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Table 1A Preliminary Experiment

Time (hr)	Temperature (°C)	Toluene (wt%)	Q (g)	1,2,3,4-THQ (g)	5,6,7,8-THQ (g)	DHQ (g)	OPA (g)	PCH (g)	PB (g)
6	300	99	0.15	1.86	0.05	0.037	0.05	-0.04	-0.012
12	300	99	0.14	2.02	0.02	0.026	0.04	-0.05	-0.019
18	300	100	0.15	2.03	0.02	0.027	0.04	-0.05	-0.019
24	300	101	0.14	2.19	0.02	0.023	0.04	-0.06	-0.022
Average*		100	0.14	2.08	0.02	0.025	0.04	-0.05	-0.020
30	350	101	0.32	0.90	0.25	0.070	0.08	0.05	0.020
36	350	101	0.36	1.07	0.25	0.080	0.08	0.04	0.016
42	350	98	0.35	1.11	0.22	0.088	0.08	0.04	0.015
48	350	100	0.41	1.30	0.24	0.090	0.09	0.02	0.009
Average*		100	0.37	1.16	0.24	0.086	0.08	0.04	0.013
54	370	99	0.49	0.77	0.38	0.024	0.11	0.11	0.047
60	370	98	0.47	0.72	0.36	0.019	0.10	0.11	0.043
66	370	100	0.48	0.75	0.37	0.022	0.11	0.10	0.041
72	370	99	0.45	0.74	0.33	0.020	0.10	0.11	0.042
Average*		99	0.47	0.74	0.35	0.020	0.10	0.11	0.042
78	390	98	0.49	0.37	0.38	-0.027	0.13	0.18	0.097
84	390	99	0.48	0.37	0.37	-0.025	0.12	0.20	0.102
90	390	99	0.49	0.39	0.39	-0.024	0.13	0.19	0.097
96	390	97	0.52	0.41	0.40	-0.024	0.13	0.17	0.089
Average*		98	0.50	0.39	0.39	-0.024	0.13	0.19	0.096

* used only the last three sample to calculate the average quantities of various compounds

Table 2A Repeatability of Quinoline in Samples

Time (hr)	Weight of Quinoline (g)					Deviation (%)
	Ref. 1	Ref. 2	Avg. Ref.	Max.	Min.	
12	0.47	0.45	0.46	0.47	0.45	2.17
24	0.45	0.47	0.46	0.47	0.45	2.17
30	0.48	0.46	0.47	0.48	0.46	2.13
36	0.49	0.48	0.48	0.49	0.48	0.88
42	0.47	0.49	0.48	0.49	0.47	2.08
48	0.49	0.49	0.49	0.49	0.49	0.51
54	0.49	0.49	0.49	0.49	0.49	0.72
60	0.49	0.50	0.50	0.50	0.49	0.60
66	0.50	0.50	0.50	0.50	0.50	0.23
72	0.50	0.51	0.51	0.51	0.50	0.99
78	0.49	0.48	0.48	0.49	0.48	1.28
84	0.48	0.48	0.48	0.48	0.48	0.12
90	0.47	0.48	0.48	0.48	0.47	0.73
96	0.47	0.49	0.48	0.49	0.47	1.82
102	0.50	0.47	0.48	0.50	0.47	2.82
108	0.50	0.49	0.49	0.50	0.49	0.39
114	0.46	0.46	0.46	0.46	0.46	0.43
120	0.45	0.48	0.46	0.48	0.45	3.20
126	0.51	0.47	0.49	0.51	0.47	3.99
132	0.45	0.46	0.45	0.46	0.45	1.20
138	0.47	0.47	0.47	0.47	0.47	0.53
144	0.49	0.48	0.49	0.49	0.48	1.03
Average Deviation (%)						1.37

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Table 3A Repeatability of 1,2,3,4-Tetrahydroquinoline in Samples

Time (hr)	Weight of 1,2,3,4-Tetrahydroquinoline (g)					Deviation (%)
	Ref. 1	Ref. 2	Avg. Ref.	Max.	Min.	
12	0.77	0.76	0.77	0.77	0.76	0.65
24	0.76	0.77	0.77	0.77	0.76	0.65
30	0.75	0.76	0.76	0.76	0.75	0.66
36	0.77	0.77	0.77	0.77	0.77	0.33
42	0.74	0.75	0.75	0.75	0.74	0.92
48	0.78	0.76	0.77	0.78	0.76	1.30
54	0.77	0.78	0.77	0.78	0.77	0.32
60	0.77	0.76	0.76	0.77	0.76	1.04
66	0.77	0.77	0.77	0.77	0.77	0.23
72	0.80	0.78	0.79	0.80	0.78	0.84
78	0.78	0.80	0.79	0.80	0.78	1.27
84	0.78	0.79	0.79	0.79	0.78	0.57
90	0.74	0.79	0.76	0.79	0.74	2.99
96	0.77	0.82	0.79	0.82	0.77	3.01
102	0.77	0.77	0.77	0.77	0.77	0.40
108	0.74	0.76	0.75	0.76	0.74	1.96
114	0.75	0.79	0.77	0.79	0.75	2.53
120	0.72	0.76	0.74	0.76	0.72	2.29
126	0.75	0.77	0.76	0.77	0.75	1.67
132	0.76	0.79	0.77	0.79	0.76	1.78
138	0.75	0.77	0.76	0.77	0.75	1.32
144	0.70	0.71	0.70	0.71	0.70	0.74
Average Deviation (%)						1.25

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Table 4A Repeatability of 5,6,7,8-Tetrahydroquinoline in Samples

Time (hr)	Area of 5,6,7,8-Tetrahydroquinoline					Deviation (%)
	Ref. 1	Ref. 2	Avg. Ref.	Max.	Min.	
12	0.320	0.335	0.33	0.34	0.32	2.29
24	0.330	0.320	0.33	0.33	0.32	1.54
30	0.340	0.330	0.34	0.34	0.33	1.49
36	0.330	0.335	0.33	0.34	0.33	0.75
42	0.325	0.328	0.33	0.33	0.33	0.46
48	0.335	0.320	0.33	0.34	0.34	2.29
54	0.324	0.339	0.33	0.34	0.32	2.31
60	0.338	0.334	0.34	0.34	0.33	0.56
66	0.320	0.316	0.32	0.32	0.32	0.60
72	0.332	0.319	0.33	0.33	0.32	1.92
78	0.318	0.320	0.32	0.32	0.32	0.28
84	0.321	0.328	0.32	0.33	0.32	1.06
90	0.325	0.309	0.32	0.33	0.31	2.60
96	0.324	0.300	0.31	0.32	0.30	3.80
102	0.325	0.330	0.33	0.33	0.33	0.76
108	0.325	0.345	0.34	0.35	0.33	2.95
114	0.321	0.346	0.33	0.35	0.32	3.79
120	0.330	0.345	0.34	0.35	0.33	2.22
126	0.331	0.320	0.33	0.33	0.32	1.69
132	0.333	0.323	0.33	0.33	0.32	1.51
138	0.335	0.320	0.33	0.34	0.32	2.29
144	0.333	0.328	0.33	0.33	0.33	0.80
Average Deviation (%)						1.73

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Table 5A Repeatability of Decahydroquinoline in Samples

Time (hr)	Weight of Decahydroquinoline (g)					Deviation (%)
	Ref. 1	Ref. 2	Avg. Ref.	Max.	Min.	
12	0.029	0.029	0.029	0.029	0.029	0.344
24	0.028	0.028	0.028	0.028	0.028	0.176
30	0.029	0.029	0.029	0.029	0.029	0.350
36	0.028	0.028	0.028	0.028	0.028	0.355
42	0.029	0.029	0.029	0.029	0.029	0.694
48	0.029	0.029	0.029	0.029	0.029	0.350
54	0.029	0.031	0.030	0.031	0.029	2.341
60	0.028	0.028	0.028	0.028	0.028	1.071
66	0.028	0.028	0.028	0.028	0.028	0.712
72	0.026	0.025	0.026	0.026	0.025	2.524
78	0.029	0.029	0.029	0.029	0.029	0.870
84	0.029	0.028	0.028	0.029	0.028	0.176
90	0.028	0.029	0.029	0.029	0.028	0.876
96	0.028	0.029	0.028	0.029	0.028	1.239
102	0.027	0.029	0.028	0.029	0.027	3.784
108	0.030	0.030	0.030	0.030	0.030	0.333
114	0.024	0.026	0.025	0.026	0.024	3.644
120	0.028	0.030	0.029	0.030	0.028	3.425
126	0.028	0.029	0.028	0.029	0.028	2.128
132	0.028	0.028	0.028	0.028	0.028	0.353
138	0.028	0.029	0.028	0.029	0.028	0.527
144	0.029	0.029	0.029	0.029	0.029	0.518
Average Deviation (%)						1.218

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Table 6A Repeatability of o-Propylaniline in Samples

Time (hr)	Weight of o-Propylaniline (g)					Deviation (%)
	Ref. 1	Ref. 2	Avg. Ref.	Max.	Min.	
12	0.10	0.10	0.10	0.10	0.10	0.81
24	0.10	0.09	0.09	0.10	0.09	2.17
30	0.10	0.10	0.10	0.10	0.10	0.97
36	0.10	0.09	0.10	0.10	0.09	3.84
42	0.10	0.10	0.10	0.10	0.10	0.80
48	0.10	0.09	0.10	0.10	0.09	2.27
54	0.10	0.10	0.10	0.10	0.10	1.25
60	0.10	0.10	0.10	0.10	0.10	0.70
66	0.10	0.10	0.10	0.10	0.10	3.06
72	0.10	0.10	0.10	0.10	0.10	1.31
78	0.10	0.10	0.10	0.10	0.10	2.03
84	0.10	0.10	0.10	0.10	0.10	0.89
90	0.09	0.09	0.09	0.09	0.09	2.35
96	0.10	0.10	0.10	0.10	0.10	2.31
102	0.10	0.10	0.10	0.10	0.10	0.68
108	0.10	0.09	0.09	0.10	0.09	3.00
114	0.10	0.10	0.10	0.10	0.10	0.10
120	0.09	0.09	0.09	0.09	0.09	0.32
126	0.10	0.10	0.10	0.10	0.10	0.31
132	0.10	0.09	0.10	0.10	0.09	3.88
138	0.10	0.11	0.10	0.11	0.10	4.63
144	0.10	0.10	0.10	0.10	0.10	1.92
Average Deviation (%)						1.80

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Table 7A Repeatability of Propylcyclohexane in Samples

Time (hr)	Weight of Propylcyclohexane (g)					Deviation (%)
	Ref. 1	Ref. 2	Avg. Ref.	Max.	Min.	
12	0.09	0.09	0.09	0.09	0.09	0.81
24	0.09	0.09	0.09	0.09	0.09	0.27
30	0.09	0.09	0.09	0.09	0.09	0.83
36	0.09	0.09	0.09	0.09	0.09	1.10
42	0.09	0.09	0.09	0.09	0.09	1.64
48	0.09	0.09	0.09	0.09	0.09	0.55
54	0.09	0.09	0.09	0.09	0.09	1.71
60	0.09	0.10	0.09	0.10	0.09	2.69
66	0.09	0.10	0.09	0.10	0.09	2.70
72	0.10	0.09	0.10	0.10	0.09	1.66
78	0.09	0.09	0.09	0.09	0.09	1.64
84	0.09	0.09	0.09	0.09	0.09	0.43
90	0.09	0.09	0.09	0.09	0.09	0.32
96	0.09	0.09	0.09	0.09	0.09	0.27
102	0.09	0.09	0.09	0.09	0.09	1.91
108	0.09	0.09	0.09	0.09	0.09	0.76
114	0.09	0.09	0.09	0.09	0.09	1.25
120	0.09	0.09	0.09	0.09	0.09	0.27
126	0.09	0.08	0.09	0.09	0.08	4.14
132	0.09	0.10	0.09	0.10	0.09	3.58
138	0.09	0.09	0.09	0.09	0.09	3.05
144	0.10	0.10	0.10	0.10	0.10	0.10
Average Deviation (%)						1.44

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Table 8A Repeatability of Propylbenzene in Samples

Time (hr)	Weight of Propylbenzene (g)					Deviation (%)
	Ref. 1	Ref. 2	Avg. Ref.	Max.	Min.	
12	0.036	0.034	0.035	0.036	0.034	2.594
24	0.032	0.035	0.033	0.035	0.032	3.892
30	0.031	0.032	0.032	0.032	0.031	1.266
36	0.032	0.034	0.033	0.034	0.032	3.313
42	0.033	0.035	0.034	0.035	0.033	1.620
48	0.034	0.034	0.034	0.034	0.034	0.442
54	0.036	0.035	0.035	0.036	0.035	1.569
60	0.036	0.034	0.035	0.036	0.034	1.854
66	0.032	0.034	0.033	0.034	0.032	3.313
72	0.034	0.033	0.034	0.034	0.033	1.630
78	0.034	0.035	0.035	0.035	0.034	1.449
84	0.033	0.036	0.035	0.036	0.033	4.348
90	0.035	0.034	0.035	0.035	0.034	1.449
96	0.033	0.034	0.033	0.034	0.033	1.198
102	0.032	0.034	0.033	0.034	0.032	2.883
108	0.033	0.035	0.034	0.035	0.033	2.511
114	0.035	0.035	0.035	0.035	0.035	0.719
120	0.033	0.034	0.034	0.034	0.033	0.595
126	0.032	0.034	0.033	0.034	0.032	2.410
132	0.038	0.040	0.039	0.040	0.038	3.093
138	0.036	0.037	0.036	0.037	0.036	1.788
144	0.035	0.038	0.037	0.038	0.035	4.110
Average Deviation (%)						2.184

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Table 9A Effects of Sulfur Compounds (Compared with Reference Experiments) on Weight of Quinoline in Samples with time

	Time (hr)	Weight of Quinoline (g)					Deviation (%)*				
		C2H6S2	C4H10S	C4H4S	C2H6S	CS2	C2H6S2	C4H10S	C4H4S	C2H6S	CS2
Feed	12	0.48	0.48	0.49	0.46	0.46	5.13	3.43	5.74	0.43	-0.87
	24	0.48	0.46	0.47	0.46	0.47	3.78	0.78	2.11	0.12	3.11
	30	0.46	0.45	0.47	0.48	0.46	-1.36	-4.26	-1.06	1.57	-1.96
	36	0.46	0.45	0.53	0.46	0.49	-5.21	-6.18	10.00	-4.23	1.77
	42	0.46	0.47	0.48	0.46	0.49	-3.50	-1.83	0.41	-4.75	1.06
	48	0.48	0.48	0.46	0.46	0.46	-2.33	-2.07	-6.45	-6.15	-5.85
Feed + Impurity	54	0.42	0.46	0.47	0.45	0.46	-13.84	-6.60	-4.72	-7.59	-5.97
	60	0.43	0.46	0.48	0.46	0.47	-13.63	-6.90	-4.10	-7.66	-5.37
	66	0.42	0.45	0.47	0.43	0.46	-15.15	-8.92	-6.43	-13.29	-8.30
	72	0.40	0.43	0.45	0.42	0.45	-21.46	-14.06	-10.38	-16.51	-10.38
	78	0.37	0.40	0.41	0.38	0.41	-23.27	-17.18	-15.96	-20.83	-14.74
	84	0.35	0.40	0.42	0.37	0.42	-27.49	-17.66	-12.75	-22.58	-12.75
	90	0.37	0.40	0.44	0.38	0.40	-23.19	-16.89	-8.08	-20.67	-15.63
	96	0.34	0.39	0.42	0.37	0.41	-28.71	-18.87	-12.73	-23.79	-15.18
Feed	102	0.44	0.47	0.45	0.47	0.45	-7.86	-2.76	-7.24	-2.53	-6.50
	108	0.46	0.48	0.51	0.47	0.47	-7.73	-2.04	3.87	-5.84	-5.72
	114	0.47	0.53	0.48	0.49	0.49	0.74	15.42	4.22	5.27	6.64
	120	0.47	0.46	0.44	0.47	0.48	0.34	-0.63	-5.68	0.92	4.07
	126	0.45	0.48	0.48	0.49	0.46	-8.72	-1.08	-1.48	0.10	-6.23
	132	0.46	0.45	0.43	0.46	0.45	0.88	-0.21	-5.16	0.99	-1.59
	138	0.46	0.49	0.47	0.48	0.47	-2.24	4.60	0.02	1.78	-0.14
	144	0.46	0.47	0.47	0.48	0.48	-4.74	-3.31	-3.48	-1.59	-1.57

* Deviation (%) which compared with average reference experiment

Table 10A Effects of Sulfur Compounds (Compared with Reference Experiments) on Weight of 1,2,3,4-Tetrahydroquinoline in Samples with time

	Time (hr)	Weight of 1,2,3,4-Tetrahydroquinoline (g)					Deviation (%)*				
		C2H6S2	C4H10S	C4H4S	C2H6S	CS2	C2H6S2	C4H10S	C4H4S	C2H6S	CS2
Feed	12	0.78	0.78	0.76	0.77	0.76	1.96	1.96	-0.65	0.65	-0.65
	24	0.77	0.76	0.77	0.76	0.77	0.65	-0.65	0.65	-1.31	0.00
	30	0.76	0.75	0.75	0.77	0.77	0.66	-0.66	-0.66	1.99	1.72
	36	0.77	0.77	0.77	0.75	0.77	-0.33	0.33	0.59	-2.54	0.33
	42	0.77	0.76	0.77	0.76	0.77	3.37	1.76	2.43	2.03	3.10
	48	0.77	0.77	0.77	0.75	0.77	-0.26	0.00	0.39	-2.60	-0.65
Feed + Impurity	54	0.69	0.75	0.76	0.74	0.75	-10.68	-3.17	-1.23	-4.21	-2.52
	60	0.68	0.73	0.76	0.73	0.75	-10.98	-4.04	-1.16	-4.82	-2.47
	66	0.68	0.73	0.75	0.70	0.74	-11.86	-5.40	-2.81	-9.93	-4.75
	72	0.64	0.70	0.73	0.68	0.73	-19.06	-11.43	-7.63	-13.96	-7.63
	78	0.63	0.68	0.69	0.65	0.70	-20.25	-13.92	-12.66	-17.72	-11.39
	84	0.59	0.67	0.71	0.63	0.71	-25.08	-14.92	-9.84	-20.00	-9.84
	90	0.61	0.66	0.73	0.63	0.67	-20.13	-13.58	-4.42	-17.51	-12.27
	96	0.58	0.66	0.71	0.62	0.69	-26.72	-16.61	-10.30	-21.67	-12.82
Feed	102	0.74	0.78	0.73	0.77	0.75	-3.77	1.44	-4.82	0.03	-2.41
	108	0.74	0.78	0.74	0.75	0.75	-1.93	4.04	-0.88	0.01	0.23
	114	0.76	0.78	0.76	0.77	0.78	-0.84	1.84	-0.74	0.26	1.56
	120	0.72	0.77	0.71	0.77	0.74	-3.32	3.72	-4.72	3.75	0.28
	126	0.73	0.78	0.79	0.79	0.74	-3.68	2.70	3.96	3.92	-2.64
	132	0.74	0.74	0.72	0.74	0.75	-4.42	-3.90	-7.15	-4.32	-3.66
	138	0.75	0.79	0.78	0.78	0.76	-1.42	3.78	2.54	2.63	0.62
	144	0.77	0.78	0.76	0.77	0.77	9.26	10.90	7.13	9.23	9.26

* Deviation (%) which compared with average reference experiment

Table 11A Effects of Sulfur Compounds (Compared with Reference Experiments) on Area of 5,6,7,8-Tetrahydroquinoline in Samples with time

	Time (hr)	Area of 5,6,7,8-Tetrahydroquinoline					Deviation (%)*				
		C ₂ H ₆ S ₂	C ₄ H ₁₀ S	C ₄ H ₄ S	C ₂ H ₆ S	CS ₂	C ₂ H ₆ S ₂	C ₄ H ₁₀ S	C ₄ H ₄ S	C ₂ H ₆ S	CS ₂
Feed	12	0.33	0.33	0.32	0.32	0.32	0.76	0.76	-2.29	-2.29	-2.29
	24	0.34	0.33	0.33	0.33	0.33	4.62	0.00	1.54	1.54	1.54
	30	0.33	0.34	0.34	0.35	0.34	-1.49	1.49	1.49	3.88	2.09
	36	0.33	0.33	0.34	0.33	0.34	-2.26	-0.75	0.75	-0.75	2.86
	42	0.34	0.33	0.33	0.34	0.34	2.60	0.46	0.46	4.13	2.60
	48	0.34	0.33	0.34	0.34	0.33	3.82	1.07	3.21	2.29	-0.46
Feed + Impurity	54	0.37	0.34	0.34	0.35	0.34	10.28	3.82	2.61	5.63	3.52
	60	0.42	0.35	0.34	0.36	0.34	24.89	3.48	1.69	7.05	1.69
	66	0.42	0.36	0.34	0.39	0.35	32.08	12.58	6.92	22.64	10.06
	72	0.39	0.36	0.35	0.38	0.37	19.98	10.55	7.48	16.08	13.62
	78	0.43	0.38	0.36	0.40	0.36	34.75	17.52	11.25	25.35	12.82
	84	0.40	0.37	0.35	0.39	0.36	23.29	14.66	7.87	20.20	10.96
	90	0.43	0.38	0.36	0.40	0.38	35.67	19.89	14.21	26.20	19.89
	96	0.42	0.37	0.35	0.40	0.35	34.59	18.57	12.16	28.18	12.16
Feed	102	0.32	0.33	0.34	0.33	0.32	-2.29	0.76	3.82	1.37	-2.29
	108	0.33	0.34	0.33	0.34	0.33	-1.52	1.46	-0.93	2.06	-1.52
	114	0.35	0.34	0.33	0.33	0.33	3.40	0.40	-1.69	-1.09	-1.69
	120	0.34	0.33	0.33	0.33	0.33	-0.44	-3.70	-2.22	-1.63	-3.41
	126	0.33	0.33	0.32	0.33	0.33	2.00	2.30	-1.08	1.38	0.77
	132	0.32	0.33	0.34	0.34	0.33	-2.76	0.59	3.64	3.64	1.20
	138	0.34	0.32	0.32	0.33	0.34	2.60	-2.29	-2.60	0.76	2.29
	144	0.34	0.34	0.32	0.32	0.34	2.83	2.83	-3.22	-3.22	1.92

* Deviation (%) which compared with average reference experiment

Table 12A Effects of Sulfur Compounds (Compared with Reference Experiments) on Weight of Decahydroquinoline in Samples with time

	Time (hr)	Weight of Decahydroquinoline (g)					Deviation (%)*				
		C2H6S2	C4H10S	C4H4S	C2H6S	CS2	C2H6S2	C4H10S	C4H4S	C2H6S	CS2
Feed	12	0.029	0.029	0.029	0.029	0.028	-2.062	-0.344	-1.718	-0.344	-2.405
	24	0.028	0.028	0.029	0.028	0.029	-0.176	-0.176	0.529	0.176	0.529
	30	0.028	0.029	0.028	0.029	0.028	-1.399	-0.350	-1.399	-0.350	-1.049
	36	0.029	0.028	0.028	0.028	0.028	2.128	-0.709	-0.709	0.355	-0.709
	42	0.028	0.028	0.029	0.029	0.028	-1.389	-1.736	0.694	0.694	-3.125
	48	0.028	0.028	0.029	0.029	0.029	-1.399	-1.399	-0.350	0.000	0.699
Feed + Impurity	54	0.018	0.024	0.027	0.022	0.024	-39.799	-19.732	-9.699	-26.421	-19.732
	60	0.017	0.023	0.025	0.021	0.023	-39.286	-17.857	-10.714	-25.000	-17.857
	66	0.016	0.022	0.025	0.019	0.025	-43.060	-23.488	-12.811	-32.384	-12.811
	72	0.015	0.022	0.024	0.017	0.022	-41.748	-16.505	-6.796	-33.981	-14.563
	78	0.016	0.020	0.023	0.017	0.023	-44.348	-32.174	-20.000	-40.870	-20.000
	84	0.013	0.019	0.025	0.017	0.019	-54.306	-33.216	-12.127	-42.004	-32.162
	90	0.014	0.018	0.023	0.015	0.022	-50.963	-35.902	-19.440	-47.461	-22.942
96	0.012	0.020	0.024	0.017	0.019	-57.522	-30.973	-15.044	-39.823	-32.743	
Feed	102	0.026	0.026	0.027	0.026	0.027	-8.108	-5.225	-2.703	-6.306	-4.505
	108	0.029	0.028	0.028	0.028	0.029	-4.000	-5.333	-5.333	-5.333	-3.333
	114	0.028	0.028	0.029	0.028	0.029	14.170	14.575	15.385	14.575	16.599
	120	0.029	0.029	0.028	0.028	0.029	-2.397	-0.685	-3.082	-2.740	-1.712
	126	0.029	0.029	0.029	0.029	0.029	1.418	2.128	2.128	2.482	1.064
	132	0.028	0.029	0.029	0.028	0.029	0.353	2.473	2.473	0.353	2.473
	138	0.029	0.028	0.028	0.029	0.029	0.176	-0.176	-0.527	0.176	1.230
	144	0.028	0.029	0.028	0.028	0.028	-2.245	-0.518	-1.900	-2.245	-2.245

* Deviation (%) which compared with average reference experiment

Table 13A Effects of Sulfur Compounds (Compared with Reference Experiments) on Weight of o-Propylaniline in Samples with time

	Time (hr)	Weight of o-Propylaniline (g)					Deviation (%)*				
		C2H6S2	C4H10S	C4H4S	C2H6S	CS2	C2H6S2	C4H10S	C4H4S	C2H6S	CS2
Feed	12	0.10	0.10	0.11	0.10	0.10	-0.20	0.81	12.02	1.83	-0.20
	24	0.10	0.10	0.11	0.10	0.10	5.65	5.65	15.16	2.48	1.43
	30	0.11	0.11	0.11	0.10	0.11	7.83	14.59	12.34	3.12	9.17
	36	0.10	0.11	0.11	0.11	0.11	-0.52	15.06	14.12	11.94	9.03
	42	0.11	0.10	0.10	0.10	0.10	8.35	3.58	2.09	4.27	1.09
	48	0.10	0.10	0.11	0.10	0.11	0.52	2.69	14.05	1.45	9.40
Feed + Impurity	54	0.15	0.12	0.11	0.14	0.11	52.91	24.74	14.35	40.33	17.46
	60	0.17	0.13	0.12	0.14	0.12	68.98	30.52	20.48	40.56	22.49
	66	0.17	0.15	0.13	0.16	0.15	67.19	48.22	28.46	61.07	43.28
	72	0.18	0.14	0.13	0.16	0.14	70.32	36.25	28.47	55.72	33.33
	78	0.17	0.15	0.14	0.17	0.15	74.27	51.98	36.78	67.17	48.94
	84	0.18	0.15	0.13	0.17	0.14	87.79	51.28	35.63	77.36	46.06
	90	0.19	0.16	0.15	0.17	0.15	112.53	75.62	67.79	85.68	67.79
	96	0.19	0.15	0.13	0.17	0.15	85.93	50.75	30.65	68.84	47.74
Feed	102	0.12	0.11	0.11	0.11	0.11	20.86	18.87	18.14	19.71	18.45
	108	0.11	0.11	0.11	0.11	0.11	20.88	15.63	15.74	18.31	15.52
	114	0.10	0.10	0.10	0.10	0.11	6.81	6.71	5.24	7.44	14.57
	120	0.10	0.10	0.10	0.10	0.11	7.53	9.54	6.68	3.71	12.41
	126	0.10	0.10	0.10	0.09	0.09	3.15	7.66	5.35	-1.26	-1.99
	132	0.09	0.10	0.10	0.10	0.10	-3.35	5.14	5.03	5.03	8.18
	138	0.10	0.11	0.10	0.11	0.10	4.43	6.82	0.95	5.82	-0.75
	144	0.10	0.11	0.10	0.10	0.10	-3.50	5.66	3.00	-4.19	-1.62

* Deviation (%) which compared with average reference experiment

Table 14A Effects of Sulfur Compounds (Compared with Reference Experiments) on Weight of Propylcyclohexane in Samples with time

	Time (hr)	Weight of Propylcyclohexane (g)					Deviation (%)*				
		C2H6S2	C4H10S	C4H4S	C2H6S	CS2	C2H6S2	C4H10S	C4H4S	C2H6S	CS2
Feed	12	0.09	0.09	0.09	0.09	0.09	0.27	-0.16	-0.38	-1.89	-1.89
	24	0.09	0.09	0.09	0.09	0.09	-1.24	-0.27	-2.10	0.27	-0.81
	30	0.09	0.09	0.09	0.09	0.09	1.93	-0.28	-0.28	2.26	-0.28
	36	0.09	0.09	0.09	0.09	0.09	-0.22	1.76	3.08	1.65	1.98
	42	0.09	0.09	0.09	0.09	0.09	1.64	1.64	0.55	1.64	2.19
	48	0.09	0.09	0.09	0.09	0.09	1.09	-0.11	-1.64	-0.55	0.00
Feed + Impurity	54	0.14	0.11	0.10	0.12	0.10	54.97	25.71	13.14	37.14	14.29
	60	0.18	0.12	0.11	0.14	0.11	90.17	26.78	10.94	47.91	16.22
	66	0.17	0.13	0.12	0.15	0.12	79.03	40.54	27.57	62.16	29.73
	72	0.18	0.13	0.12	0.17	0.12	89.83	34.85	19.29	76.35	19.29
	78	0.18	0.13	0.12	0.15	0.13	96.72	42.08	31.15	63.93	42.08
	84	0.19	0.16	0.12	0.17	0.15	105.63	67.75	32.03	78.57	62.34
	90	0.18	0.15	0.13	0.18	0.14	96.14	60.77	39.34	87.57	50.05
	96	0.18	0.16	0.14	0.18	0.15	101.64	75.34	53.42	91.78	64.38
Feed	102	0.11	0.11	0.09	0.10	0.10	19.89	19.24	-2.02	11.17	9.75
	108	0.11	0.09	0.09	0.10	0.10	13.76	0.98	2.28	3.79	6.07
	114	0.11	0.09	0.06	0.10	0.07	17.40	3.44	-31.91	3.87	-22.75
	120	0.10	0.10	0.07	0.10	0.08	10.50	6.52	-23.86	7.59	-19.12
	126	0.11	0.10	0.08	0.10	0.08	22.97	12.65	-11.97	13.10	-11.74
	132	0.11	0.10	0.10	0.10	0.10	17.16	10.32	2.30	2.19	9.25
	138	0.10	0.11	0.10	0.10	0.10	9.25	18.12	6.04	12.80	14.13
	144	0.11	0.10	0.09	0.12	0.09	4.94	-3.00	-12.60	15.50	-12.50

* Deviation (%) which compared with average reference experiment

Table 15A Effects of Sulfur Compounds (Compared with Reference Experiments) on Weight of Propylbenzene in Samples with time

	Time (hr)	Weight of Propylbenzene (g)					Deviation (%)*				
		C ₂ H ₆ S ₂	C ₄ H ₁₀ S	C ₄ H ₄ S	C ₂ H ₆ S	CS ₂	C ₂ H ₆ S ₂	C ₄ H ₁₀ S	C ₄ H ₄ S	C ₂ H ₆ S	CS ₂
Feed	12	0.035	0.033	0.034	0.035	0.035	-0.576	-3.977	-2.017	0.865	0.865
	24	0.035	0.035	0.035	0.034	0.033	4.192	3.293	4.790	1.796	-1.198
	30	0.035	0.034	0.034	0.033	0.036	11.392	7.911	8.861	5.696	13.291
	36	0.034	0.034	0.034	0.034	0.033	2.711	0.904	2.711	3.313	-1.506
	42	0.035	0.035	0.033	0.035	0.033	3.387	3.387	-2.209	3.093	-1.620
	48	0.035	0.035	0.035	0.034	0.037	3.093	3.093	3.093	-0.442	9.573
Feed + Impurity	54	0.046	0.037	0.037	0.041	0.037	30.385	5.563	4.137	16.976	5.563
	60	0.050	0.040	0.038	0.046	0.038	42.653	14.123	6.990	31.241	7.846
	66	0.049	0.043	0.038	0.047	0.042	47.590	29.518	14.458	41.566	26.506
	72	0.053	0.040	0.039	0.046	0.040	57.037	18.519	15.556	36.296	18.519
	78	0.051	0.045	0.040	0.049	0.043	47.826	30.435	15.942	42.029	24.638
	84	0.055	0.044	0.038	0.048	0.042	59.420	27.536	10.145	39.130	21.739
	90	0.052	0.044	0.041	0.049	0.045	50.725	27.536	18.841	42.029	30.435
	96	0.058	0.045	0.038	0.049	0.043	73.653	33.533	13.772	46.707	28.743
Feed	102	0.034	0.036	0.033	0.033	0.034	1.973	9.256	0.455	0.152	3.035
	108	0.034	0.032	0.032	0.033	0.032	-1.034	-6.647	-6.647	-2.511	-6.647
	114	0.034	0.033	0.032	0.032	0.033	-2.216	-4.460	-8.201	-8.489	-4.460
	120	0.033	0.034	0.033	0.033	0.035	-1.429	-0.298	-1.786	-1.190	3.274
	126	0.033	0.034	0.035	0.033	0.032	0.301	2.410	5.422	0.602	-4.819
	132	0.033	0.032	0.034	0.035	0.033	-14.691	-18.041	-12.887	-10.567	-14.433
	138	0.034	0.034	0.032	0.035	0.034	-7.290	-7.565	-13.067	-4.264	-7.840
	144	0.034	0.033	0.034	0.033	0.034	-7.397	-8.493	-8.219	-8.767	-6.986

* Deviation (%) which compared with average reference experiment

Table 16A Slope and y-Intercept for Standard Curves of Various Compounds

Compounds	Slope	y-Intercept
Toluene	1.04556	-0.10292
Quinoline	0.68255	0.00302
1,2,3,4-THQ	0.62834	0.00473
DHQ	0.56896	0.00657
OPA	0.56692	-0.00333
PCH	0.73151	0.00860
PB	0.84949	0.00388

* Weight of various compounds is calculated by

Weight of compound =

$$\frac{[(\text{compound/standard} - c) / m] \times m_i \times 100 \times m_s}{\rho \times v}$$

where

compound/internal = ratio peak area of compound to internal standard

c = y-intercept

m = slope

m_i = weight of internal standard (g)

m_s = sample weight (g)

ρ = sample density (g/cc)

v = sample volume which used for mixing with internal standard (cc)



VITA

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