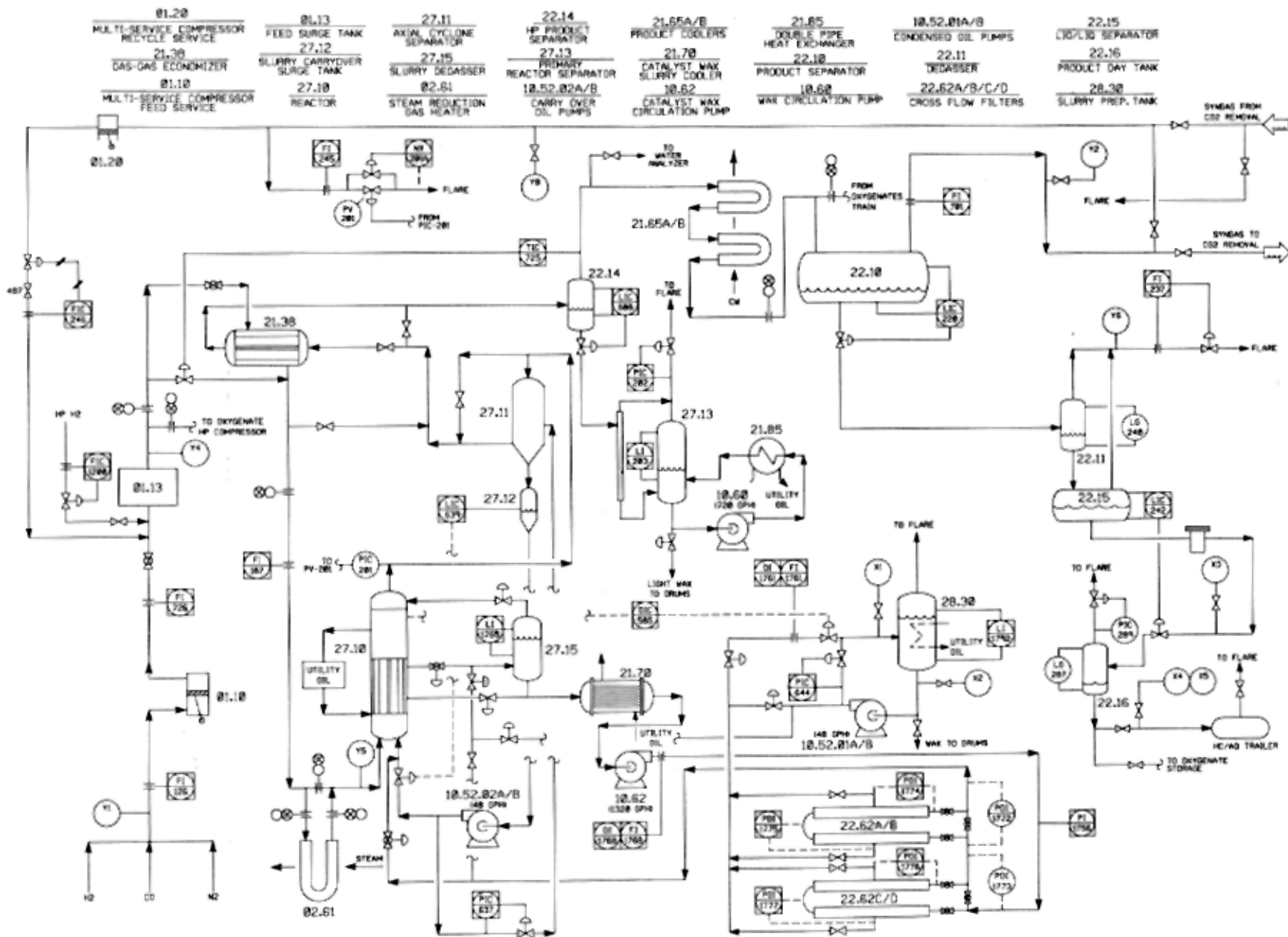


Figure 1



ALT FUELS DEVELOPMENT UNIT
LIQUID PHASE
FISCHER-TROPSCH III RUN

| | | |
|---|---|--|
| DRAWN: J.D. FANELLI DATE: 8/28/97 DESIGNED: BHW/TFB | TITLE: SIMPLIFIED PROCESS FLOW DIAGRAM MAIN PROCESS LOOP LIQUID PHASE FISCHER-TROPSCH III AT LAPORTE AFUD | PRODUCTS CHEMICALS CORPORATION 10000 W. 10TH AVE. DENVER, CO 80202 TEL: 303.750.1000 FAX: 303.750.1001 |
|---|---|--|

Figure 2

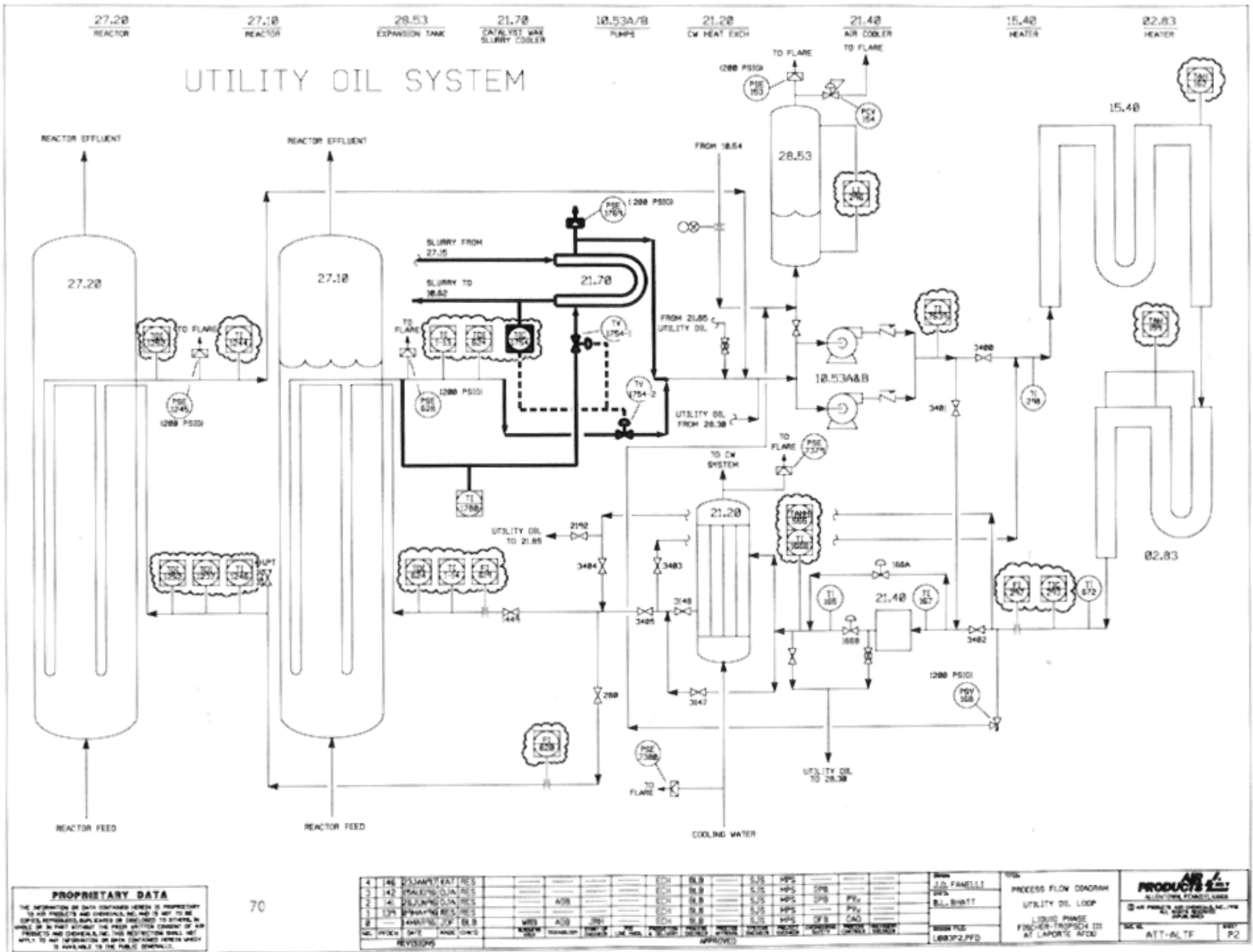


Figure 3

FISCHER-TROPSCH III FILTRATION SYSTEM LAYOUT
(NOT TO SCALE)

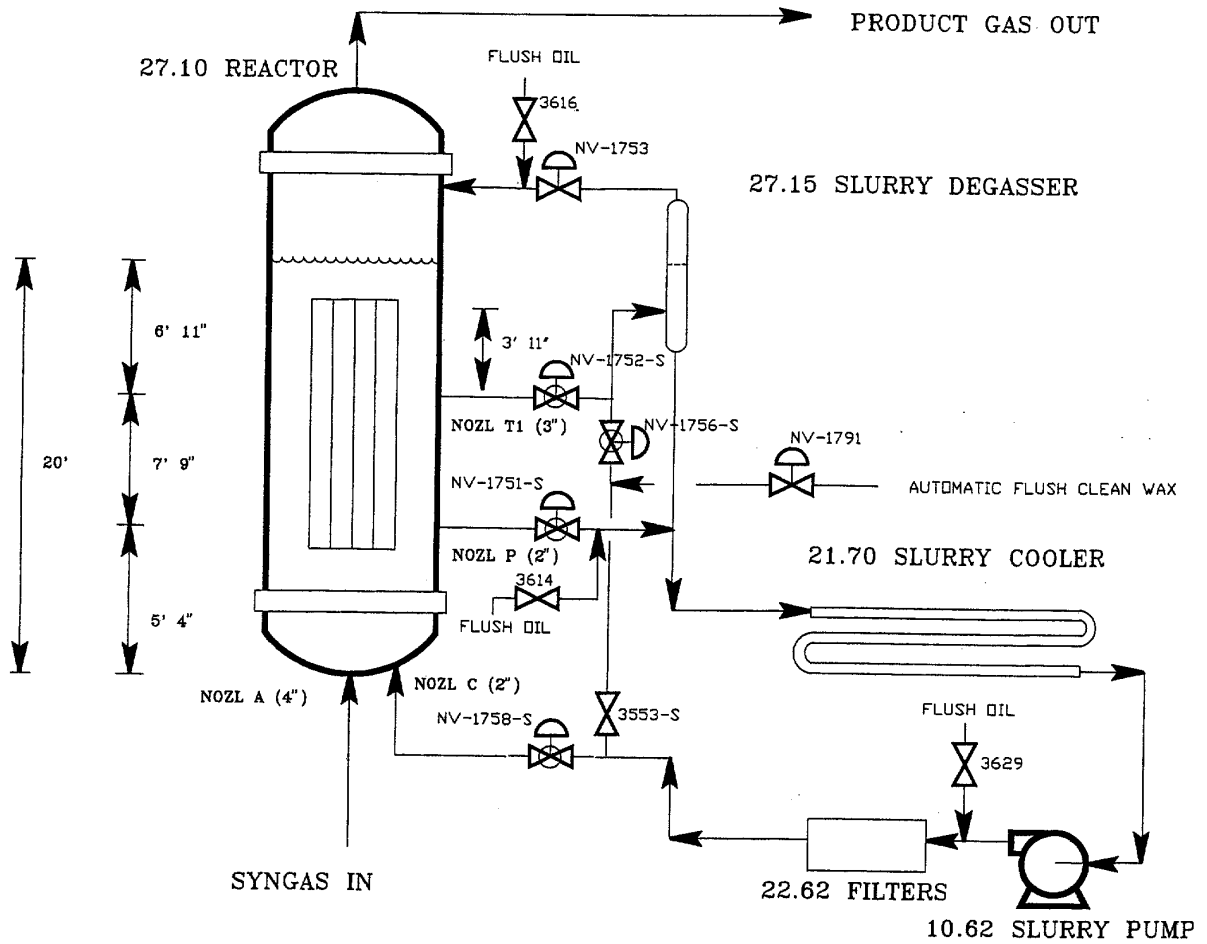
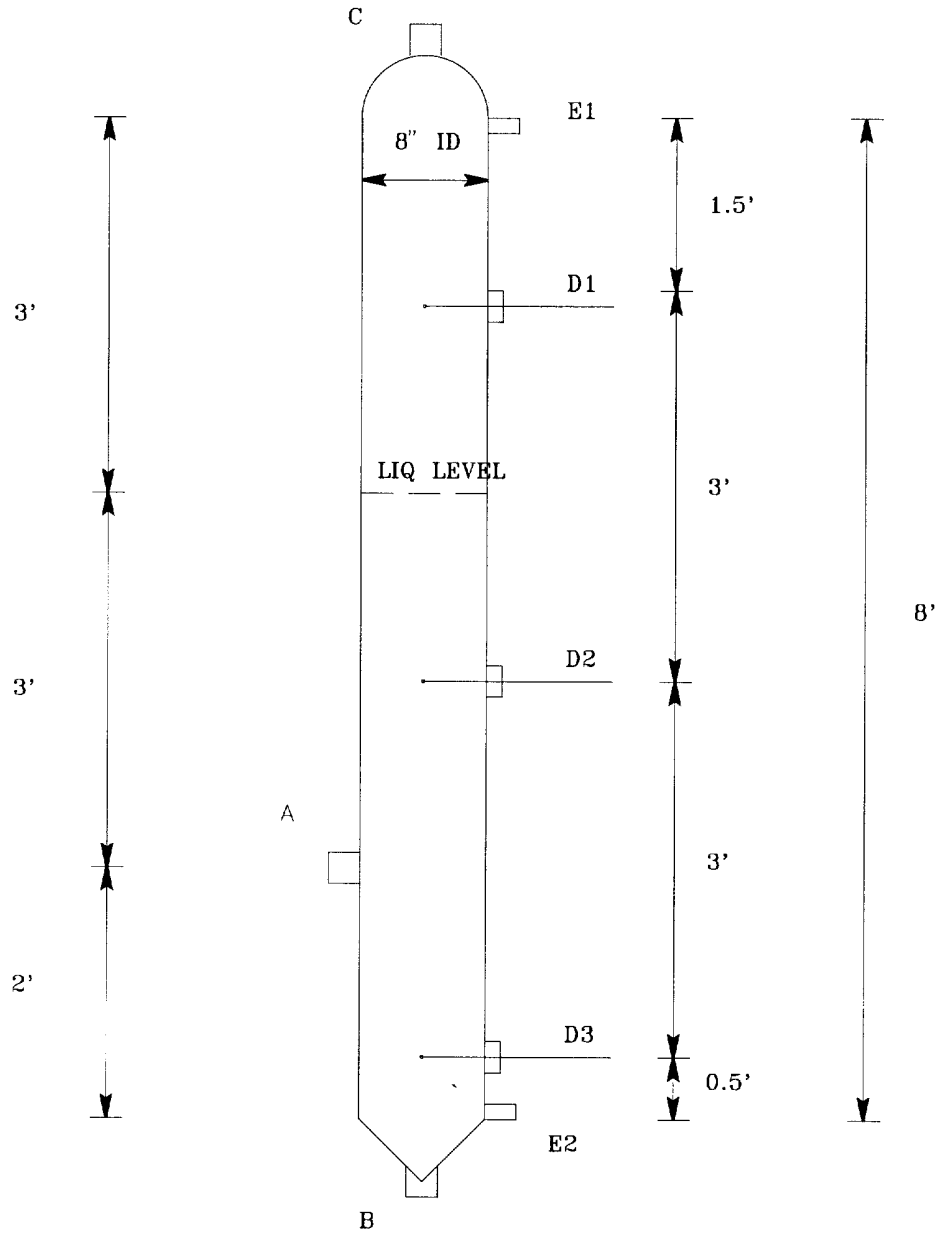


FIGURE 4

27.15 SLURRY DEGASSER

NOT TO SCALE



| NOZZLES | SERVICE |
|---------|-----------------------|
| A | 3-PHASE SLURRY INLET |
| B | 2-PHASE SLURRY OUTLET |
| C | GAS OUTLET |
| D | THERMOCOUPLES |
| E | DP TAPS |

FIGURE 5

F-T III Activation Results

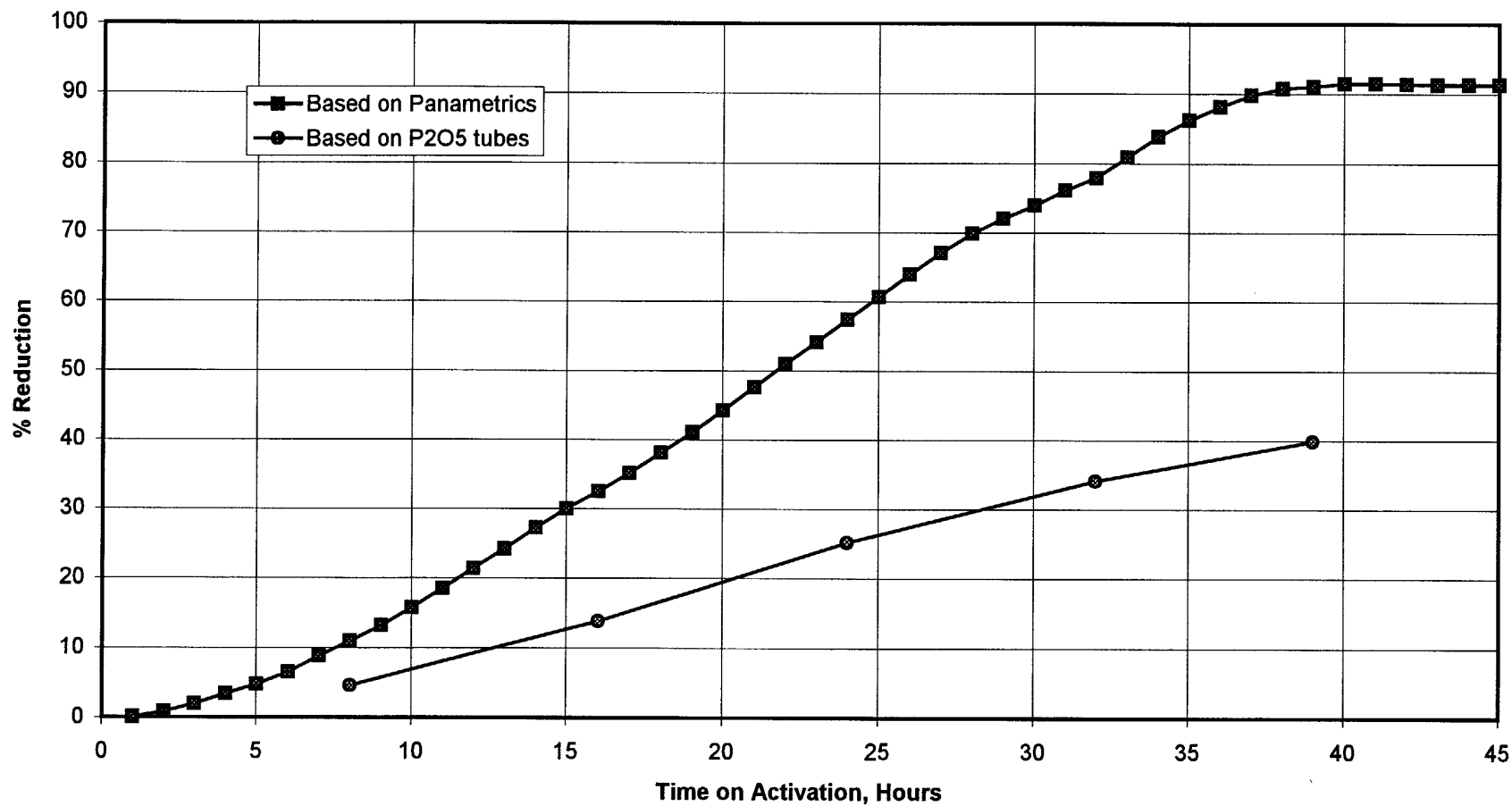


FIGURE 6

F-T III Activation

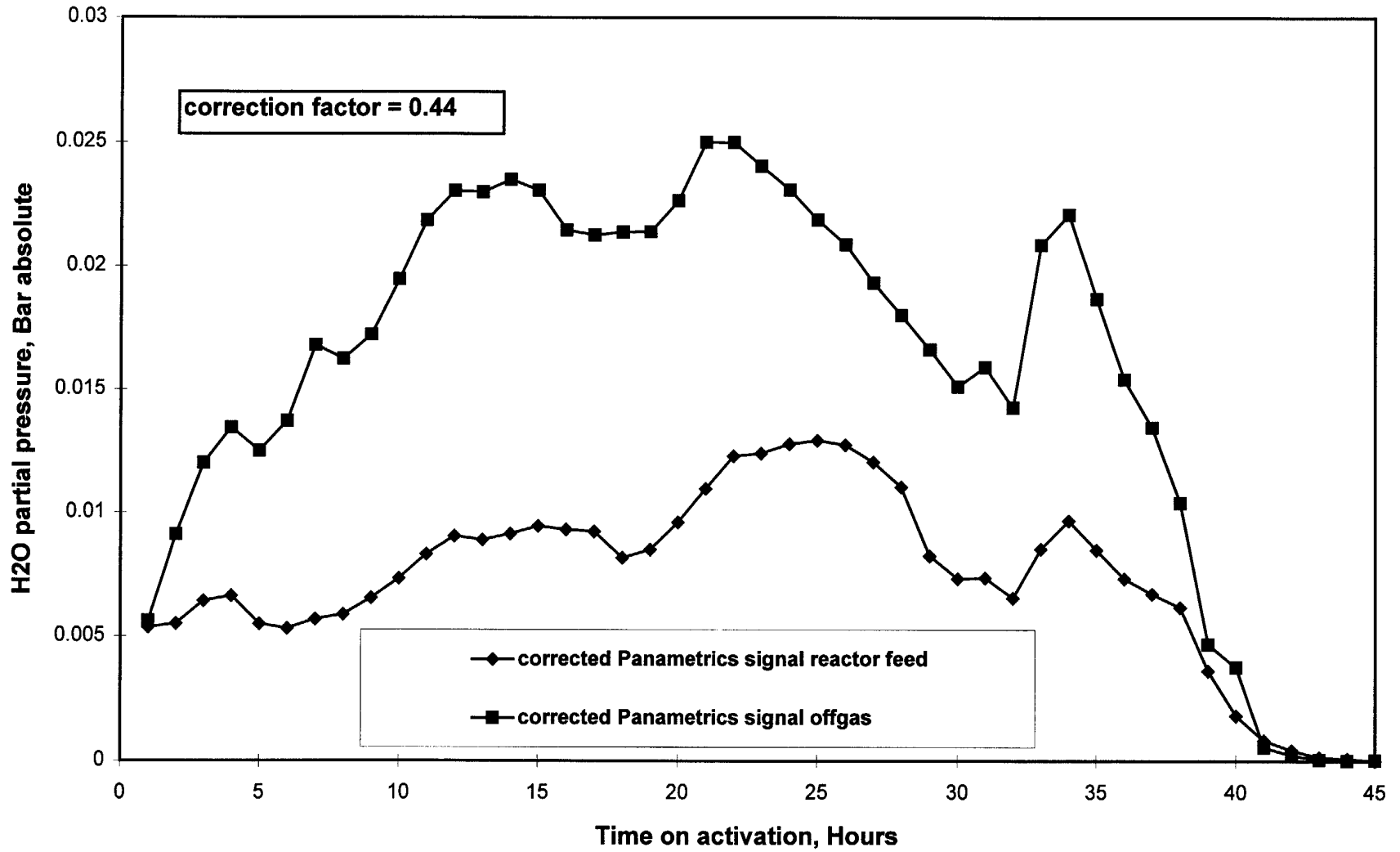


FIGURE 7

F-T III Slurry Flow and Longitudinal DP

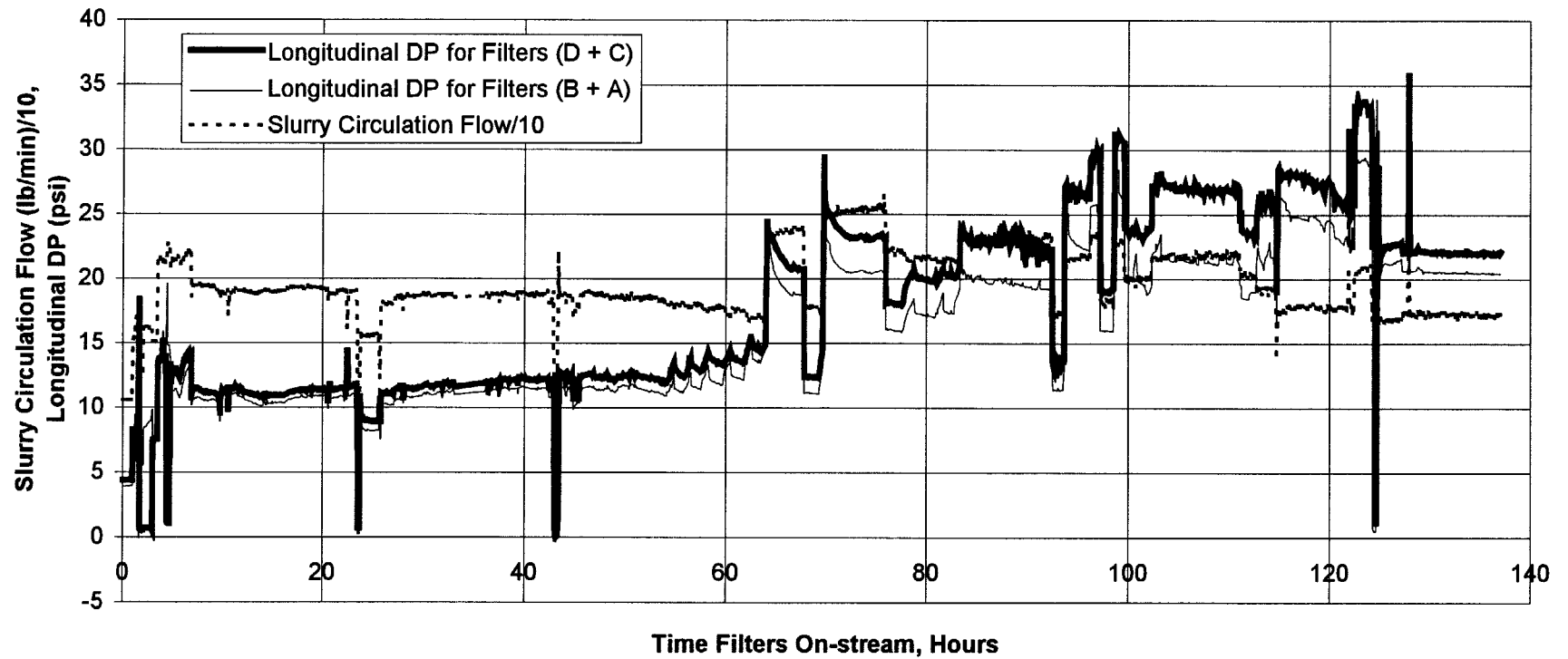


FIGURE 8

F-T III Filtrate Flow and Membrane DP

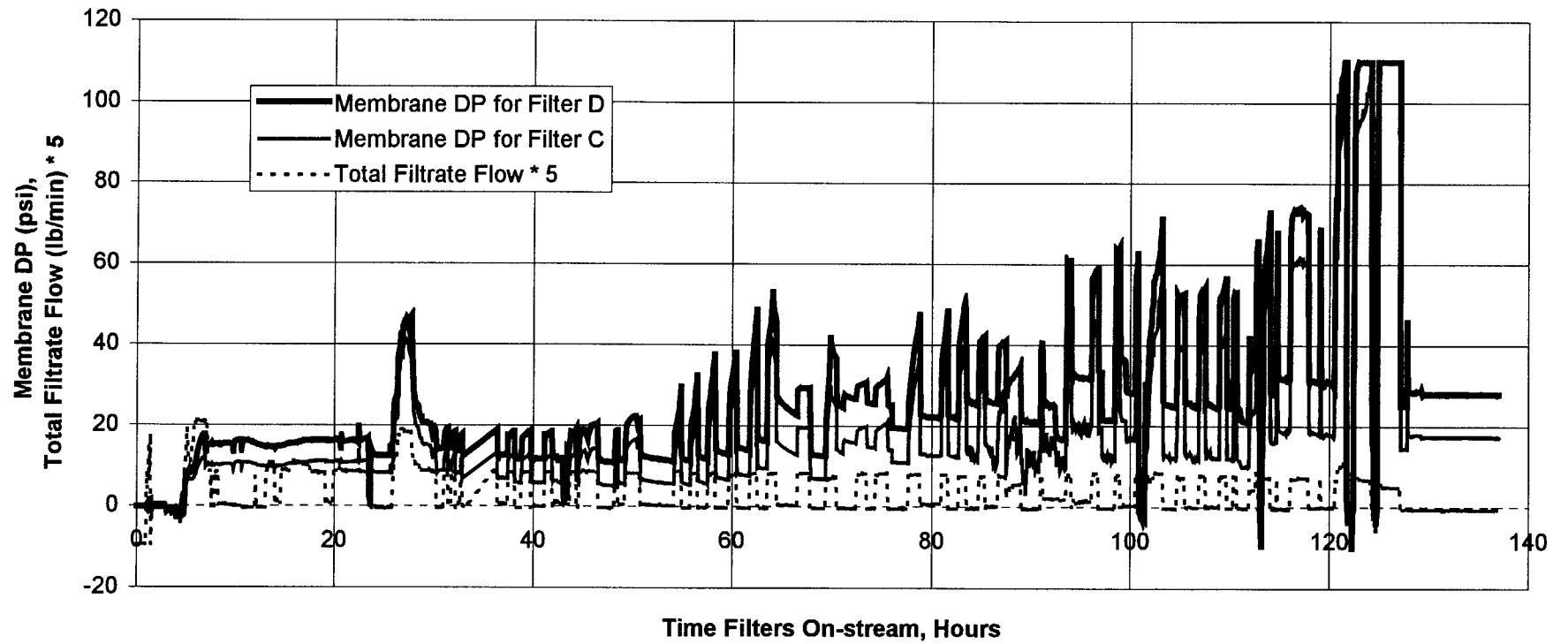


FIGURE 9

F-T III Filtrate Flow and Membrane DP

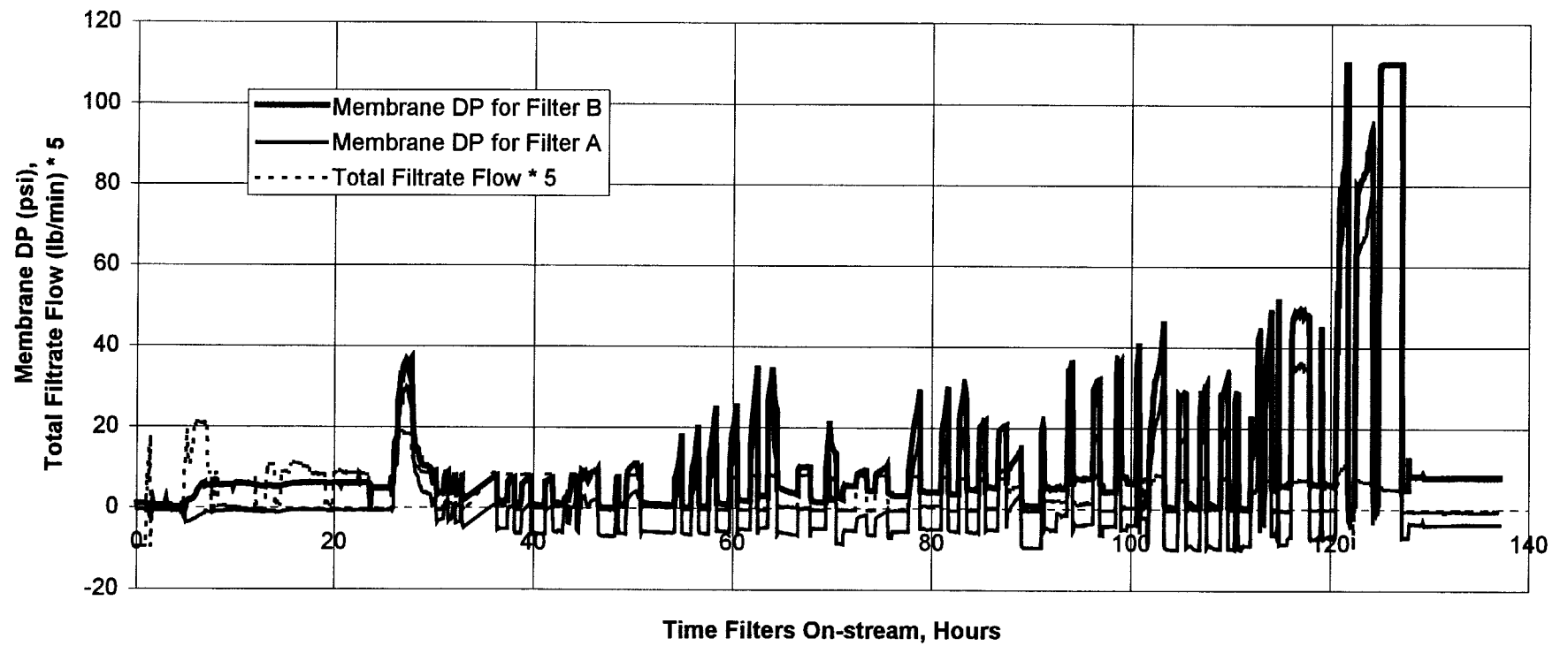


FIGURE 10

Catalyst Concentrations during F-T III

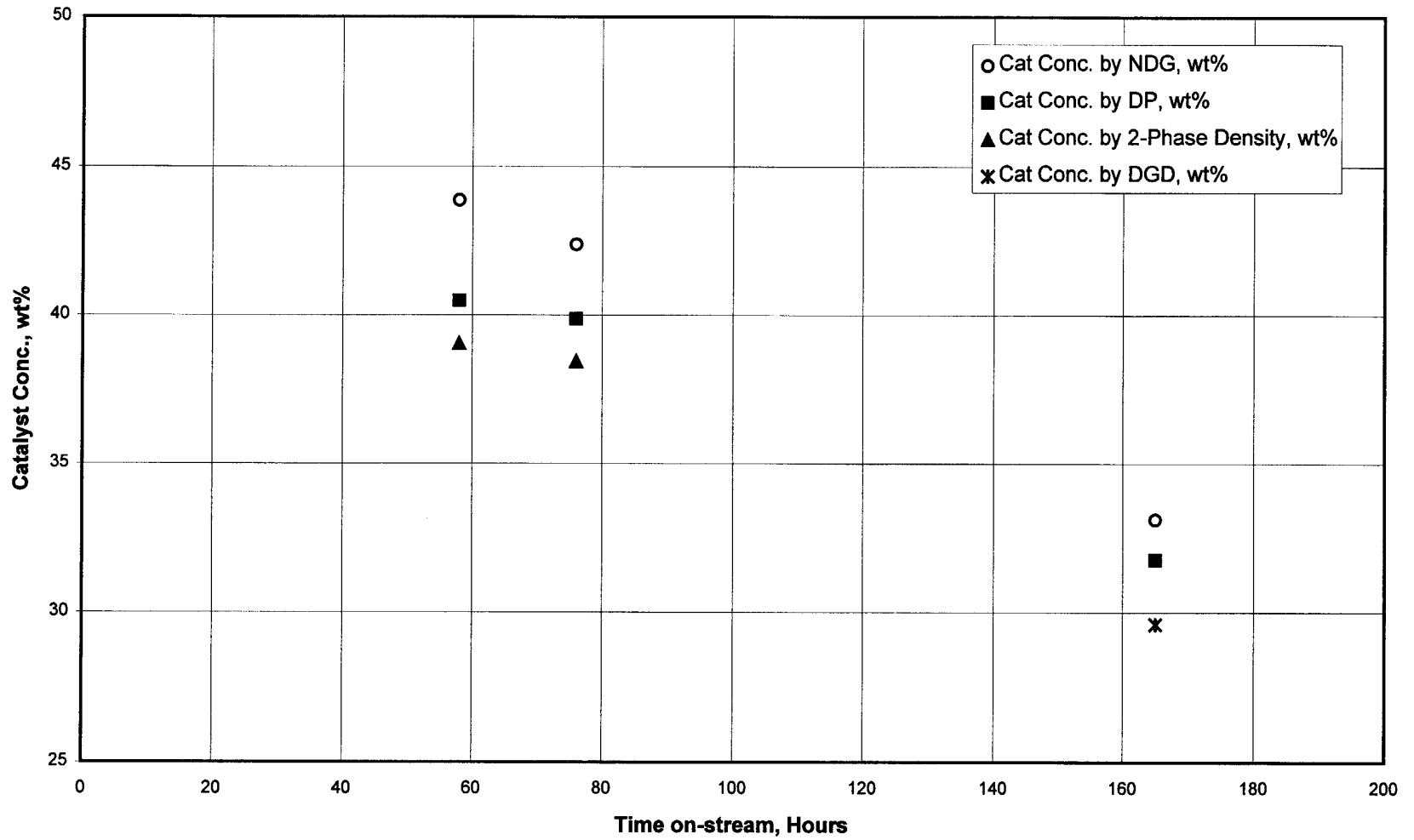


FIGURE 11

Gas Hold-up during F-T III

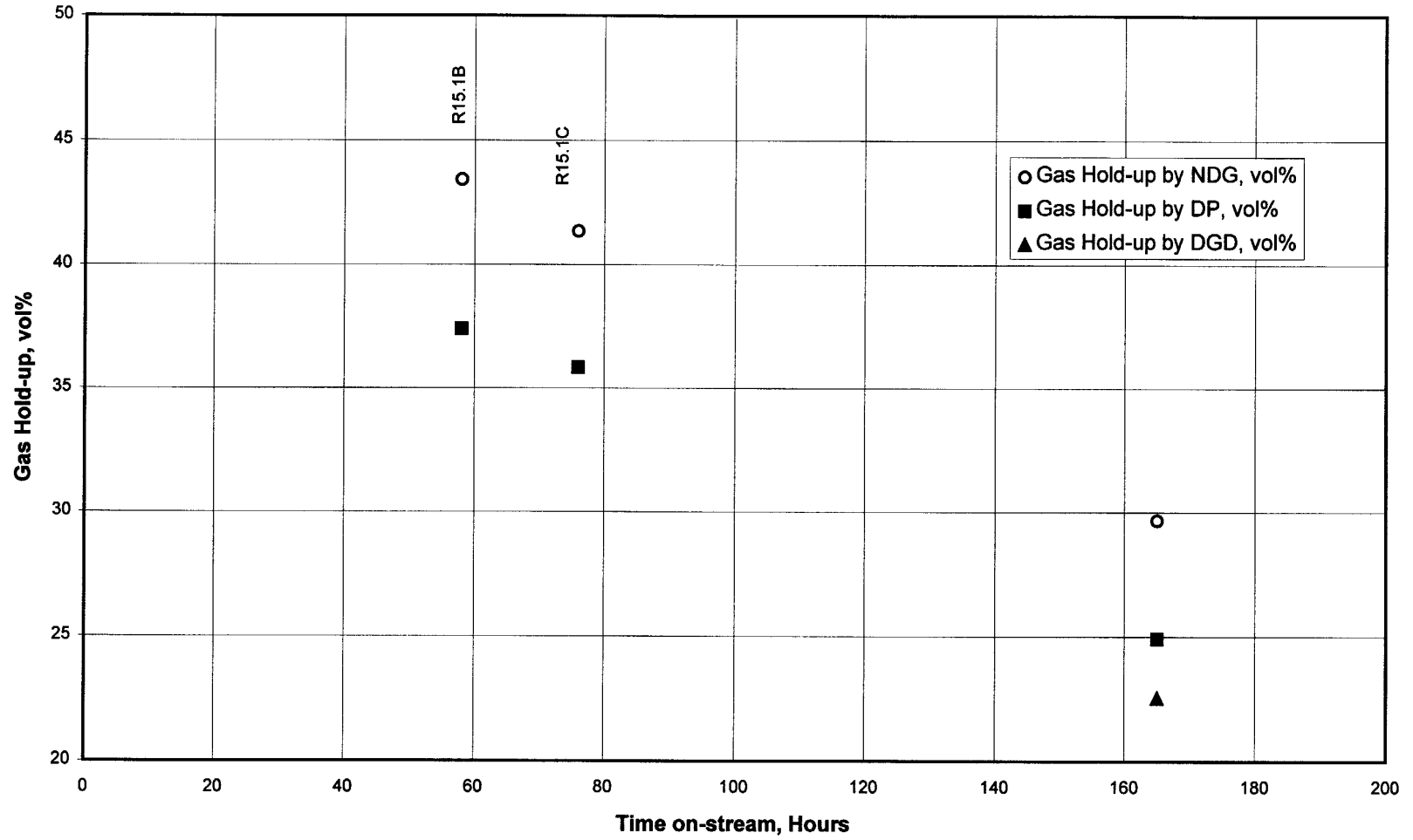


FIGURE 12

**Gas Hold-up Profile based on NDG Data
(F-T III , Run AF-R15.1)**

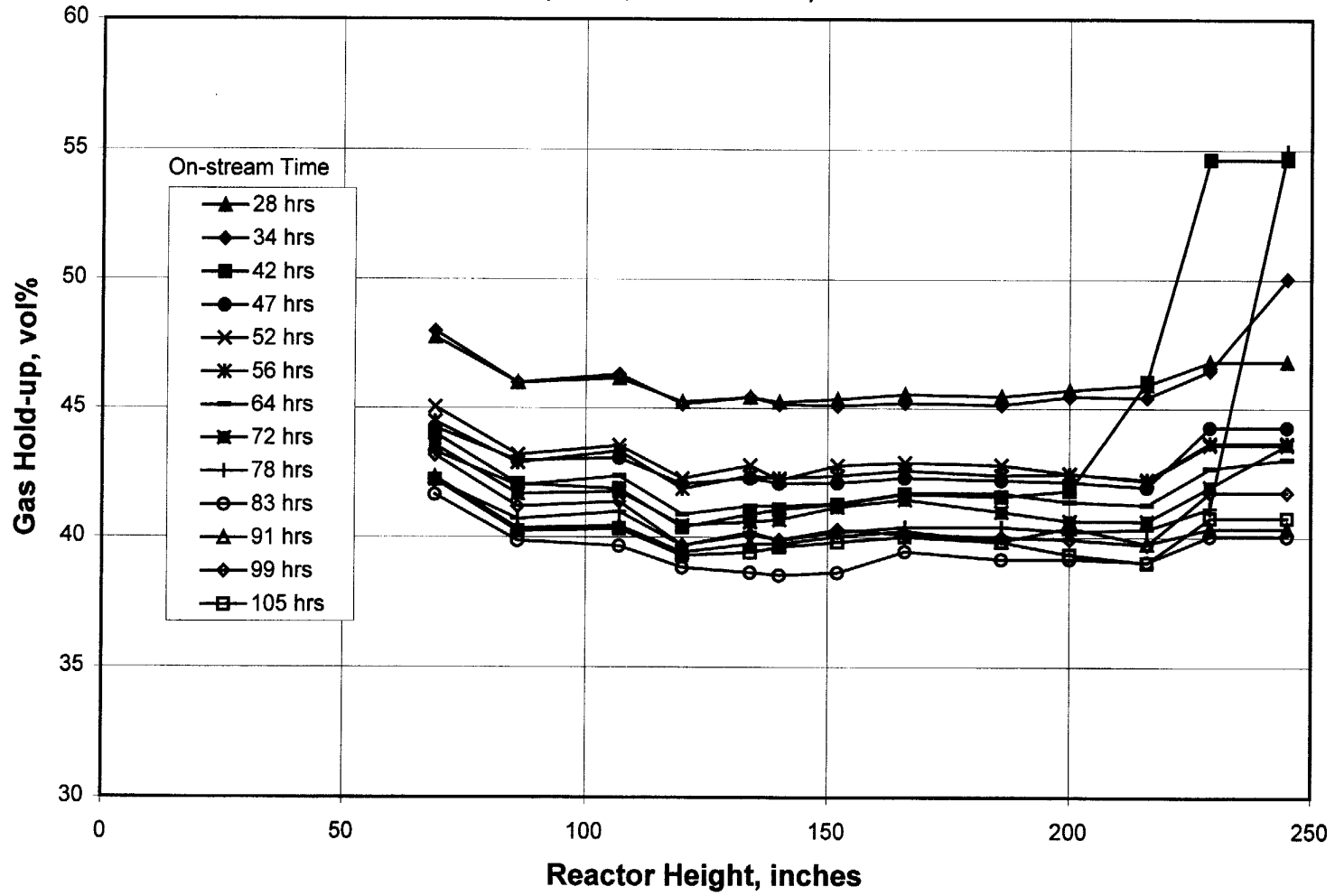


FIGURE 13

Dynamic Gas Disengagement Test (F-T III)

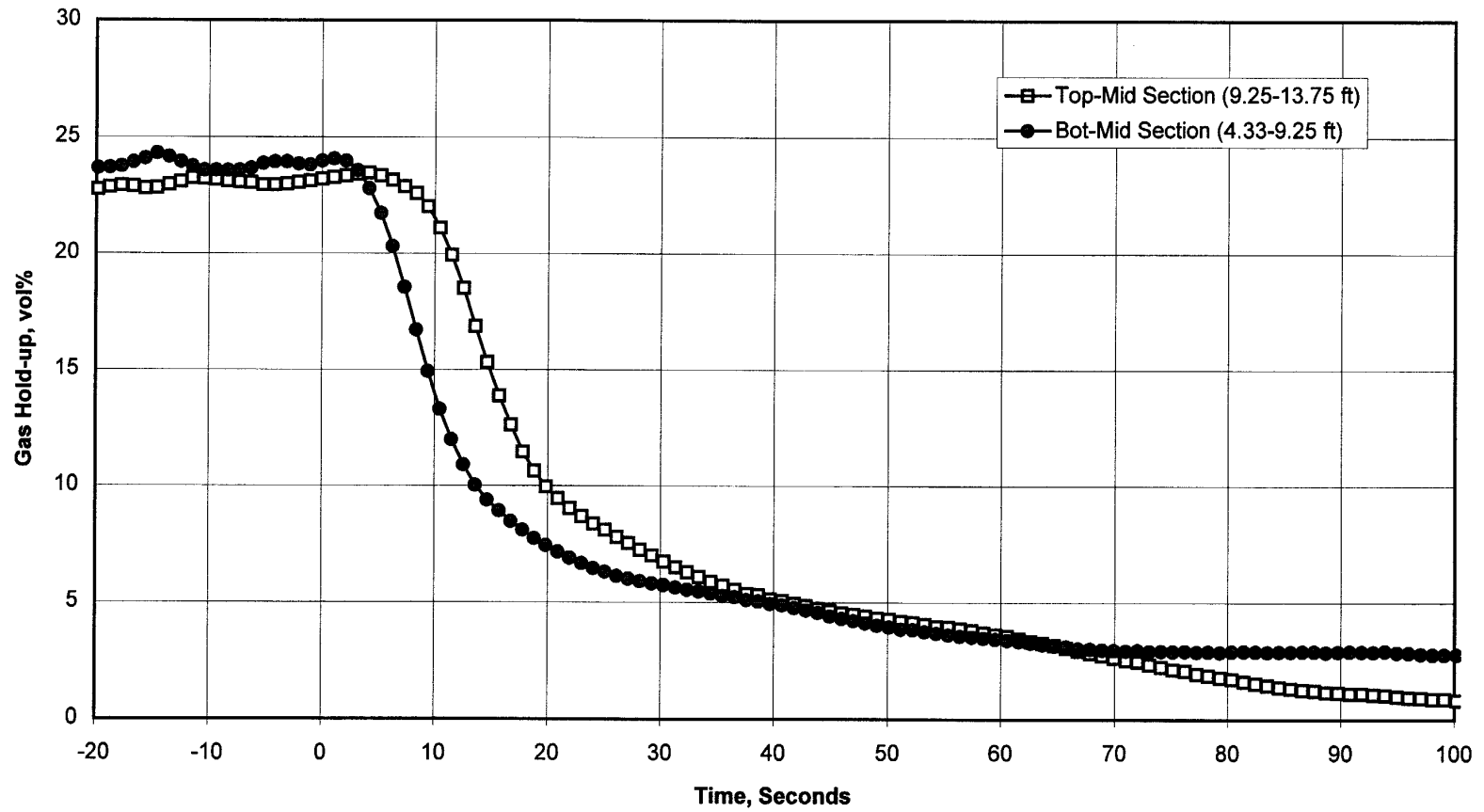


FIGURE 14

Heat Transfer Estimates during F-T III

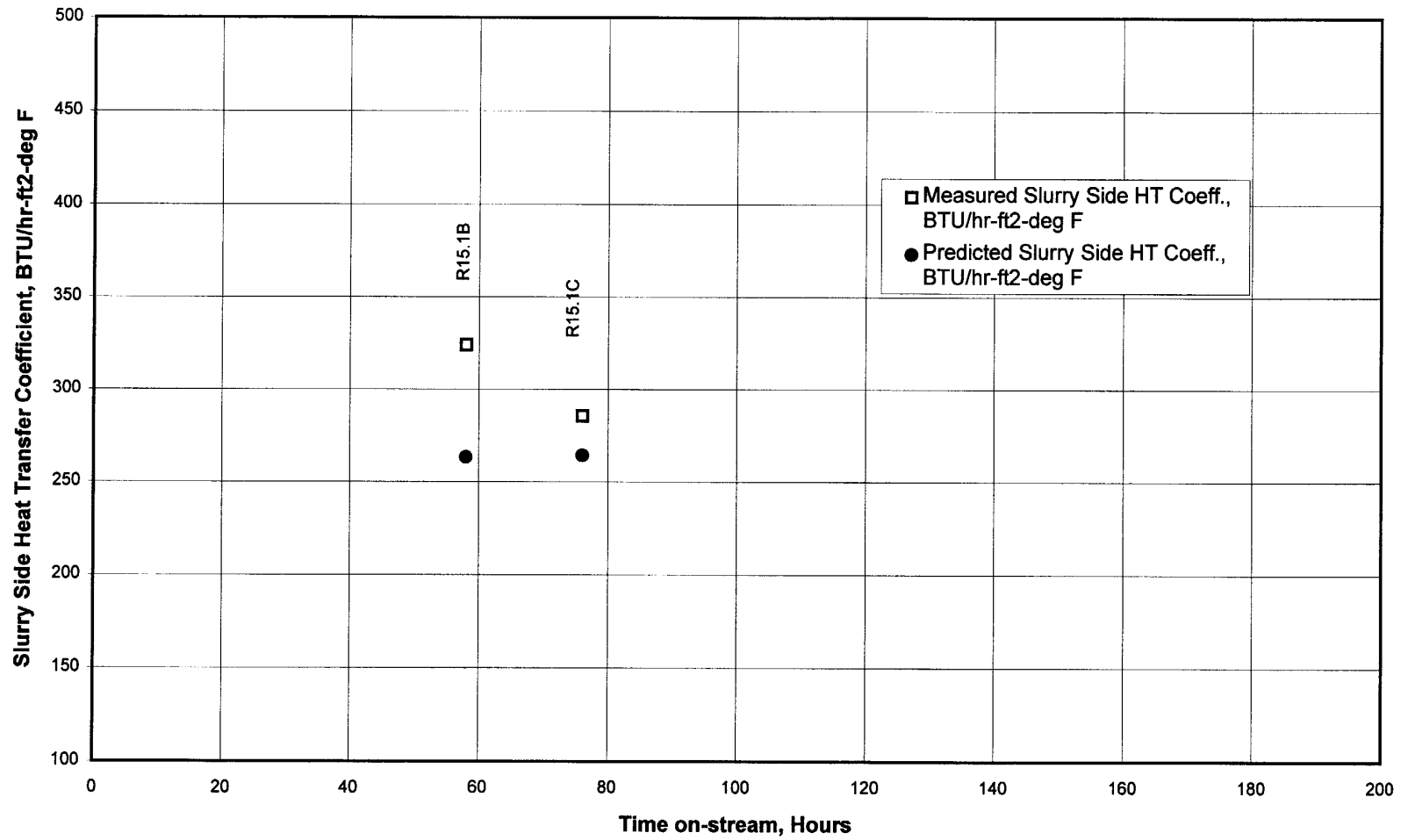


FIGURE 15

FT III: CO Conversion Rate vs. Prediction based on Autoclave Data
(prediction includes initial deactivation)

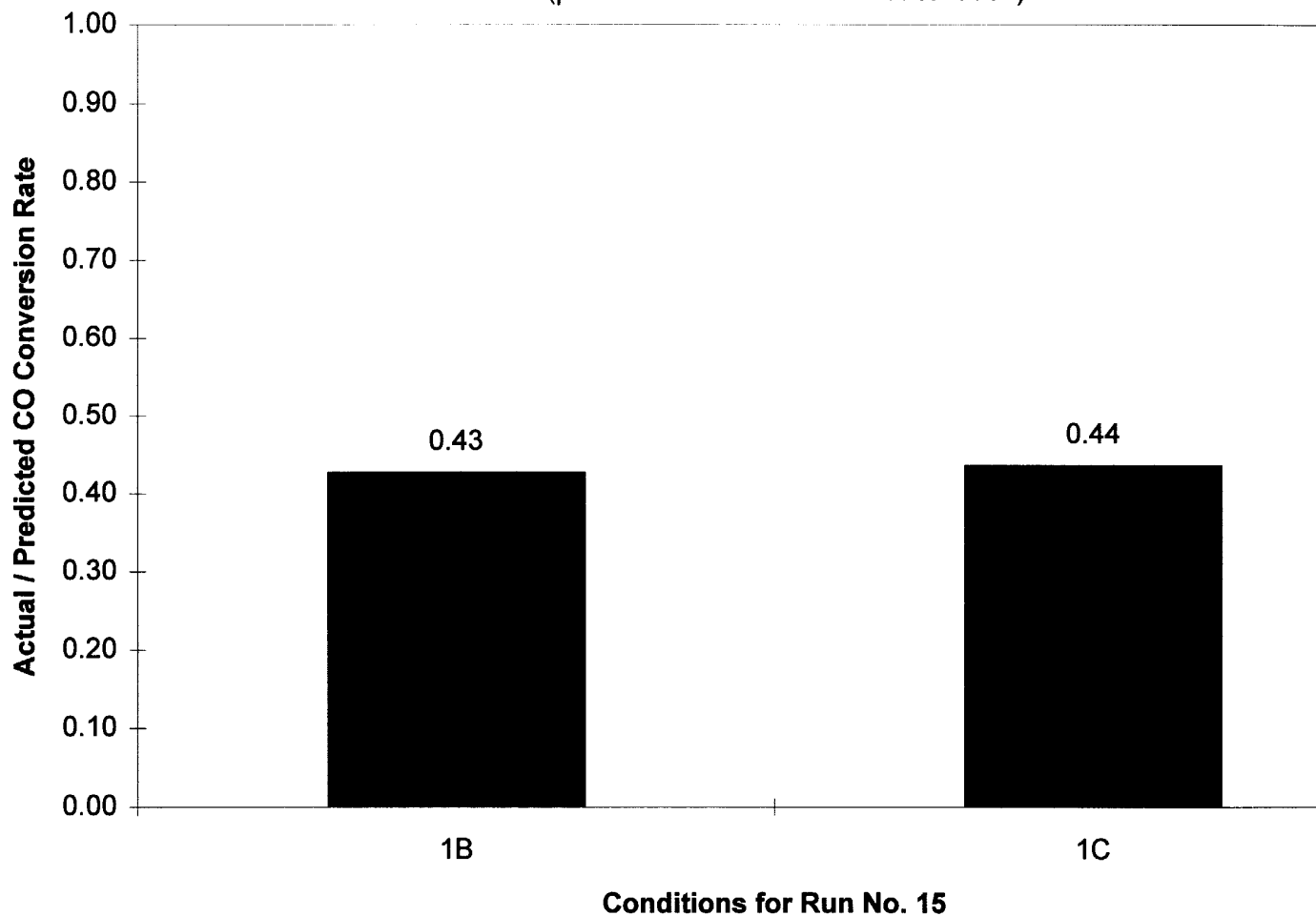


FIGURE 16

Catalyst Particle Size Variation and Fines Formation for FT III

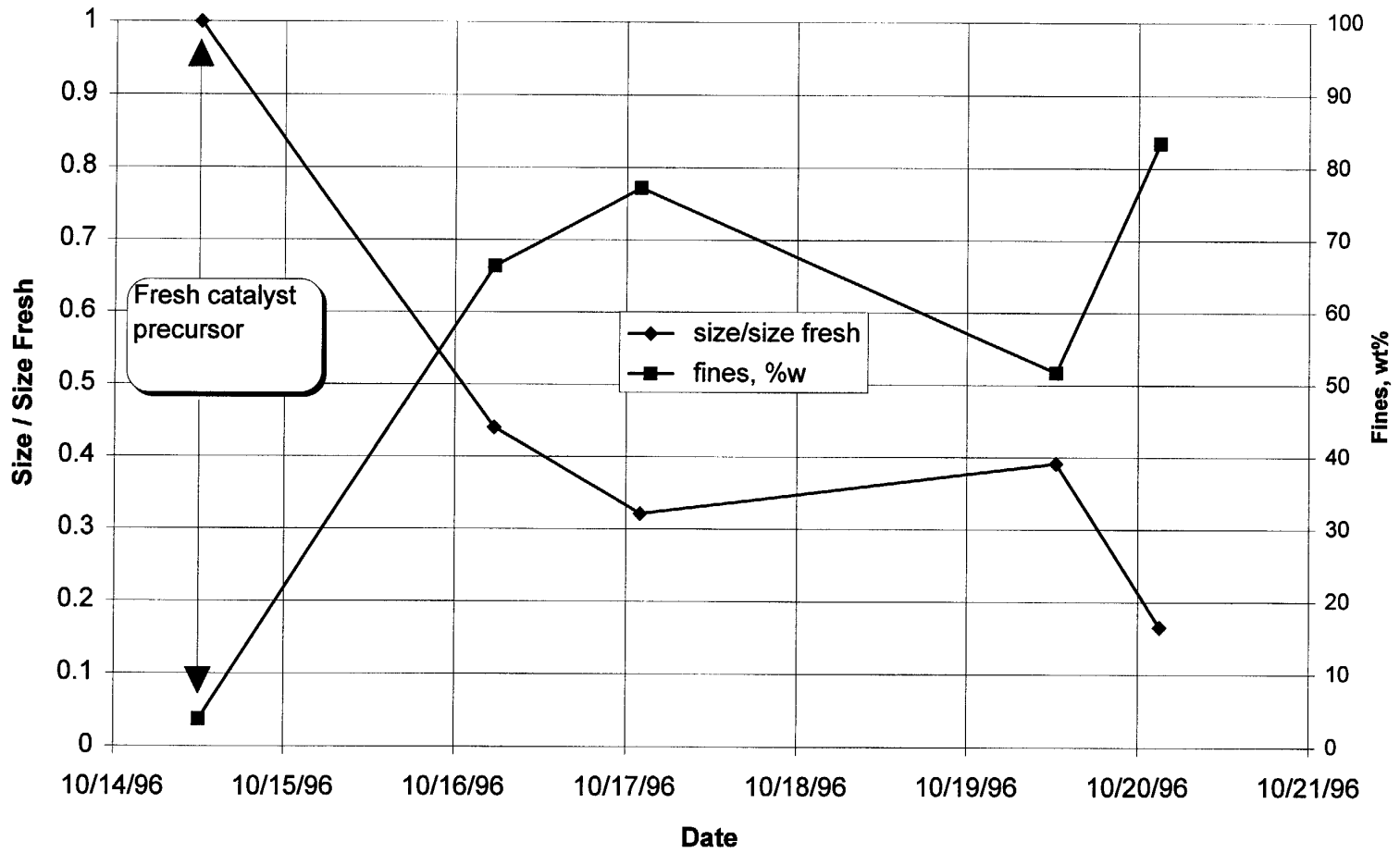


FIGURE 17

FT III: Carbon Distribution for Light Hydrocarbon Sample ex Trailer

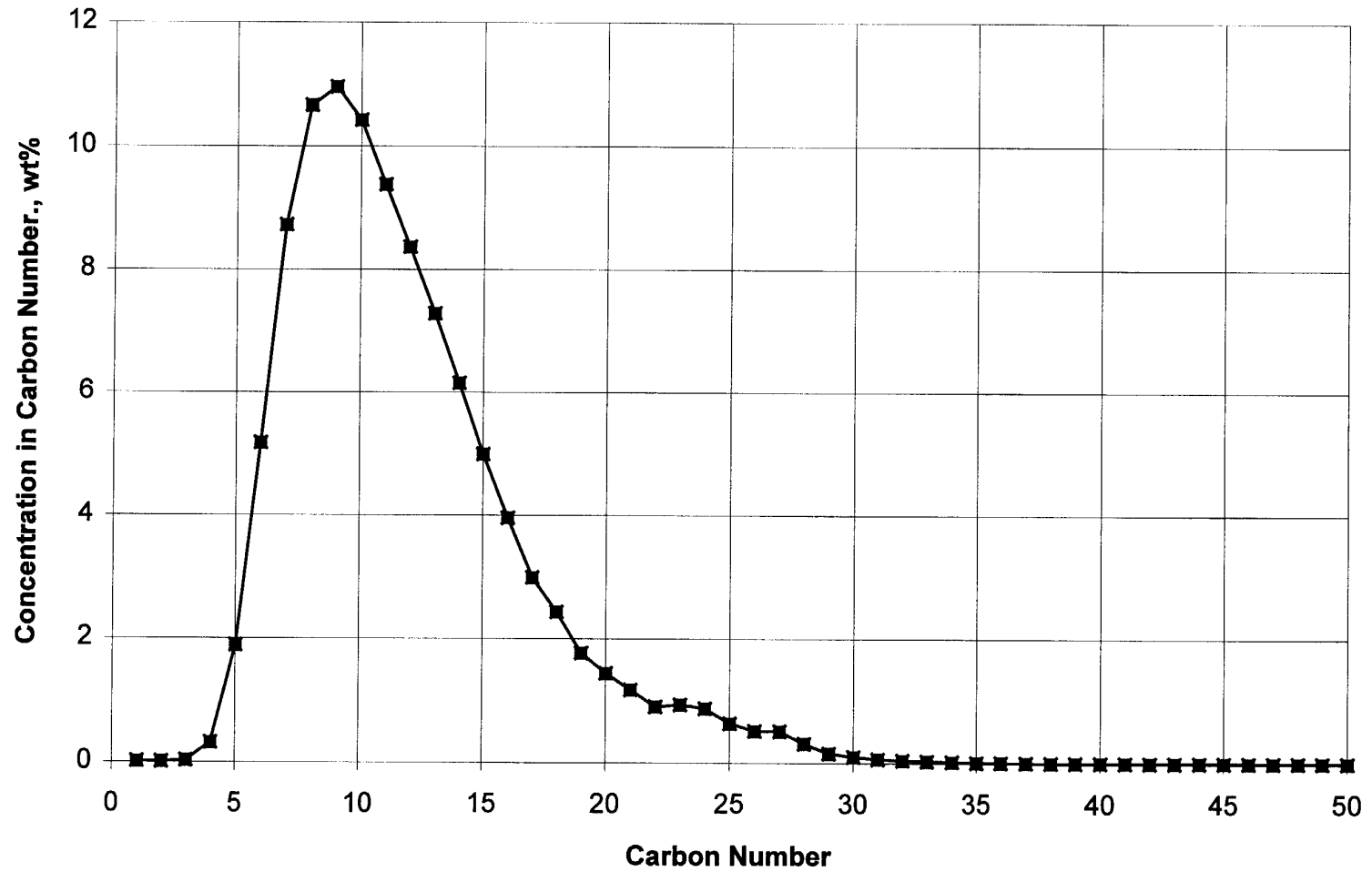


FIGURE 18

FT III: Light HC Product from Trailer (sample #6)
(type distribution by capillary GC, unidentified peaks assumed to be isoparaffins)

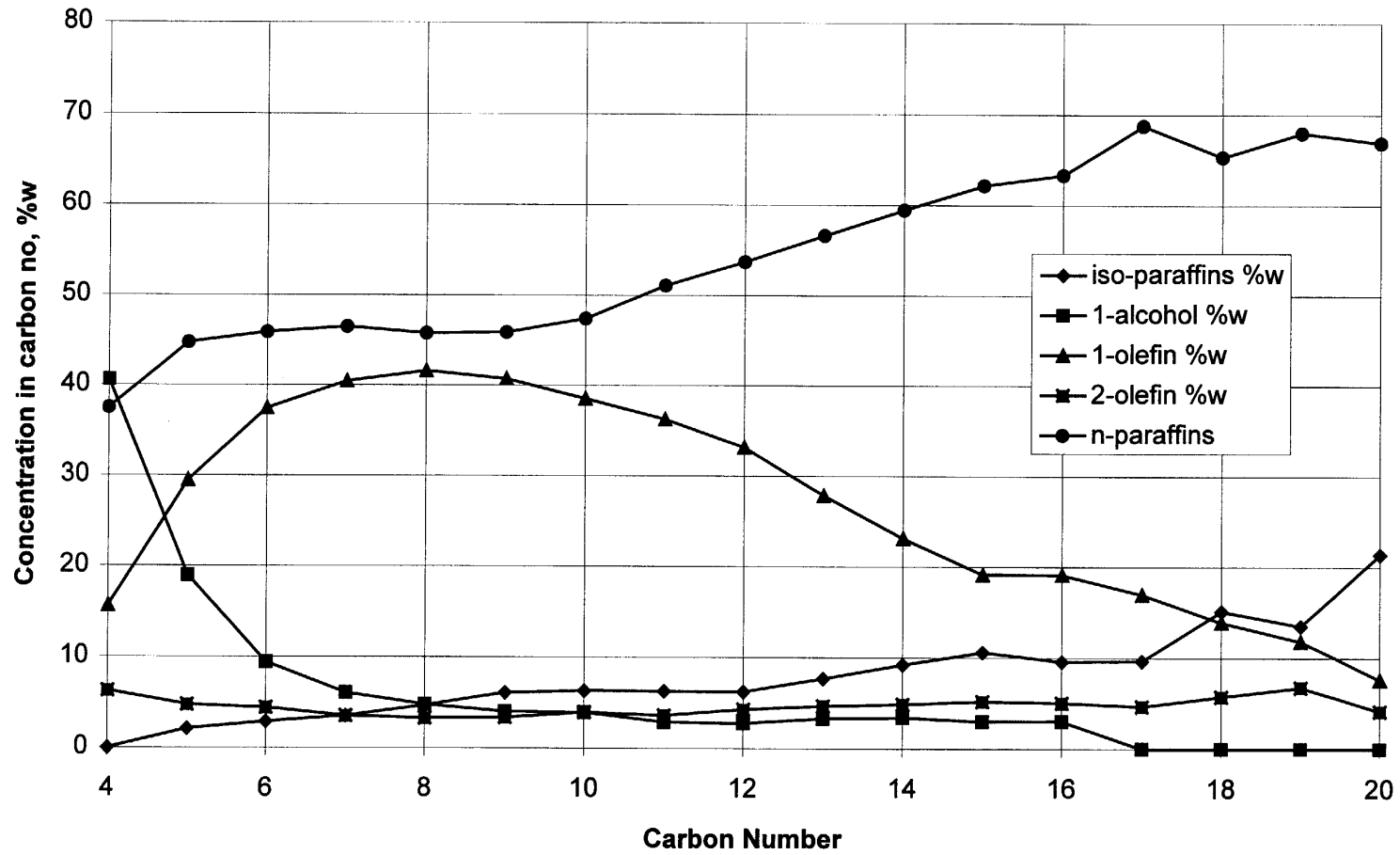


FIGURE 19

FT III: Wax Products Carbon Distribution

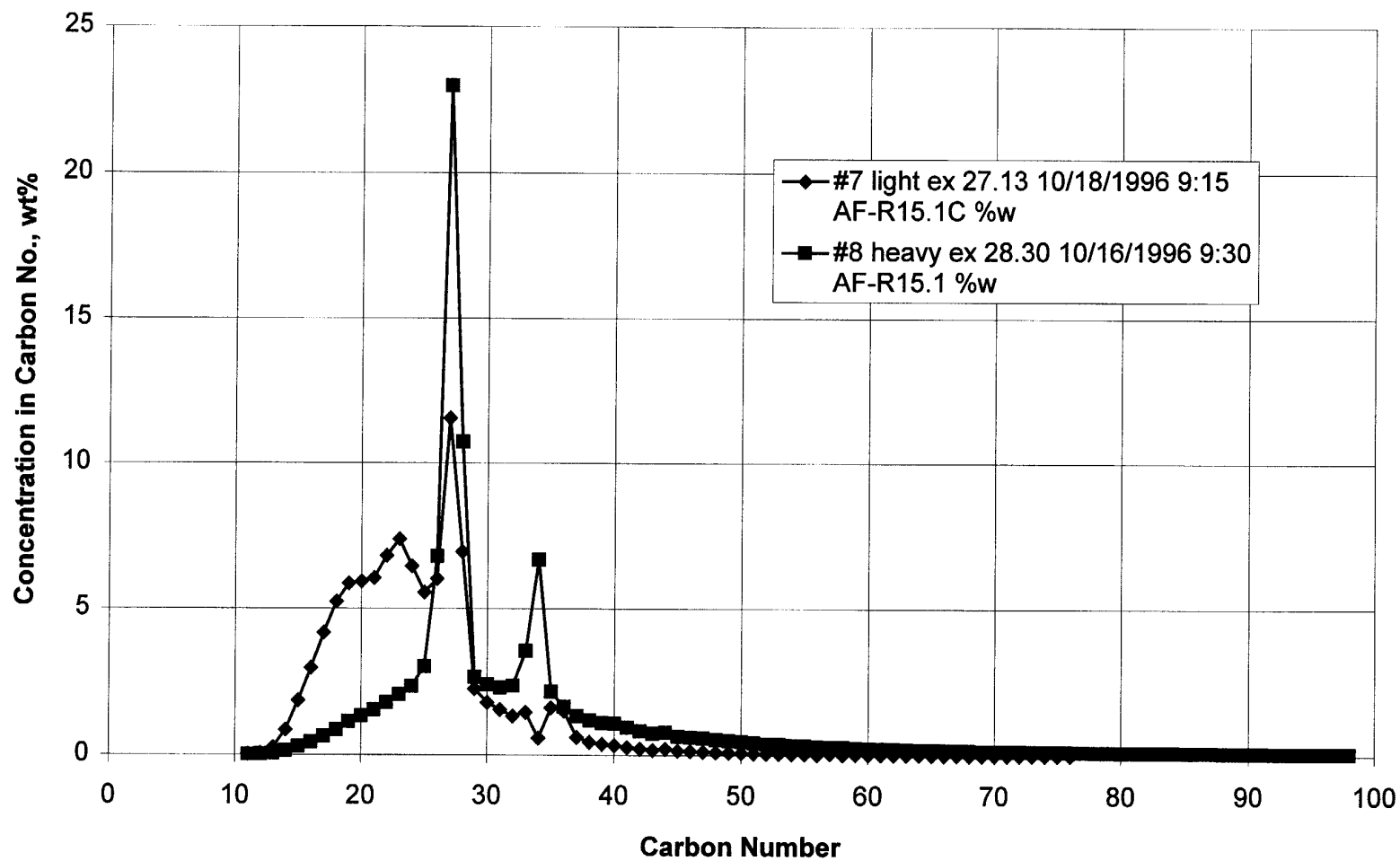


FIGURE 20

**FT III: Total Product Carbon Distribution
(Run 15.1C)**

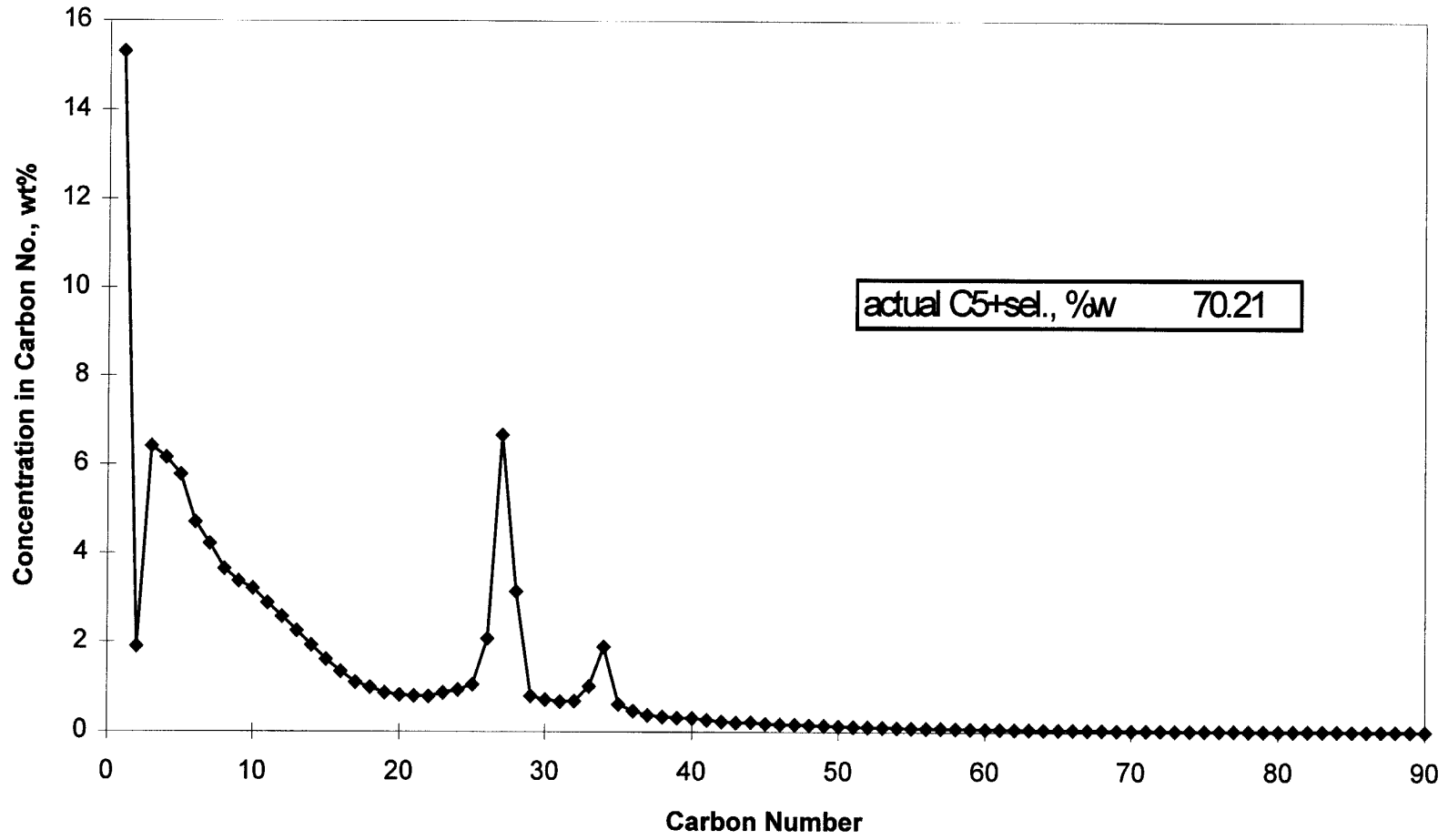


FIGURE 21

**AFS Alpha Plot
(Run 15.1C)**

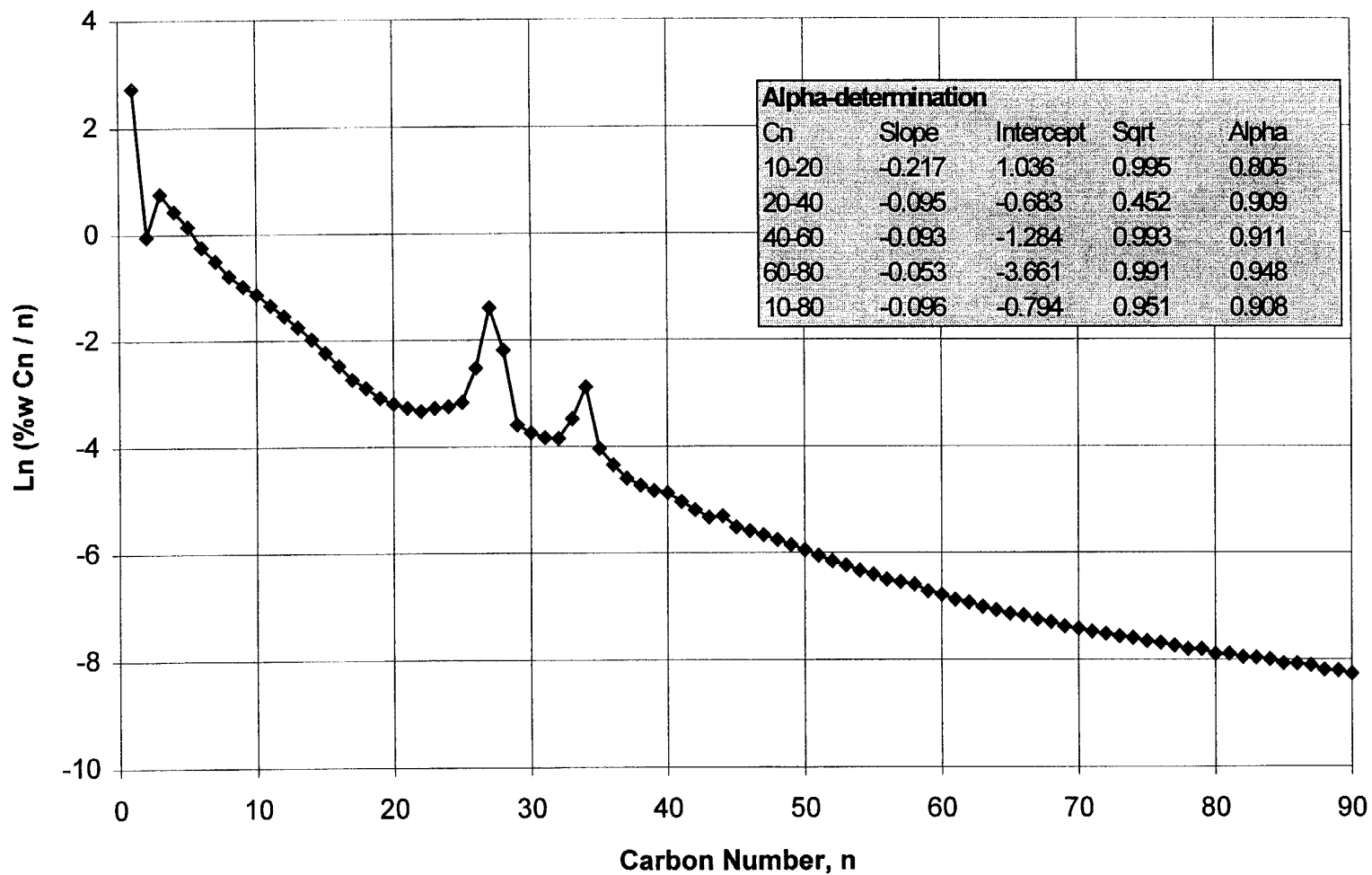
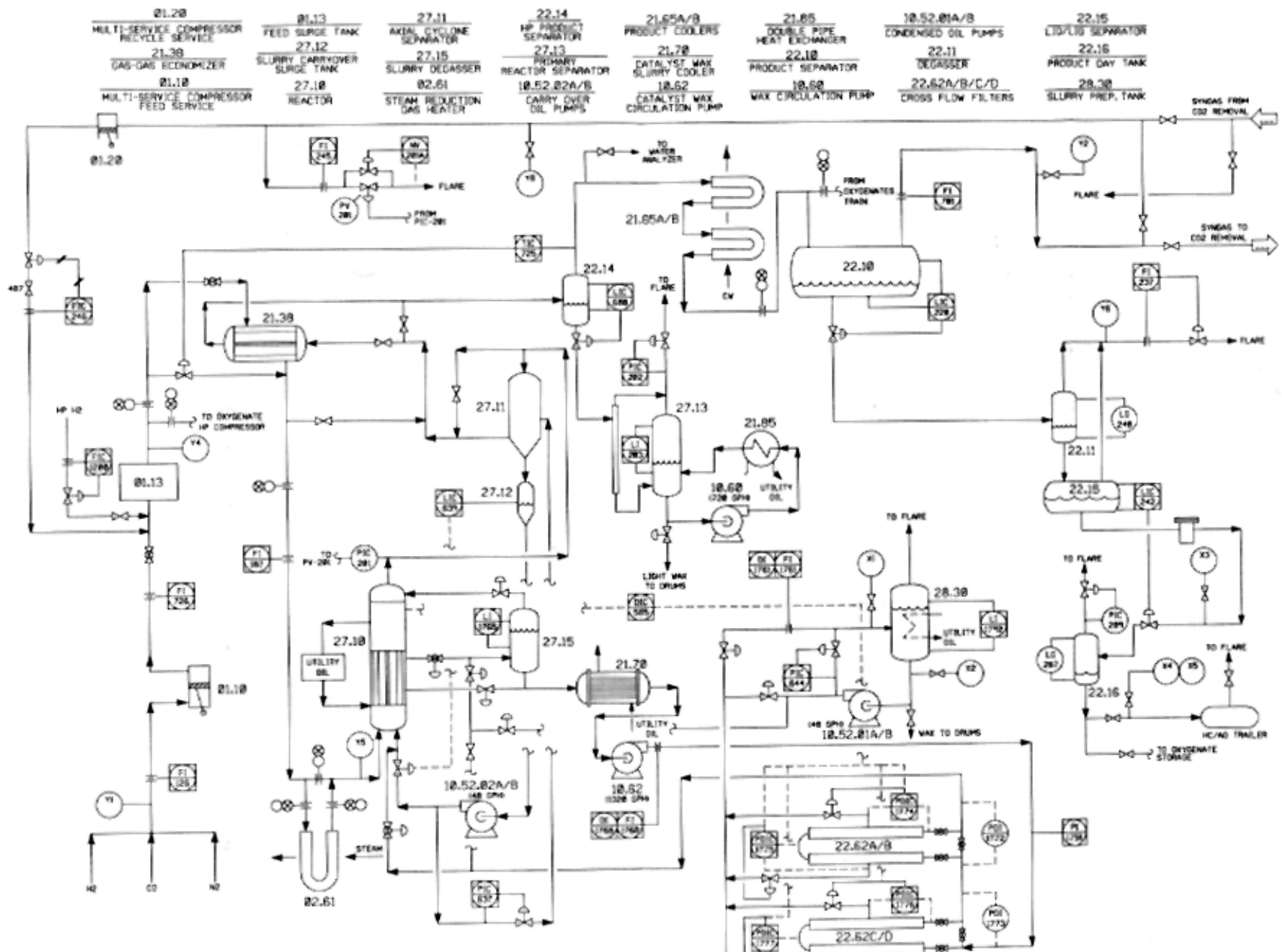


Figure 22



ALT FUELS DEVELOPMENT UNIT
LIQUID PHASE
FISCHER-TROPSCH IV RUN


| | | |
|--|--|--|
| DRAWN J.D. FINELLI DATE: 1/25/91 TOWN: 10 SHATT: 2.FPD | TITLE SIMPLIFIED PROCESS FLOW DIAGRAM MAIN PROCESS LOOP LIQUID PHASE FISCHER-TROPSCH IV AT (APORTE) AFDU |  CUSTOMER: PROJECT: SHEET: ATT-AL-IF |
|--|--|--|

FIGURE 23

F-T IV Activation Results

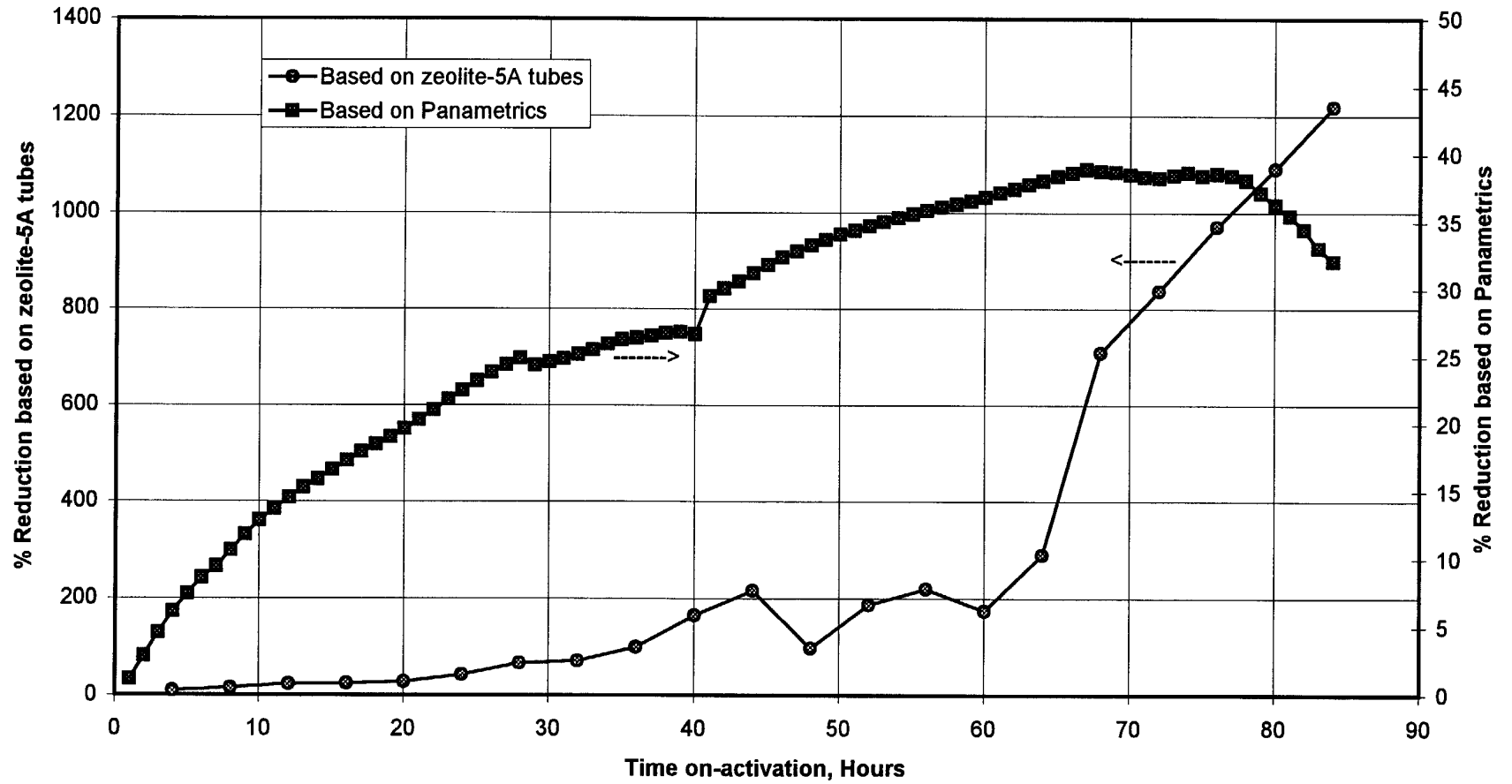


FIGURE 24

F-T IV Activation

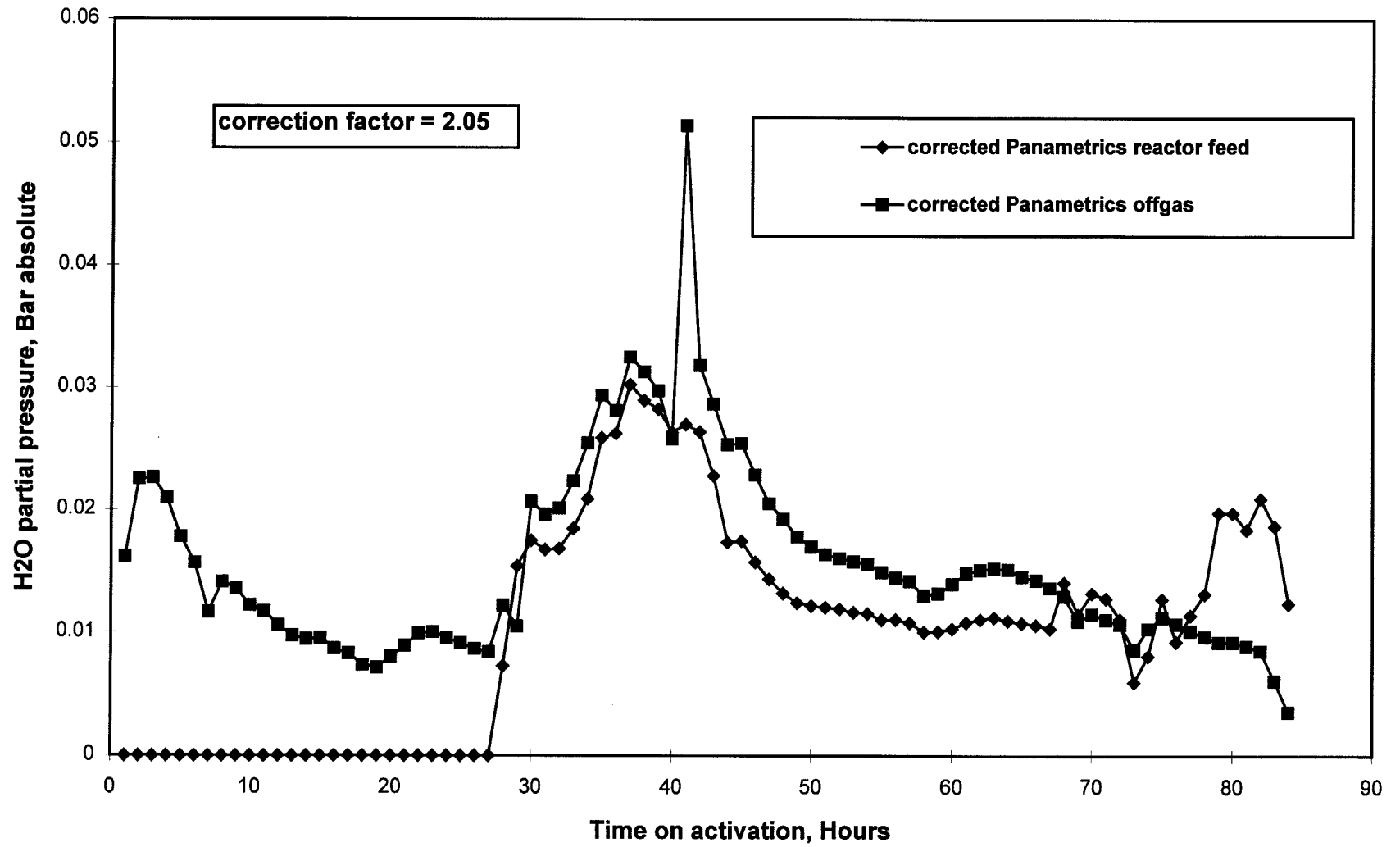


FIGURE 25

FISCHER-TROPSCH IV - REACTOR TEMPERATURE
& PRESSURE FLUCTUATIONS (RUN R16.1A)

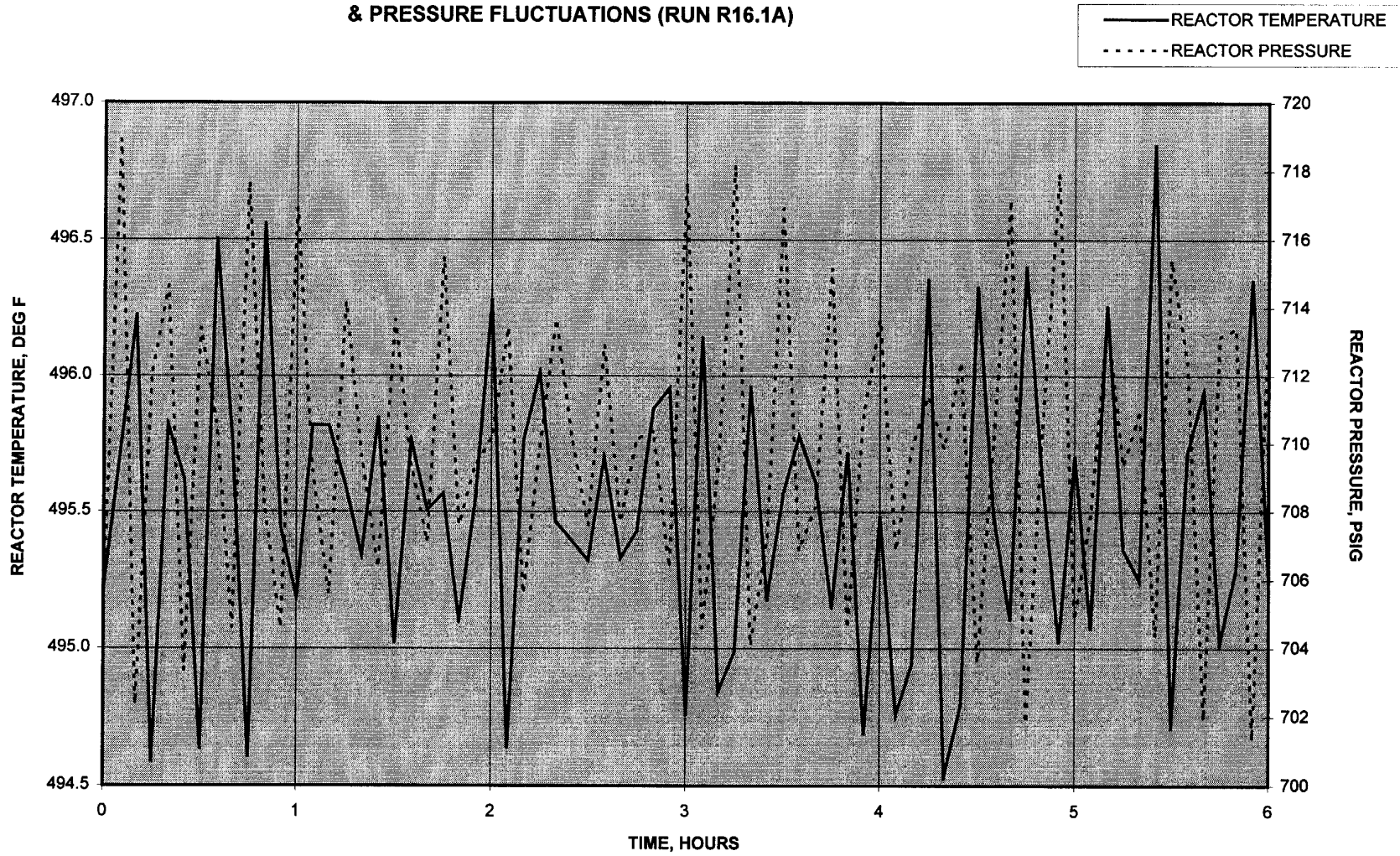


FIGURE 26

FISCHER-TROPSCH IV - REACTOR TEMPERATURE
& PRESSURE FLUCTUATIONS (RUN R16.1A)

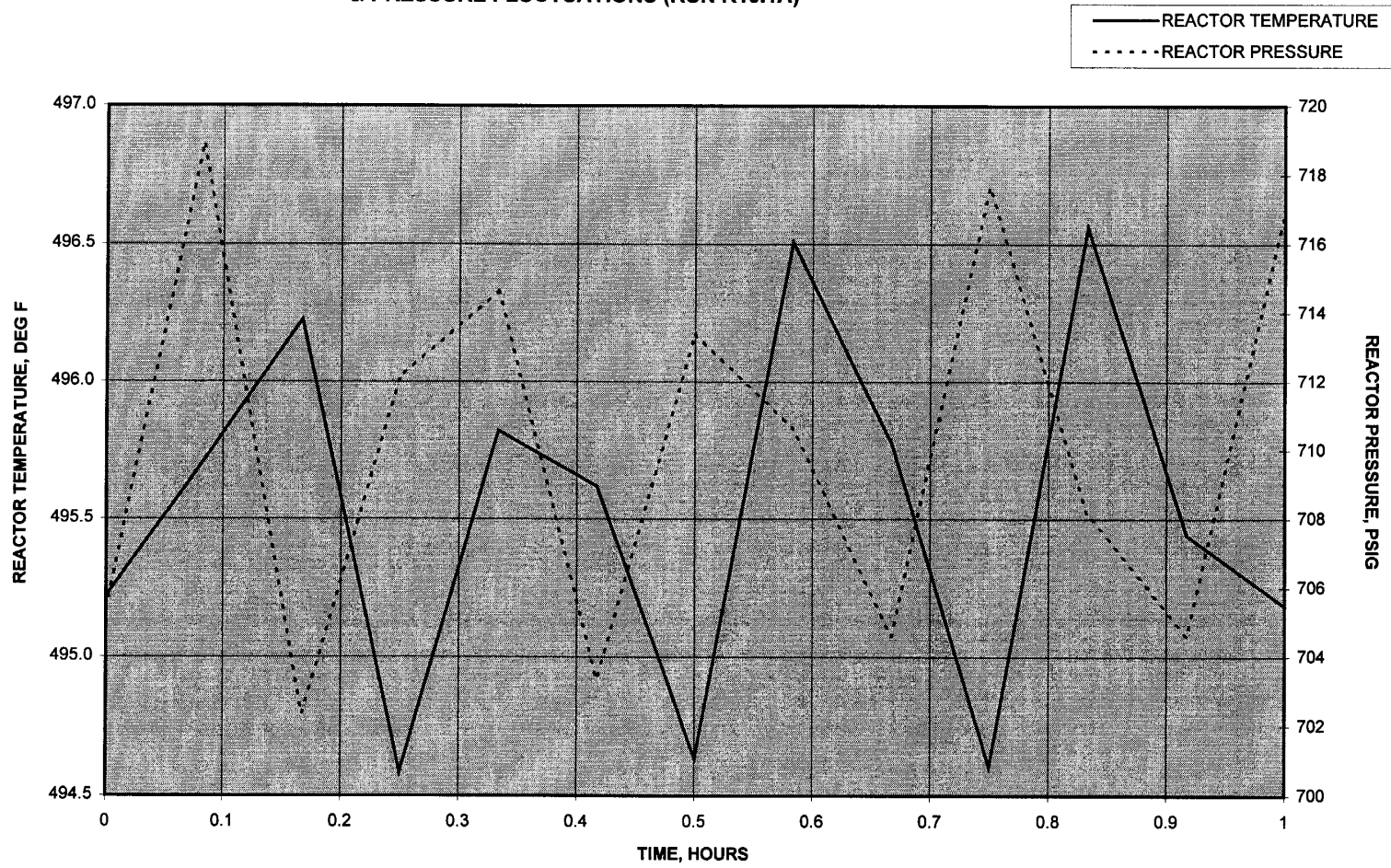


FIGURE 27

Catalyst Concentrations during F-T IV

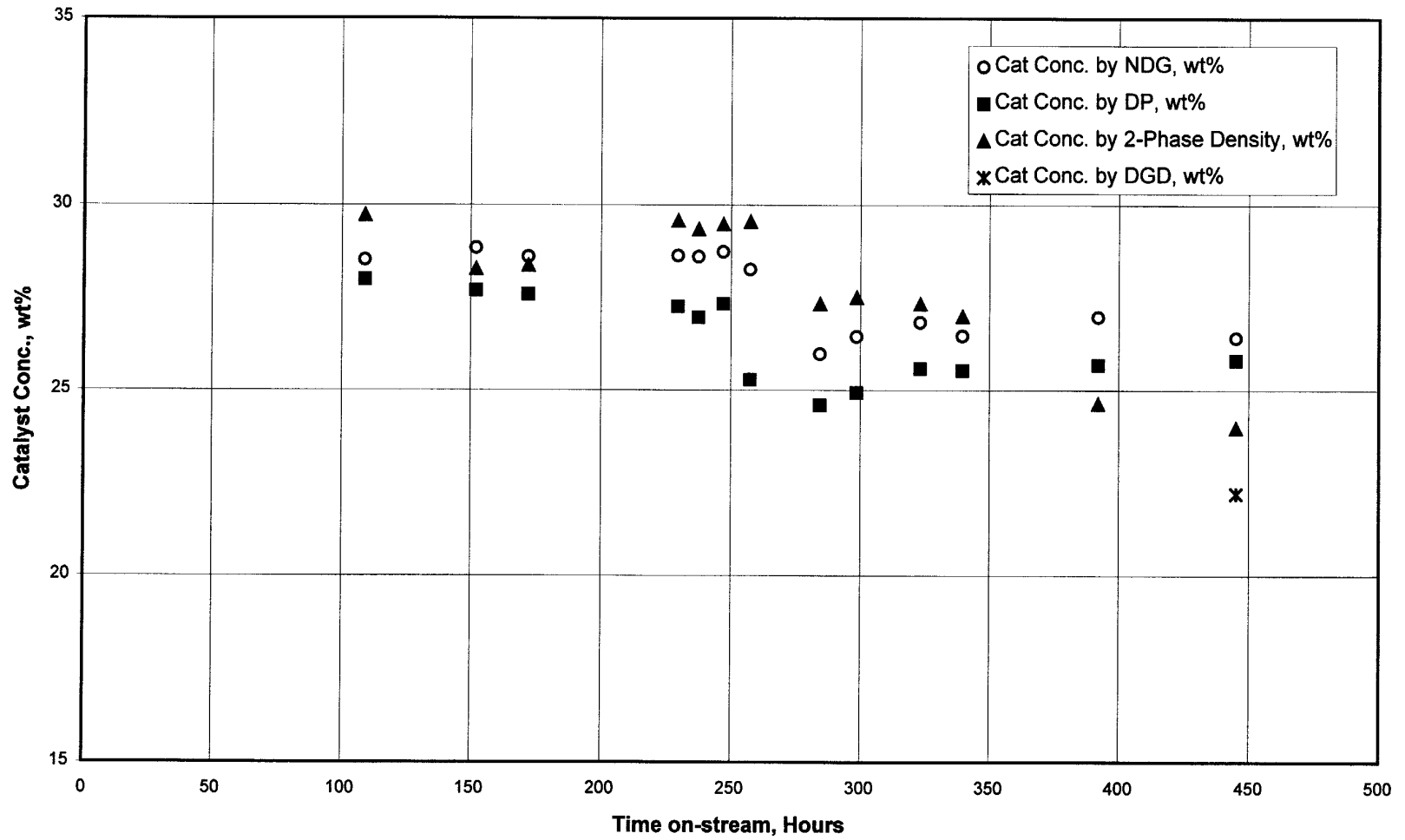


FIGURE 28

Gas Hold-up during F-T IV

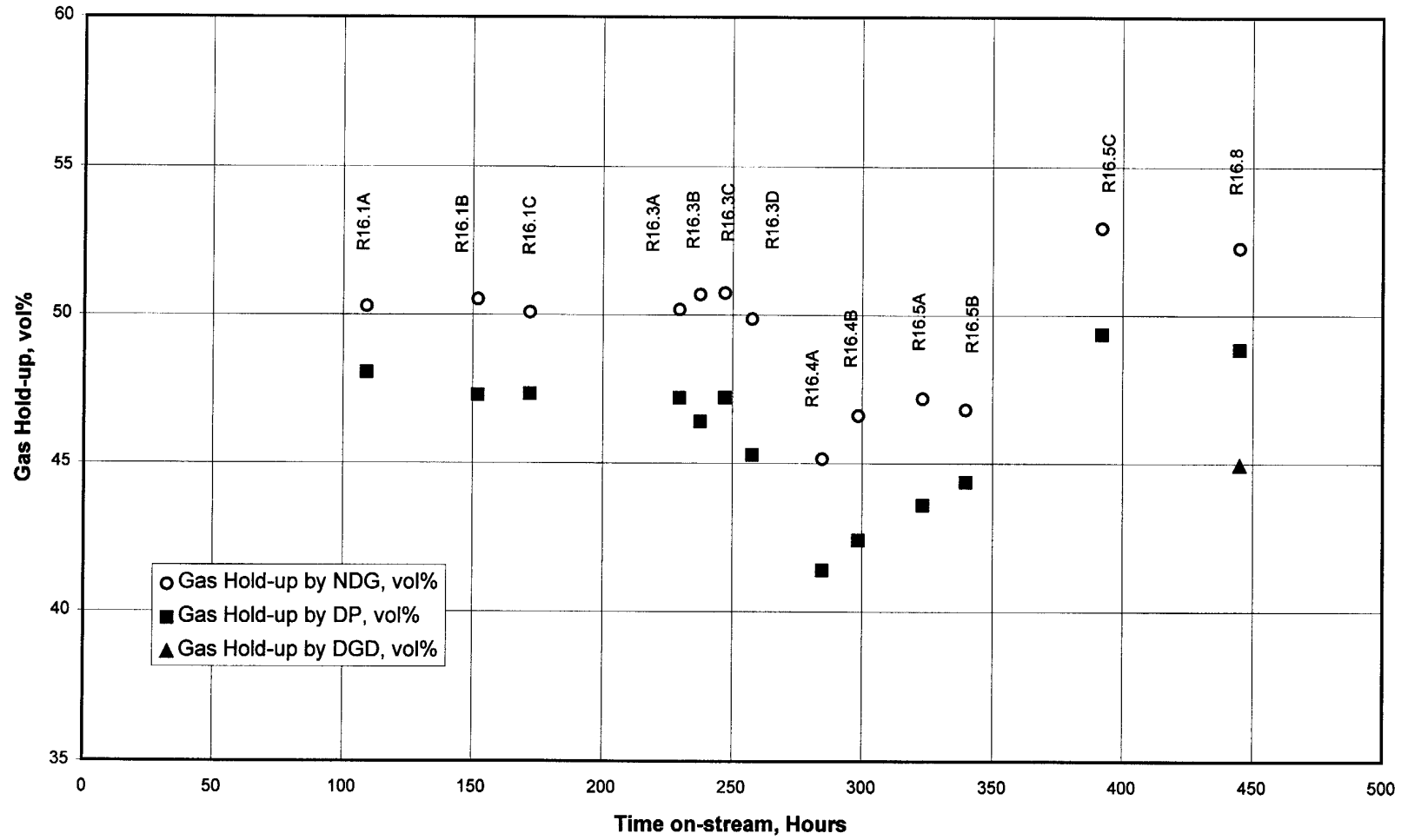


FIGURE 29

Dynamic Gas Disengagement Test (F-T IV)

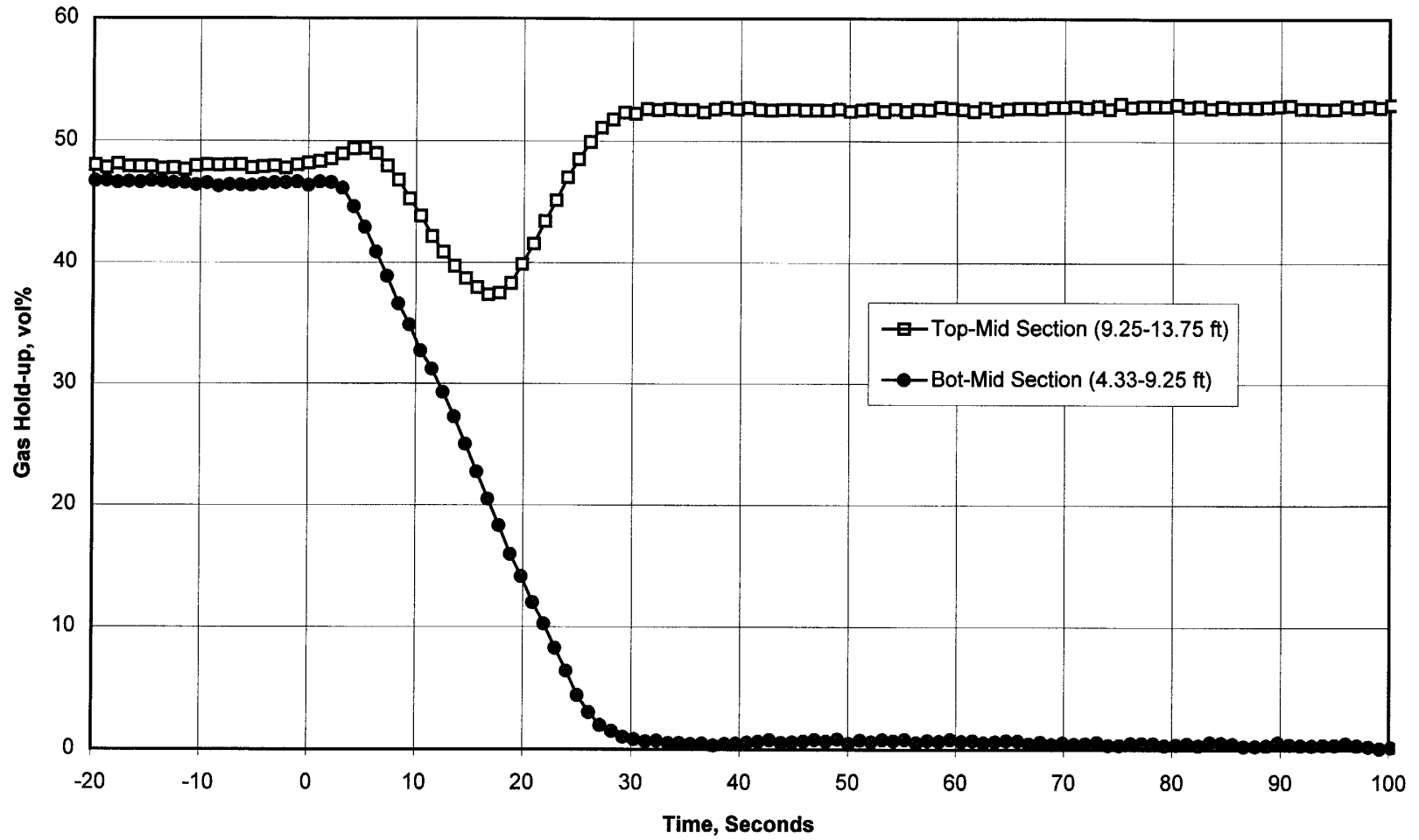


FIGURE 30

Heat Transfer Estimates during F-T IV

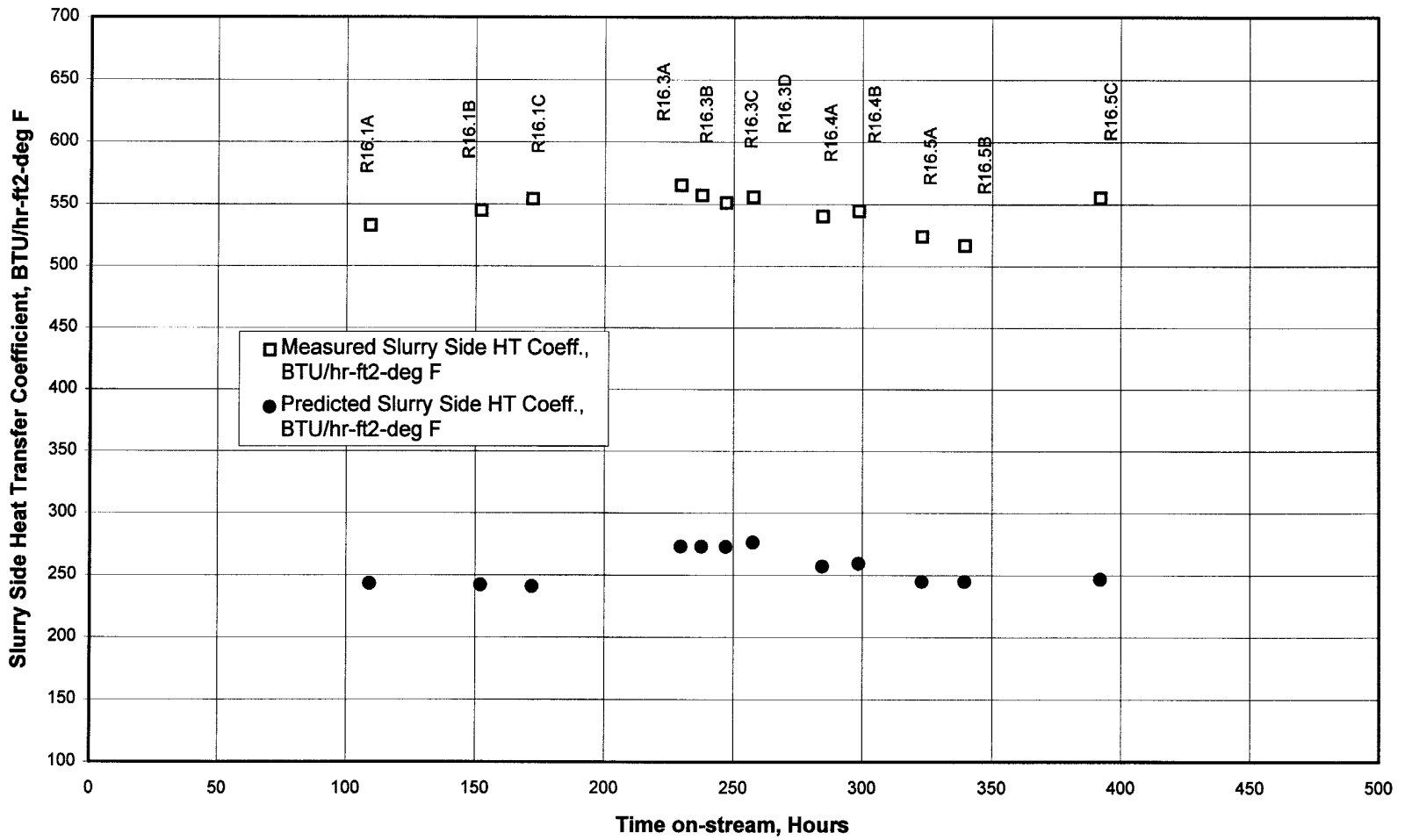


FIGURE 31

FT IV: CO Conversion Rate vs. Prediction based on Autoclave Data
(prediction includes initial deactivation)

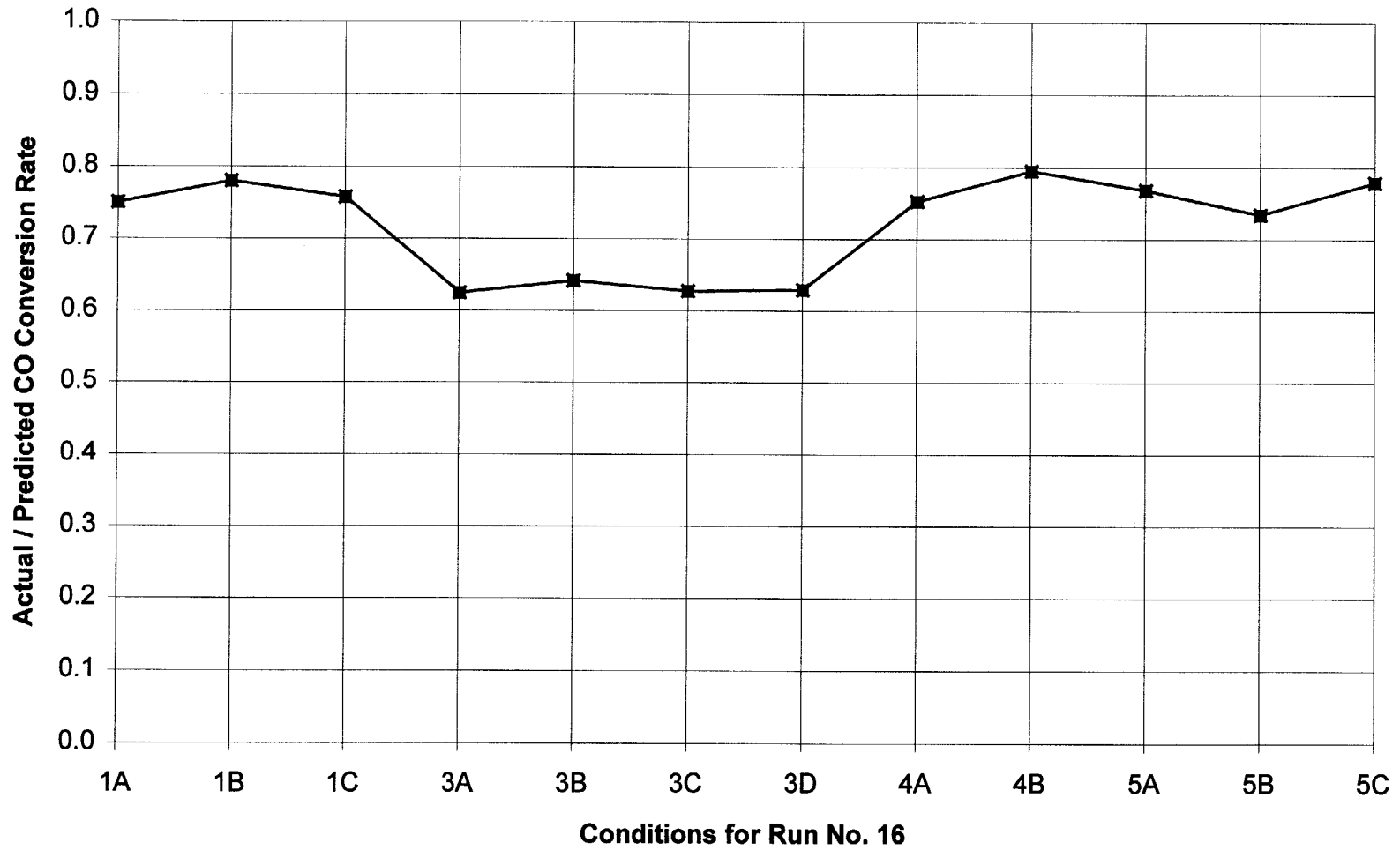


FIGURE 32

Catalyst Particle Size Variation and Fines Formation for FT IV

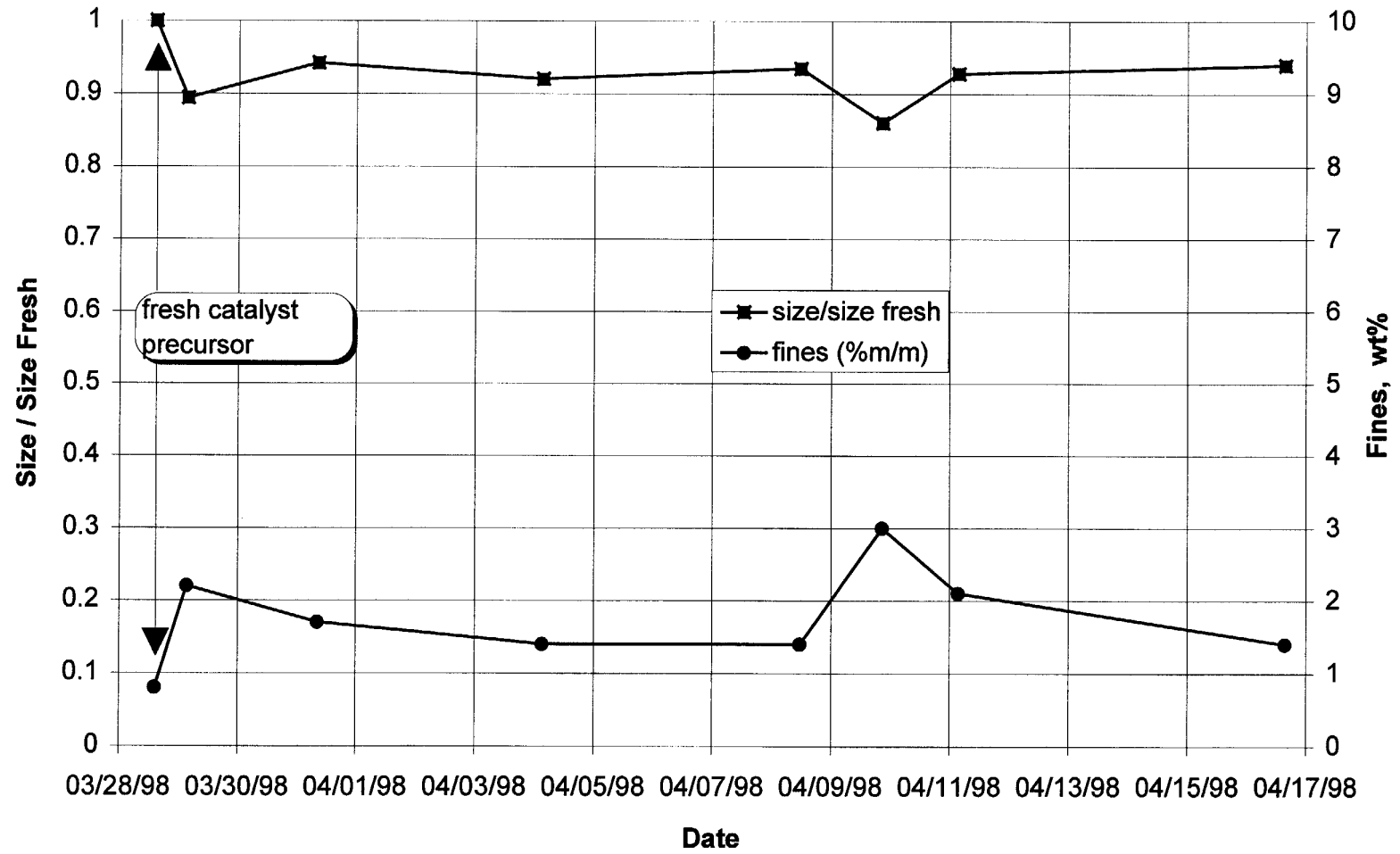


FIGURE 33

FT IV: Carbon Distribution of Light Hydrocarbon Product Samples

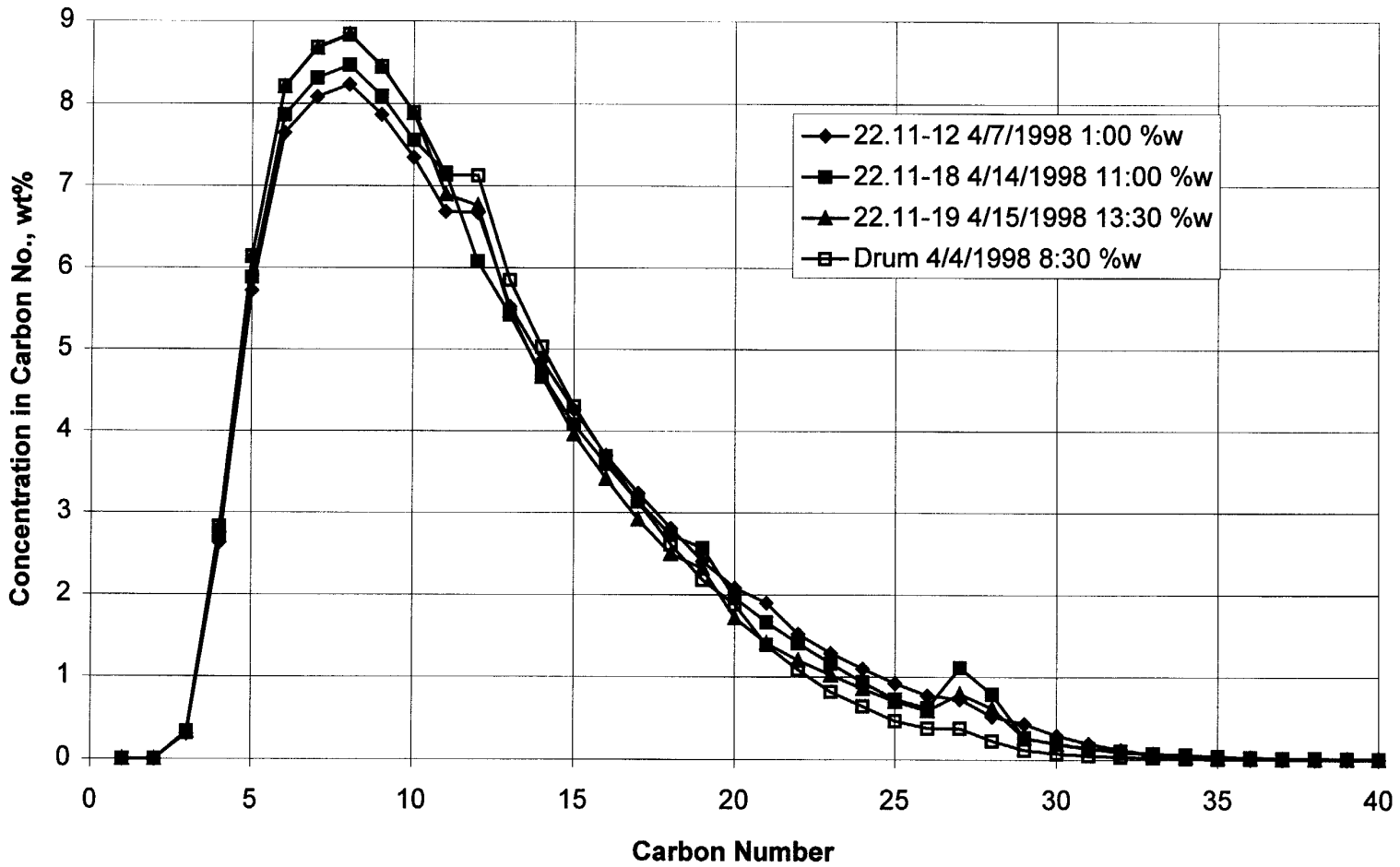


FIGURE 34

FT IV: Light HC Product Drum Sample (4/4/98 08:30, Run 16.1C)
(type distribution by capillary GC, unidentified peaks assumed to be isoparaffins)

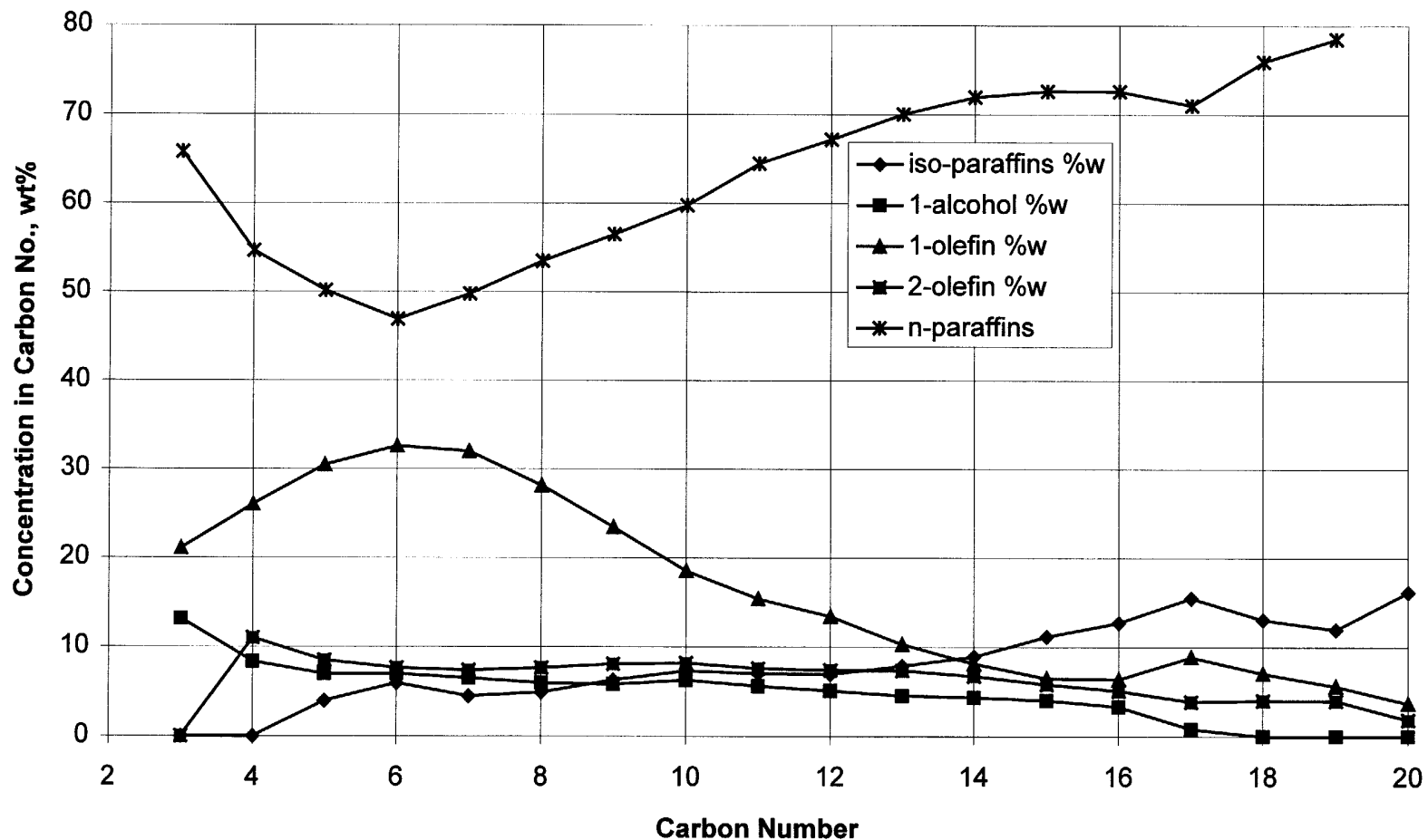


FIGURE 35

FT IV: Wax Product Carbon Distributions

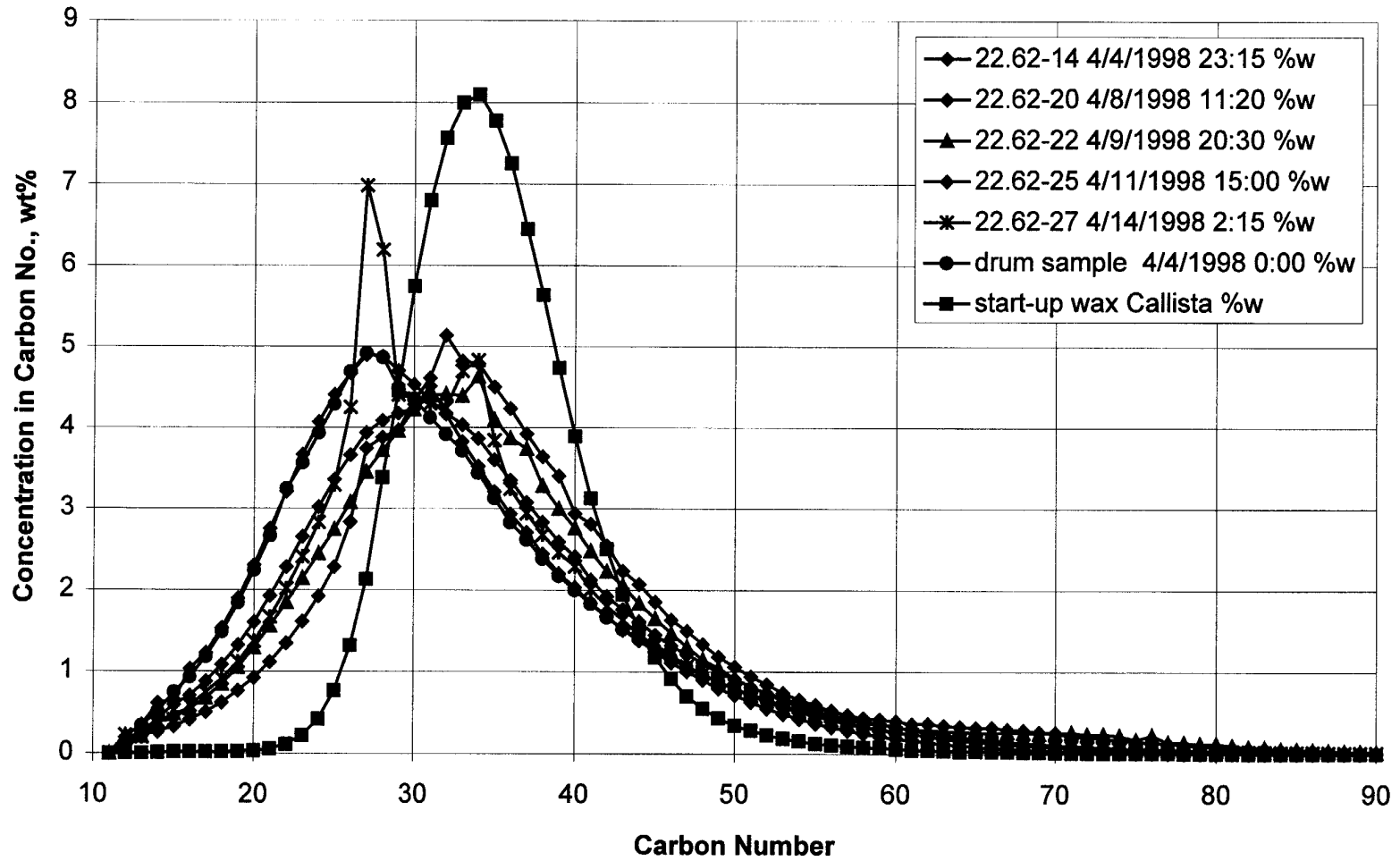


FIGURE 36

**FT IV: Total Product Carbon Distribution
(Run 16.1C)**

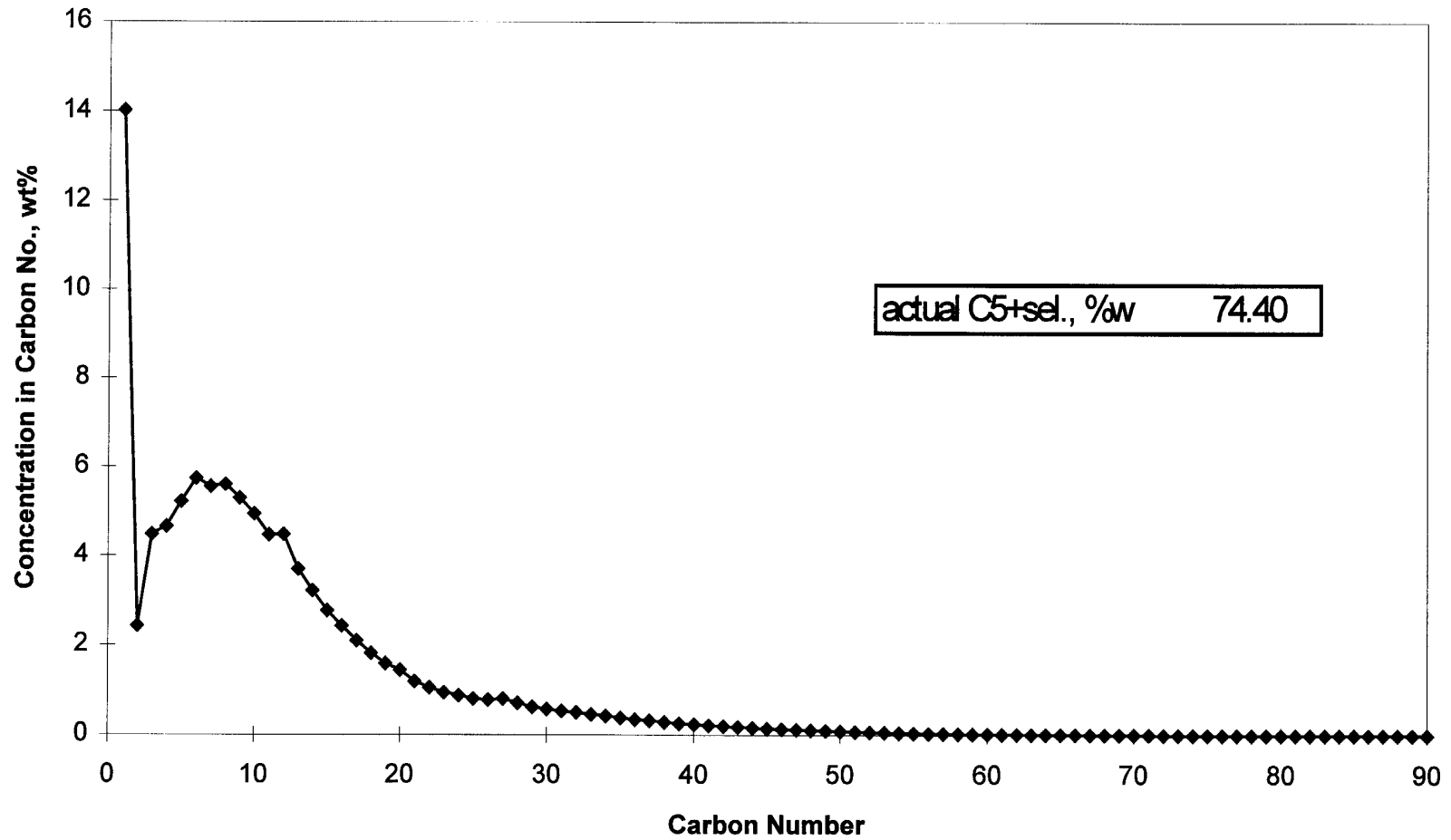


FIGURE 37

**AFS Alpha Plot
(Run 16.1C)**

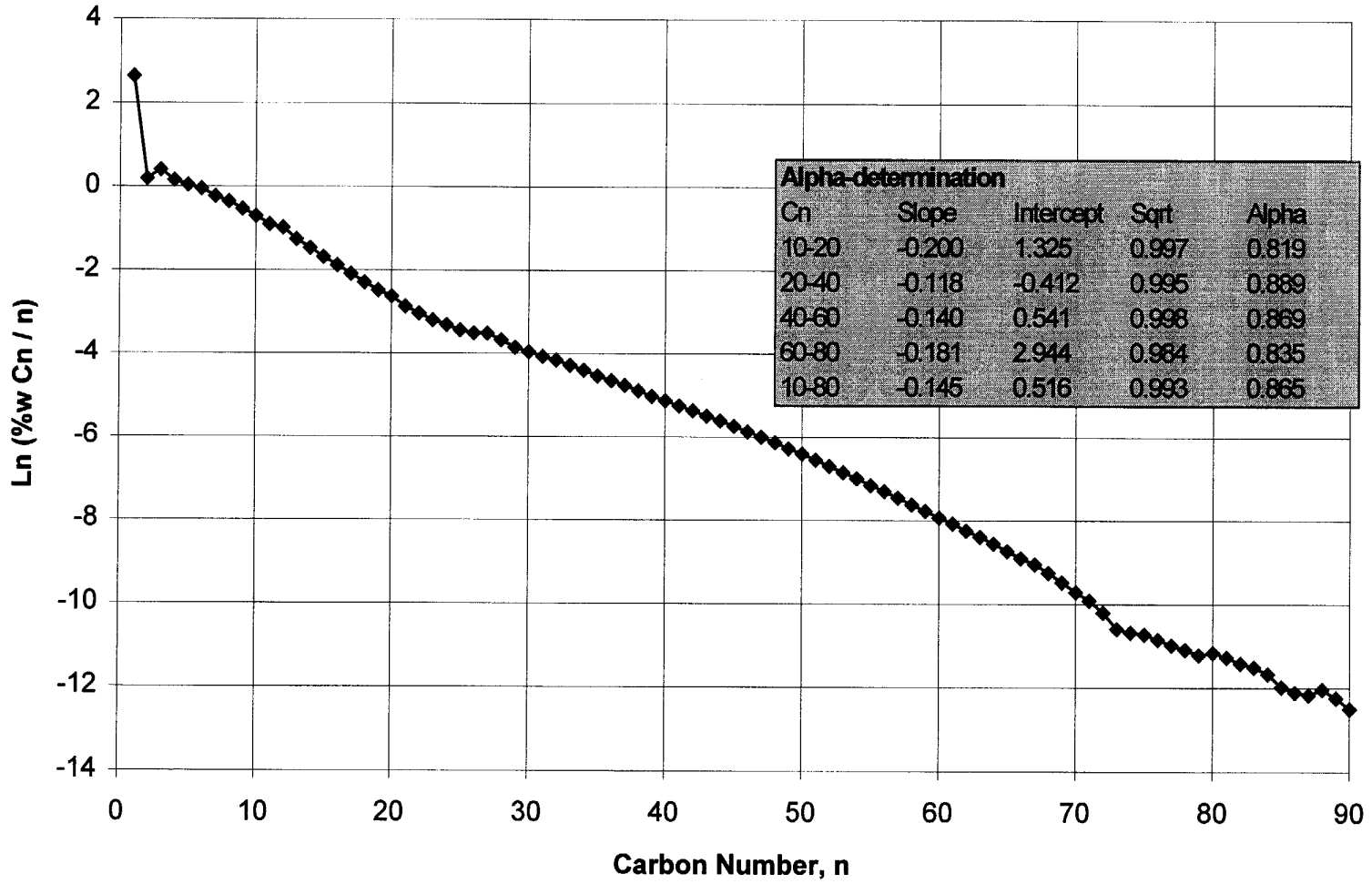


FIGURE 38

**FT IV: Total Product Carbon Distribution
(Run 16.3D)**

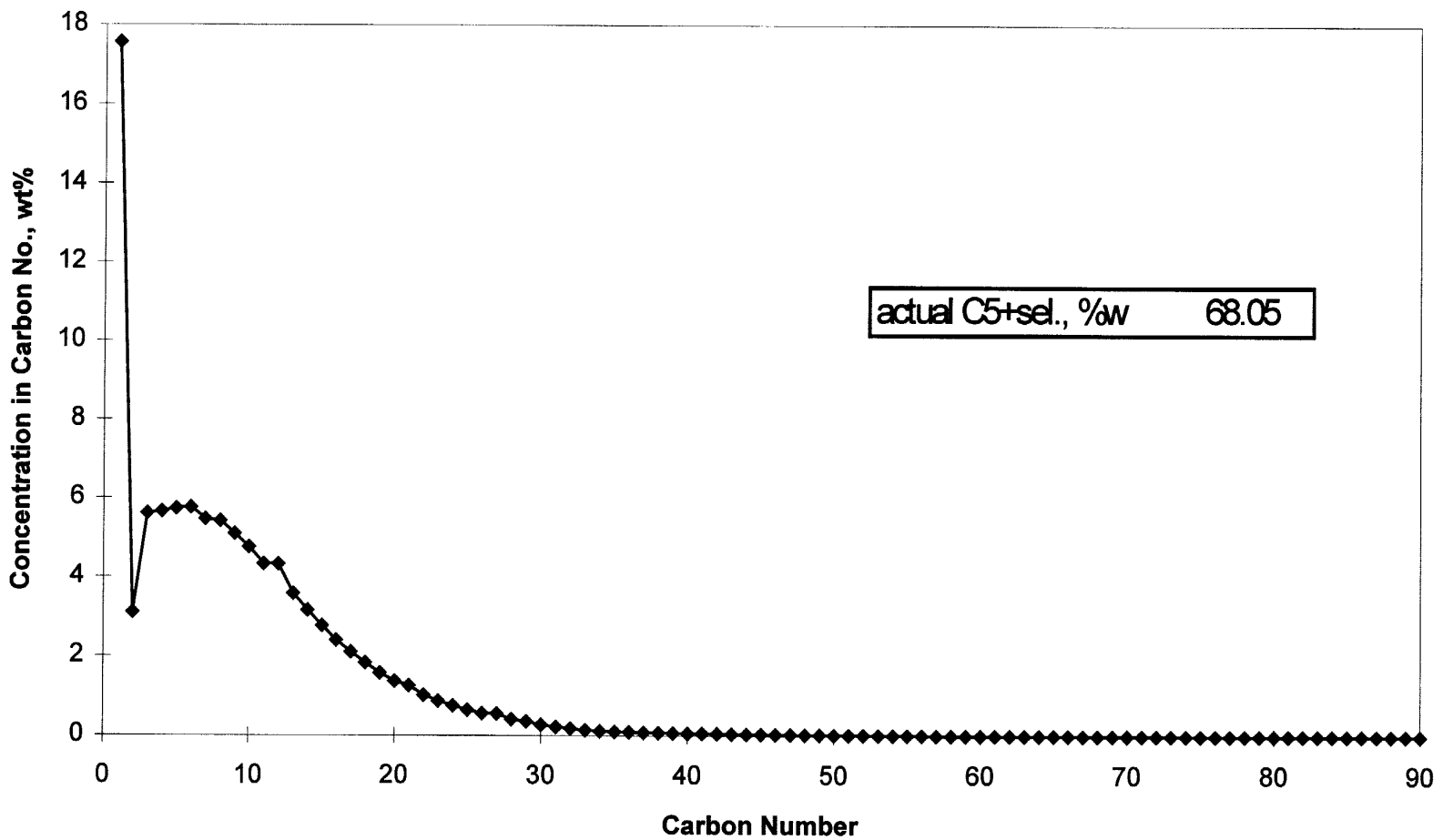


FIGURE 39

**AFS Alpha Plot
(Run 16.3D)**

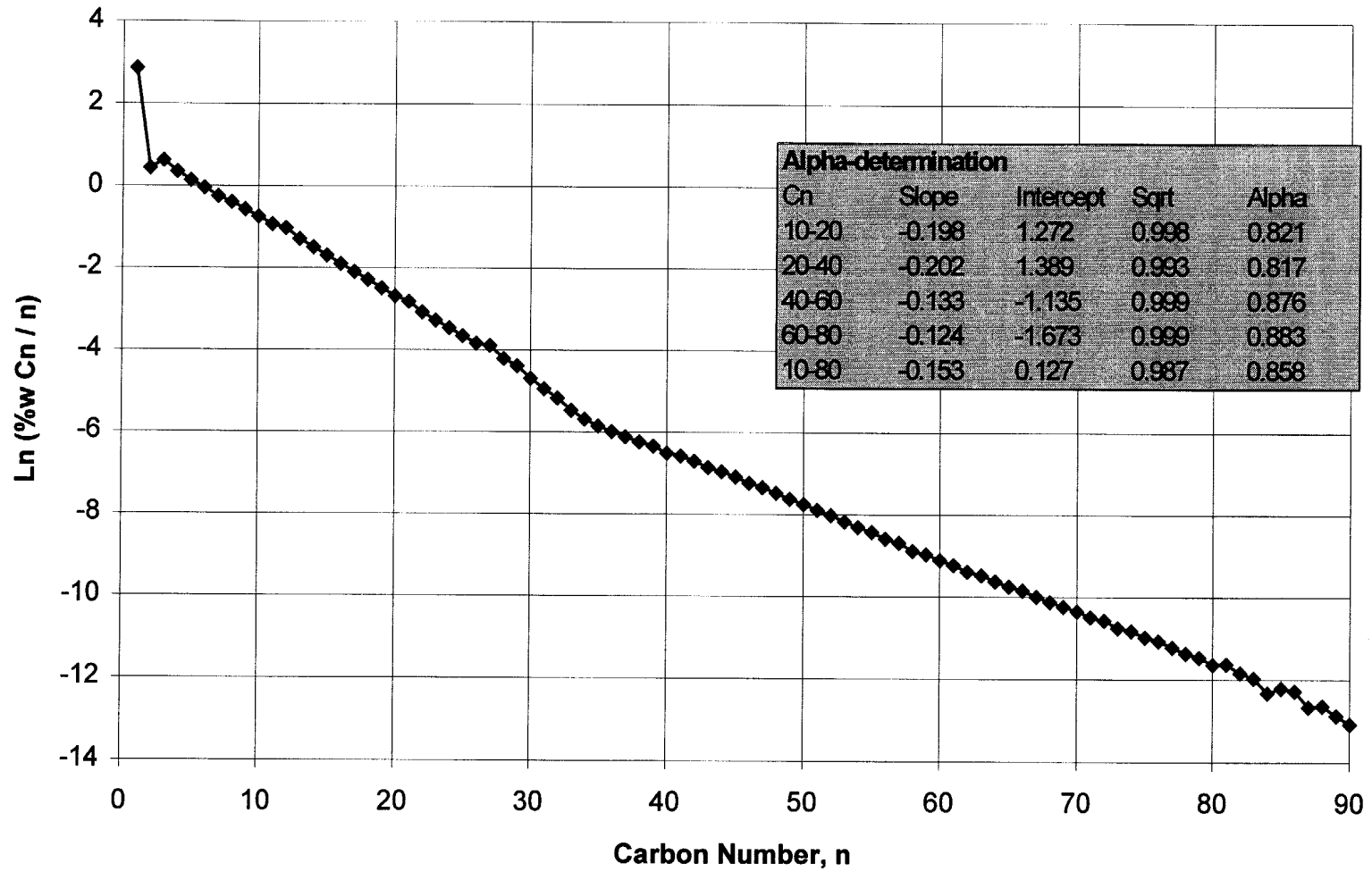


FIGURE 40

**FT IV: Total Product Carbon Distribution
(Run 16.4A)**

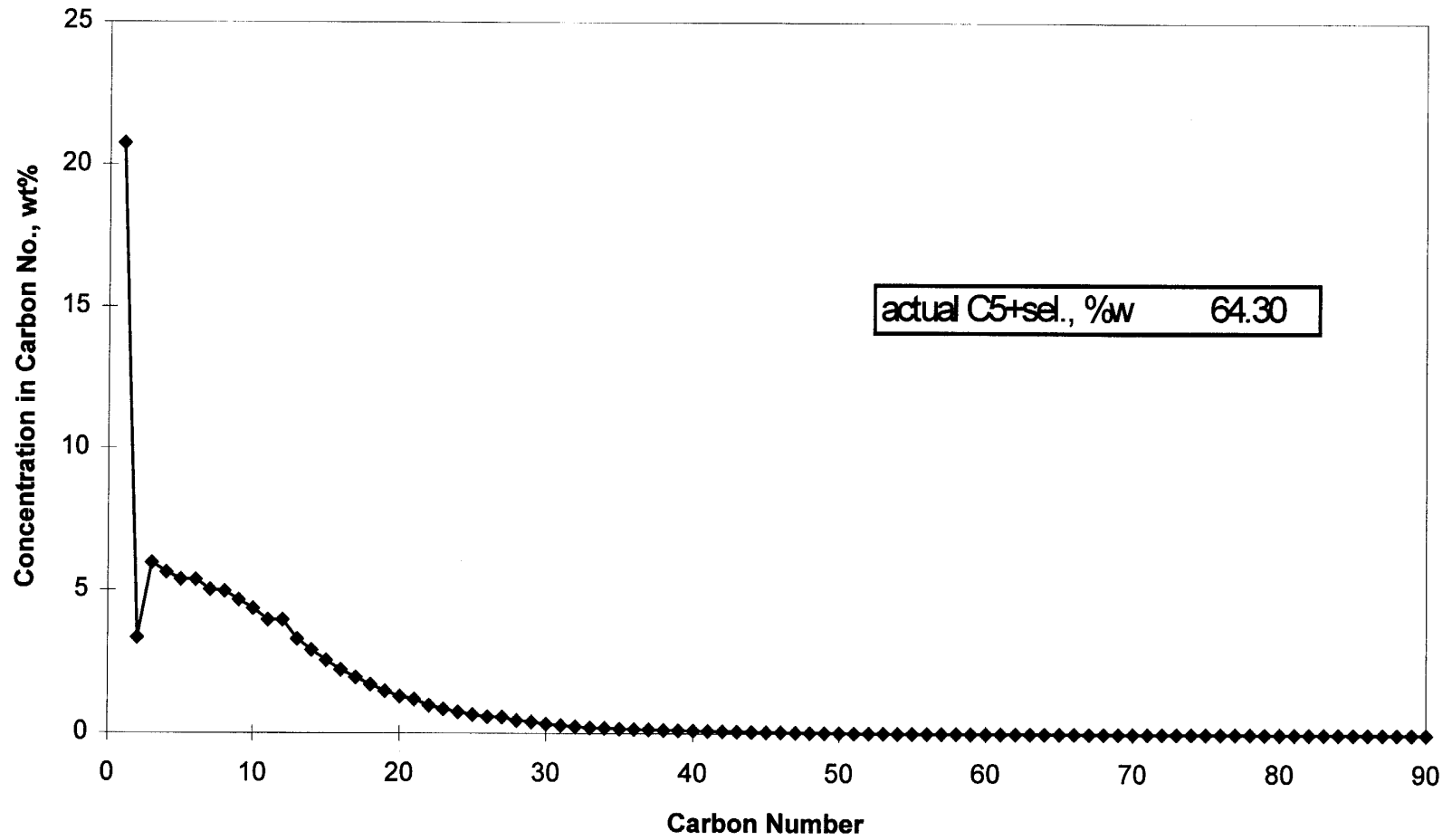


FIGURE 41

**AFS Alpha Plot
(Run 16.4A)**

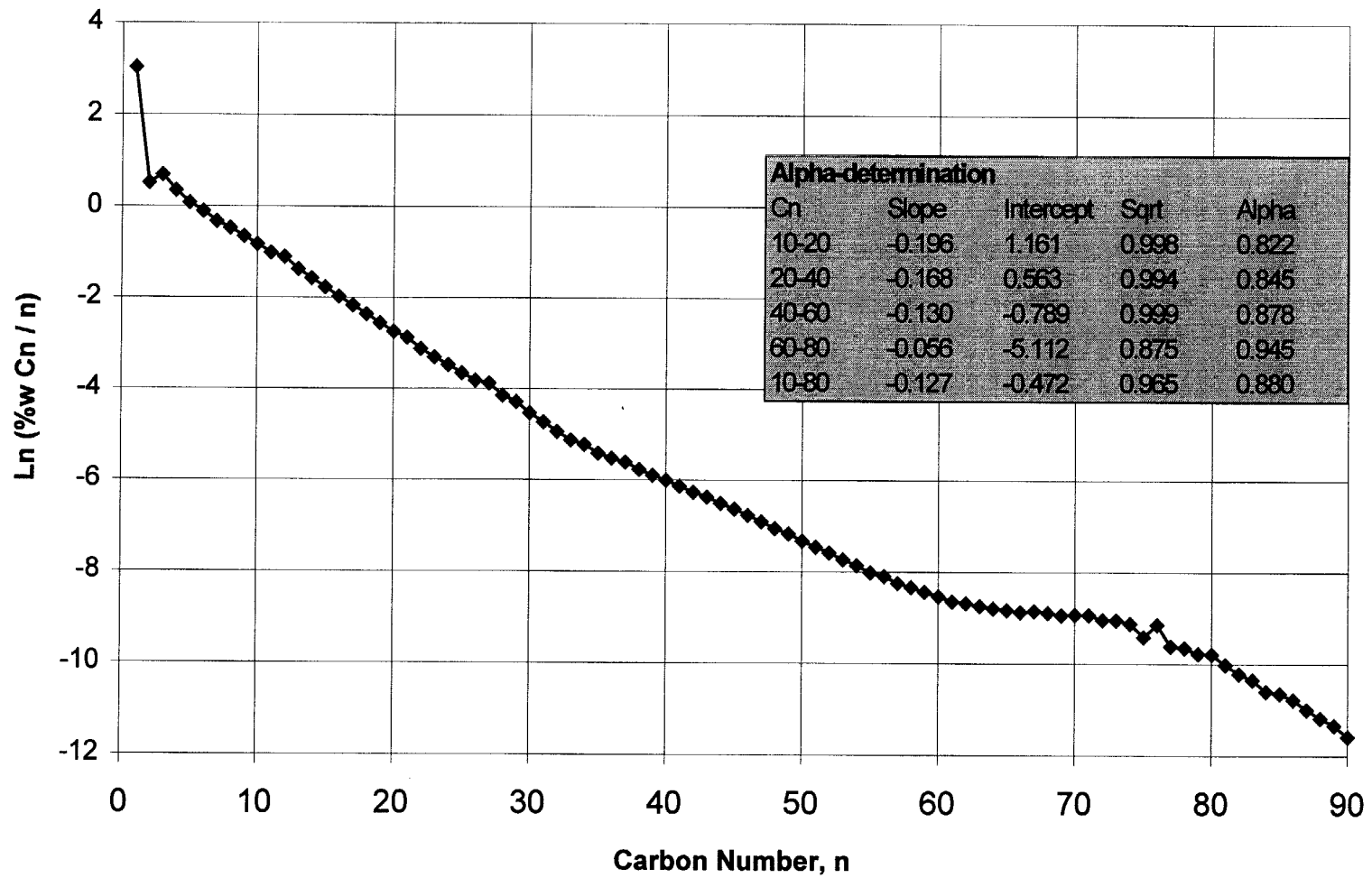


FIGURE 42

**FT IV: Total Product Carbon Distribution
(Run 16.5C)**

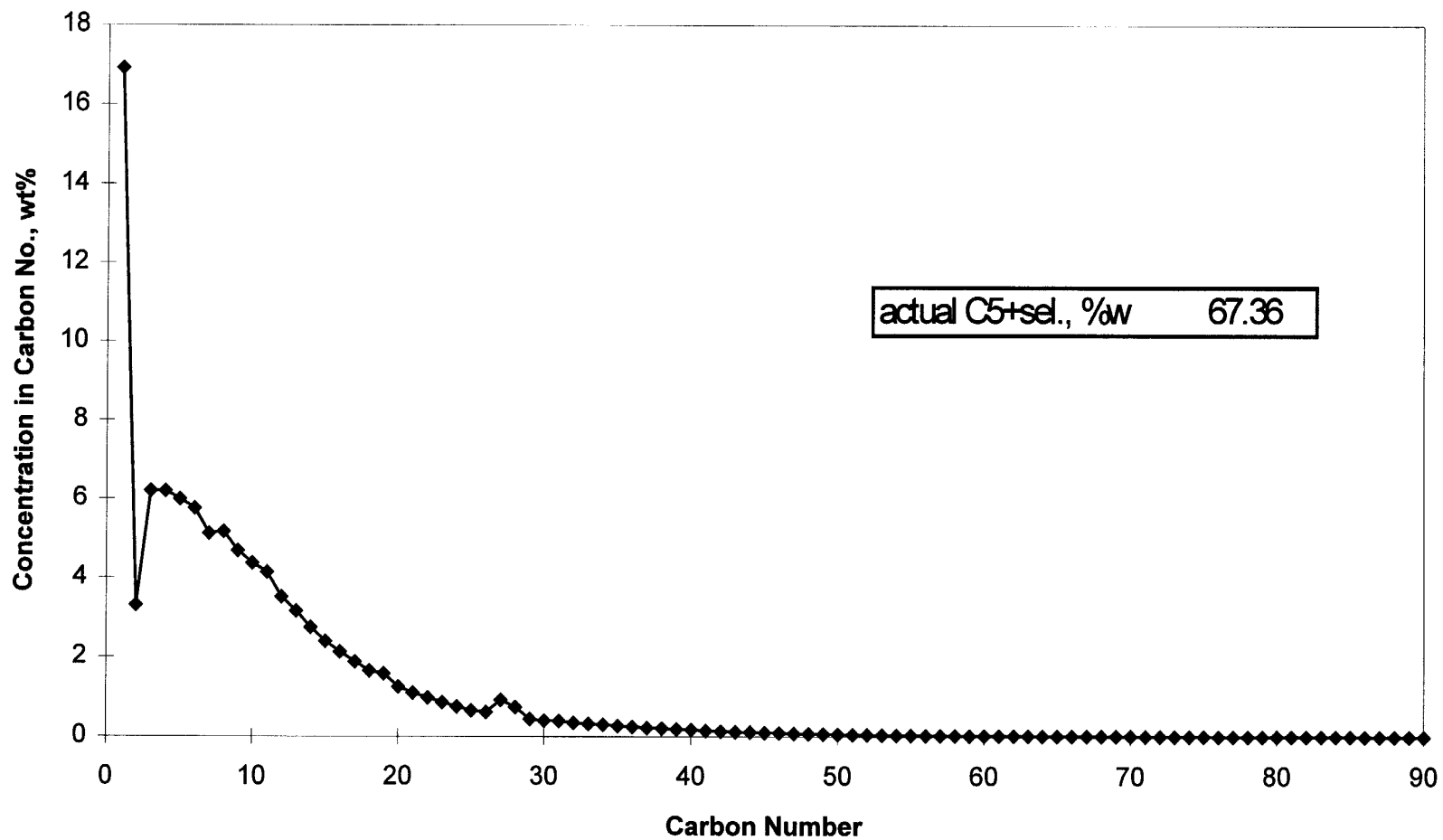


FIGURE 43

**AFS Alpha Plot
(Run 16.5C)**

