

APPENDIX B: Summary of Log Sheets

Summary of Tracer Study Data
 ess 2/13/90

Tracer Case	1	2	3	4
Injection	24-Feb-89	24-Feb-89	24-Feb-89	28-Feb-89
Date	15:43	18:00	22:14	15:05
Time	17:18		20:02	0:37
End	481.7	482.7	482.9	484
Begin	481.7	482.7	482.9	481.8
End	752.5	753.1	753.1	752.5
Begin	752.5	753.1	753.1	751.9
End	192	206	204	203.5
Begin	192	206	204	198
End	36.254	37.006	36.138	37.36
Begin	36.254	37.006	36.138	37.36
End	361.9	361.9	355.1	361.9
Begin	361.9	361.9	355.1	361.9
End	28.58	36.33	35.58	37.84
Begin	28.58	36.33	35.58	37.84
End	71567.73	145879.7	147398.1	175472.7
Begin	71567.73	145879.7	147398.1	175472.7
End	0.245	0.500	0.505	0.602
Begin	0.245	0.500	0.505	0.602
End	0.205	0.414	0.419	0.506
Begin	0.205	0.414	0.419	0.506
End	101.049	99.629	99.684	99.789
Begin	101.049	99.629	99.684	99.789
End	21.982	24.027	26.736	27.512
Begin	21.982	24.027	26.736	27.512
End	0.611	0.556	0.718	0.669
Begin	0.611	0.556	0.718	0.669
End	0.265	0.187	0.236	0.303
Begin	0.265	0.187	0.236	0.303
End	55.410	53.617	51.545	51.437
Begin	55.410	53.617	51.545	51.437
End	13.570	13.482	13.161	12.962
Begin	13.570	13.482	13.161	12.962
End	0.013	0.015	0.045	0.026
Begin	0.013	0.015	0.045	0.026
End	9.197	7.745	7.243	6.880
Begin	9.197	7.745	7.243	6.880
End	0.001	0.000	0.000	0.000
Begin	0.001	0.000	0.000	0.000
End	0.000	0.000	0.000	0.000
Begin	0.000	0.000	0.000	0.000

Outlet GC analysis -2		mole %	
H2	100.151	99.626	99.626
N2	21.802	22.028	22.028
CH4	0.604	0.612	0.612
CO	0.237	0.192	0.192
CO2	54.773	53.280	53.280
H2O	13.781	14.514	14.514
MeOH	0.000	0.000	0.000
DME	8.954	9.000	9.000
ETOH	0.000	0.000	0.000
99.805	99.595	100.025	99.643
26.956	27.064	26.350	28.736
0.672	0.695	0.675	0.457
0.294	0.324	0.206	0.194
52.151	52.014	52.194	51.855
12.983	13.130	13.250	12.399
0.000	0.000	0.000	0.000
6.749	6.368	7.350	6.002
0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000
100.000	100.000	100.000	100.000
27.289	26.780	26.582	28.284
0.672	0.690	0.698	0.469
0.299	0.329	0.221	0.207
51.899	52.615	51.945	52.205
12.999	13.212	13.225	12.786
0.013	0.001	0.023	0.006
6.828	6.372	7.307	6.043
0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000
100.000	100.000	100.000	100.000
27.035	26.848	24.848	28.439
0.681	0.642	0.642	0.467
0.314	0.206	0.206	0.191
52.257	52.797	52.797	52.180
13.106	13.638	13.638	12.770
0.007	0.015	0.015	0.007
6.600	7.855	7.855	5.946
0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000
Average GC analysis		(Norm.)	
H2	100.000	100.000	100.000
N2	21.761	22.049	21.761
CH4	0.604	0.618	0.604
CO	0.249	0.201	0.249
CO2	54.763	53.565	54.763
H2O	13.595	14.659	13.595
MeOH	0.006	0.000	0.006
DME	9.021	8.907	9.021
ETOH	0.000	0.000	0.000
100.000	100.000	100.000	100.000
Average Outlet GC		(Norm.)	
H2	100.000	100.000	100.000
N2	21.905	24.848	21.905
CH4	0.611	0.642	0.611
CO	0.225	0.206	0.225
CO2	54.164	52.797	54.164
H2O	14.127	13.638	14.127
MeOH	0.003	0.015	0.003
DME	8.964	7.855	8.964
ETOH	0.000	0.000	0.000
100.000	100.000	100.000	100.000
28.439	28.439	28.439	28.439
0.467	0.467	0.467	0.467
0.191	0.191	0.191	0.191
52.180	52.180	52.180	52.180
12.770	12.770	12.770	12.770
0.007	0.007	0.007	0.007
5.946	5.946	5.946	5.946
0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000

Feed GC analysis -1		mole %	
H2	99.838	100.025	100.419
N2	34.147	35.790	35.411
CH4	0.518	0.627	0.602
CO	0.172	0.211	0.307
CO2	52.607	51.464	51.936
H2O	12.165	11.652	11.906
MeOH	0.000	0.000	0.000
DME	0.229	0.281	0.257
ETOH	0.000	0.000	0.000
	0.000	0.000	0.000

Feed GC analysis -2		mole %	
H2	99.314	100.065	99.925
N2	34.194	35.615	34.423
CH4	0.491	0.607	0.614
CO	0.149	0.189	0.273
CO2	52.531	51.791	52.726
H2O	11.822	11.698	11.708
MeOH	0.000	0.000	0.000
DME	0.127	0.165	0.181
ETOH	0.000	0.000	0.000
	0.000	0.000	0.000

Avg Feed GC analysis (Norm.)			
H2	100.000	100.000	100.000
N2	33.571	35.686	34.856
CH4	0.497	0.617	0.607
CO	0.206	0.200	0.289
CO2	54.065	51.604	52.242
H2O	11.359	11.670	11.787
MeOH	0.000	0.000	0.000
DME	0.301	0.223	0.219
ETOH	0.000	0.000	0.000
	0.000	0.000	0.000

Avg Feed GC	(Norm.)				
H2	100.000	100.000	100.000	100.000	100.000
N2	33.822	35.001	35.423	35.815	35.815
CH4	0.502	0.562	0.607	0.408	0.408
CO	0.191	0.181	0.271	0.179	0.179
CO2	53.554	52.199	51.905	51.691	51.691
H2O	11.683	11.857	11.580	11.716	11.716
MeOH	0.000	0.000	0.000	0.000	0.000
DME	0.249	0.201	0.214	0.191	0.191
ETOH	0.000	0.000	0.000	0.000	0.000
density corr. outlet/inlet	1.196	1.206	1.191	1.150	1.150

Summary of Tracer Study Data
 ess 2/13/90

Tracer Case Injection Date Time	5		6		7	
	Begin	End	Begin	End	Begin	End
	28-Feb-89 18:05	19:53	28-Feb-89 20:32	22:12	30-Mar-89 14:55	19:10
Temperature	482.7	481.2	481.5	482.1	483	482.1
Pressure	753.1	752.5	752.5	752.5	752.5	752.5
Slurry Height	118.5	114	109.5	107	211	219
Wt % catalyst		37.506		37.468		35
Catalyst Loading		255.9		255.9		301.4
Gas Holdup		27.3		22.67		43.9
FT-187 Reactor flow	73388.6	71884.84	54640.67	54101.82	148702.4	148180.1
Inlet Sup Velocity	0.251	0.246	0.187	0.185	0.510	0.508
Outlet Sup Velocity	0.225	0.221	0.168	0.167	0.430	0.428
Outlet GC analysis -1						
H2	99.399	99.463	99.372	99.536	99.944	99.060
N2	28.900	25.340	25.244	23.120	23.876	23.078
CH4	0.470	0.481	0.472	0.490	0.869	1.018
CO	0.181	0.188	0.185	0.208	0.386	0.364
CO2	51.311	51.565	51.610	51.296	50.428	50.607
H2O	12.777	14.009	14.071	16.230	15.249	14.857
MeOH	0.010	0.009	0.011	0.013	0.019	0.007
DME	5.750	7.871	7.779	8.179	9.111	9.129
ETOH	0.000	0.000	0.000	0.000	0.006	0.000
	0.000	0.000	0.000	0.000	0.000	0.000

Outlet GC analysis -2		mole %							
H2	99.756	99.755	99.702	99.747	99.352				
N2	29.186	25.143	22.784	23.887	23.042				
CH4	0.470	0.487	0.498	0.828	1.026				
CO	0.174	0.177	0.201	0.379	0.367				
CO2	51.229	51.881	51.427	50.299	50.864				
H2O	12.826	14.241	16.523	15.255	14.941				
MeOH	0.000	0.000	0.000	0.000	0.000				
DME	5.871	7.826	8.269	9.099	9.112				
ETOH	0.000	0.000	0.000	0.000	0.000				
Average GC analysis (Norm.)									
H2	100.000	100.000	99.619	99.846	99.206				
N2	29.166	25.341	22.952	23.882	23.060				
CH4	0.472	0.486	0.494	0.849	1.022				
CO	0.178	0.183	0.205	0.383	0.366				
CO2	51.488	51.926	51.362	50.364	50.736				
H2O	12.856	14.180	16.377	15.252	14.899				
MeOH	0.005	0.005	0.007	0.010	0.004				
DME	5.835	7.879	8.224	9.105	9.121				
ETOH	0.000	0.000	0.000	0.003	0.000				
Average Outlet GC (Norm.)									
H2	100.000	100.000	99.591	99.526	99.526				
N2	27.253	27.253	24.073	23.471	23.471				
CH4	0.479	0.479	0.487	0.935	0.935				
CO	0.161	0.161	0.193	0.374	0.374				
CO2	51.707	51.707	51.554	50.550	50.550				
H2O	13.518	13.518	15.266	15.076	15.076				
MeOH	0.005	0.005	0.006	0.007	0.007				
DME	6.857	6.857	8.013	9.113	9.113				
ETOH	0.000	0.000	0.000	0.002	0.002				
	0.000	0.000	0.000	0.000	0.000				

Feed GC analysis -1		mole %	
H2	100.019	100.060	100.238
N2	36.629	35.415	33.904
CH4	0.394	0.391	0.394
CO	0.166	0.170	0.182
CO2	51.070	51.649	51.342
H2O	11.495	12.203	14.187
MeOH	0.000	0.000	0.000
DME	0.265	0.232	0.229
ETOH	0.000	0.000	0.000
	0.000	0.000	0.000

Feed GC analysis -2		mole %	
H2	99.990	100.055	99.536
N2	35.858	35.230	33.338
CH4	0.432	0.424	0.425
CO	0.154	0.146	0.173
CO2	51.577	51.741	51.114
H2O	11.794	12.362	14.353
MeOH	0.000	0.000	0.000
DME	0.175	0.152	0.133
ETOH	0.000	0.000	0.000
	0.000	0.000	0.000

Avg Feed GC analysis (Norm.)			
H2	100.000	100.000	100.000
N2	36.242	35.302	33.658
CH4	0.413	0.407	0.410
CO	0.160	0.158	0.178
CO2	51.321	51.665	51.286
H2O	11.644	12.275	14.287
MeOH	0.000	0.000	0.000
DME	0.220	0.192	0.181
ETOH	0.000	0.000	0.000
	0.000	0.000	0.000

	100.082	99.169
	35.595	34.740
	0.688	0.853
	0.324	0.308
	50.255	50.402
	12.833	12.482
	0.000	0.000
	0.387	0.384
	0.000	0.000
	0.000	0.000

	99.946	98.688
	35.320	34.416
	0.737	0.812
	0.324	0.295
	50.420	50.492
	12.882	12.429
	0.000	0.000
	0.263	0.244
	0.000	0.000
	0.000	0.000

	100.000	100.000
	35.452	34.952
	0.712	0.841
	0.324	0.305
	50.331	50.994
	12.856	12.590
	0.000	0.000
	0.325	0.317
	0.000	0.000
	0.000	0.000

Avg Feed GC	(Norm.)			
H2	100.000	100.000	100.000	100.000
N2	35.772	34.442	35.202	35.202
CH4	0.410	0.406	0.777	0.777
CO	0.159	0.169	0.314	0.314
CO2	51.493	51.495	50.662	50.662
H2O	11.960	13.308	12.723	12.723
MeOH	0.000	0.000	0.000	0.000
DME	0.206	0.180	0.321	0.321
ETOH	0.000	0.000	0.000	0.000
density corr. outlet/inlet	1.116	1.111	1.185	1.185