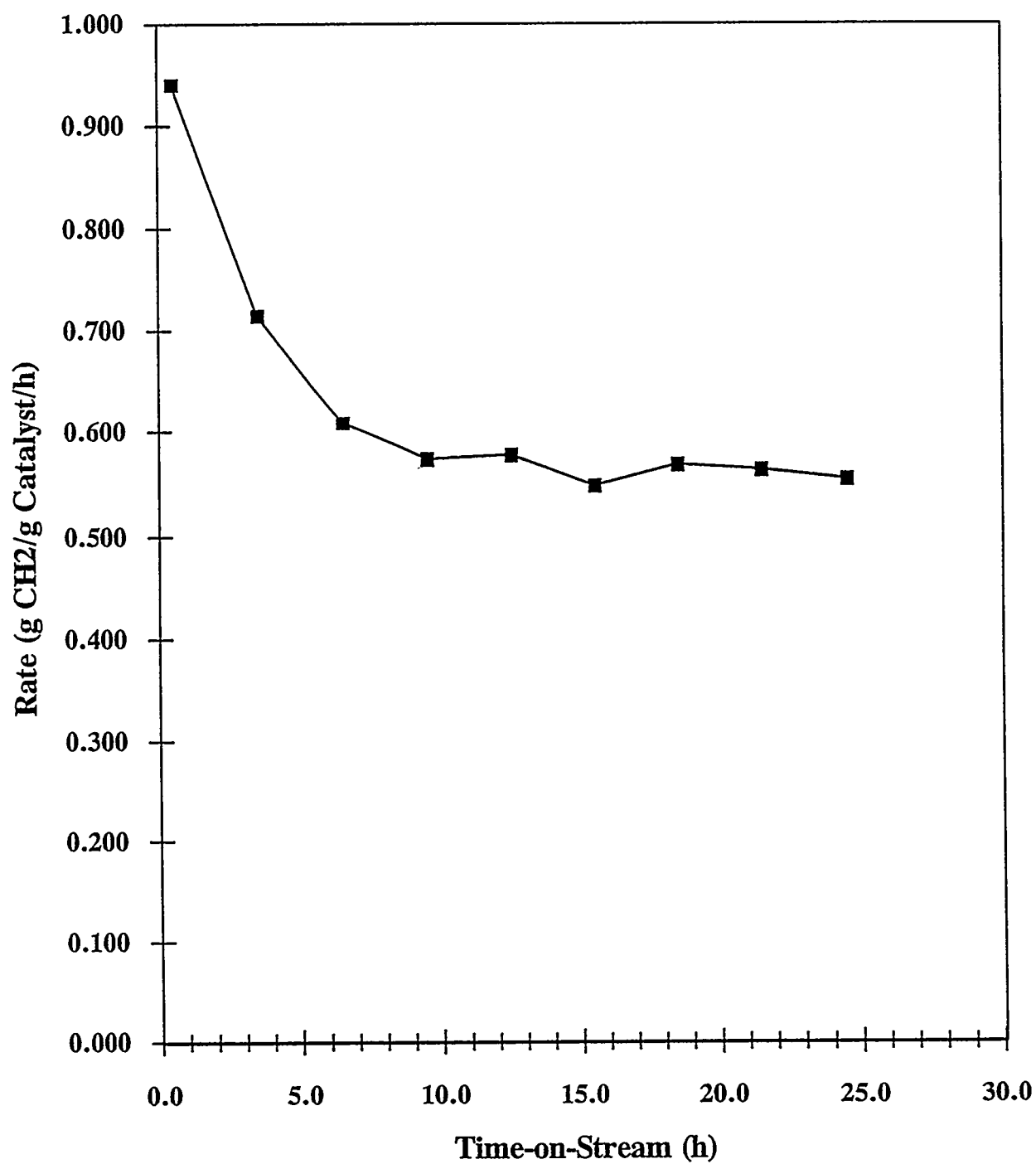
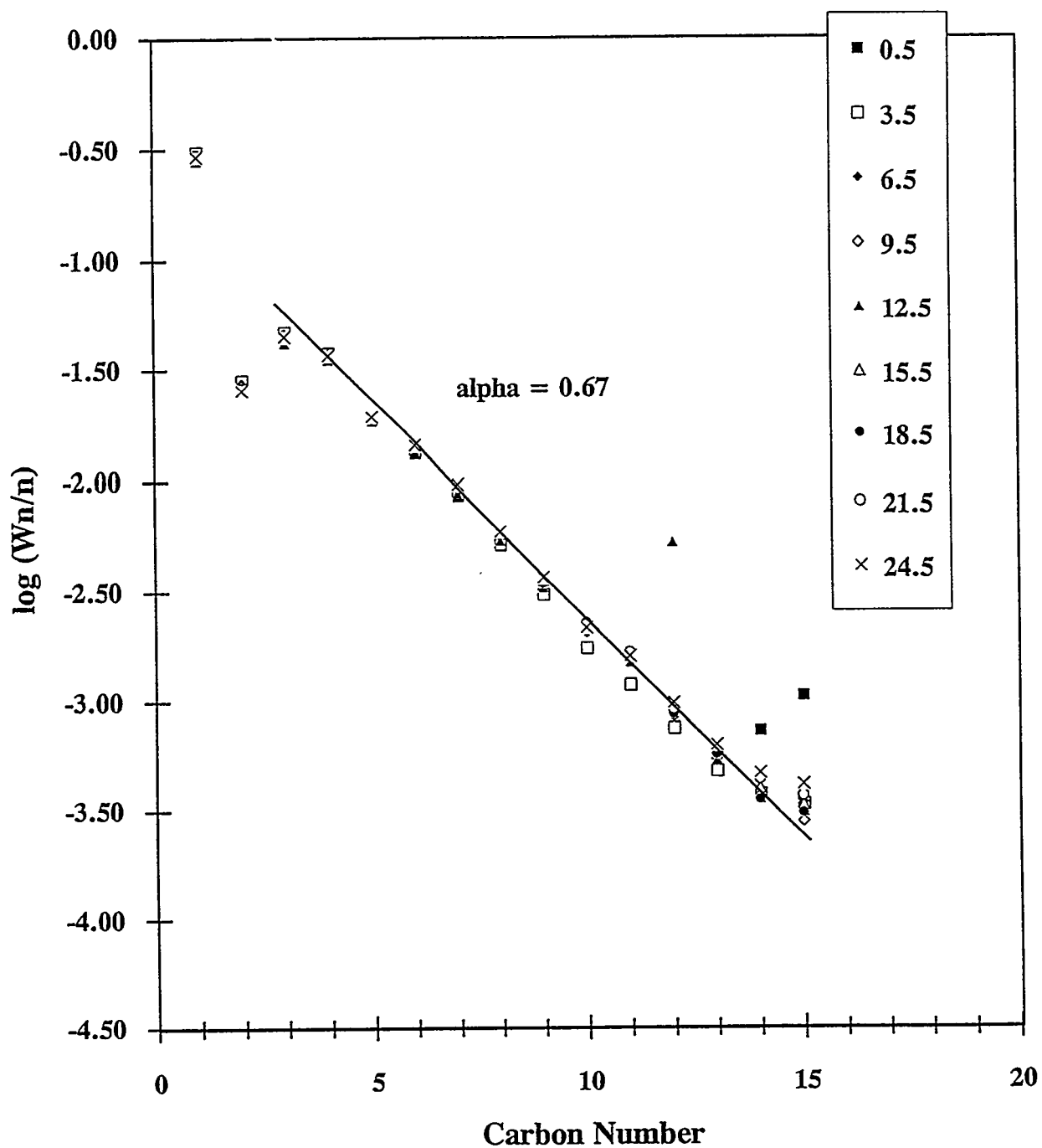


Time-on-Stream Plot for Co.061 - Run #1



Schulz-Flory Plot for Co.061 - Run #1
Time on Stream (hrs)

hrs.



Co.064 - Run #1

Co wt%	NM wt %	Promotor wt%		Support
20	Ru 0.50		Zr 8.50	Al ₂ O ₃

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 = 24.5 hrs

CO₂ (g/g cat/hr) = 0.028CO₂ (% of CO) = 0.2

O/P = 1.58

CO conversion (%)	7.1
rate (g CH ₂ /g cat/hr)	0.38
alpha	0.64
C1 (wt%)	27.5
C2 - C4 (wt%)	28.4
C5 - C12 (wt%)	41.5
C13 + (wt%)	2.7

Performance of Co.064

Dates: 04/11/95 - 04/12/95 Run #1

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

time on stream, hr	3.5	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 %

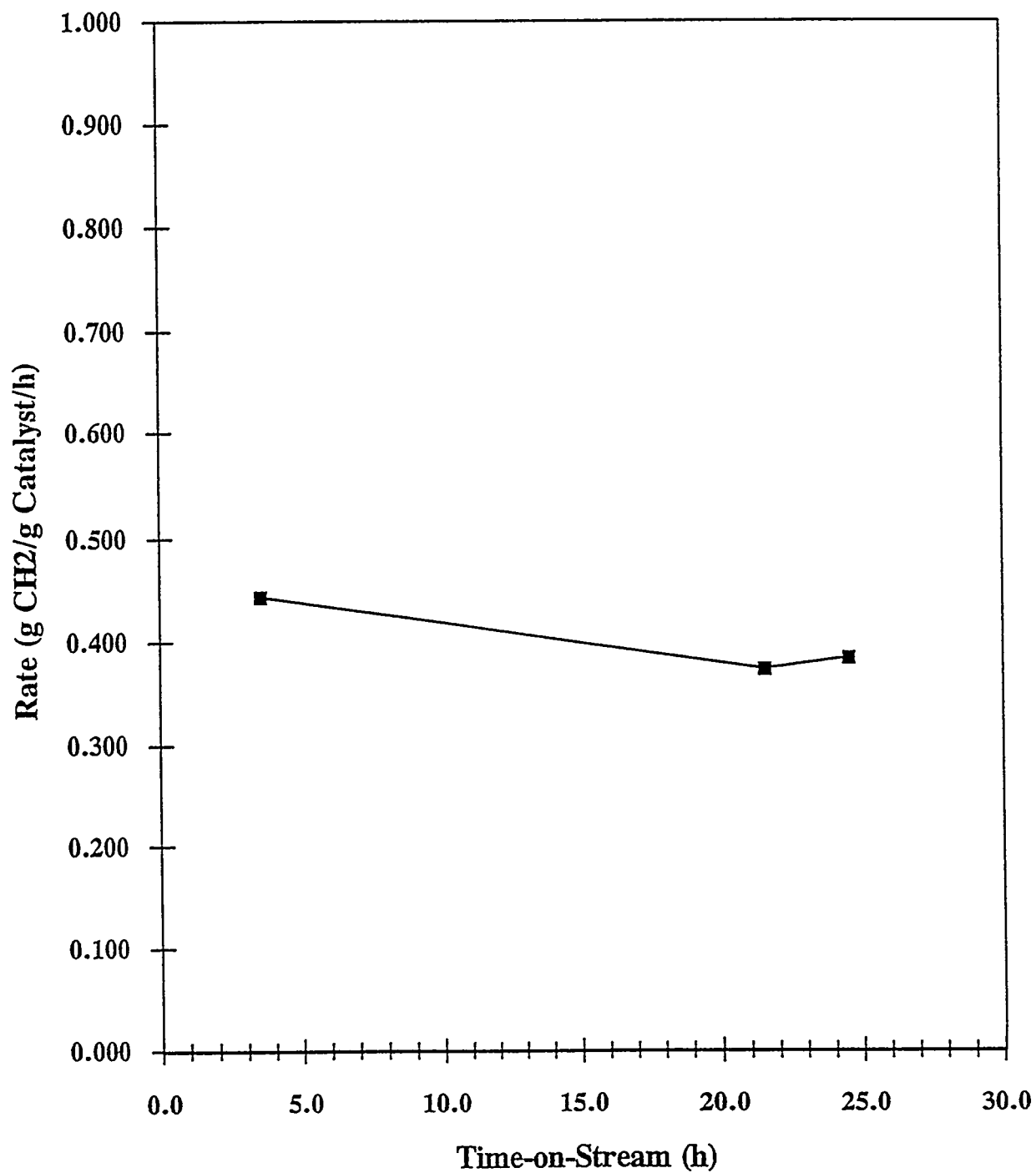
C1	28.79	28.40	27.58
C2	5.44	3.25	4.61
C3	13.05	12.20	11.78
C4	11.30	11.80	12.14
C5	12.01	11.57	11.67
C6	9.28	9.08	8.43
C7	6.71	7.11	7.15
C8	4.67	5.03	5.13
C9	3.22	3.63	3.70
C10	2.08	2.44	2.53
C11	1.52	1.93	1.90
C12	0.90	1.19	1.25
C13	0.58	1.00	0.89
C14	0.32	0.96	0.86
C15	0.13	0.42	0.40
alpha chain growth probability	0.57	0.64	0.64

C1 - C50 estimated total product distribution, weight %

C1	29.1	28.3	27.5
C2 - C4	30.1	27.1	28.4
C5 - C12	39.8	41.8	41.5
C13 - C50	0.9	2.8	2.7

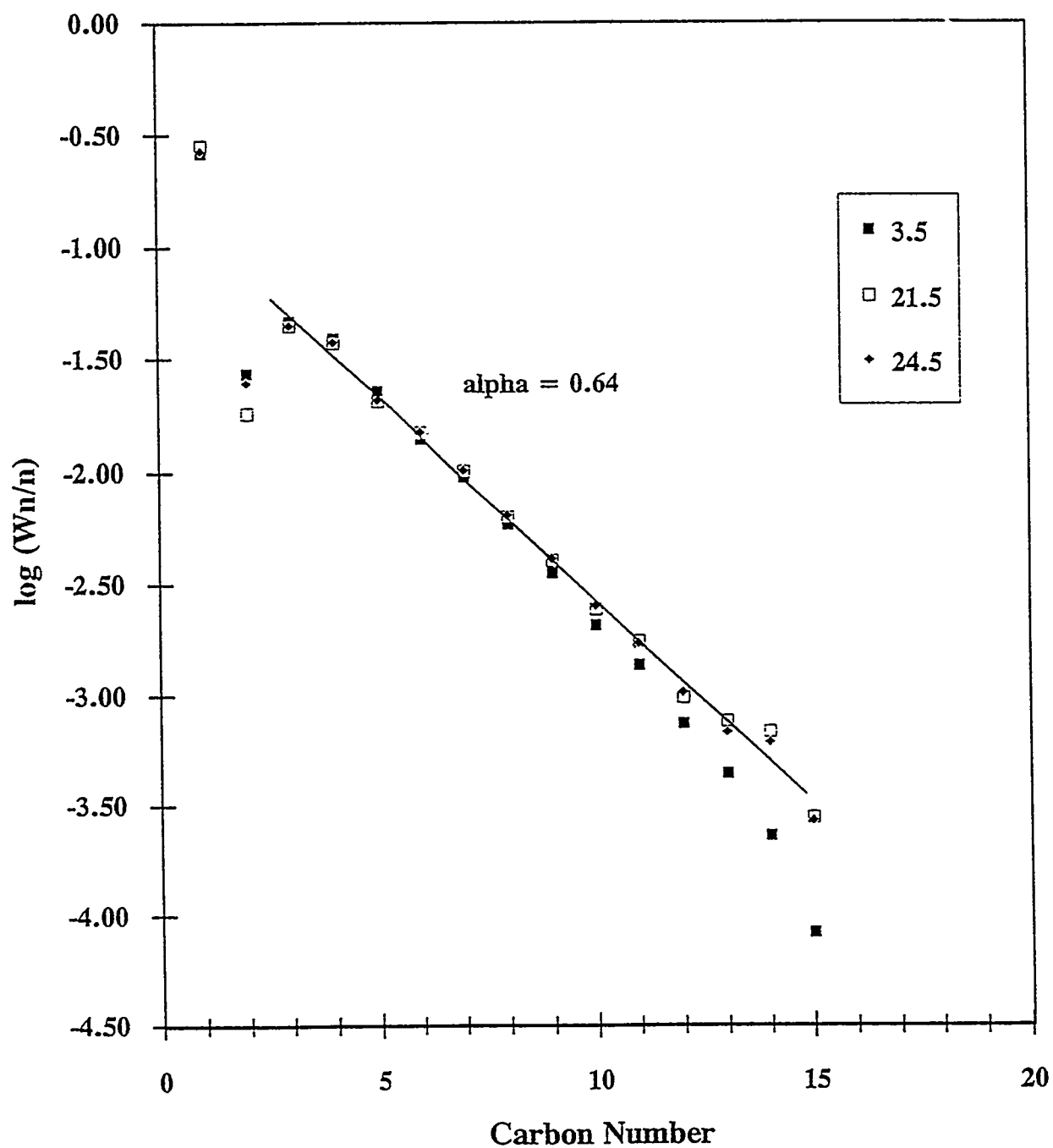
CO conversion, %	8.2	6.9	7.1
rate, g CH ₂ /g cat/hr	0.44	0.37	0.38
CO ₂ formation, %	0.2	0.2	0.2

Time-on-Stream Plot for Co.064 - Run #1



Schulz-Flory Plot for Co.064 - Run #1
Time on Stream (hrs)

hrs.



Cal.11 - Run #1

Co wt%	NM wt %	Promotor wt%		Support
20	Ru 0.50	K 0.30		Al ₂ O ₃

SUMMARY REACTION DATA

Reaction Conditions:

P = 1.0 atm

T = 220 °C

H₂/CO = 2

weight of catalyst = 0.208 g

WHSV = 12.39 1/hr

time on stream = 21.5 hrs

CO₂ (g/g cat/hr) = 0.029CO₂ (% of CO) = 0.2

O/P = 4.71

CO conversion (%)	5.2
rate (g CH ₂ /g cat/hr)	0.28
alpha	0.75
C1 (wt%)	20.0
C2 - C4 (wt%)	19.6
C5 - C12 (wt%)	48.1
C13 + (wt%)	12.2

Performance of Cal.11

Dates: 02/13/95 - 02/14/95 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	0.5	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	21.42	22.60	20.99	20.99	21.03	21.11
C2	4.00	4.74	4.30	3.92	3.95	3.95
C3	9.74	9.74	8.60	8.30	8.23	8.17
C4	10.89	10.55	9.52	8.96	8.84	8.77
C5	12.00	9.57	10.28	10.33	10.20	10.11
C6	10.48	10.27	9.13	8.85	9.36	9.13
C7	8.89	7.54	8.32	8.47	8.40	8.37
C8	6.91	6.08	6.73	6.91	6.85	6.83
C9	5.38	4.85	5.48	5.64	5.66	5.67
C10	4.35	3.88	4.44	4.65	4.74	4.73
C11	3.10	3.17	3.65	3.73	4.01	3.94
C12	1.87	2.45	2.90	3.23	3.01	3.35
C13	0.72	1.79	2.26	2.38	2.39	2.53
C14	0.23	1.47	1.85	2.03	1.80	1.90
C15	0.03	1.29	1.57	1.61	1.54	1.44
alpha chain growth probability	0.51	0.73	0.74	0.75	0.74	0.74

C1 - C50 estimated total product distribution, weight %

C1	22.6	21.5	19.7	19.8	19.9	20.3
C2 - C4	26.0	23.8	21.1	20.0	19.9	20.1
C5 - C12	51.2	45.9	48.2	48.8	49.2	49.3
C13 - C50	0.2	8.8	11.0	11.4	10.9	10.3

CO conversion, %	6.0	5.9	6.0	5.6	5.3	5.2
rate, g CH ₂ /g cat/hr	0.33	0.32	0.33	0.30	0.29	0.28
CO ₂ formation, %	0.2	0.1	0.2	0.2	0.2	0.1

Performance of Cal.11

Dates: 02/13/95 - 02/14/95 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	18.5	21.5	27.5
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 %

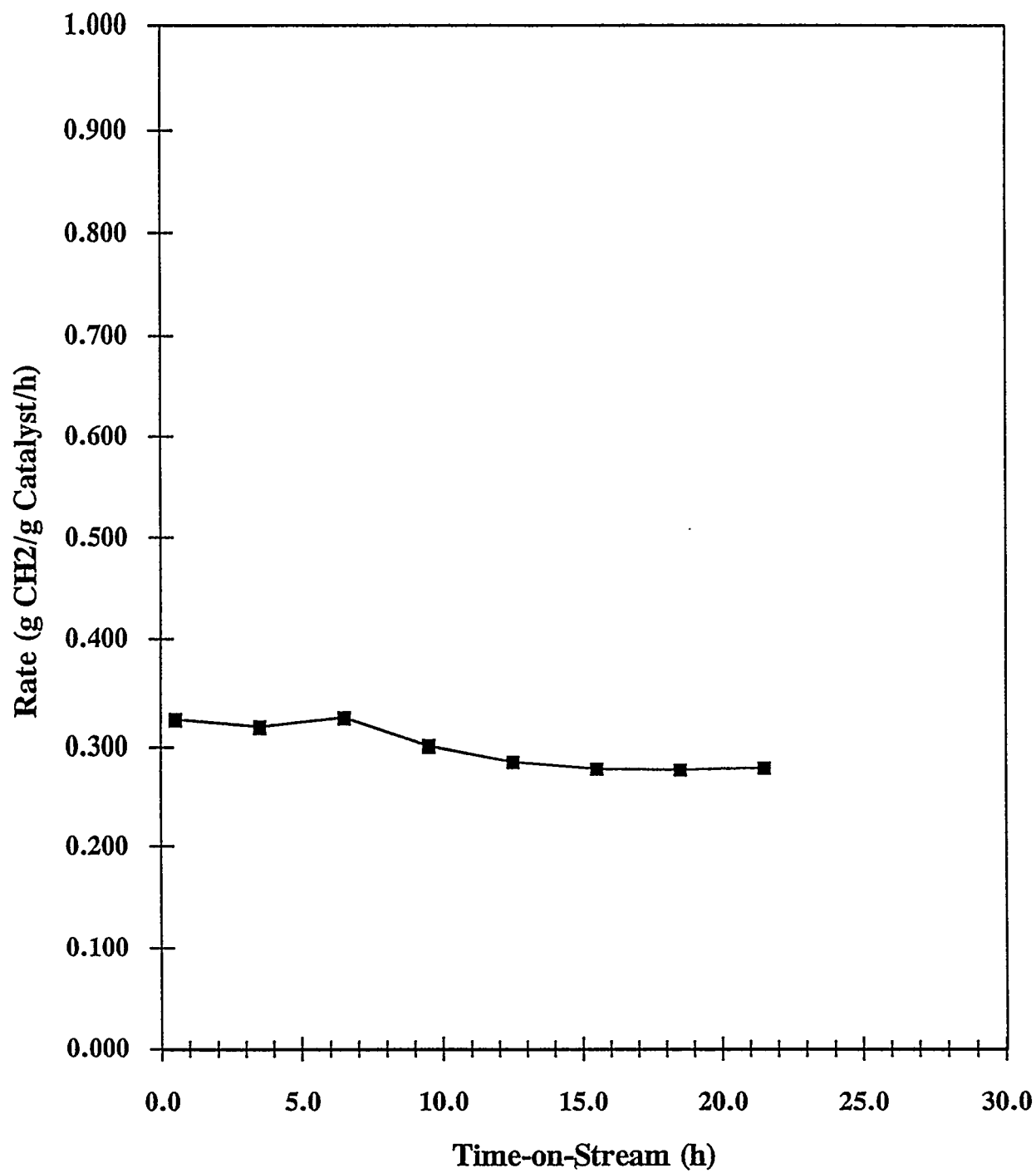
C1	21.33	21.58	2.74
C2	4.01	4.05	5.19
C3	8.20	8.27	10.43
C4	8.79	8.83	11.16
C5	10.12	10.15	12.83
C6	9.30	9.09	9.14
C7	8.41	8.34	10.29
C8	6.92	6.82	8.55
C9	5.67	5.67	7.14
C10	4.67	4.63	5.91
C11	3.57	3.75	4.88
C12	3.36	3.04	4.14
C13	2.23	2.20	3.05
C14	1.88	1.86	2.46
C15	1.56	1.72	2.09
alpha chain growth probability	0.74	0.75	0.77

C1 - C50 estimated total product distribution, weight %

C1	20.2	20.0	2.5
C2 - C4	19.8	19.6	24.8
C5 - C12	49.0	48.1	57.3
C13 - C50	11.0	12.2	15.4

CO conversion, %	5.1	5.2	4.0
rate, g CH ₂ /g cat/hr	0.28	0.28	0.22
CO ₂ formation, %	0.1	0.2	0.2

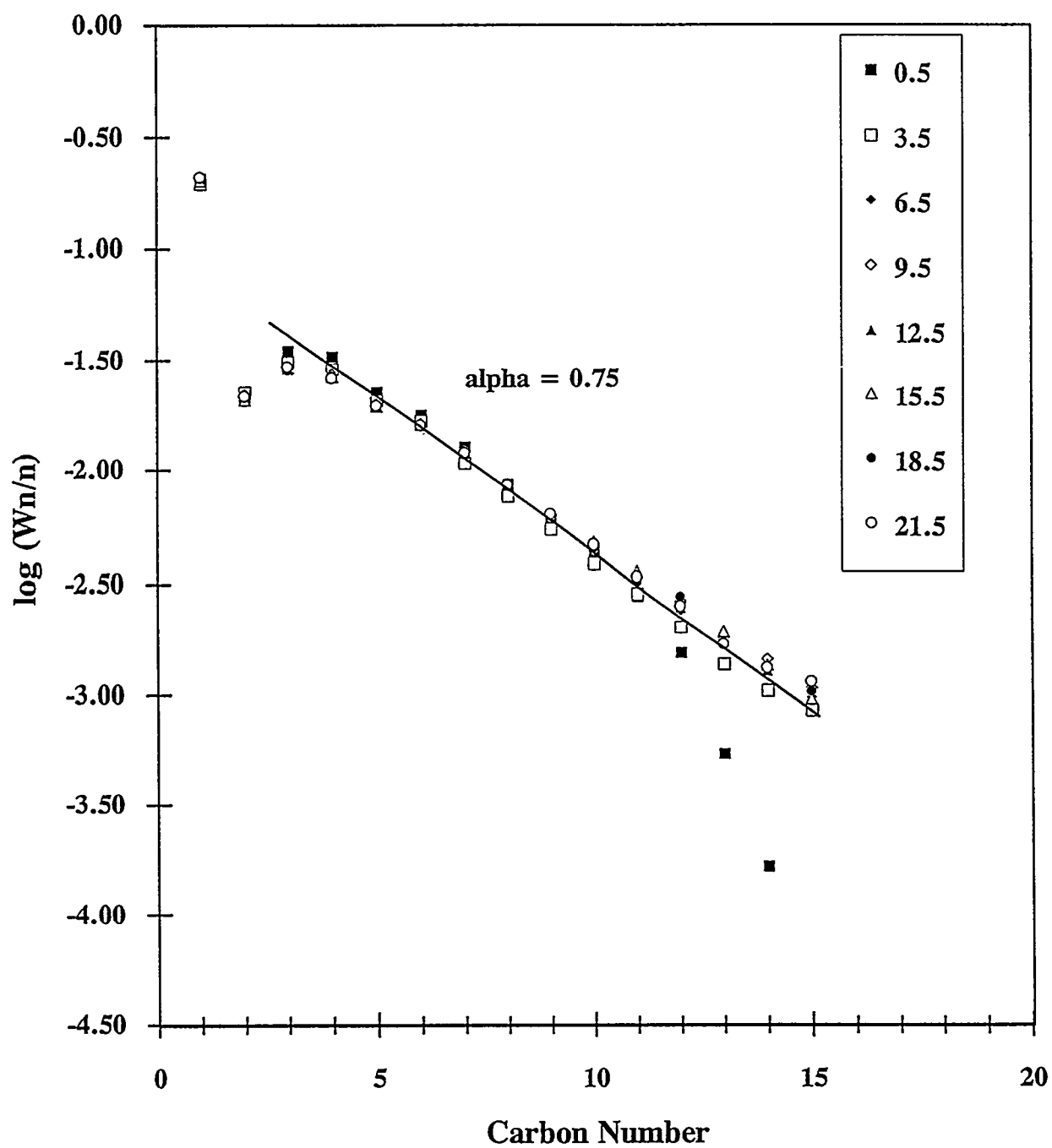
Time-on-Stream Plot for CAL.11 - Run #1



Schulz-Flory Plot for Cal.11 - Run #1

Time on Stream (hrs)

hrs.



Cal.12 - Run #1

Co wt%	NM wt %	Promotor wt%		Support
20	0.50	0.30		

SUMMARY REACTION DATA

Reaction Conditions:

P = 1.0 atm

T = 220 °C

H₂/CO = 2

weight of catalyst = 0.203 g

WHSV = 12.64 1/hr

time on stream = 24.5 hrs

CO₂ (g/g cat/hr) = 0.035CO₂ (% of CO) = 0.2

O/P = 3.89

CO conversion (%)	5.2
rate (g CH ₂ /g cat/hr)	0.29
alpha	0.73
C1 (wt%)	21.6
C2 - C4 (wt%)	20.6
C5 - C12 (wt%)	48.2
C13 + (wt%)	9.6

Performance of Cal.12

Dates: 02/16/95 - 02/17/95 Run #1

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	22.52	21.69	22.06	22.26	22.81	22.48
C2	4.17	4.28	4.06	4.09	4.18	4.13
C3	10.18	9.57	8.74	8.66	8.74	8.53
C4	11.14	10.43	9.45	9.27	9.34	9.11
C5	11.95	10.80	10.57	10.43	10.04	10.38
C6	10.41	9.27	9.12	9.30	9.57	8.47
C7	8.49	8.17	8.26	8.27	8.01	8.36
C8	6.55	6.43	6.61	6.56	6.43	6.77
C9	4.95	5.03	5.31	5.24	5.20	5.52
C10	3.80	4.07	4.25	4.24	4.24	4.45
C11	2.86	3.22	3.47	3.51	3.44	3.59
C12	1.74	2.44	2.80	2.77	2.65	3.01
C13	0.76	1.93	2.25	2.18	2.15	2.04
C14	0.32	1.52	1.79	1.76	1.74	1.71
C15	0.16	1.16	1.26	1.45	1.45	1.45
alpha chain growth probability	0.60	0.72	0.73	0.74	0.74	0.74

C1 - C50 estimated total product distribution, weight %

C1	23.3	20.9	21.3	21.1	21.6	21.3
C2 - C4	26.3	23.4	21.5	20.9	21.0	20.7
C5 - C12	49.3	47.7	48.4	47.9	47.3	47.9
C13 - C50	1.1	8.0	8.8	10.1	10.1	10.2

CO conversion, %	6.4	6.3	5.9	5.7	5.5	5.4
rate, g CH ₂ /g cat/hr	0.35	0.35	0.33	0.32	0.30	0.30
CO ₂ formation, %	0.2	0.2	0.2	0.2	0.2	0.2

Performance of Cal.12

Dates: 02/16/95 - 02/17/95 Run #1

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 %

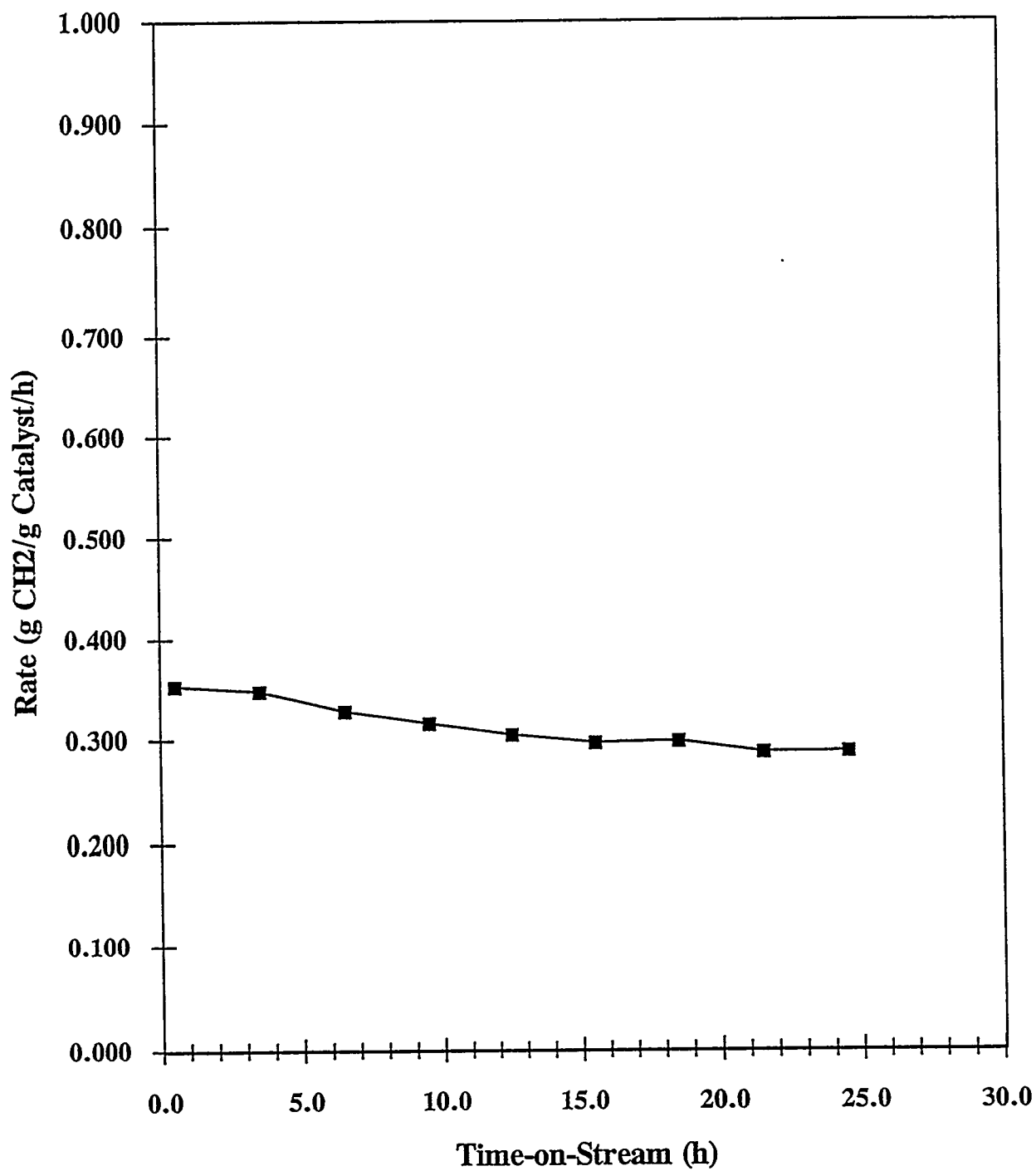
C1	22.34	22.38	22.56
C2	4.11	4.11	4.16
C3	8.44	8.43	8.39
C4	8.94	9.27	8.99
C5	10.17	10.20	10.07
C6	9.44	8.54	9.49
C7	8.28	8.28	8.15
C8	6.67	6.73	6.61
C9	5.43	5.48	5.40
C10	4.45	4.53	4.40
C11	3.62	3.69	3.31
C12	2.79	2.87	3.30
C13	2.08	2.11	2.04
C14	1.74	1.81	1.77
C15	1.49	1.57	1.37
alpha chain growth probability	0.74	0.74	0.73

C1 - C50 estimated total product distribution, weight %

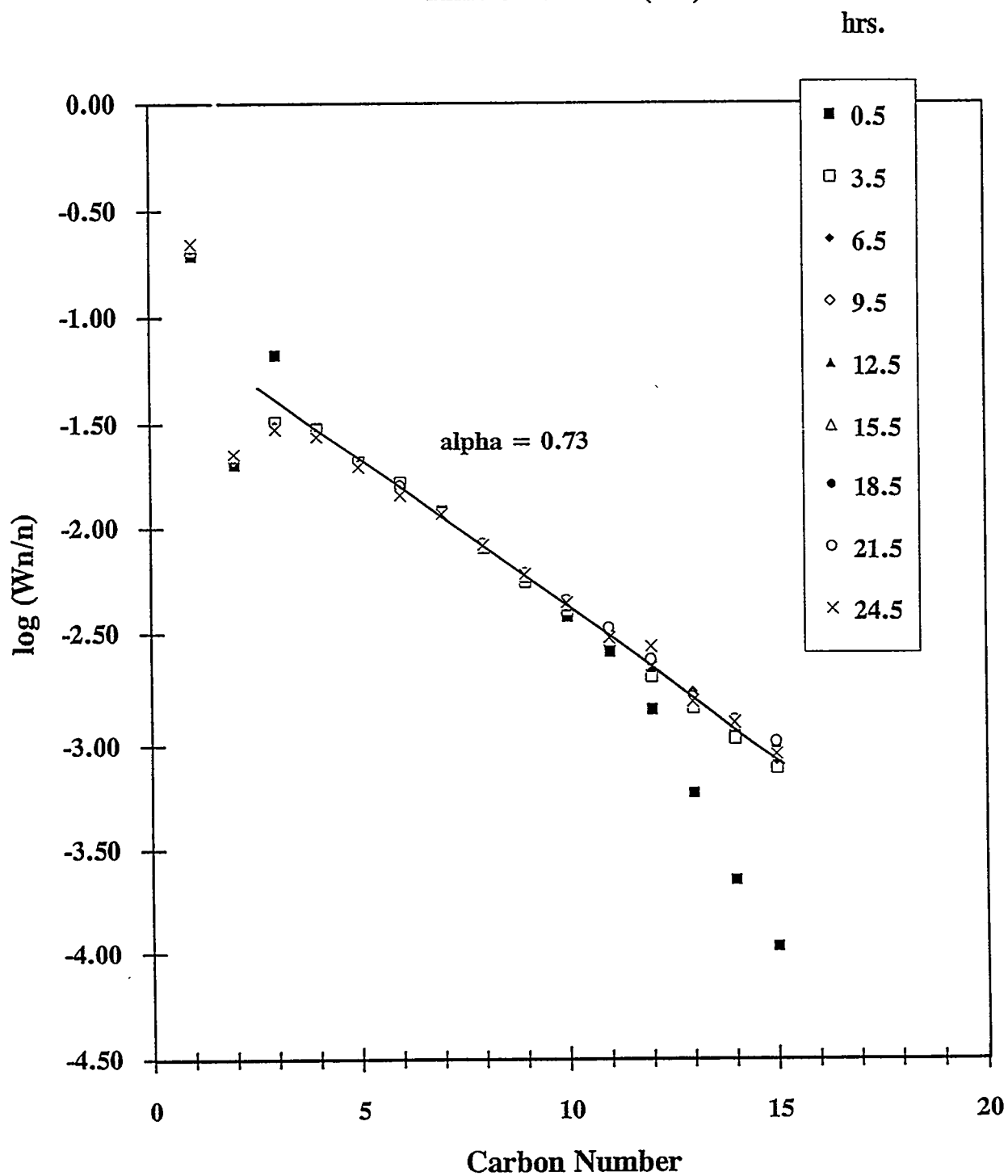
C1	21.1	21.0	21.6
C2 - C4	20.3	20.5	20.6
C5 - C12	48.2	47.5	48.2
C13 - C50	10.4	11.0	9.6

CO conversion, %	5.4	5.2	5.2
rate, g CH ₂ /g cat/hr	0.30	0.29	0.29
CO ₂ formation, %	0.2	0.2	0.2

Time-on-Stream Plot for CAL.12 - Run #1



Schulz-Flory Plot for Cal.12 - Run #1
Time on Stream (hrs)



Cal.13 - Run #1

Co wt%	NM wt %	Promotor wt%		Support
20	0.50	0.30		

SUMMARY REACTION DATA

Reaction Conditions:

P = 1.0 atm

T = 220 °C

H₂/CO = 2

weight of catalyst = 0.202 g

WHSV = 12.75 1/hr

time on stream = 24.5 hrs

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

O/P = 3.38

CO conversion (%)	4.6
rate (g CH ₂ /g cat/hr)	0.26
alpha	0.77
C1 (wt%)	18.0
C2 - C4 (wt%)	20.1
C5 - C12 (wt%)	46.3
C13 + (wt%)	15.6

Performance of Cal.13

Dates: 02/20/95 - 02/21/95 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	3.5	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	17.08	19.53	20.72	20.28	20.31	20.46
C2	3.22	3.90	2.31	3.87	3.87	3.93
C3	7.40	7.79	7.98	7.77	7.67	7.66
C4	8.40	8.63	8.62	8.40	8.28	8.28
C5	9.49	9.97	10.01	9.75	9.60	9.60
C6	8.59	8.17	8.25	8.88	8.85	8.91
C7	7.51	8.30	8.44	8.23	8.25	8.22
C8	6.11	6.88	7.05	6.93	6.97	6.94
C9	4.96	7.09	5.87	5.79	5.82	5.80
C10	4.07	4.73	4.91	4.93	4.91	4.95
C11	3.37	3.91	4.04	4.15	4.17	4.16
C12	3.98	3.41	3.39	3.36	3.58	3.52
C13	7.31	2.86	2.80	2.80	2.80	2.80
C14	6.02	2.54	2.76	2.64	2.65	2.62
C15	2.49	2.31	2.85	2.22	2.26	2.15
alpha chain growth probability	0.78	0.77	0.79	0.77	0.77	0.77

C1 - C50 estimated total product distribution, weight %

C1	16.0	17.4	17.5	18.3	18.2	18.6
C2 - C4	17.9	18.1	16.0	18.0	17.8	18.0
C5 - C12	46.9	48.0	46.1	47.7	47.6	47.8
C13 - C50	19.2	16.6	20.4	16.0	16.4	15.6

CO conversion, %	7.0	5.7	5.5	4.9	4.8	4.6
rate, g CH ₂ /g cat/hr	0.39	0.32	0.31	0.28	0.27	0.26
CO ₂ formation, %	0.1	0.1	0.2	0.2	0.2	0.1

Performance of Cal.13

Dates: 02/20/95 - 02/21/95 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	18.5	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 %

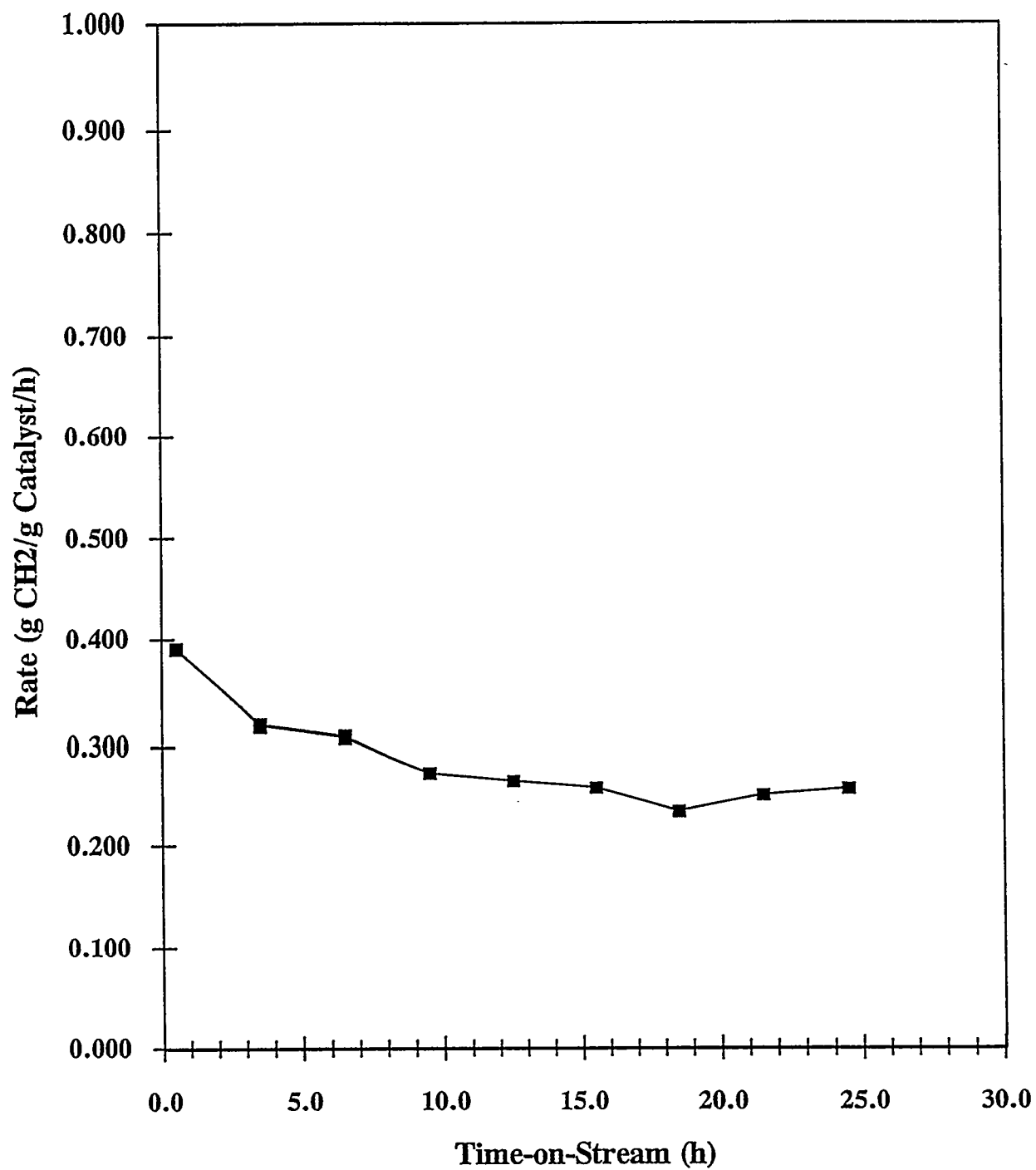
C1	21.93	20.45	19.93
C2	4.23	3.95	3.84
C3	0.83	7.68	7.47
C4	8.85	8.25	10.94
C5	10.27	9.58	9.31
C6	9.27	8.88	8.55
C7	8.84	8.19	7.95
C8	7.51	6.91	6.72
C9	6.34	5.79	5.62
C10	5.35	4.91	4.76
C11	4.46	4.11	3.98
C12	3.89	3.59	3.48
C13	3.05	2.89	2.74
C14	2.88	2.61	2.54
C15	2.30	2.22	2.16
alpha chain growth probability	0.78	0.77	0.77

C1 - C50 estimated total product distribution, weight %

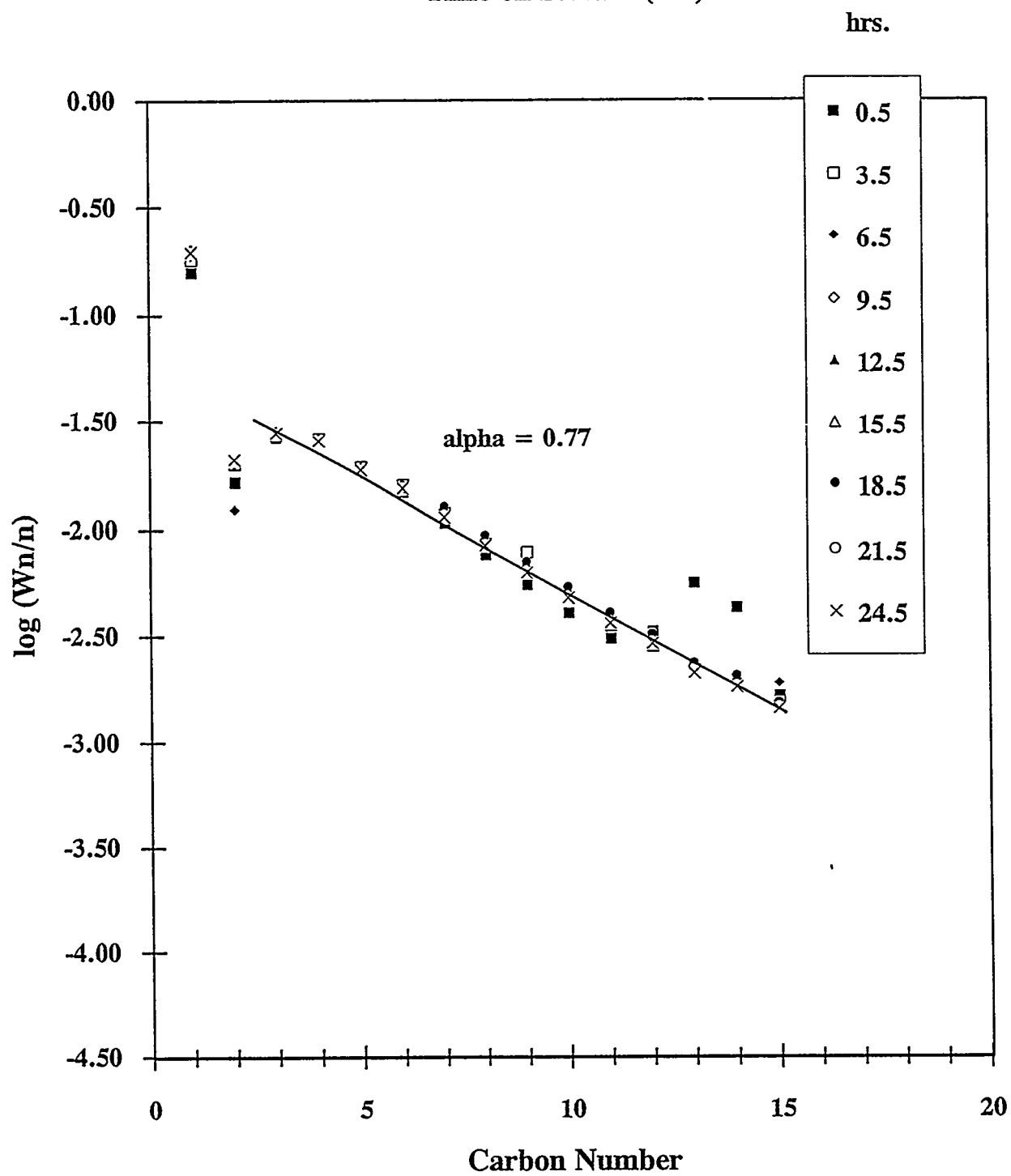
C1	19.8	18.4	18.0
C2 - C4	12.6	17.9	20.1
C5 - C12	50.8	47.5	46.3
C13 - C50	16.9	16.1	15.6

CO conversion, %	4.2	4.5	4.6
rate, g CH ₂ /g cat/hr	0.23	0.25	0.26
CO ₂ formation, %	0.2	0.1	0.1

Time-on-Stream Plot for CAL.13 - Run #1



Schulz-Flory Plot for Cal.13 - Run #1
Time on Stream (hrs)



Cal.13 - Run #2

Co wt%	NM wt%	Promotor wt%		Support
20	0.50	K 0.3		Al ₂ O ₃

SUMMARY REACTION DATA*

Reaction Conditions:

P = 1.0 atm

T = 220 °C

H₂/CO = 2

weight of catalyst = 0.209 g

WHSV = 12.32 1/hr

time on stream = 23.0 hrs

CO₂ (g/g cat/hr) = 0.085CO₂ (% of CO) = 0.5

O/P = 2.58

CO conversion (%)	3.7
rate (g CH ₂ /g cat/hr)	0.20
alpha	0.83
C1 (wt%)	14.0
C2 - C4 (wt%)	13.8
C5 - C12 (wt%)	39.5
C13 + (wt%)	32.7

* Reaction carried out in second reaction system

Performance of Cal.13

Dates: 02/20/95 - 02/21/95 Run #2

flow rate = 90.0 cc/min, loading = 0.21 g, WHSV = 12.3 1/hr, H₂/CO ratio in feed = 2

time on stream, hr	3.0	5.5	21.0	23.0
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	17.87	18.93	20.05	19.22		
C2	3.82	4.06	4.34	4.11		
C3	7.26	7.85	7.94	7.63		
C4	8.20	8.92	8.62	7.22		
C5	9.30	10.14	9.25	9.06		
C6	8.37	9.51	10.12	9.29		
C7	7.25	7.35	6.55	6.91		
C8	7.46	5.58	5.53	6.15		
C9	6.23	5.18	4.91	4.95		
C10	5.48	4.16	4.23	4.68		
C11	4.83	3.42	4.19	4.26		
C12	3.90	2.92	4.19	3.79		
C13	4.31	5.61	3.17	3.40		
C14	2.96	2.75	4.18	4.89		
C15	2.76	3.62	2.75	4.44		
alpha	chain growth probability	0.80	0.81	0.79	0.83	1.00 1.00

C1 - C50 estimated total product distribution, weight %

C1	15.6	14.9	17.5	14.0
C2 - C4	16.8	16.4	18.2	13.8
C5 - C12	46.5	42.3	43.8	39.5
C13 - C50	21.1	26.4	20.5	32.7

CO conversion, %	3.8	3.9	3.0	3.7
rate, g CH ₂ /g cat/hr	0.21	0.21	0.16	0.20
CO ₂ formation, %	1.5	0.9	0.7	0.5
