APPENDIX B

FIXED BED REACTION DATA

Co.004 - Run #2

Co wt%	NM wt %	Promotor wt%		Support
20	Ru 0.43		La2O3 1.00	Al2O3

SUMMARY REACTION DATA

Reaction Conditions:

P = 1.0 atm
T = 220 °C
H2/CO = 2
weight of catalyst = 0.244 g
WHSV = 10.54 1/hr
time on stream = 27.5 hrs

CO2 (g/g cat/hr) = 0.038
CO2 (% of CO) = 0.2
O/P = 1.02

CO conversion (%)	11.2
rate (g CH2/g cat/hr)	0.52
alpha	0.61
C1 (wt%)	28.9
C2 - C4 (wt%)	30.7
C5 - C12 (wt%)	38.6
C13 + (wt%)	1.7

Performance of Co.004

Dates: 07/11/94 - 07/12/94 Run #2

flow rate = 90.0 cc/min, loading= 0.2 g, WHSV = 10.5 1/hr, H2/CO ratio in feed = 2

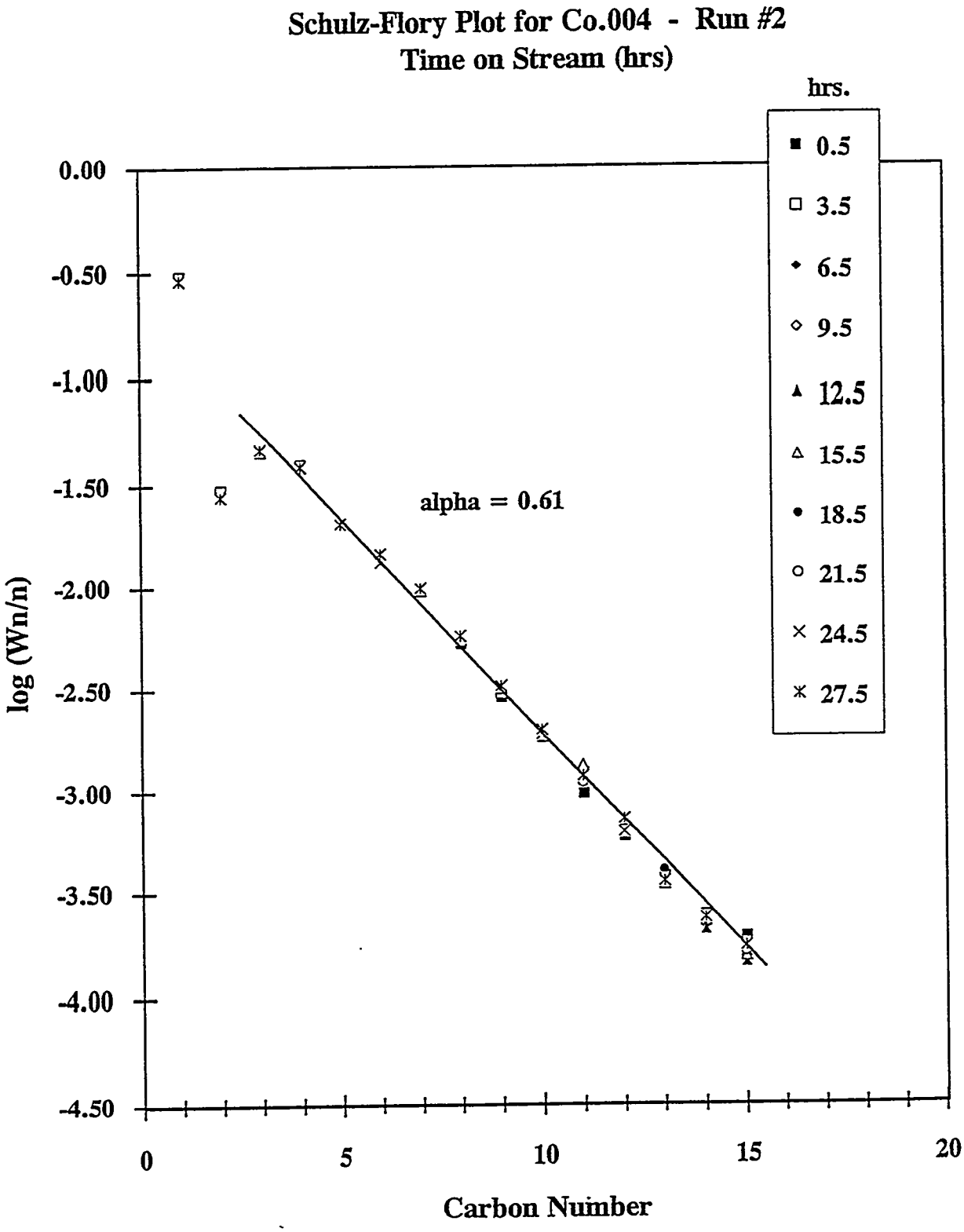
time on stream, hr	0.5	3.5	6.5	9.5	12.5	15.5
reaction temperature, °C	220	220	220	220	220	220
pressure, atm	1.0	1.0	1.0	1.0	1.0	1.0
flow, cc/min	90.0	90.0	90.0	90.0	90.0	90.0
C1 - C15 product distribution, weight %						
C1	28.82	28.66	28.91	28.87	29.00	28.71
C2	5.34	5.19	5.17	5.13	5.14	5.07
C3	13.23	13.11	13.05	13.02	13.05	12.99
C4	13.52	13.29	13.20	13.18	13.15	13.02
C5	12.08	12.00	11.84	11.85	11.83	11.86
C6	8.90	8.93	8.80	8.88	8.83	8.92
C7	6.59	6.66	6.76	6.79	6.77	6.79
C8	4.20	4.33	4.48	4.50	4.48	4.50
C9	2.59	2.73	2.87	2.85	2.87	2.85
C10	1.85	1.93	1.88	1.87	1.87	1.95
C11	1.07	1.29	1.22	1.21	1.23	1.48
C12	0.71	0.82	0.77	0.85	0.78	0.87
C13	0.48	0.48	0.50	0.46	0.50	0.44
C14	0.34	0.33	0.33	0.30	0.29	0.32
C15	0.29	0.25	0.23	0.23	0.21	0.23
alpha chain growth probability	0.62	0.61	0.60	0.60	0.60	0.60
C1 - C50 estimated total product distribution, weight %						
C1	28.4	28.4	28.7	28.7	28.9	28.6
C2 - C4	31.6	31.4	31.2	31.2	31.2	31.0
C5 - C12	38.1	38.5	38.5	38.6	38.5	38.9
C13 - C50	1.9	1.7	1.5	1.5	1.4	1.5
CO conversion, %	15.5	13.5	12.9	12.4	12.1	11.6
rate, g CH2/g cat/hr	0.71	0.62	0.60	0.57	0.56	0.53
CO2 formation, %	0.4	0.3	0.3	0.3	0.3	0.3

Performance of Co.004

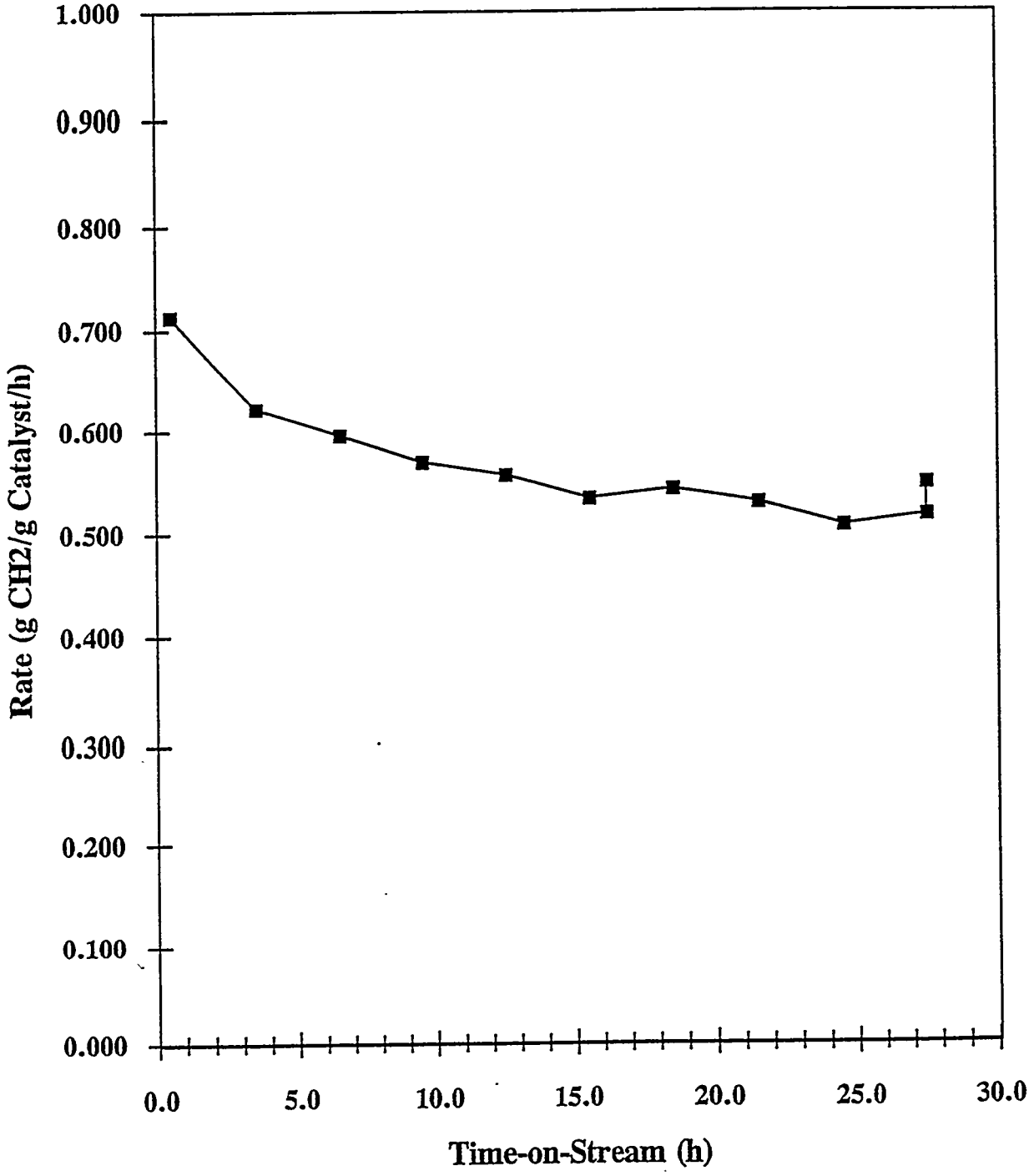
Dates: 07/11/94 - 07/12/94 Run #2

flow rate = 90.0 cc/min, loading= 0.2 g, WHSV = 10.5 1/hr, H2/CO ratio in feed = 2

time on stream, hr	18.5	21.5	24.5	27.5	30.5
reaction temperature, °C	220	220	220	220	220
pressure, atm	1.0	1.0	1.0	1.0	1.0
flow, cc/min	90.0	90.0	90.0	90.0	22.5
C1 - C15 product distribution, weight %					
C1	29.03	28.99	28.84	29.15	21.94
C2	5.11	5.09	5.06	5.10	4.50
C3	12.99	12.98	12.97	12.95	10.74
C4	13.04	13.02	13.02	12.91	12.93
C5	11.74	11.76	11.78	11.67	12.60
C6	8.80	8.82	8.93	8.72	9.79
C7	6.76	6.81	6.88	6.81	8.43
C8	4.53	4.54	4.55	4.57	5.97
C9	2.94	2.90	2.94	2.92	4.22
C10	1.88	2.01	1.89	2.00	3.10
C11	1.27	1.21	1.33	1.30	2.12
C12	0.81	0.86	0.75	0.87	1.52
C13	0.52	0.46	0.47	0.46	1.02
C14	0.32	0.32	0.33	0.33	0.71
C15	0.24	0.24	0.26	0.26	0.41
alpha chain growth probability	0.61	0.61	0.61	0.61	0.64
C1 - C50 estimated total product distribution, weight %					
C1	28.9	28.8	28.6	28.9	21.9
C2 - C4	31.0	30.9	30.8	30.7	28.2
C5 - C12	38.6	38.7	38.9	38.6	47.2
C13 - C50	1.6	1.6	1.7	1.7	2.7
CO conversion, %	11.8	11.5	11.0	11.2	47.6
rate, g CH2/g cat/hr	0.54	0:53	0.51	0.52	0.55
CO2 formation, %	0.3	0.2	0.2	0.2	2.3


Schulz-Flory Plot for Co.004 - Run #2
Time on Stream (hrs)
hrs.
0.5
3.5
6.5
9.5
12.5
15.5
18.5
21.5
24.5
27.5
alpha = 0.61
log (Wn/n)
0.00
-0.50
-1.00
-1.50
-2.00
-2.50
-3.00
-3.50
-4.00
-4.50
0
5
10
15
20
Carbon Number

Time-on-Stream Plot for Co.004 - Run #2



Co.004 - Run #2h

Co wt%	NM wt %	Promotor wt%		Support
20	Ru 0.43		La2O3 1.00	Al2O3

SUMMARY REACTION DATA*

Reaction Conditions:

P = 1.0 atm
T = 220 °C
H2/CO = 2
weight of catalyst = 0.244 g
WHSV = 2.63 1/hr
time on stream = 30.5 hrs

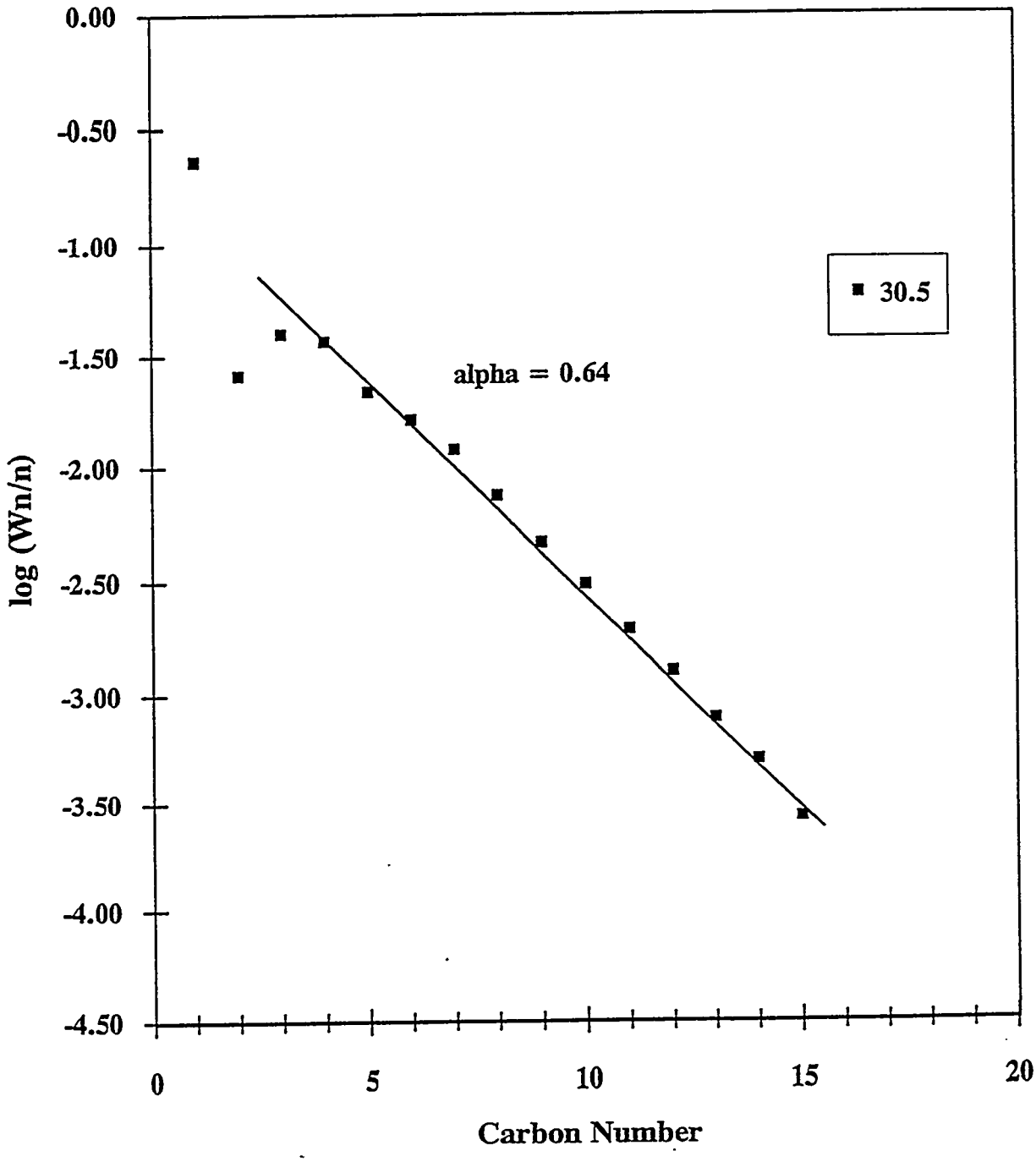
CO2 (g/g cat/hr) = 0.090
CO2 (% of CO) = 2.3
O/P = 0.40

CO conversion (%)	47.6
rate (g CH2/g cat/hr)	0.55
alpha	0.64
C1 (wt%)	21.9
C2 - C4 (wt%)	28.2
C5 - C12 (wt%)	47.2
C13 + (wt%)	2.7

* High Conversion study

Schulz-Flory Plot for Co.004 - Run #2h
Time on Stream (hrs)

hrs.



Co.004 - Run #2a

Co wt%	NM wt %	Promotor wt%		Support
20	Ru 0.43		La2O3 1.00	Al2O3

SUMMARY REACTION DATA*

Reaction Conditions:

P = 1.0 atm
T = 220 °C
H2/CO = 2
weight of catalyst = 0.244 g
WHSV = 10.54 1/hr
time on stream = 24.5 hrs

CO2 (g/g cat/hr) = 0.024
CO2 (% of CO) = 0.2
O/P = 3.02

CO conversion (%)	3.8
rate (g CH2/g cat/hr)	0.18
alpha	0.65
C1 (wt%)	25.5
C2 - C4 (wt%)	28.8
C5 - C12 (wt%)	42.7
C13 + (wt%)	3.0

* calc. and reduced after run#2, with temp. surge to 260 °C

Performance of Co.004

Dates: 07/14/94 - 07/15/94 Run #2a

flow rate = 90.0 cc/min, loading= 0.2 g, WHSV = 10.5 1/hr, H2/CO ratio in feed = 2

time on stream, hr	0.5	3.5	6.5	9.5	12.5	15.5
reaction temperature, °C	260	220	220	220	220	220
pressure, atm	1.0	1.0	1.0	1.0	1.0	1.0
flow, cc/min	90.0	90.0	90.0	90.0	90.0	90.0
C1 - C15 product distribution, weight %						
C1	90.25	23.38	24.31	24.72	24.83	25.10
C2	2.90	4.85	5.02	5.08	5.09	5.13
C3	1.85	11.84	11.94	11.93	11.85	11.84
C4	1.51	12.53	12.45	12.36	12.23	12.14
C5	1.28	12.77	12.32	12.19	12.04	11.89
C6	0.89	9.99	9.87	9.65	9.57	9.41
C7	0.54	7.71	7.46	7.51	7.42	7.41
C8	0.35	5.42	5.28	5.37	5.29	5.26
C9	0.19	3.76	3.71	3.78	3.76	3.74
C10	0.11	2.72	2.65	2.74	2.70	2.75
C11	0.06	1.70	1.76	1.77	1.86	1.83
C12	0.04	1.19	1.20	1.27	1.25	1.29
C13	0.02	0.84	0.88	0.92	0.92	0.94
C14		0.70	0.63	0.71	0.67	0.74
C15		0.60	0.53		0.50	0.53
alpha chain growth probability	0.55	0.64	0.64	0.65	0.65	0.65
C1 - C50 estimated total product distribution, weight %						
C1	90.2	23.3	24.1	24.4	24.6	24.9
C2 - C4	6.3	29.1	29.2	28.9	28.9	28.8
C5 - C12	3.5	45.1	44.0	43.7	43.5	43.2
C13 - C50	0.1	2.6	2.8	3.0	3.0	3.1
CO conversion, %	35.1	3.9	4.0	4.0	4.0	4.0
rate, g CH2/g cat/hr	1.62	0.18	0.18	0.19	0.18	0.18
CO2 formation, %	57.3	0.2	0.2	0.2	0.2	0.2

Performance of Co.004

Dates: 07/14/94 - 07/15/94 Run #2a

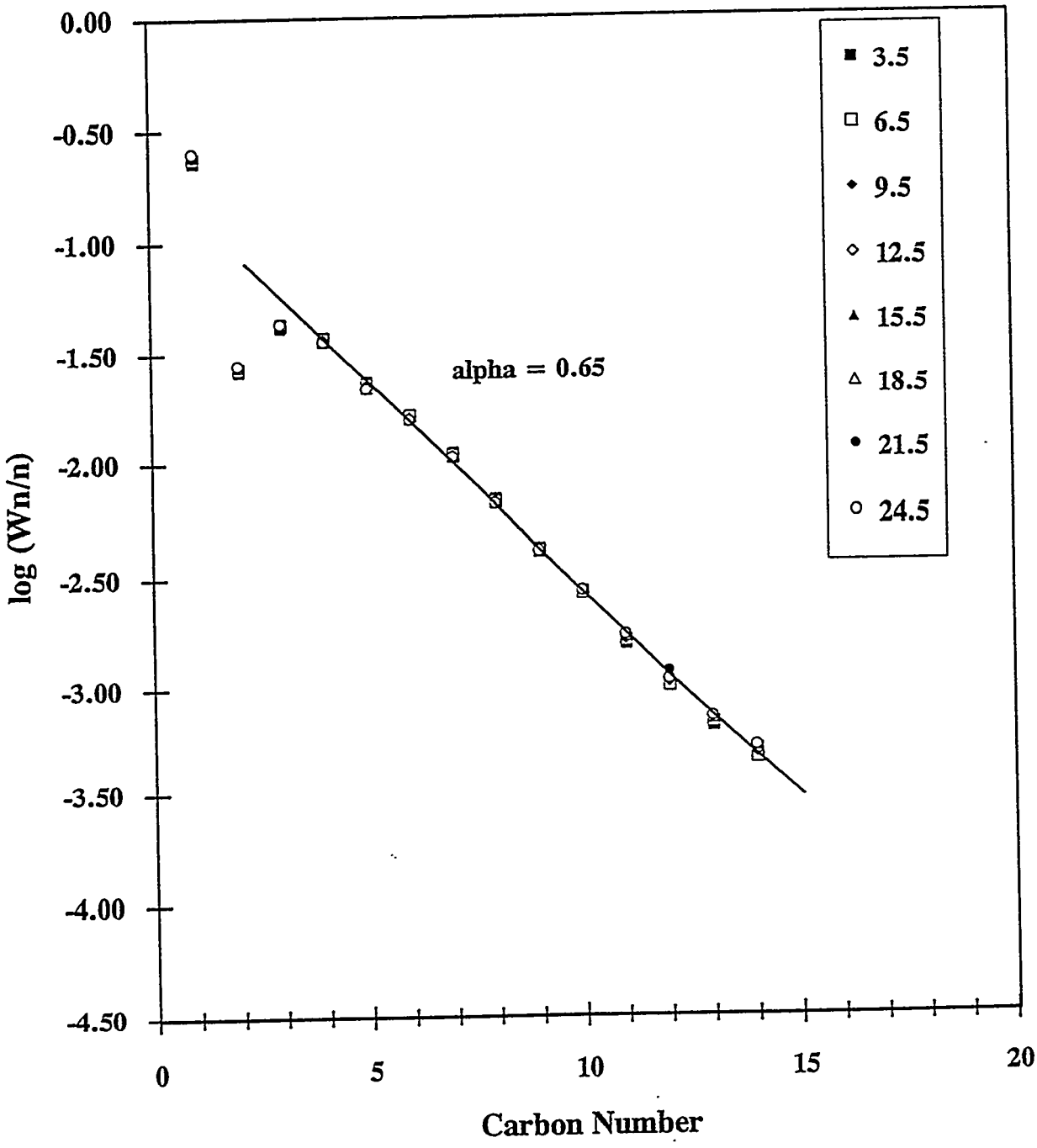
flow rate = 90.0 cc/min, loading= 0.2 g, WHSV = 10.5 1/hr, H2/CO ratio in feed = 2

time on stream, hr	18.5	21.5	24.5
reaction temperature, °C	220	220	220
pressure, atm	1.0	1.0	1.0
flow, cc/min	90.0	90.0	90.0
C1 - C15 product distribution, weight %			
C1	25.34	25.55	25.69
C2	5.16	5.20	5.22
C3	11.86	11.85	11.86
C4	12.04	12.00	12.01
C5	11.85	11.73	11.75
C6	9.40	9.27	9.31
C7	7.38	7.30	7.29
C8	5.24	5.22	5.19
C9	3.68	3.69	3.68
C10	2.75	2.75	2.71
C11	1.84	1.86	1.86
C12	1.32	1.40	1.28
C13	0.91	0.92	0.93
C14	0.72	0.73	0.72
C15	0.51	0.54	0.52
alpha chain growth probability	0.65	0.65	0.65
C1 - C50 estimated total product distribution, weight %			
C1	25.1	25.4	25.5
C2 - C4	28.8	28.8	28.8
C5 - C12	43.1	42.8	42.7
C13 - C50	3.0	3.0	3.0
CO conversion, %	4.0	4.0	3.8
rate, g CH2/g cat/hr	0.19	0.19	0.18
CO2 formation, %	0.2	0.2	0.2

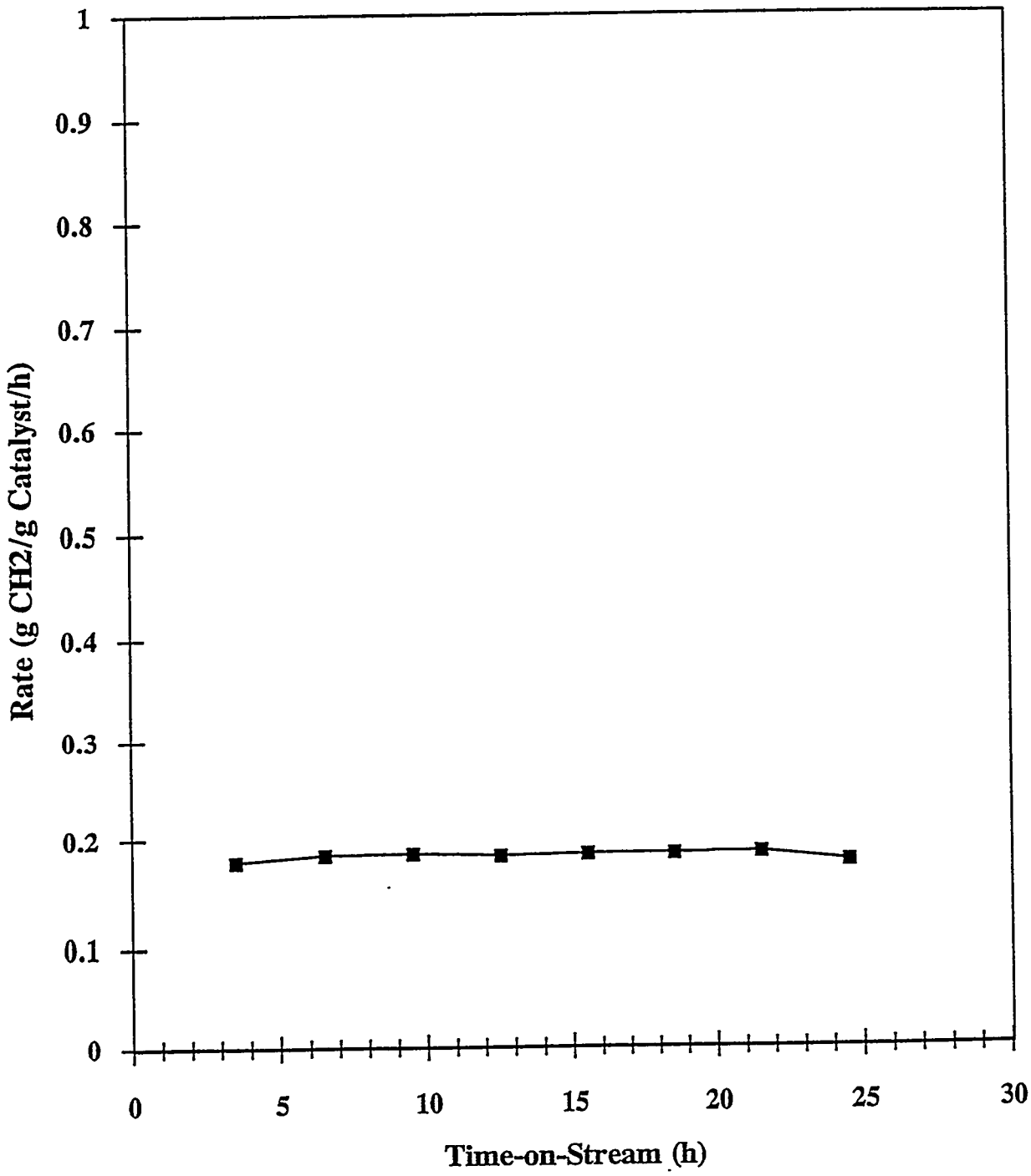
Schulz-Flory Plot for Co.004 - Run #2a

Time on Stream (hrs)

hrs.



Time-on-Stream Plot for Co.004 - Run #2a



Co.004 - Run #3

Co wt%	NM wt %	Promotor wt%		Support
20	Ru 0.43		La2O3 1.00	Al2O3

SUMMARY REACTION DATA

Reaction Conditions:

P = 1.0 atm
T = 220 °C
H2/CO = 2
weight of catalyst = 0.150 g
WHSV = 17.17 1/hr
time on stream = 24.5 hrs

CO2 (g/g cat/hr) = 0.036
CO2 (% of CO) = 0.1
O/P = 1.45

CO conversion (%)	6.7
rate (g CH2/g cat/hr)	0.50
alpha	0.61
C1 (wt%)	27.8
C2 - C4 (wt%)	30.8
C5 - C12 (wt%)	39.7
C13 + (wt%)	1.7

Performance of Co.004

Dates: 07/18/94 - 07/19/94 Run #3

flow rate = 90.0 cc/min, loading= 0.1 g, WHSV = 17.2 1/hr, H2/CO ratio in feed = 2

time on stream, hr	0.5	3.5	6.5	9.5	12.5	15.5
reaction temperature, °C	220	220	220	220	220	220
pressure, atm	1.0	1.0	1.0	1.0	1.0	1.0
flow, cc/min	90.0	90.0	90.0	90.0	90.0	90.0
C1 - C15 product distribution, weight %						
C1	26.34	27.15	27.26	27.66	27.41	27.68
C2	4.96	5.03	5.02	5.06	5.00	5.03
C3	13.32	13.30	13.17	13.18	13.08	13.07
C4	13.56	13.40	13.22	13.15	13.14	13.05
C5	12.43	12.27	12.20	12.08	12.15	12.07
C6	9.38	9.26	9.12	9.06	9.16	9.09
C7	7.08	7.00	7.16	7.09	7.05	7.06
C8	4.65	4.59	4.73	4.66	4.71	4.69
C9	2.96	2.99	2.98	2.92	2.96	2.99
C10	1.93	1.87	2.02	2.07	2.07	2.06
C11	1.23	1.24	1.26	1.27	1.33	1.30
C12	0.88	0.82	0.79	0.73	0.86	0.86
C13	0.56	0.46	0.46	0.47	0.50	0.49
C14	0.41	0.35	0.35	0.33	0.34	0.33
C15	0.30	0.27	0.25	0.26	0.24	0.25
alpha chain growth probability	0.62	0.61	0.61	0.61	0.61	0.61
C1 - C50 estimated total product distribution, weight %						
C1	26.0	26.9	27.0	27.4	27.3	27.5
C2 - C4	31.5	31.4	31.1	31.1	31.1	31.0
C5 - C12	40.5	39.9	40.1	39.8	40.1	39.9
C13 - C50	2.0	1.8	1.7	1.7	1.6	1.6
CO conversion, %	8.4	7.9	7.4	7.4	6.9	6.9
rate, g CH2/g cat/hr	0.63	0.59	0.56	0.55	0.52	0.52
CO2 formation, %	0.2	0.2	0.2	0.2	0.2	0.2

Performance of Co.004

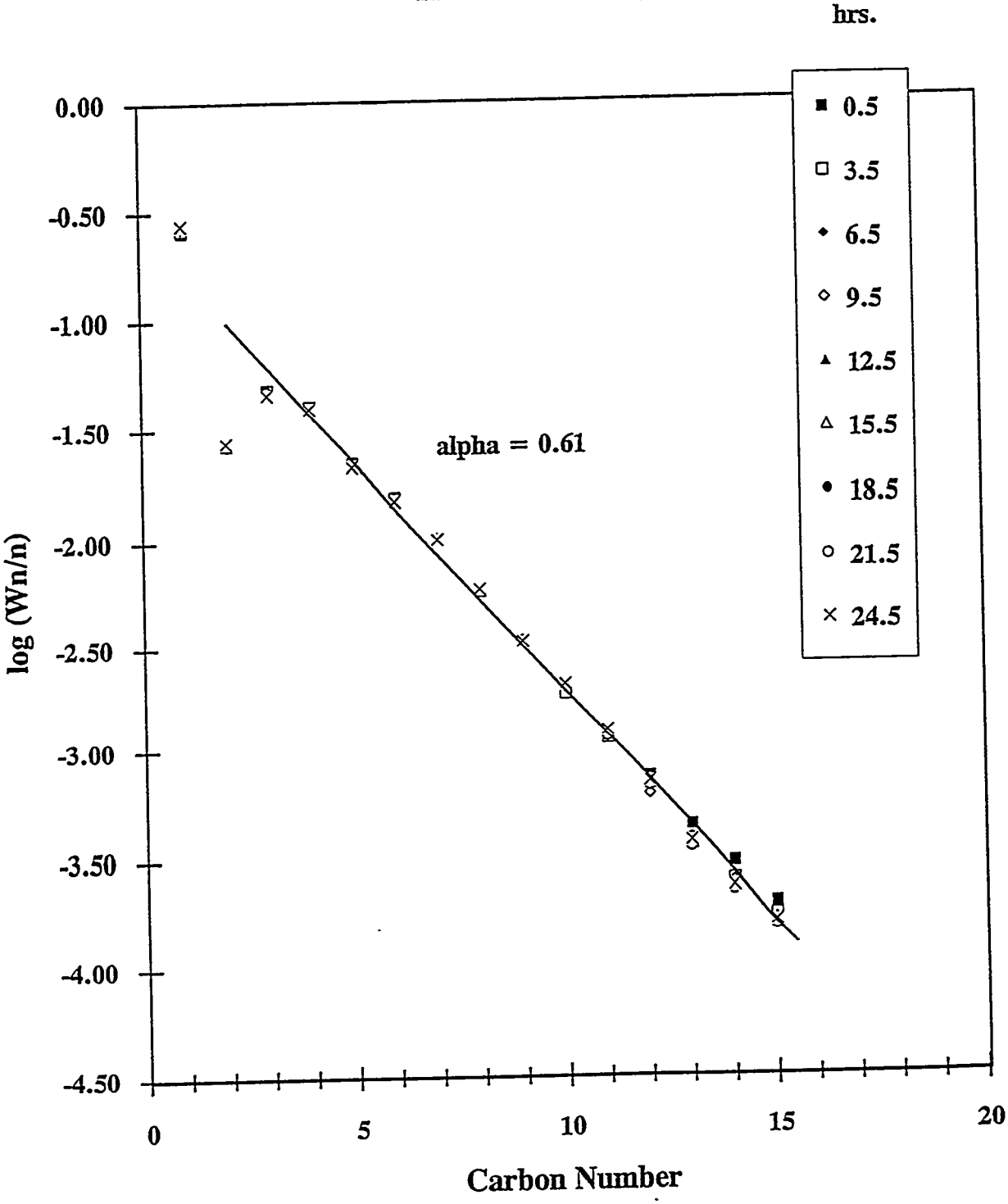
Dates: 07/18/94 - 07/19/94 Run #3

flow rate = 90.0 cc/min, loading= 0.1 g, WHSV = 17.2 1/hr, H2/CO ratio in feed = 2

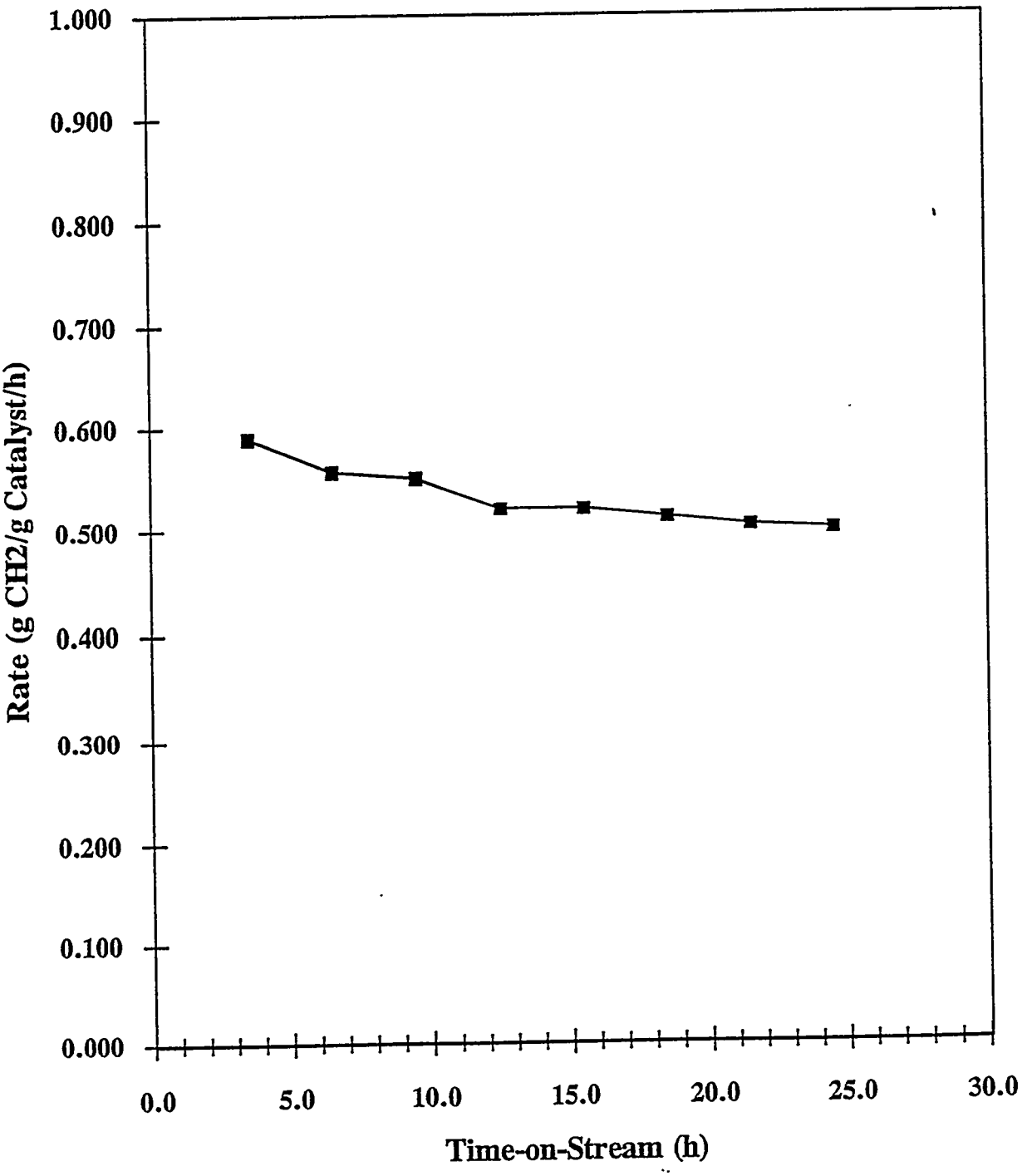
time on stream, hr	18.5	21.5	24.5	27.5
reaction temperature, °C	220	220	220	220
pressure, atm	1.0	1.0	1.0	1.0
flow, cc/min	90.0	90.0	90.0	22.5
C1 - C15 product distribution, weight %				
C1	27.72	27.90	27.96	27.57
C2	5.03	5.05	5.05	5.14
C3	13.07	13.09	13.03	11.63
C4	13.03	13.03	12.94	13.01
C5	12.05	12.05	11.98	12.04
C6	9.11	9.09	9.05	9.03
C7	7.06	7.03	7.01	7.33
C8	4.73	4.68	4.69	4.97
C9	3.03	2.97	2.98	3.32
C10	2.10	2.06	2.07	2.14
C11	1.24	1.26	1.35	1.58
C12	0.79	0.79	0.83	0.98
C13	0.49	0.45	0.48	0.67
C14	0.32	0.32	0.33	0.47
C15	0.24	0.24	0.25	0.12
alpha chain growth probability	0.61	0.61	0.61	0.62
C1 - C50 estimated total product distribution, weight %				
C1	27.5	27.7	27.8	27.3
C2 - C4	30.9	31.0	30.8	29.5
C5 - C12	40.0	39.8	39.7	41.0
C13 - C50	1.6	1.6	1.7	2.1
CO conversion, %	6.8	6.7	6.7	27.0
rate, g CH2/g cat/hr	0.51	0.50	0.50	0.51
CO2 formation, %	0.1	0.1	0.1	0.8

Schulz-Flory Plot for Co.004 - Run #3

Time on Stream (hrs)



Time-on-Stream Plot for Co.004 - Run #3



Co.004 - Run #3h

Co wt%	NM wt %	Promotor wt%		Support
20	Ru 0.43		La2O3 1.00	Al2O3

SUMMARY REACTION DATA*

Reaction Conditions:

P = 1.0 atm
T = 220 °C
H2/CO = 2
weight of catalyst = 0.150 g
WHSV = 4.29 1/hr
time on stream = 27.5 hrs

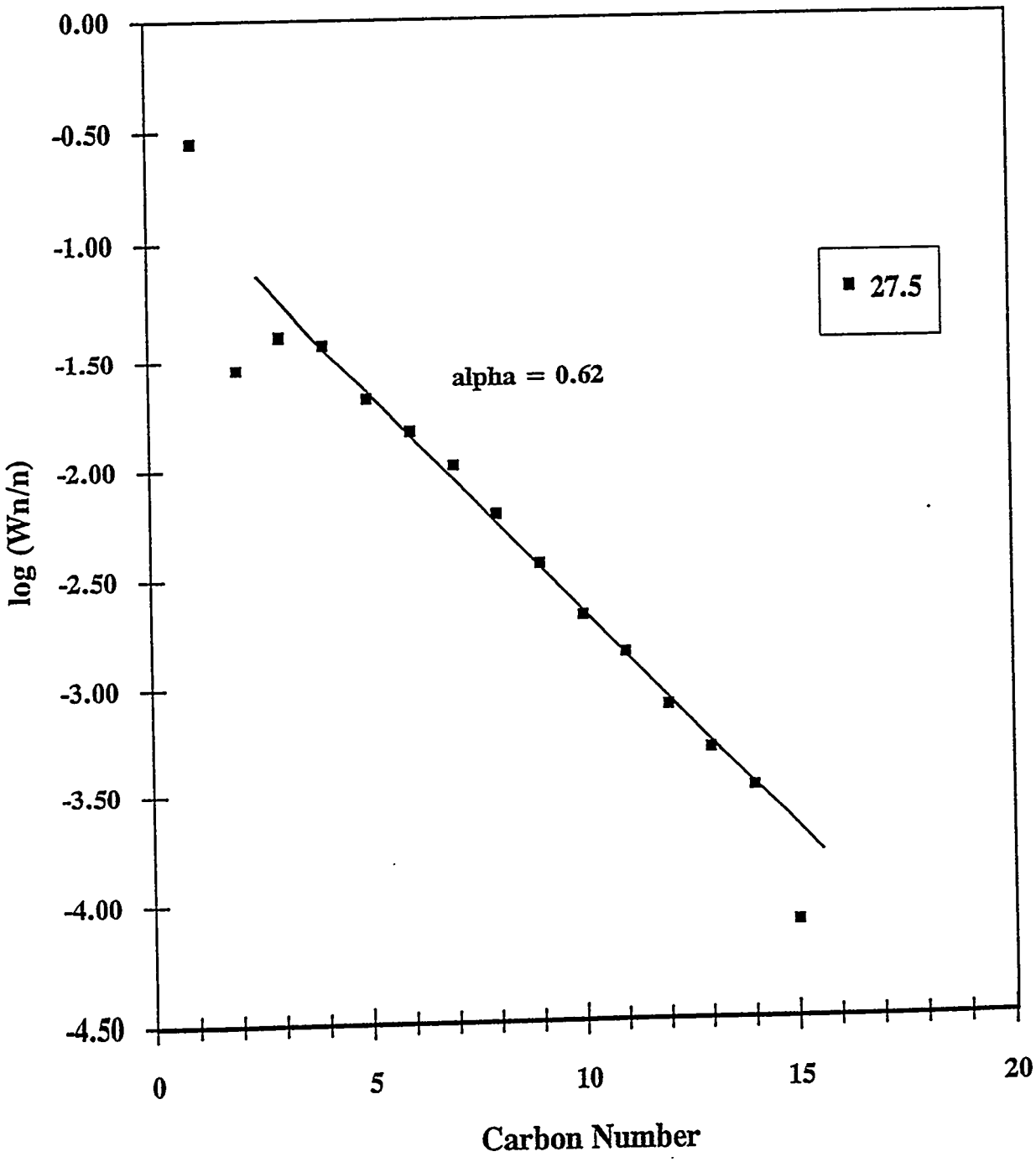
CO2 (g/g cat/hr) = 0.048
CO2 (% of CO) = 0.8
O/P = 0.46

CO conversion (%)	27.0
rate (g CH2/g cat/hr)	0.51
alpha	0.62
C1 (wt%)	27.3
C2 - C4 (wt%)	29.5
C5 - C12 (wt%)	41.0
C13 + (wt%)	2.1

* High conversion study

Schulz-Flory Plot for Co.004 - Run #3h
Time on Stream (hrs)

hrs.



Co.004 - Run #4

Co wt%	NM wt %	Promotor wt%		Support
20	Ru 0.43		La2O3 1.00	Al2O3

SUMMARY REACTION DATA*

Reaction Conditions:

P = 10.0 atm
T = 220 °C
H2/CO = 2
weight of catalyst = 0.049 g
WHSV = 52.91 1/hr
time on stream = 24.5 hrs

CO2 (g/g cat/hr) = 0.078
CO2 (% of CO) = 0.1
O/P = 2.40

CO conversion (%)	1.8
rate (g CH2/g cat/hr)	0.43
alpha	0.79
C1 (wt%)	24.0
C2 - C4 (wt%)	14.8
C5 - C12 (wt%)	41.7
C13 + (wt%)	19.5

* High pressure run

Performance of Co.004

Dates: 08/04/94 - 08/05/94 Run #4

flow rate = 110.0 cc/min, loading= 0.0 g, WHSV = 52.9 1/hr, H2/CO ratio in feed = 2

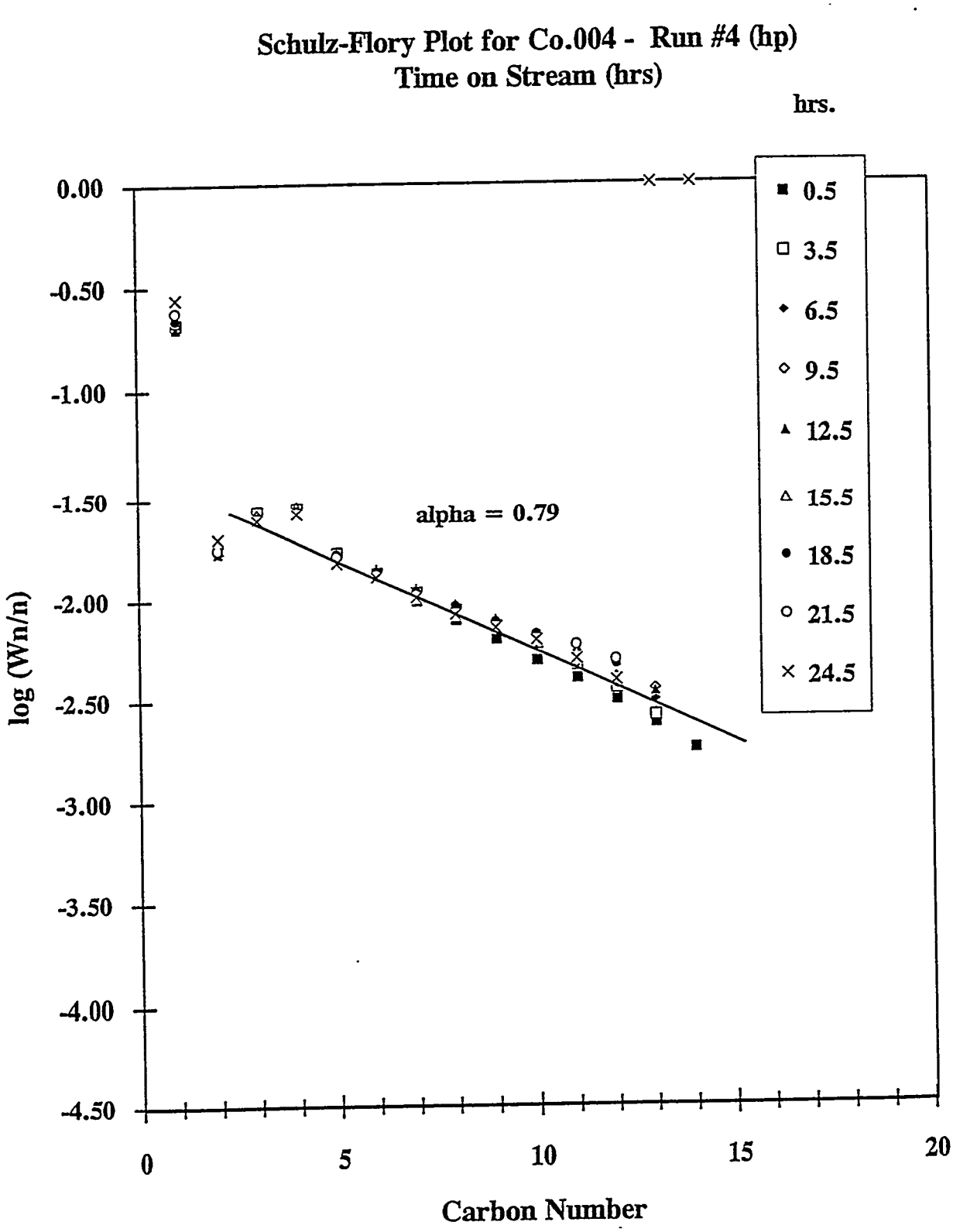
time on stream, hr	0.5	3.5	6.5	9.5	12.5	15.5
reaction temperature, °C	220	220	220	220	220	220
pressure, atm	10.0	10.0	10.0	10.0	10.0	10.0
flow, cc/min	110.0	110.0	110.0	110.0	110.0	110.0
C1 - C15 product distribution, weight %						
C1	21.23	23.30	23.42	23.09	21.94	23.88
C2	3.77	3.99	3.94	3.75	3.45	3.65
C3	7.72	8.14	7.92	7.72	7.38	7.88
C4	13.85	7.81	7.57	7.57	7.33	7.88
C5	8.33	8.79	8.53	8.58	8.35	9.00
C6	7.41	7.87	7.64	7.71	7.52	8.18
C7	6.87	7.62	7.48	7.52	7.41	7.85
C8	6.30	7.03	6.94	7.06	7.11	7.48
C9	5.68	6.57	6.43	6.53	6.70	7.03
C10	4.96	6.01	6.00	6.06	6.28	6.42
C11	4.43	5.15	5.46	5.25	6.28	5.89
C12	3.77	4.31	4.60	4.54	5.78	4.87
C13	3.13	3.41	4.06	4.62	4.47	
C14	2.52					
C15						
alpha chain growth probability	0.76	0.77	0.78	0.78	0.81	0.78
C1 - C50 estimated total product distribution, weight %						
C1	19.2	20.0	19.8	19.7	16.9	19.3
C2 - C4	22.9	17.1	16.4	16.2	14.0	15.7
C5 - C12	43.4	45.8	44.9	45.5	42.9	45.7
C13 - C50	14.5	17.1	18.8	18.6	26.2	19.4
CO conversion, %	2.0	1.8	1.8	1.8	2.0	1.7
rate, g CH2/g cat/hr	0.46	0.42	0.43	0.41	0.46	0.41
CO2 formation, %	0.1	0.1	0.1	0.1	0.1	0.1

Performance of Co.004

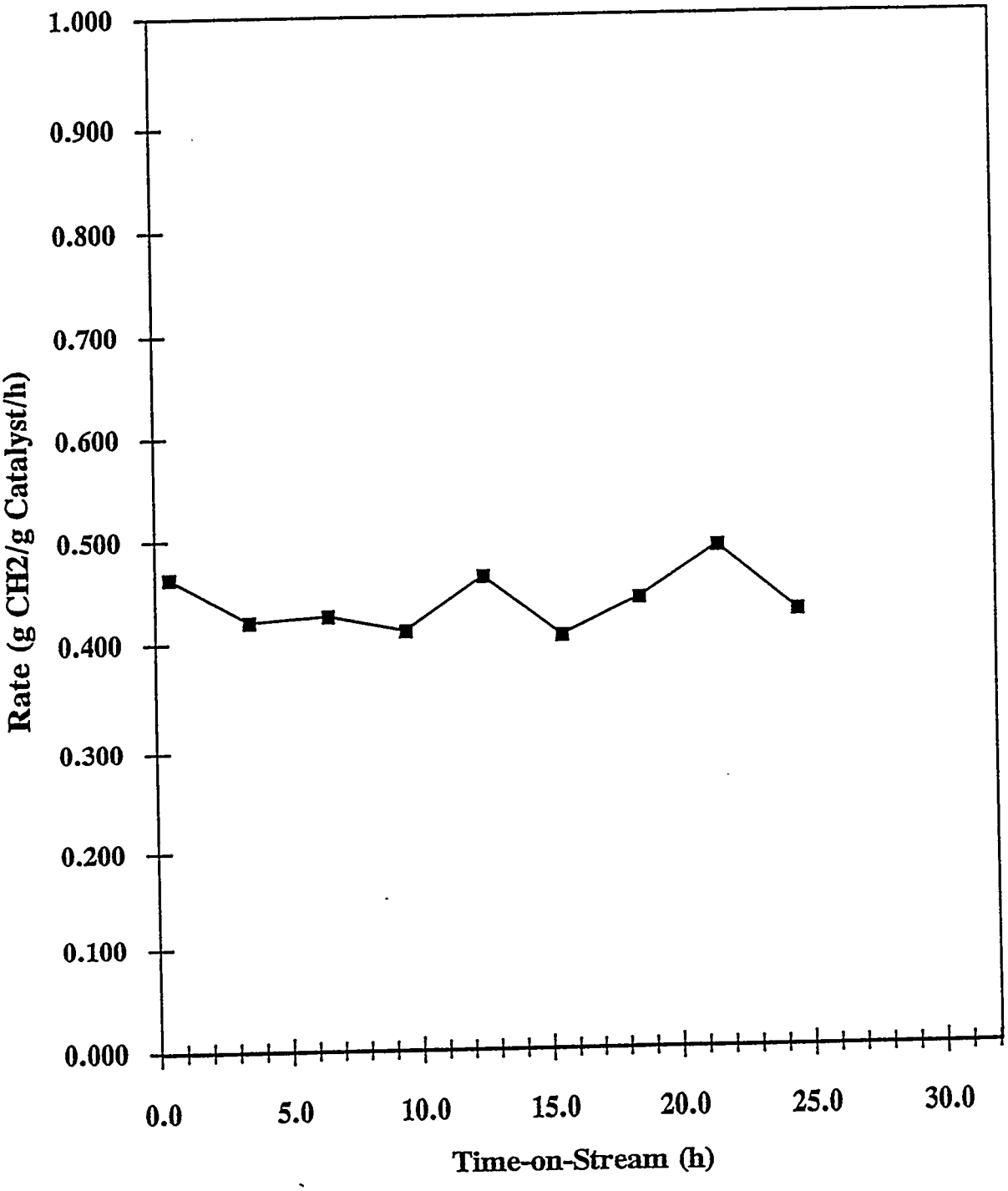
Dates: 08/04/94 - 08/05/94 Run #4

flow rate = 110.0 cc/min, loading= 0.0 g, WHSV = 52.9 1/hr, H2/CO ratio in feed = 2

time on stream, hr	18.5	21.5	24.5
reaction temperature, °C	220	220	220
pressure, atm	10.0	10.0	10.0
flow, cc/min	110.0	110.0	110.0
C1 - C15 product distribution, weight %			
C1	24.11	26.31	29.81
C2	3.46	3.58	3.93
C3	7.57	7.43	7.37
C4	7.61	7.32	7.07
C5	8.73	8.40	8.02
C6	7.83	7.57	7.12
C7	7.71	7.37	7.11
C8	7.36	6.82	6.66
C9	6.90	6.56	6.46
C10	6.67	6.20	6.22
C11	6.42	6.48	5.53
C12	5.64	5.96	4.70
C13			
C14			
C15			
alpha chain growth probability	0.80	0.81	0.79
C1 - C50 estimated total product distribution, weight %			
C1	18.2	19.3	24.0
C2 - C4	14.1	13.4	14.8
C5 - C12	43.3	40.7	41.7
C13 - C50	24.3	26.6	19.5
CO conversion, %	1.9	2.1	1.8
rate, g CH2/g cat/hr	0.44	0.49	0.43
CO2 formation, %	0.1	0.1	0.1


Schulz-Flory Plot for Co.004 - Run #4 (hp)
Time on Stream (hrs)
hrs.
0.5
3.5
6.5
9.5
12.5
15.5
18.5
21.5
24.5
alpha = 0.79
log (Wn/n)
0.00
-0.50
-1.00
-1.50
-2.00
-2.50
-3.00
-3.50
-4.00
-4.50
0
5
10
15
20
Carbon Number

Time-on-Stream Plot for Co.004 - Run #4 (hp)



Co.004 - Run #5

Co wt%	NM wt %	Promotor wt%		Support
20	Ru 0.43		La2O3 1.00	Al2O3

SUMMARY REACTION DATA

Reaction Conditions:

P = 1.0 atm
T = 220 °C
H2/CO = 2
weight of catalyst = 0.177 g
WHSV = 14.54 1/hr
time on stream = 24.5 hrs

CO2 (g/g cat/hr) = 0.027
CO2 (% of CO) = 0.1
O/P = 7.84

CO conversion (%)	4.5
rate (g CH2/g cat/hr)	0.29
alpha	0.75
C1 (wt%)	19.4
C2 - C4 (wt%)	20.3
C5 - C12 (wt%)	48.6
C13 + (wt%)	11.6

Performance of Co.004

Dates: 08/08/94 - 08/09/94 Run #5

flow rate = 90.0 cc/min, loading= 0.2 g, WHSV = 14.5 1/hr, H2/CO ratio in feed = 2

time on stream, hr	0.5	3.5	6.5	9.5	12.5	21.5
reaction temperature, °C	220	220	220	220	220	220
pressure, atm	1.0	1.0	1.0	1.0	1.0	1.0
flow, cc/min	90.0	90.0	90.0	90.0	90.0	90.0
C1 - C15 product distribution, weight %						
C1	19.54	20.17	20.29	20.44	20.40	20.52
C2	3.77	3.89	3.92	3.95	3.95	3.98
C3	9.13	8.78	8.66	8.62	8.57	8.57
C4	10.31	9.51	9.35	9.27	9.18	9.16
C5	11.44	10.63	10.46	10.27	10.27	10.18
C6	10.08	8.99	8.94	8.76	8.89	8.71
C7	8.78	8.62	8.54	8.50	8.38	8.41
C8	6.96	7.07	7.05	7.03	7.02	7.06
C9	5.51	5.79	5.84	5.78	5.75	5.89
C10	4.44	4.78	4.79	4.76	4.77	4.83
C11	3.45	3.79	3.80	3.92	3.89	3.93
C12	2.63	2.98	2.99	2.98	3.11	3.13
C13	1.95	2.18	2.27	2.38	2.35	2.38
C14	1.38	1.74	1.84	1.93	1.91	1.84
C15	0.64	1.07	1.27	1.42	1.54	1.42
alpha chain growth probability	0.71	0.73	0.74	0.74	0.74	0.74
C1 - C50 estimated total product distribution, weight %						
C1	19.0	19.3	19.3	19.4	19.4	19.6
C2 - C4	22.6	21.2	20.9	20.7	20.6	20.8
C5 - C12	51.2	49.9	49.6	49.1	49.2	49.3
C13 - C50	7.2	9.6	10.2	10.8	10.8	10.3
CO conversion, %	5.5	5.1	4.7	4.8	4.5	4.4
rate, g CH2/g cat/hr	0.35	0.32	0.30	0.31	0.29	0.28
CO2 formation, %	0.1	0.1	0.1	0.1	0.1	0.1

Performance of Co.004

Dates: 08/08/94 - 08/09/94 Run #5

flow rate = 90.0 cc/min, loading= 0.2 g, WHSV = 14.5 1/hr, H2/CO ratio in feed = 2

time on stream, hr	24.5
reaction temperature, °C	220
pressure, atm	1.0
flow, cc/min	90.0

C1 - C15 product distribution, weight %

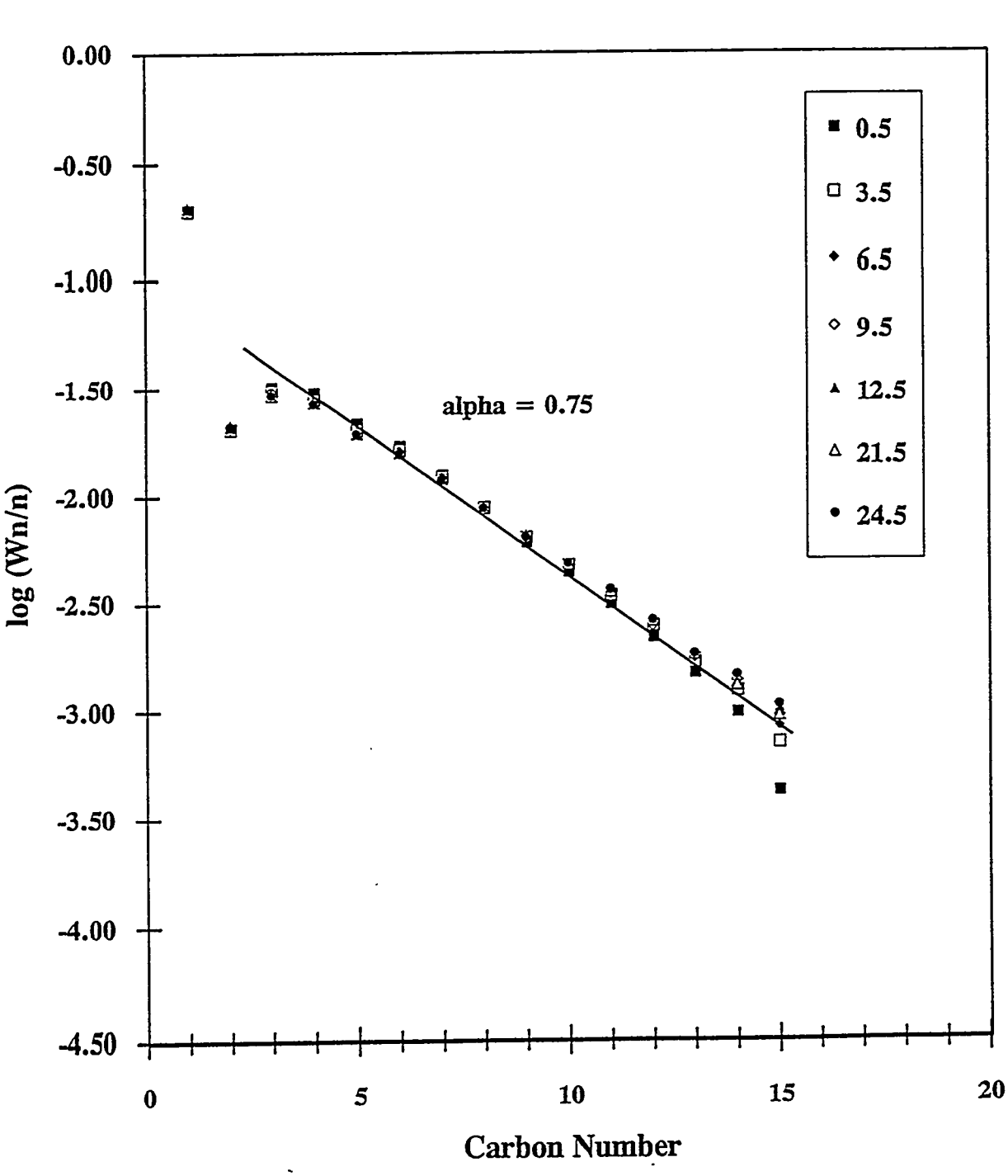
C1	20.64
C2	3.99
C3	8.54
C4	9.05
C5	10.05
C6	8.63
C7	8.30
C8	6.99
C9	5.79
C10	4.86
C11	4.01
C12	3.15
C13	2.38
C14	2.04
C15	1.59
alpha chain growth probability	0.75

C1 - C50 estimated total product distribution, weight %

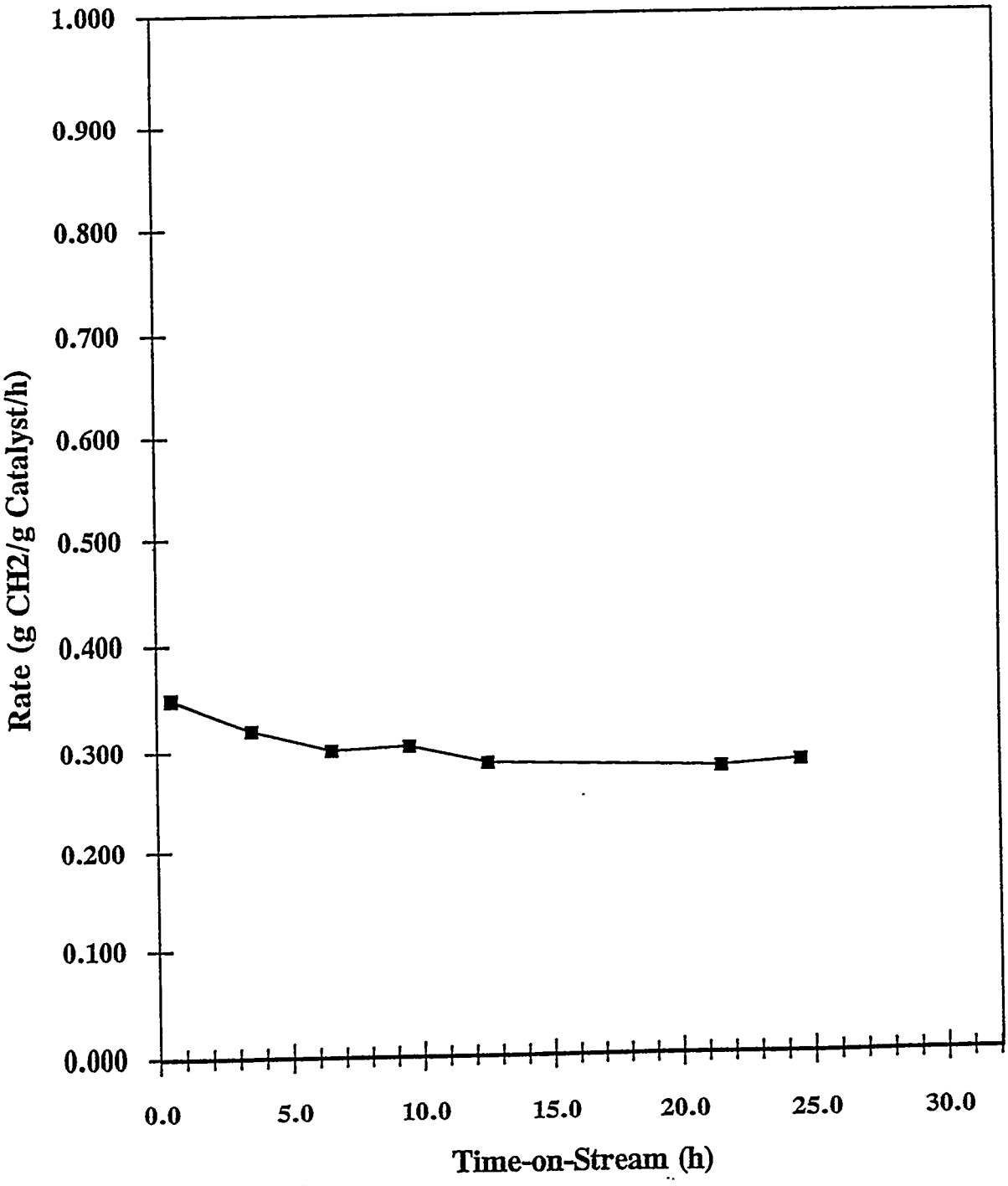
C1	19.4
C2 - C4	20.3
C5 - C12	48.6
C13 - C50	11.6

CO conversion, %	4.5
rate, g CH2/g cat/hr	0.29
CO2 formation, %	0.1

Schulz-Flory Plot for Co.004 - Run #5
Time on Stream (hrs)



Time-on-Stream Plot for Co.004 - Run #5



Co.005 - Run #6

Co wt%	NM wt %	Promotor wt%		Support
20				Al2O3

SUMMARY REACTION DATA

Reaction Conditions:

P = 1.0 atm
T = 220 °C
H2/CO = 2
weight of catalyst = 0.186 g
WHSV = 13.80 1/hr
time on stream = 27.5 hrs

CO2 (g/g cat/hr) = 0.017
CO2 (% of CO) = 0.1
O/P = 5.53

CO conversion (%)	2.1
rate (g CH2/g cat/hr)	0.13
alpha	0.64
C1 (wt%)	25.7
C2 - C4 (wt%)	29.5
C5 - C12 (wt%)	42.2
C13 + (wt%)	2.6

Performance of Co.005

Dates: 08/19/94 - 08/20/94 Run #6

flow rate = 90.0 cc/min, loading= 0.2 g, WHSV = 13.8 1/hr, H2/CO ratio in feed = 2

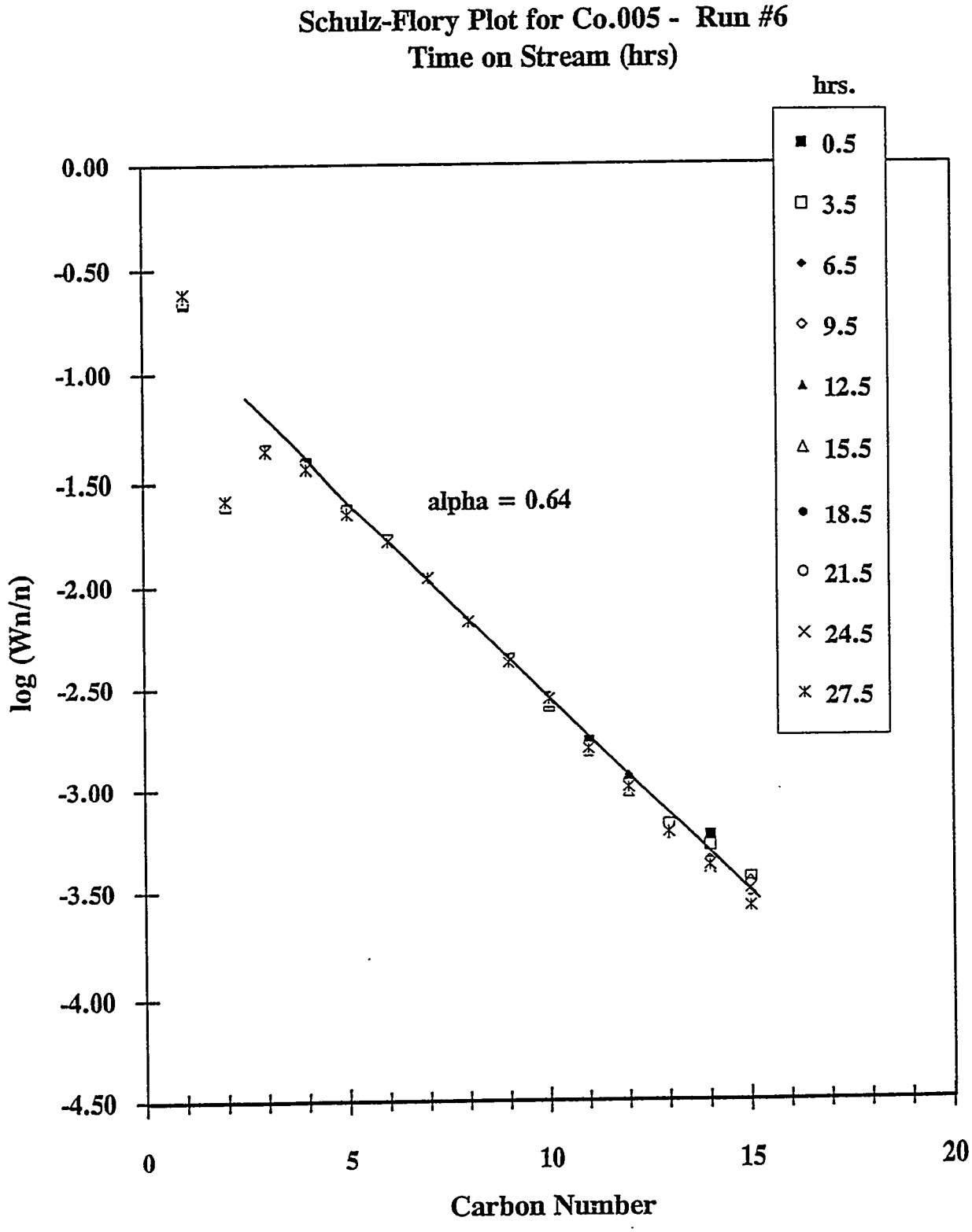
time on stream, hr	0.5	3.5	6.5	9.5	12.5	15.5
reaction temperature, °C	220	220	220	220	220	220
pressure, atm	1.0	1.0	1.0	1.0	1.0	1.0
flow, cc/min	90.0	90.0	90.0	90.0	90.0	90.0
C1 - C15 product distribution, weight %						
C1	22.93	23.94	24.62	25.28	25.00	25.03
C2	4.80	4.91	5.02	5.11	5.03	5.01
C3	12.33	12.23	12.29	12.44	12.16	12.08
C4	13.07	12.76	12.75	12.84	12.62	12.49
C5	13.18	12.81	12.68	12.82	12.64	12.57
C6	9.01	8.66	8.29	7.06	8.30	8.53
C7	7.70	7.61	7.61	7.71	7.56	7.63
C8	5.39	5.31	5.28	5.40	5.25	5.30
C9	3.77	3.97	3.71	3.75	4.00	3.79
C10	2.56	2.60	2.73	2.65	2.69	2.82
C11	1.92	1.78	1.72	1.80	1.69	1.73
C12	1.30	1.26	1.41	1.22	1.21	1.16
C13	0.82	0.87	0.78	0.77	0.77	0.78
C14	0.82	0.74	0.62	0.62	0.60	0.59
C15	0.39	0.55	0.48	0.52	0.49	0.50
alpha chain growth probability	0.64	0.66	0.65	0.65	0.65	0.65
C1 - C50 estimated total product distribution, weight %						
C1	22.8	23.4	24.2	24.7	24.5	24.5
C2 - C4	30.1	29.2	29.6	29.7	29.2	29.0
C5 - C12	44.4	43.7	43.0	42.1	43.0	43.2
C13 - C50	2.6	3.6	3.2	3.4	3.2	3.3
CO conversion, %	2.4	2.4	2.3	2.3	2.3	2.3
rate, g CH2/g cat/hr	0.15	0.15	0.14	0.14	0.14	0.14
CO2 formation, %	0.1	0.1	0.1	0.1	0.1	0.1

Performance of Co.005

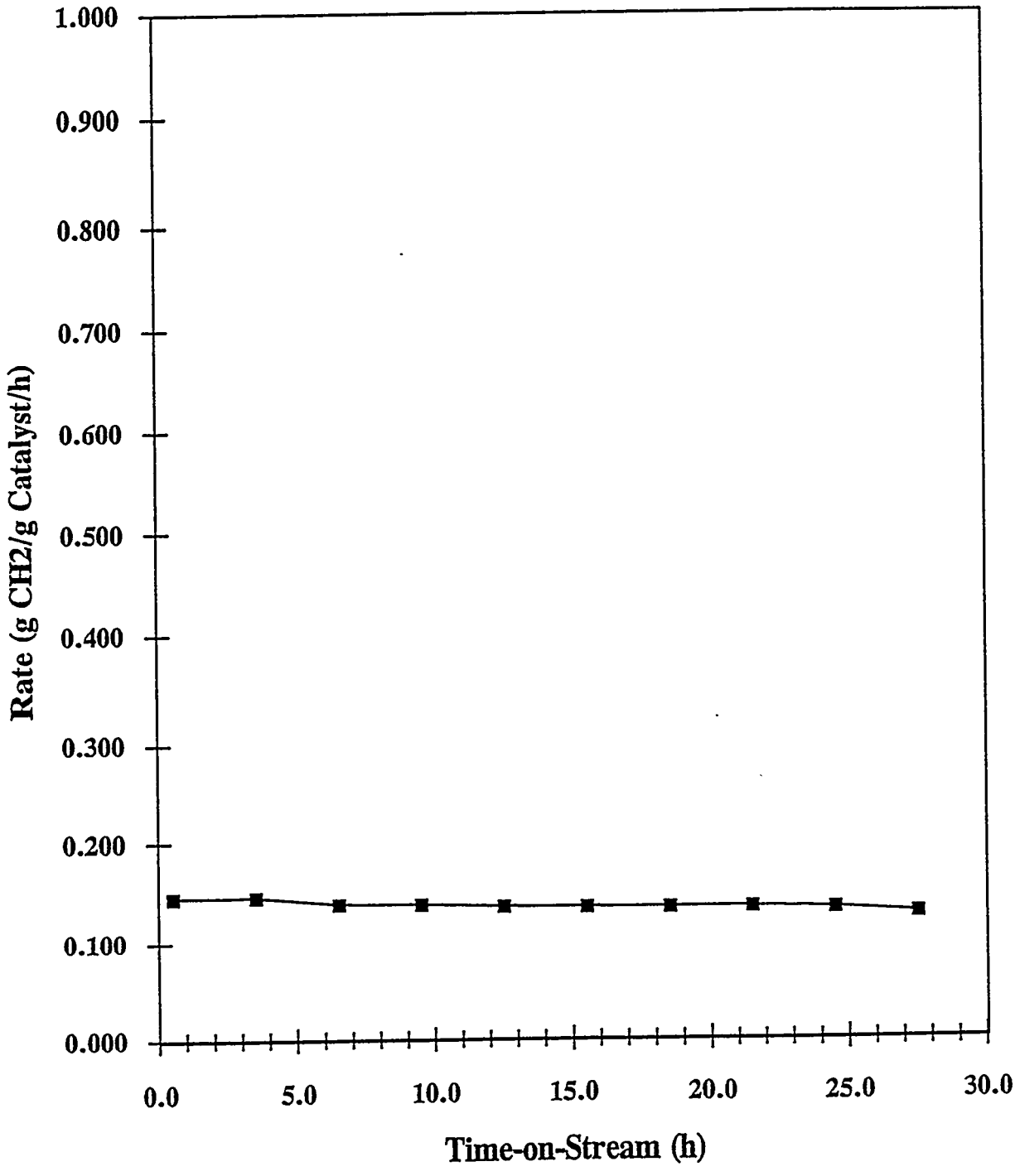
Dates: 08/19/94 - 08/20/94 Run #6

flow rate = 90.0 cc/min, loading= 0.2 g, WHSV = 13.8 1/hr, H2/CO ratio in feed = 2

time on stream, hr	18.5	21.5	24.5	27.5
reaction temperature, °C	220	220	220	220
pressure, atm	1.0	1.0	1.0	1.0
flow, cc/min	90.0	90.0	90.0	90.0
C1 - C15 product distribution, weight %				
C1	25.19	25.17	26.02	25.93
C2	5.04	5.01	5.18	5.16
C3	12.03	11.95	12.27	12.16
C4	12.36	12.27	12.37	12.39
C5	12.41	12.39	12.46	12.53
C6	8.78	8.99	7.42	7.48
C7	7.59	7.58	7.62	7.64
C8	5.28	5.31	5.32	5.35
C9	3.71	3.75	3.77	3.81
C10	2.88	2.74	2.75	2.79
C11	1.71	1.71	1.74	1.76
C12	1.23	1.21	1.23	1.23
C13	0.76	0.81	0.80	0.79
C14	0.57	0.60	0.57	0.59
C15	0.46	0.50	0.49	0.40
alpha chain growth probability	0.65	0.65	0.65	0.64
C1 - C50 estimated total product distribution, weight %				
C1	24.8	24.7	25.6	25.7
C2 - C4	28.9	28.7	29.3	29.5
C5 - C12	43.2	43.4	42.0	42.2
C13 - C50	3.0	3.3	3.2	2.6
CO conversion, %	2.3	2.3	2.2	2.1
rate, g CH2/g cat/hr	0.14	0.14	0.13	0.13
CO2 formation, %	0.1	0.1	0.1	0.1


Schulz-Flory Plot for Co.005 - Run #6
Time on Stream (hrs)
hrs.
0.5
3.5
6.5
9.5
12.5
15.5
18.5
21.5
24.5
27.5
alpha = 0.64
log (Wn/n)
0.00
-0.50
-1.00
-1.50
-2.00
-2.50
-3.00
-3.50
-4.00
-4.50
0
5
10
15
20
Carbon Number

Time-on-Stream Plot for Co.005 - Run #6



Co.005 S2 - Run #7

Co wt%	NM wt %	Promotor wt%		Support
20				Al2O3

SUMMARY REACTION DATA*

Reaction Conditions:

P = 1.0 atm
T = 220 °C
H2/CO = 2
weight of catalyst = 0.300 g
WHSV = 2.86 1/hr
time on stream = 21.0 hrs

CO2 (g/g cat/hr) = 0.003
CO2 (% of CO) = 0.1
O/P = 1.95

CO conversion (%)	6.7
rate (g CH2/g cat/hr)	0.08
alpha	0.70
C1 (wt%)	18.8
C2 - C4 (wt%)	23.4
C5 - C12 (wt%)	50.9
C13 + (wt%)	6.8

* Reaction studied in system 2

Performance of Co.005 S2

Dates: 08/06/94 - 08/07/94 Run #7

flow rate = 30.0 cc/min, loading= 0.3 g, WHSV = 2.9 1/hr, H2/CO ratio in feed = 2

time on stream, hr	0.5	3.5	6.0	21.0
reaction temperature, °C	220	220	220	220
pressure, atm	1.0	1.0	1.0	1.0
flow, cc/min	30.0	30.0	30.0	30.0
C1 - C15 product distribution, weight %				
C1	17.44	19.77	20.61	19.28
C2	2.95	3.34	3.35	3.13
C3	9.88	10.75	10.70	9.81
C4	11.23	12.04	11.70	10.99
C5	12.12	12.79	12.43	11.99
C6	10.48	11.13	10.70	12.20
C7	7.61	8.18	7.53	7.78
C8	6.03	6.57	6.05	6.06
C9	4.60	4.79	4.55	4.90
C10	3.91	4.09	3.88	3.93
C11	2.93	2.82	2.53	2.93
C12	2.28	1.87	2.01	2.28
C13	1.72	1.02	1.23	1.53
C14	1.59	0.30	0.88	1.32
C15	1.51	0.28	0.73	1.10
alpha chain growth probability	0.71	0.68	0.69	0.70
C1 - C50 estimated total product distribution, weight %				
C1	17.7	19.2	20.2	18.8
C2 - C4	24.4	25.4	25.3	23.4
C5 - C12	50.8	50.5	48.9	50.9
C13 - C50	7.1	4.9	5.6	6.8
CO conversion, %	8.2	7.8	7.0	6.7
rate, g CH2/g cat/hr	0.10	0.10	0.09	0.08
CO2 formation, %	0.2	0.1	0.1	0.1

Performance of Co.005 S2

Dates: 08/06/94 - 08/07/94 Run #7

flow rate = 30.0 cc/min, loading= 0.3 g, WHSV = 2.9 1/hr, H2/CO ratio in feed = 2

---

time on stream, hr
reaction temperature, °C
pressure, atm
flow, cc/min

C1 - C15 product distribution, weight %

C1

C2
C3
C4

C5
C6
C7
C8
C9
C10
C11
C12
C13
C14
C15

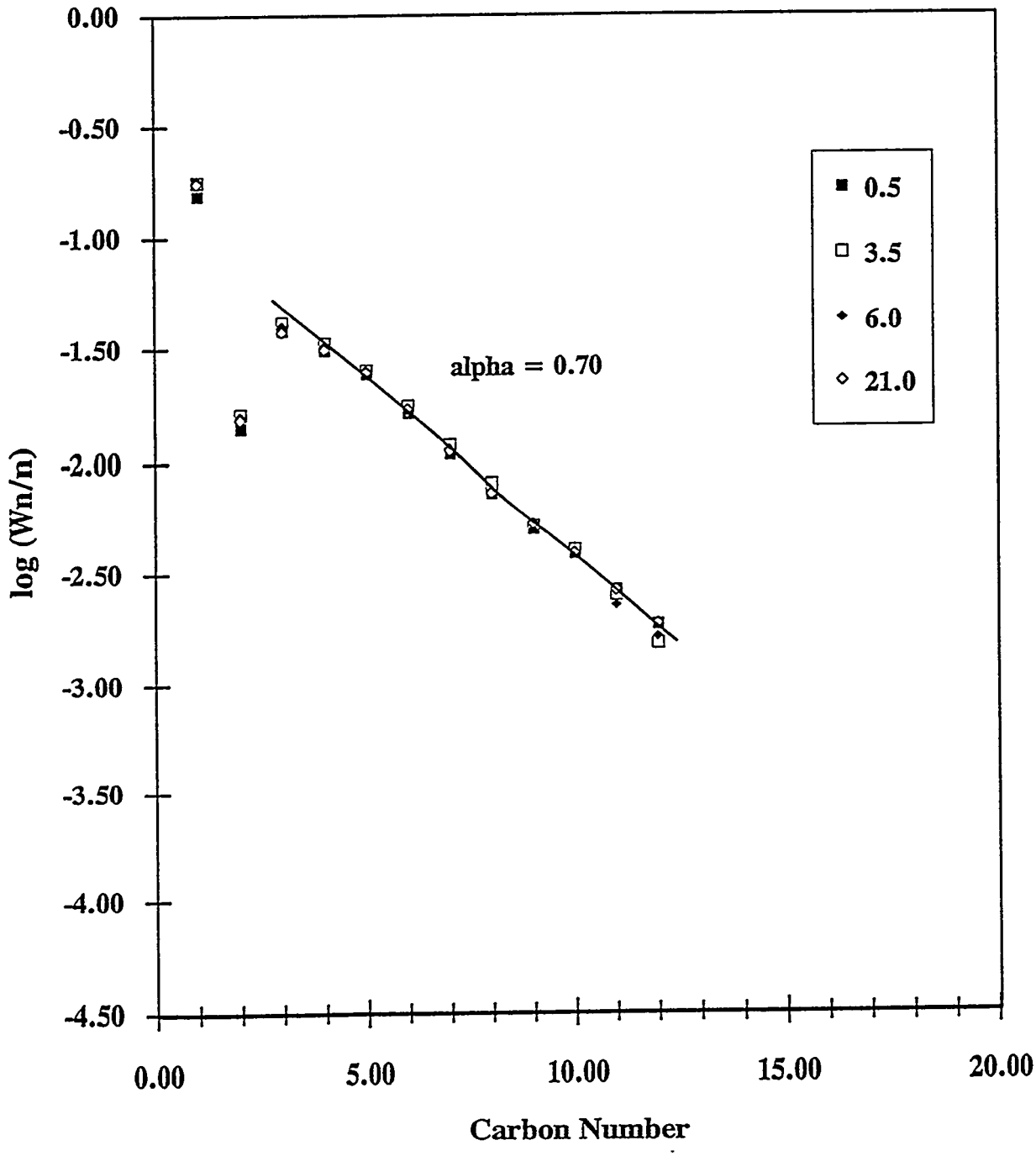
alpha chain growth probability

C1 - C50 estimated total product distribution, weight %

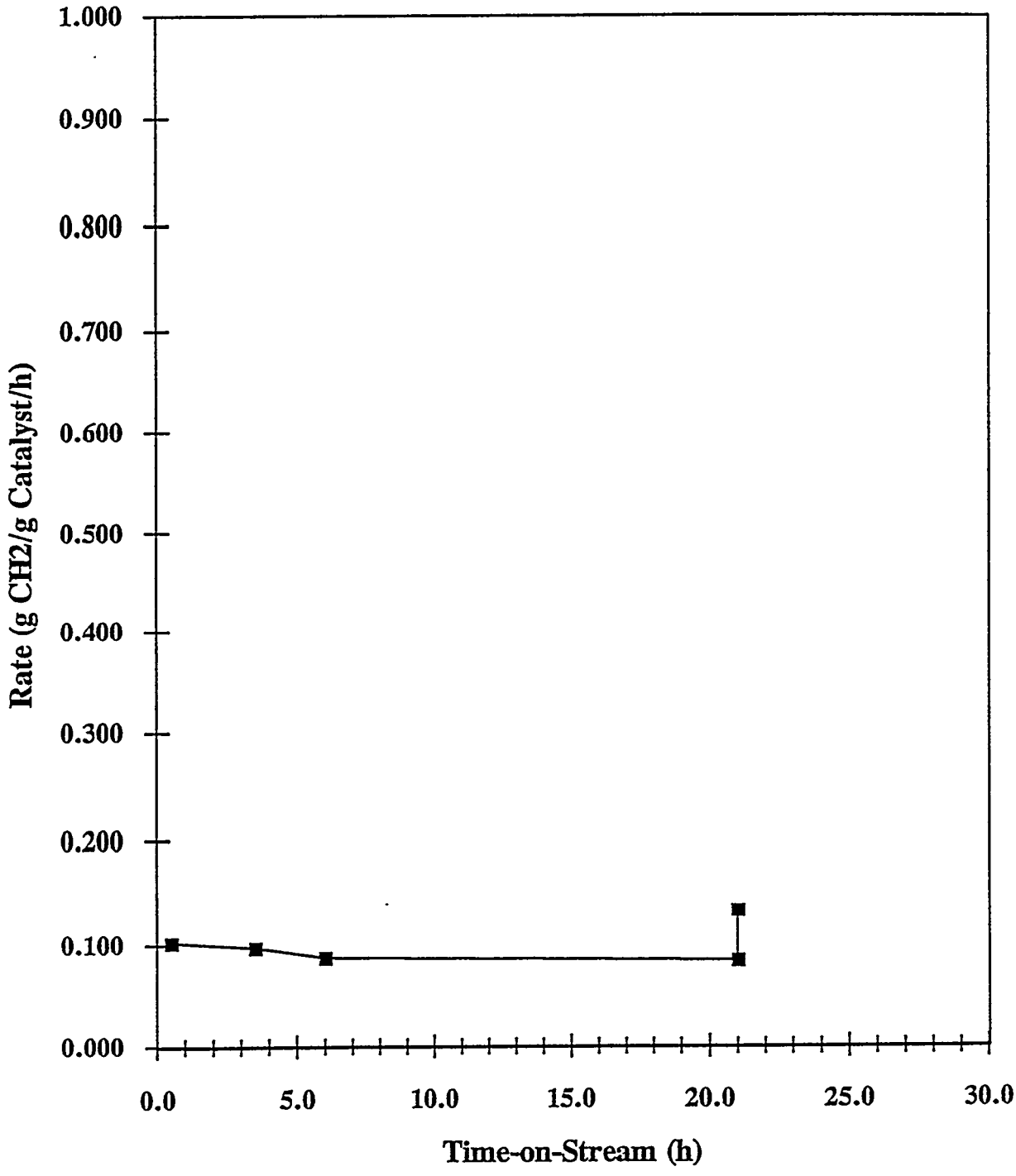
C1
C2 - C4
C5 - C12
C13 - C50

CO conversion, %
rate, g CH2/g cat/hr
CO2 formation, %

Schulz-Flory Plot for Co.005 (S2) - Run #7
Time on Stream (hrs)



Time-on-Stream Plot for Co.005 - Run #7 S2



Co.005b - Run #1

Co wt%		Promotor wt%		Support
20		WGS.03 25		Al2O3

SUMMARY REACTION DATA

Reaction Conditions:

P = 1.0 atm
T = 220 °C
H2/CO = 2
weight of catalyst = 0.225 g
WHSV = 3.81 1/hr
time on stream = 24.0 hrs

CO2 (g/g cat/hr) = 0.023
CO2 (% of CO) = 0.4
O/P = 0.61

CO conversion (%)	2.2
rate (g CH2/g cat/hr)	0.04
alpha	0.32
C1 (wt%)	19.5
C2 - C4 (wt%)	24.7
C5 - C12 (wt%)	55.8
C13 + (wt%)	0.0

Performance of Co.005b

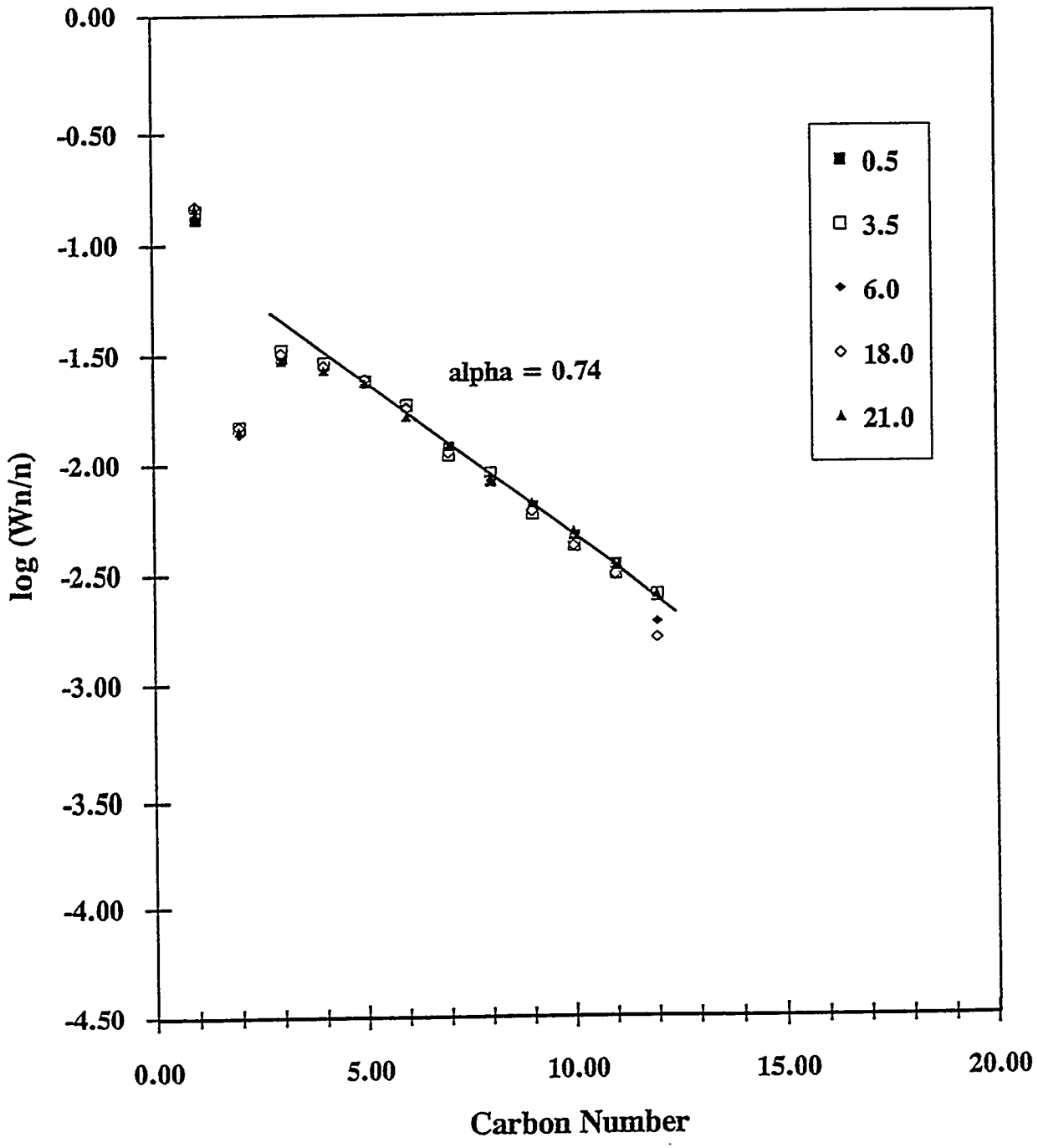
Dates: 08/08/94 - 08/09/94 Run #1

flow rate = 30.0 cc/min, loading= 0.23 g, WHSV = 3.8 1/hr, H2/CO ratio in feed = 2

time on stream, hr	0.5	3.5	6.0	18.0	21.0	
reaction temperature, °C	220	220	220	220	220	
pressure, atm	1.0	1.0	1.0	1.0	1.0	
flow, cc/min	30.0	30.0	30.0	30.0	30.0	
C1 - C15 product distribution, weight %						
C1	13.50	14.69	14.04	14.29	14.82	17.26
C2	2.83	2.90	2.70	2.70	2.73	3.26
C3	7.36	7.54	7.17	7.23	7.39	8.56
C4	9.33	9.24	8.85	8.66	8.69	10.06
C5	11.08	11.25	10.86	10.43	10.83	11.80
C6	17.80	18.37	17.24	23.52	17.45	12.08
C7	8.34	7.69	7.89	7.81	8.43	8.60
C8	6.62	7.21	6.59	6.79	6.90	6.89
C9	5.65	5.27	5.57	5.39	5.88	5.68
C10	4.60	4.18	4.80	4.15	4.86	4.35
C11	3.76	3.48	3.73	3.42	3.74	3.90
C12	3.05	3.06	2.32	1.95	3.08	3.14
C13	2.66	2.03	2.21	1.88	3.02	1.61
C14	1.68	1.66	1.78	1.77	2.18	1.43
C15	1.72	1.43	1.62			1.38
alpha chain growth probability	0.48	0.47	0.46	0.39	0.35	0.32
C1 - C50 estimated total product distribution, weight %						
C1	15.4	16.6	16.3	15.7	16.8	19.5
C2 - C4	22.3	22.2	21.8	20.4	21.4	24.7
C5 - C12	62.2	61.2	61.8	63.9	61.8	55.8
C13 - C50	0.2	0.1	0.1	0.0	0.0	0.0
CO conversion, %	3.1	2.7	2.4	2.0	2.0	2.2
rate, g CH2/g cat/hr	0.05	0.04	0.04	0.03	0.03	0.04
CO2 formation, %	1.5	0.9	0.7	0.5	0.4	0.4

Schulz-Flory Plot for Co.005b (S2) - Run 1
Time on Stream (hrs)

hrs.



Co.005c - Run #1

Co wt%		Promotor wt%		Support
20		WGS.03 50		Al2O3

SUMMARY REACTION DATA

Reaction Conditions:

P = 1.0 atm
T = 220 °C
H2/CO = 2
weight of catalyst = 0.300 g
WHSV = 2.86 1/hr
time on stream = 28.0 hrs

CO2 (g/g cat/hr) = 0.076
CO2 (% of CO) = 1.8
O/P = 0.21

CO conversion (%)	5.1
rate (g CH2/g cat/hr)	0.06
alpha	0.39
C1 (wt%)	22.3
C2 - C4 (wt%)	27.7
C5 - C12 (wt%)	50.1
C13 + (wt%)	0.0

Performance of Co.005c

Dates: 09/02/94 - 09/03/94 Run #1

flow rate = 30.0 cc/min, loading= 0.30 g, WHSV = 2.9 1/hr, H2/CO ratio in feed = 2

time on stream, hr	0.5	3.5	22.5	28.0	21.0
reaction temperature, °C	220	220	220	220	220
pressure, atm	1.0	1.0	1.0	1.0	1.0
flow, cc/min	30.0	30.0	30.0	30.0	30.0
C1 - C15 product distribution, weight %					
C1	15.10	15.69	21.21	20.44	
C2	3.42	3.69	4.47	4.56	
C3	7.92	9.27	10.66	9.70	
C4	10.09	10.89	11.81	11.15	
C5	11.82	12.37	13.01	12.36	
C6	11.98	12.93	10.80	11.27	
C7	8.47	8.45	8.63	9.73	
C8	6.72	6.43	5.72	5.76	
C9	5.40	5.15	4.02	4.11	
C10	4.01	3.74	2.96	2.67	
C11	3.46	3.24	2.15	2.37	
C12	2.95	3.02	1.64	1.65	
C13	2.55	2.41	1.40	1.32	
C14	2.08	1.57	0.93	0.83	
C15	2.20	1.14	0.59	1.38	
alpha chain growth probability	0.48	0.47	0.46	0.39	
C-/C=[C3-C5]	56571	7.40	5.20	4.80	
C1 - C50 estimated total product distribution, weight %					
C1	17.7	17.6	22.7	22.3	
C2 - C4	25.1	26.8	28.8	27.7	
C5 - C12	57.1	55.5	48.5	50.1	
C13 - C50	0.2	0.1	0.1	0.0	
CO conversion, %	3.6	3.9	5.7	5.1	
rate, g CH2/g cat/hr	0.05	0.05	0.07	0.06	
CO2 formation, %	3.9		2.6	1.8	

Co.012 - Run #4

Co wt%	NM wt %	Promotor wt%		Support
20				SiO2

SUMMARY REACTION DATA

Reaction Conditions:

P = 1.0 atm
T = 220 °C
H2/CO = 2
weight of catalyst = 0.266 g
WHSV = 9.66 1/hr
time on stream = 27.5 hrs

CO2 (g/g cat/hr) = 0.023
CO2 (% of CO) = 0.2
O/P = 4.94

CO conversion (%)	2.5
rate (g CH2/g cat/hr)	0.11
alpha	0.61
C1 (wt%)	28.4
C2 - C4 (wt%)	28.1
C5 - C12 (wt%)	41.9
C13 + (wt%)	1.6

Performance of Co.012

Dates: 07/29/94 - 07/30/94 Run #4

flow rate = 90.0 cc/min, loading= 0.3 g, WHSV = 9.7 1/hr, H2/CO ratio in feed = 2

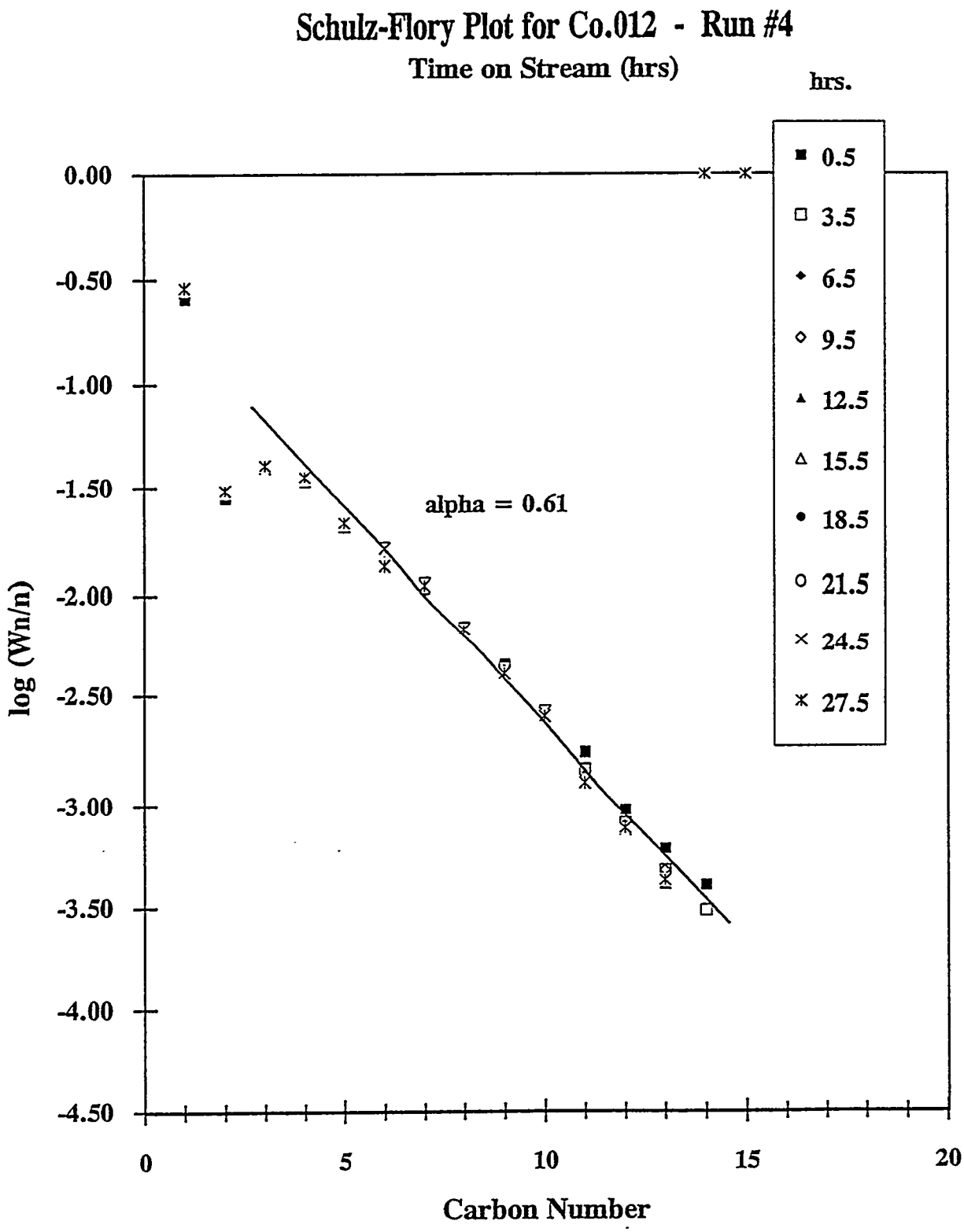
time on stream, hr	0.5	3.5	6.5	9.5	12.5	15.5
reaction temperature, °C	220	220	220	220	220	220
pressure, atm	1.0	1.0	1.0	1.0	1.0	1.0
flow, cc/min	90.0	90.0	90.0	90.0	90.0	90.0
C1 - C15 product distribution, weight %						
C1	26.89	28.51	29.37	29.95	29.87	29.79
C2	5.35	5.48	5.62	5.69	5.67	5.66
C3	11.61	11.17	11.27	11.36	11.31	11.39
C4	11.74	10.98	11.00	11.01	10.97	11.11
C5	11.94	11.28	11.23	11.18	11.16	11.25
C6	8.11	9.21	9.24	9.01	9.09	9.06
C7	7.82	7.88	7.68	7.30	7.50	7.53
C8	5.53	5.40	5.31	5.22	5.26	5.21
C9	3.96	3.80	3.67	3.70	3.63	3.55
C10	2.64	2.65	2.56	2.53	2.59	2.56
C11	1.92	1.61	1.53	1.48	1.43	1.46
C12	1.15	0.98	0.96	0.94	0.95	0.89
C13	0.79	0.62	0.56	0.61	0.57	0.53
C14	0.56	0.43				
C15						
alpha chain growth probability	0.64	0.62	0.62	0.62	0.62	0.61
C1 - C50 estimated total product distribution, weight %						
C1	26.7	28.4	29.2	29.6	29.6	29.6
C2 - C4	28.5	27.5	27.7	27.8	27.7	28.0
C5 - C12	42.4	42.3	41.5	40.8	41.0	40.9
C13 - C50	2.4	1.8	1.6	1.8	1.7	1.5
CO conversion, %	3.1	2.8	2.6	2.6	2.6	2.5
rate, g CH2/g cat/hr	0.13	0.12	0.11	0.11	0.11	0.11
CO2 formation, %	0.2	0.2	0.2	0.2	0.2	0.2

Performance of Co.012

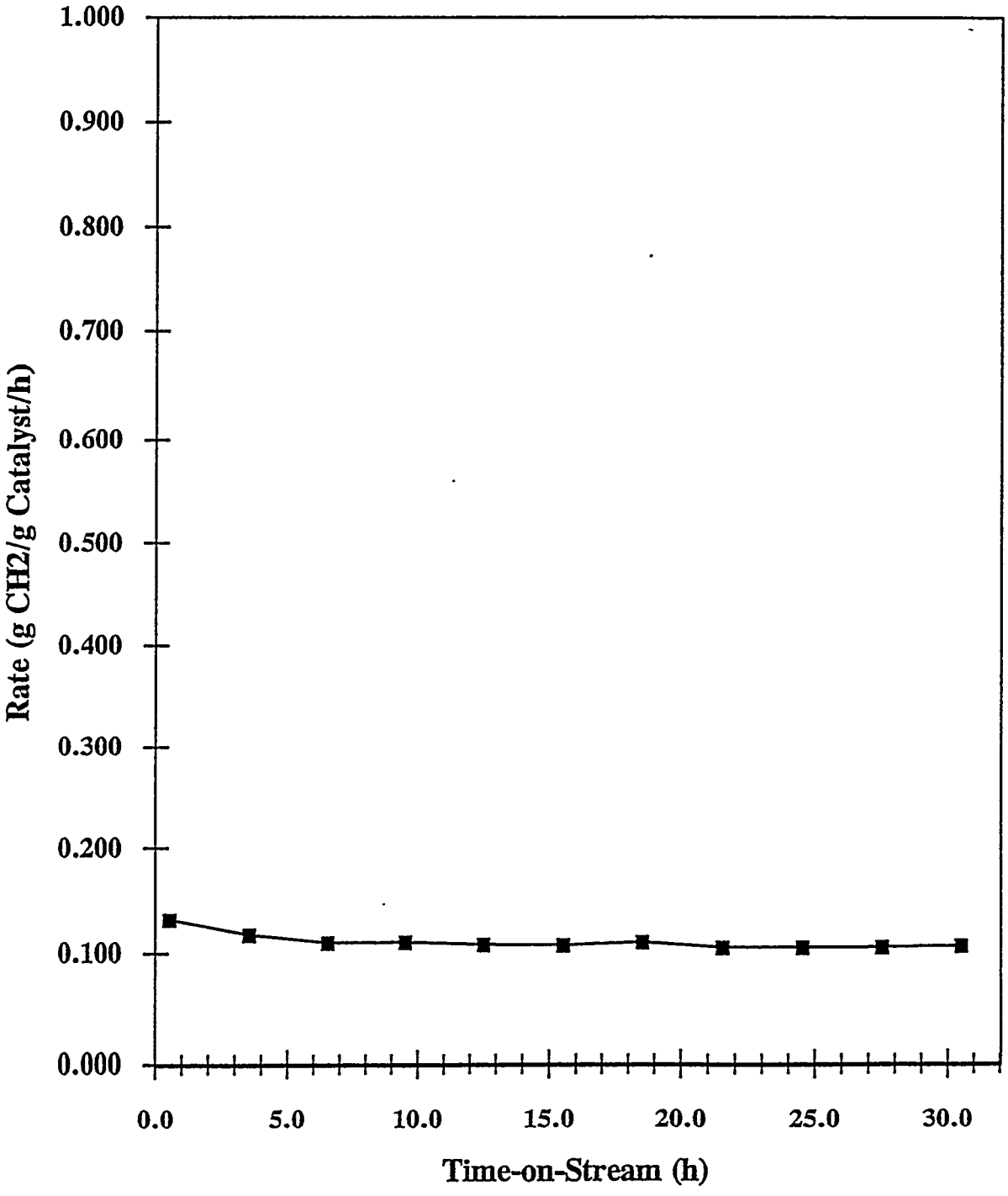
Dates: 07/29/94 - 07/30/94 Run #4

flow rate = 90.0 cc/min, loading= 0.3 g, WHSV = 9.7 1/hr, H2/CO ratio in feed = 2

time on stream, hr	18.5	21.5	24.5	27.5	30.5
reaction temperature, °C	220	220	220	220	220
pressure, atm	1.0	1.0	1.0	1.0	1.0
flow, cc/min	90.0	90.0	90.0	90.0	90.0
C1 - C15 product distribution, weight %					
C1	29.53	28.89	29.44	28.67	28.62
C2	5.56	5.54	5.65	5.53	5.53
C3	11.41	11.36	11.59	11.39	11.39
C4	11.15	11.32	11.47	11.35	11.34
C5	11.29	11.63	11.75	11.66	11.62
C6	9.13	9.43	7.98	9.45	9.38
C7	7.57	7.54	7.69	7.67	7.67
C8	5.20	5.28	5.28	5.27	5.27
C9	3.60	3.65	3.64	3.60	3.70
C10	2.59	2.51	2.59	2.51	2.55
C11	1.48	1.44	1.45	1.41	1.48
C12	0.94	0.88	0.90	0.92	0.90
C13	0.53	0.53	0.55	0.55	0.54
C14					
C15					
alpha chain growth probability	0.61	0.61	0.61	0.61	0.61
C1 - C50 estimated total product distribution, weight %					
C1	29.4	28.7	29.2	28.4	28.4
C2 - C4	28.0	28.0	28.5	28.1	28.1
C5 - C12	41.2	41.8	40.7	41.9	41.9
C13 - C50	1.5	1.5	1.6	1.6	1.6
CO conversion, %	2.6	2.5	2.5	2.5	2.5
rate, g CH2/g cat/hr	0.11	0.11	0.10	0.11	0.11
CO2 formation, %	0.2	0.1	0.2	0.2	0.2


Schulz-Flory Plot for Co.012 - Run #4
Time on Stream (hrs)
hrs.
0.5
3.5
6.5
9.5
12.5
15.5
18.5
21.5
24.5
27.5
alpha = 0.61
log (Wn/n)
0.00
-0.50
-1.00
-1.50
-2.00
-2.50
-3.00
-3.50
-4.00
-4.50
0
5
10
15
20
Carbon Number

Time-on-Stream Plot for Co.012 - Run #4



CO.015 - Run #2

Co wt%	NM wt %	Promotor wt%		Support
20	Ru 0.43		La2O3 1.00	Al2O3

SUMMARY REACTION DATA

Reaction Conditions:

P = 1.0 atm
T = 220 °C
H2/CO = 2
weight of catalyst = 0.204 g
WHSV = 12.63 1/hr
time on stream = 24.5 hrs

CO2 (g/g cat/hr) = 0.025
CO2 (% of CO) = 0.1
O/P = 1.39

CO conversion (%)	7.0
rate (g CH2/g cat/hr)	0.39
alpha	0.64
C1 (wt%)	26.4
C2 - C4 (wt%)	28.4
C5 - C12 (wt%)	42.3
C13 + (wt%)	3.0

Performance of CO.015

Dates: 09/19/94 - 09/20/94 Run #2

flow rate = 90.0 cc/min, loading= 0.2 g, WHSV = 12.6 1/hr, H2/CO ratio in feed = 2

time on stream, hr	0.5	3.5	6.5	9.5	12.5	15.5
reaction temperature, °C	220	220	220	220	220	220
pressure, atm	1.0	1.0	1.0	1.0	1.0	1.0
flow, cc/min	90.0	90.0	90.0	90.0	90.0	90.0
C1 - C15 product distribution, weight %						
C1	26.54	27.62	26.41	28.28	26.68	26.80
C2	4.25	4.93	4.67	4.99	4.68	4.69
C3	12.55	12.81	12.15	12.76	12.01	11.97
C4	13.08	13.00	12.69	12.68	12.48	12.41
C5	12.31	11.55	12.13	10.76	12.05	11.90
C6	9.16	9.02	9.29	5.87	9.23	9.12
C7	7.33	7.01	7.44	7.94	7.51	7.48
C8	4.96	4.56	5.13	5.51	5.14	5.16
C9	3.30	3.24	3.45	3.79	3.48	3.52
C10	2.23	2.13	2.31	2.48	2.39	2.46
C11	1.62	1.54	1.65	1.86	1.66	1.70
C12	1.02	0.94	0.97	1.22	1.12	1.07
C13	0.69	0.68	0.72	0.75	0.66	0.73
C14	0.55	0.55	0.52	0.63	0.51	0.55
C15	0.42	0.44	0.45	0.47	0.42	0.46
alpha chain growth probability	0.64	0.64	0.64	0.65	0.64	0.64
C1 - C50 estimated total product distribution, weight %						
C1	26.1	27.1	25.9	27.9	26.3	26.3
C2 - C4	29.4	30.1	28.9	30.0	28.7	28.5
C5 - C12	41.8	39.9	42.2	39.1	42.3	42.2
C13 - C50	2.7	2.9	3.0	3.1	2.7	3.0
CO conversion, %	9.3	7.7	7.9	6.3	7.4	7.2
rate, g CH2/g cat/hr	0.51	0.42	0.44	0.35	0.41	0.40
CO2 formation, %	0.2	0.2	0.2	0.3	0.2	0.1

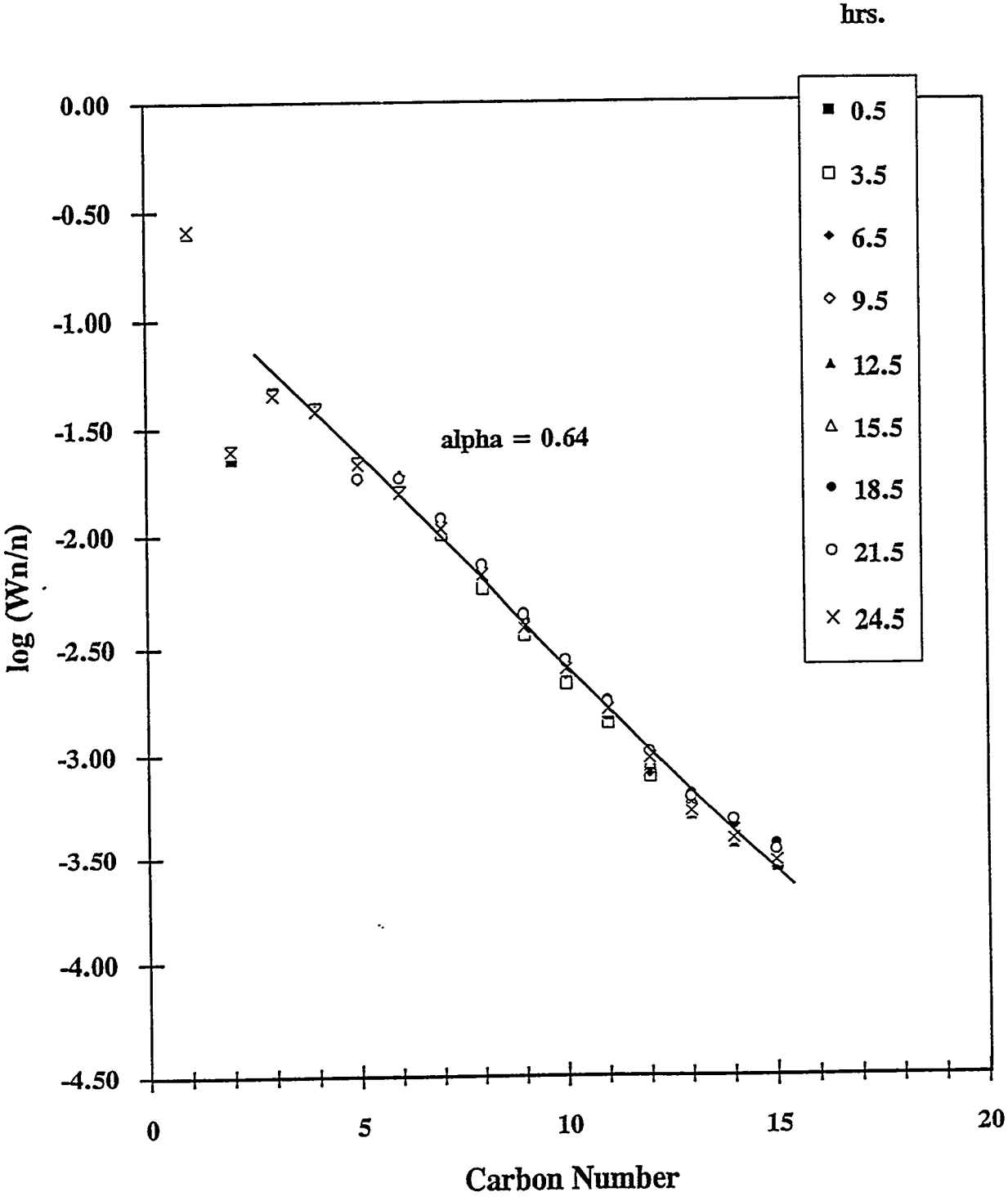
Performance of CO.015

Dates: 09/19/94 - 09/20/94 Run #2

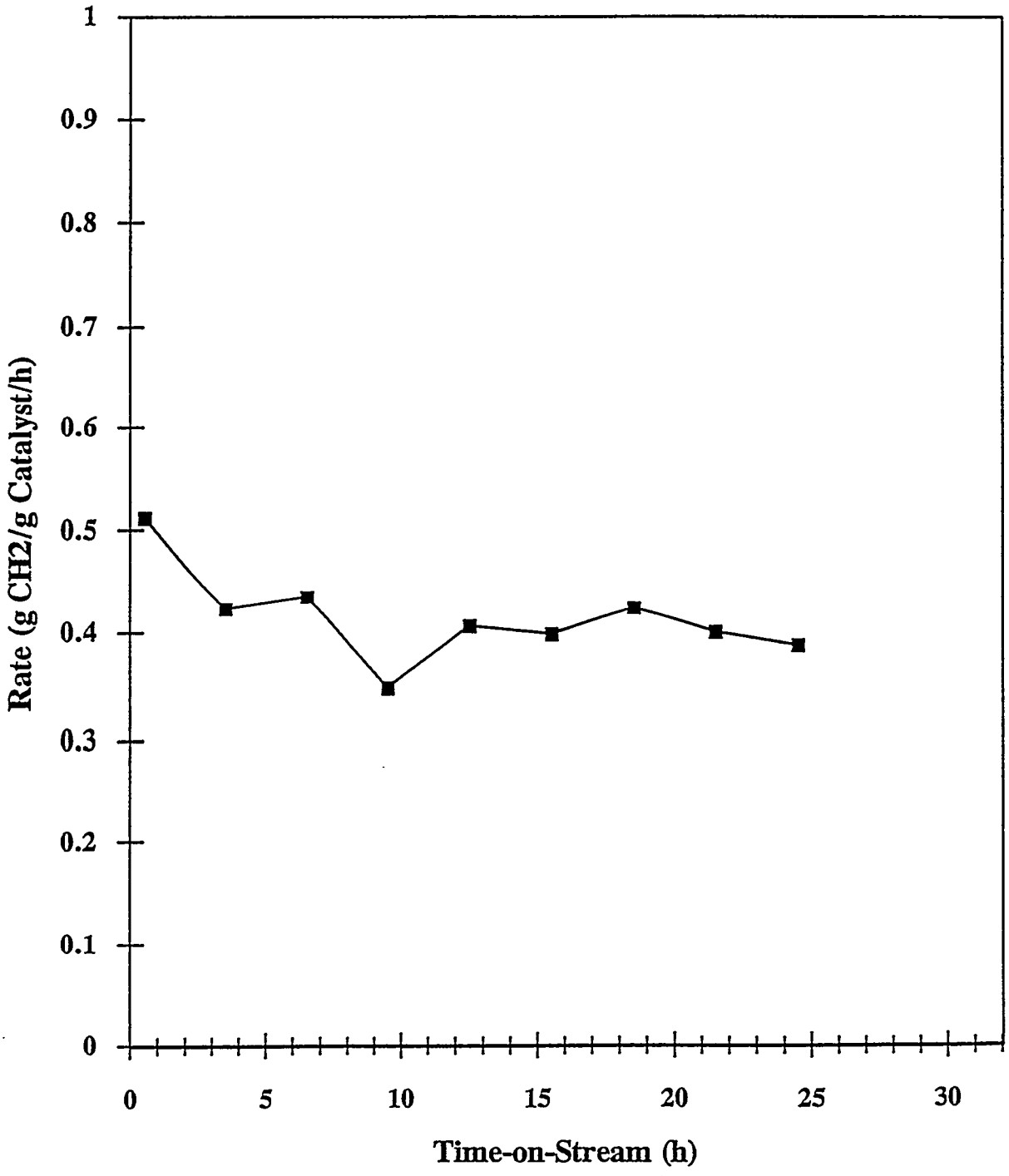
flow rate = 90.0 cc/min, loading= 0.2 g, WHSV = 12.6 1/hr, H2/CO ratio in feed = 2

time on stream, hr	18.5	21.5	24.5
reaction temperature, °C	220	220	220
pressure, atm	1.0	1.0	1.0
flow, cc/min	90.0	90.0	90.0
C1 - C15 product distribution, weight %			
C1	25.85	26.30	26.85
C2	4.52	4.59	4.69
C3	11.50	11.67	11.89
C4	11.84	11.94	12.27
C5	11.36	11.30	11.87
C6	8.74	8.27	9.20
C7	8.39	8.33	7.47
C8	5.83	5.78	5.21
C9	4.02	3.96	3.47
C10	2.76	2.75	2.48
C11	1.96	1.90	1.75
C12	1.20	1.23	1.14
C13	0.84	0.80	0.69
C14	0.63	0.67	0.55
C15	0.55	0.51	0.45
alpha chain growth probability	0.66	0.65	0.64
C1 - C50 estimated total product distribution, weight %			
C1	25.3	25.8	26.4
C2 - C4	27.2	27.7	28.4
C5 - C12	43.9	43.1	42.3
C13 - C50	3.6	3.4	3.0
CO conversion, %	7.7	7.2	7.0
rate, g CH2/g cat/hr	0.42	0.40	0.39
CO2 formation, %	0.1	0.2	0.1

Schulz-Flory Plot for Co.015 - Run #2
Time on Stream (hrs)



Time-on-Stream Plot for Co.015 - Run #2



Co.016 - Run #2

Co wt%	NM wt %	Promotor wt%		Support
20	Ru 0.43		La2O3 1.00	Al2O3

SUMMARY REACTION DATA

Reaction Conditions:

P = 1.0 atm
T = 220 °C
H2/CO = 2
weight of catalyst = 0.197 g
WHSV = 13.05 1/hr
time on stream = 27.5 hrs

CO2 (g/g cat/hr) = 0.024
CO2 (% of CO) = 0.1
O/P = 2.48

CO conversion (%)	5.1
rate (g CH2/g cat/hr)	0.29
alpha	0.68
C1 (wt%)	25.1
C2 - C4 (wt%)	26.6
C5 - C12 (wt%)	43.7
C13 + (wt%)	4.7

Performance of Co.016

Dates: 09/29/94 - 09/30/94 Run #2

flow rate = 90.0 cc/min, loading= 0.2 g, WHSV = 13.1 1/hr, H2/CO ratio in feed = 2

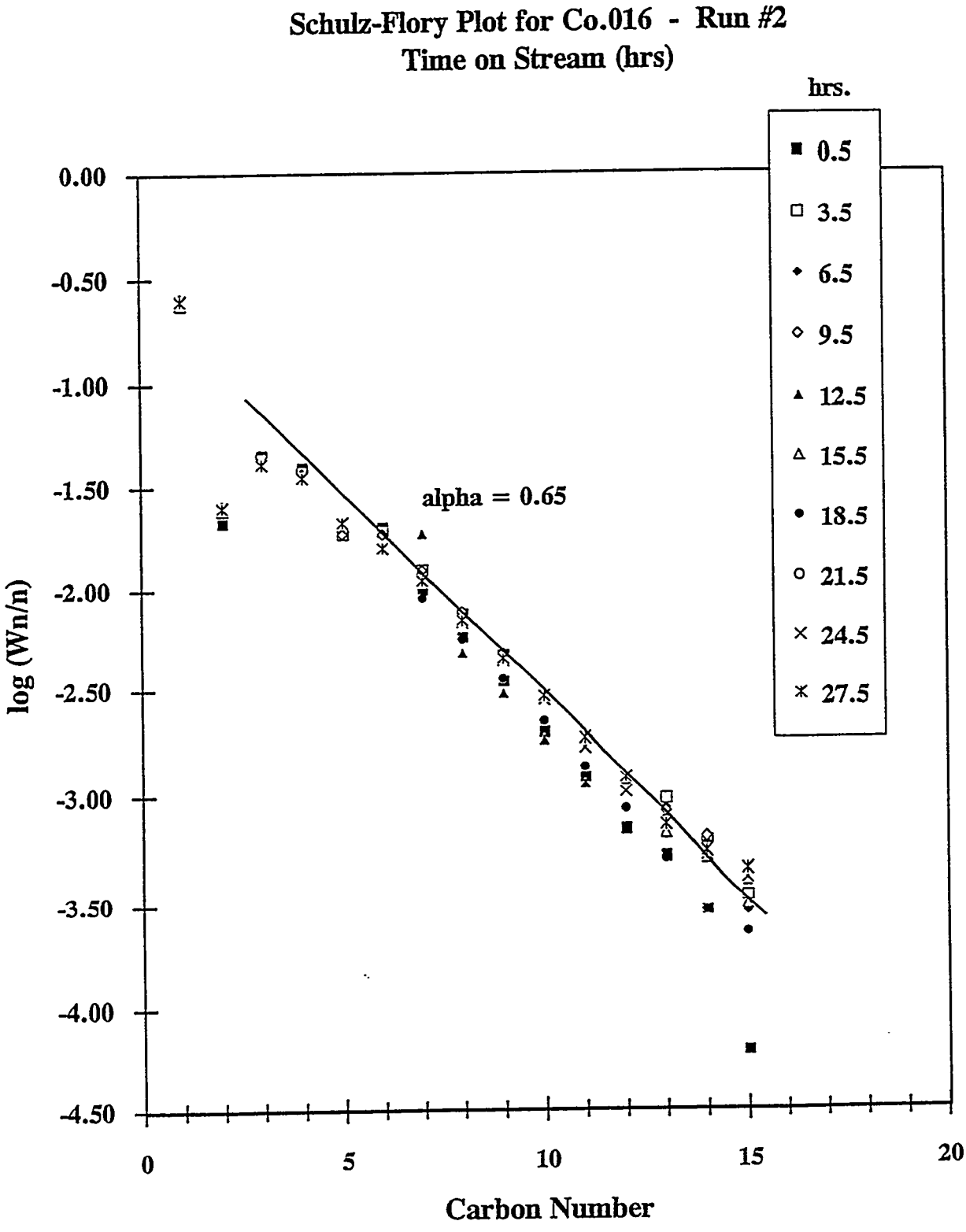
time on stream, hr	0.5	3.5	6.5	9.5	12.5	15.5
reaction temperature, °C	220	220	220	220	220	220
pressure, atm	1.0	1.0	1.0	1.0	1.0	1.0
flow, cc/min	90.0	90.0	90.0	90.0	90.0	90.0
C1 - C15 product distribution, weight %						
C1	38.10	23.78	24.85	24.88	25.24	28.28
C2	6.05	4.42	4.60	4.57	4.63	5.20
C3	14.71	11.42	11.62	11.35	11.40	12.62
C4	11.48	11.83	11.97	11.64	11.68	12.62
C5	9.58	11.64	11.41	11.53	11.68	11.85
C6	0.07	9.15	8.34	7.89	9.20	4.36
C7	6.95	8.65	8.58	8.64	12.99	7.68
C8	4.61	5.98	5.94	6.14	3.83	5.49
C9	3.09	4.18	4.15	4.29	2.71	3.94
C10	1.98	2.89	2.85	2.93	1.85	2.76
C11	1.34	2.00	1.96	2.06	1.25	1.91
C12	0.84	1.44	1.35	1.45	1.25	1.21
C13	0.70	1.25	1.12	1.08	0.92	0.87
C14	0.41	0.85	0.84	0.90	0.75	0.73
C15	0.09	0.53	0.44	0.65	0.62	0.47
alpha chain growth probability	0.56	0.65	0.64	0.67	0.67	0.65
C1 - C50 estimated total product distribution, weight %						
C1	38.7	23.5	24.7	24.3	24.4	27.9
C2 - C4	32.8	27.4	28.1	26.9	26.8	30.1
C5 - C12	27.9	45.6	44.3	44.5	44.7	38.9
C13 - C50	0.6	3.5	2.9	4.3	4.0	3.1
CO conversion, %	0.9	6.3	5.8	5.9	5.6	4.7
rate, g CH2/g cat/hr	0.05	0.36	0.33	0.34	0.32	0.27
CO2 formation, %	0.2	0.2	0.2	0.1	0.1	0.2

Performance of Co.016

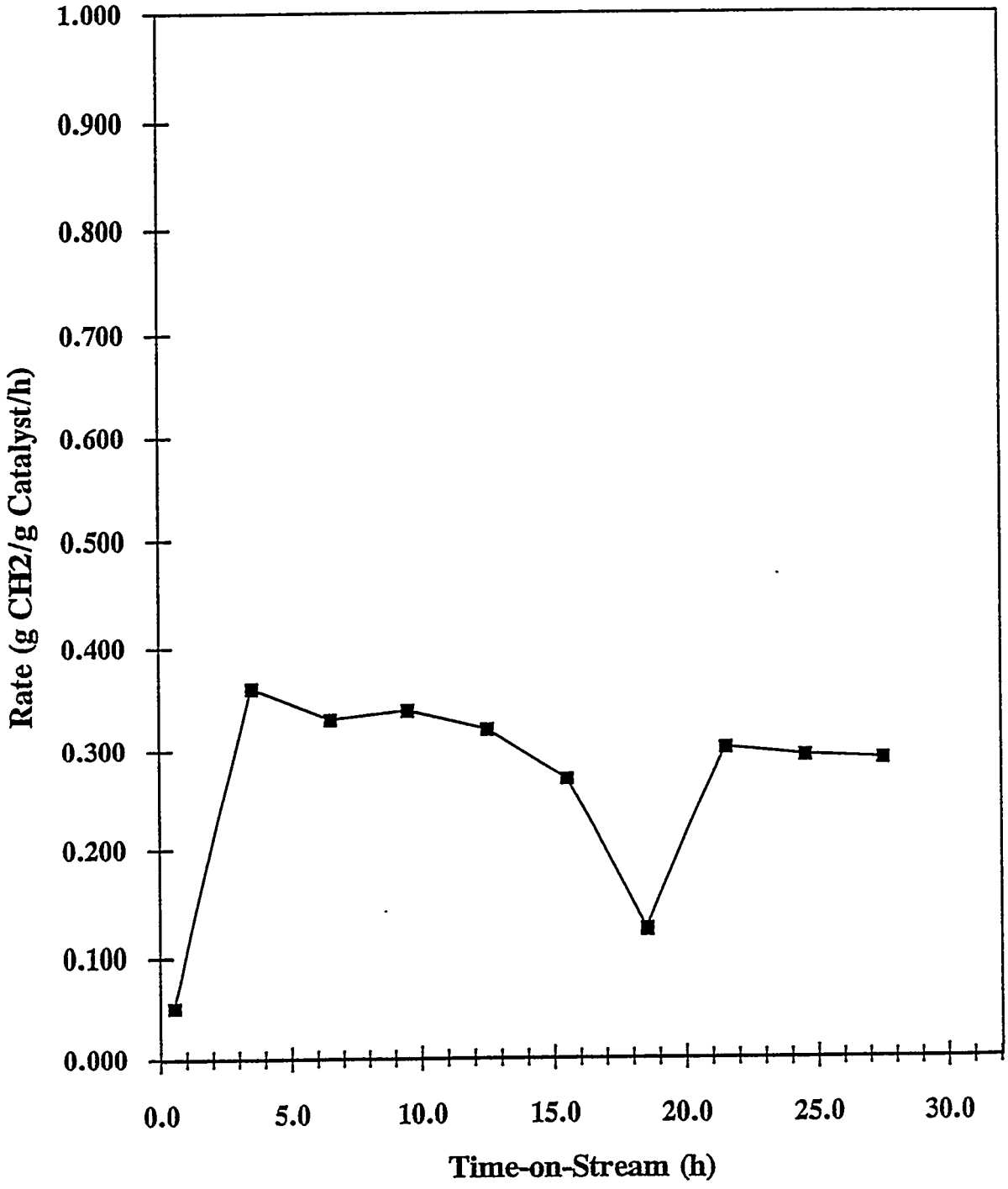
Dates: 09/29/94 - 09/30/94 Run #2

flow rate = 90.0 cc/min, loading= 0.2 g, WHSV = 13.1 l/hr, H2/CO ratio in feed = 2

time on stream, hr	18.5	21.5	24.5	27.5
reaction temperature, °C	220	220	220	220
pressure, atm	1.0	1.0	1.0	1.0
flow, cc/min	90.0	90.0	90.0	90.0
C1 - C15 product distribution, weight %				
C1	34.21	25.92	26.24	25.86
C2	6.02	4.75	4.81	4.74
C3	13.99	11.45	11.51	11.26
C4	12.77	11.67	11.68	11.42
C5	9.69	11.62	11.54	11.52
C6	3.22	9.29	9.06	9.04
C7	6.30	7.57	7.60	7.67
C8	4.46	5.41	5.41	5.59
C9	3.17	3.92	3.92	4.03
C10	2.21	2.75	2.79	2.91
C11	1.51	1.84	1.86	2.05
C12	1.03	1.42	1.24	1.46
C13	0.68	0.96	0.94	0.95
C14	0.41	0.78	0.75	0.78
C15	0.34	0.64	0.65	0.71
alpha chain growth probability	0.63	0.67	0.67	0.68
C1 - C50 estimated total product distribution, weight %				
C1	33.9	25.2	25.5	25.1
C2 - C4	32.5	27.1	27.2	26.6
C5 - C12	31.4	43.4	43.1	43.7
C13 - C50	2.2	4.2	4.2	4.7
CO conversion, %	2.2	5.3	5.2	5.1
rate, g CH2/g cat/hr	0.12	0.30	0.29	0.29
CO2 formation, %	0.3	0.1	0.1	0.1


Schulz-Flory Plot for Co.016 - Run #2
Time on Stream (hrs)
hrs.
0.5
3.5
6.5
9.5
12.5
15.5
18.5
21.5
24.5
27.5
alpha = 0.65
log (Wn/n)
0.00
-0.50
-1.00
-1.50
-2.00
-2.50
-3.00
-3.50
-4.00
-4.50
0
5
10
15
20
Carbon Number

Time-on-Stream Plot for Co.016 - Run #2



Co.019 - Run #3

Co wt%	NM wt %	Promotor wt%		Support
20	Ru 0.50			SiO2

SUMMARY REACTION DATA

Reaction Conditions:

P = 1.0 atm
T = 220 °C
H2/CO = 2
weight of catalyst = 0.273 g
WHSV = 9.43 1/hr
time on stream = 24.5 hrs

CO2 (g/g cat/hr) = 0.025
CO2 (% of CO) = 0.2
O/P = 6.74

CO conversion (%)	3.4
rate (g CH2/g cat/hr)	0.14
alpha	0.72
C1 (wt%)	19.3
C2 - C4 (wt%)	21.6
C5 - C12 (wt%)	50.4
C13 + (wt%)	8.7

Performance of Co.019

Dates: 07/05/94 - 07/06/94 Run #3

flow rate = 90.0 cc/min, loading= 0.3 g, WHSV = 9.4 1/hr, H2/CO ratio in feed = 2

time on stream, hr	0.5	3.5	6.5	9.5	12.5	15.5
reaction temperature, °C	220	220	220	220	220	220
pressure, atm	1.0	1.0	1.0	1.0	1.0	1.0
flow, cc/min	90.0	90.0	90.0	90.0	90.0	90.0
C1 - C15 product distribution, weight %						
C1	20.39	21.73	21.65	21.62	21.22	20.65
C2	4.18	4.41	4.41	4.44	4.40	4.32
C3	9.54	9.50	9.35	9.31	9.17	8.96
C4	10.44	10.23	10.07	9.98	9.86	9.52
C5	11.51	11.19	10.98	10.98	10.98	10.81
C6	10.24	10.15	9.99	9.25	9.42	9.31
C7	8.72	8.68	8.64	8.71	8.34	8.75
C8	6.64	6.63	6.68	6.86	6.90	7.02
C9	4.88	5.08	5.21	5.34	5.45	5.58
C10	3.61	3.93	4.09	4.16	4.31	4.42
C11	3.01	2.68	2.80	3.08	3.12	3.29
C12	2.19	1.89	2.21	2.29	2.42	2.51
C13	1.80	1.48	1.53	1.60	1.85	1.95
C14	1.50	1.36	1.38	1.35	1.46	1.63
C15	1.35	1.08	1.00	1.04	1.11	1.29
alpha chain growth probability	0.72	0.71	0.71	0.71	0.71	0.73
C1 - C50 estimated total product distribution, weight %						
C1	19.2	20.8	20.9	20.9	20.5	19.7
C2 - C4	22.7	23.1	23.1	23.0	22.7	21.8
C5 - C12	49.0	48.9	49.2	49.0	49.3	49.6
C13 - C50	9.1	7.3	6.8	7.1	7.6	8.9
CO conversion, %	4.7	4.2	4.0	3.9	3.7	3.7
rate, g CH2/g cat/hr	0.20	0.17	0.16	0.16	0.15	0.15
CO2 formation, %	0.3	0.2	0.2	0.2	0.2	0.2

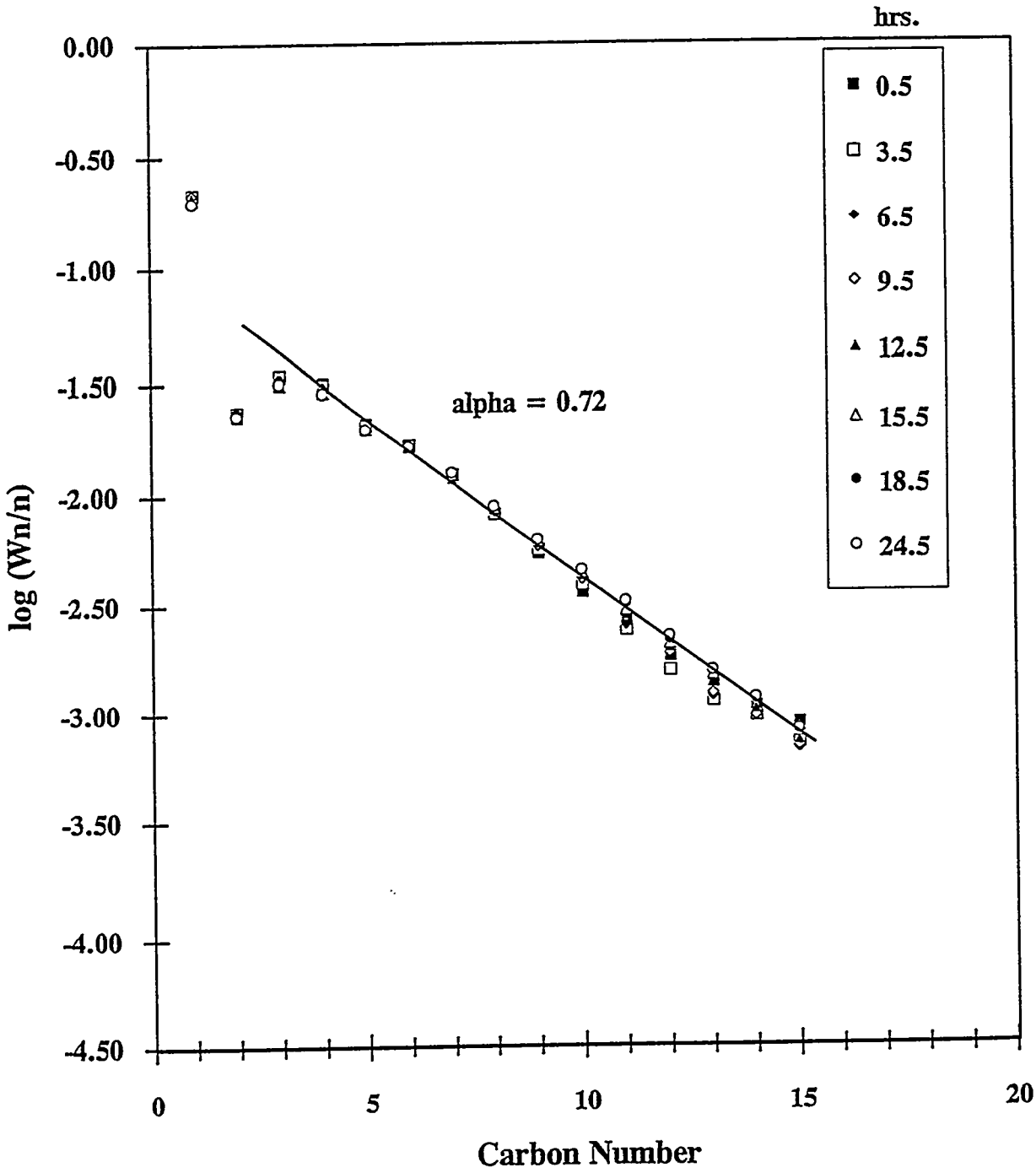
Performance of Co.019

Dates: 07/05/94 - 07/06/94 Run #3

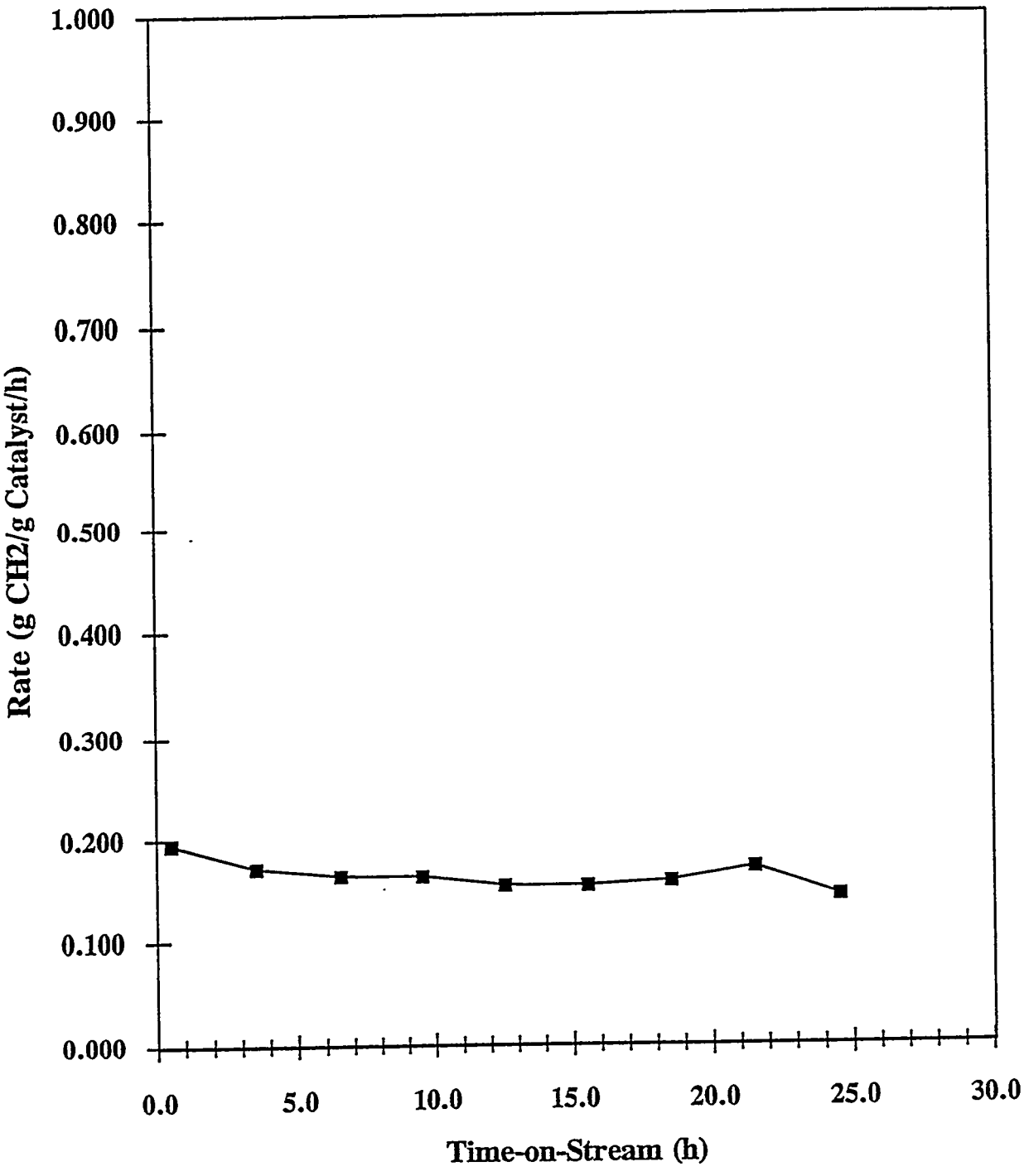
flow rate = 90.0 cc/min, loading= 0.3 g, WHSV = 9.4 1/hr, H2/CO ratio in feed = 2

time on stream, hr	18.5	21.5	24.5	29.5	32.5
reaction temperature, °C	220	220	220	220	220
pressure, atm	1.0	1.0	1.0	1.0	1.0
flow, cc/min	90.0	90.0	90.0	22.5	22.5
C1 - C15 product distribution, weight %					
C1	20.51	21.52	20.01	19.33	15.23
C2	4.31	4.51	4.27	3.64	2.94
C3	8.92	9.31	8.77	8.59	6.86
C4	9.43	9.63	9.37	9.39	8.03
C5	10.69	10.77	10.68	10.31	9.57
C6	9.23	9.20	9.51	9.52	9.34
C7	8.76	8.63	8.80	8.67	8.78
C8	7.07	6.90	7.14	7.18	7.76
C9	5.59	5.38	5.63	5.97	6.80
C10	4.51	4.20	4.56	4.80	5.96
C11	3.50	3.24	3.61	3.79	5.19
C12	2.60	2.48	2.72	3.12	4.50
C13	2.03	1.75	2.04	2.29	3.45
C14	1.61	1.42	1.63	1.83	3.06
C15	1.25	1.06	1.25	1.58	2.51
alpha chain growth probability	0.72	0.71	0.72	0.74	0.79
C1 - C50 estimated total product distribution, weight %					
C1	19.7	20.9	19.3	18.2	13.7
C2 - C4	21.8	22.8	21.6	20.4	16.0
C5 - C12	49.8	49.0	50.4	50.3	51.4
C13 - C50	8.7	7.3	8.7	11.1	18.9
CO conversion, %	3.8	4.1	3.4	16.7	8.8
rate, g CH2/g cat/hr	0.16	0.17	0.14	0.17	0.09
CO2 formation, %	0.2	0.2	0.2	1.0	0.5

Schulz-Flory Plot for Co.019 - Run #3
Time on Stream (hrs)



Time-on-Stream Plot for Co.019 - Run #3



Co.019 - Run #3h

Co wt%	NM wt %	Promotor wt%		Support
20	Ru 0.50			SiO2

SUMMARY REACTION DATA*

Reaction Conditions:

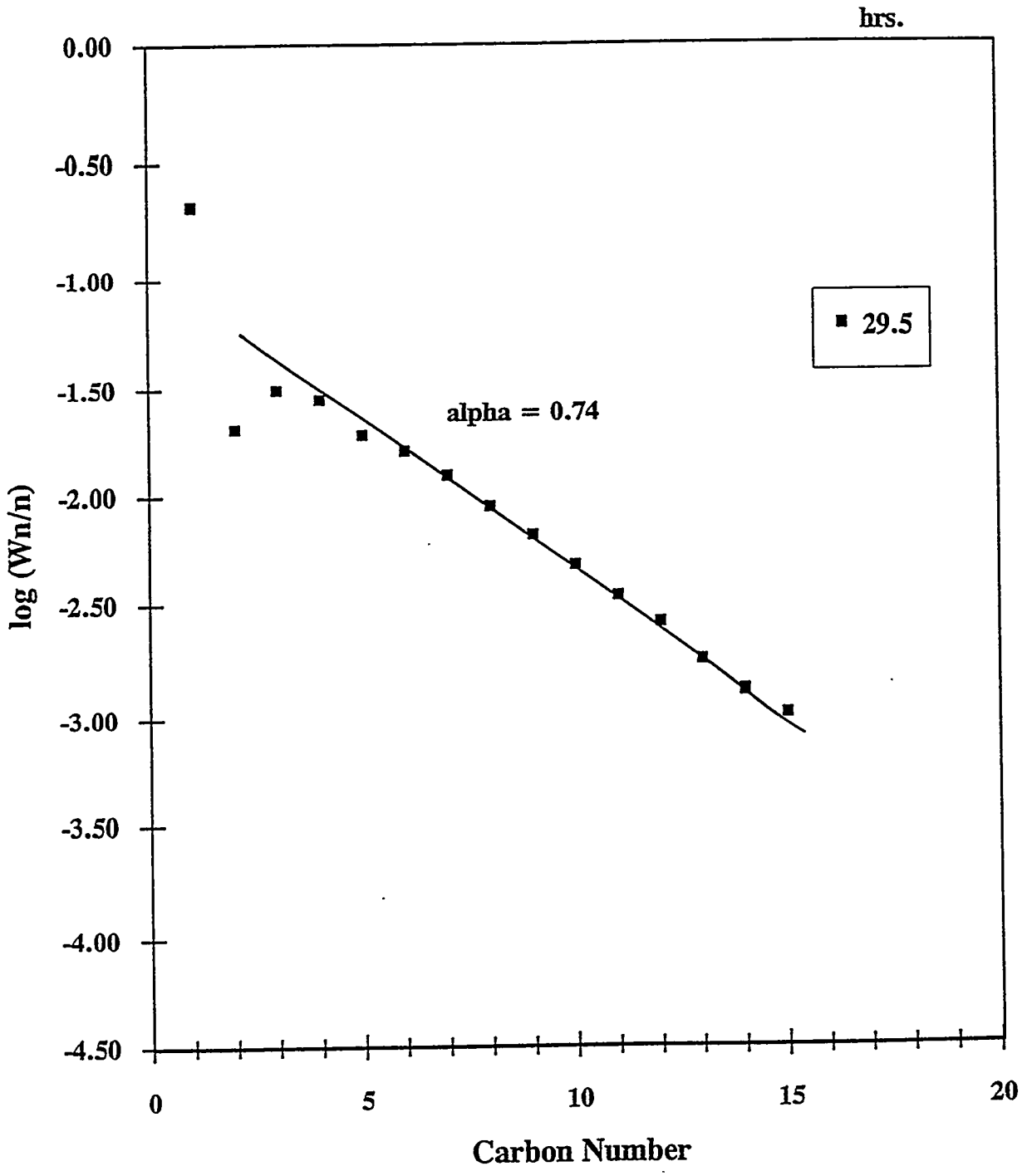
P = 1.0 atm
T = 220 °C
H2/CO = 2
weight of catalyst = 0.273 g
WHSV = 2.36 1/hr
time on stream = 29.5 hrs

CO2 (g/g cat/hr) = 0.034
CO2 (% of CO) = 1.0
O/P = 1.77

CO conversion (%)	16.7
rate (g CH2/g cat/hr)	0.17
alpha	0.74
C1 (wt%)	18.2
C2 - C4 (wt%)	20.4
C5 - C12 (wt%)	50.3
C13 + (wt%)	11.1

* High conversion study

Schulz-Flory Plot for Co.019 - Run #3h
Time on Stream (hrs)



Co.032 - Run #1

Co wt%	NM wt %	Promotor wt%		Support
20			Zr 8.50	Al2O3

SUMMARY REACTION DATA

Reaction Conditions:

P = 1.0 atm
T = 220 °C
H2/CO = 2
weight of catalyst = 0.200 g
WHSV = 12.86 1/hr
time on stream = 27.1 hrs

CO2 (g/g cat/hr) = 0.022
CO2 (% of CO) = 0.1
O/P = 5.28

CO conversion (%)	3.3
rate (g CH2/g cat/hr)	0.18
alpha	0.70
C1 (wt%)	22.0
C2 - C4 (wt%)	24.9
C5 - C12 (wt%)	46.8
C13 + (wt%)	6.3

Performance of Co.032

Dates: 09/14/94 - 09/15/94 Run #1

flow rate = 90.0 cc/min, loading= 0.2 g, WHSV = 12.9 1/hr, H2/CO ratio in feed = 2

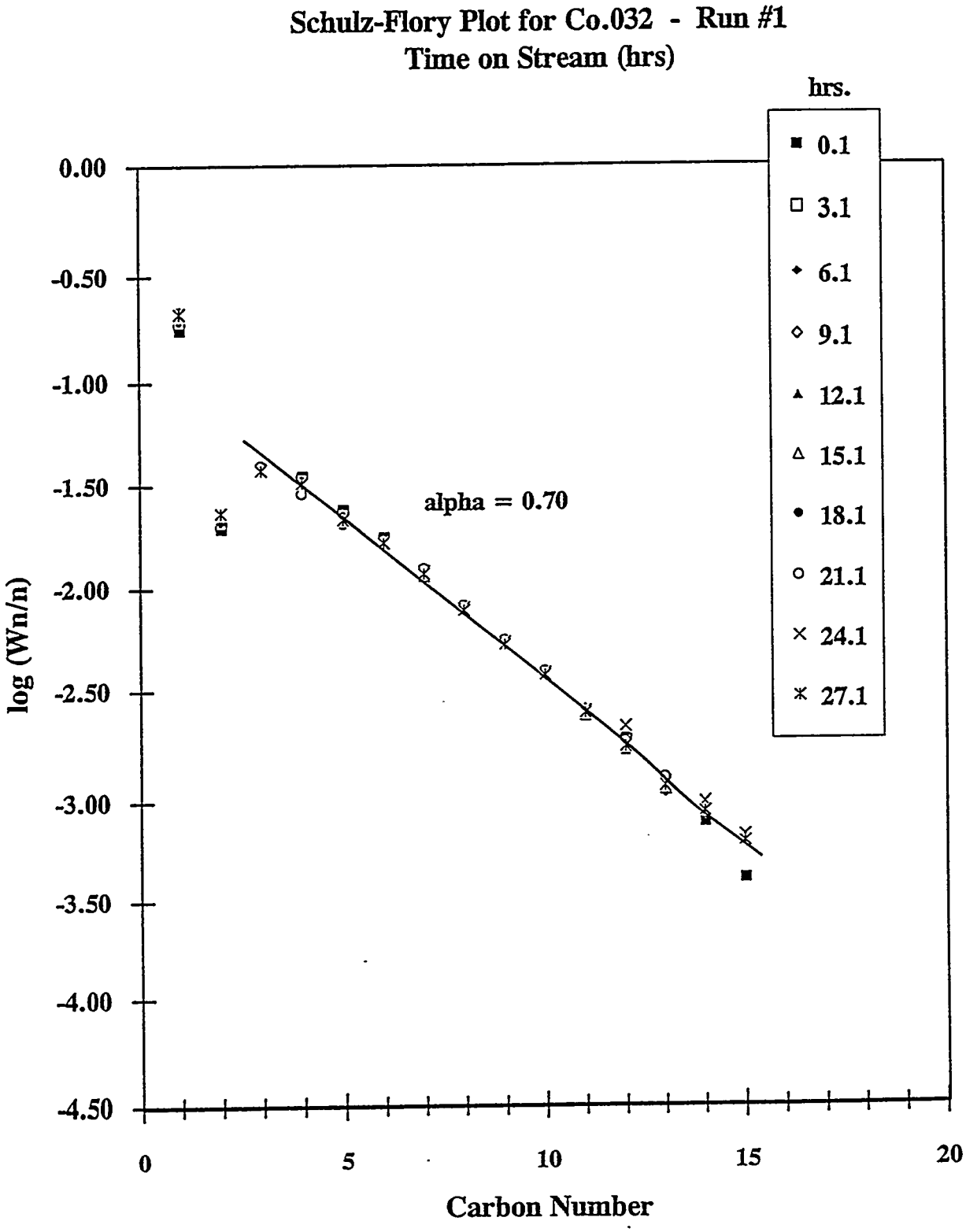
time on stream, hr	0.1	3.1	6.1	9.1	12.1	15.1
reaction temperature, °C	220	220	220	220	220	220
pressure, atm	1.0	1.0	1.0	1.0	1.0	1.0
flow, cc/min	90.0	90.0	90.0	90.0	90.0	90.0
C1 - C15 product distribution, weight %						
C1	20.50	20.57	20.98	21.50	21.65	21.91
C2	4.09	4.04	4.09	4.19	4.23	4.31
C3	11.07	10.29	10.16	10.27	10.21	10.25
C4	12.48	11.50	11.24	11.21	11.06	11.09
C5	12.49	12.37	12.05	12.00	11.84	11.92
C6	8.40	9.18	9.82	9.09	9.09	9.25
C7	8.33	8.54	8.40	8.46	8.48	8.01
C8	6.23	6.37	6.32	6.41	6.40	6.32
C9	4.74	4.82	4.79	4.81	4.80	4.85
C10	3.70	3.74	3.71	3.77	3.79	3.75
C11	2.69	2.66	2.83	2.69	2.74	2.62
C12	2.03	2.17	2.04	1.98	1.98	2.01
C13	1.53	1.47	1.41	1.47	1.50	1.54
C14	1.10	1.25	1.19	1.21	1.29	1.24
C15	0.61	1.02	0.95	0.94	0.94	0.92
alpha chain growth probability	0.67	0.70	0.70	0.70	0.70	0.70
C1 - C50 estimated total product distribution, weight %						
C1	20.5	19.8	20.3	20.8	21.0	21.3
C2 - C4	27.6	24.8	24.7	24.8	24.7	24.9
C5 - C12	47.8	48.5	48.7	48.1	48.0	47.7
C13 - C50	4.1	6.9	6.4	6.3	6.3	6.2
CO conversion, %	3.5	3.8	3.7	3.6	3.5	3.3
rate, g CH2/g cat/hr	0.20	0.21	0.21	0.20	0.20	0.19
CO2 formation, %	0.2	0.1	0.1	0.1	0.1	0.1

Performance of Co.032

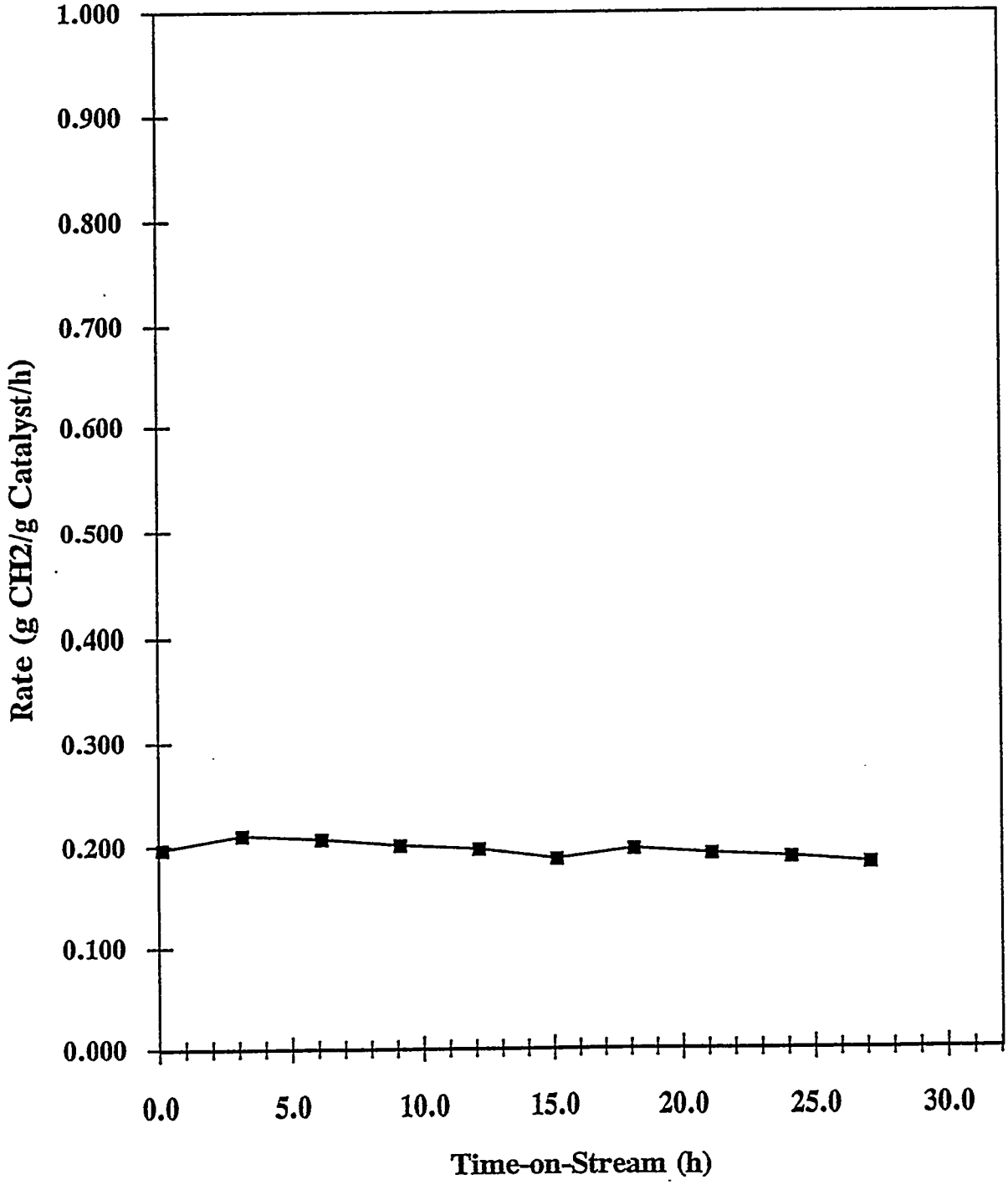
Dates: 09/14/94 - 09/15/94 Run #1

flow rate = 90.0 cc/min, loading= 0.2 g, WHSV = 12.9 1/hr, H2/CO ratio in feed = 2

time on stream, hr	18.1	21.1	24.1	27.1
reaction temperature, °C	220	220	220	220
pressure, atm	1.0	1.0	1.0	1.0
flow, cc/min	90.0	90.0	90.0	90.0
C1 - C15 product distribution, weight %				
C1	22.06	21.81	21.69	22.71
C2	4.36	4.33	4.34	4.54
C3	10.29	10.10	9.98	10.32
C4	10.90	10.68	10.55	10.84
C5	11.60	11.33	11.90	11.47
C6	8.93	8.68	8.76	8.77
C7	8.28	8.73	8.44	8.24
C8	6.20	6.56	6.41	6.20
C9	4.78	5.01	4.87	4.74
C10	3.75	3.90	3.83	3.75
C11	2.70	2.72	2.76	2.69
C12	2.35	2.16	2.53	2.05
C13	1.52	1.62	1.54	1.51
C14	1.30	1.35	1.39	1.25
C15	0.98	1.02	1.02	0.94
alpha chain growth probability	0.70	0.71	0.70	0.70
C1 - C50 estimated total product distribution, weight %				
C1	21.4	21.0	21.0	22.0
C2 - C4	24.8	24.2	24.1	24.9
C5 - C12	47.3	47.8	48.0	46.8
C13 - C50	6.6	6.9	6.9	6.3
CO conversion, %	3.5	3.4	3.4	3.3
rate, g CH2/g cat/hr	0.20	0.19	0.19	0.18
CO2 formation, %	0.1	0.1	0.1	0.1


Schulz-Flory Plot for Co.032 - Run #1
Time on Stream (hrs)
hrs.
0.1
3.1
6.1
9.1
12.1
15.1
18.1
21.1
24.1
27.1
alpha = 0.70
log (Wn/n)
0.00
-0.50
-1.00
-1.50
-2.00
-2.50
-3.00
-3.50
-4.00
-4.50
0
5
10
15
20
Carbon Number

Time-on-Stream Plot for Co.032 - Run #1



Co.033 - Run #1

Co wt%	NM wt %	Promotor wt%		Support
20			Zr 8.50	Al2O3

SUMMARY REACTION DATA

Reaction Conditions:

P = 1.0 atm
T = 217 °C
H2/CO = 2
weight of catalyst = 0.194 g
WHSV = 13.27 1/hr
time on stream = 30.5 hrs

CO2 (g/g cat/hr) = 0.020
CO2 (% of CO) = 0.1
O/P = 7.36

CO conversion (%)	1.3
rate (g CH2/g cat/hr)	0.07
alpha	0.67
C1 (wt%)	24.1
C2 - C4 (wt%)	28.1
C5 - C12 (wt%)	44.0
C13 + (wt%)	3.8

Performance of Co.033

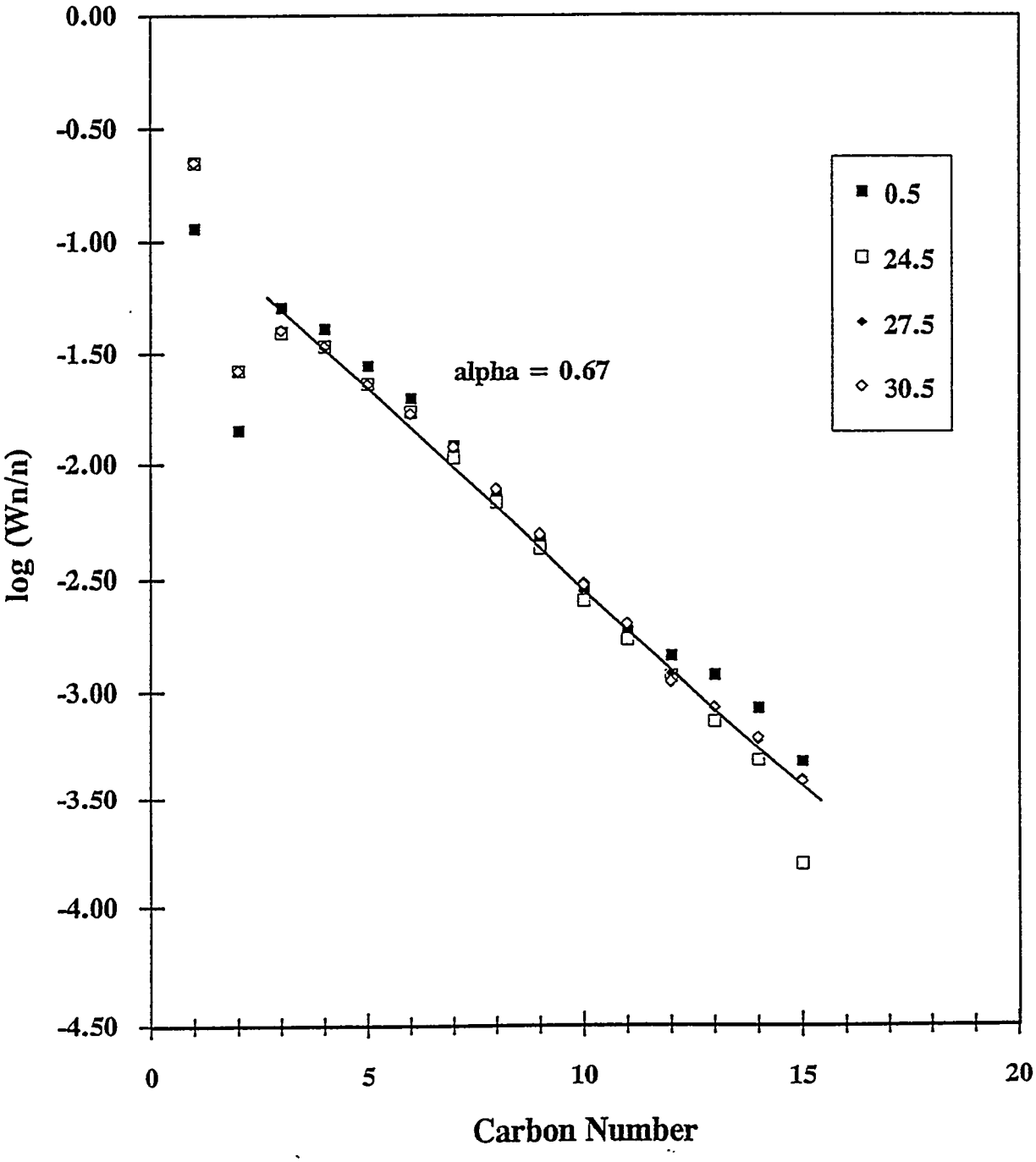
Dates: 08/29/94 - 08/30/94 Run #1

flow rate = 90.0 cc/min, loading= 0.2 g, WHSV = 13.3 1/hr, H2/CO ratio in feed = 2

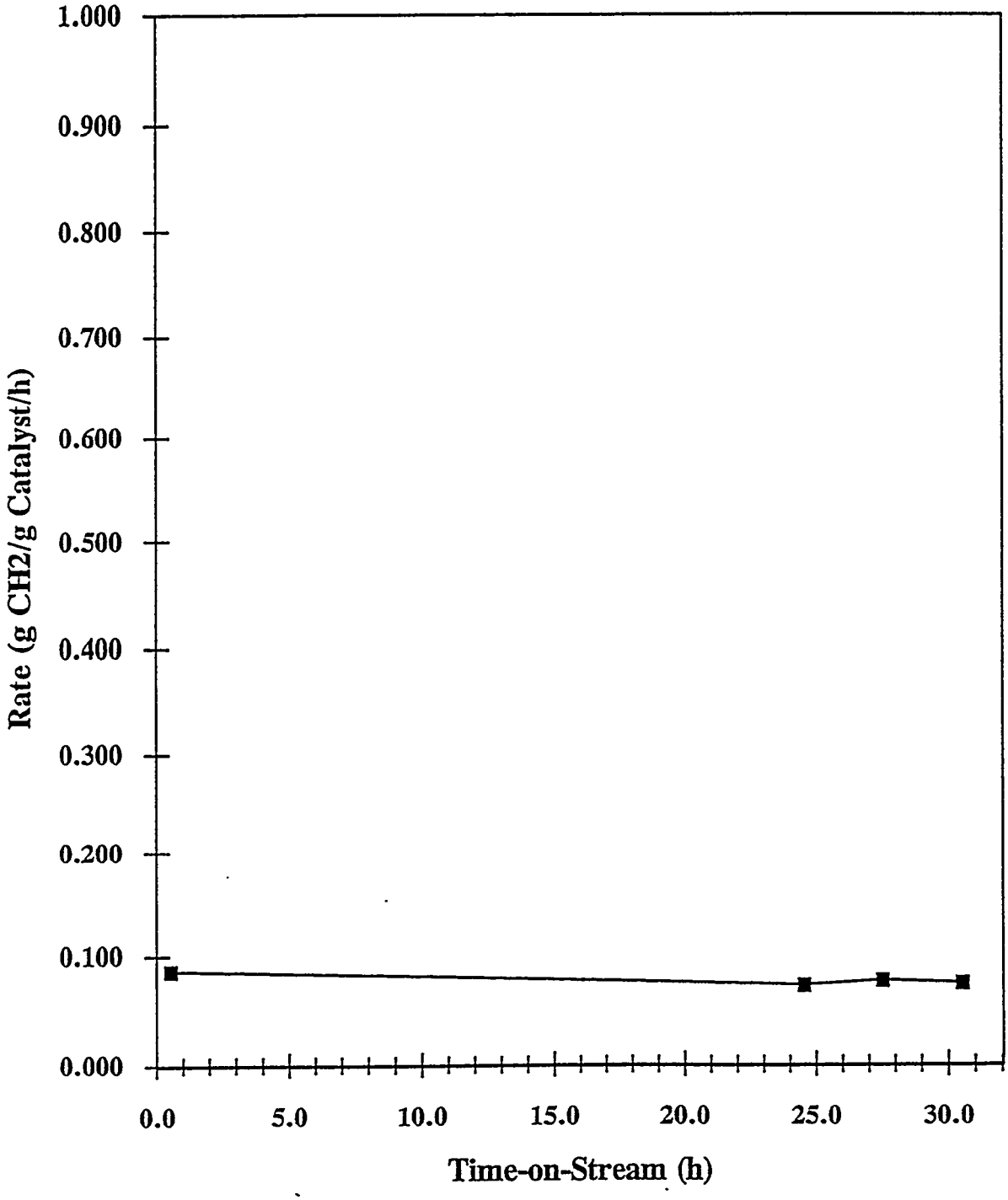
time on stream, hr	0.5	24.5	27.5	30.5
reaction temperature, °C	217	217	217	217
pressure, atm	1.0	1.0	1.0	1.0
flow, cc/min	90.0	90.0	90.0	90.0
C1 - C15 product distribution, weight %				
C1	22.02	23.36	24.68	24.50
C2	5.01	5.03	5.29	5.26
C3	12.12	11.00	11.53	11.44
C4	13.26	20.38	11.91	11.80
C5	13.98	11.11	12.49	12.53
C6	5.00	4.69	6.06	6.46
C7	8.42	7.46	8.33	8.35
C8	5.92	5.38	6.15	6.18
C9	4.10	3.85	4.35	4.38
C10	2.92	2.57	3.08	2.99
C11	2.06	1.88	2.15	2.22
C12	1.73	1.42	1.44	1.33
C13	1.55	0.97	1.11	1.11
C14	1.19	0.68	0.84	0.87
C15	0.72	0.23	0.60	0.58
alpha chain growth probability	0.67	0.61	0.67	0.67
C1 - C50 estimated total product distribution, weight %				
C1	21.6	23.7	24.3	24.1
C2 - C4	29.7	37.0	28.2	28.1
C5 - C12	44.0	37.7	43.5	44.0
C13 - C50	4.7	1.6	4.0	3.8
CO conversion, %	1.5	1.2	1.3	1.3
rate, g CH2/g cat/hr	0.09	0.07	0.08	0.07
CO2 formation, %	0.1	0.1	0.1	0.1

Schulz-Flory Plot for Co.033 - Run #1
Time on Stream (hrs)

hrs.



Time-on-Stream Plot for Co.033 - Run #1



Co.034 - Run #1

Co wt%	NM wt %	Promotor wt%		Support
20			Zr 8.50	Al2O3

SUMMARY REACTION DATA

Reaction Conditions:

P = 1.0 atm
T = 220 °C
H2/CO = 2
weight of catalyst = 0.203 g
WHSV = 12.67 1/hr
time on stream = 30.0 hrs

CO2 (g/g cat/hr) = 0.018
CO2 (% of CO) = 0.1
O/P = 4.29

CO conversion (%)	5.0
rate (g CH2/g cat/hr)	0.27
alpha	0.67
C1 (wt%)	24.0
C2 - C4 (wt%)	26.7
C5 - C12 (wt%)	45.3
C13 + (wt%)	4.0

Performance of Co.034

Dates: 08/26/94 - 08/27/94 Run #1

flow rate = 90.0 cc/min, loading= 0.2 g, WHSV = 12.7 l/hr, H2/CO ratio in feed = 2

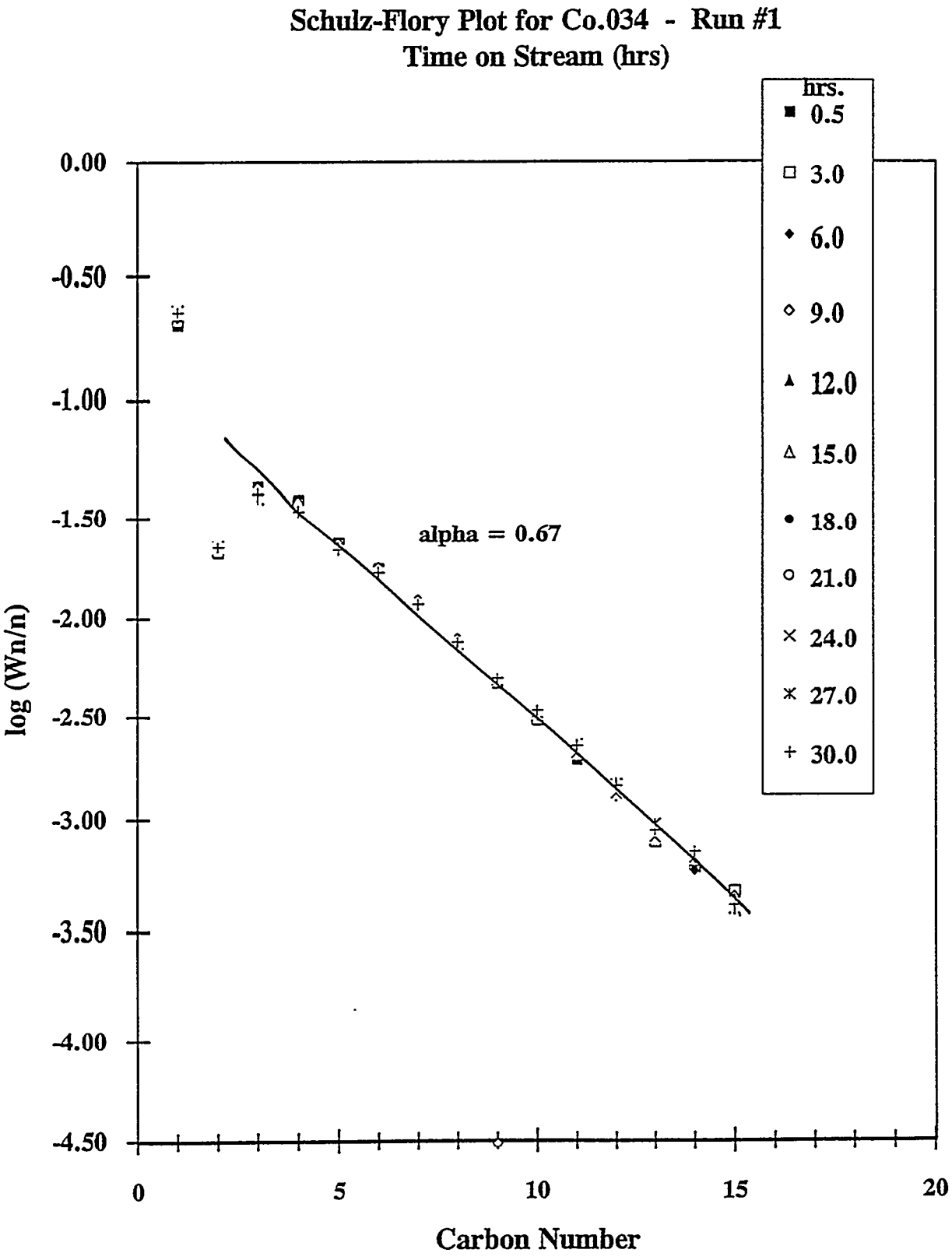
time on stream, hr	0.5	3.0	6.0	9.0	12.0	15.0
reaction temperature, °C	220	220	220	220	220	220
pressure, atm	1.0	1.0	1.0	1.0	1.0	1.0
flow, cc/min	90.0	90.0	90.0	90.0	90.0	90.0
C1 - C15 product distribution, weight %						
C1	21.45	22.14	22.28	23.63	22.97	23.08
C2	3.98	4.03	4.02	4.24	4.10	4.12
C3	11.70	11.49	11.23	11.67	11.16	11.07
C4	12.75	12.29	12.06	12.43	11.78	11.61
C5	12.86	12.44	12.40	12.80	12.08	11.95
C6	9.66	9.65	10.01	10.33	9.74	9.49
C7	8.22	8.08	8.20	8.50	8.11	8.11
C8	5.88	5.94	6.02	6.33	5.99	6.02
C9	4.19	4.28	4.40	0.03	4.39	4.43
C10	3.02	3.08	3.16	3.37	3.25	3.29
C11	2.13	2.45	2.23	2.38	2.28	2.48
C12	1.61	1.60	1.53	1.64	1.60	1.78
C13	1.07	1.02	1.05	1.12	1.07	1.10
C14	0.87	0.83	0.79	0.88	0.83	0.88
C15	0.61	0.68	0.61	0.65	0.63	0.58
alpha chain growth probability	0.66	0.67	0.67	0.67	0.67	0.66
C1 - C50 estimated total product distribution, weight %						
C1	21.1	21.6	21.9	23.2	22.5	22.9
C2 - C4	27.9	27.2	26.8	27.8	26.5	26.6
C5 - C12	47.0	46.7	47.3	44.7	46.7	46.7
C13 - C50	4.0	4.5	4.1	4.3	4.2	3.9
CO conversion, %	6.0	6.0	5.6	5.2	5.4	5.2
rate, g CH2/g cat/hr	0.33	0.33	0.31	0.29	0.30	0.29
CO2 formation, %	0.1	0.1	0.1	0.1	0.1	0.1

Performance of Co.034

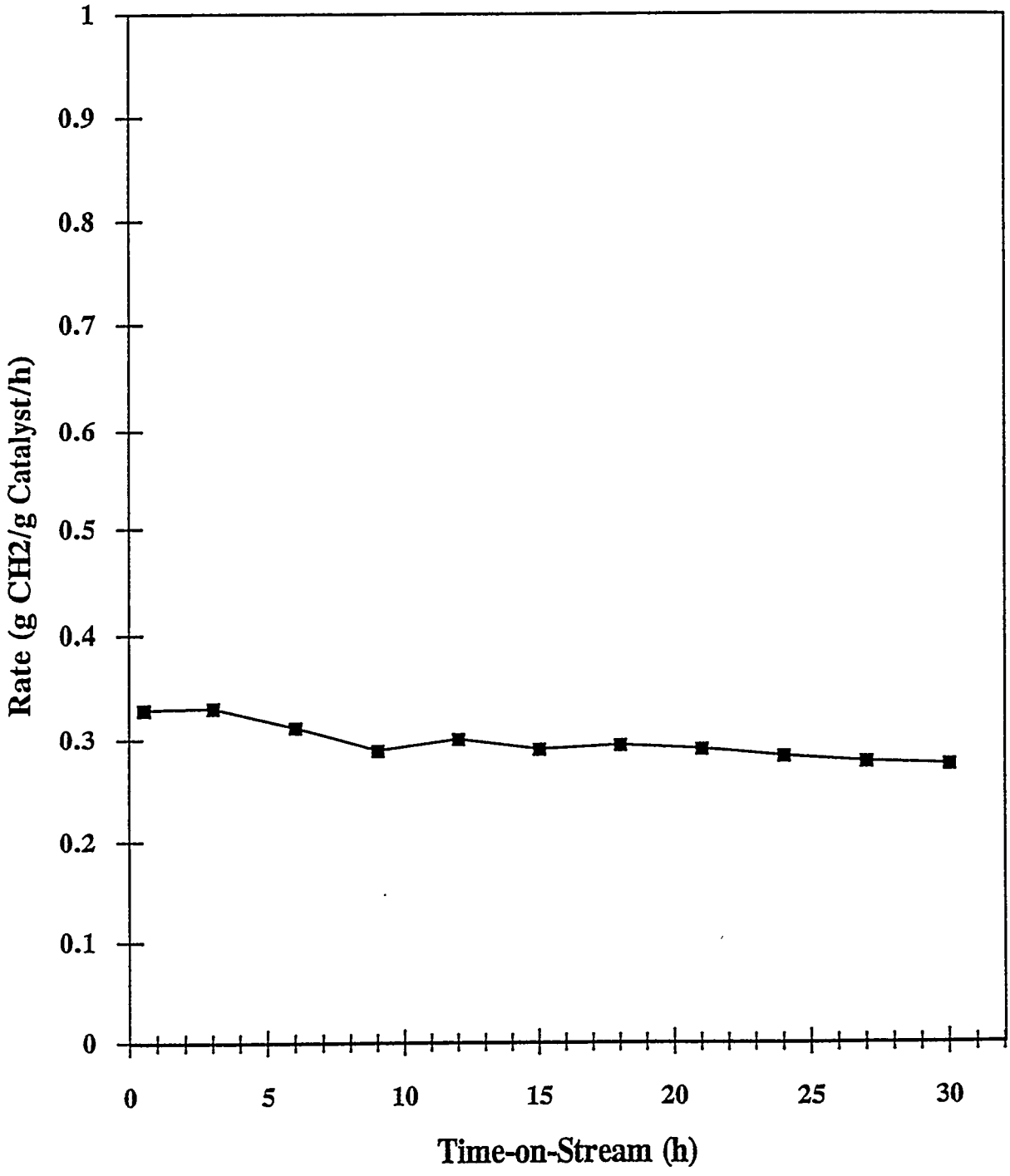
Dates: 08/26/94 - 08/27/94 Run #1

flow rate = 90.0 cc/min, loading= 0.2 g, WHSV = 12.7 1/hr, H2/CO ratio in feed = 2

time on stream, hr	18.0	21.0	24.0	27.0	30.0
reaction temperature, °C	220	220	220	220	220
pressure, atm	1.0	1.0	1.0	1.0	1.0
flow, cc/min	90.0	90.0	90.0	90.0	90.0
C1 - C15 product distribution, weight %					
C1	23.30	23.38	23.60	23.78	24.19
C2	4.14	4.15	4.19	4.22	4.29
C3	11.07	11.01	11.05	11.05	11.19
C4	11.51	11.43	11.45	11.38	11.48
C5	11.87	11.78	11.85	11.67	11.81
C6	9.62	9.51	9.67	9.21	7.99
C7	8.08	8.12	8.11	8.04	8.16
C8	5.99	6.00	5.98	5.97	6.08
C9	4.39	4.46	4.38	4.37	4.48
C10	3.29	3.32	3.27	3.31	3.40
C11	2.48	2.45	2.29	2.52	2.49
C12	1.68	1.71	1.60	1.76	1.74
C13	1.09	1.18	1.06	1.22	1.14
C14	0.91	0.92	0.93	0.91	0.98
C15	0.58	0.57	0.57	0.58	0.60
alpha chain growth probability	0.66	0.66	0.66	0.67	0.67
C1 - C50 estimated total product distribution, weight %					
C1	23.1	23.2	23.3	23.6	24.0
C2 - C4	26.5	26.4	26.4	26.5	26.7
C5 - C12	46.6	46.6	46.5	46.0	45.3
C13 - C50	3.9	3.8	3.8	3.9	4.0
CO conversion, %	5.3	5.2	5.1	5.0	5.0
rate, g CH2/g cat/hr	0.29	0.29	0.28	0.28	0.27
CO2 formation, %	0.1	0.1	0.1	0.1	0.1


Schulz-Flory Plot for Co.034 - Run #1
Time on Stream (hrs)
hrs.
0.5
3.0
6.0
9.0
12.0
15.0
18.0
21.0
24.0
27.0
30.0
alpha = 0.67
log (Wn/n)
0.00
-0.50
-1.00
-1.50
-2.00
-2.50
-3.00
-3.50
-4.00
-4.50
0
5
10
15
20
Carbon Number

Time-on-Stream Plot for Co.034 - Run #1



Co.055 - Run #1

Co wt%	NM wt %	Promotor wt%		Support
20	Re 1.00		La2O3 1.00	Al2O3

SUMMARY REACTION DATA

Reaction Conditions:

P = 1.0 atm
T = 220 °C
H2/CO = 2
weight of catalyst = 0.208 g
WHSV = 12.36 1/hr
time on stream = 21.3 hrs

CO2 (g/g cat/hr) = 0.034
CO2 (% of CO) = 0.2
O/P = 1.31

CO conversion (%)	9.1
rate (g CH2/g cat/hr)	0.49
alpha	0.63
C1 (wt%)	28.9
C2 - C4 (wt%)	28.8
C5 - C12 (wt%)	40.0
C13 + (wt%)	2.2

Performance of Co.055

Dates: 09/01/94 - 09/02/94 Run #1

flow rate = 90.0 cc/min, loading= 0.2 g, WHSV = 12.4 1/hr, H2/CO ratio in feed = 2

time on stream, hr	0.3	3.3	6.3	9.3	12.3	21.3
reaction temperature, °C	220	220	220	220	220	220
pressure, atm	1.0	1.0	1.0	1.0	1.0	1.0
flow, cc/min	90.0	90.0	90.0	90.0	90.0	90.0
C1 - C15 product distribution, weight %						
C1	27.41	28.60	28.58	30.85	29.60	29.05
C2	4.66	4.75	4.69	5.02	4.79	4.65
C3	12.79	12.74	12.57	13.35	12.75	12.29
C4	13.03	11.14	12.64	7.77	12.70	12.04
C5	11.97	11.82	11.73	12.11	11.74	11.04
C6	8.71	8.86	7.94	7.83	6.82	6.39
C7	7.01	7.19	7.12	7.46	7.09	8.03
C8	4.79	5.03	5.01	5.27	5.00	5.65
C9	3.28	3.38	3.43	3.57	3.37	3.84
C10	2.13	2.17	2.21	2.36	2.23	2.58
C11	1.51	1.59	1.60	1.72	1.58	1.80
C12	1.04	1.04	0.94	1.11	1.00	1.10
C13	0.75	0.74	0.61	0.75	0.58	0.71
C14	0.55	0.56	0.44	0.47	0.40	0.50
C15	0.38	0.38	0.49	0.37	0.33	0.34
alpha chain growth probability	0.63	0.63	0.65	0.63	0.63	0.63
C1 - C50 estimated total product distribution, weight %						
C1	27.1	28.3	27.8	30.6	29.3	28.9
C2 - C4	30.1	28.3	29.1	25.9	30.0	28.8
C5 - C12	40.3	40.9	39.8	41.1	38.5	40.0
C13 - C50	2.5	2.5	3.2	2.4	2.2	2.2
CO conversion, %	11.7	10.8	10.1	9.0	8.9	9.1
rate, g CH2/g cat/hr	0.63	0.59	0.55	0.49	0.48	0.49
CO2 formation, %	0.3	0.2	0.2	0.2	0.2	0.2

Performance of Co.055

Dates: 09/01/94 - 09/02/94 Run #1

flow rate = 90.0 cc/min, loading= 0.2 g, WHSV = 12.4 1/hr, H2/CO ratio in feed = 2

time on stream, hr	24.3
reaction temperature, °C	220
pressure, atm	1.0
flow, cc/min	90.0

C1 - C15 product distribution, weight %

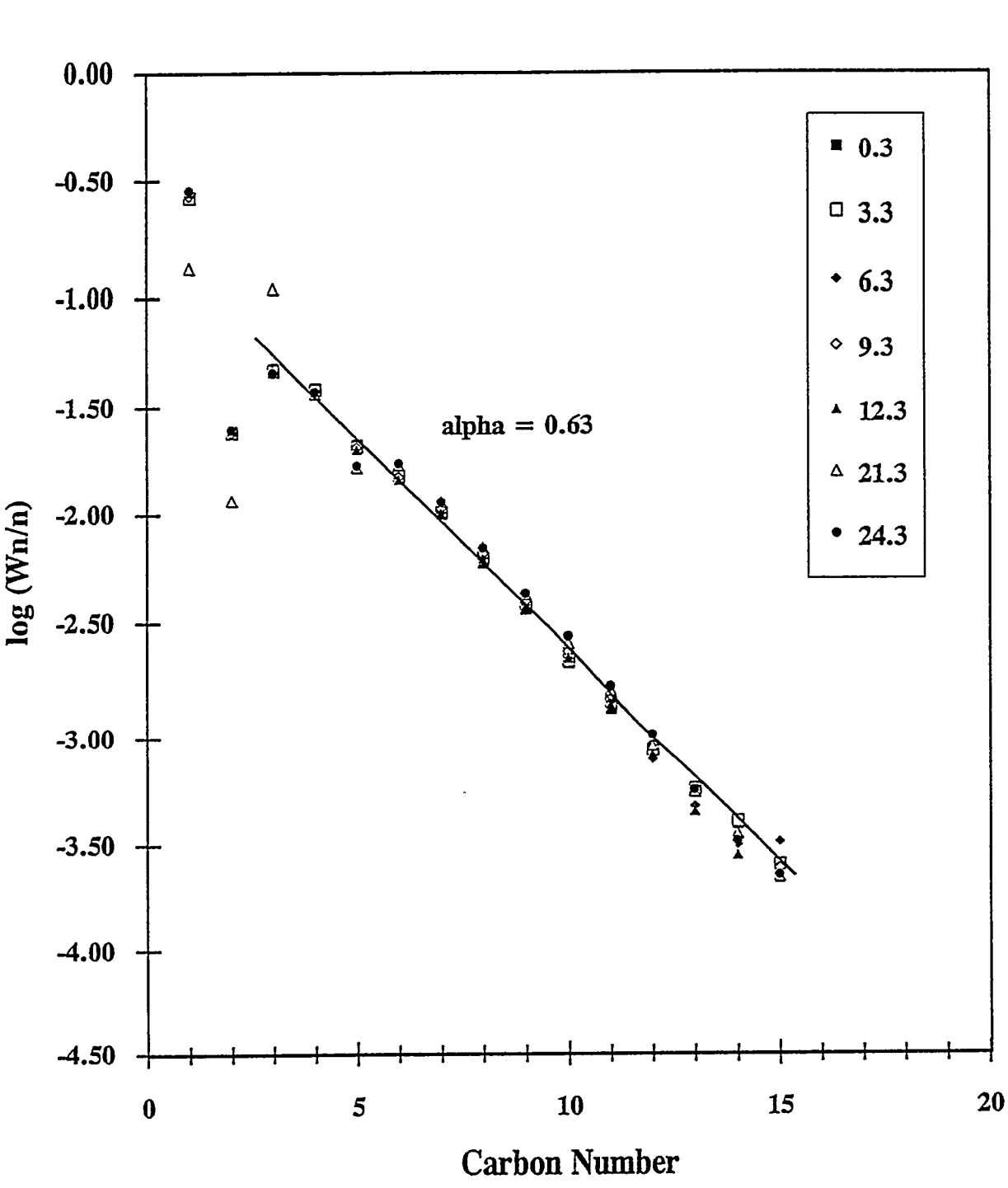
C1	29.10
C2	4.65
C3	12.17
C4	11.87
C5	10.90
C6	6.55
C7	7.94
C8	5.58
C9	3.88
C10	2.74
C11	1.85
C12	1.24
C13	0.73
C14	0.46
C15	0.34
alpha chain growth probability	0.63

C1 - C50 estimated total product distribution, weight %

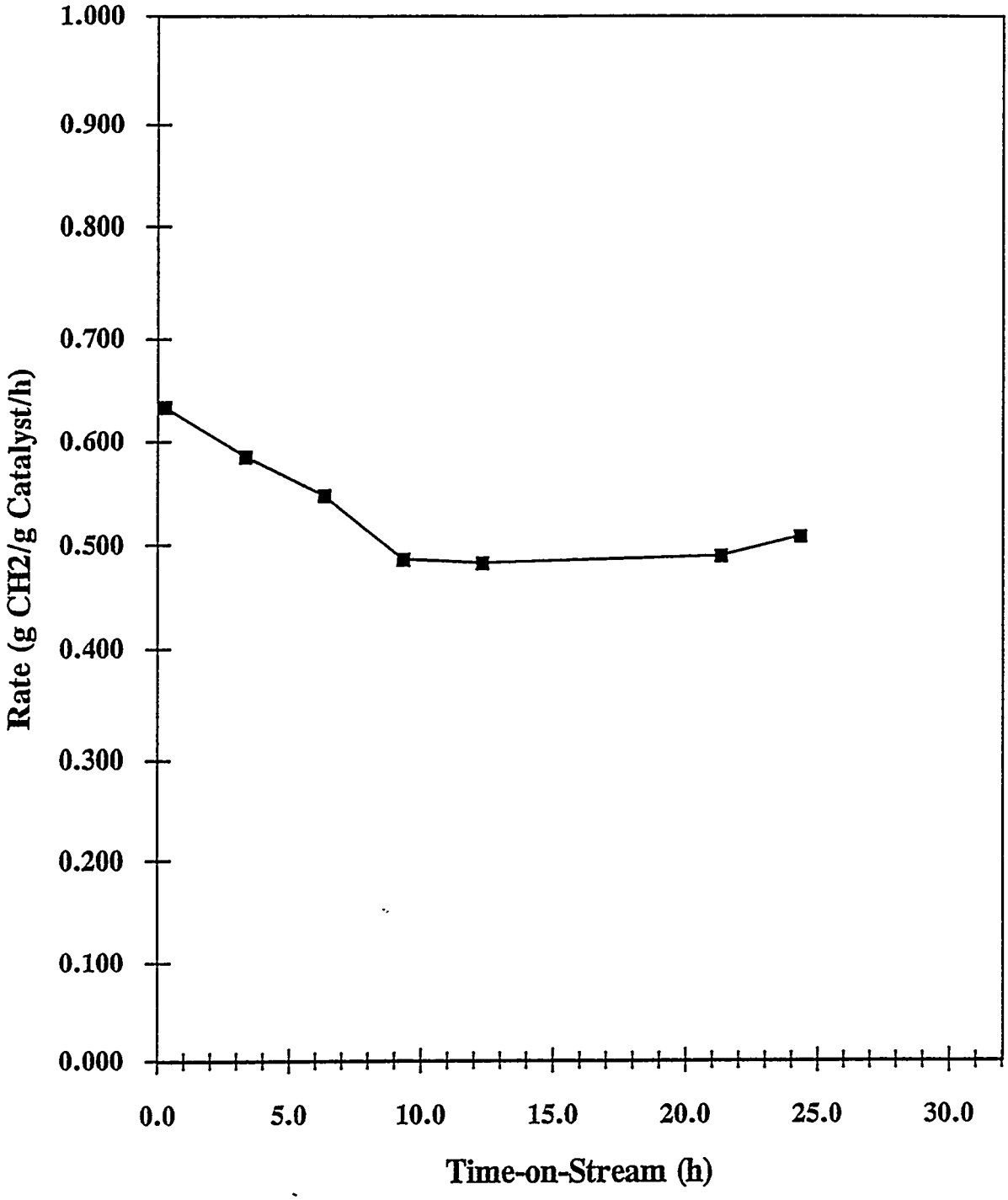
C1	29.0
C2 - C4	28.6
C5 - C12	40.1
C13 - C50	2.3

CO conversion, %	9.4
rate, g CH2/g cat/hr	0.51
CO2 formation, %	0.1

Schulz-Flory Plot for Co.055 - Run #1
Time on Stream (hrs)



Time-on-Stream Plot for Co.055 - Run #1



Co.055 - Run #2

Co wt%	NM wt %	Promotor wt%		Support
20	Re 1.00		La2O3 1.00	Al2O3

SUMMARY REACTION DATA

Reaction Conditions:

P = 1.0 atm
T = 220 °C
H2/CO = 2
weight of catalyst = 0.191 g
WHSV = 13.46 1/hr
time on stream = 24.1 hrs

CO2 (g/g cat/hr) = 0.022
CO2 (% of CO) = 0.1
O/P = 1.49

CO conversion (%)	4.9
rate (g CH2/g cat/hr)	0.29
alpha	0.65
C1 (wt%)	25.7
C2 - C4 (wt%)	27.6
C5 - C12 (wt%)	43.3
C13 + (wt%)	3.4

* Catalyst is directly reduced without calcination
* Temperature serge during startup

Performance of Co.055

Dates: 09/07/94 - 09/08/94 Run #2

flow rate = 90.0 cc/min, loading= 0.2 g, WHSV = 13.5 1/hr, H2/CO ratio in feed = 2

time on stream, hr	0.1	3.1	6.1	9.1	12.1	15.1
reaction temperature, °C	220	220	220	220	220	220
pressure, atm	1.0	1.0	1.0	1.0	1.0	1.0
flow, cc/min	90.0	90.0	90.0	90.0	90.0	90.0
C1 - C15 product distribution, weight %						
C1	24.41	23.88	25.48	25.63	25.93	26.11
C2	4.22	4.08	4.32	4.33	4.37	4.38
C3	11.89	11.40	11.73	11.65	11.71	11.71
C4	12.82	12.39	12.45	12.34	12.33	12.25
C5	12.55	12.35	12.19	12.11	12.00	11.98
C6	9.71	9.74	9.45	9.47	9.09	9.22
C7	7.76	8.04	7.74	7.78	7.73	7.68
C8	5.33	5.66	5.43	5.46	5.46	5.45
C9	3.65	4.01	3.78	3.76	3.83	3.75
C10	2.43	2.71	2.50	2.53	2.63	2.55
C11	1.78	1.97	1.79	1.82	1.80	1.84
C12	1.25	1.32	1.17	1.18	1.22	1.14
C13	0.94	1.04	0.83	0.78	0.78	0.75
C14	0.63	0.83	0.65	0.64	0.64	0.65
C15	0.63	0.58	0.49	0.54	0.48	0.54
alpha chain growth probability	0.66	0.66	0.65	0.65	0.65	0.66
C1 - C50 estimated total product distribution, weight %						
C1	23.7	23.4	25.0	25.0	25.5	25.5
C2 - C4	28.0	27.3	28.0	27.7	27.9	27.7
C5 - C12	44.2	45.5	43.8	43.8	43.4	43.3
C13 - C50	4.1	3.8	3.2	3.5	3.2	3.6
CO conversion, %	6.3	5.2	5.6	5.5	5.3	5.3
rate, g CH2/g cat/hr	0.37	0.30	0.33	0.32	0.31	0.31
CO2 formation, %	0.1	0.1	0.1	0.1	0.1	0.1

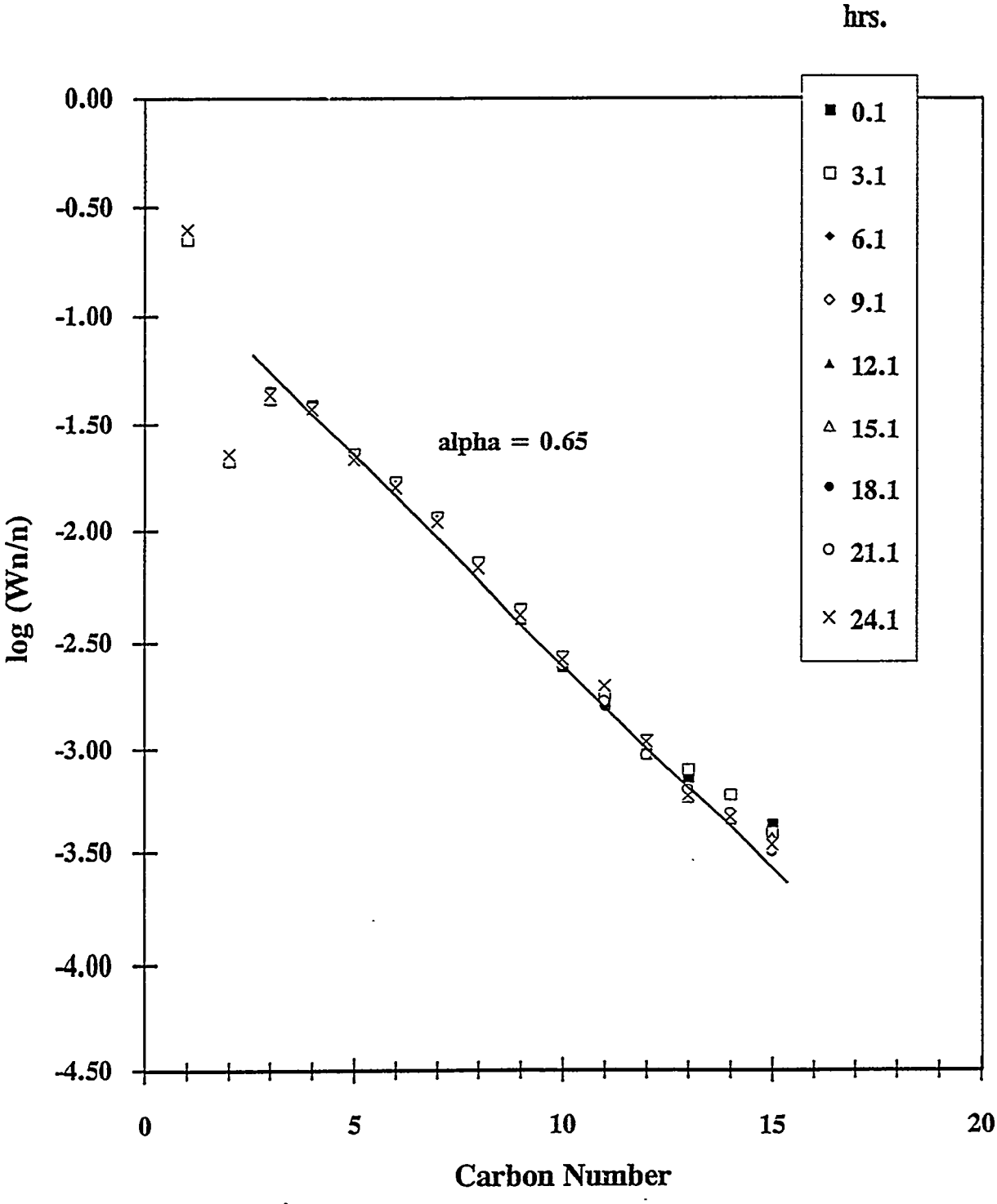
Performance of Co.055

Dates: 09/07/94 - 09/08/94 Run #2

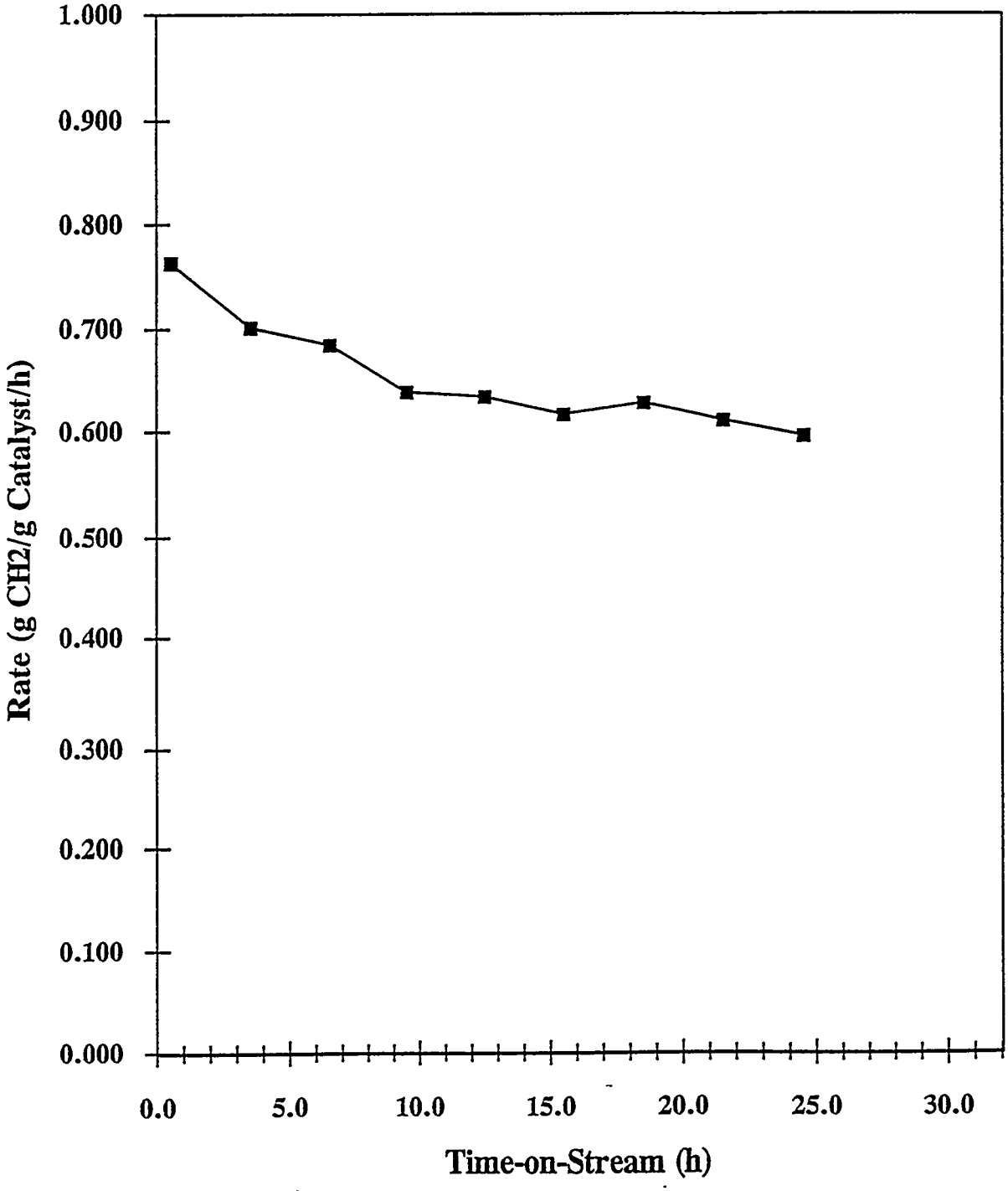
flow rate = 90.0 cc/min, loading= 0.2 g, WHSV = 13.5 1/hr, H2/CO ratio in feed = 2

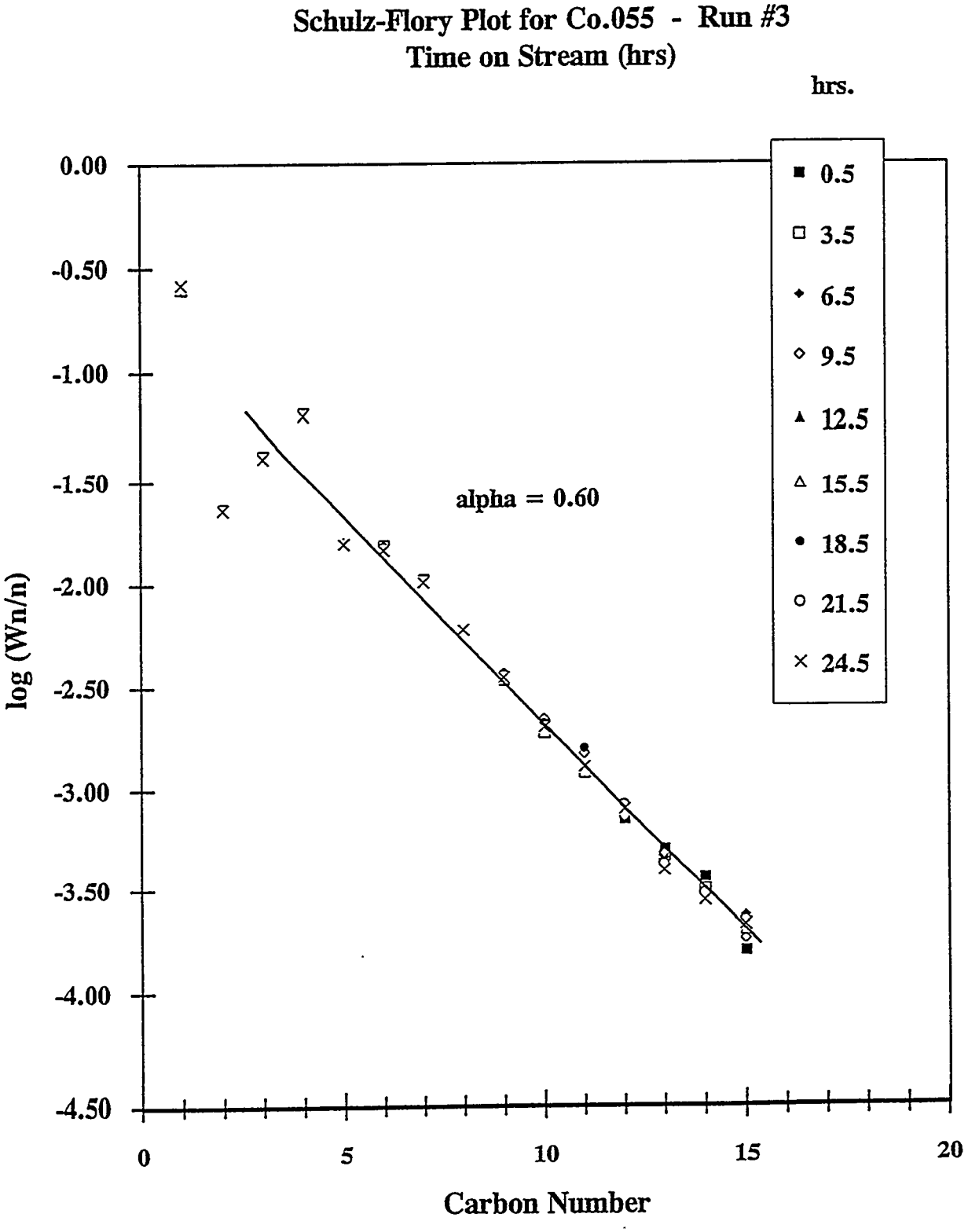
time on stream, hr	18.1	21.1	24.1
reaction temperature, °C	220	220	220
pressure, atm	1.0	1.0	1.0
flow, cc/min	90.0	90.0	90.0
C1 - C15 product distribution, weight %			
C1	26.38	26.58	26.13
C2	4.41	4.44	4.35
C3	11.78	11.82	11.61
C4	12.26	12.28	12.08
C5	11.90	11.84	11.83
C6	8.94	8.86	9.14
C7	7.65	7.61	7.65
C8	5.46	5.38	5.38
C9	3.73	3.79	3.81
C10	2.56	2.47	2.63
C11	1.73	1.84	2.17
C12	1.24	1.12	1.30
C13	0.81	0.82	0.76
C14	0.67	0.67	0.64
C15	0.47	0.48	0.51
alpha chain growth probability	0.65	0.65	0.65
C1 - C50 estimated total product distribution, weight %			
C1	26.0	26.1	25.7
C2 - C4	28.0	28.1	27.6
C5 - C12	42.9	42.6	43.3
C13 - C50	3.1	3.2	3.4
CO conversion, %	5.1	5.0	4.9
rate, g CH2/g cat/hr	0.30	0.29	0.29
CO2 formation, %	0.1	0.1	0.1

Schulz-Flory Plot for Co.055 - Run #2
Time on Stream (hrs)



Time-on-Stream Plot for Co.055 - Run #3




Schulz-Flory Plot for Co.055 - Run #3
Time on Stream (hrs)
hrs.
0.5
3.5
6.5
9.5
12.5
15.5
18.5
21.5
24.5
alpha = 0.60
log (Wn/n)
0.00
-0.50
-1.00
-1.50
-2.00
-2.50
-3.00
-3.50
-4.00
-4.50
0
5
10
15
20
Carbon Number

co.055 - Run #3

Co wt%	NM wt %	Promotor wt%		Support
20	Re 1.00		La2O3 1.00	Al2O3

SUMMARY REACTION DATA

Reaction Conditions:

P = 1.0 atm
T = 220 °C
H2/CO = 2
weight of catalyst = 0.203 g
WHSV = 12.70 1/hr
time on stream = 21.5 hrs

CO2 (g/g cat/hr) = 0.033
CO2 (% of CO) = 0.2
O/P = 1.02

CO conversion (%)	11.0
rate (g CH2/g cat/hr)	0.61
alpha	0.60
C1 (wt%)	29.4
C2 - C4 (wt%)	29.3
C5 - C12 (wt%)	39.1
C13 + (wt%)	2.2

* Catalyst is reduced without calcination

Performance of co.055

Dates: 09/12/94 - 09/13/94 Run #3

flow rate = 90.0 cc/min, loading= 0.2 g, WHSV = 12.7 1/hr, H2/CO ratio in feed = 2

time on stream, hr	0.5	3.5	6.5	9.5	12.5	15.5
reaction temperature, °C	220	220	220	220	220	220
pressure, atm	1.0	1.0	1.0	1.0	1.0	1.0
flow, cc/min	90.0	90.0	90.0	90.0	90.0	90.0
C1 - C15 product distribution, weight %						
C1	30.11	29.21	29.16	30.15	29.80	29.95
C2	5.08	4.82	4.77	4.89	4.81	4.81
C3	10.36	12.59	12.42	12.63	12.45	12.50
C4	13.16	12.68	12.57	12.57	12.44	12.43
C5	11.74	11.44	11.30	11.09	11.25	11.24
C6	8.37	8.33	8.27	7.53	8.23	8.30
C7	7.49	7.35	7.22	7.16	7.19	7.16
C8	4.83	4.80	4.82	4.79	4.89	4.85
C9	3.06	3.19	3.37	3.15	3.21	3.16
C10	2.10	1.91	2.15	2.23	2.01	1.99
C11	1.43	1.34	1.69	1.65	1.45	1.42
C12	0.87	0.97	0.89	0.89	0.99	0.96
C13	0.66	0.61	0.59	0.63	0.57	0.51
C14	0.51	0.45	0.43	0.39	0.40	0.42
C15	0.24	0.32	0.35	0.27	0.31	0.30
alpha chain growth probability	0.58	0.60	0.60	0.59	0.59	0.59
C1 - C50 estimated total product distribution, weight %						
C1	30.0	28.8	28.7	29.9	29.4	29.5
C2 - C4	28.5	29.6	29.3	29.9	29.3	29.3
C5 - C12	39.9	39.5	39.7	38.4	39.2	39.1
C13 - C50	1.6	2.1	2.3	1.8	2.0	2.0
CO conversion, %	13.7	12.6	12.3	11.5	11.4	11.1
rate, g CH2/g cat/hr	0.76	0.70	0.68	0.64	0.63	0.62
CO2 formation, %	0.2	0.2	0.2	0.2	0.2	0.2

Performance of co.055

Dates: 09/12/94 - 09/13/94 Run #3

flow rate = 90.0 cc/min, loading= 0.2 g, WHSV = 12.7 1/hr, H2/CO ratio in feed = 2

time on stream, hr	18.5	21.5	24.5
reaction temperature, °C	220	220	220
pressure, atm	1.0	1.0	1.0
flow, cc/min	90.0	90.0	90.0

C1 - C15 product distribution, weight %

C1	29.89	29.91	29.93
C2	4.81	4.80	4.79
C3	12.49	12.55	12.55
C4	12.37	12.43	12.46
C5	11.12	11.21	11.23
C6	8.09	8.15	8.24
C7	7.19	7.20	7.19
C8	4.81	4.82	4.83
C9	3.21	3.18	3.17
C10	2.11	2.03	2.02
C11	1.75	1.40	1.42
C12	0.94	1.02	0.96
C13	0.51	0.55	0.52
C14	0.40	0.42	0.39
C15	0.32	0.33	0.32
alpha chain growth probability	0.60	0.60	0.60

C1 - C50 estimated total product distribution, weight %

C1	29.5	29.4	29.5
C2 - C4	29.3	29.3	29.3
C5 - C12	39.1	39.1	39.1
C13 - C50	2.1	2.2	2.1

CO conversion, %	11.3	11.0	10.7
rate, g CH2/g cat/hr	0.63	0.61	0.60
CO2 formation, %	0.2	0.2	0.2

CAL.04 - Run #1

Co wt%	NM wt %	Promotor wt%		Support
20	Ru 0.50	K 0.30		Al2O3

SUMMARY REACTION DATA

Reaction Conditions:

P = 1.0 atm
T = 220 °C
H2/CO = 2
weight of catalyst = 0.195 g
WHSV = 13.19 1/hr
time on stream = 29.0 hrs

CO2 (g/g cat/hr) = 0.026
CO2 (% of CO) = 0.1
O/P = 8.98

CO conversion (%)	4.1
rate (g CH2/g cat/hr)	0.23
alpha	0.71
C1 (wt%)	19.1
C2 - C4 (wt%)	20.0
C5 - C12 (wt%)	50.6
C13 + (wt%)	10.2

Performance of CAL.04

Dates: 08/01/94 - 08/02/94 Run #1

flow rate = 90.0 cc/min, loading= 0.2 g, WHSV = 13.2 1/hr, H2/CO ratio in feed = 2

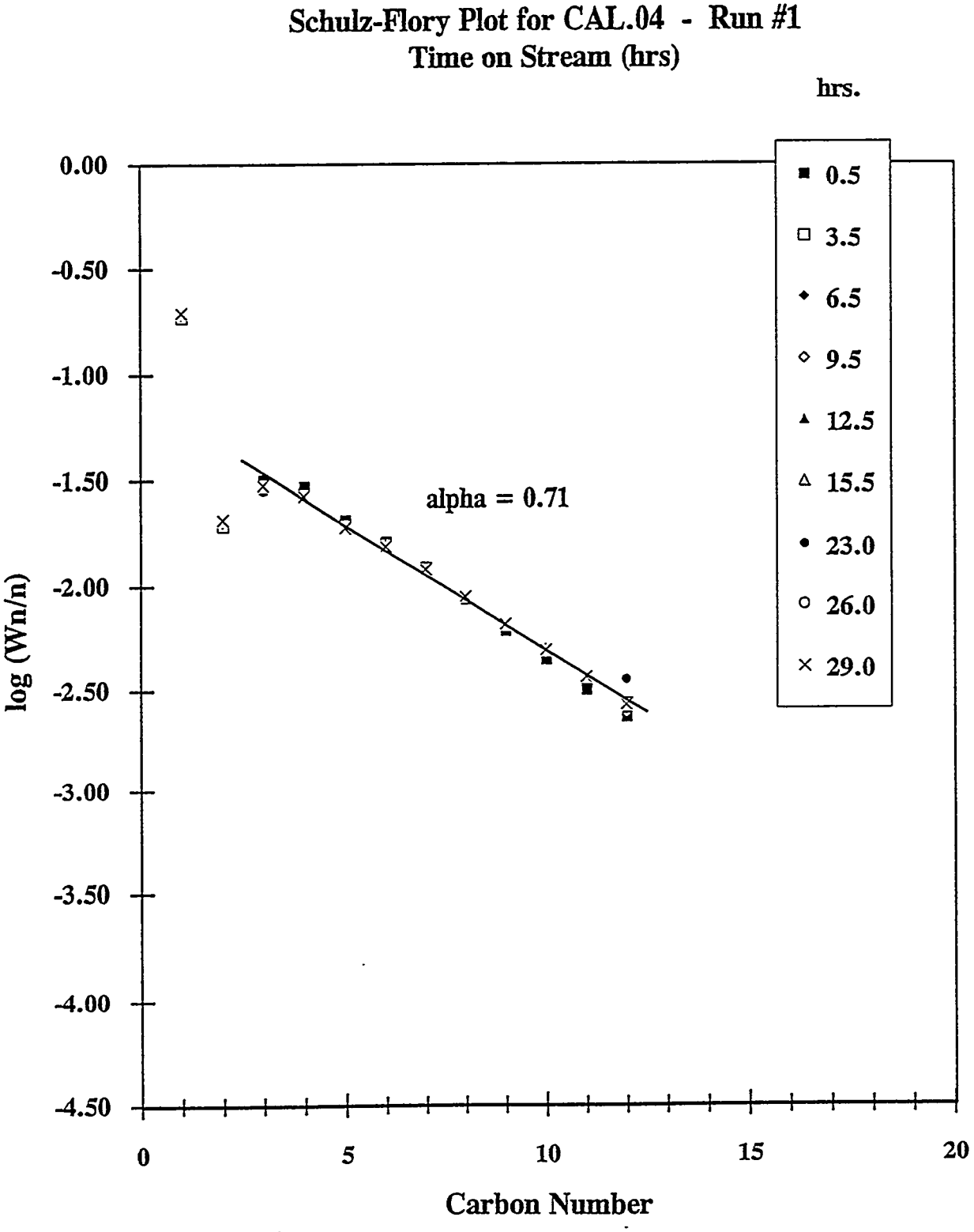
time on stream, hr	0.5	3.5	6.5	9.5	12.5	15.5
reaction temperature, °C	220	220	220	220	220	220
pressure, atm	1.0	1.0	1.0	1.0	1.0	1.0
flow, cc/min	90.0	90.0	90.0	90.0	90.0	90.0
C1 - C15 product distribution, weight %						
C1	19.57	19.50	19.66	19.92	20.11	20.00
C2	3.75	3.75	3.81	3.87	3.90	3.89
C3	8.94	8.42	8.35	8.38	8.40	8.32
C4	9.99	9.26	9.12	9.06	9.08	9.00
C5	10.98	10.42	10.35	10.16	10.11	10.13
C6	9.84	8.98	9.21	8.97	8.96	9.02
C7	8.57	8.60	8.50	8.44	8.37	8.43
C8	6.91	7.12	7.11	7.08	7.05	7.07
C9	5.50	5.89	5.87	5.91	5.82	5.89
C10	4.44	4.90	4.84	4.98	4.88	4.92
C11	3.47	3.88	3.96	4.01	3.90	3.93
C12	2.81	3.27	3.13	2.92	3.07	3.18
C13	2.07	2.43	2.45	2.53	2.50	2.51
C14	1.74	2.00	2.03	2.11	2.24	2.02
C15	1.42	1.59	1.61	1.65	1.62	1.69
alpha chain growth probability	0.69	0.71	0.71	0.71	0.72	0.71
C1 - C50 estimated total product distribution, weight %						
C1	18.7	18.5	18.7	18.8	18.8	19.0
C2 - C4	21.7	20.4	20.2	20.1	20.0	20.2
C5 - C12	51.1	51.1	51.0	50.5	50.0	50.7
C13 - C50	8.4	10.0	10.2	10.6	11.3	10.2
CO conversion, %	6.5	5.2	4.7	4.8	4.7	4.3
rate, g CH2/g cat/hr	0.37	0.30	0.27	0.28	0.27	0.25
CO2 formation, %	0.1	0.1	0.1	0.1	0.1	0.1

Performance of CAL.04

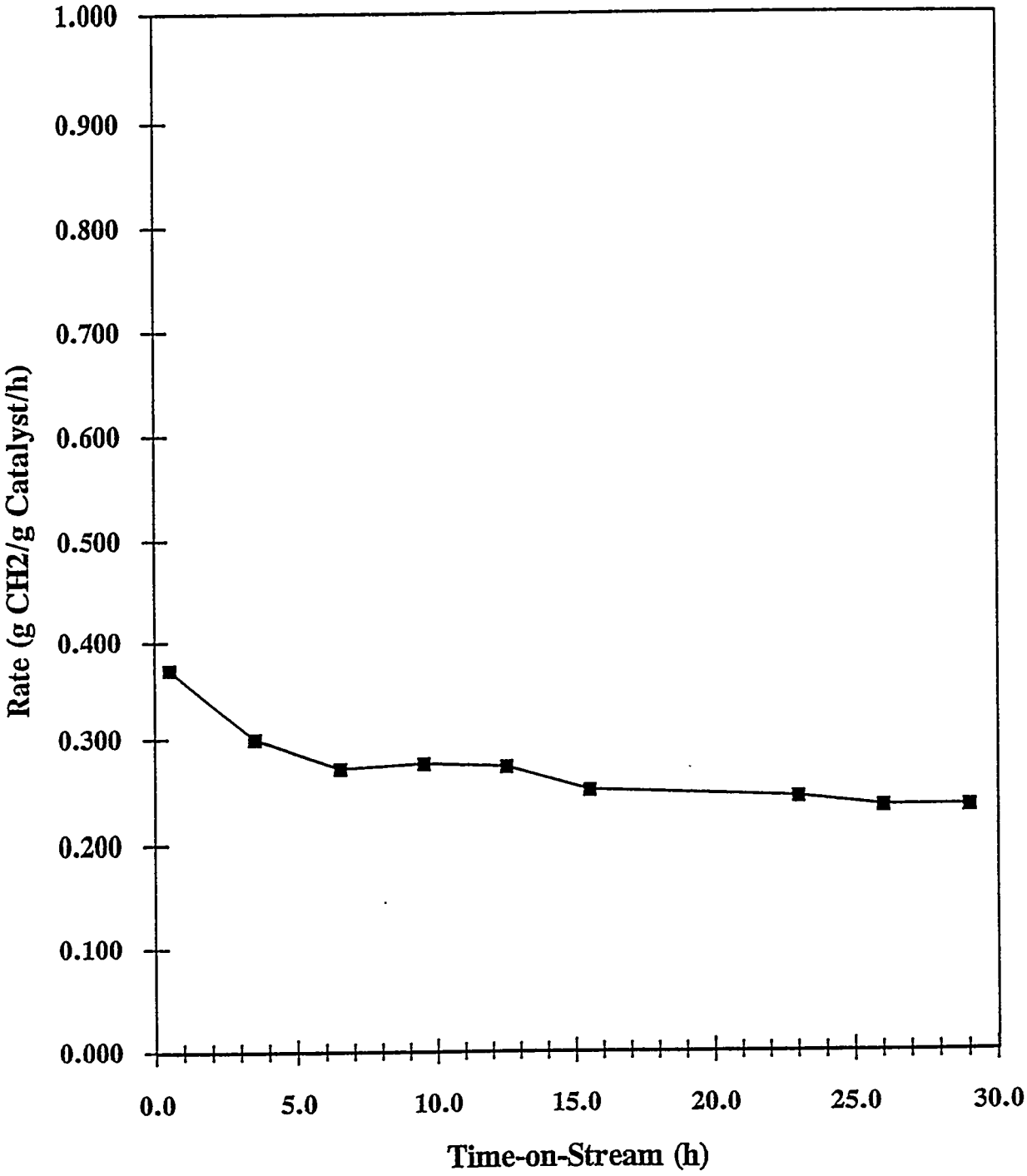
Dates: 08/01/94 - 08/02/94 Run #1

flow rate = 90.0 cc/min, loading= 0.2 g, WHSV = 13.2 1/hr, H2/CO ratio in feed = 2

time on stream, hr	23.0	26.0	29.0
reaction temperature, °C	220	220	220
pressure, atm	1.0	1.0	1.0
flow, cc/min	90.0	90.0	90.0
C1 - C15 product distribution, weight %			
C1	19.97	20.24	20.13
C2	3.89	3.94	3.93
C3	8.23	8.33	8.26
C4	8.86	8.91	8.86
C5	9.91	10.13	10.21
C6	8.83	9.03	8.88
C7	8.29	8.39	8.45
C8	7.02	7.03	7.09
C9	5.73	5.84	5.89
C10	4.88	4.85	4.92
C11	3.96	3.93	4.02
C12	4.24	3.11	3.21
C13	2.50	2.45	2.45
C14	1.99	2.12	2.03
C15	1.69	1.71	1.67
alpha chain growth probability	0.71	0.71	0.71
C1 - C50 estimated total product distribution, weight %			
C1	19.2	19.1	19.1
C2 - C4	20.2	20.0	20.0
C5 - C12	50.4	50.3	50.6
C13 - C50	10.2	10.7	10.2
CO conversion, %	4.2	4.1	4.1
rate, g CH2/g cat/hr	0.24	0.23	0.23
CO2 formation, %	0.1	0.1	0.1


Schulz-Flory Plot for CAL.04 - Run #1
Time on Stream (hrs)
hrs.
0.5
3.5
6.5
9.5
12.5
15.5
23.0
26.0
29.0
alpha = 0.71
log (Wn/n)
0.00
-0.50
-1.00
-1.50
-2.00
-2.50
-3.00
-3.50
-4.00
-4.50
0
5
10
15
20
Carbon Number

Time-on-Stream Plot for CAL.04 - Run #1



CAL.05 - Run #1

Co wt%	NM wt %	Promotor wt%		Support
20	Ru 0.50	K 0.30		Al2O3

SUMMARY REACTION DATA

Reaction Conditions:

P = 1.0 atm
T = 219 °C
H2/CO = 2
weight of catalyst = 0.192 g
WHSV = 13.37 1/hr
time on stream = 24.5 hrs

CO2 (g/g cat/hr) = 0.026
CO2 (% of CO) = 0.1
O/P = 6.85

CO conversion (%)	4.7
rate (g CH2/g cat/hr)	0.27
alpha	0.75
C1 (wt%)	20.8
C2 - C4 (wt%)	21.5
C5 - C12 (wt%)	46.1
C13 + (wt%)	11.6

Performance of CAL.05

Dates: 08/16/94 - 08/17/94 Run #1

flow rate = 90.0 cc/min, loading= 0.2 g, WHSV = 13.4 1/hr, H2/CO ratio in feed = 2

time on stream, hr	0.5	3.5	6.5	9.5	12.5	15.5
reaction temperature, °C	217	219	219	219	219	219
pressure, atm	1.0	1.0	1.0	1.0	1.0	1.0
flow, cc/min	90.0	90.0	90.0	90.0	90.0	90.0
C1 - C15 product distribution, weight %						
C1	19.27	19.88	20.68	20.63	20.67	20.71
C2	3.61	3.71	3.86	3.85	3.87	3.88
C3	8.92	8.55	8.68	8.53	8.50	8.45
C4	10.36	9.66	9.58	9.35	9.26	9.09
C5	11.57	10.80	10.70	10.44	10.42	10.32
C6	10.16	9.76	8.55	8.89	8.73	8.93
C7	8.73	8.65	8.69	8.54	8.60	8.53
C8	6.96	6.96	7.06	6.97	7.05	7.01
C9	5.43	5.57	5.72	5.72	5.81	5.78
C10	4.25	4.73	4.63	4.70	4.78	4.76
C11	3.33	3.59	3.71	3.74	3.80	3.83
C12	2.48	2.93	2.95	3.18	3.04	3.14
C13	1.92	2.09	2.16	2.37	2.21	2.26
C14	1.66	1.74	1.72	1.77	1.83	1.85
C15	1.33	1.39	1.31	1.32	1.42	1.46
alpha chain growth probability	0.72	0.73	0.73	0.73	0.74	0.74
C1 - C50 estimated total product distribution, weight %						
C1	18.3	19.0	19.9	20.0	19.8	19.8
C2 - C4	21.8	20.9	21.3	21.0	20.7	20.4
C5 - C12	50.8	50.4	49.6	49.7	49.5	49.5
C13 - C50	9.1	9.7	9.2	9.3	10.0	10.3
CO conversion, %	6.4	6.0	5.6	5.6	5.4	5.3
rate, g CH2/g cat/hr	0.37	0.35	0.33	0.33	0.31	0.31
CO2 formation, %	0.2	0.1	0.2	0.2	0.1	0.1

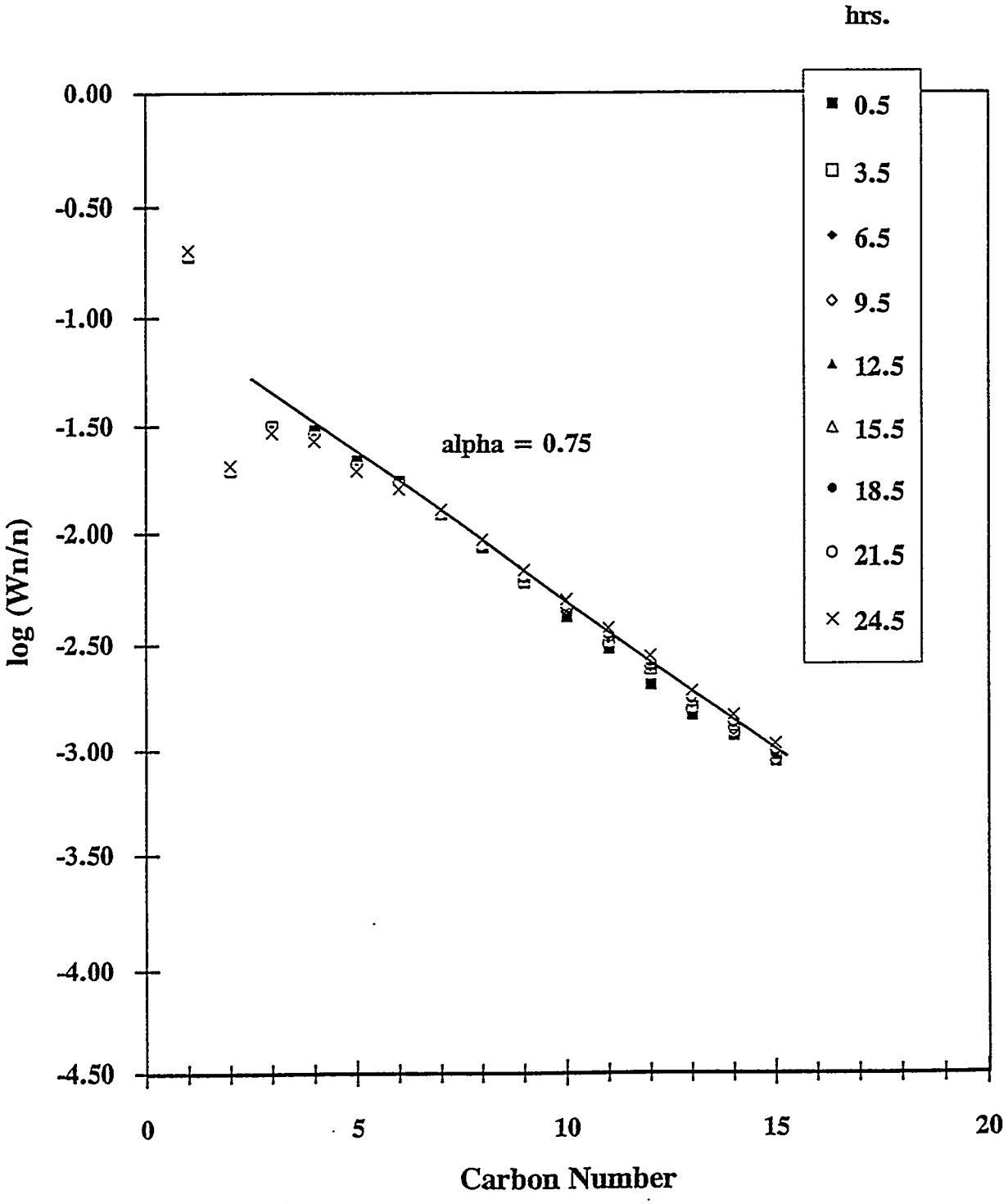
Performance of CAL.05

Dates: 08/16/94 - 08/17/94 Run #1

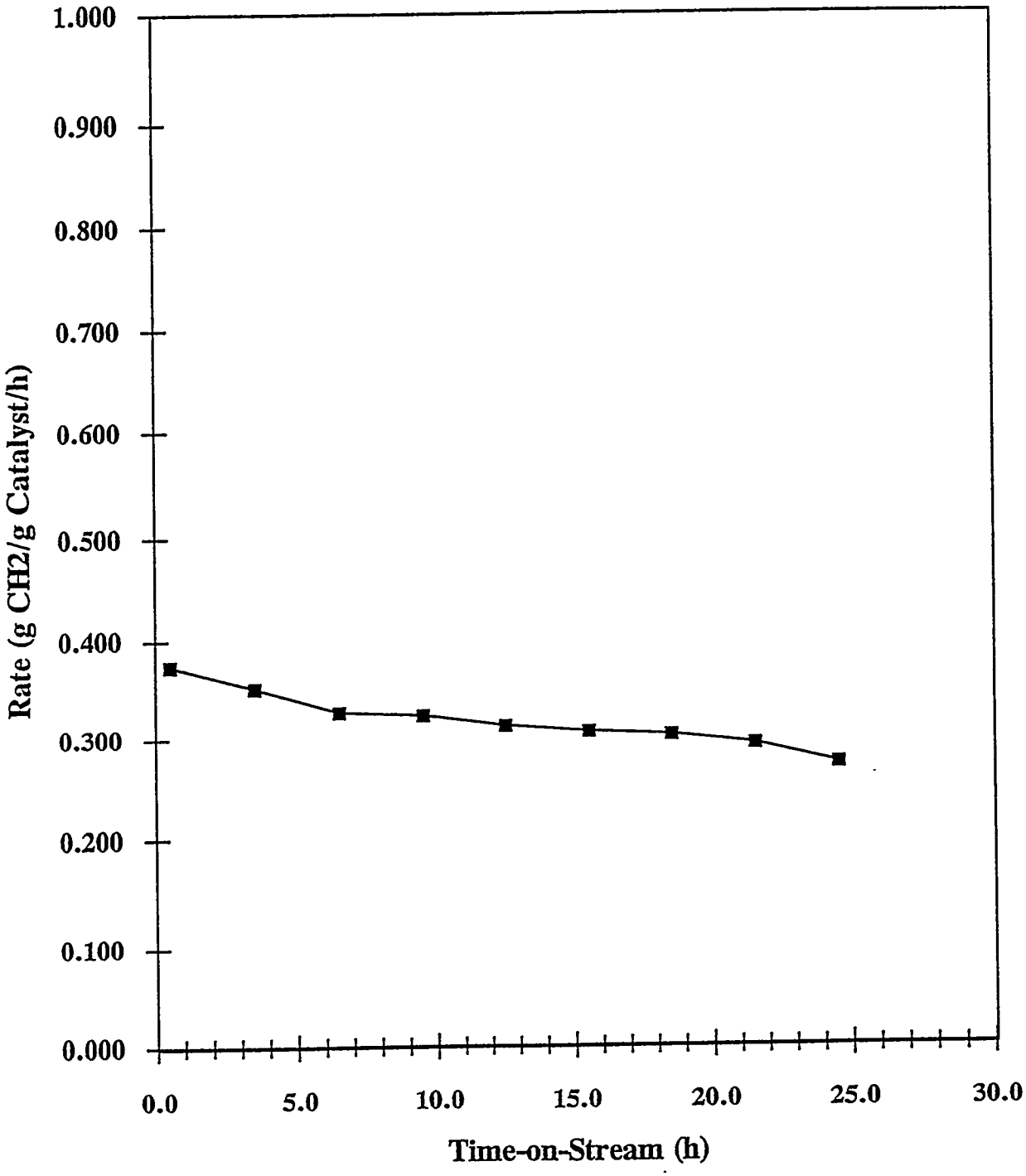
flow rate = 90.0 cc/min, loading= 0.2 g, WHSV = 13.4 1/hr, H2/CO ratio in feed = 2

time on stream, hr	18.5	21.5	24.5
reaction temperature, °C	219	219	219
pressure, atm	1.0	1.0	1.0
flow, cc/min	90.0	90.0	90.0
C1 - C15 product distribution, weight %			
C1	21.01	20.77	21.97
C2	3.93	3.89	4.12
C3	8.53	8.41	8.87
C4	9.21	9.13	9.67
C5	10.23	10.17	10.76
C6	8.59	8.54	3.38
C7	8.47	8.48	8.95
C8	7.00	6.99	7.40
C9	5.77	5.80	6.12
C10	4.73	4.80	5.06
C11	3.84	3.94	4.16
C12	3.12	3.28	3.37
C13	2.27	2.35	2.49
C14	1.88	1.93	2.07
C15	1.43	1.52	1.62
alpha chain growth probability	0.74	0.74	0.75
C1 - C50 estimated total product distribution, weight %			
C1	20.1	19.8	20.8
C2 - C4	20.7	20.4	21.5
C5 - C12	49.0	49.0	46.1
C13 - C50	10.1	10.8	11.6
CO conversion, %	5.2	5.0	4.7
rate, g CH2/g cat/hr	0.30	0.29	0.27
CO2 formation, %	0.1	0.1	0.1

Schulz-Flory Plot for CAL.05 - Run #1
Time on Stream (hrs)



Time-on-Stream Plot for CAL.05 - Run #1



CAL.06 - Run #1

Co wt%	NM wt %	Promotor wt%		Support
20	Ru 0.50	K 0.30		Al2O3

SUMMARY REACTION DATA

Reaction Conditions:

P = 1.0 atm
T = 220 °C
H2/CO = 2
weight of catalyst = 0.246 g
WHSV = 10.47 1/hr
time on stream = 27.5 hrs

CO2 (g/g cat/hr) = 0.021
CO2 (% of CO) = 0.1
O/P = 5.50

CO conversion (%)	5.8
rate (g CH2/g cat/hr)	0.27
alpha	0.74
C1 (wt%)	20.7
C2 - C4 (wt%)	20.9
C5 - C12 (wt%)	47.9
C13 + (wt%)	10.5

Performance of CAL.06

Dates: 07/27/94 - 07/28/94 Run #1

flow rate = 90.0 cc/min, loading= 0.2 g, WHSV = 10.5 1/hr, H2/CO ratio in feed = 2

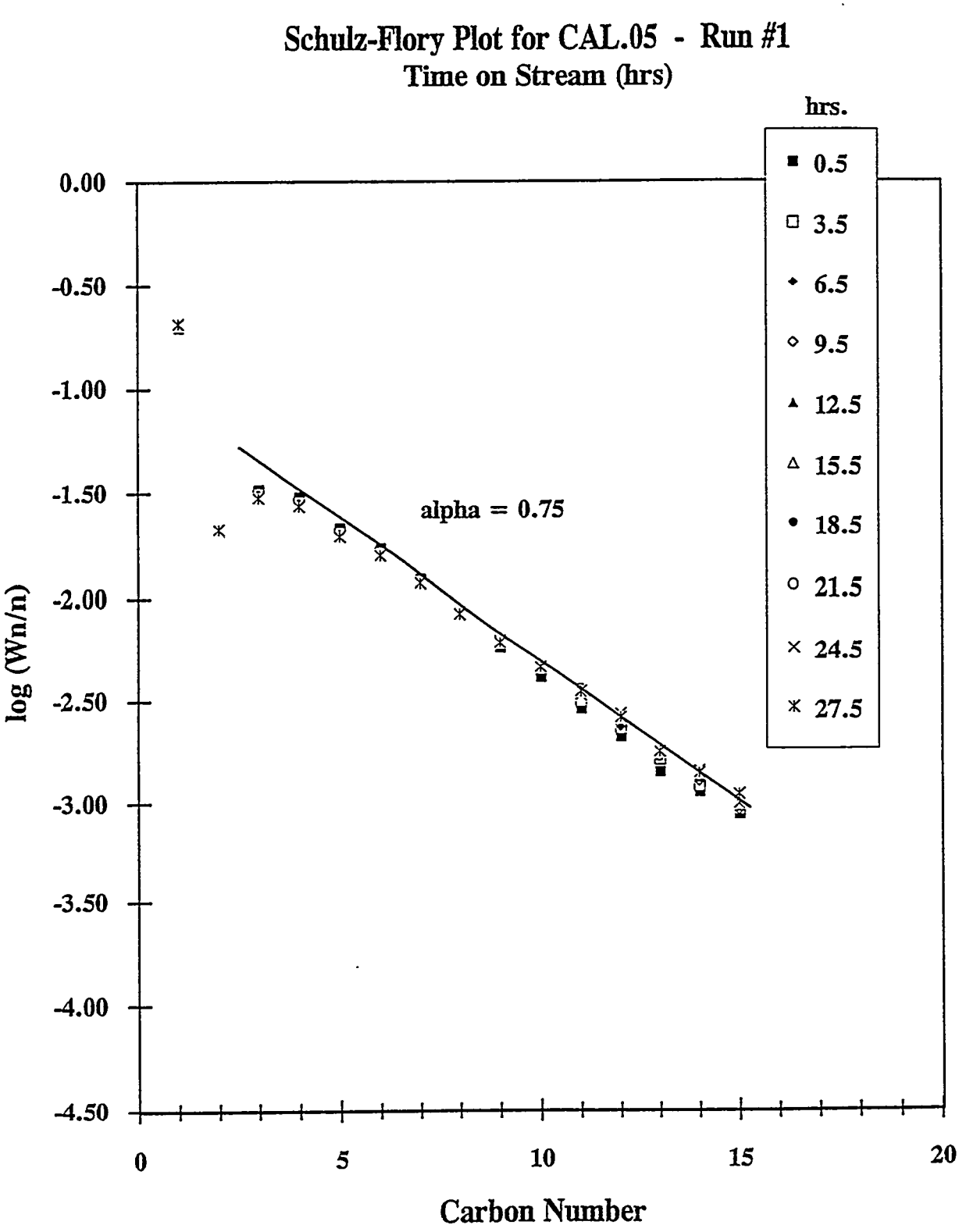
time on stream, hr	0.5	3.5	6.5	9.5	12.5	15.5
reaction temperature, °C	220	220	220	220	220	220
pressure, atm	1.0	1.0	1.0	1.0	1.0	1.0
flow, cc/min	90.0	90.0	90.0	90.0	90.0	90.0
C1 - C15 product distribution, weight %						
C1	20.50	20.91	21.17	21.15	21.35	21.30
C2	3.80	3.84	3.89	3.89	3.93	3.93
C3	9.22	8.83	8.75	8.66	8.66	8.61
C4	10.29	9.66	9.49	9.43	9.40	9.34
C5	11.21	10.61	10.40	10.28	10.21	10.21
C6	9.90	9.53	9.36	9.28	8.70	8.74
C7	8.50	8.35	8.36	8.30	8.32	8.30
C8	6.73	6.80	6.78	6.76	6.77	6.78
C9	5.23	5.51	5.52	5.53	5.56	5.57
C10	4.13	4.51	4.50	4.55	4.59	4.66
C11	3.20	3.46	3.64	3.71	3.77	3.75
C12	2.54	2.78	2.82	3.06	3.18	3.14
C13	1.84	2.13	2.17	2.23	2.25	2.27
C14	1.58	1.68	1.78	1.79	1.87	1.86
C15	1.32	1.39	1.38	1.38	1.44	1.54
alpha chain growth probability	0.71	0.73	0.73	0.74	0.74	0.74
C1 - C50 estimated total product distribution, weight %						
C1	20.0	20.1	20.3	20.3	20.5	20.4
C2 - C4	22.7	21.4	21.2	21.0	21.1	21.0
C5 - C12	49.9	49.3	49.0	48.8	48.4	48.5
C13 - C50	7.4	9.2	9.5	9.9	10.1	10.2
CO conversion, %	7.9	7.2	6.9	6.5	6.4	6.1
rate, g CH2/g cat/hr	0.36	0.33	0.32	0.30	0.29	0.28
CO2 formation, %	0.2	0.2	0.2	0.1	0.1	0.1

Performance of CAL.06

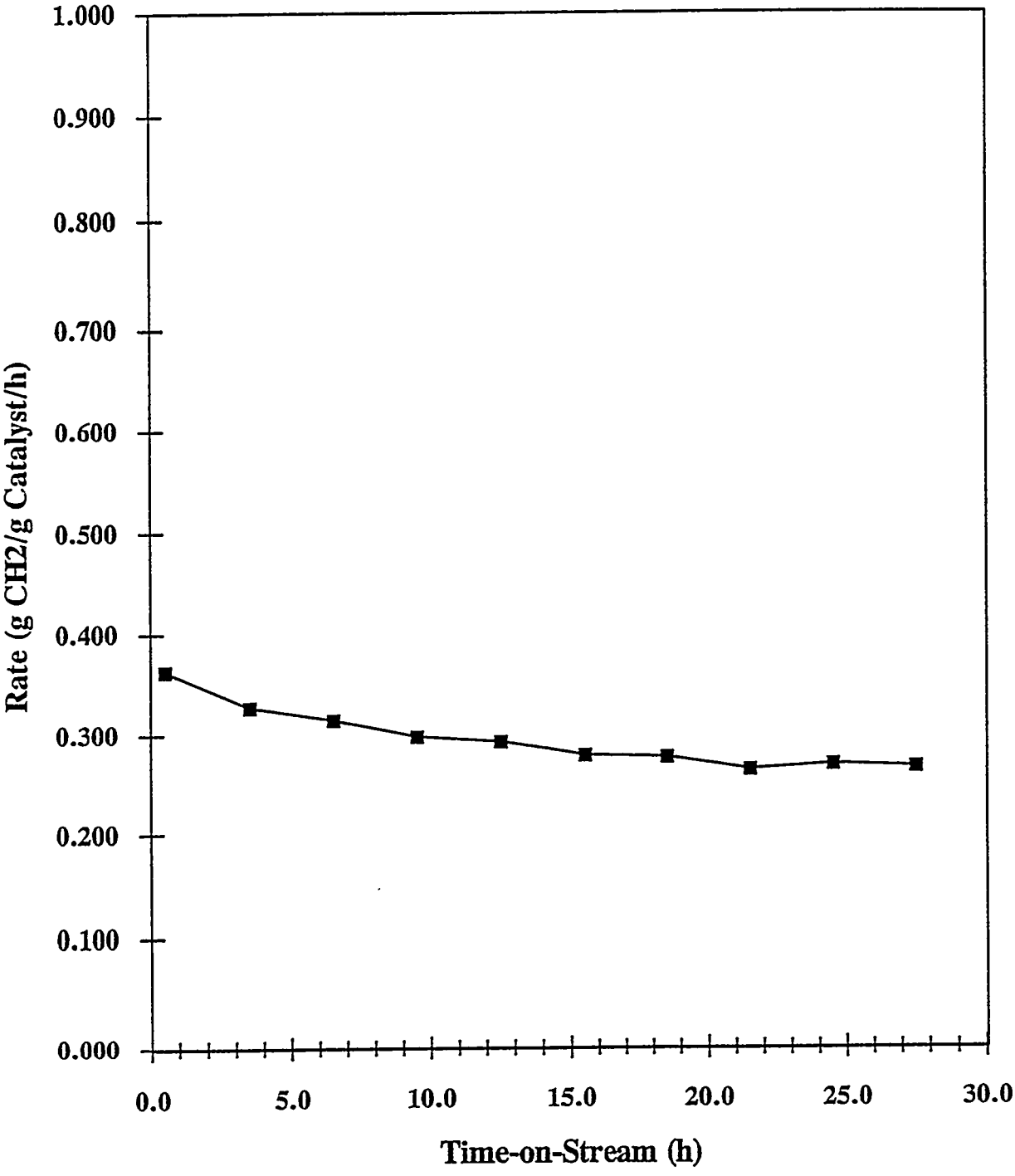
Dates: 07/27/94 - 07/28/94 Run #1

flow rate = 90.0 cc/min, loading= 0.2 g, WHSV = 10.5 1/hr, H2/CO ratio in feed = 2

time on stream, hr	18.5	21.5	24.5	27.5
reaction temperature, °C	220	220	220	220
pressure, atm	1.0	1.0	1.0	1.0
flow, cc/min	90.0	90.0	90.0	90.0
C1 - C15 product distribution, weight %				
C1	21.47	21.37	21.50	21.63
C2	3.96	3.95	3.97	4.00
C3	8.63	8.56	8.58	8.59
C4	9.33	9.25	9.21	9.21
C5	10.12	10.14	10.02	10.03
C6	8.64	8.72	8.58	8.52
C7	8.17	8.22	8.25	8.18
C8	6.75	6.77	6.86	6.76
C9	5.59	5.60	5.66	5.55
C10	4.63	4.66	4.60	4.62
C11	3.75	3.95	3.71	3.85
C12	3.21	3.27	3.28	3.15
C13	2.30	2.20	2.29	2.31
C14	1.98	1.88	2.01	1.95
C15	1.45	1.47	1.48	1.65
alpha chain growth probability	0.74	0.74	0.74	0.74
C1 - C50 estimated total product distribution, weight %				
C1	20.5	20.6	20.6	20.7
C2 - C4	21.0	21.0	20.8	20.9
C5 - C12	48.1	48.5	48.2	47.9
C13 - C50	10.4	9.8	10.4	10.5
CO conversion, %	6.1	5.8	5.9	5.8
rate, g CH2/g cat/hr	0.28	0.26	0.27	0.27
CO2 formation, %	0.1	0.1	0.1	0.1


Schulz-Flory Plot for CAL.05 - Run #1
Time on Stream (hrs)
hrs.
0.5
3.5
6.5
9.5
12.5
15.5
18.5
21.5
24.5
27.5
alpha = 0.75
log (Wn/n)
0.00
-0.50
-1.00
-1.50
-2.00
-2.50
-3.00
-3.50
-4.00
-4.50
0
5
10
15
20
Carbon Number

Time-on-Stream Plot for CAL.06 - Run #1



UOP - Run #1

Co wt%	NM wt %	Promotor wt%		Support
#REF!	#REF! #REF!	#REF! #REF!	#REF! #REF!	#REF!

SUMMARY REACTION DATA

Reaction Conditions:

P = 1.0 atm
T = 220 °C
H2/CO = 2
weight of catalyst = 0.293 g
WHSV = 8.77 1/hr
time on stream = 24.5 hrs

CO2 (g/g cat/hr) = 0.023
CO2 (% of CO) = 0.2
O/P = 1.29

CO conversion (%)	7.8
rate (g CH2/g cat/hr)	0.30
alpha	0.61
C1 (wt%)	22.6
C2 - C4 (wt%)	30.9
C5 - C12 (wt%)	44.7
C13 + (wt%)	1.9

Performance of UOP

Dates: 07/07/94 - 07/08/94 Run #1

flow rate = 90.0 cc/min, loading= 0.3 g, WHSV = 8.8 1/hr, H2/CO ratio in feed = 2

time on stream, hr	0.5	3.5	6.5	9.5	12.5	15.5
reaction temperature, °C	220	220	220	220	220	220
pressure, atm	1.0	1.0	1.0	1.0	1.0	1.0
flow, cc/min	90.0	90.0	90.0	90.0	90.0	90.0
C1 - C15 product distribution, weight %						
C1	25.00	23.37	22.86	23.03	22.65	22.66
C2	4.98	4.69	4.61	4.65	4.57	4.56
C3	13.42	13.17	13.02	13.12	13.01	12.99
C4	13.74	13.62	13.51	13.60	13.59	13.55
C5	12.62	12.83	12.86	12.87	13.01	12.98
C6	9.44	9.83	9.90	9.93	10.10	10.06
C7	7.47	7.65	7.77	7.85	7.93	7.92
C8	4.86	5.07	5.31	5.32	5.46	5.43
C9	3.24	3.32	3.56	3.50	3.49	3.54
C10	2.05	2.38	2.53	2.29	2.44	2.38
C11	1.44	1.66	1.78	1.65	1.53	1.56
C12	0.82	1.16	1.03	0.94	0.85	1.01
C13	0.49	0.62	0.59	0.58	0.69	0.68
C14	0.30	0.35	0.36	0.38	0.38	0.36
C15	0.13	0.27	0.32	0.29	0.30	0.30
alpha chain growth probability	0.57	0.61	0.62	0.61	0.62	0.62
C1 - C50 estimated total product distribution, weight %						
C1	25.2	23.3	22.7	22.9	22.5	22.5
C2 - C4	32.4	31.4	30.9	31.2	30.9	30.9
C5 - C12	41.5	43.4	44.3	44.0	44.6	44.6
C13 - C50	0.9	1.8	2.1	1.9	2.0	2.0
CO conversion, %	12.7	10.1	9.4	9.1	8.4	8.3
rate, g CH2/g cat/hr	0.49	0.39	0.36	0.35	0.32	0.32
CO2 formation, %	0.3	0.2	0.2	0.2	0.2	0.2

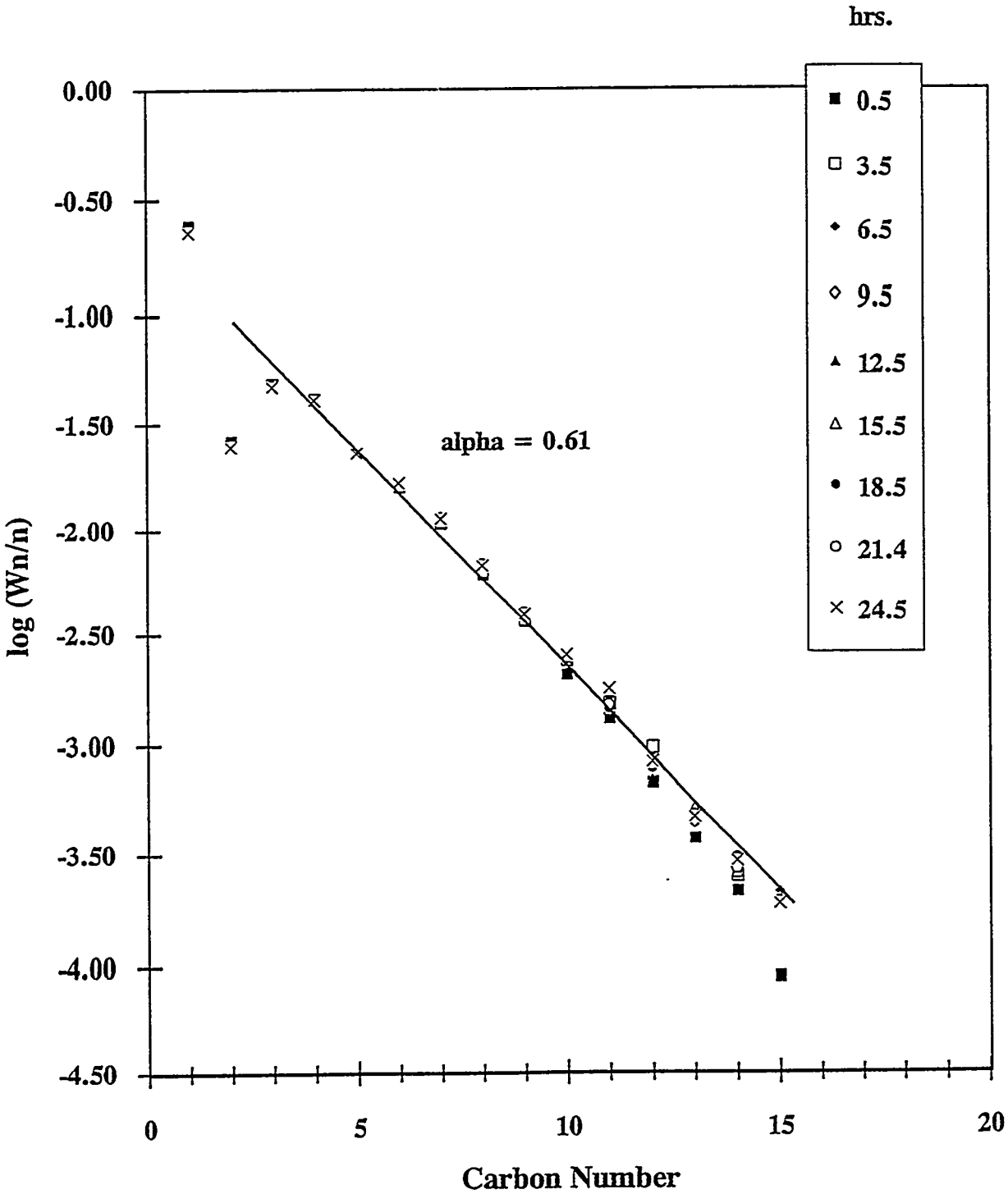
Performance of UOP

Dates: 07/07/94 - 07/08/94 Run #1

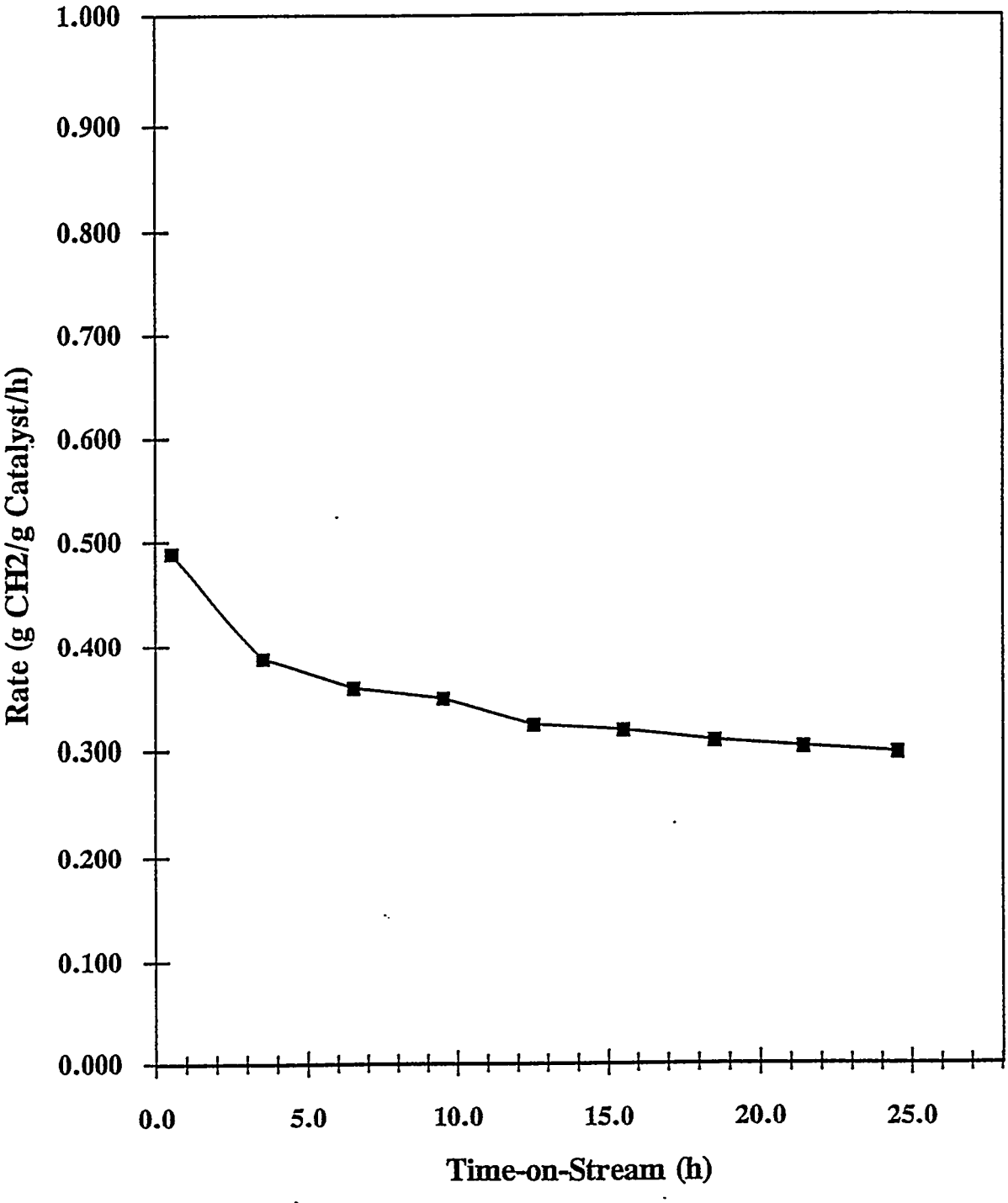
flow rate = 90.0 cc/min, loading= 0.3 g, WHSV = 8.8 1/hr, H2/CO ratio in feed = 2

time on stream, hr	18.5	21.4	24.5	27.5
reaction temperature, °C	220	220	220	220
pressure, atm	1.0	1.0	1.0	1.0
flow, cc/min	90.0	90.0	90.0	22.5
C1 - C15 product distribution, weight %				
C1	22.62	22.58	22.62	20.79
C2	4.54	4.53	4.52	4.29
C3	12.98	12.93	12.91	11.14
C4	13.56	13.50	13.47	12.87
C5	13.02	12.96	12.92	12.88
C6	10.14	10.06	10.03	10.45
C7	7.98	7.95	7.87	8.69
C8	5.42	5.47	5.40	6.16
C9	3.48	3.58	3.52	4.21
C10	2.39	2.50	2.51	3.01
C11	1.57	1.64	1.94	2.08
C12	0.94	1.02	1.00	1.42
C13	0.63	0.63	0.62	0.89
C14	0.43	0.38	0.41	0.66
C15	0.29	0.28	0.28	0.45
alpha chain growth probability	0.61	0.61	0.61	0.64
C1 - C50 estimated total product distribution, weight %				
C1	22.5	22.5	22.6	20.6
C2 - C4	30.9	30.8	30.9	28.1
C5 - C12	44.7	44.8	44.7	48.3
C13 - C50	1.9	1.9	1.9	3.0
CO conversion, %	8.1	7.9	7.8	36.1
rate, g CH2/g cat/hr	0.31	0.30	0.30	0.35
CO2 formation, %	0.2	0.2	0.2	0.9

Schulz-Flory Plot for UOP - Run #1
Time on Stream (hrs)



Time-on-Stream Plot for UOP - Run #1



CoW.05 - Run #1

Co wt%	NM wt %	Promotor wt%		Support
20	Cu 5.00	Cr 4.00		Al2O3

SUMMARY REACTION DATA

Reaction Conditions:

P = 1.0 atm
T = 220 °C
H2/CO = 2
weight of catalyst = 0.300 g
WHSV = 2.86 1/hr
time on stream = 24.0 hrs

CO2 (g/g cat/hr) = 0.008
CO2 (% of CO) = 0.2
O/P = 0.66

CO conversion (%)	2.8
rate (g CH2/g cat/hr)	0.04
alpha	0.55
C1 (wt%)	33.1
C2 - C4 (wt%)	38.2
C5 - C12 (wt%)	28.2
C13 + (wt%)	0.6

Performance of CoW.05

Dates: 08/30/94 - 01/00/00 Run #1

flow rate = 30.0 cc/min, loading= 0.3 g, WHSV = 2.9 1/hr, H2/CO ratio in feed = 2

time on stream, hr	0.5	3.0	6.0	24.0	27.0
reaction temperature, °C	220	220	220	220	220
pressure, atm	1.0	1.0	1.0	1.0	1.0
flow, cc/min	30.0	30.0	30.0	30.0	30.0
C1 - C15 product distribution, weight %					
C1	35.91	33.56	33.43	32.99	32.52
C2	7.66	7.16	7.19	7.32	7.30
C3	17.42	16.24	16.18	17.46	17.55
C4	14.49	14.26	14.16	13.29	13.32
C5	9.31	10.80	11.13	11.56	11.62
C6	5.99	7.20	7.55	7.48	7.52
C7	3.81	4.29	4.21	4.10	4.27
C8	1.83	2.48	2.35	2.15	2.12
C9	1.43	1.69	1.46	1.27	1.30
C10	0.99	0.67	0.61	0.56	0.58
C11	0.49	0.48	0.43	0.47	0.48
C12	0.36	0.40	0.36	0.39	0.41
C13	0.30	0.30	0.29	0.36	0.38
C14		0.27	0.25	0.37	0.38
C15		0.21	0.20	0.25	0.26
alpha chain growth probability	0.54	0.55	0.54	0.55	0.55
C1 - C50 estimated total product distribution, weight %					
C1	35.8	33.6	33.5	33.1	32.6
C2 - C4	39.4	37.7	37.6	38.2	38.3
C5 - C12	24.3	28.2	28.4	28.2	28.6
C13 - C50	0.5	0.6	0.5	0.6	0.6
CO conversion, %	3.2	3.2	3.1	2.8	2.8
rate, g CH2/g cat/hr	0.04	0.04	0.04	0.04	0.04
CO2 formation, %	0.5	0.3	0.2	0.2	0.2

Cow05 - Run #2

(Uncalcined)

Co wt%		Promotor wt%		Support
20	Cu 5%	Cr 4		Al2O3

SUMMARY REACTION DATA

Reaction Conditions:

P = 1.0 atm
T = 220 °C
H2/CO = 2
weight of catalyst = 0.300 g
WHSV = 2.86 1/hr
time on stream = 27.7 hrs

CO2 (g/g cat/hr) = 0.009
CO2 (% of CO) = 0.2
O/P = 0.85

CO conversion (%)	4.7
rate (g CH2/g cat/hr)	0.06
alpha	0.50
C1 (wt%)	34.8
C2 - C4 (wt%)	35.1
C5 - C12 (wt%)	29.8
C13 + (wt%)	0.2

Performance of Cow05

Dates: 09/06/94 - 09/07/94 Run #2

flow rate = 30.0 cc/min, loading= 0.30 g, WHSV = 2.9 1/hr, H2/CO ratio in feed = 2

time on stream, hr	0.5	3.0	4.5	22.0	27.7
reaction temperature, °C	220	220	220	220	220
pressure, atm	1.0	1.0	1.0	1.0	1.0
flow, cc/min	30.0	30.0	30.0	30.0	30.0
C1 - C15 product distribution, weight %					
C1	32.87	33.36	32.57	36.02	34.78
C2	6.04	6.10	5.86	6.34	6.20
C3	15.11	15.39	14.64	15.60	15.27
C4	14.95	14.27	13.48	13.54	13.59
C5	12.26	12.07	11.53	11.34	11.38
C6	8.32	7.95	12.34	8.31	7.69
C7	4.73	4.90	4.19	4.37	4.91
C8	2.50	2.49	2.35	2.21	2.77
C9	1.04	1.46	1.36	1.23	1.61
C10	0.74	0.63	0.62	0.38	0.82
C11	0.42	0.51	0.31	0.32	0.33
C12	0.35	0.28	0.26	0.20	0.21
C13	0.27	0.21	0.20	0.13	0.13
C14	0.22	0.19	0.17		0.14
C15	0.19	0.19	0.15		0.16
alpha chain growth probability	0.54	0.53	0.52	0.50	0.50
C1 - C50 estimated total product distribution, weight %					
C1	32.9	33.4	32.6	36.0	34.8
C2 - C4	36.1	35.8	34.0	35.4	35.1
C5 - C12	30.5	30.3	33.1	28.4	29.8
C13 - C50	0.5	0.4	0.3	0.2	0.2
CO conversion, %	6.0	5.6	5.5	4.8	4.7
rate, g CH2/g cat/hr	0.07	0.07	0.07	0.06	0.06
CO2 formation, %	0.7	0.4	0.3	0.3	0.2

CoW.06 - Run #1

Co wt%	NM wt %	Promotor wt%		Support
20	Cu 5.00	Cr 4.00		SiO2

SUMMARY REACTION DATA

Reaction Conditions:

P = 1.0 atm
T = 220 °C
H2/CO = 2
weight of catalyst = 0.300 g
WHSV = 2.86 1/hr
time on stream = 24.0 hrs

CO2 (g/g cat/hr) = 0.007
CO2 (% of CO) = 0.2
O/P = 2.21

CO conversion (%)	3.3
rate (g CH2/g cat/hr)	0.04
alpha	0.59
C1 (wt%)	26.0
C2 - C4 (wt%)	33.2
C5 - C12 (wt%)	39.7
C13 + (wt%)	1.1

Performance of CoW.06

Dates: 09/01/94 - 09/02/94 Run #1

flow rate = 30.0 cc/min, loading= 0.3 g, WHSV = 2.9 1/hr, H2/CO ratio in feed = 2

time on stream, hr	0.5	3.0	4.5	24.0
reaction temperature, °C	220	220	220	220
pressure, atm	1.0	1.0	1.0	1.0
flow, cc/min	30.0	30.0	30.0	30.0
C1 - C15 product distribution, weight %				
C1	23.10	24.99	25.94	26.08
C2	5.62	6.21	6.18	6.29
C3	13.54	14.89	14.36	13.96
C4	13.99	14.75	13.94	13.05
C5	13.19	13.64	13.88	12.46
C6	10.63	10.33	10.32	12.30
C7	5.97	5.53	5.52	5.46
C8	4.21	3.19	3.31	3.57
C9	3.07	2.58	2.66	2.79
C10	2.24	1.60	1.62	1.67
C11	1.58	0.98	0.97	1.04
C12	0.86	0.61	0.62	0.64
C13	0.63	0.49	0.49	0.48
C14	0.54	0.21	0.20	0.20
C15	0.46			
alpha chain growth probability	0.62	0.59	0.59	0.59
C1 - C50 estimated total product distribution, weight %				
C1	23.2	24.9	25.8	26.0
C2 - C4	33.4	35.7	34.4	33.2
C5 - C12	41.7	38.3	38.7	39.7
C13 - C50	1.7	1.1	1.1	1.1
CO conversion, %	5.1	4.3	4.0	3.3
rate, g CH2/g cat/hr	0.06	0.05	0.05	0.04
CO2 formation, %	0.4	0.2	0.2	0.2

CoW06 - Run #2

Co wt%	NM wt %	Promotor wt%		Support
20	Cu 5.00	Cr 4.00		SiO2

SUMMARY REACTION DATA

Reaction Conditions:

P = 1.0 atm
T = 220 °C
H2/CO = 2
weight of catalyst = 0.300 g
WHSV = 2.86 1/hr
time on stream = 24.0 hrs

CO2 (g/g cat/hr) = 0.012
CO2 (% of CO) = 0.3
O/P = 0.99

CO conversion (%)	2.6
rate (g CH2/g cat/hr)	0.03
alpha	0.46
C1 (wt%)	39.3
C2 - C4 (wt%)	39.3
C5 - C12 (wt%)	21.4
C13 + (wt%)	0.1

Performance of CoW06

Dates: 09/09/94 - 09/12/94 Run #2

flow rate = 30.0 cc/min, loading= 0.3 g, WHSV = 2.9 1/hr, H2/CO ratio in feed = 2

time on stream, hr	0.5	3.0	24.0	27.5	30.0	44.5
reaction temperature, °C	220	220	220	240	260	280
pressure, atm	1.0	1.0	1.0	1.0	1.0	1.0
flow, cc/min	30.0	30.0	30.0	30.0	30.0	30.0
C1 - C15 product distribution, weight %						
C1	36.49	37.08	39.14	49.15	62.36	68.75
C2	8.54	8.70	9.10	10.04	10.87	11.05
C3	16.83	16.92	16.95	15.74	12.02	10.59
C4	13.35	13.76	13.10	10.92	7.48	5.27
C5	10.34	10.18	9.80	7.01	3.95	2.48
C6	6.32	6.66	5.86	4.06	1.93	1.12
C7	3.62	2.92	2.96	1.75	0.78	0.41
C8	1.86	1.56	1.52	0.74	0.38	0.25
C9	1.08	0.93	0.61	0.28	0.14	0.06
C10	0.46	0.36	0.33	0.12	0.04	0.02
C11	0.32	0.30	0.25	0.09	0.03	
C12	0.24	0.29	0.13	0.07	0.02	
C13	0.23	0.17	0.17	0.04		
C14	0.16	0.16	0.08			
C15	0.15					
alpha chain growth probability	0.48	0.47	0.46	0.39	0.35	0.32
C1 - C50 estimated total product distribution, weight %						
C1	36.7	37.3	39.3	49.2	62.4	68.7
C2 - C4	39.0	39.6	39.3	36.7	30.4	26.9
C5 - C12	24.2	23.0	21.4	14.0	7.2	4.3
C13 - C50	0.1	0.1	0.1	0.0	0.0	0.0
CO conversion, %	3.3	3.1	2.6	6.9	16.6	16.6
rate, g CH2/g cat/hr	0.04	0.04	0.03	0.09	0.21	0.21
CO2 formation, %	0.4	0.3	0.3	0.4	1.1	1.7

CoW06 - Run #2

Co wt%	NM wt %	Promotor wt%		Support
20	Cu 5.00	Cr 4.00		SiO2

SUMMARY REACTION DATA*

Reaction Conditions:

P = 1.0 atm
T = 280 °C
H2/CO = 2
weight of catalyst = 0.300 g
WHSV = 2.86 1/hr
time on stream = 44.5 hrs

CO2 (g/g cat/hr) = 0.073
CO2 (% of CO) = 1.7
O/P = 0.37

CO conversion (%)	16.6
rate (g CH2/g cat/hr)	0.21
alpha	0.32
C1 (wt%)	68.7
C2 - C4 (wt%)	26.9
C5 - C12 (wt%)	4.3
C13 + (wt%)	0.0

* Reaction at 280 deg C.