

FIGURE 51

Effect of Potassium Level on Iron Catalyst Performance

Catalyst Fe:X, wt	Feed Rate NL/gFe/hr	Line-Out Results ^a			
		CO Conv., %	Carbon Selec., mol-%		H ₂ /CO, ^b Molar
			C ₁ +C ₂	C ₃ =	
100:1.16 (Run 35)	2.7	73	8.5	2.0	0.90
100:1.72 (Run 36)	2.4	73	8.4	2.2	0.90
100:2.06 (Run 37)	2.4	73	5.2	2.8	1.0
100:2.70 (Run 39)	2.4	50	3.6	2.6	0.78
	1.2	73	4.4	2.7	1.03
100:3.85 (Run 38)	2.4	50	3.0	2.9	0.72

^a 130 HOS
^b At reactor outlet

Effect of K Level on Conversion

FIGURE 52

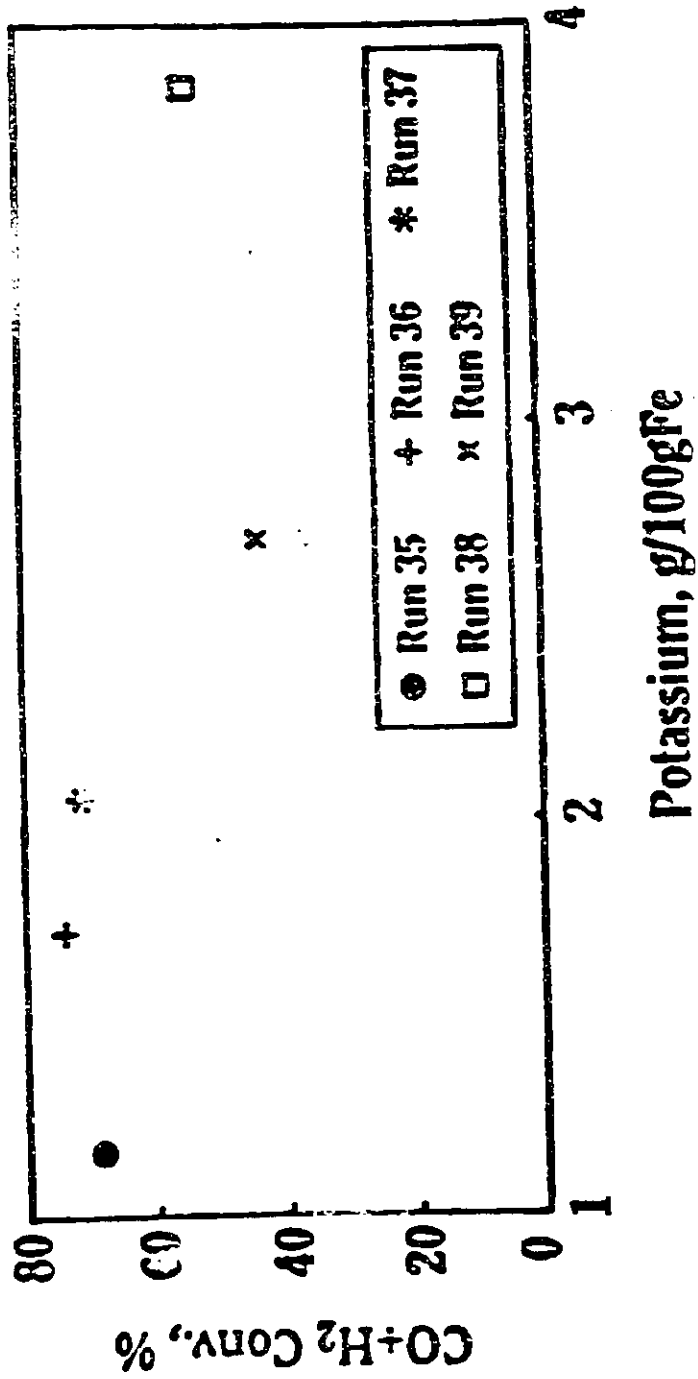
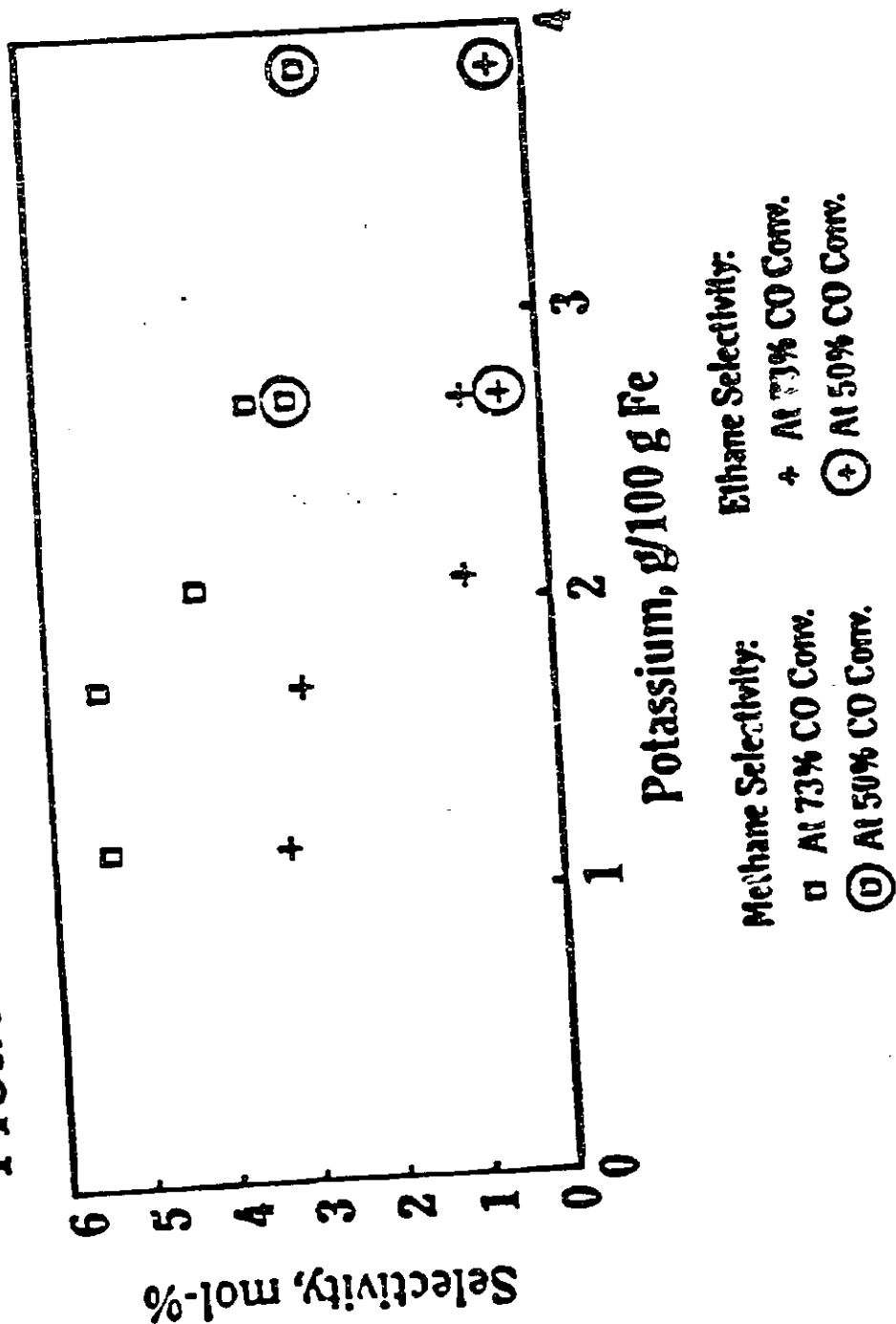


FIGURE 53

Methane and Ethane Selectivities



Olefin : Paraffin Ratios at 73% CO Conversion

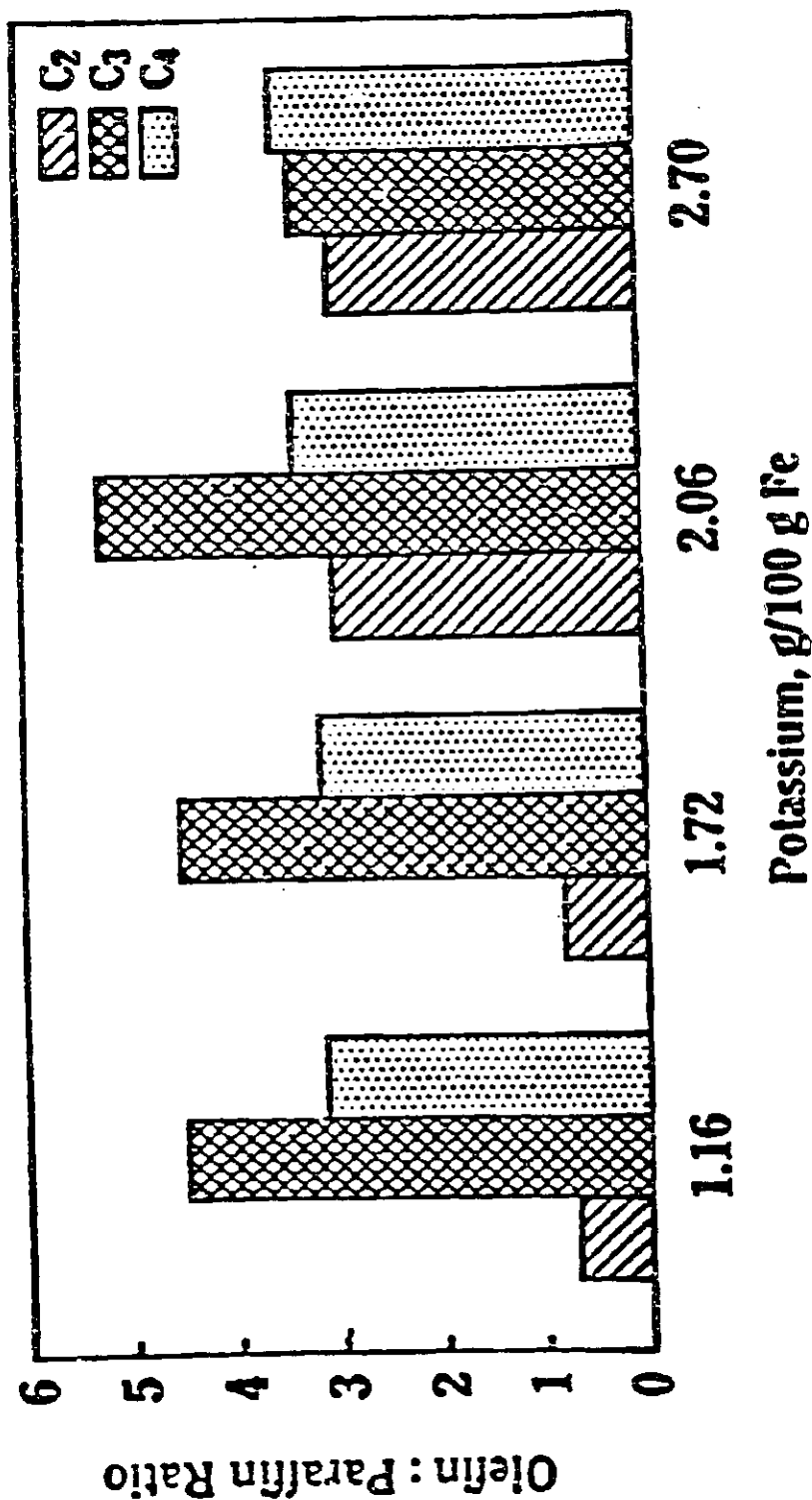


FIGURE 54

FIGURE 55

Comparison of CO₂ Selectivities

Catalyst Fe:K, wt	Feed Rate NL/gFe/hr	CO Conv., %	Line-Out CO ₂ Selec., mol-%
100.1.16 (Run 35)	2.7	73	45.5
100.1.72 (Run 36)	2.4	73	45.5
100.2.06 (Run 37)	2.4	73	46.5
100.2.70 (Run 39)	2.4	45	45.0
	1.2	73	46.2
100.3.85 (Run 38)	2.4	55	44.8
* 130 HOS			

Alcohol Selectivities at 73% CO Conversion

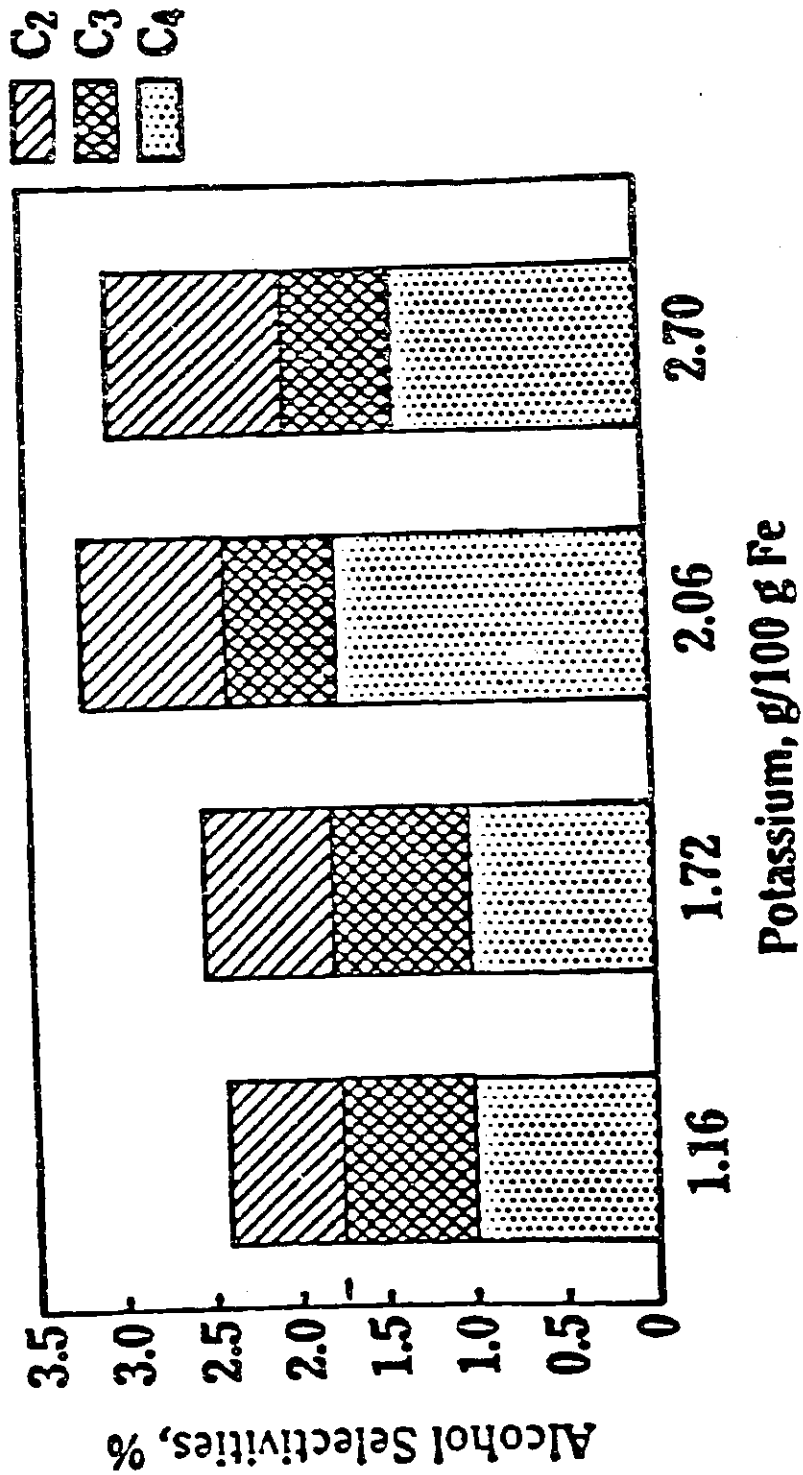


FIGURE 56

UOP 2084-17

Schulz-Flory Plots

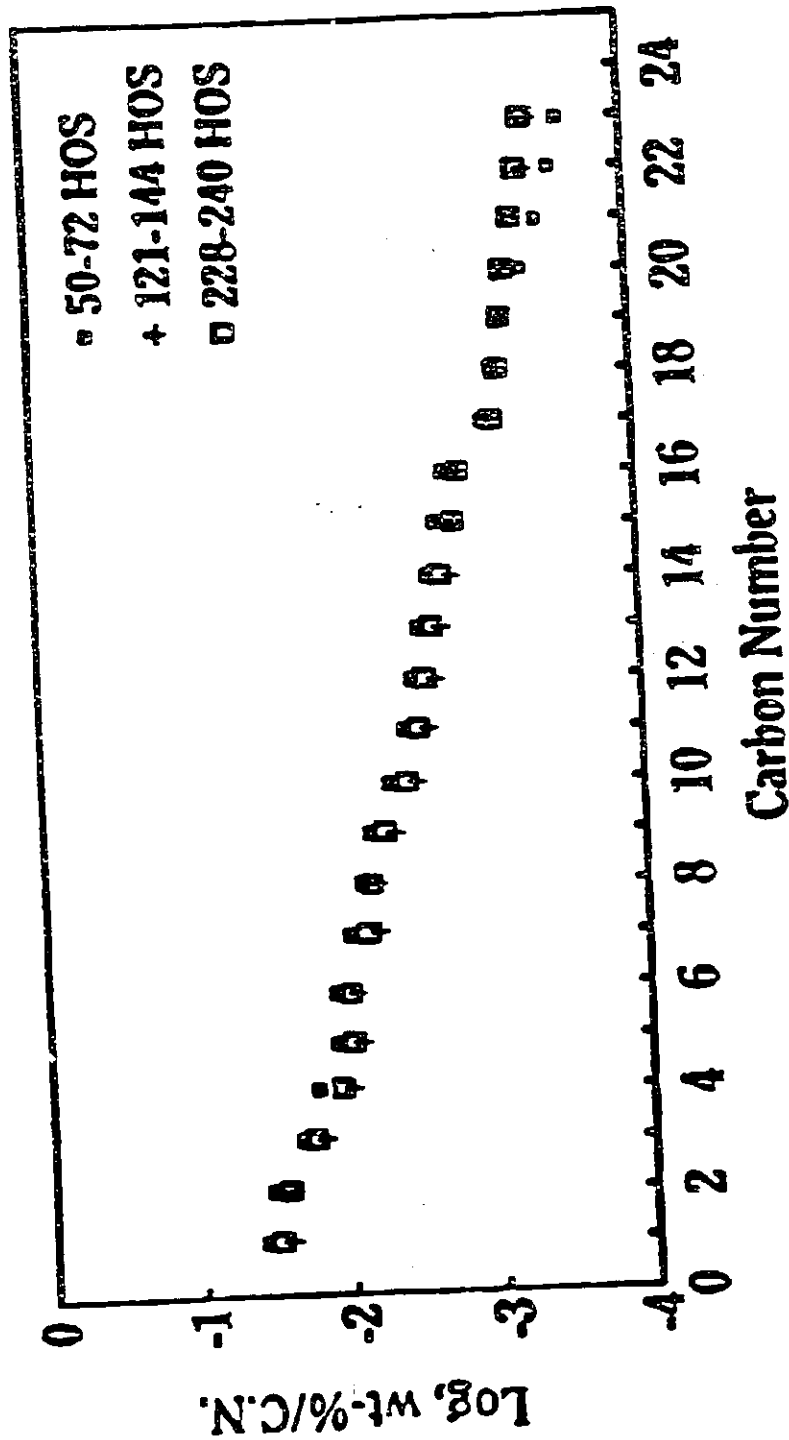


FIGURE 57

Liq. by Off-Line and Gas by On-Line Analysis

100-7081-03

FIGURE 58

Schulz-Flory Distribution

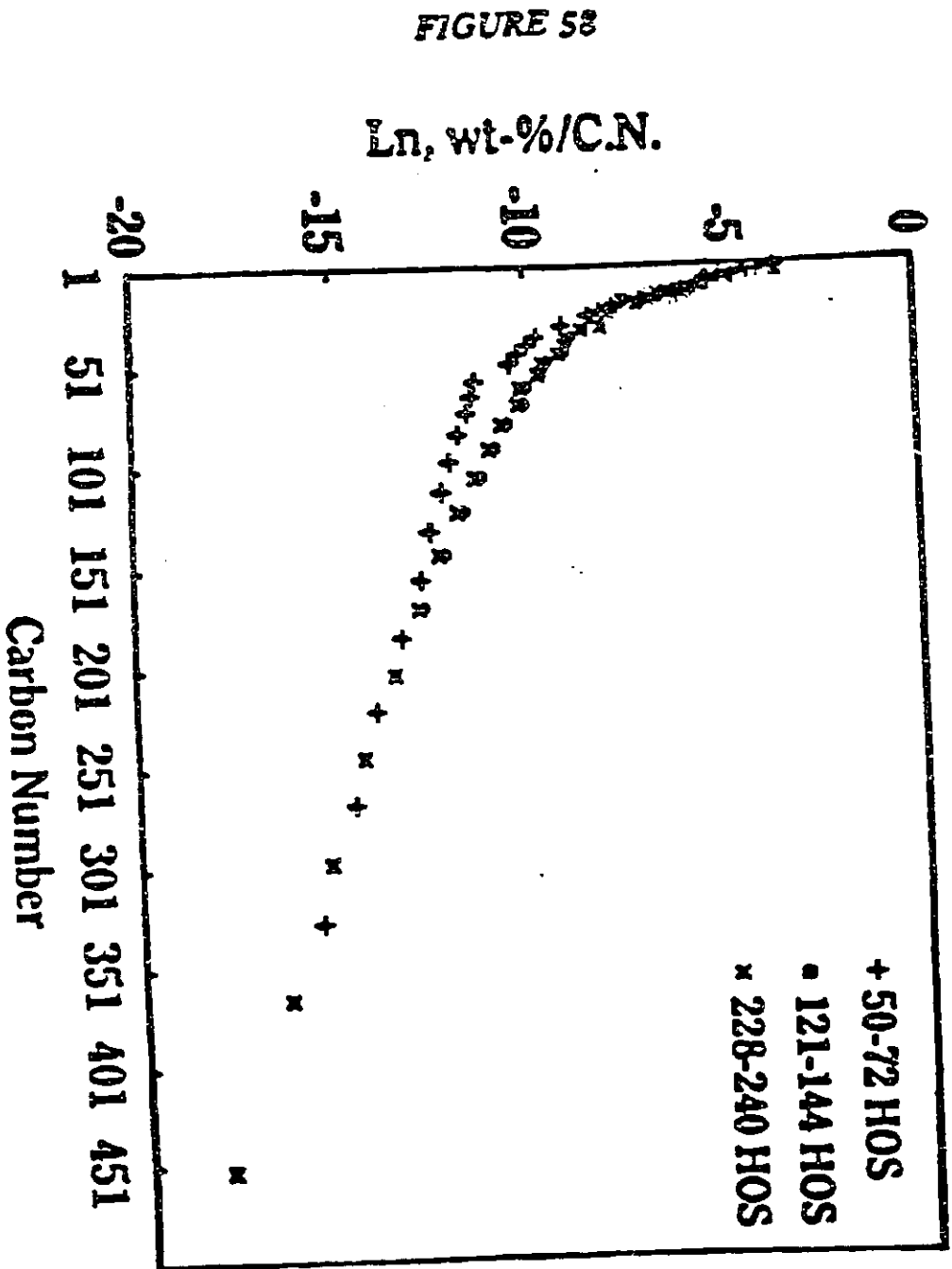


FIGURE 59

HC PRODUCT DISTRIBUTION
PLANT 700B RUN 37

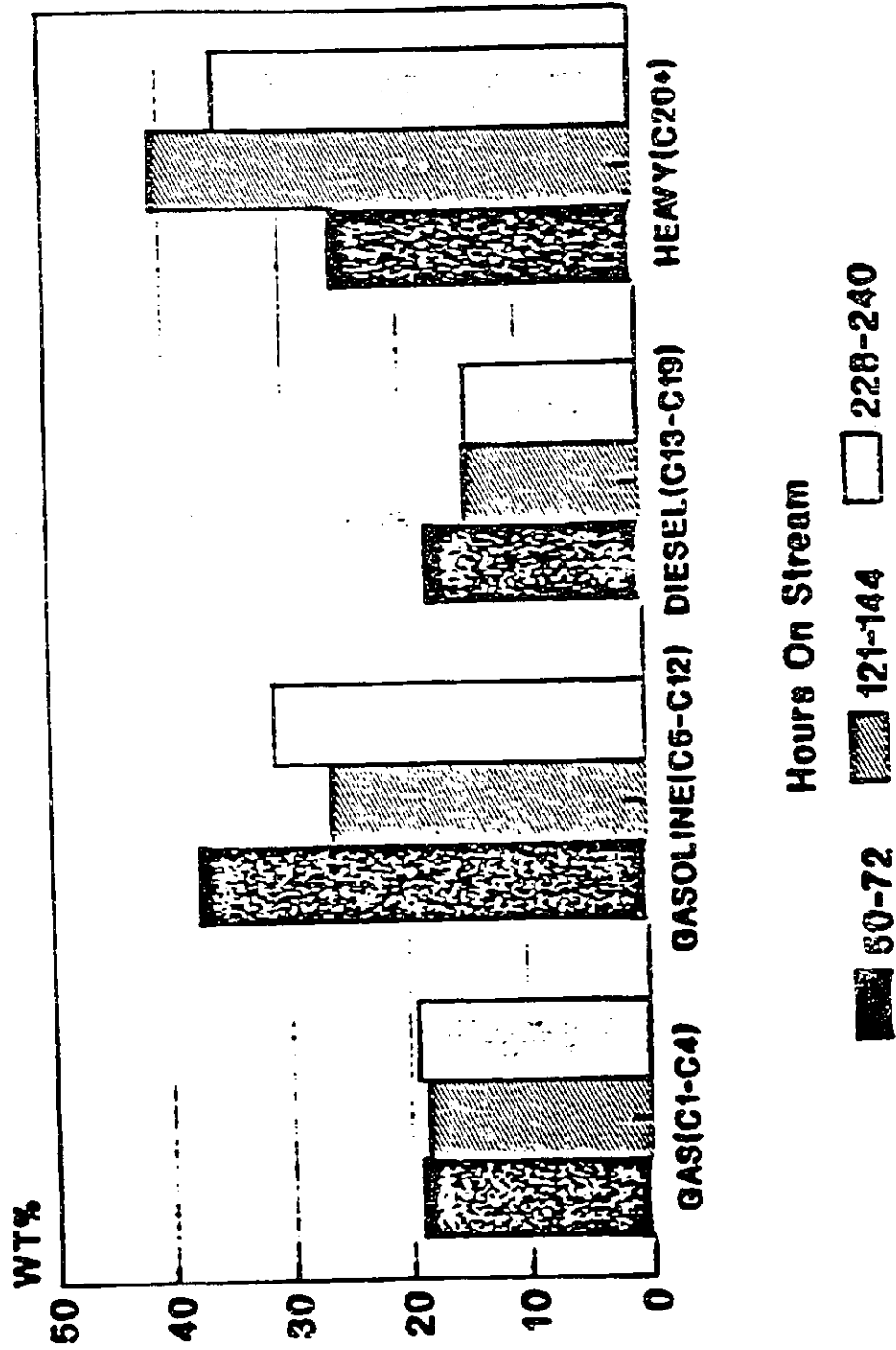


FIGURE 60

METAL OXIDES USED FOR FOUR RUNS WITH POTASSIUM LAURATE

OXIDE PREP FLT NO.	AUTOCLAVE FLT RUN NO.	MESH RANGE	METALS, WT% (AS REC'D)			LOI @ 500° C	BET	
			Fe	Cu	K		SA, m ² /g	PV, cc/g
19 ^a	42	-140 + 400	62.2	1.3	N/A	4.55	220	0.24
	43		60.7	0.7	N/A		212	0.24
	46							
	49 (AFTER K IMP)		62.8	0.8	0.6		197	0.22

1. SEVERAL LOTS WERE MADE DURING WORKUP OF RUN 19. ONE LOT FURNISHED MATERIAL FOR AUTOCLAVE RUNS 42 AND 43, AND ANOTHER FURNISHED MATERIAL FOR AUTOCLAVE RUNS 46 AND 49.

FIGURE 61

POTASSIUM LAURATE ADDITION TO SLURRY

PJ 700B RUN 42 H₂:CO feed=0.7, 1100 rpm

100g Fe : 2.15 Cu : 3.63 K : 72.7g Fe/Cu Oxide+10g K Salt in 200 g C₃₀ oil

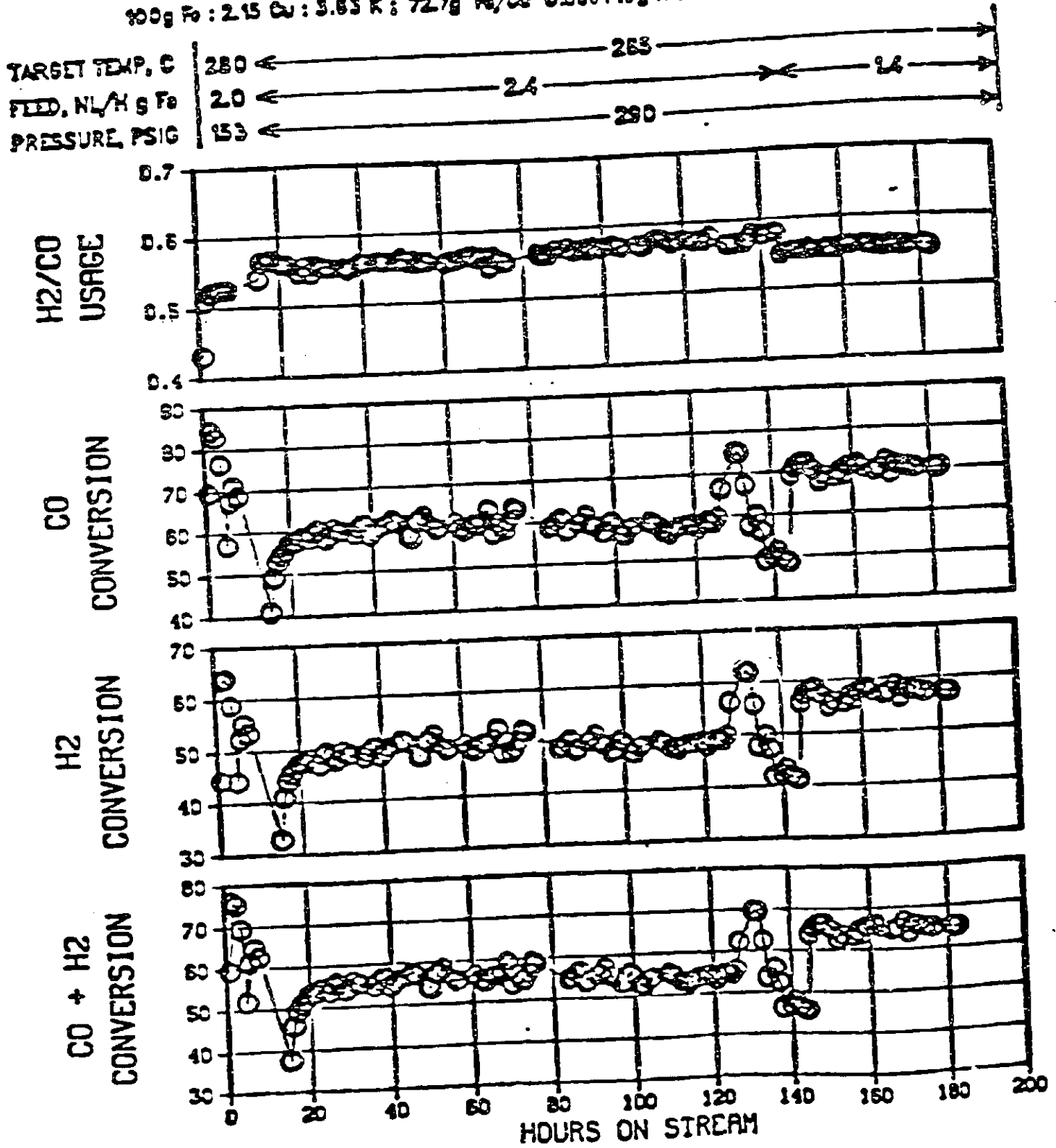


FIGURE 62

POTASSIUM LAURATE ADDITION TO SLURRY

PLT 700B RUN 42 H₂:CO feed=0.7, 1100 rpm

100g Fe : 2.15 Cu : 3.53 K : 72.7g Fe/Cu Oxide+10g K Salt in 290 g C₃₀ oil

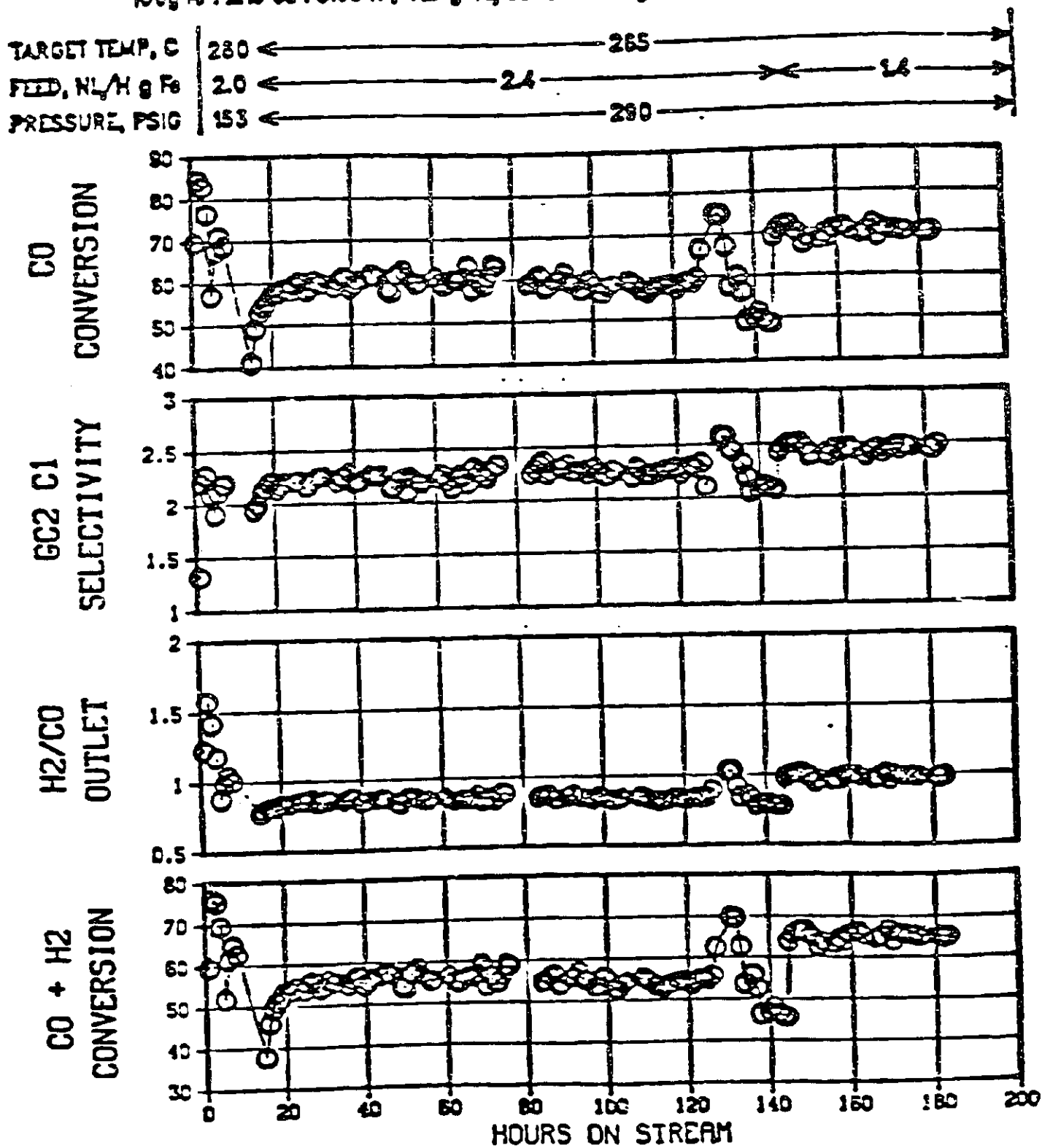


FIGURE 63

POTASSIUM LAURATE ADDITION TO SLURRY

PLJ 700B RUN 42 H₂:CO feed = 0.7, 1100 rpm

100g Fe : 2.13 Cu : 3.83 K : 72.7g Fe₂O₃ Oxide + 10g K Salt in 290 g C₃₀ oil

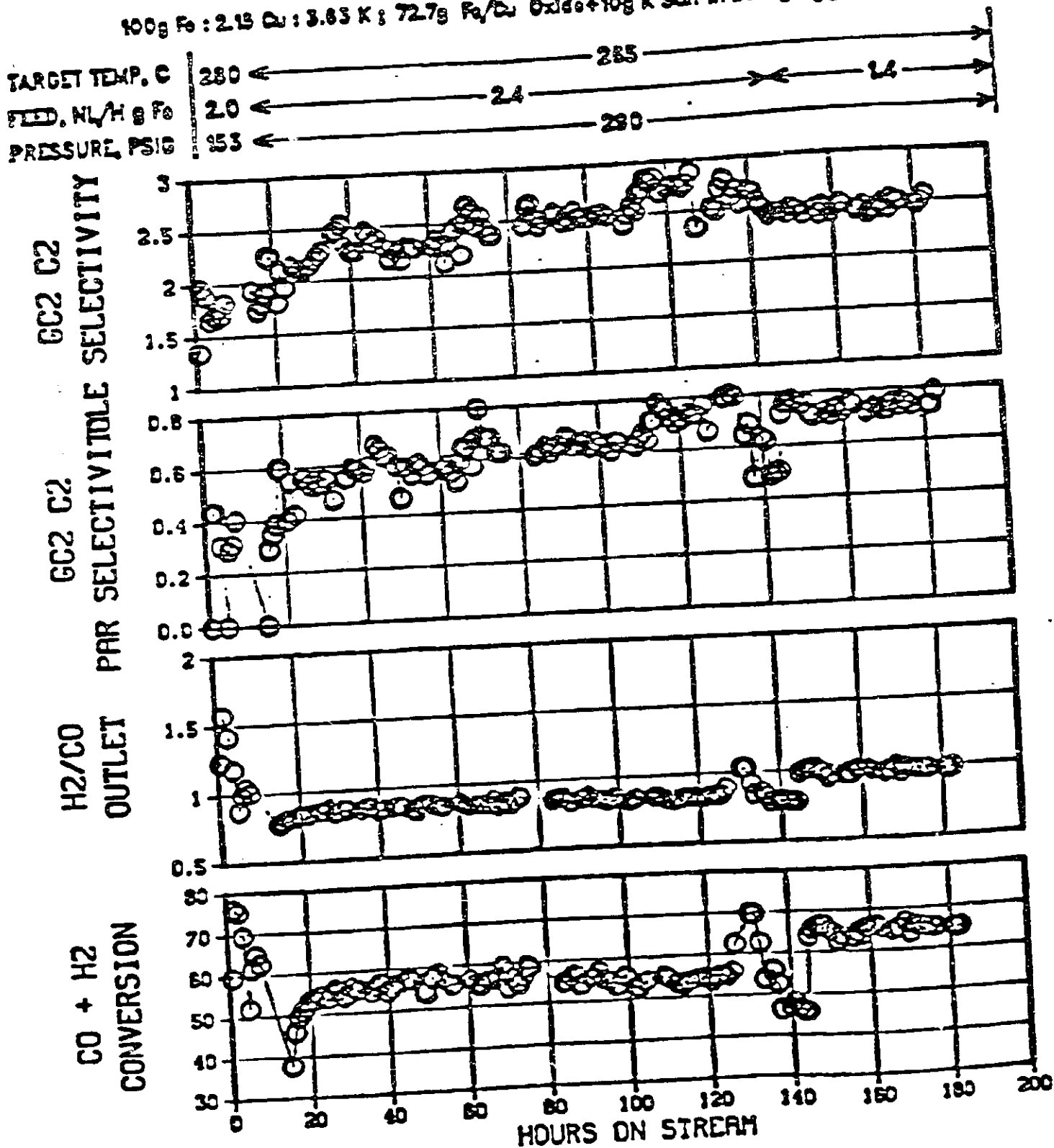


FIGURE 64

POTASSIUM LAURATE ADDITION TO SLURRY

PLJ 700B RUN 42 H₂:CO feed=0.7, 1100 rpm

100g Fe : 2.15 Cu : 3.2 K : 72.7g Fe/Cu Oxide+90g K Salt in 290 g C₃₀ oil

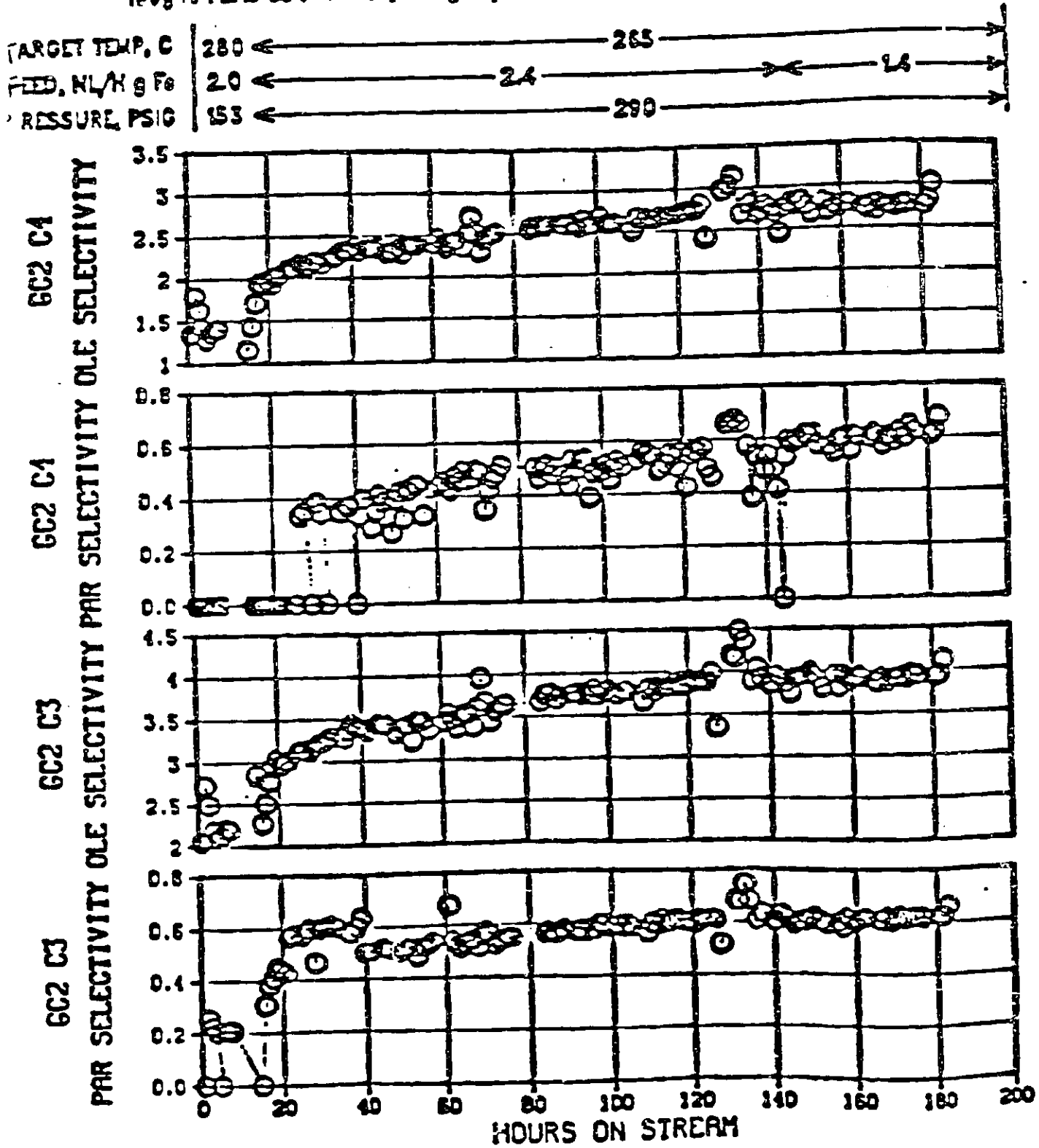


FIGURE 65

POTASSIUM LAURATE ADDITION TO SLURRY

PJ 700B RUN 42 H₂:CO feed=0.7, 9100 rpm

100g Fe : 2.15 Cu : 9.2 K : 72.7g Fe/Cu Cu/60+10g K Salt in 290 g C₃₀ oil

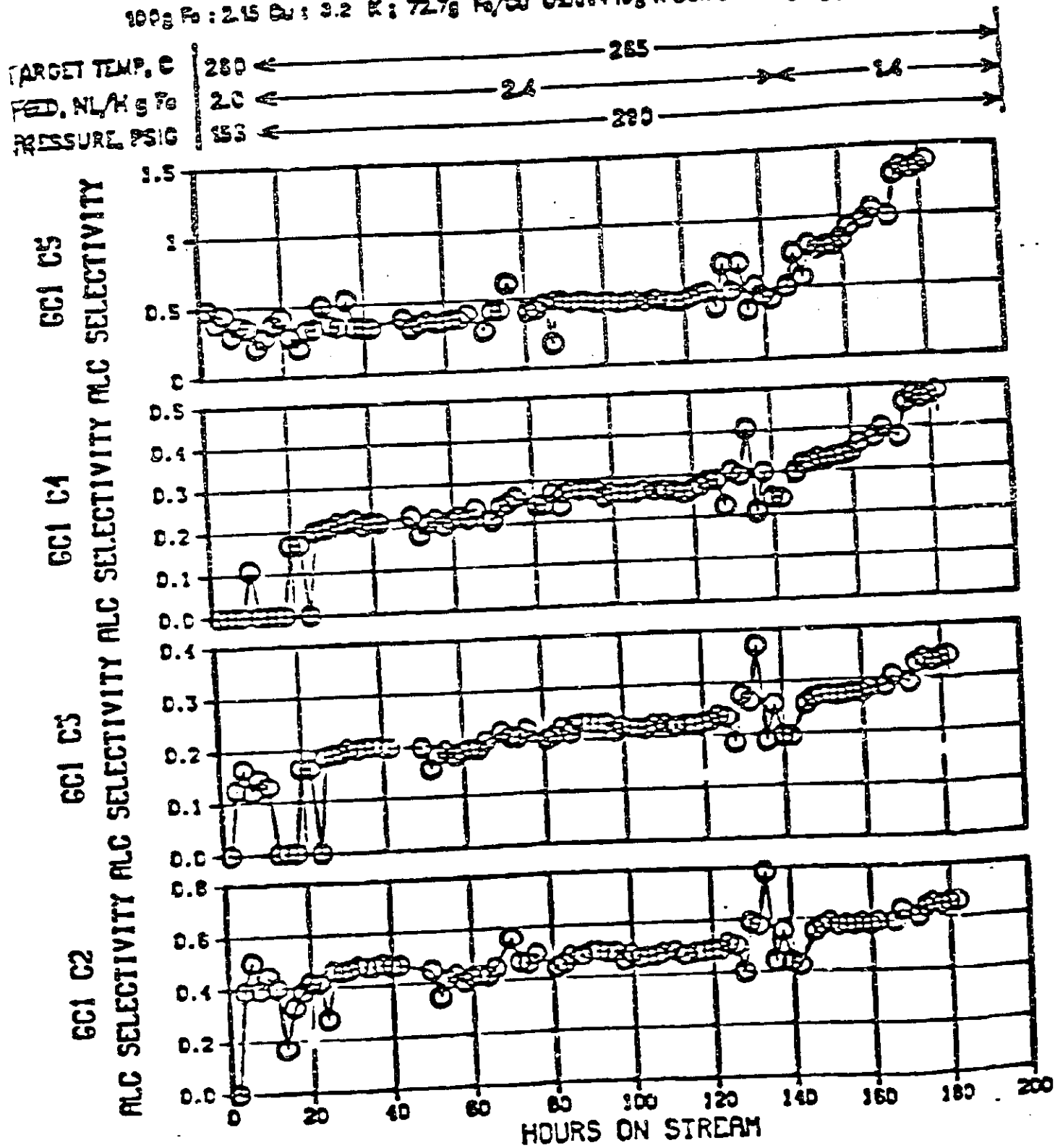
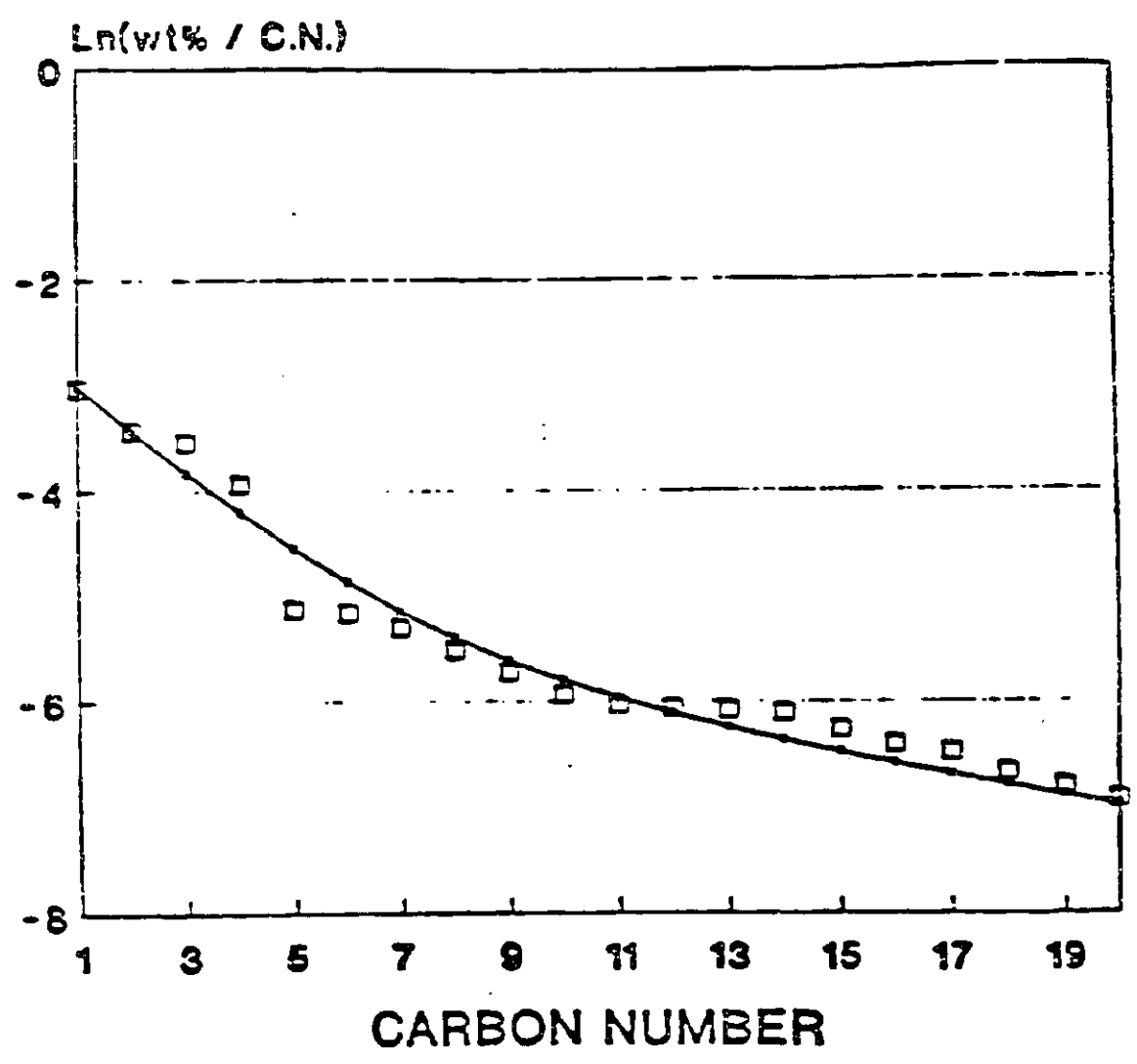


FIGURE 66

NONLINEAR REGRESSION OF F-T PROD. DIST
PLANT 700B, RUN 42, PERIOD 3

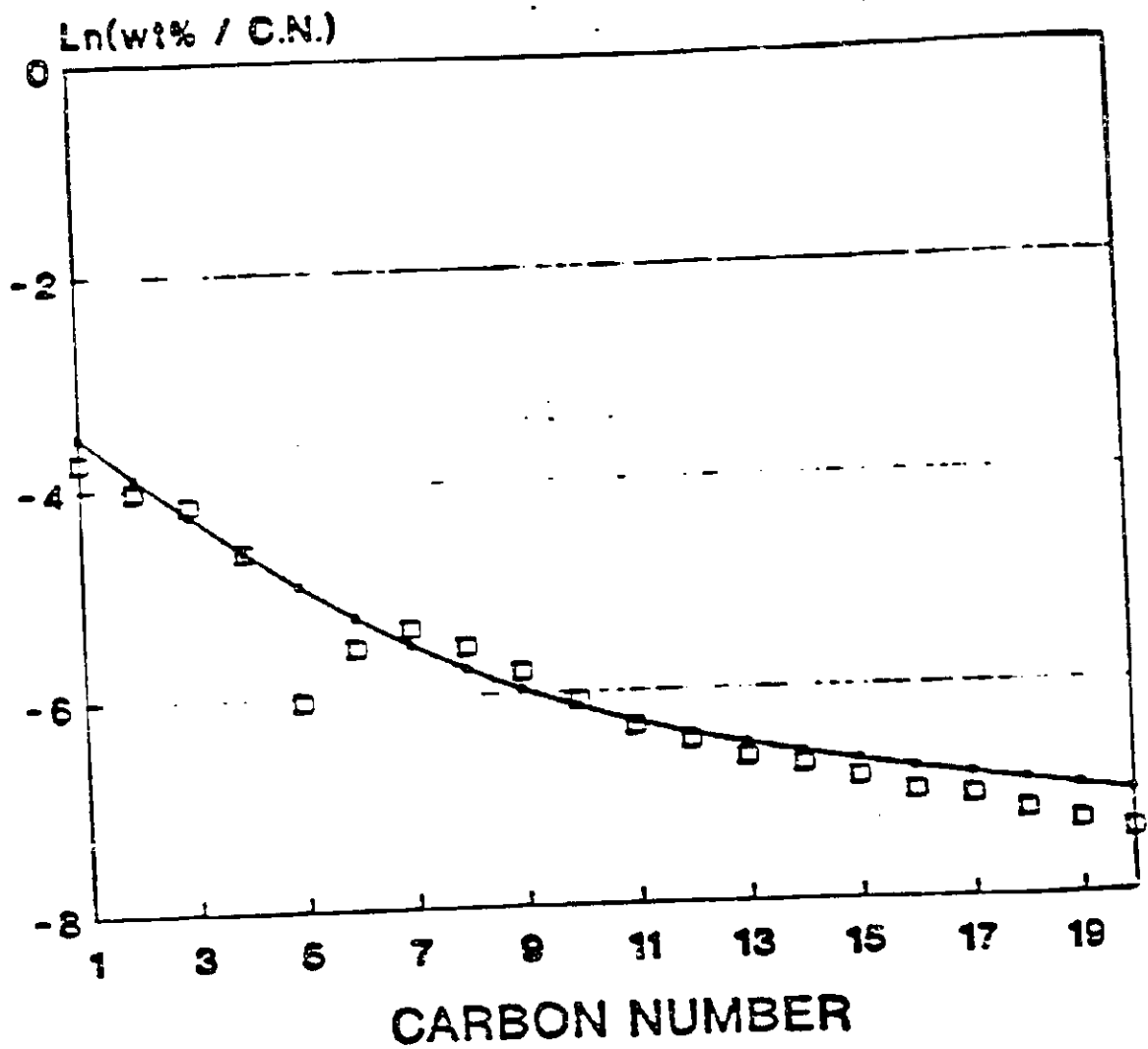


□ Experimental — NLR Fitted

ALPHA 1=0.63; ALPHA 2=0.91; XI=6.6;
PHI=0.458
\\RUN42\PSNLR.CHY

FIGURE 67

NONLINEAR REGRESSION OF F-T PROD. DIST
PLANT 700B, RUN 42, PERIOD 6



□ Experimental — NLR Fitted

ALPHA 1=0.65; ALPHA 2=0.94; XI=7.2;
PHI=0.672
\\RUN42\PS6NLR.CHT

FIGURE 68

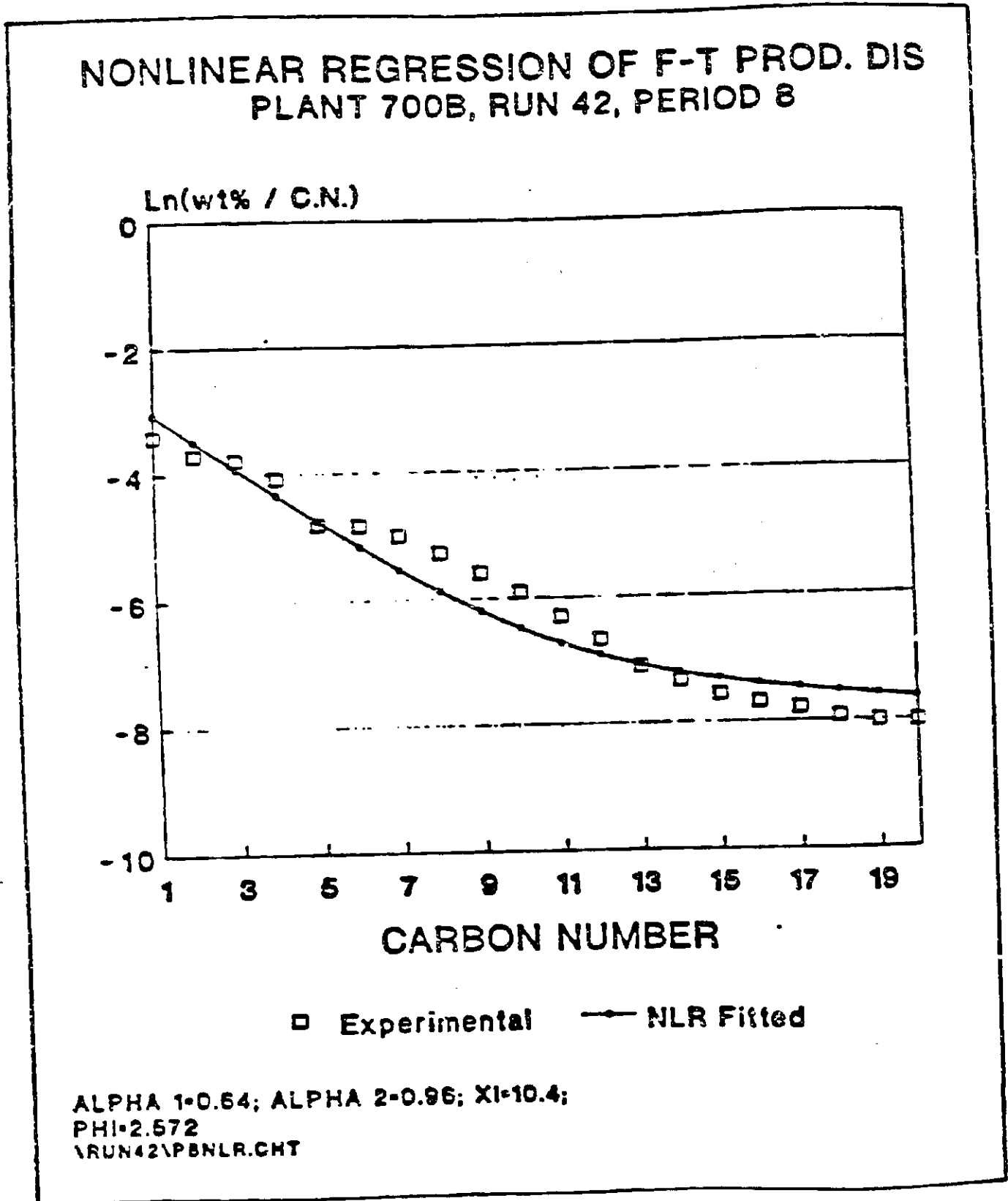


FIGURE 69

IRON AND POTASSIUM IN WITHDRAWN WAX

RUN NO.	PERIOD NO.	HOURS ON STREAM	WAX ANALYSES, AAS			Fe : K (VVT)
			Fe, WT%	K, WT%	Fe : K	
42	1	0-12	0.35	0.0142	100 : 4.1	
42	2	13-36	0.21	0.0101	100 : 4.8	
42	3	37-60	0.32	0.0157	100 : 11.2	
43	1	0-12	1.75	0.0643	100 : 3.7	
43	2	13-36	0.18	0.0112	100 : 6.2	
43	3	37-60	0.49	0.0290	100 : 5.9	

FIGURE 70

POTASSIUM LAURATE ADDITION TO SLURRY

PLJ 7003 RUN 43 H₂:CO feed=0.7, 1100 rpm

100g Fe : 2.15 Cu : 2.1 K : 72.7g Fe/Cu Oxide + 8.5g K Salt in 290 g C₃₀ oil

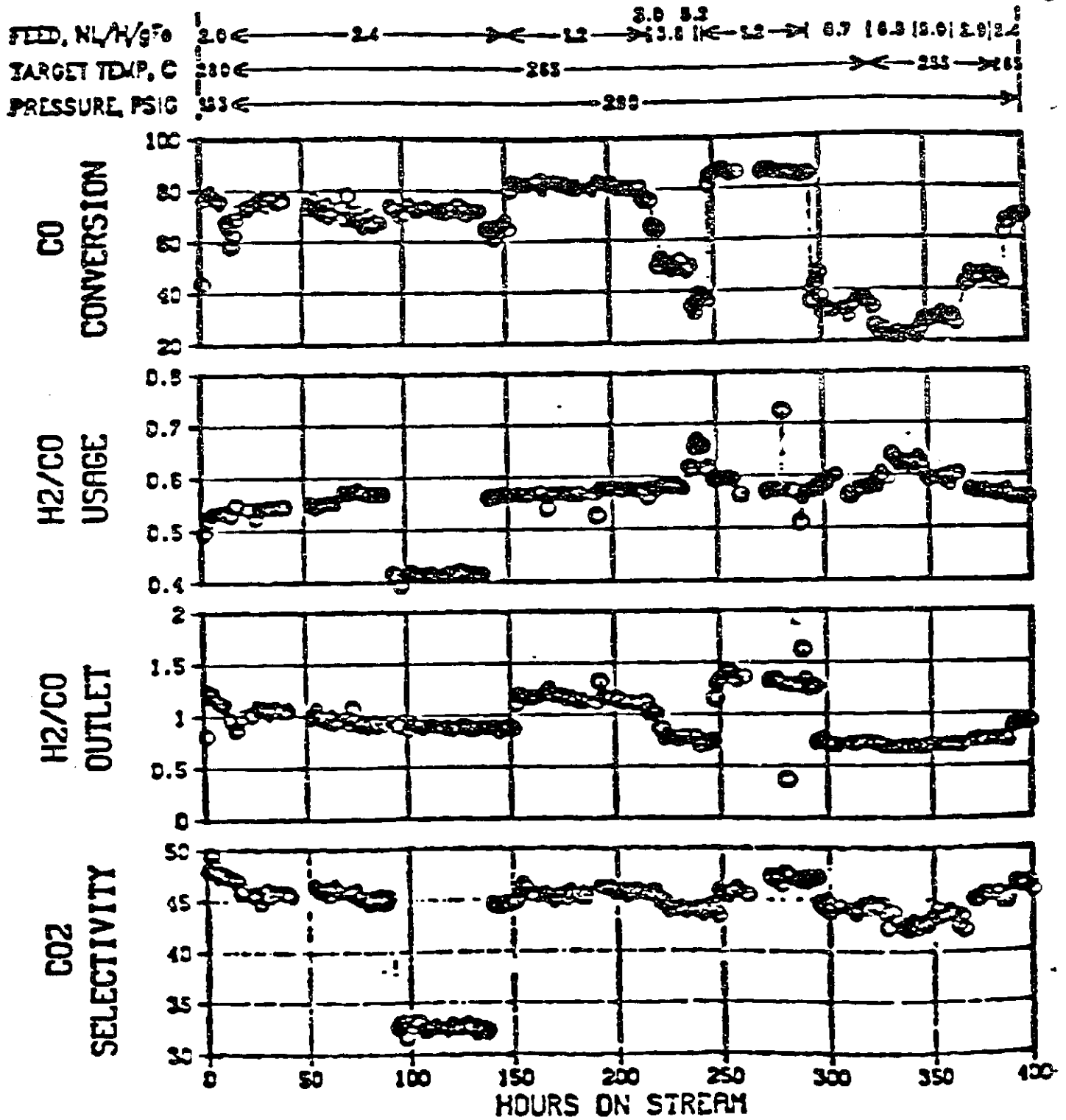


FIGURE 71

POTASSIUM LAURATE ADDITION TO SLURRY

PLJ 700B RUN 43 H₂:CO feed=0.7, 1100 rpm

500g Fe : 2.15 Cu : 2.1 K : 72.7g Fe/Cu Oxide + 8.5g K Salt in 290 g C₃₀ oil

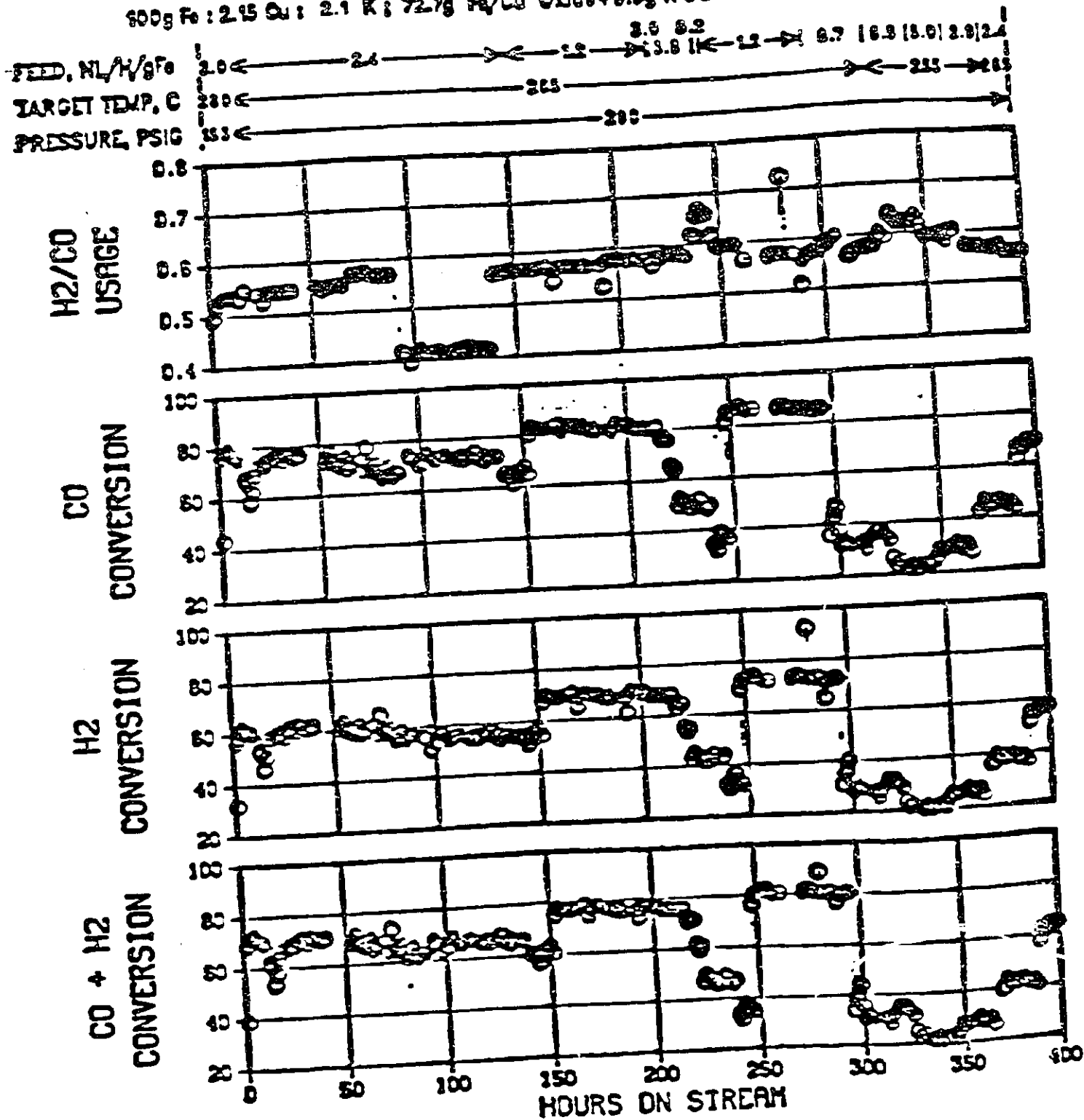


FIGURE 72

POTASSIUM LAURATE ADDITION TO SLURRY

PLJ 700B RUN 45 H₂:CO feed=0.7, 1100 rpm

100g Fe : 2.15 Cu : 2.1 K : 72.7g Fe/Cu Oxide + 8.5g K Salt in 290 g C₃₀ oil

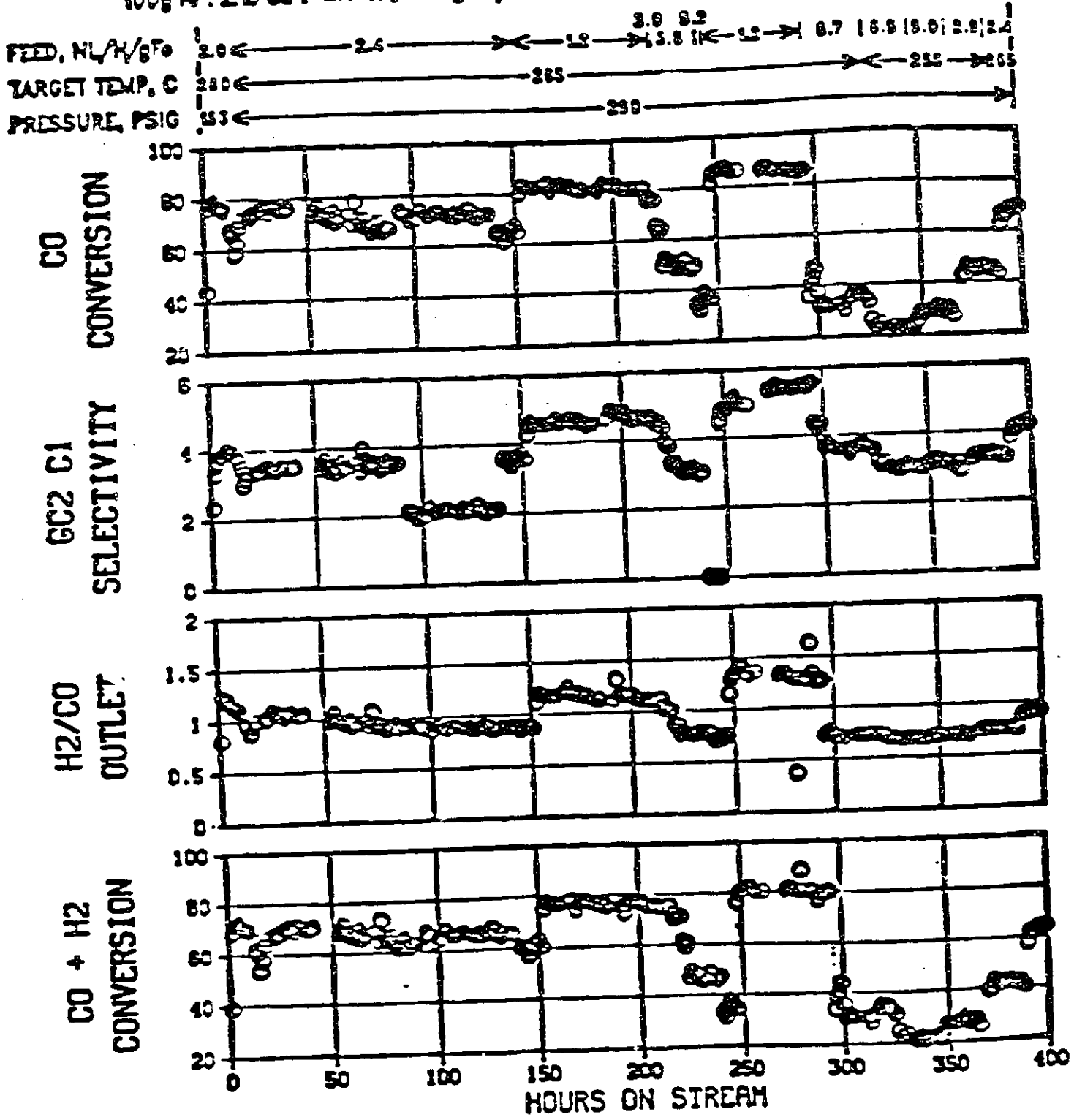


FIGURE 73

POTASSIUM LAURATE ADDITION TO SLURRY

PLJ 7002 RUN 43 H₂:CO feed=0.7, 1100 rpm

100g Fe : 2.15 Cu : 2.1 K : 72.7g Fe/Cu Oxide + 8.5g K Salt in 290 g C₃₀ oil

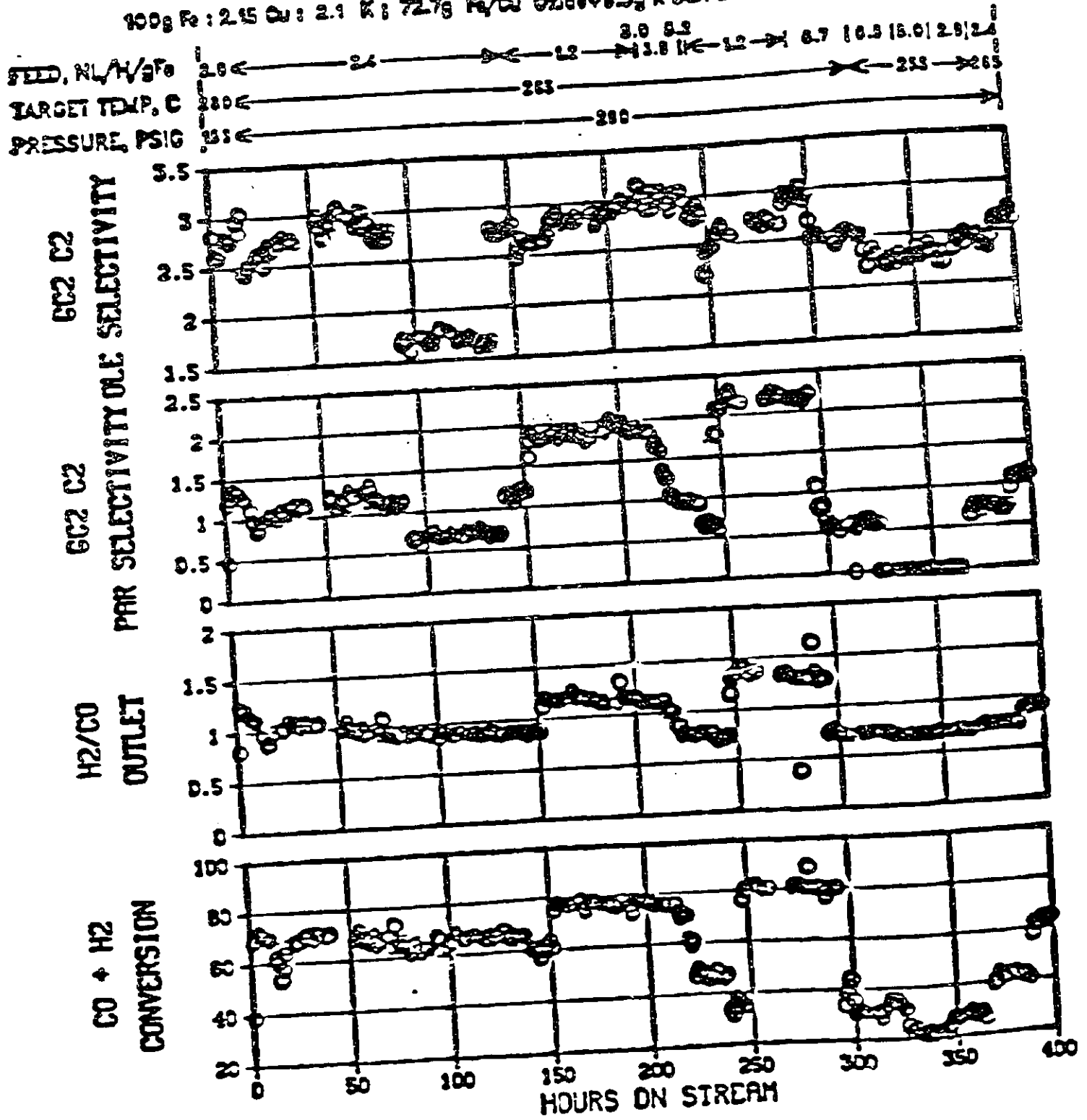
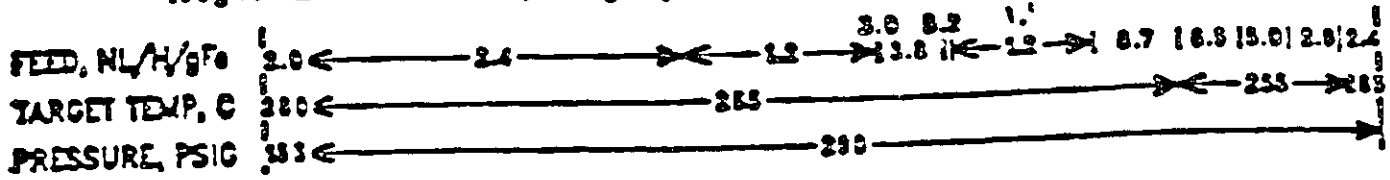


FIGURE 74

POTASSIUM LAURATE ADDITION TO SLURRY

PLJ 700B RUN 43 H₂:CO feed=0.7, 1100 rpm

100g Fe : 2.15 Cu : 2.1 K : 72.7g Fe/Cu Oxide + 6.5g K Salt in 200 g C₃₀ oil



GC2 C4
GC2 C4
GC2 C3
GC2 C3
PAR SELECTIVITY OLE SELECTIVITY PAR SELECTIVITY OLE SELECTIVITY

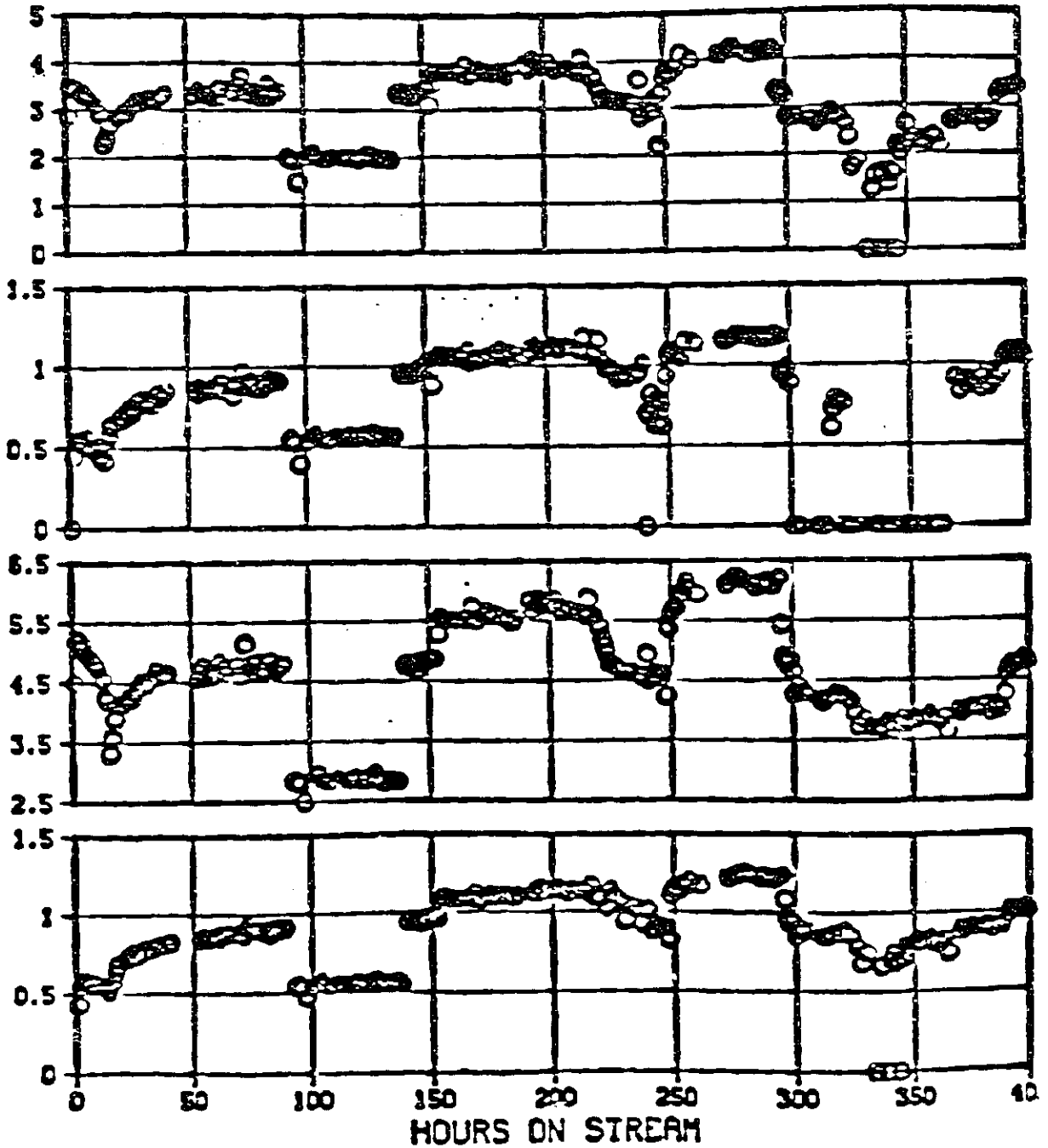


FIGURE 75

POTASSIUM LAURATE ADDITION TO SLURRY

PL 700B RUN 43 H₂O feed=0.7, 1100 rpm

100g Fe : 2.15 Cu : 2.1 K : 72.7g Fe/Cu Oxide+8.5g K Salt P. 290 g C₃₀ 97

