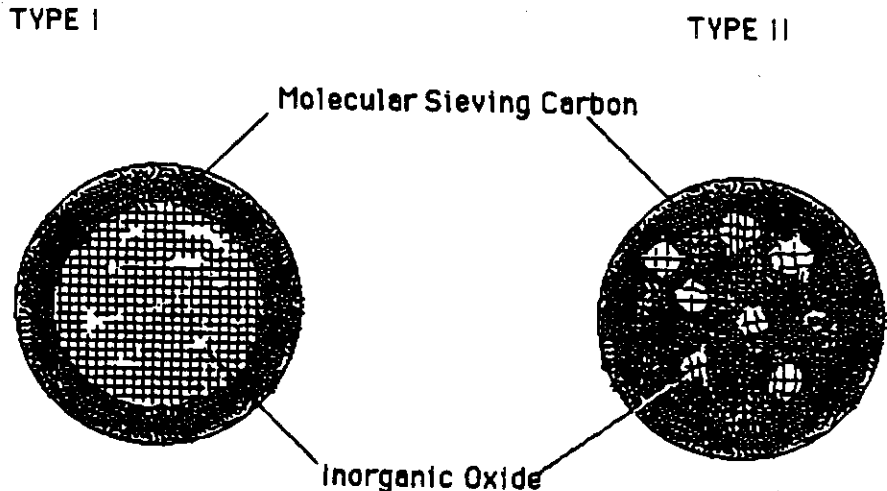


Figure 1  
Schematics of the Types of IOM-CMS Materials



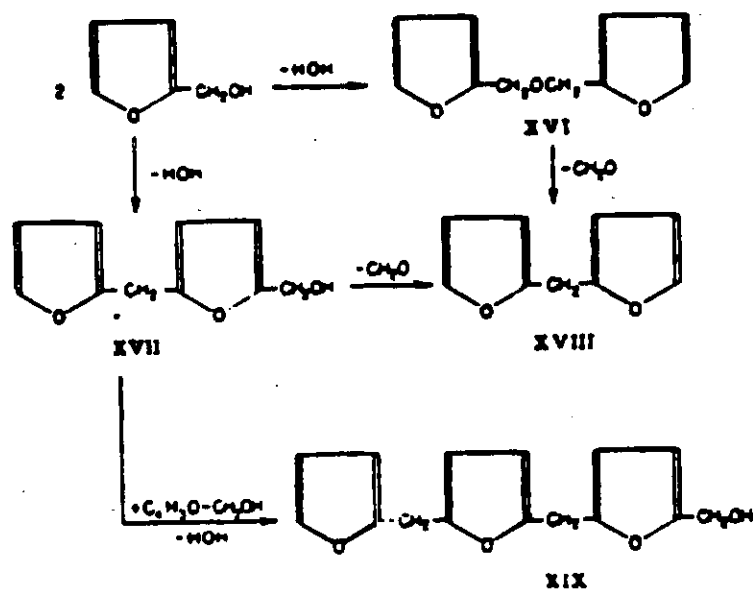


Figure 2  
Pyrolytic Chemistry of PFA

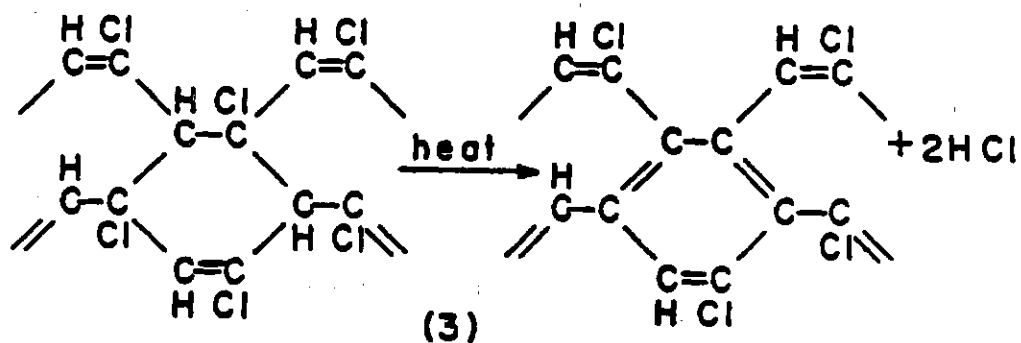
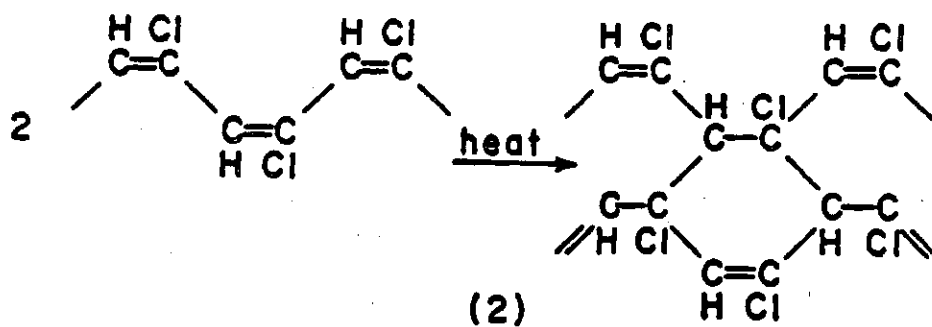
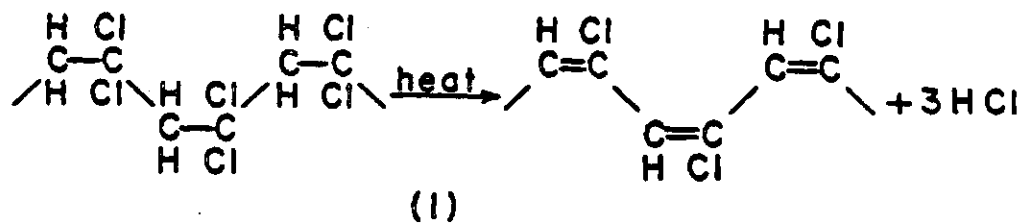


Figure 3

Pyrolytic Chemistry of PVC/PVDC

## GRAVIMETRIC GAS ADSORPTION WITH SAMPLE CAROUSEL

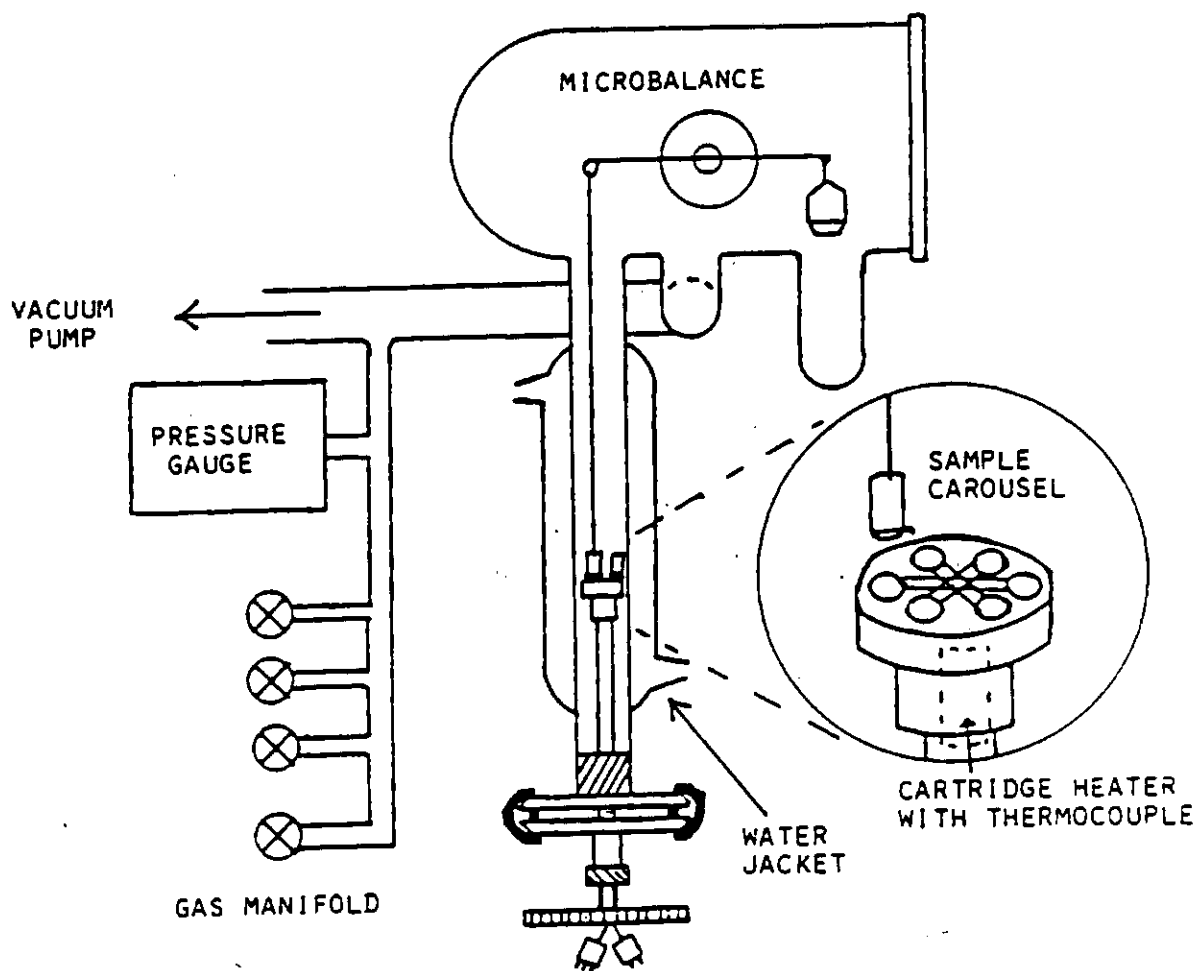
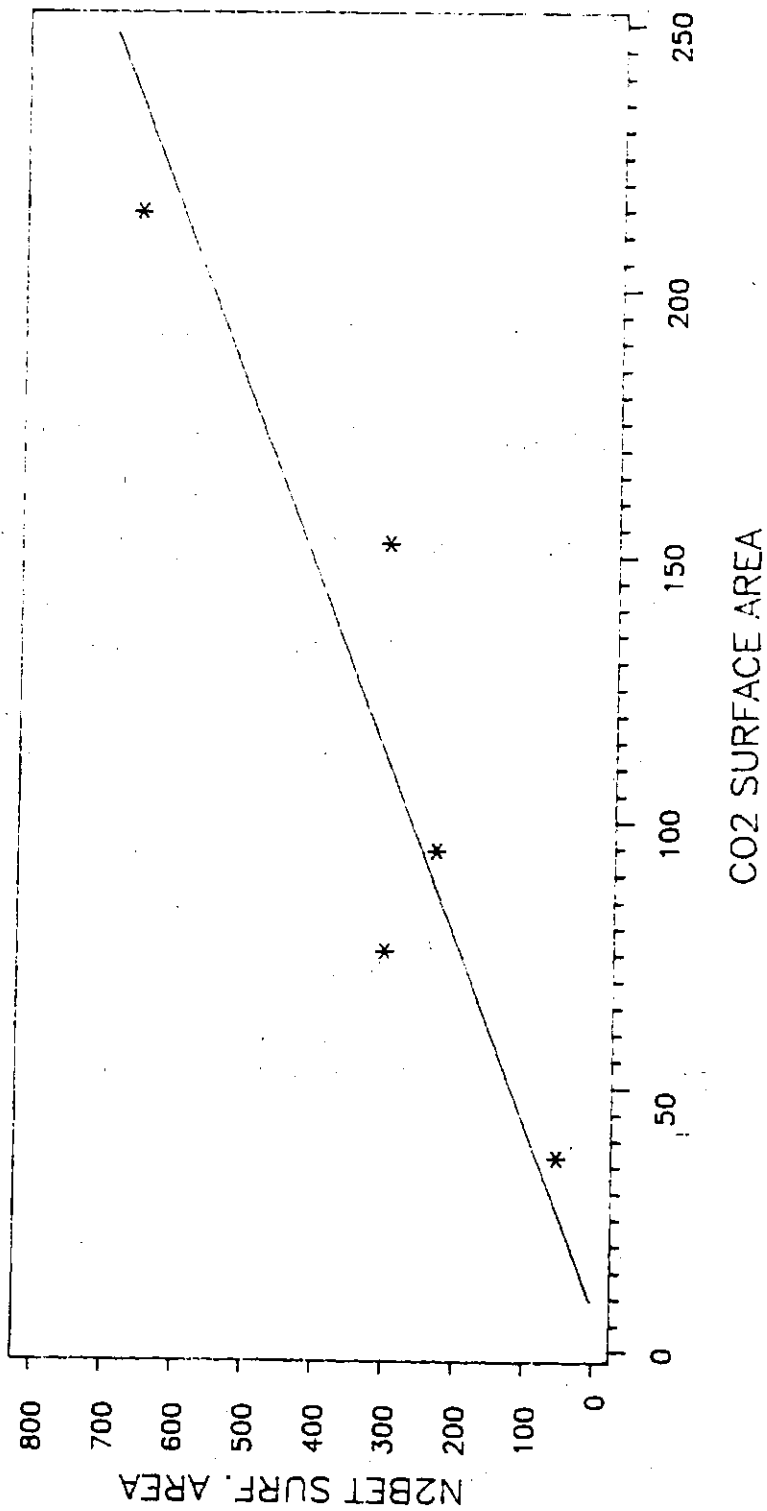


Figure 4

Molecular Probe Analysis Apparatus

N2 BET SURFACE AREA vs CO2 AREA  
FIGURE 5.



# MOLECULAR PROBE ANALYSIS

CARBON COATED TITANIA PELLETS

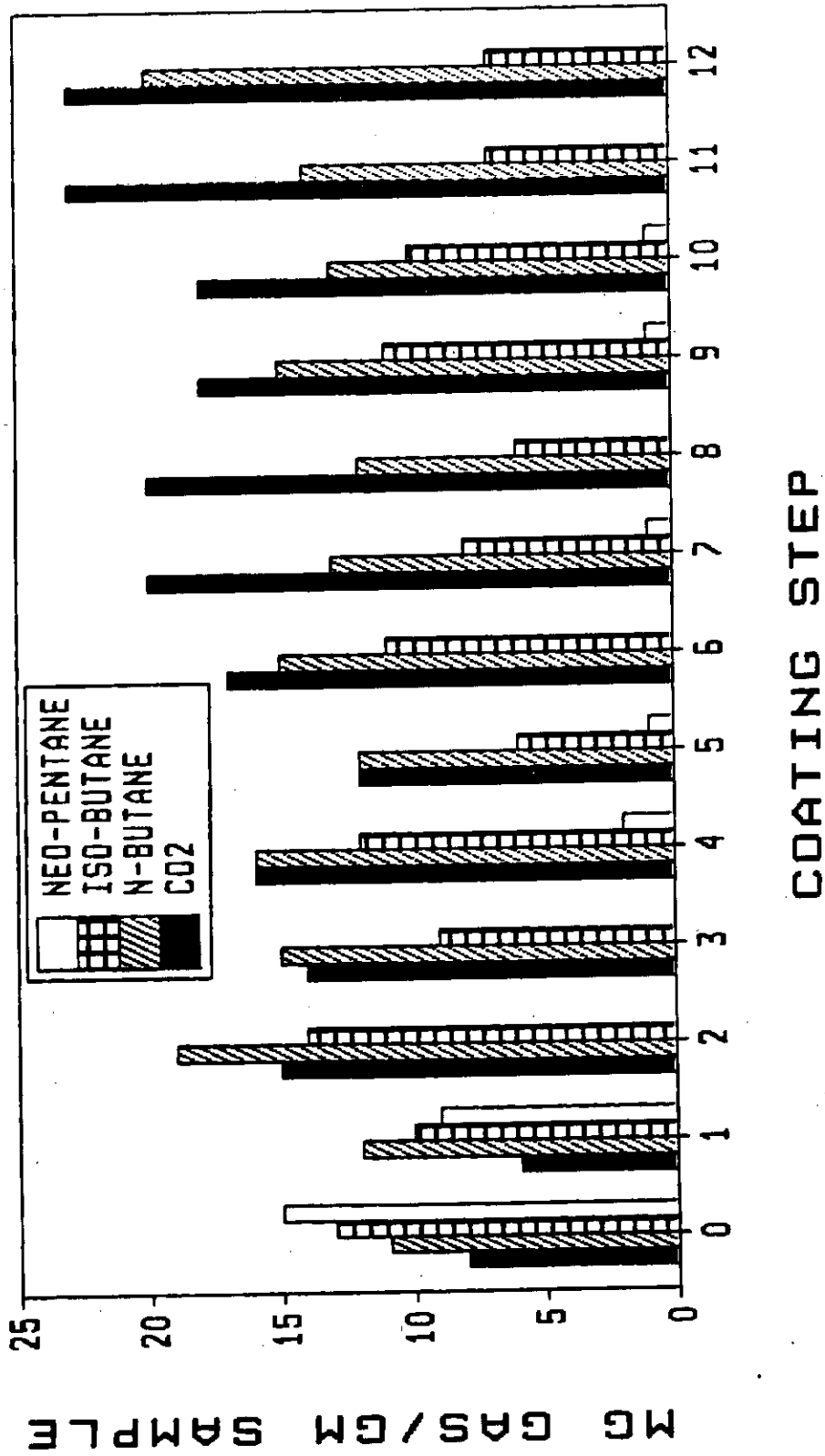
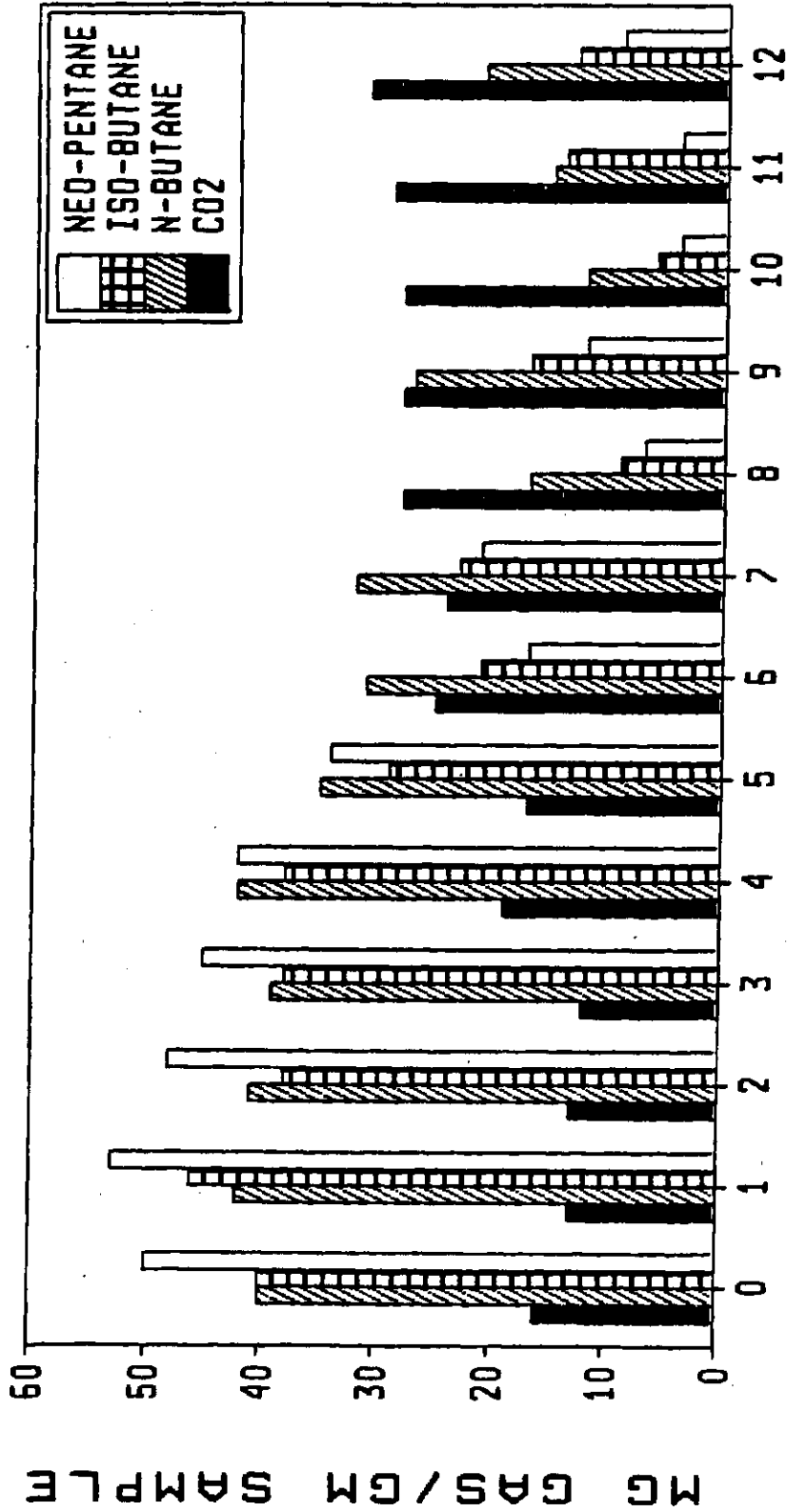


Figure 6

Molecular Probe Analyses for C-TiO<sub>2</sub> versus Coating Step

MOLECULAR PROBE ANALYSIS  
 CARBON COATED LARGE PORE SILICA



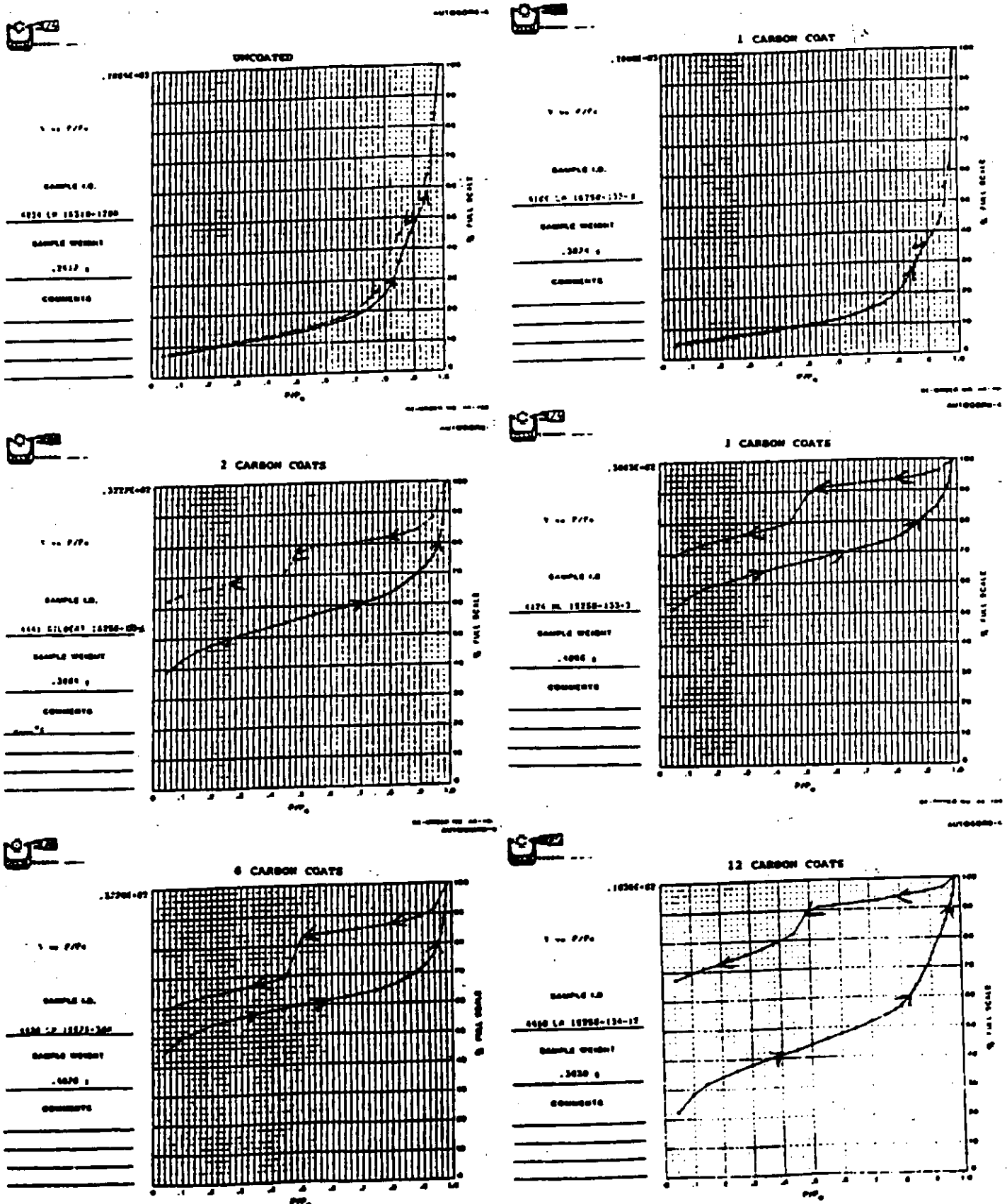
COATING STEPS

Figure 7  
 Molecular Probe Analyses for C-SiO<sub>2</sub> versus Coating Step

Figure 8

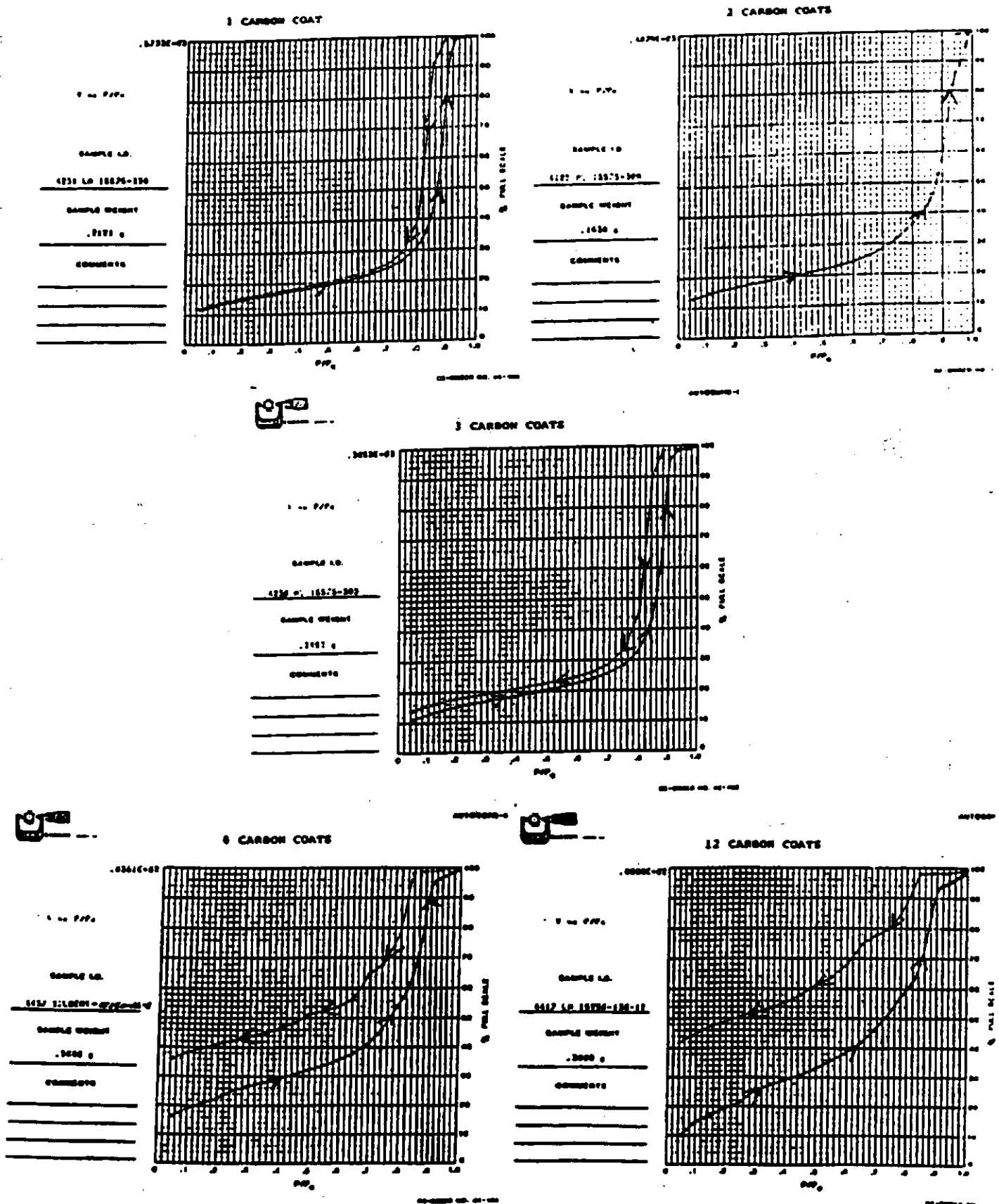
I-62

(a-f) Nitrogen Isotherms for C-TiO<sub>2</sub> versus Coating Step





(a-e) Nitrogen Isotherms for C-SiO<sub>2</sub> versus Coating Step



# CO<sub>2</sub> SPECIFIC ADSORPTION C-FT-HC :SIEVING VS NON-SIEVING

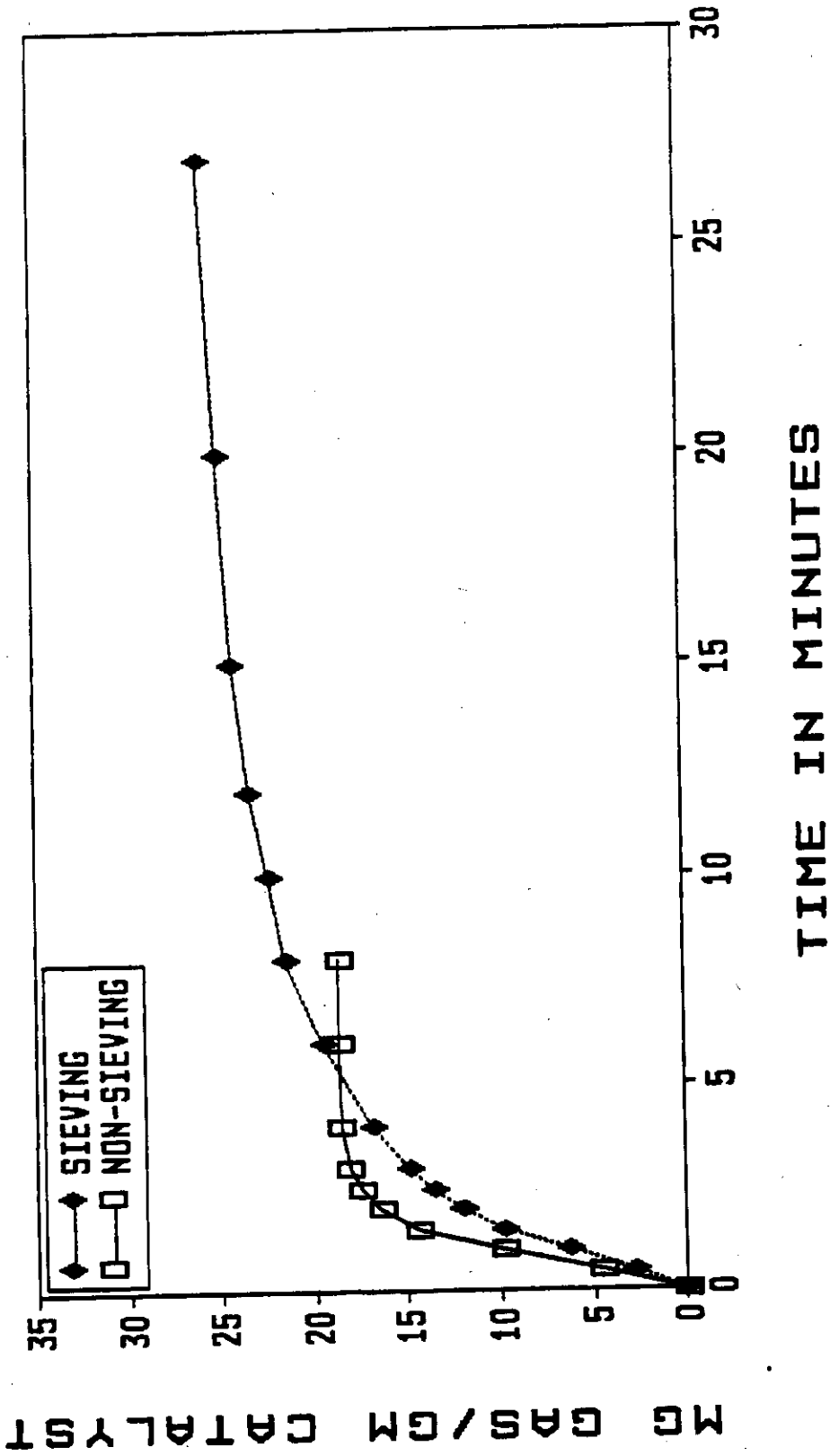


Figure 10  
Adsorption of CO<sub>2</sub> on Type-I, C-FT-HC(1:1) versus Uncoated

# CO<sub>2</sub> SPECIFIC DESORPTION C-FT-HC :SIEVING VS NON-SIEVING

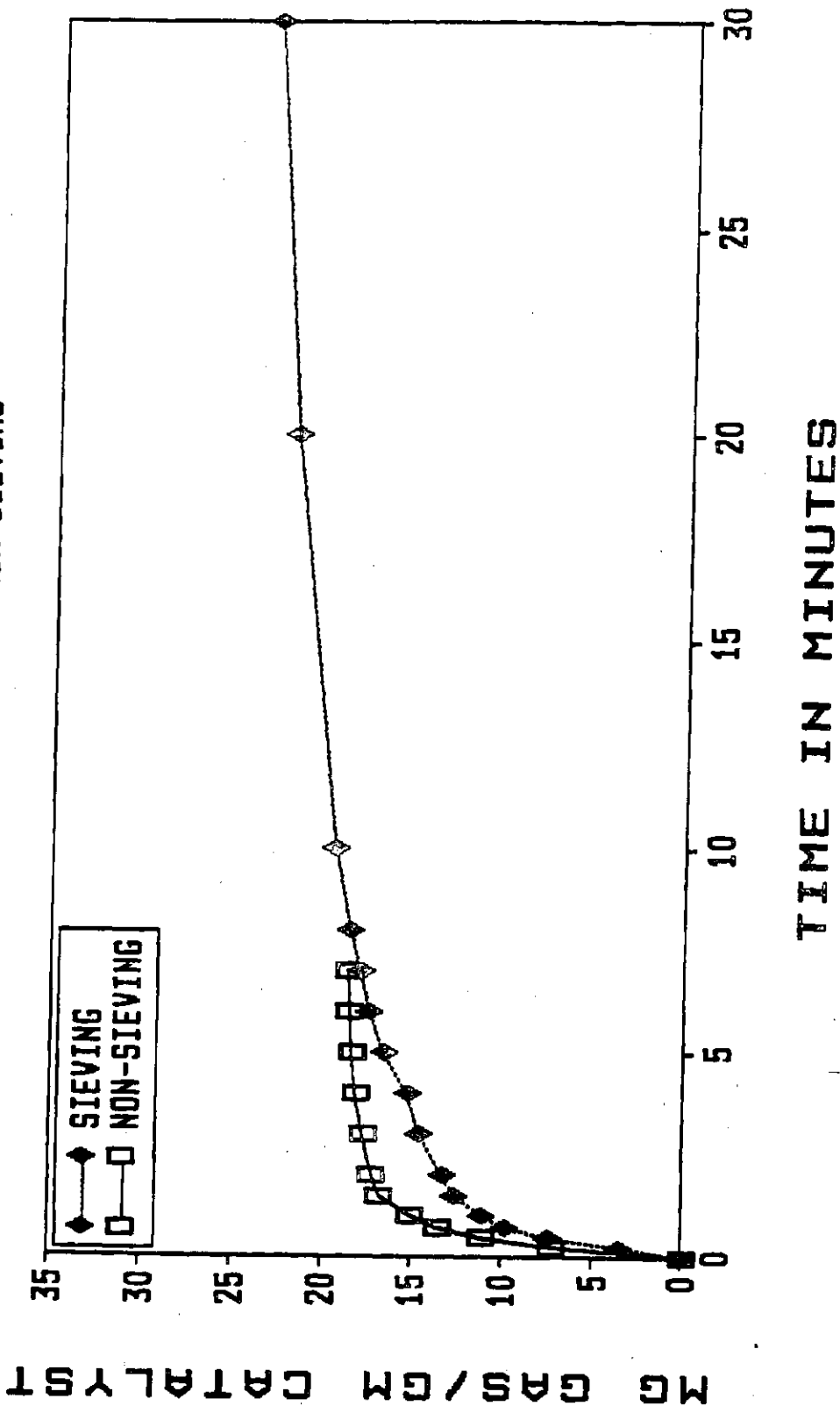
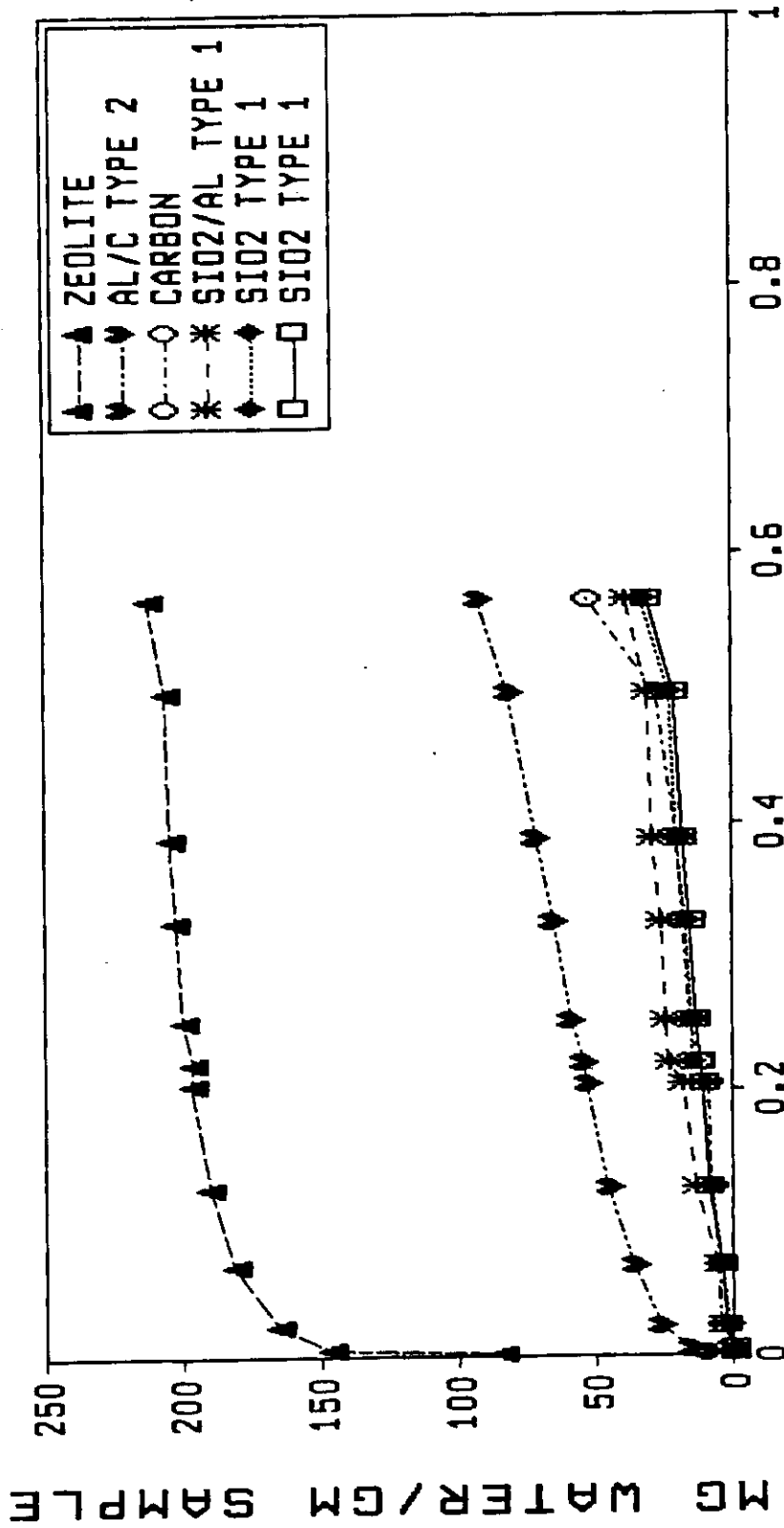


Figure 11

Desorption of CO<sub>2</sub> on Type-I, C-FT-HC(1:1) versus Uncoated

WATER ADSORPTION  
SPECIFIC ADSORPTION VS PARTIAL PRESSURE



PARTIAL PRESSURE OF WATER

Figure 12

Water Adsorption Isotherms for IOM-CMS Materials

# ANDERSON SCHULZ FLORY PLOT

## COMPARISON OF RUNS 10, 12 AND 13

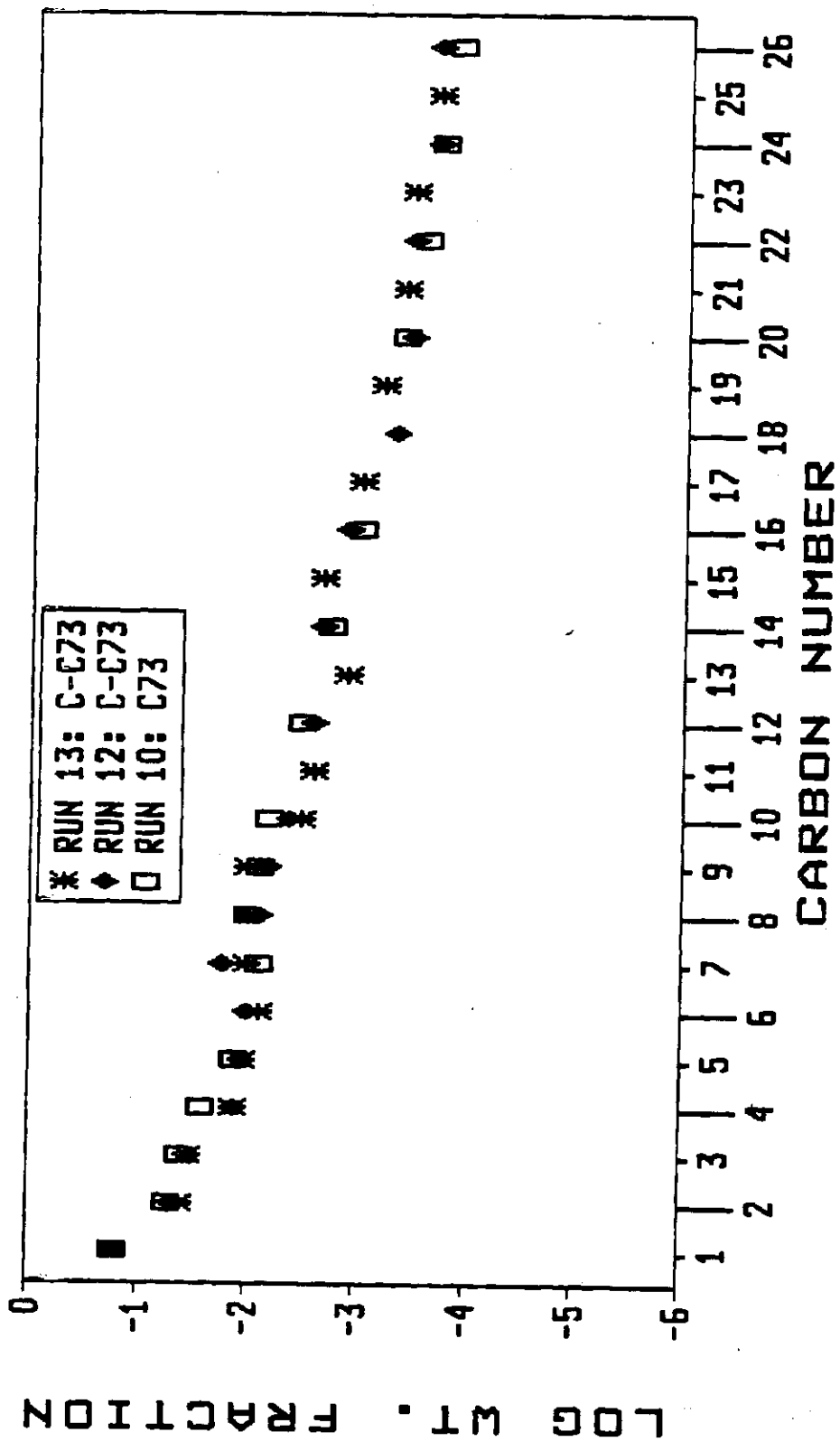


Figure 13 (a)

ASF Plots for Carbonized C-73 and Control

# ANDERSON SCHULZ FLORY PLOT

RUNS 14 & 15; CARBON-C73 CO/HZ 1:1

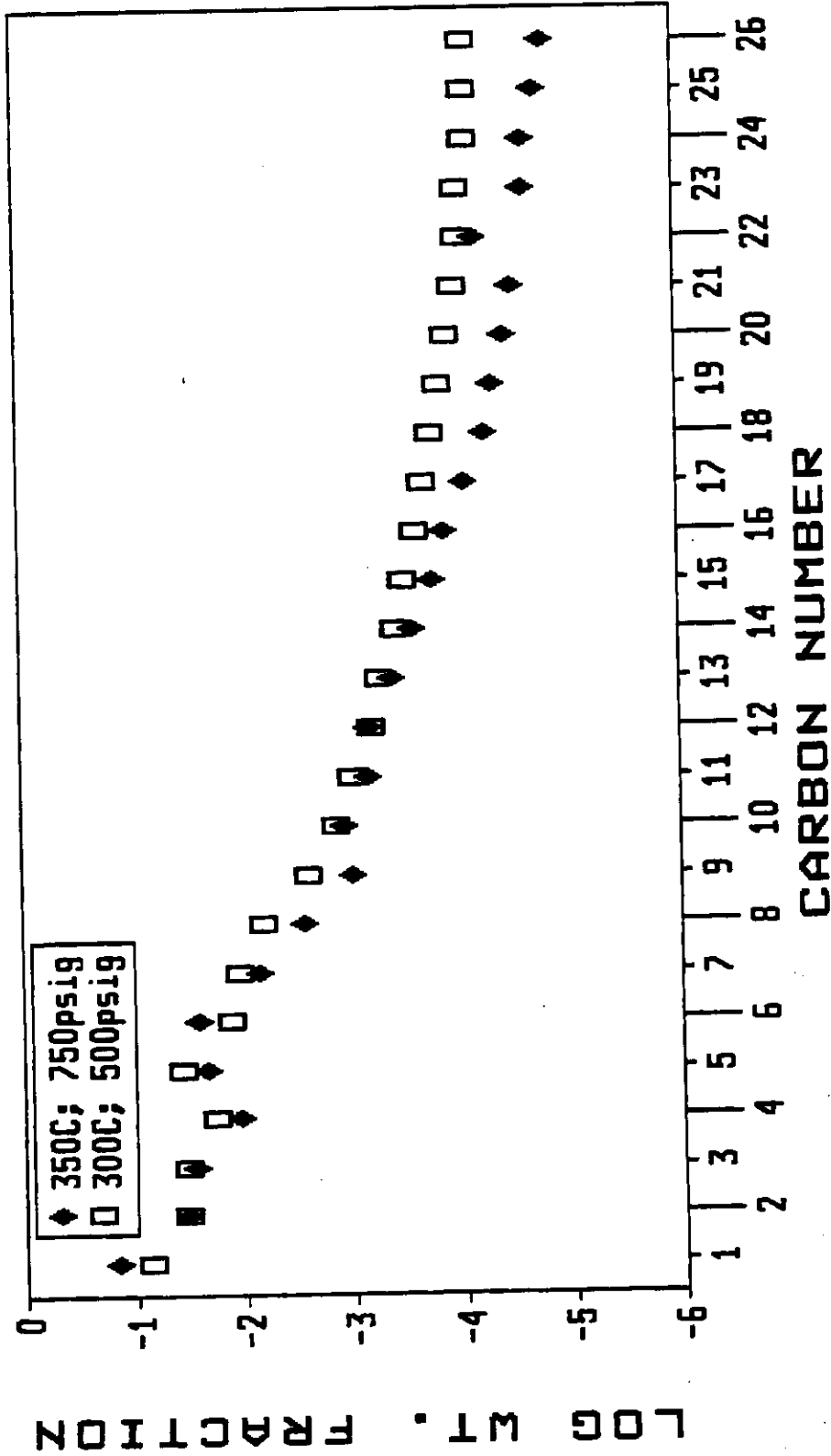


Figure 13 (b)

ASF Plots for Carbonized C-73 and Control

# ANDERSON SCHULZ FLORY PLOT

FE-K/SiO<sub>2</sub>, TYI C-FE-K/SiO<sub>2</sub> 18,19-2-1

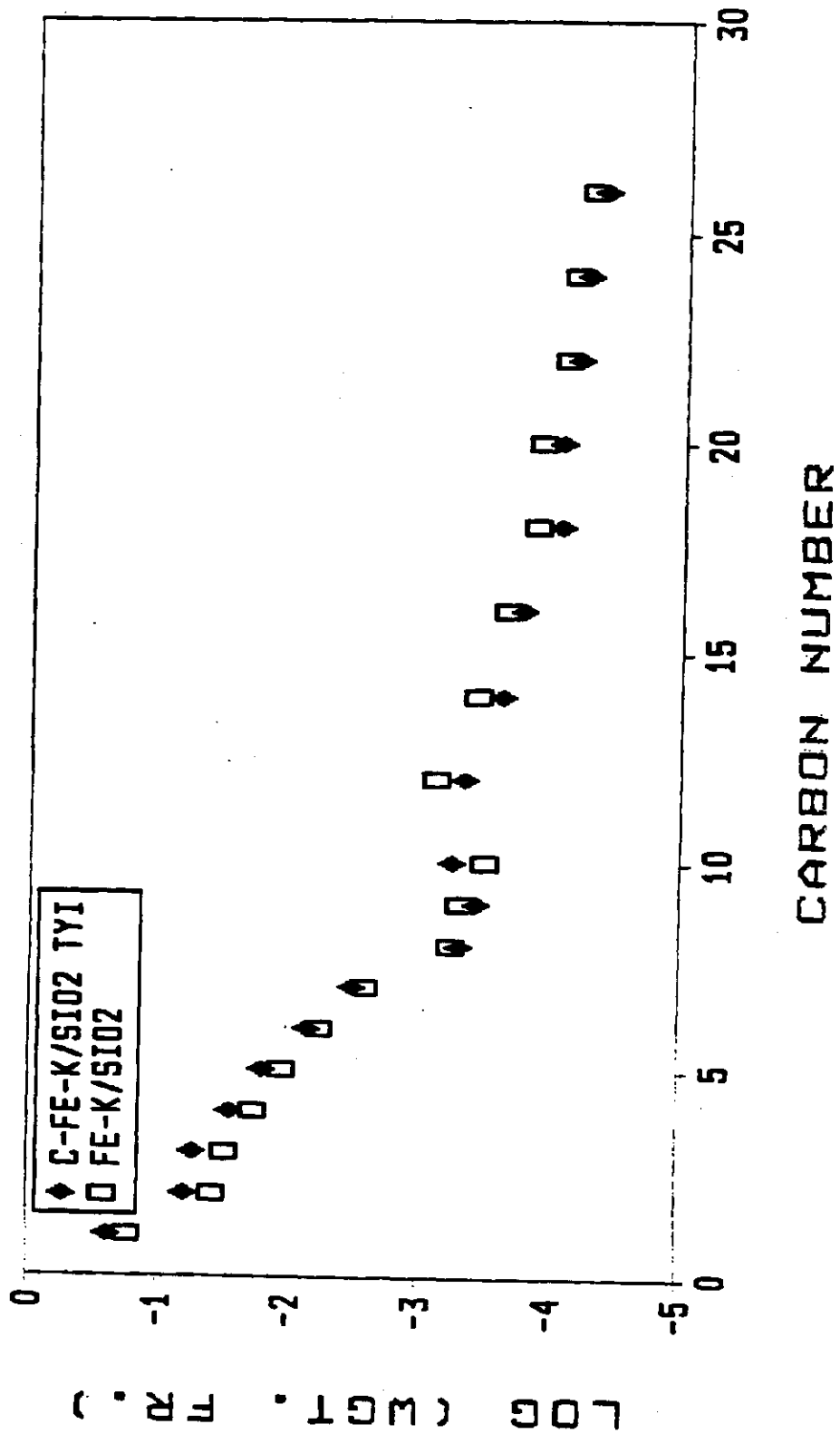


Figure 14 (a)

ASF Plots for Carbonized Fe-K/SiO<sub>2</sub>

# ANDERSON SCHULZ FLORY PLOT

FE/K/SiO<sub>2</sub> & C-FE/K/SiO<sub>2</sub> 325C, 500P, 1:1

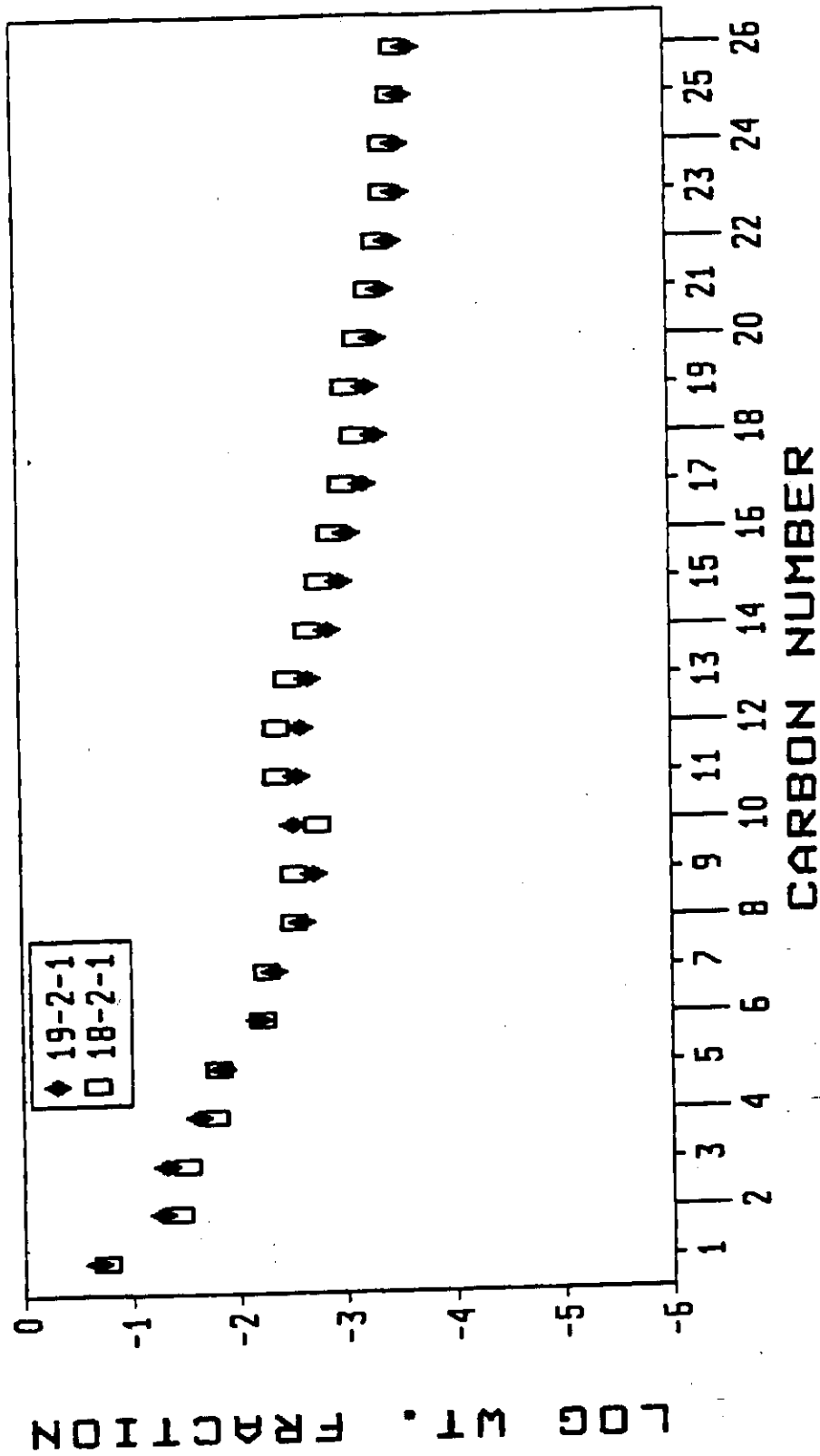


Figure 14 (b)

ASF Plots for Carbonized Fe-K/SiO<sub>2</sub>



**HYDROCARBON DISTRIBUTION (GM. FRACTION)**  
**CARBON-FE-K/SiO<sub>2</sub>, 250C, 500psig**

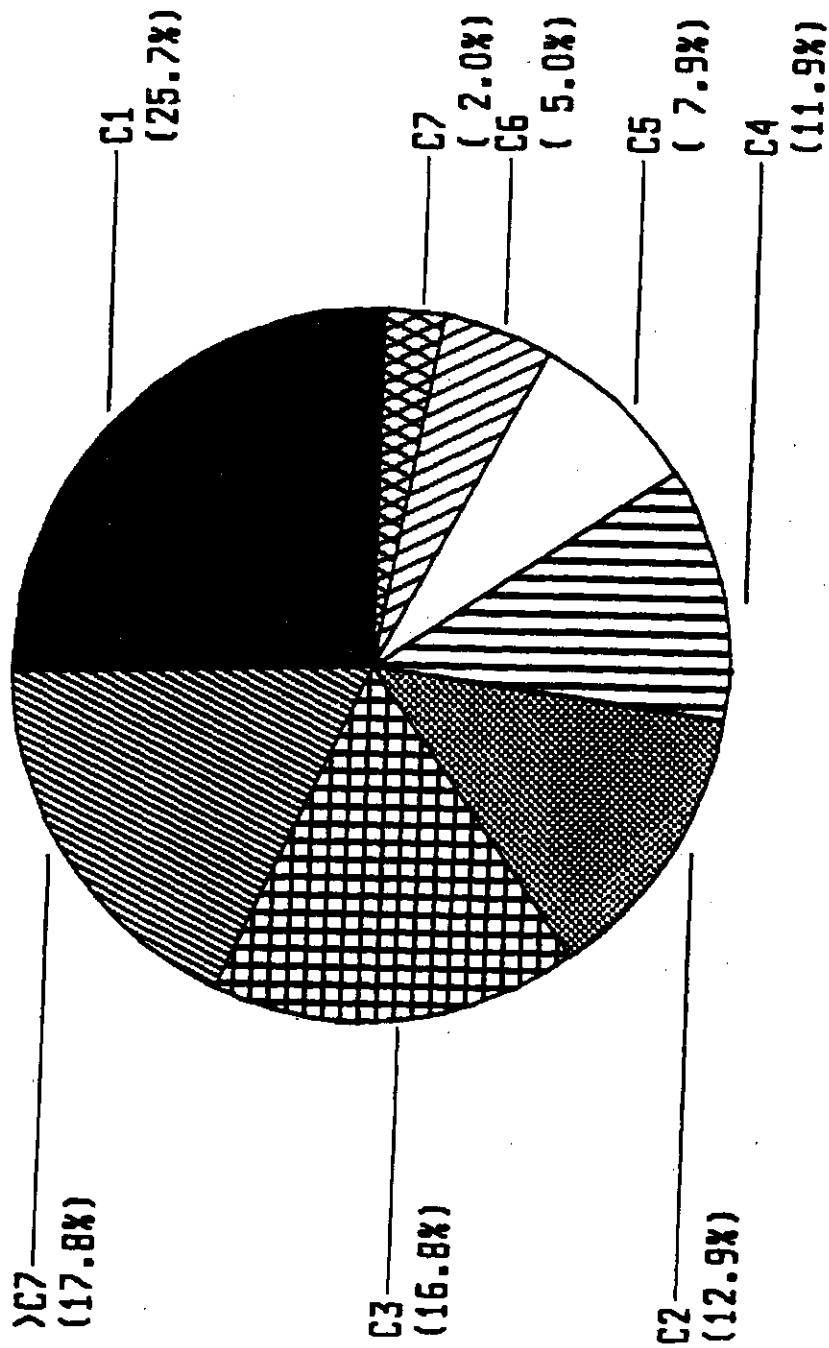


Figure 15 (a)

Gram Fractions of Products for Carbonized Fe-K/SiO<sub>2</sub>

# HYDROCARBON DISTRIBUTION (GM. FRACTION)

CARBON-FE-K/SiO<sub>2</sub> : 325C, 500 PSIg

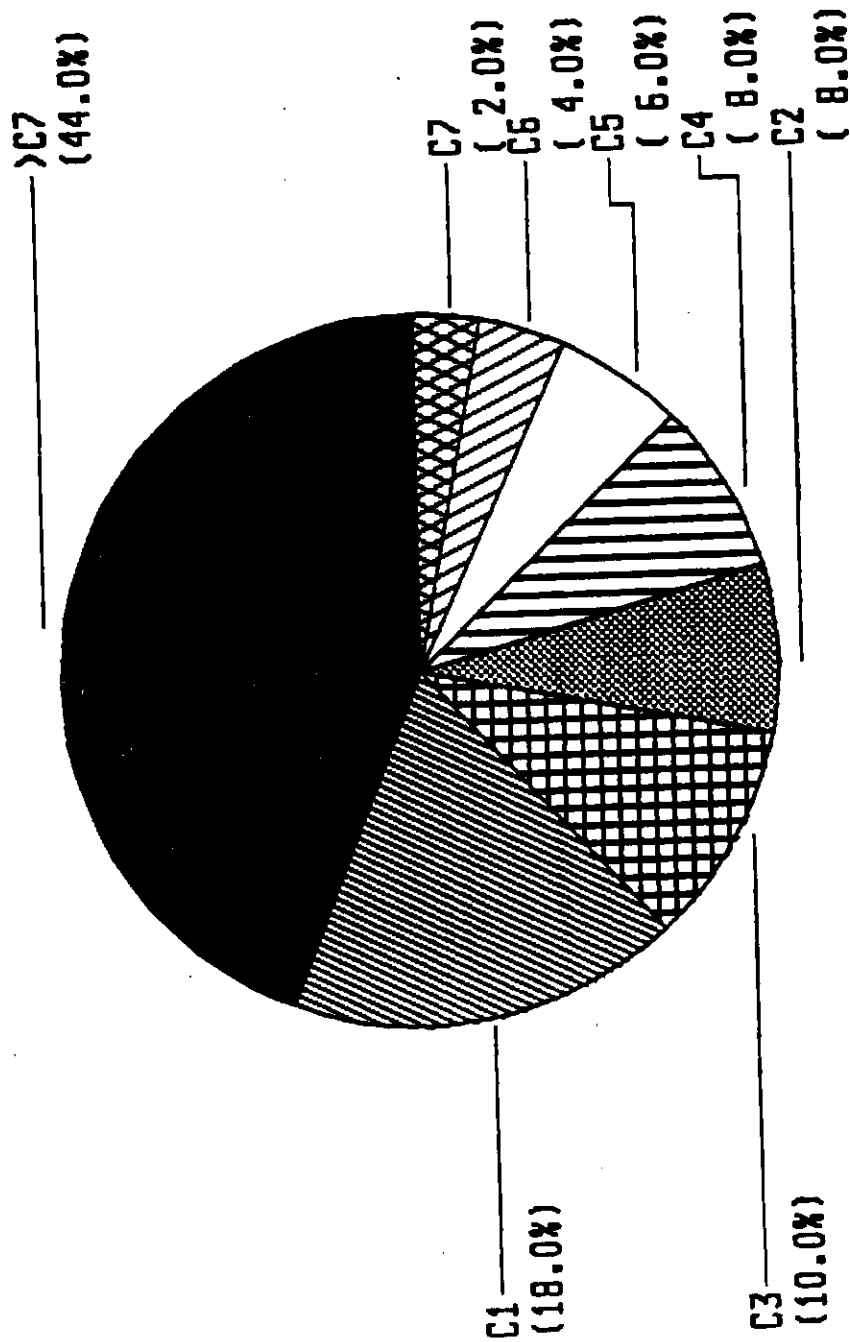
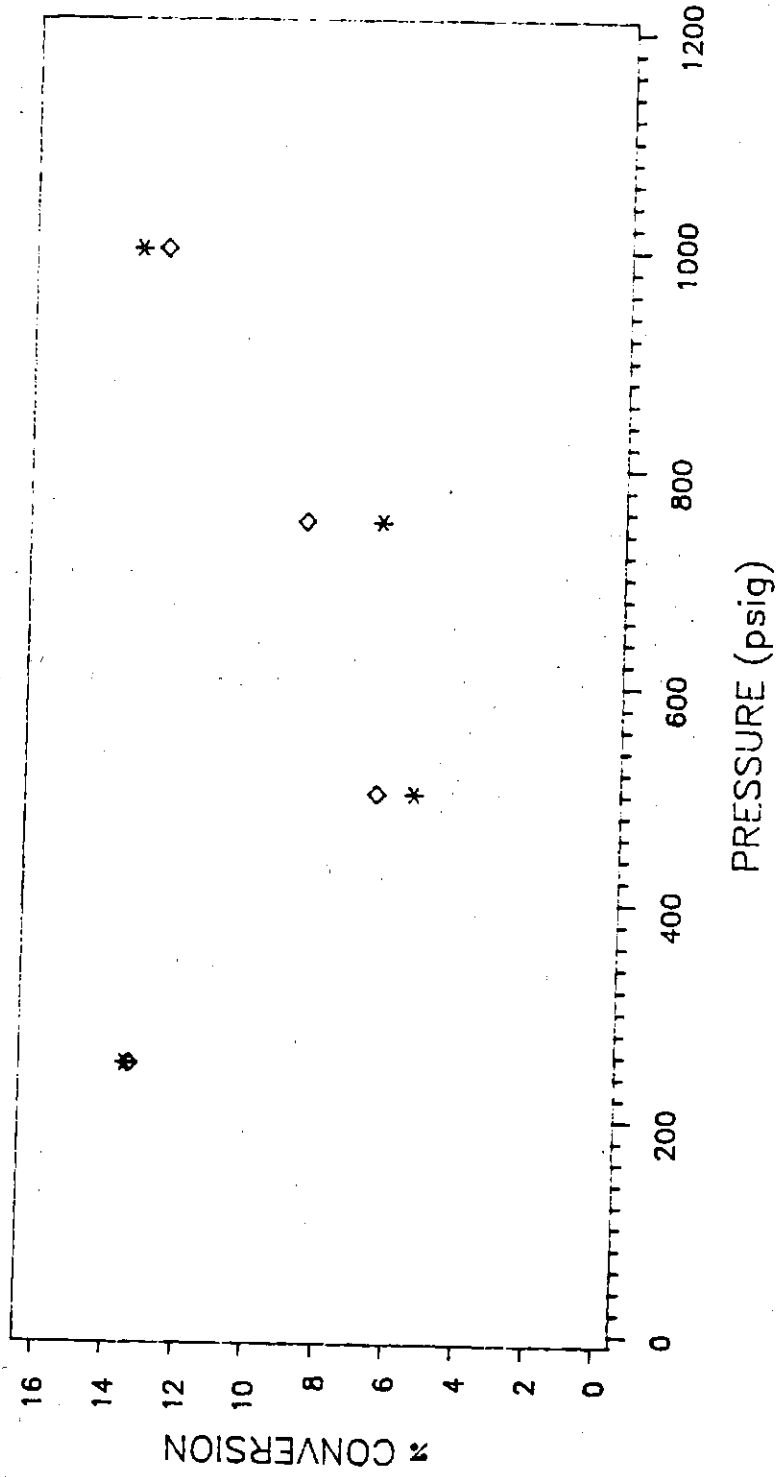


Figure 15 (b)  
Gram Fractions of Products for Carbonized Fe-K/SiO<sub>2</sub>

CO and H2 CONVERSION vs PRESSURE for Rh-Mo/Al2O3  
250C; 140 hr-1



\* \* \* H2 conversion    ♦ ♦ ♦ CO conversion

Figure 16

CO and H2 Conversions over Rh-Mo/Al<sub>2</sub>O<sub>3</sub>

# PRODUCT DISTRIBUTION

T=250C, P=250psig; H<sub>2</sub>/CO=.77; SV=140hr-1

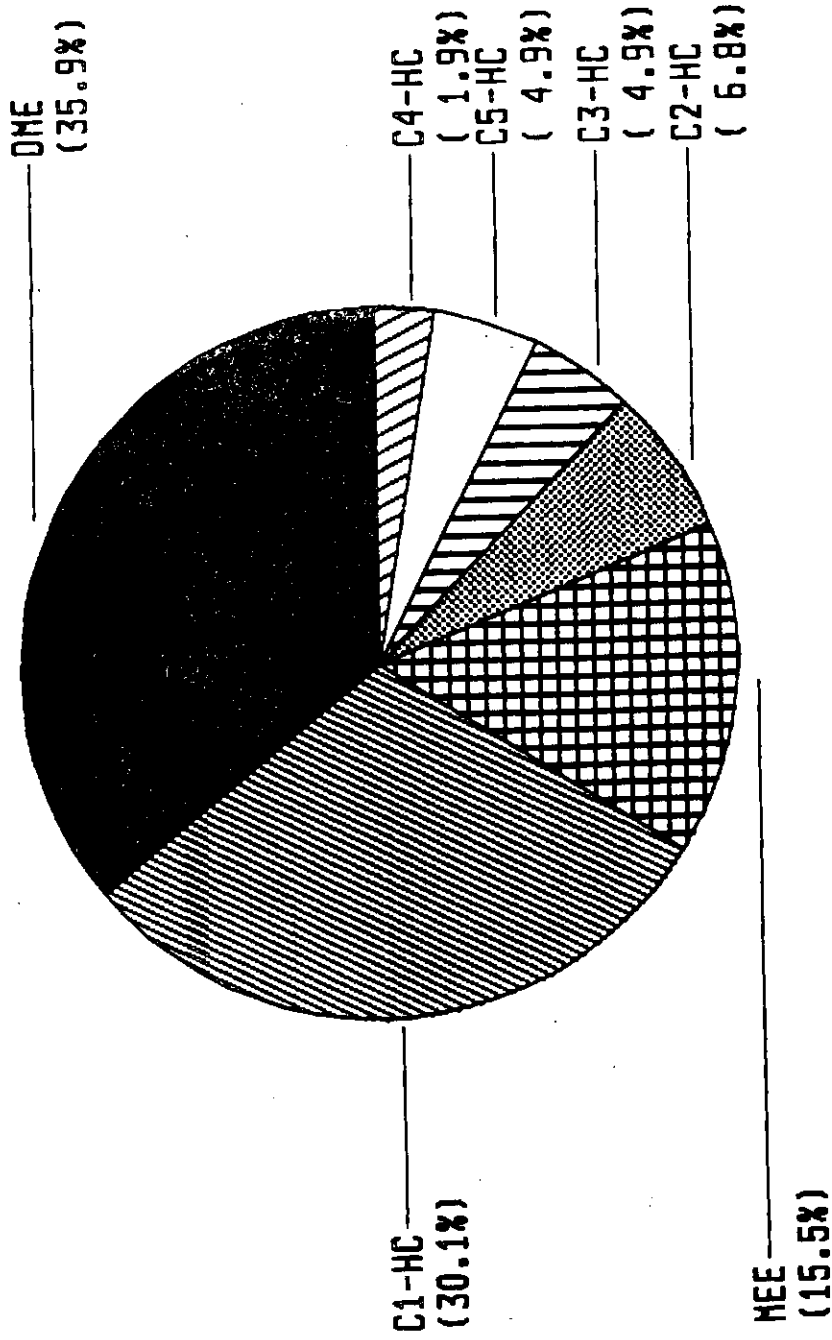


Figure 17 (a)

Product Distributions for Rh-Mo/Al<sub>2</sub>O<sub>3</sub> at 250 and 970 psig

# PRODUCT DISTRIBUTION

T=250C; P=970psig; H<sub>2</sub>/CO=0.77; SV=140hr-1

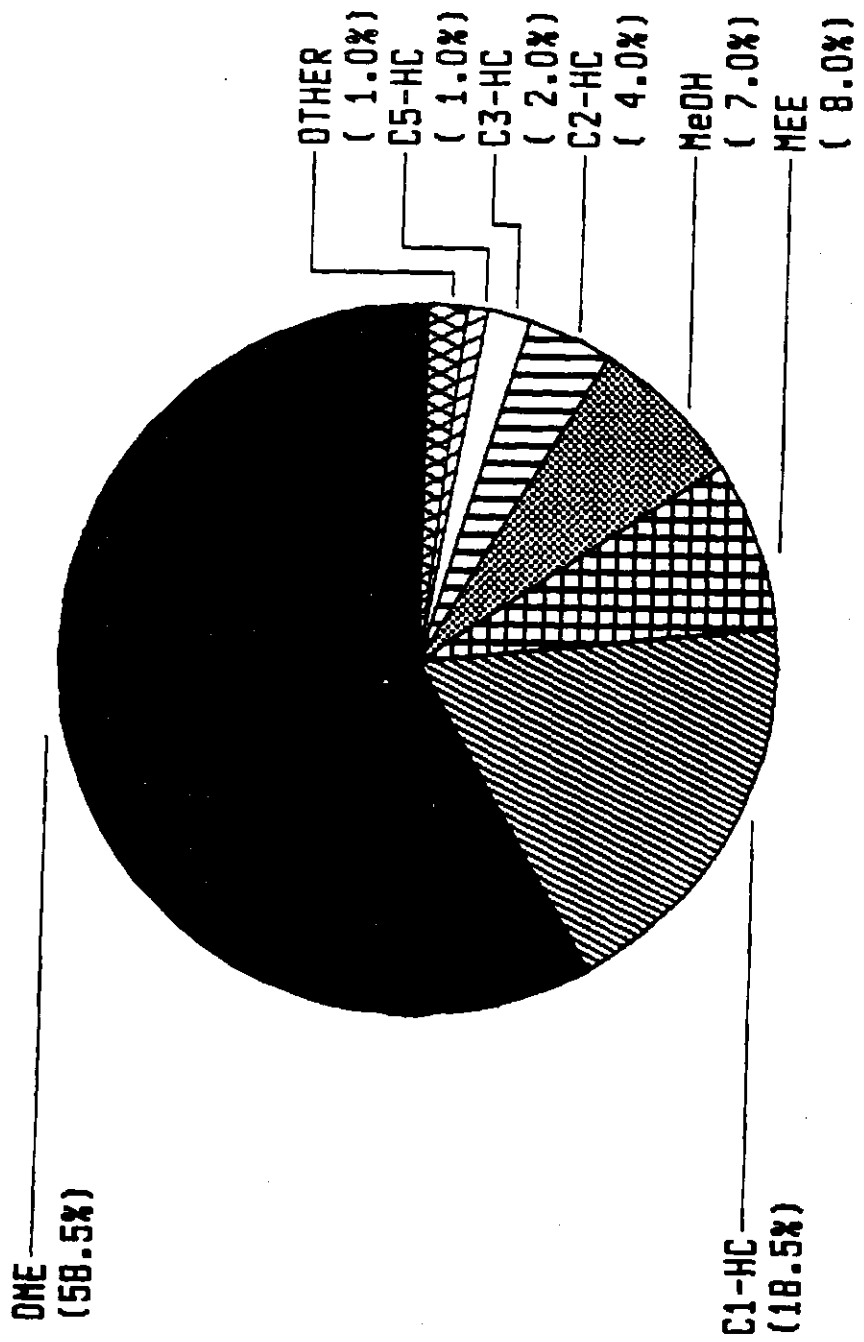


Figure 17 (b)  
Product Distributions for Rh-Mo/Al<sub>2</sub>O<sub>3</sub> at 250 and 970 psig

FIGURE 18  
DME Yld. (g)/CH<sub>4</sub> Yld (g) vs P (psig) for Rh-Mo/Al<sub>2</sub>O<sub>3</sub>

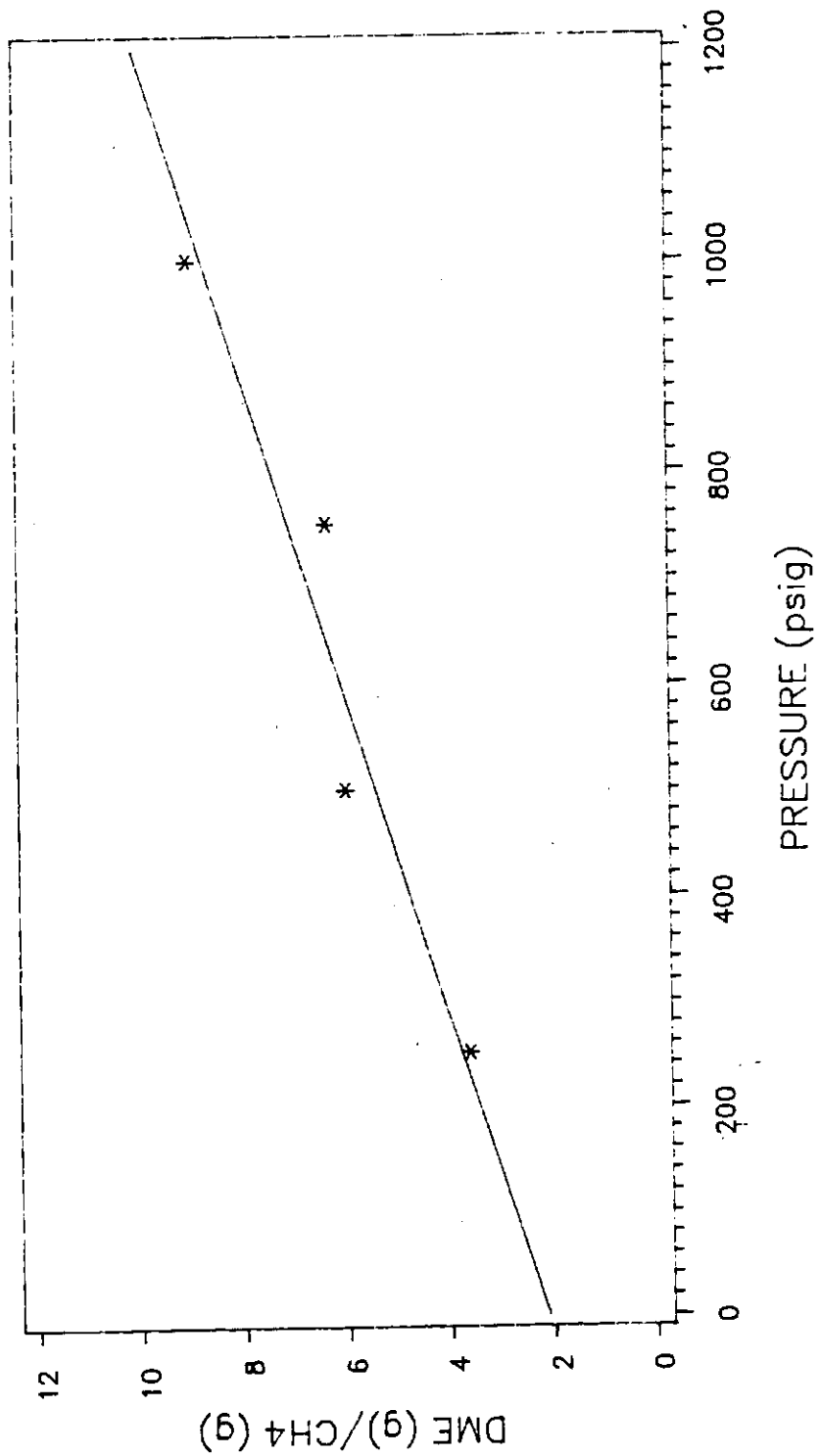


Figure 18  
DME Yield/Methane Yield versus Pressure for Rh-Mo/Al<sub>2</sub>O<sub>3</sub>

OXYGENATE EFFICIENCY  
OXYGENATE YIELD (g)/HYDROCARBON YIELD (g) vs P (psig)

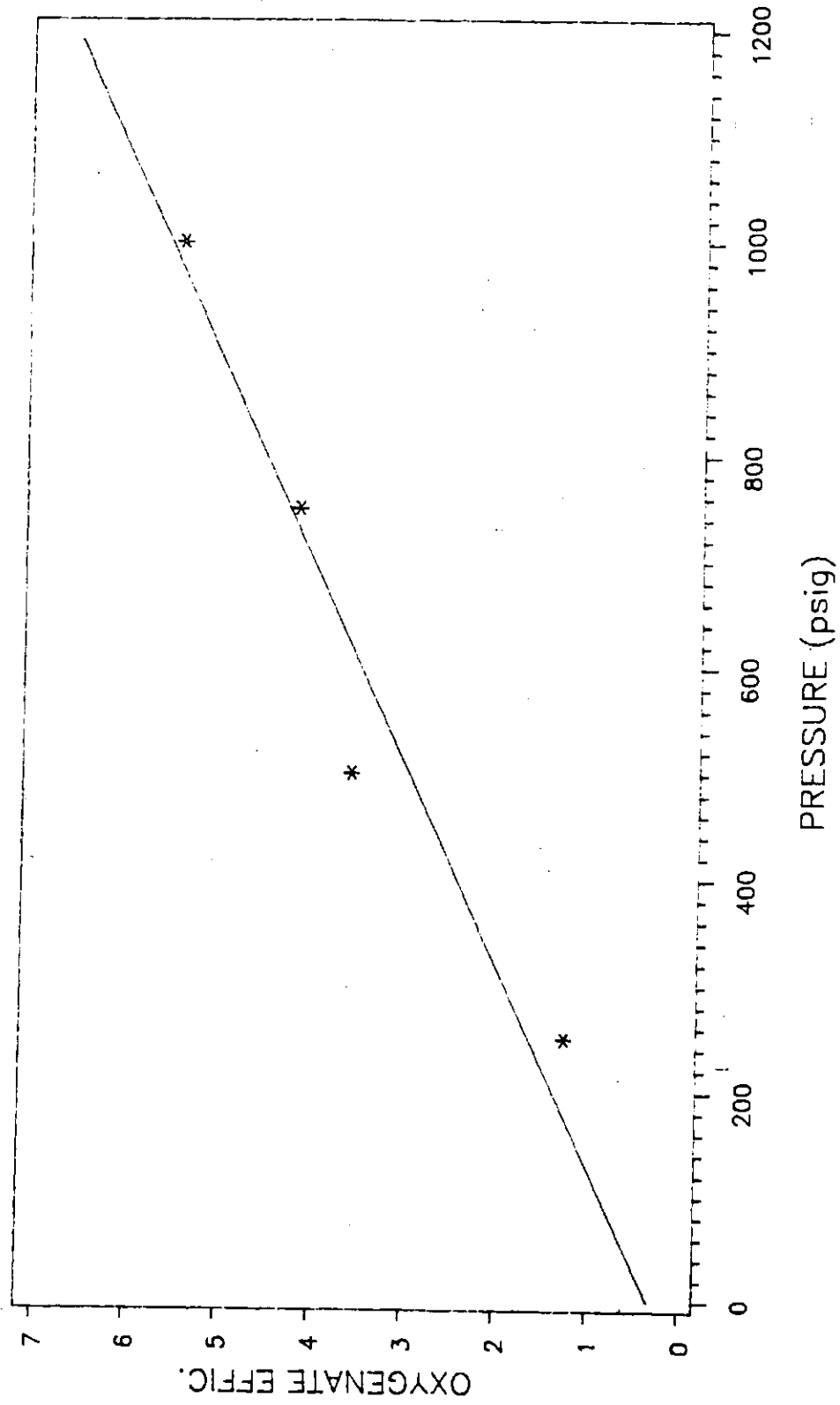


Figure 19

Overall Oxygenat Efficiency versus Pressure for Rh-Mo/Al<sub>2</sub>O<sub>3</sub>

Figure 20 (a)

CO Conversion for FT-Based Systems

% CO CONVERSION FOR FT-BASED CATALYSTS  
250C, 250 PSIG (500 PSIG FOR NONSIEVING

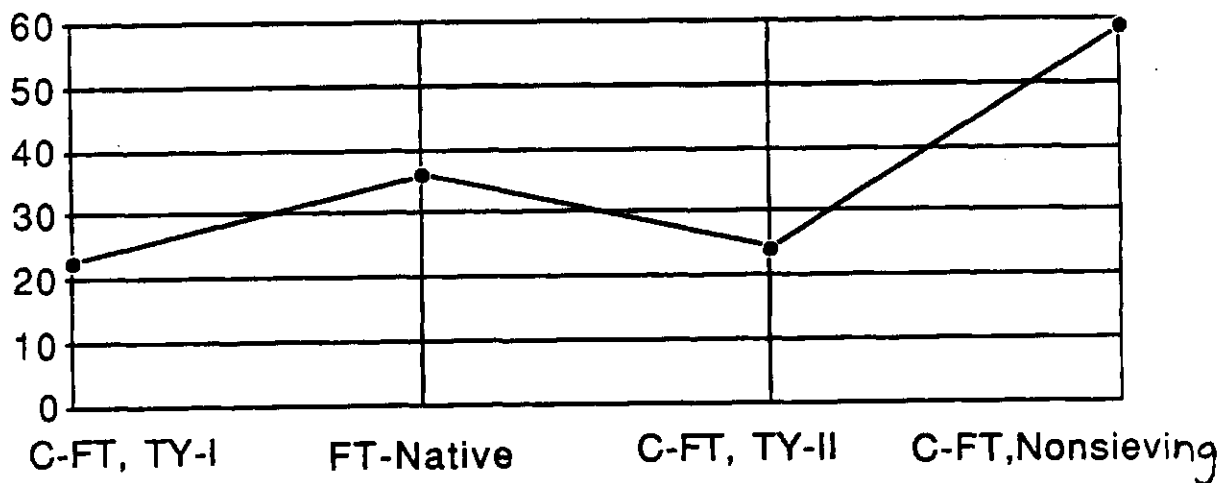
SAMPLE), 1:1:CO:H<sub>2</sub>



Figure 20 (b)  
CO Conversion for FT-Based Systems

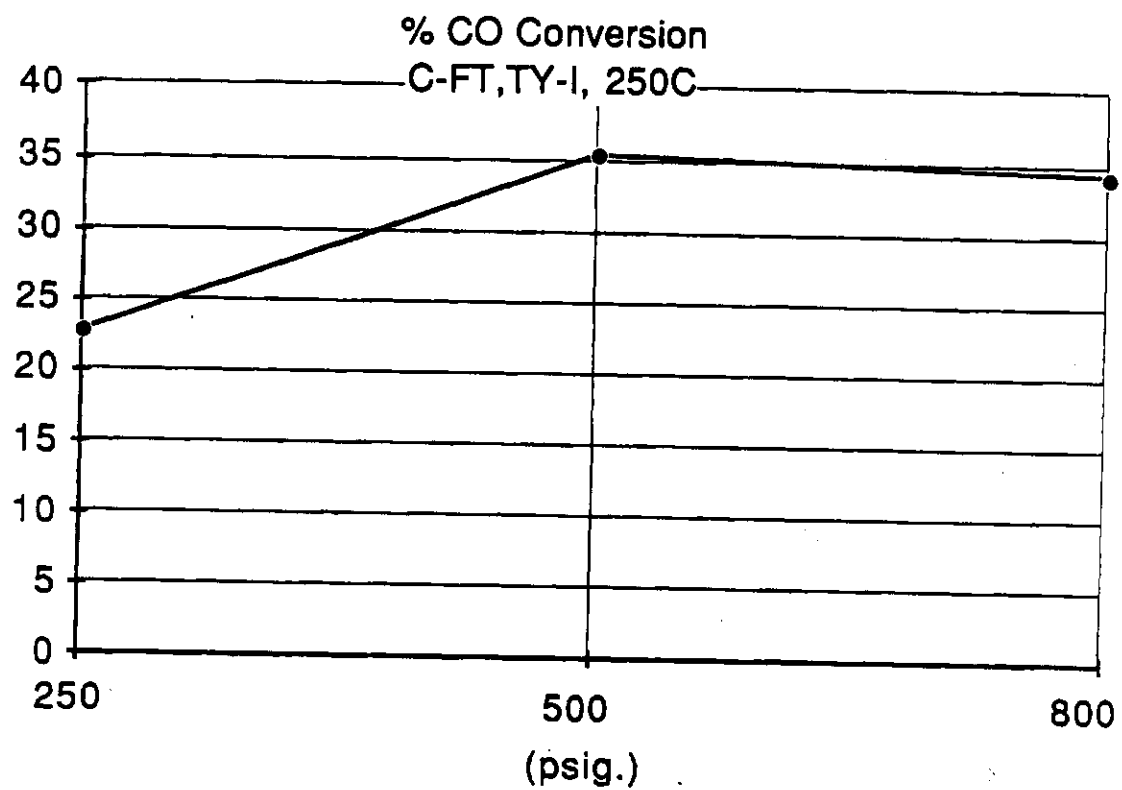
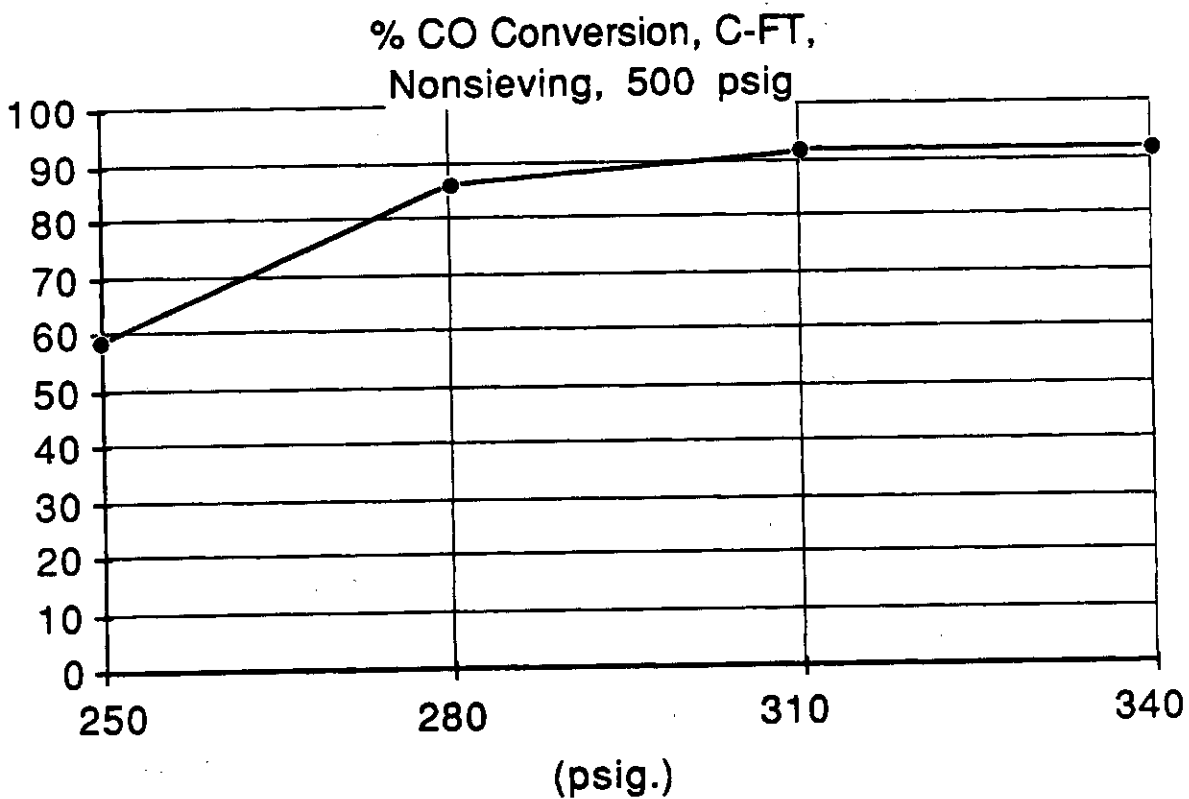


Figure 20 (c)  
CO Conversion for FT-Based Systems



GRAM FRACTIONS AT 250C, 250 PSIG, 1:1:CO:H2,  
 C-FT-TY-I; C-FT TY-II, FT NAT.; C-FT NON-  
 SIEVING

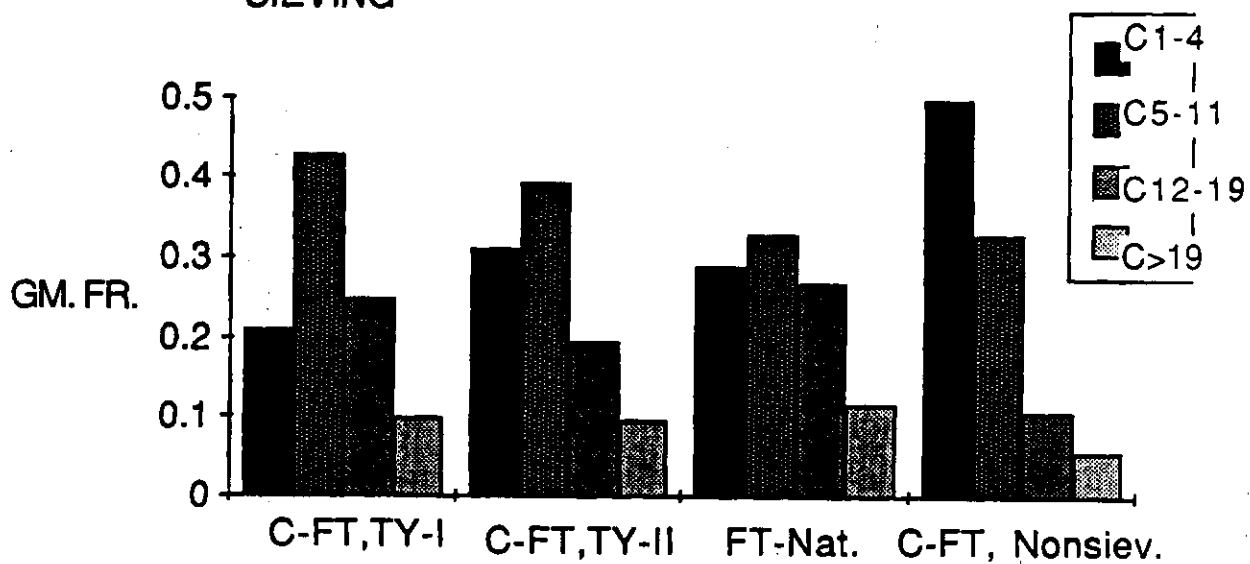


Figure 21 (a)

Gram Fractions of Products for FT-Based Materials

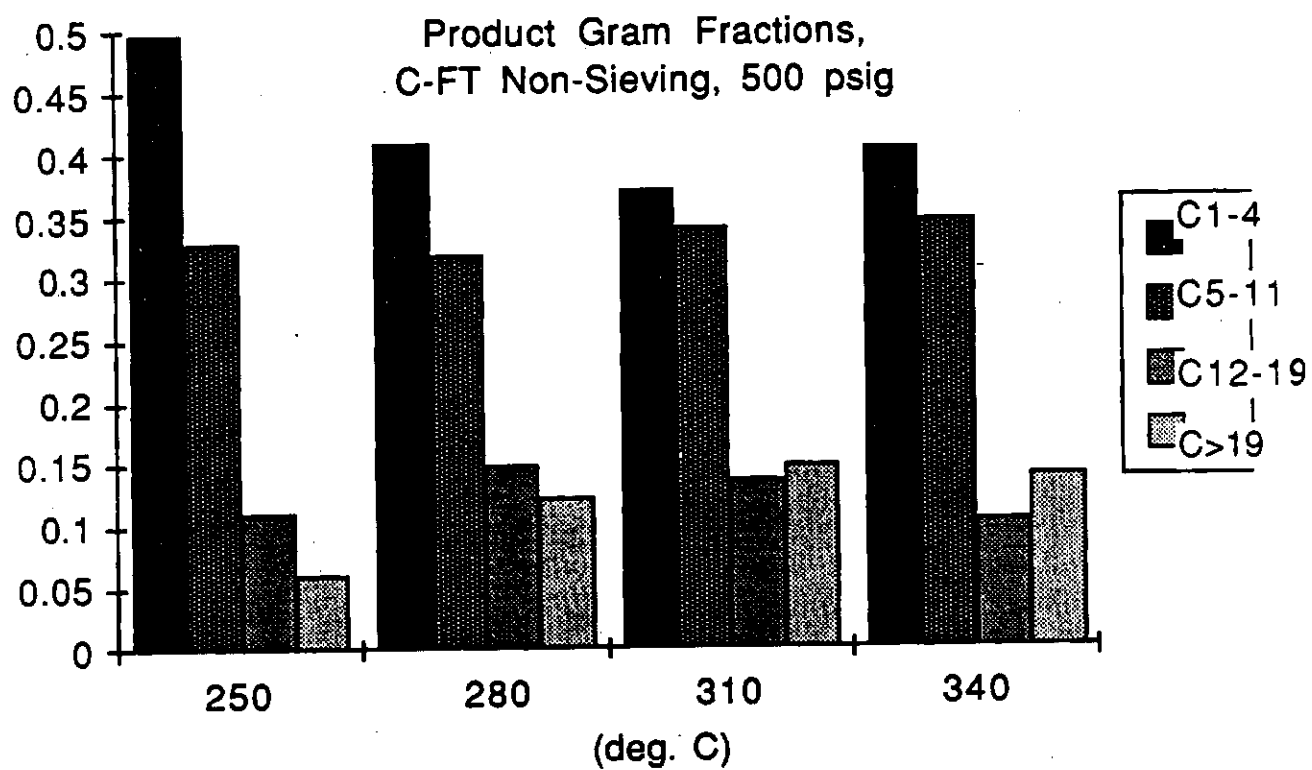


Figure 2<sub>1</sub> (b)  
Gram Fractions of Products for FT-Based Materials

# ANDERSON SHULZ FLORY PLOT

## NATIVE FT VS C-FT TYPE 1 AND 2

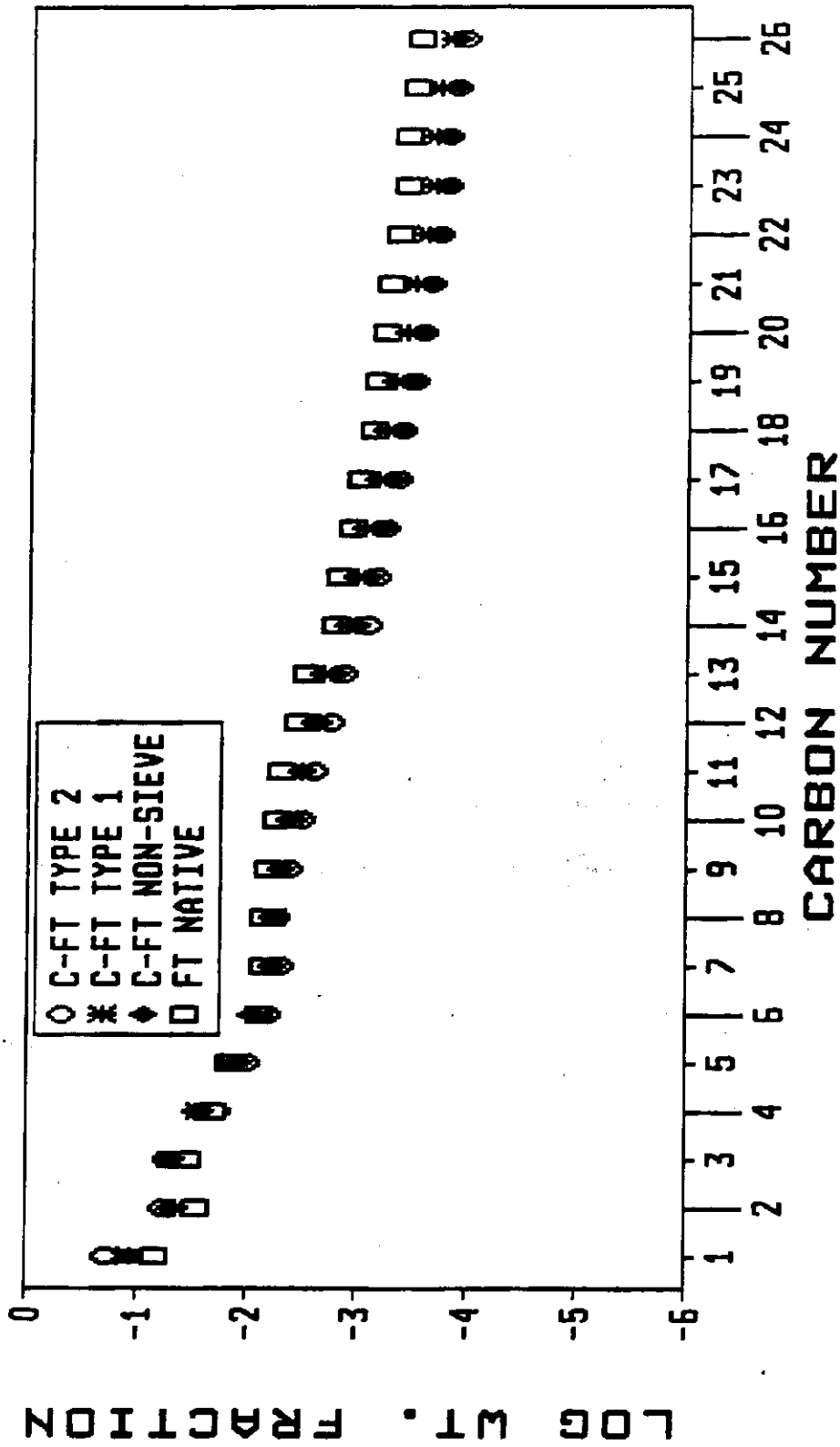


Figure 22(a)

ASF Plot for FT-Based Systems

ANDERSON SHULZ FLORY PLOT  
NATIVE FT SAMPLE 250C;250PSIG CO:H2 1:1

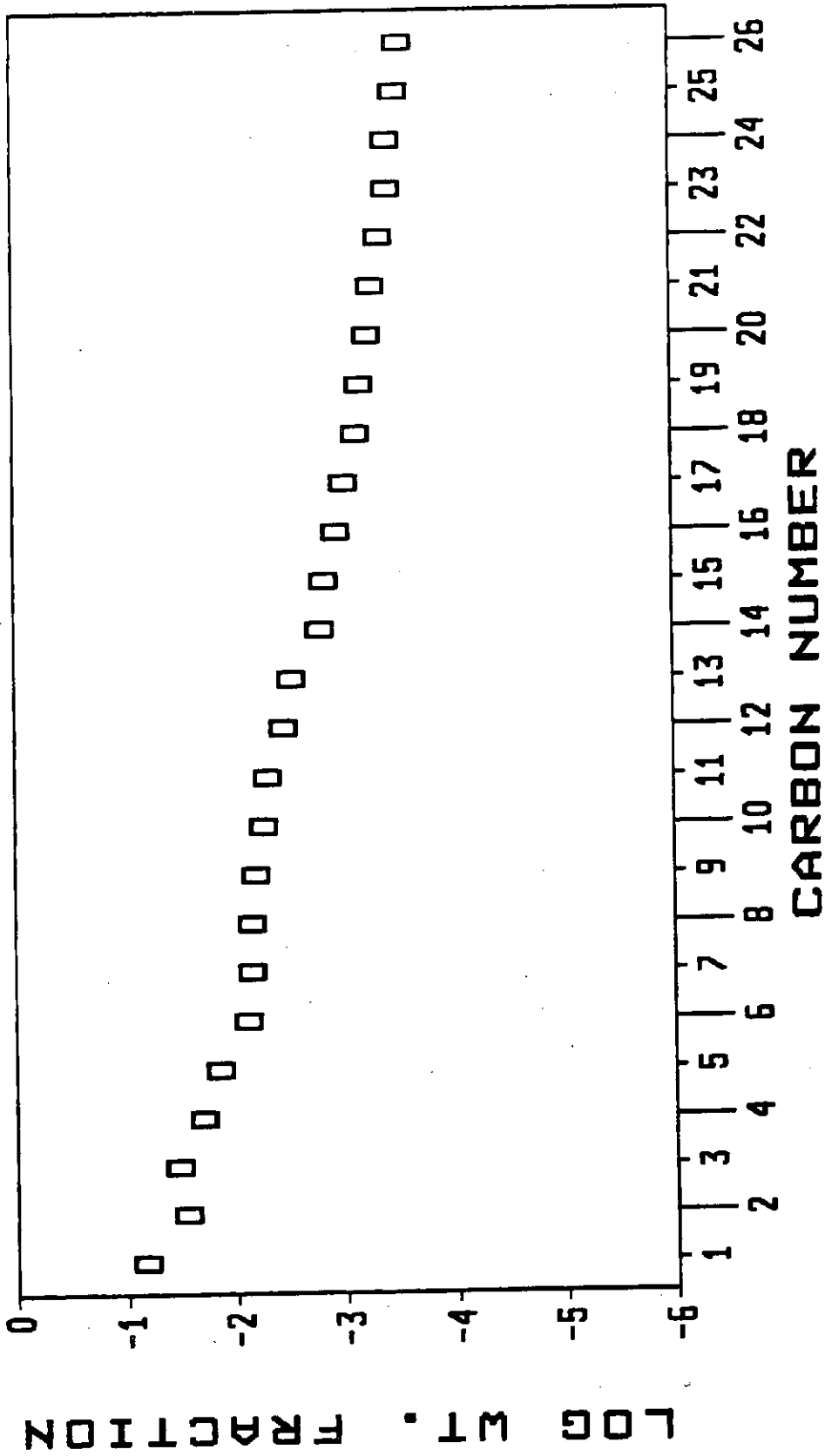
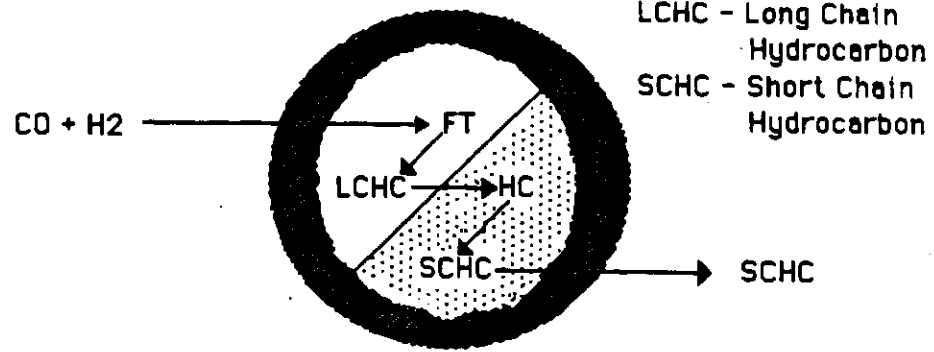


Figure 22 (b)  
ASF Plot for FT-Based Systems

Figure 23

Schematic of FT-HC Concept

TYPE I - Product Selectivity  
FT - Fischer Tropsch  
HC - Hydrocracking



TYPE II - Transition State Selectivity  
Carbon Matrix

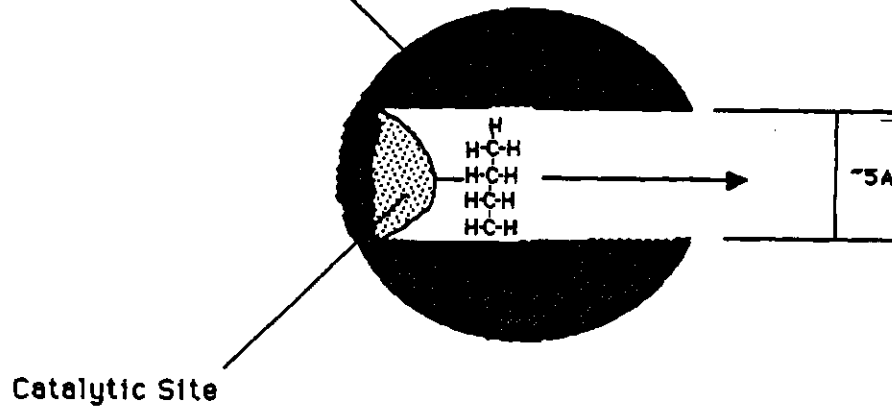


Figure 24

CO Conversion for C-FT-HC(1:1),TY-I

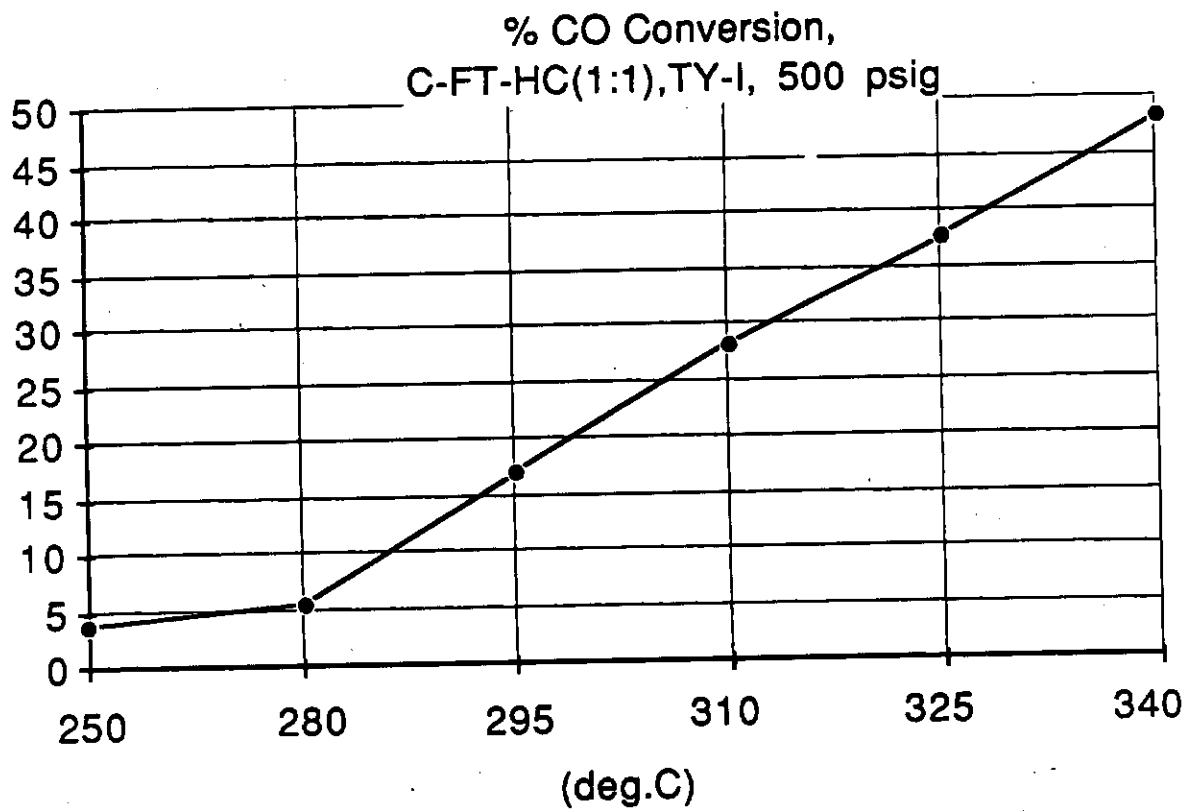
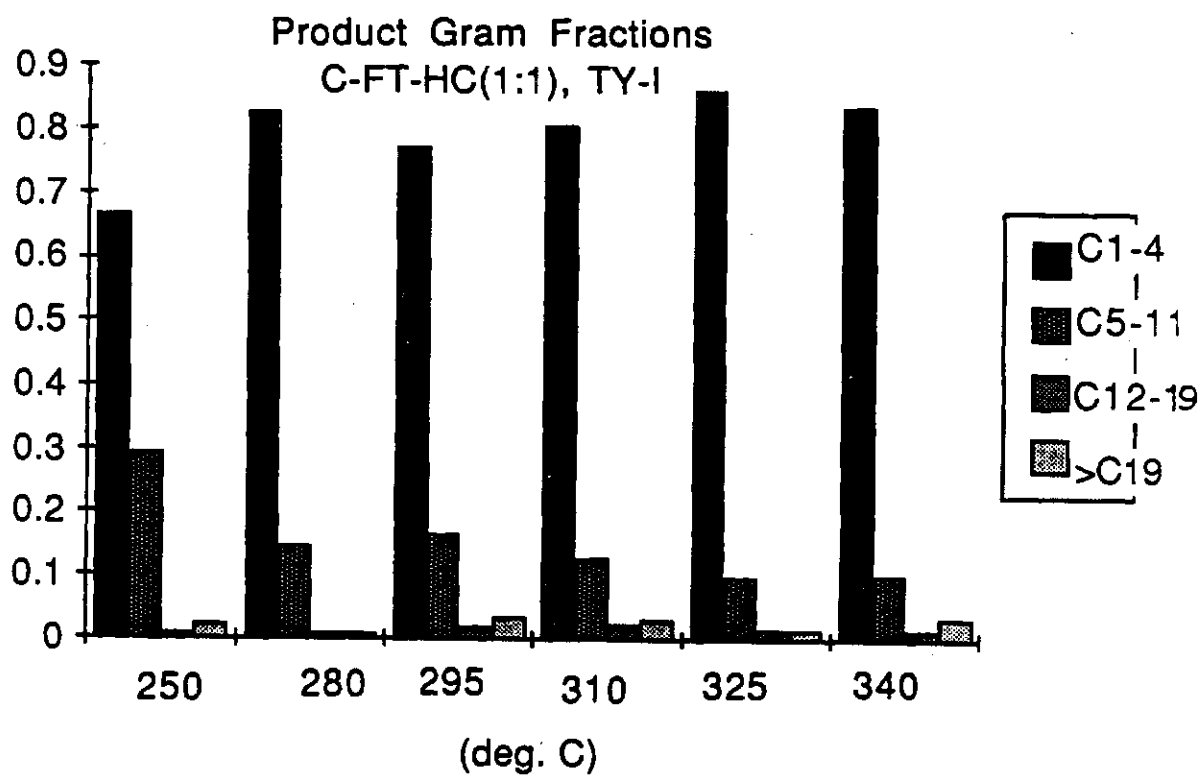




Figure 25  
Gram Fractions of Products from C-FT-HC(1:1), Ty-I



# ANDERSON SHULZ FLORY PLOT

RUN 27 C-FT-HC(1:1) TYPE 1

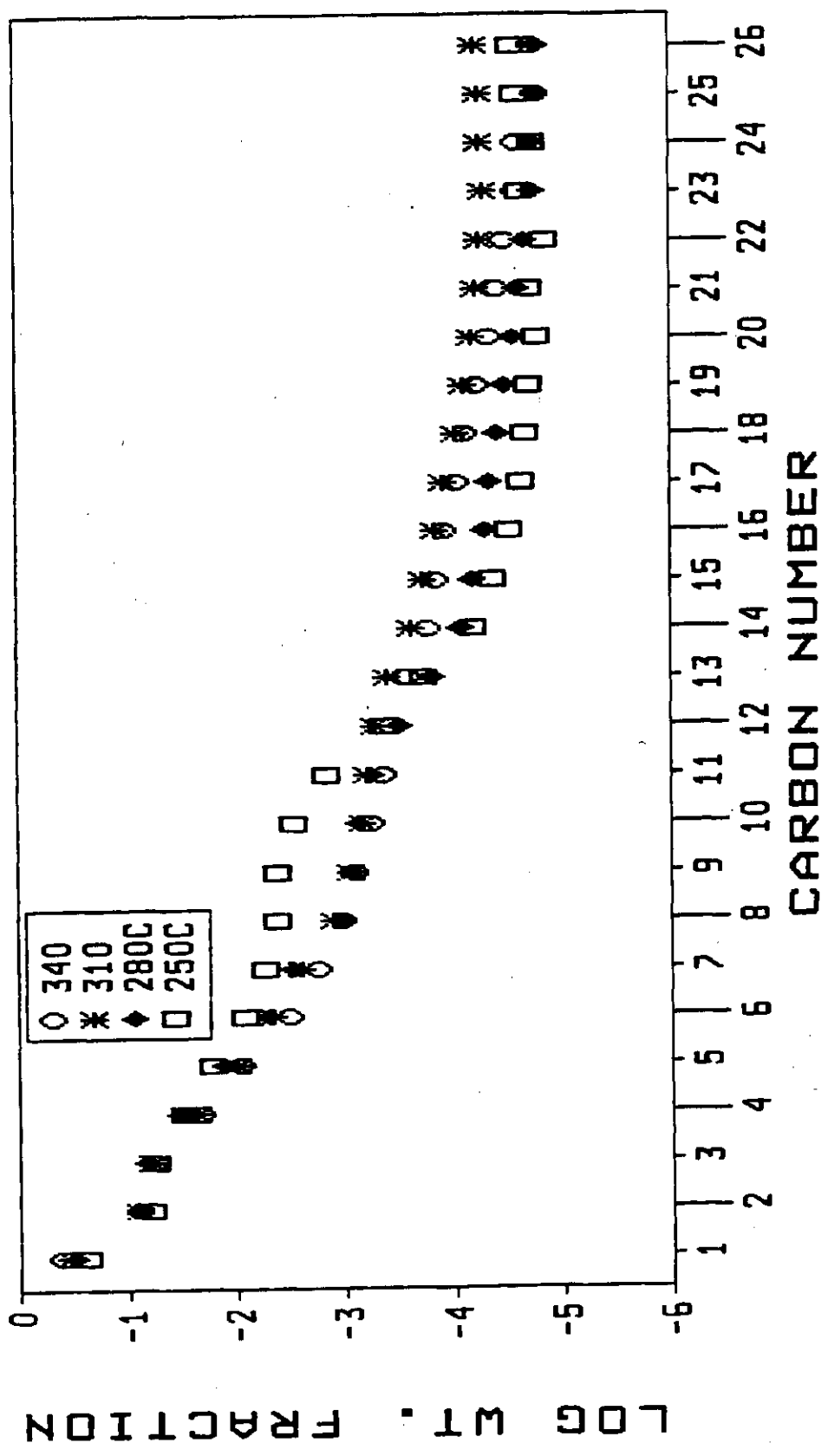


Figure 26

ASF Plots for C-FT-HC(1:1), Ty-I

Figure 27

CO Conversion for C-FT-HC(1:1), Non-Sieving

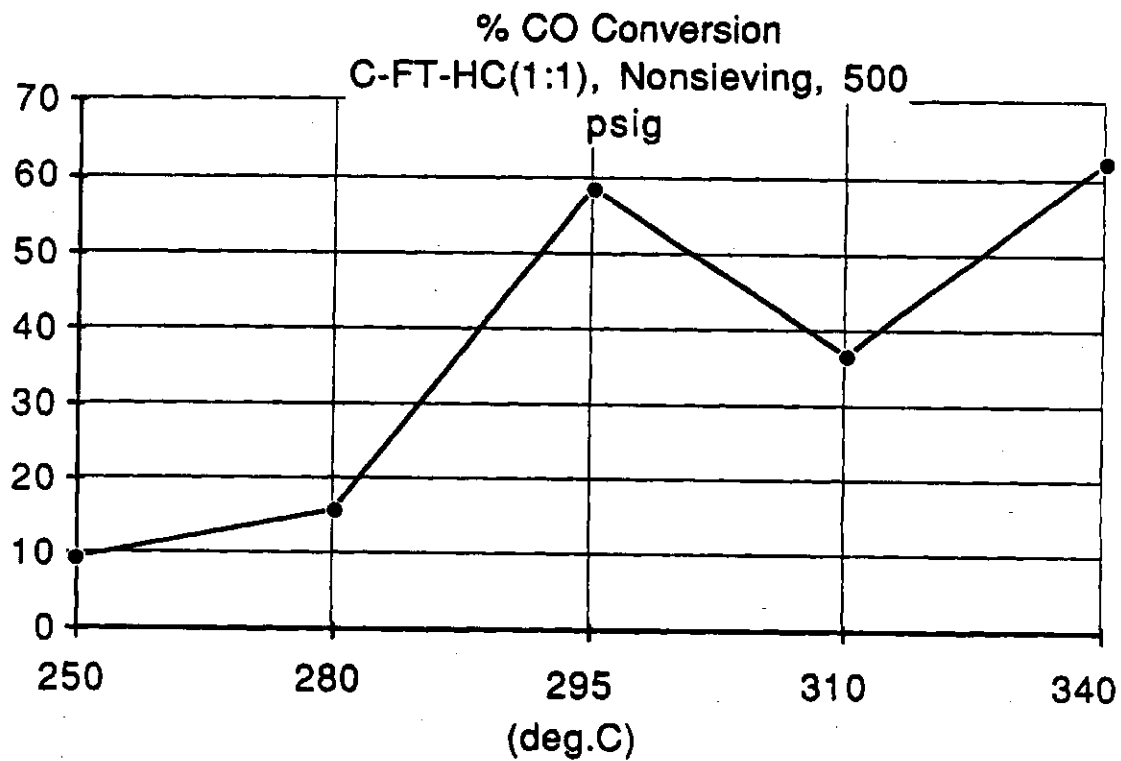


Figure 28

CO Conversion for FT-HC, Native

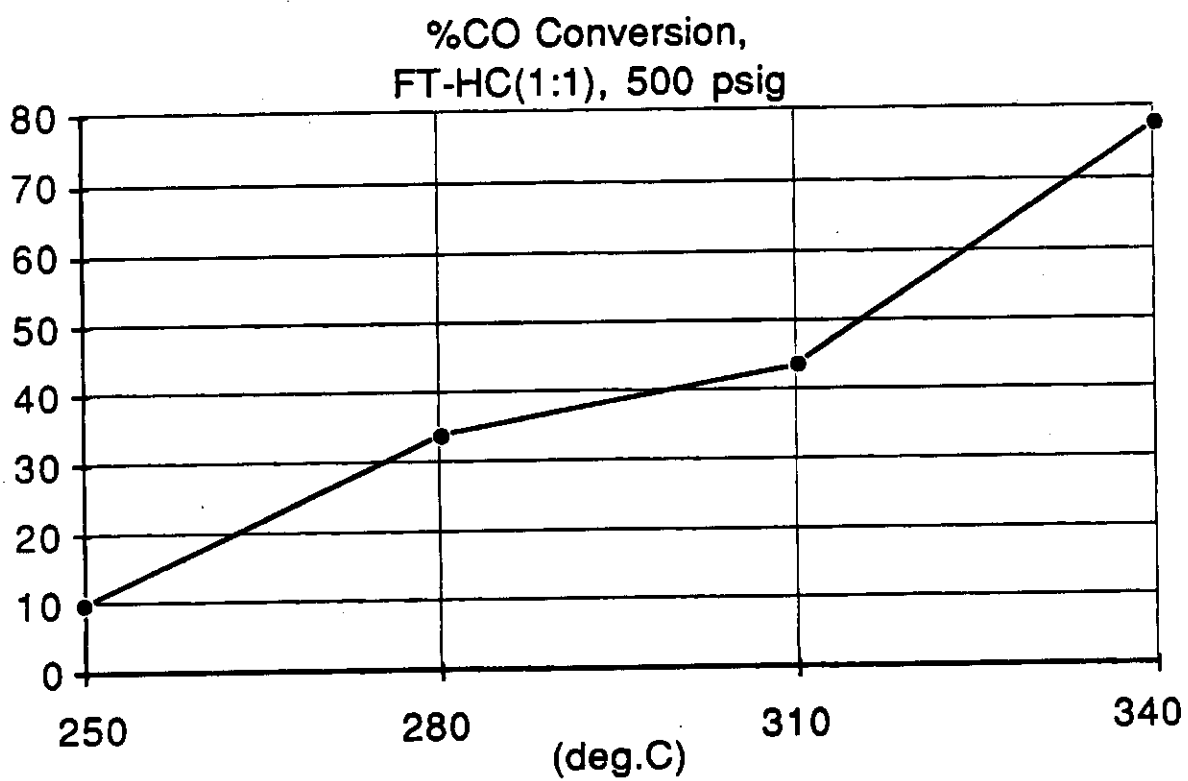


Figure 29

Gram Fractions for C-FT-HC(1:1), Non-Sieving

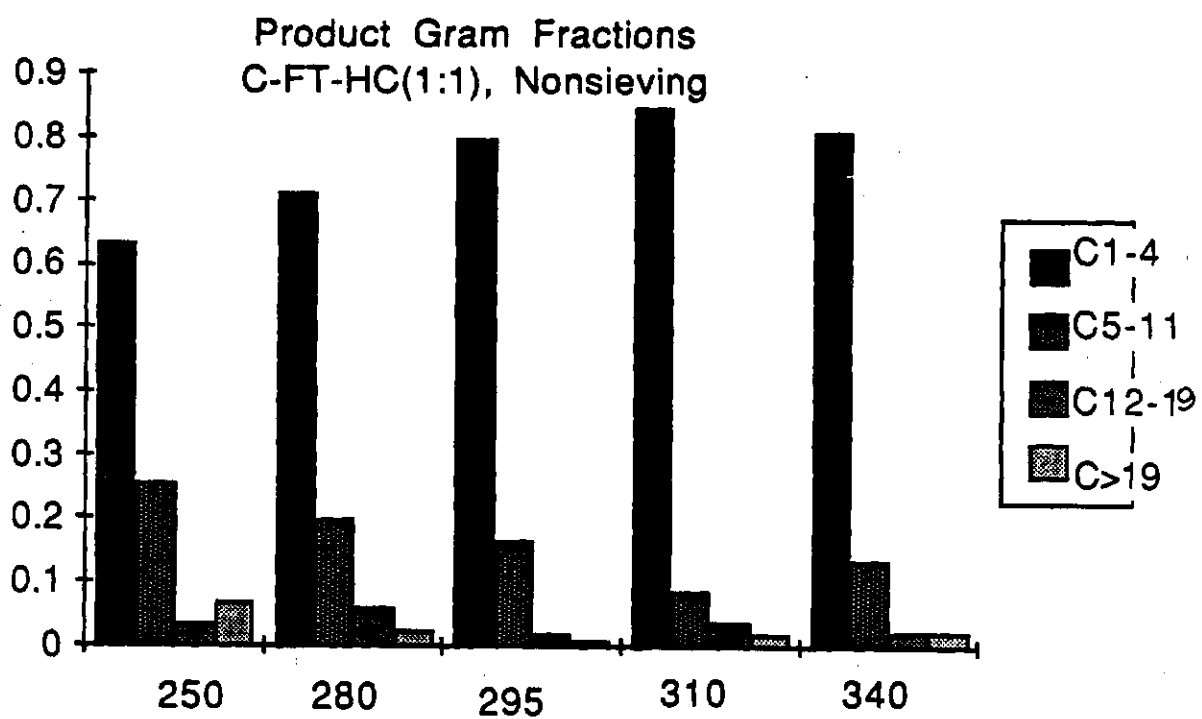
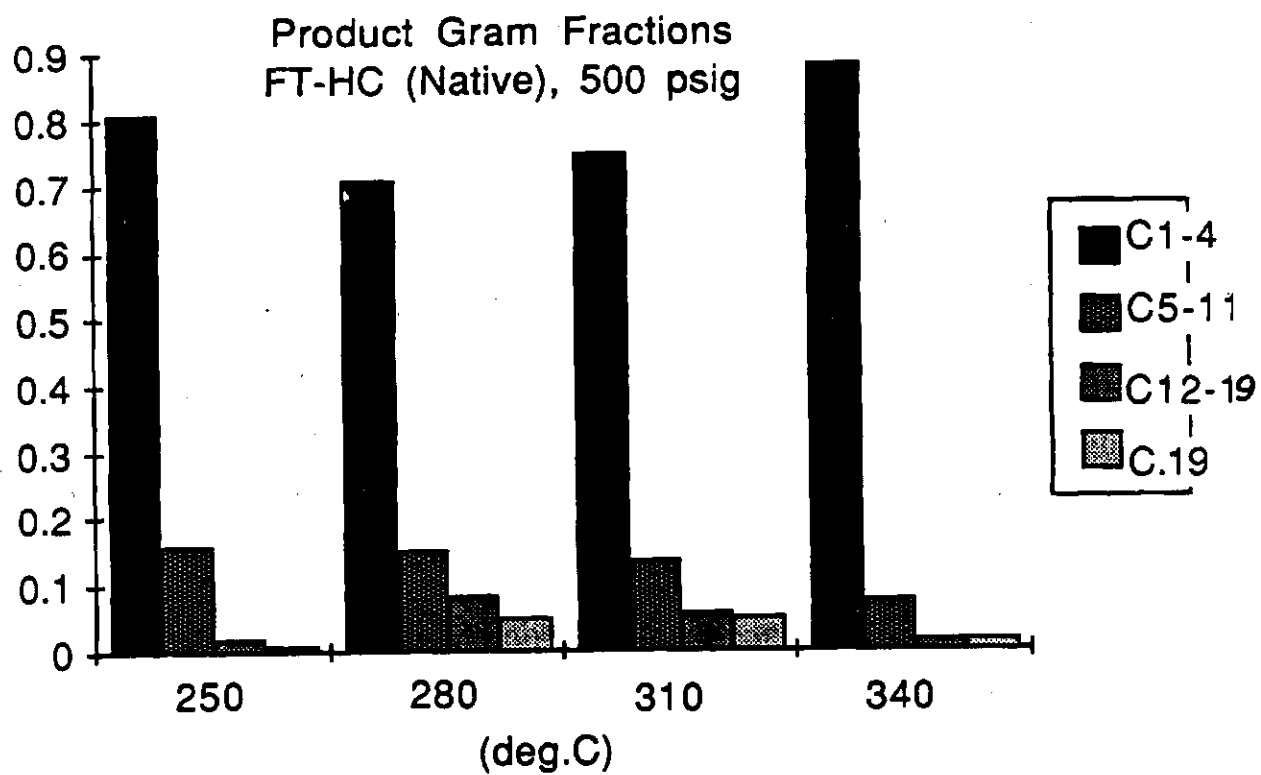


Figure 30

Gram Fractions for FT-HC, Native



# ANDERSON SHULZ FLORY PLOT

RUN 28 C-FT-HC(1:1) NONSIEVING

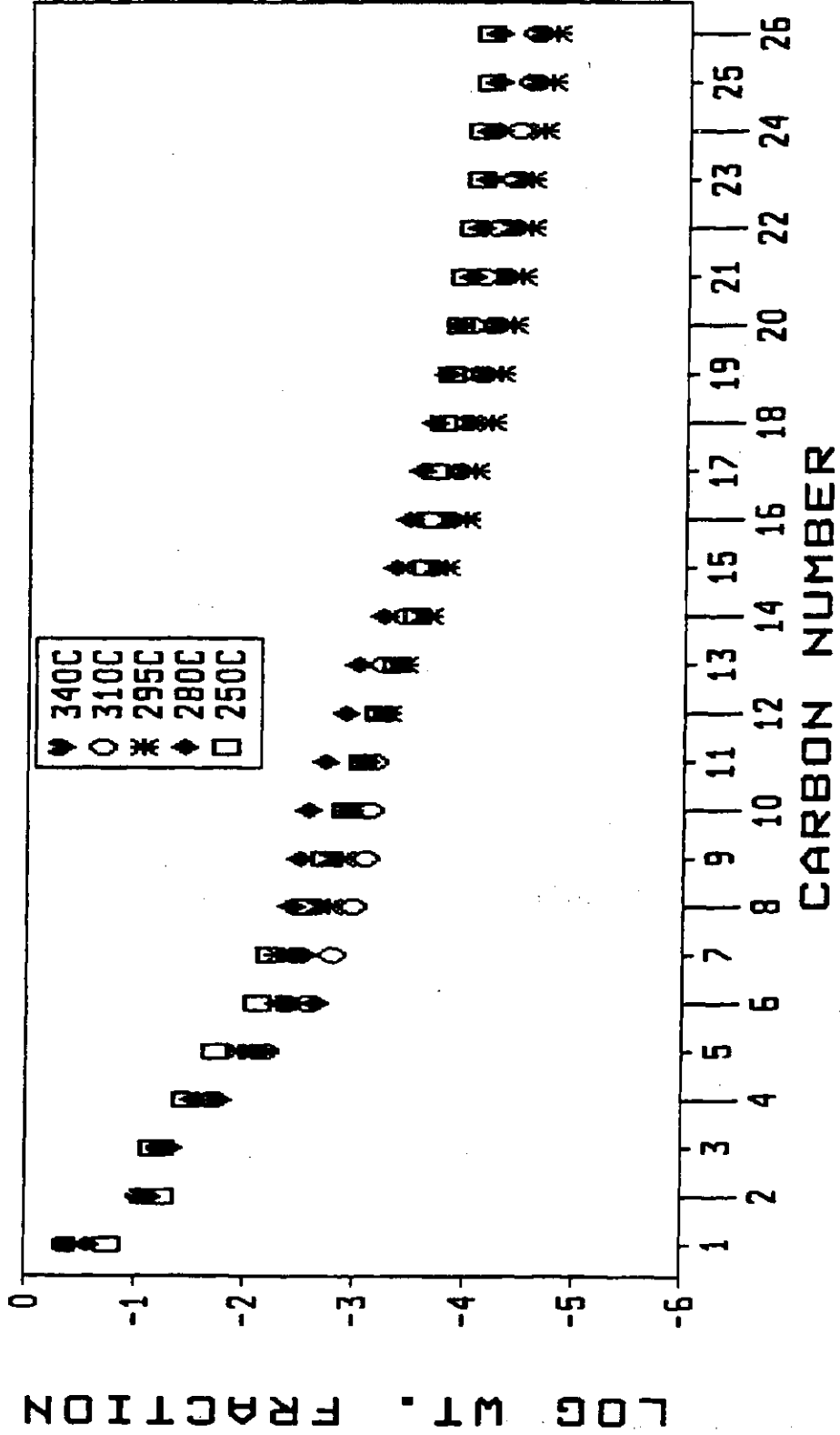


Figure 31

ASF Plots for C-FT-HC(1:1), Non-Sieving

# ANDERSON SHULZ FLORY PLOT

RUN 30 FT-HC(1:1)

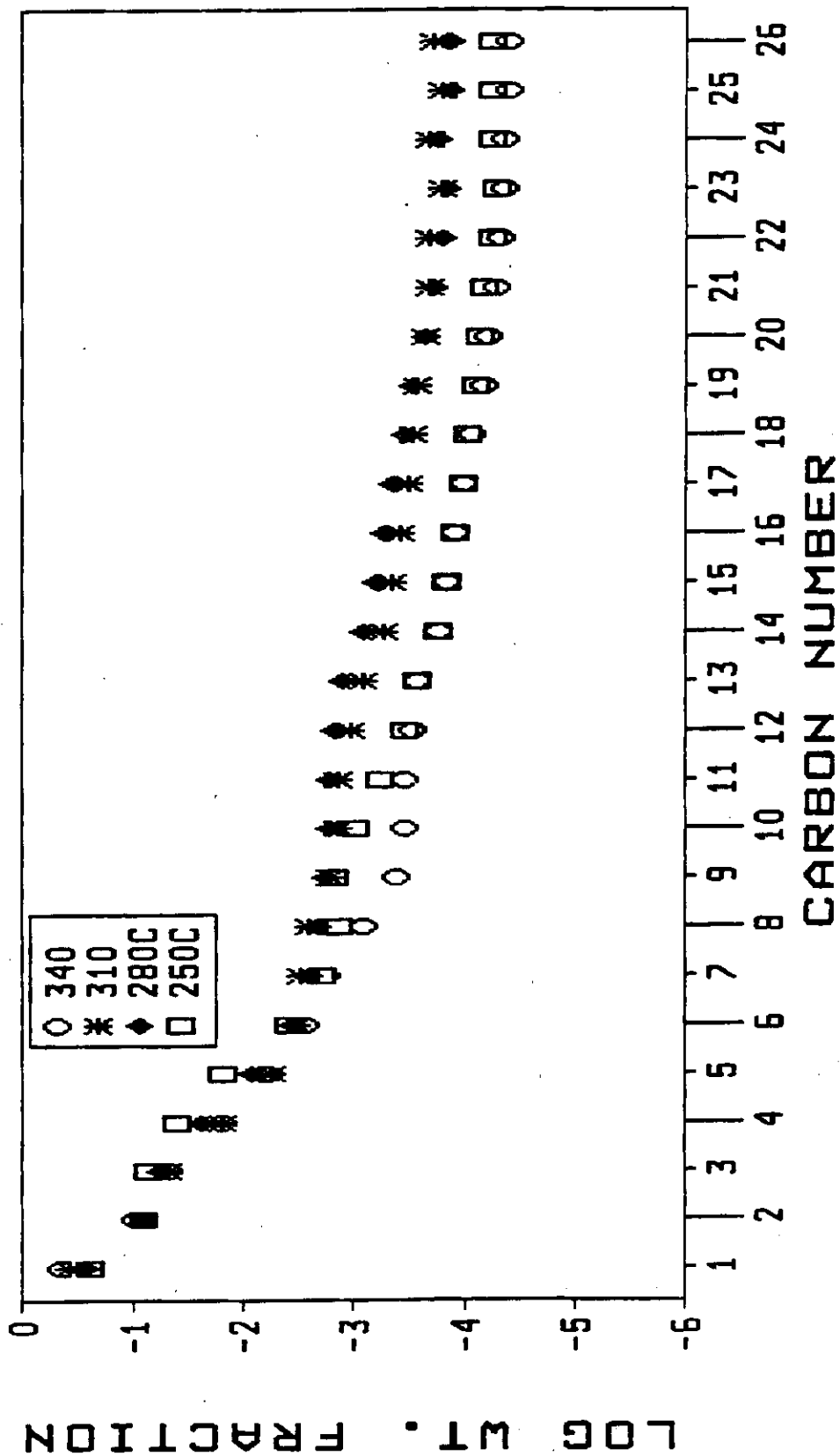


Figure 32

ASF Plots for FT-HC, Native



Figure 33

CO Conversion for C-FT-HC, Ty-I(6:1)

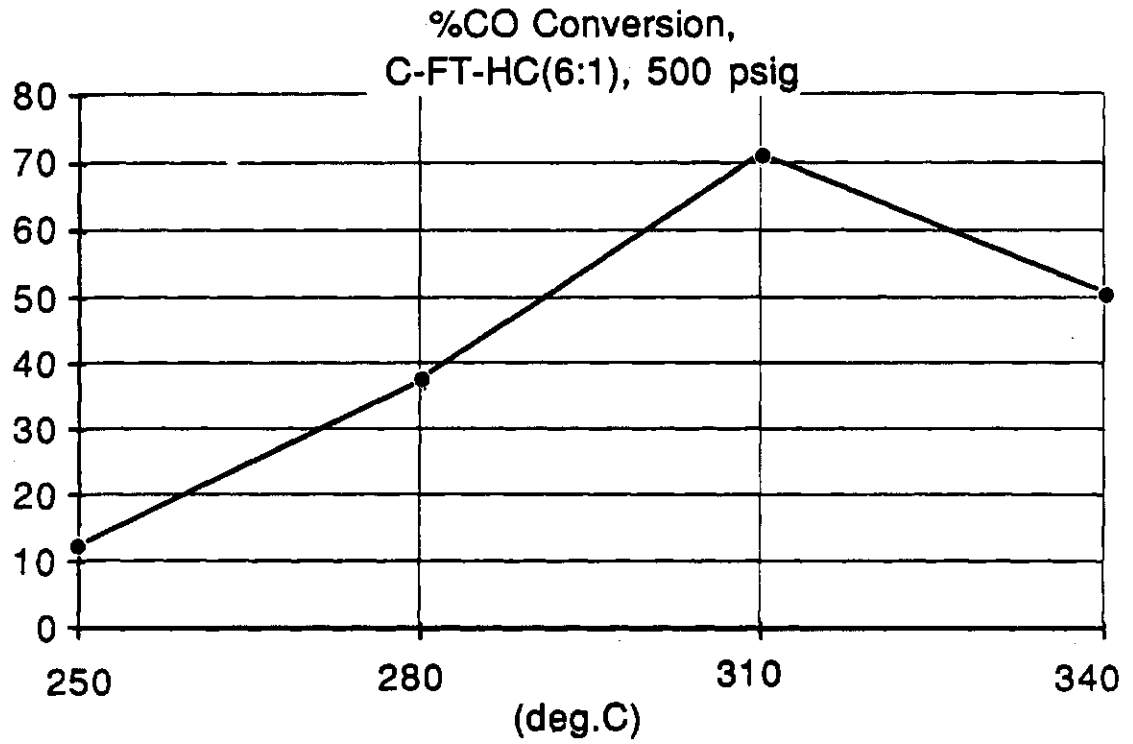
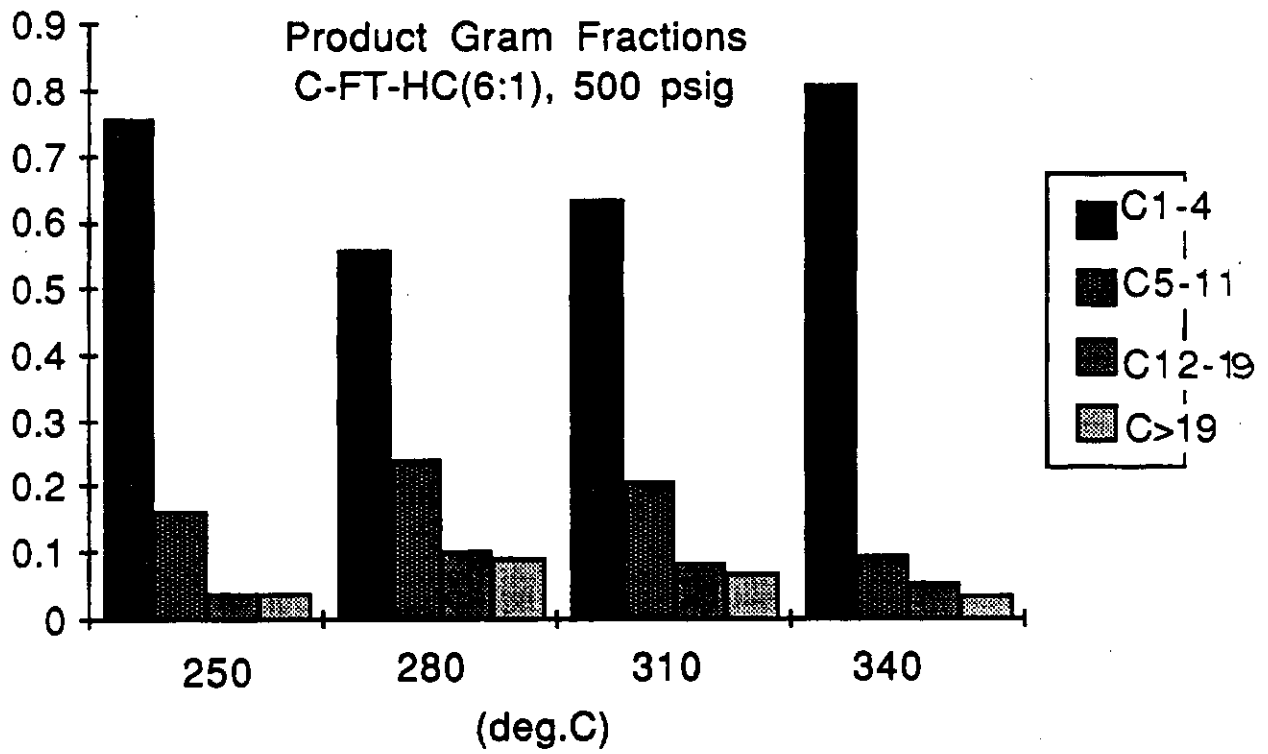


Figure 34

Gram Fractions for C-FT-HC,Ty-I(6:1)



# ANDERSON SCHULZ FLORY PLOT

RUN 32 C-FT-HC(6:1) TYPE 1

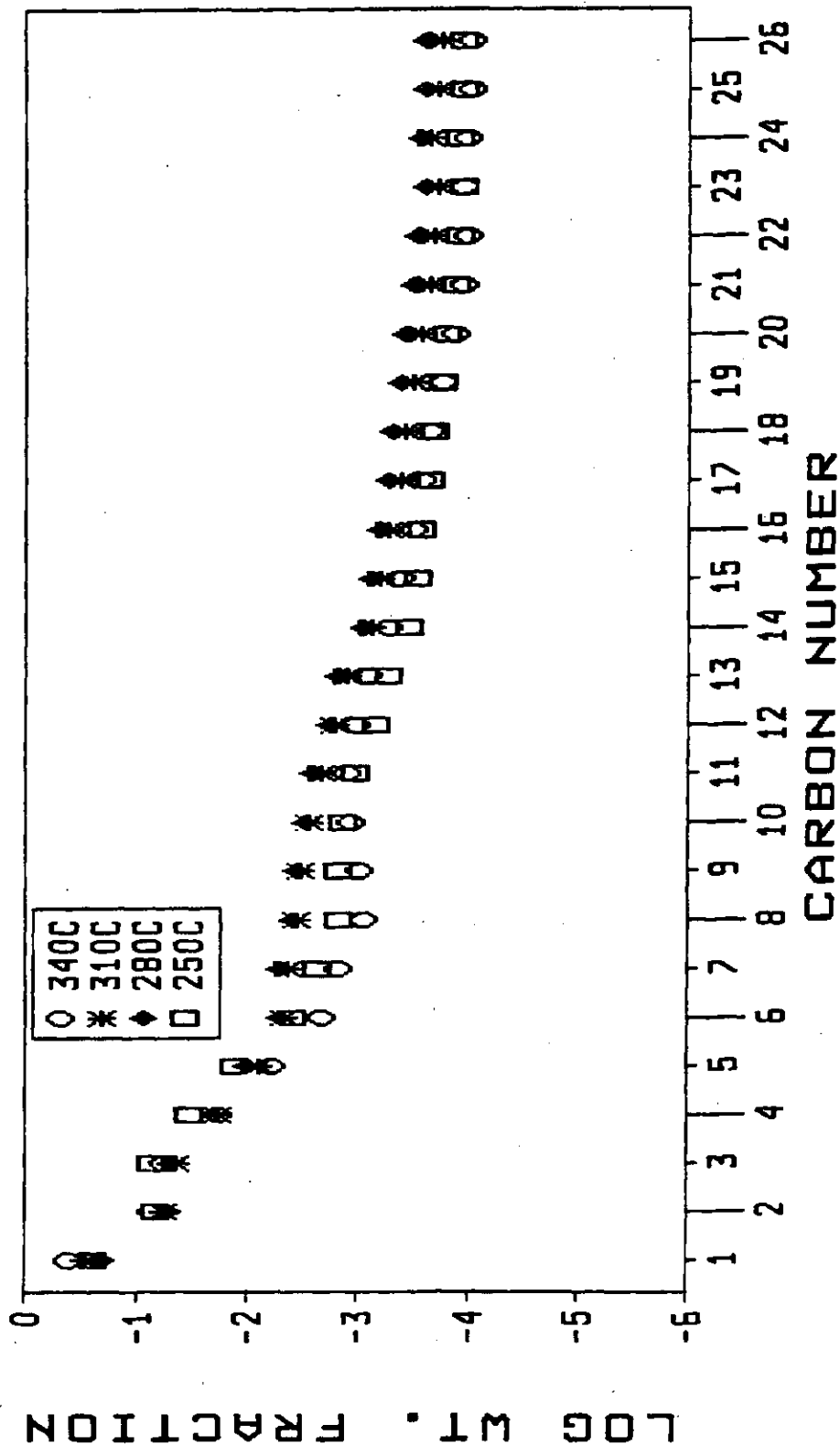


Figure 35

ASF Plots for C-FT-HC, TY-I(6:1)

Figure 36

CO Conversion for C-FT-HC,Ty-I(3:1)

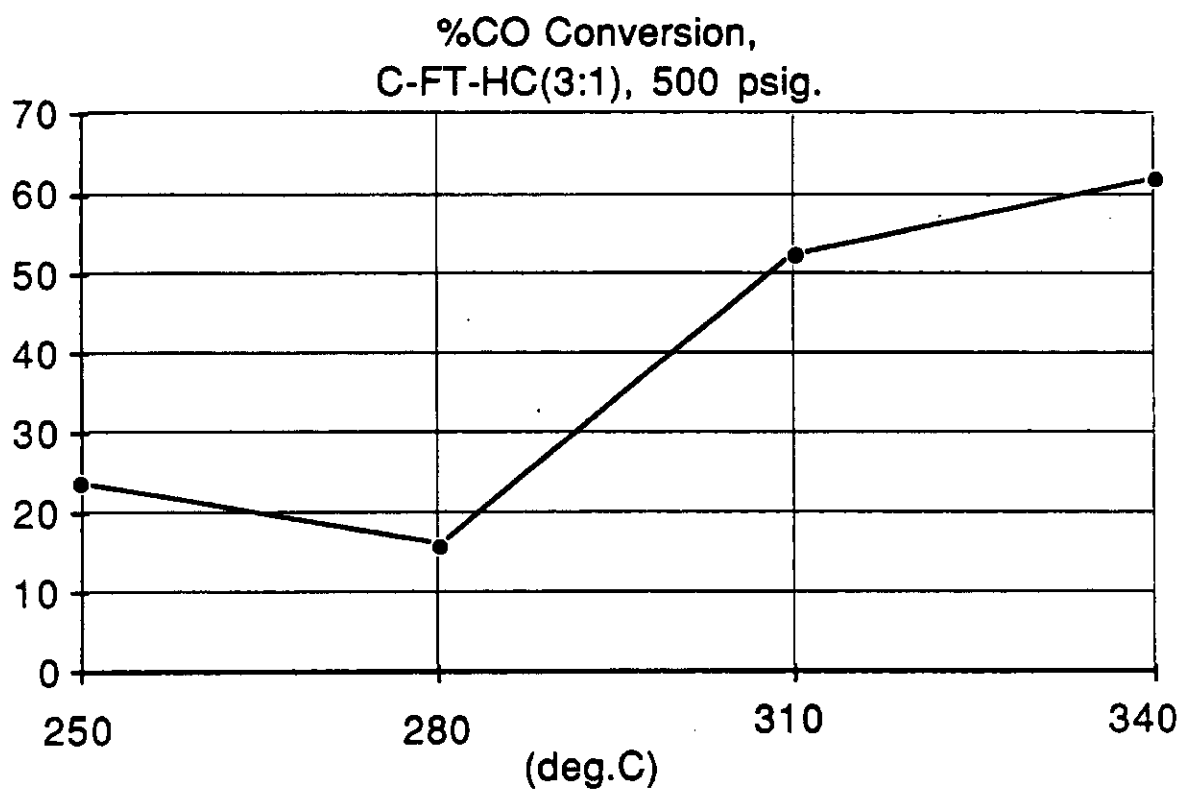
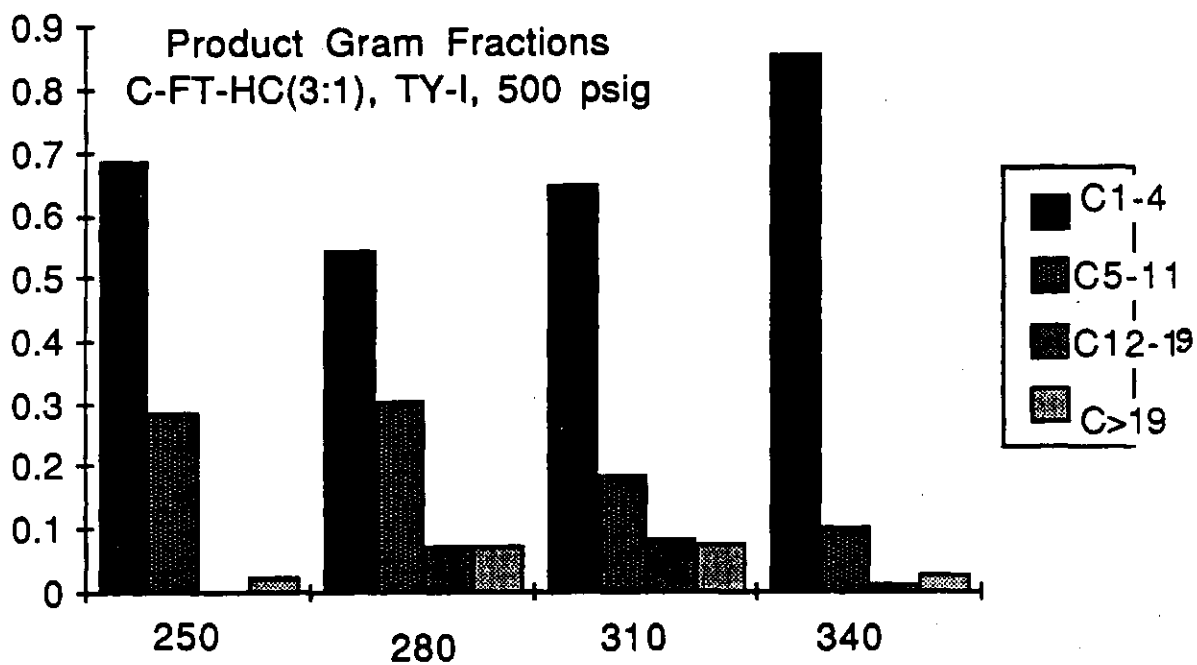


Figure 37  
Gram Fractions for C-FT-HC, Ty-I(3:1)



# ANDERSON SCHULZ FLORY PLOT

RUN 33 C-FT-HC(3:1) TYPE 1

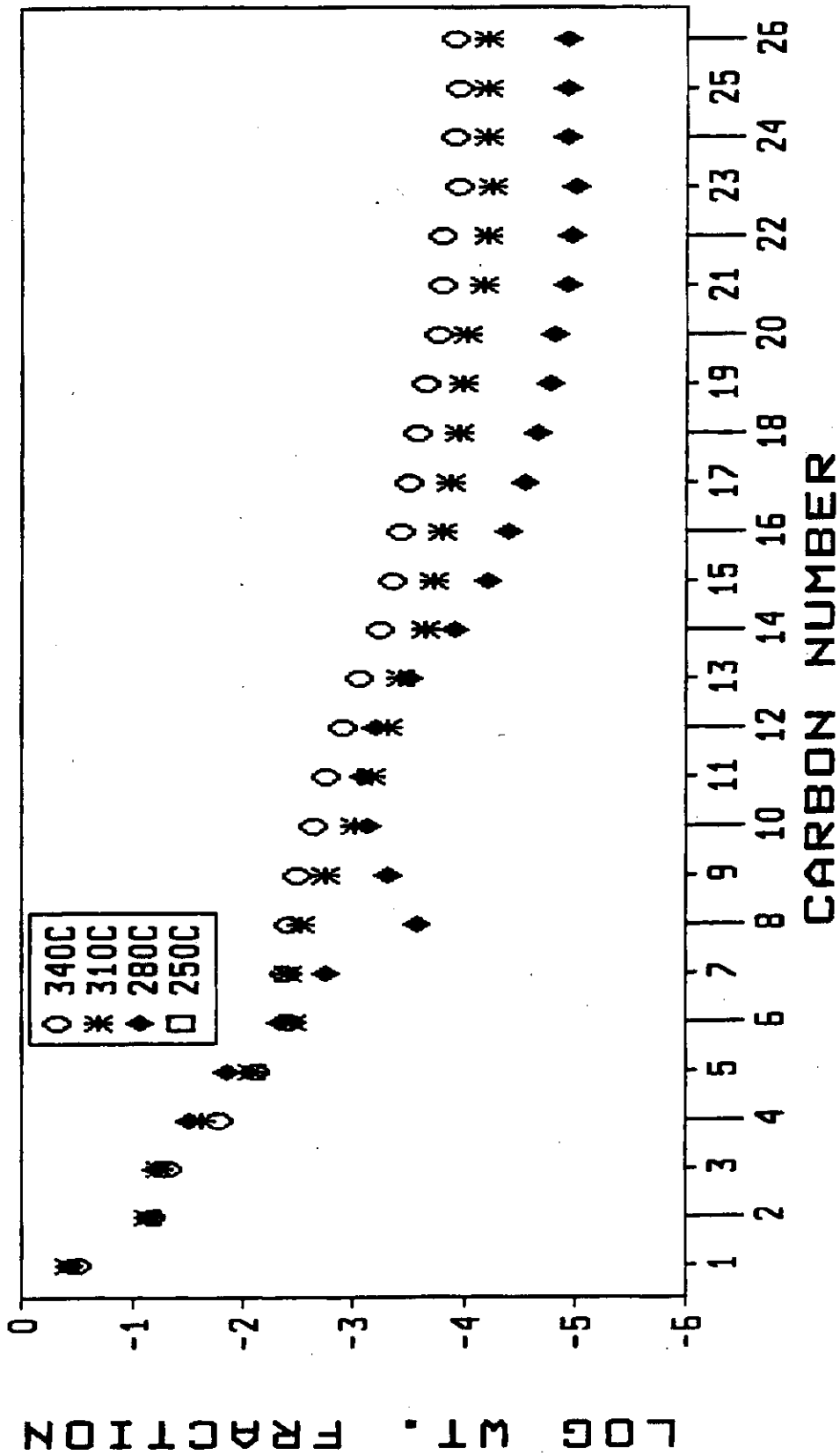


Figure 38

ASF Plots for C-FT-HC,Ty-I(3:1)

# ANDERSON SCHULZ FLORY PLOT

RUN 33 C-FT-HC(3:1) TYPE 1 H<sub>2</sub>/CO=70/30

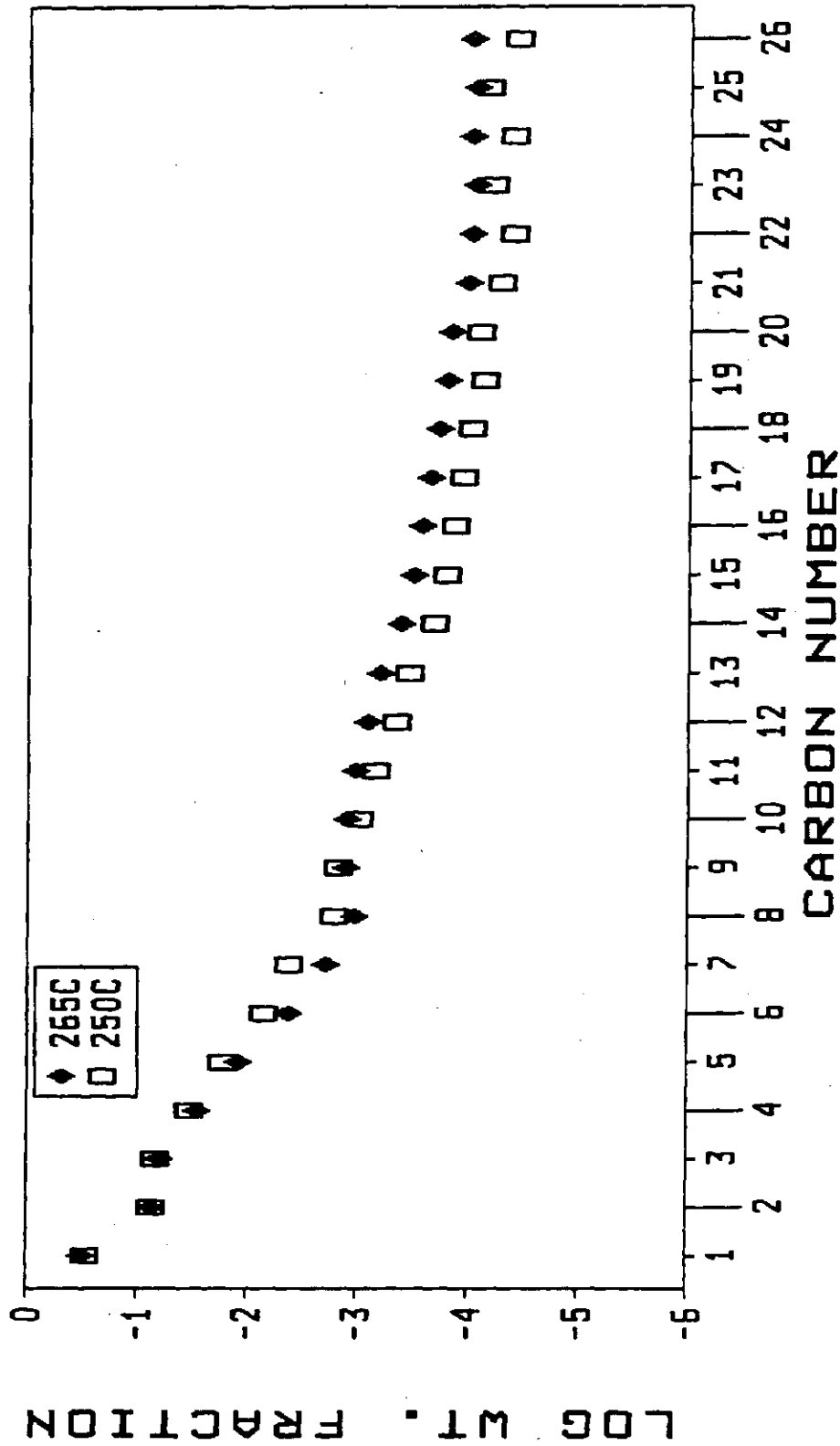


Figure 39

ASF Plots for C-FT-HC, Ty-I(3:1) with Hydrogen-Rich Feedstock