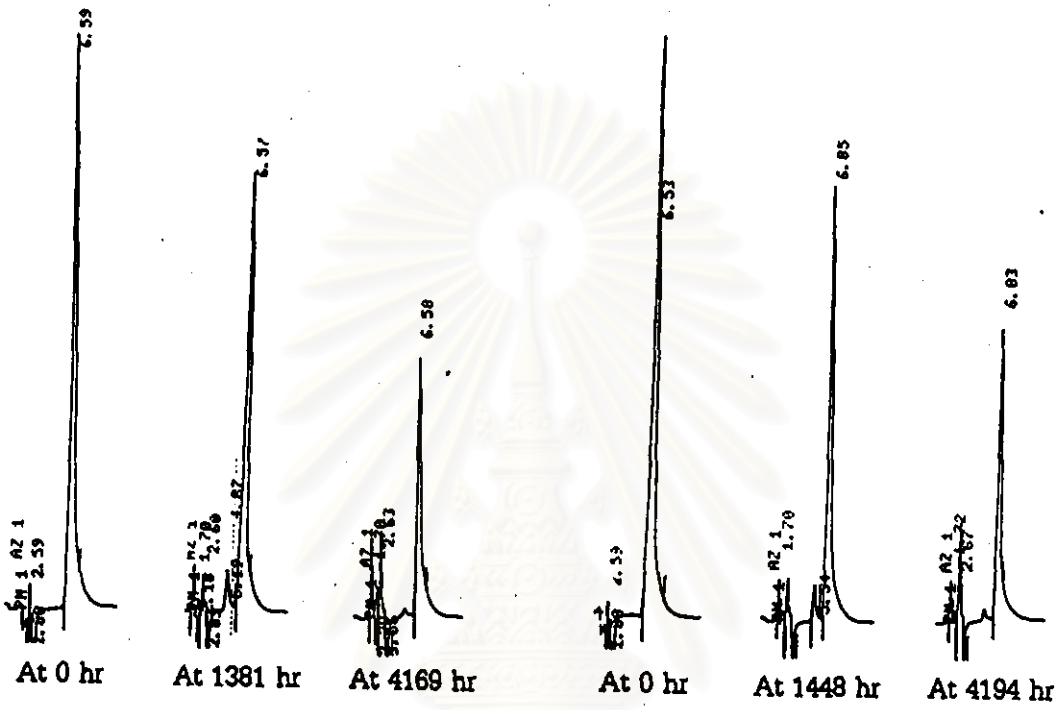
Presence of oxygen but absence of light



Presence of light but absence of oxygen

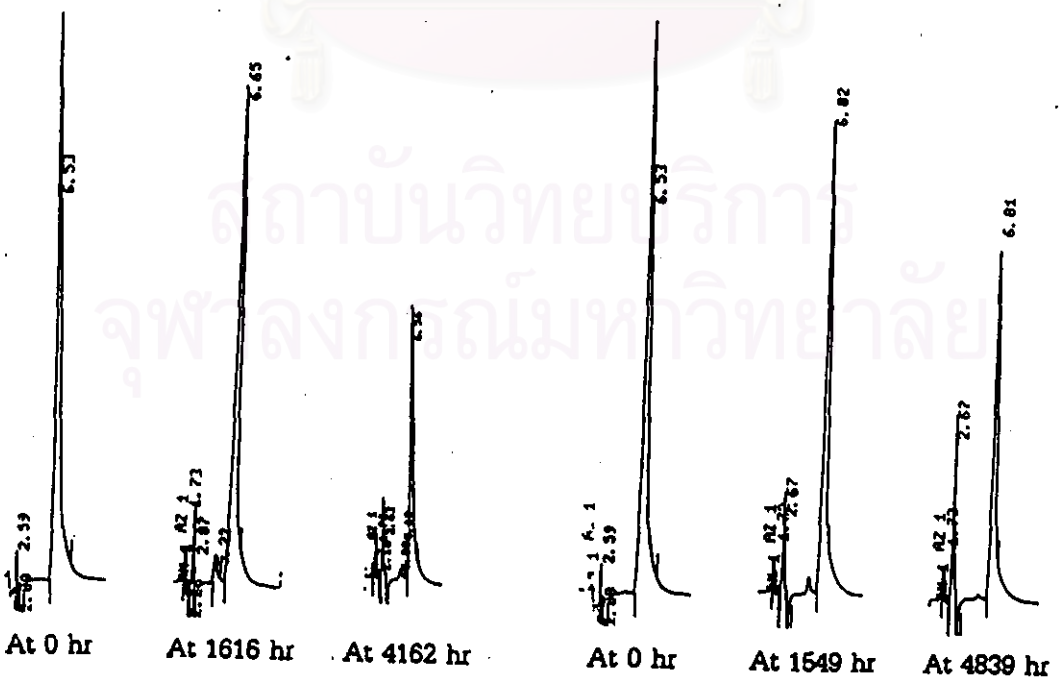
Absence of oxygen and light

Chromatograms Detected at 229 nm of Ranitidine HCl
0.01 % SODIUM BISULFITE



Presence of oxygen and light

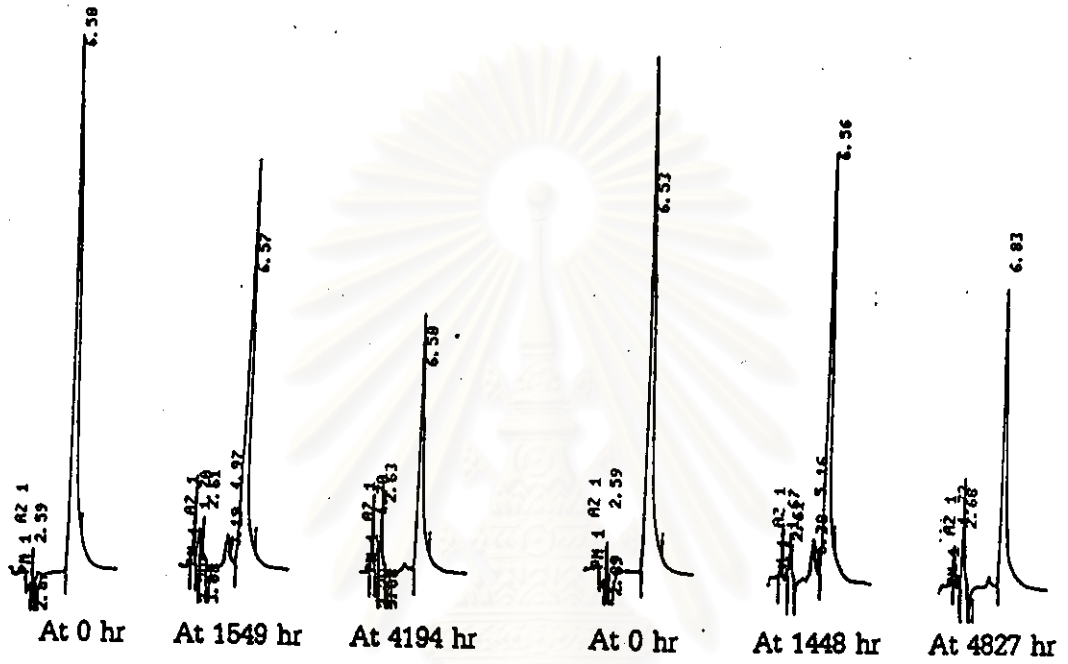
Presence of oxygen but absence of light



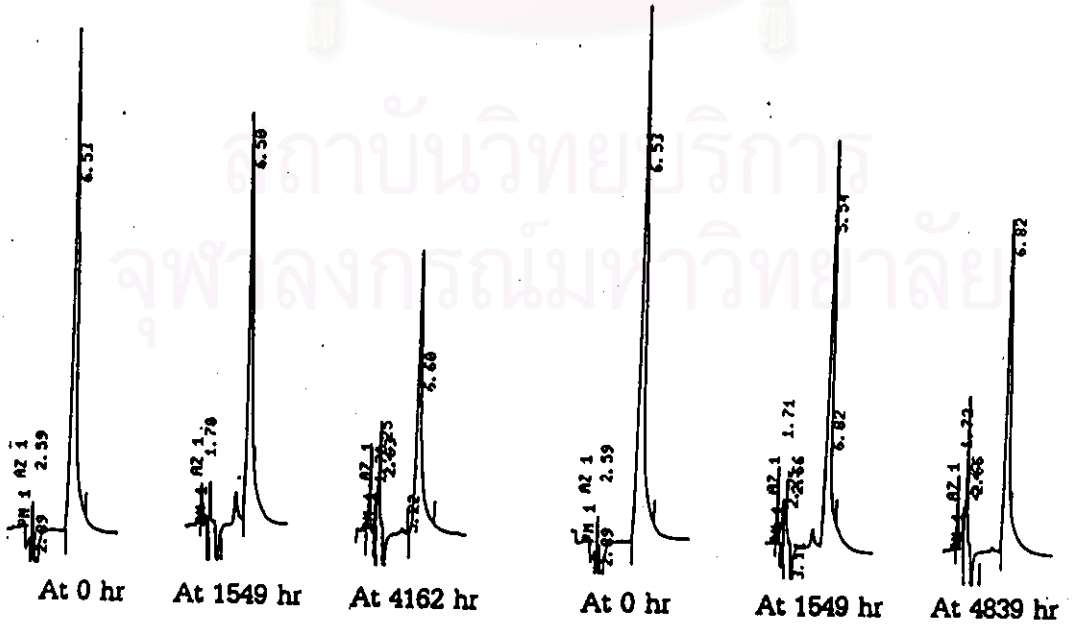
Presence of light but absence of oxygen

Absence of oxygen and light

Chromatograms Detected at 229 nm of Ranitidine HCl
0.1 % SODIUM BISULFITE

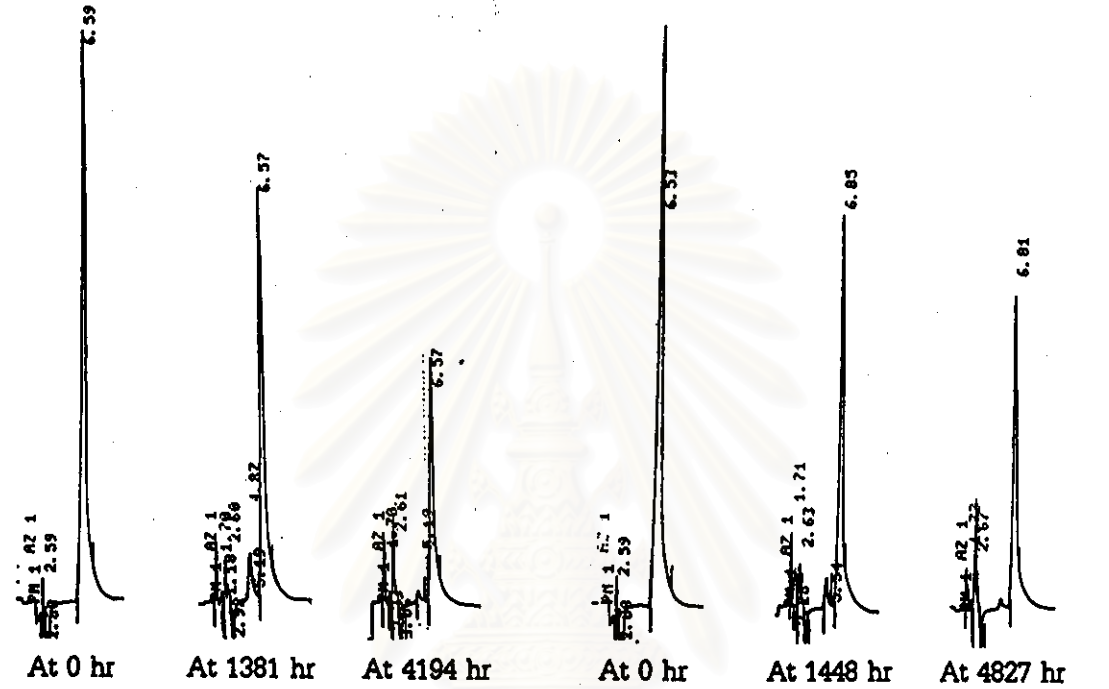


Presence of oxygen and light **Presence of oxygen but absence of light**



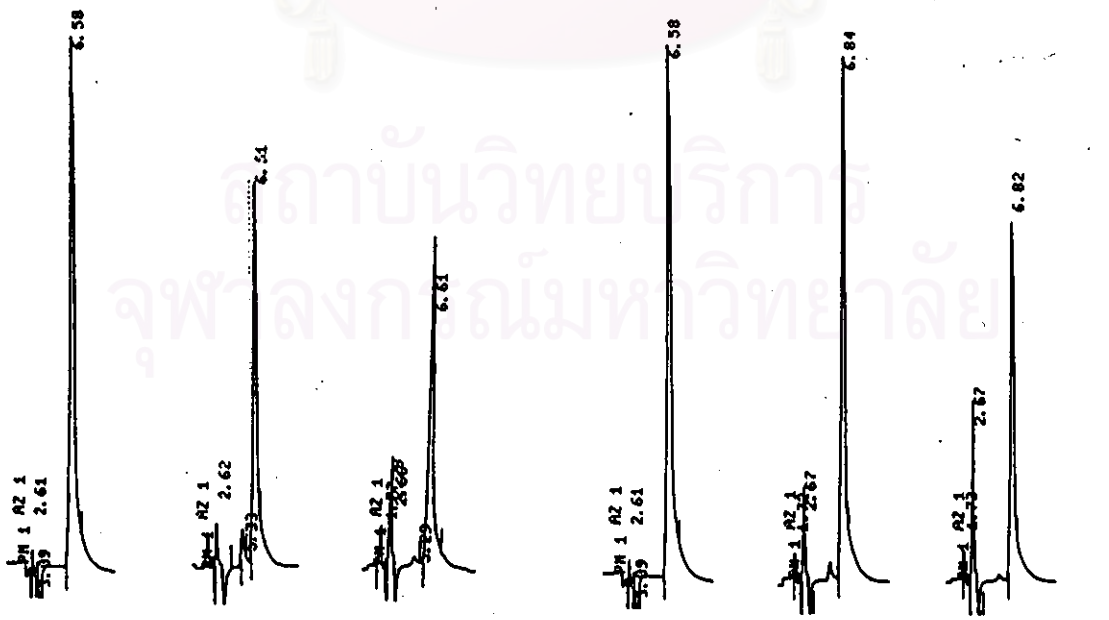
Presence of light but absence of oxygen **Absence of oxygen and light**

Chromatograms Detected at 229 nm of Ranitidine HCl
0.01 % ASCORBIC ACID



At 0 hr At 1381 hr At 4194 hr At 0 hr At 1448 hr At 4827 hr

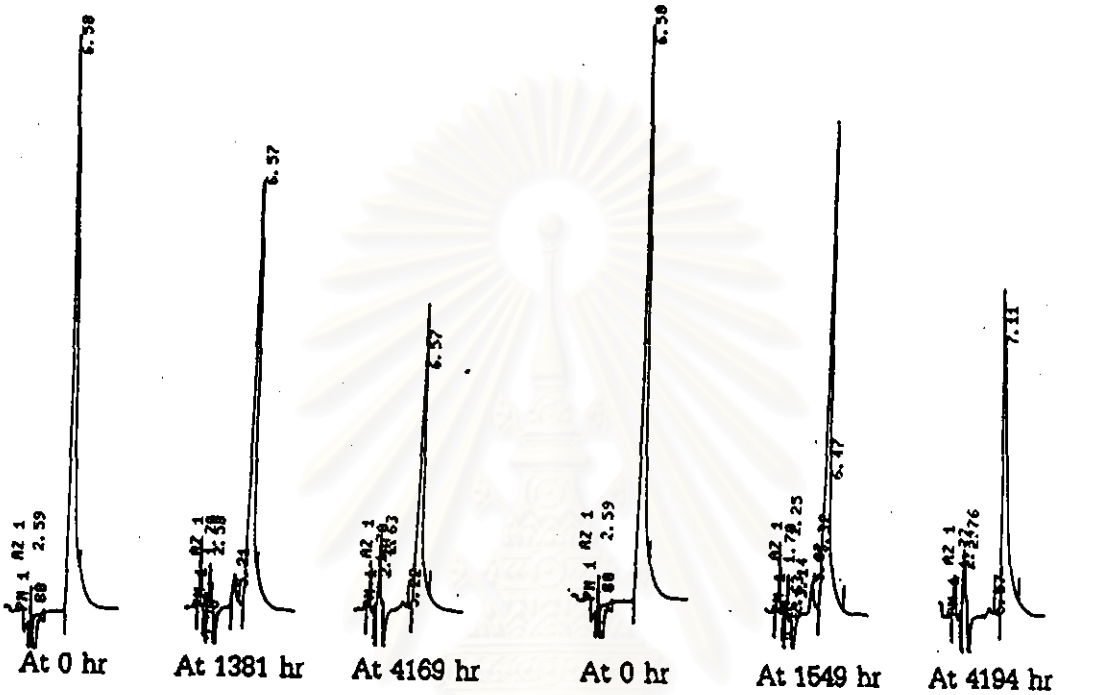
Presence of oxygen and light **Presence of oxygen but absence of light**



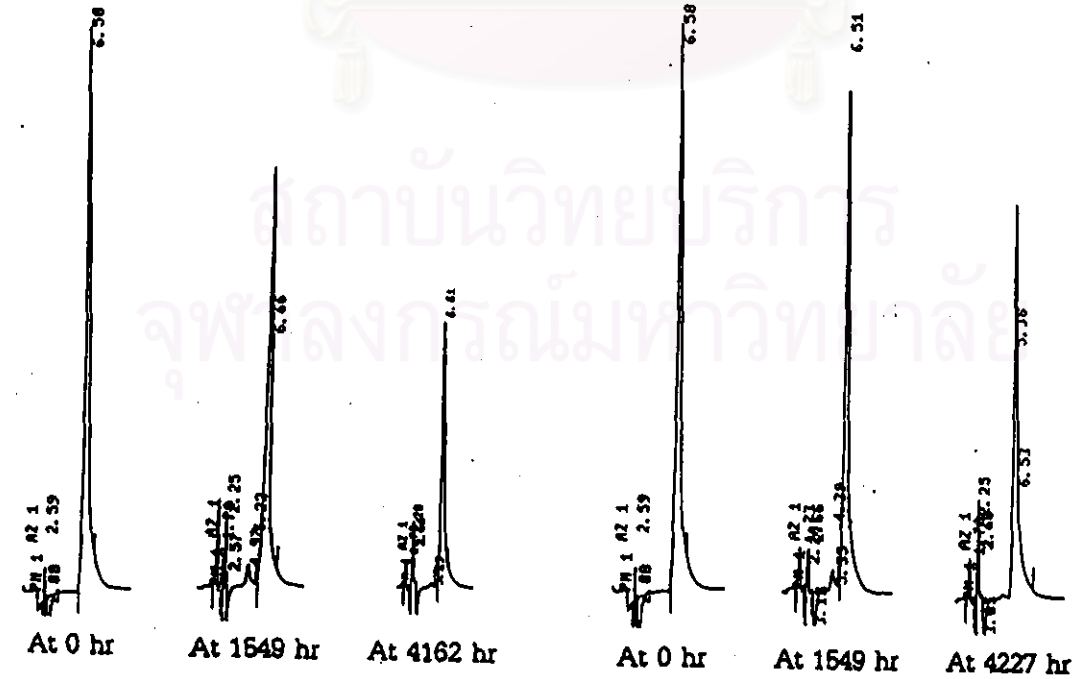
At 0 hr At 1549 hr At 4227 hr At 0 hr At 1549 hr At 4839 hr

Presence of light but absence of oxygen **Absence of oxygen and light**

Chromatograms Detected at 229 nm of Ranitidine HCl
0.1 % ASCORBIC ACID

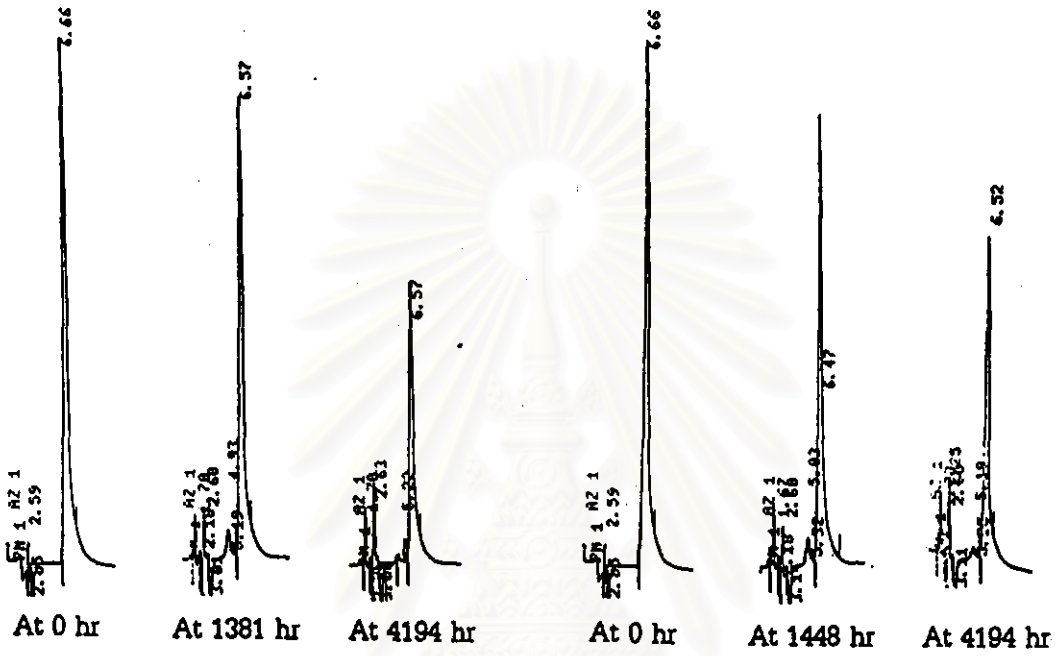


Presence of oxygen and light **Presence of oxygen but absence of light**

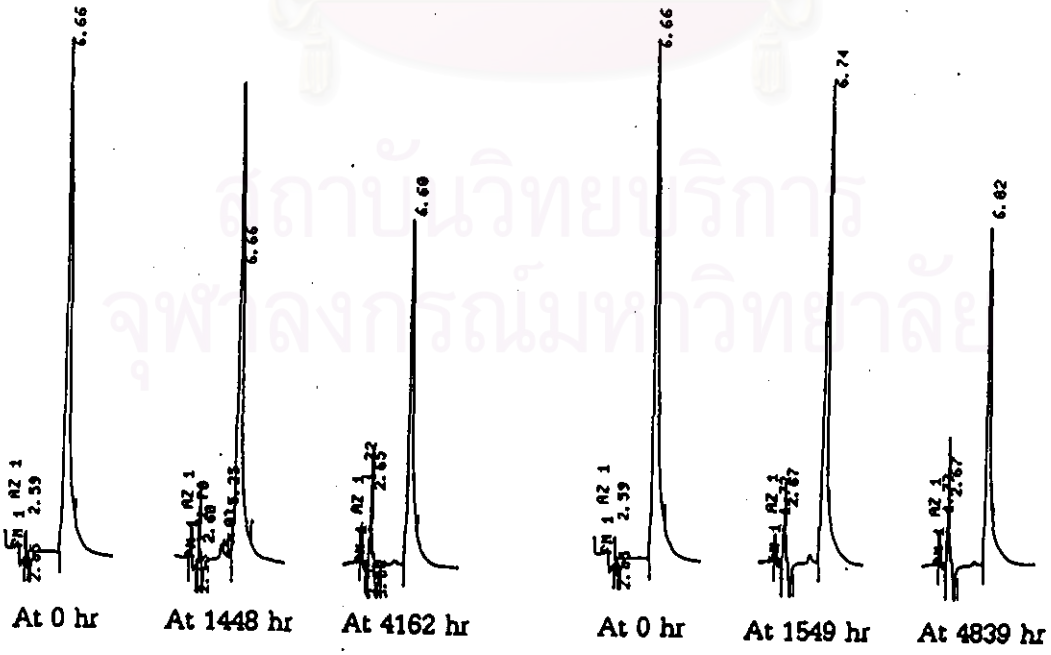


Presence of light but absence of oxygen **Absence of oxygen and light**

Chromatograms Detected at 229 nm of Ranitidine HCl
0.01 % EDTA

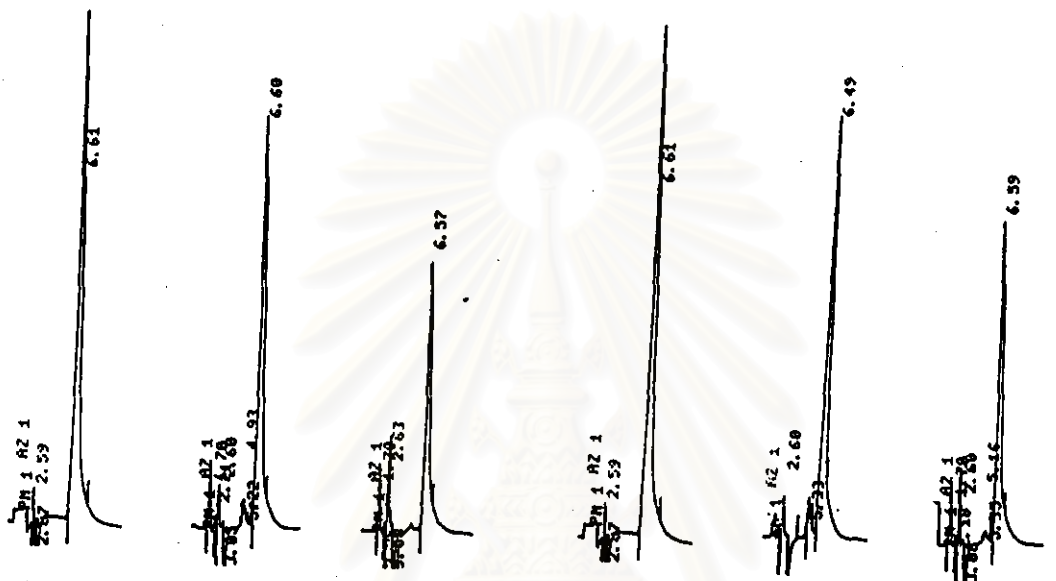


Presence of oxygen and light **Presence of oxygen but absence of light**



Presence of light but absence of oxygen **Absence of oxygen and light**

Chromatograms Detected at 229 nm of Ranitidine HCl
0.075 % EDTA

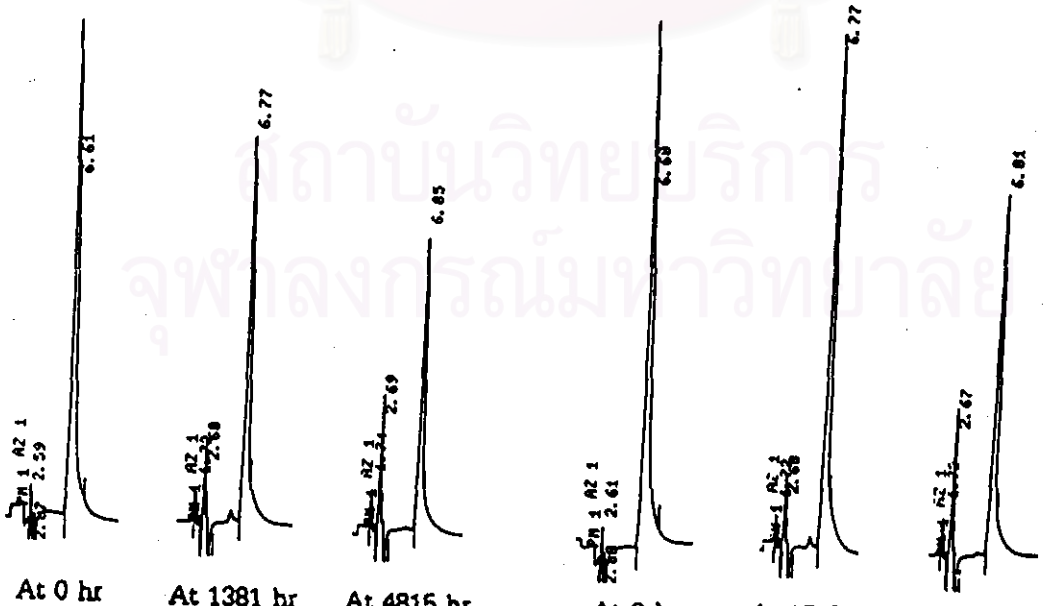


At 0 hr At 1381 hr At 4194 hr

Presence of oxygen and light

At 0 hr At 1448 hr At 4194 hr

Presence of oxygen but absence of light



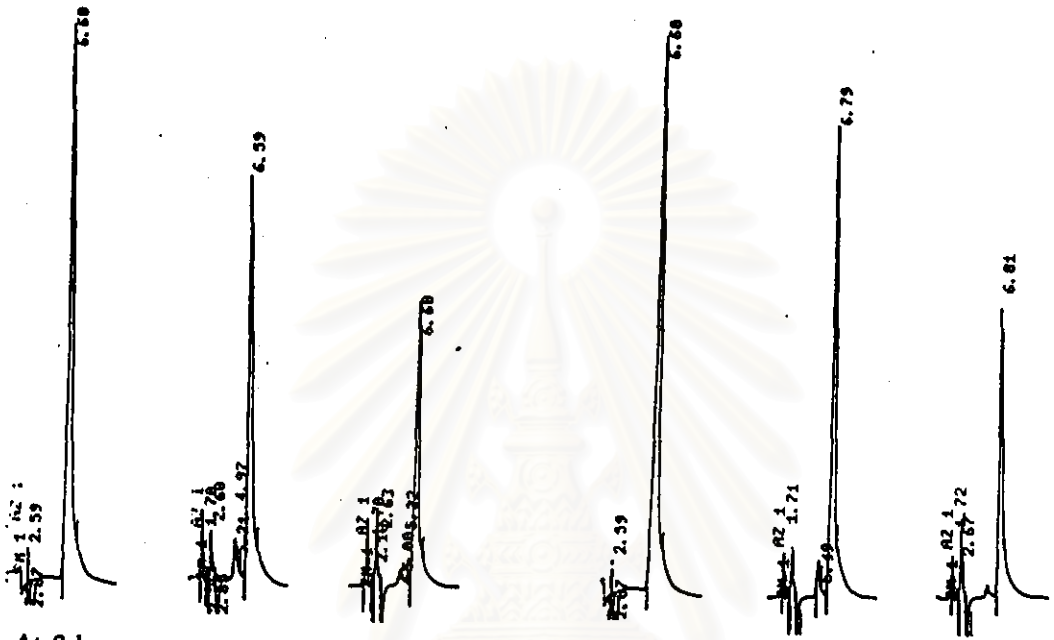
At 0 hr At 1381 hr At 4815 hr

Presence of light but absence of oxygen

At 0 hr At 1549 hr At 4137 hr

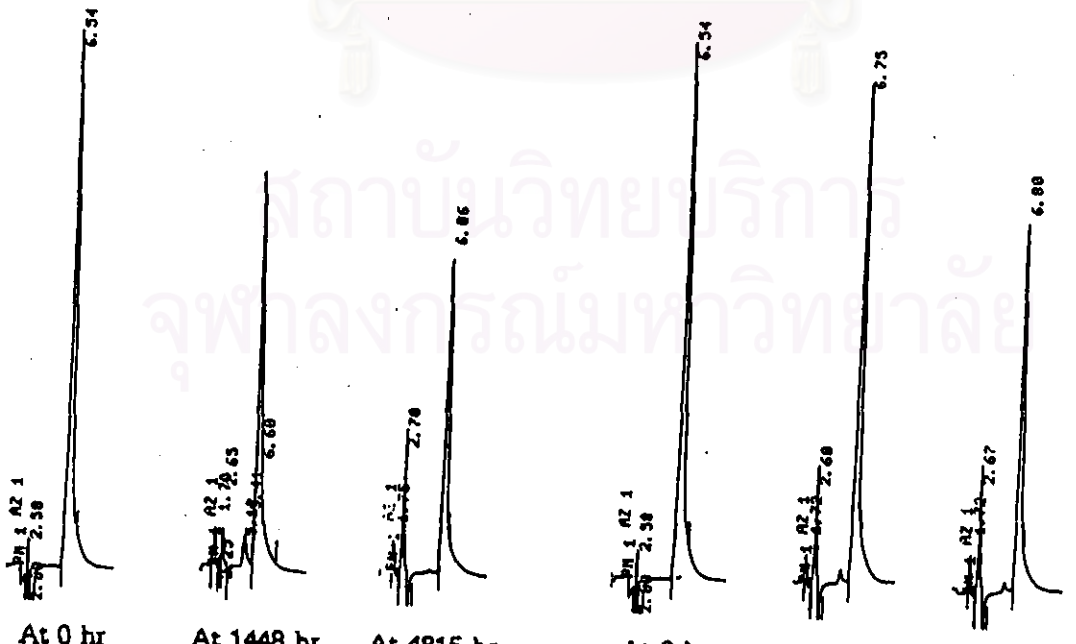
Absence of oxygen and light

Chromatograms Detected at 229 nm of Ranitidine HCl
0.3 % CITRIC ACID



Presence of oxygen and light

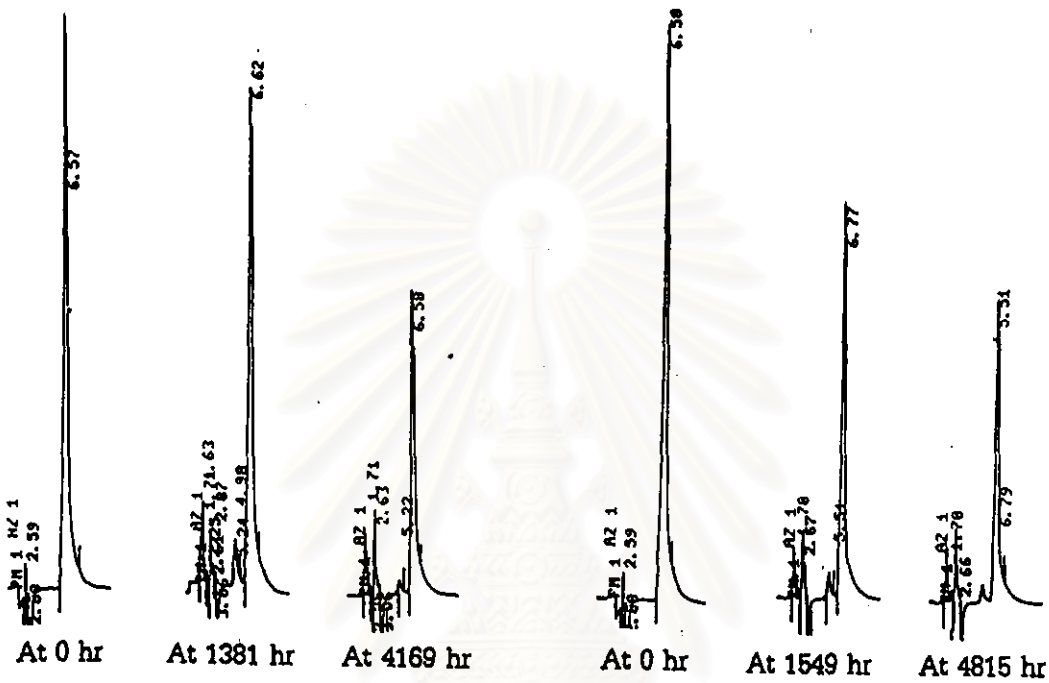
Presence of oxygen but absence of light



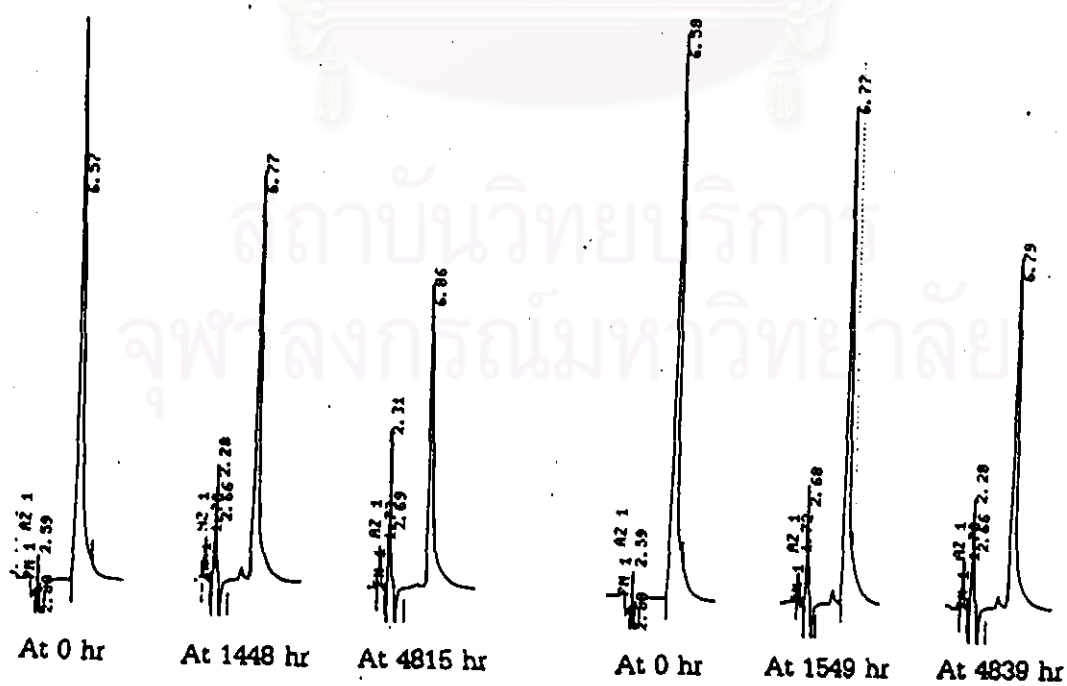
Presence of light but absence of oxygen

Absence of oxygen and light

Chromatograms Detected at 229 nm of Ranitidine HCl
2.0 % CITRIC ACID



Presence of oxygen and light **Presence of oxygen but absence of light**



Presence of light but absence of oxygen **Absence of oxygen and light**

VITA

Miss Patima Phuangchan was born in February 20, 1968. She has received her Bachelor Degree of Science in Pharmacy from the Faculty of Pharmaceutical Sciences, Chulalongkorn University, Bangkok, Thailand since 1993. After graduation, she has worked as a pharmacist in the division of drug, department of medical science, Ministry of public heath before she entered the Master's Degree program in Pharmacy at Chulalongkorn University.