



8.0 FIGURES

FIGURE 1
HYDROCARBON WEIGHT DISTRIBUTION
7075-12-B1-17

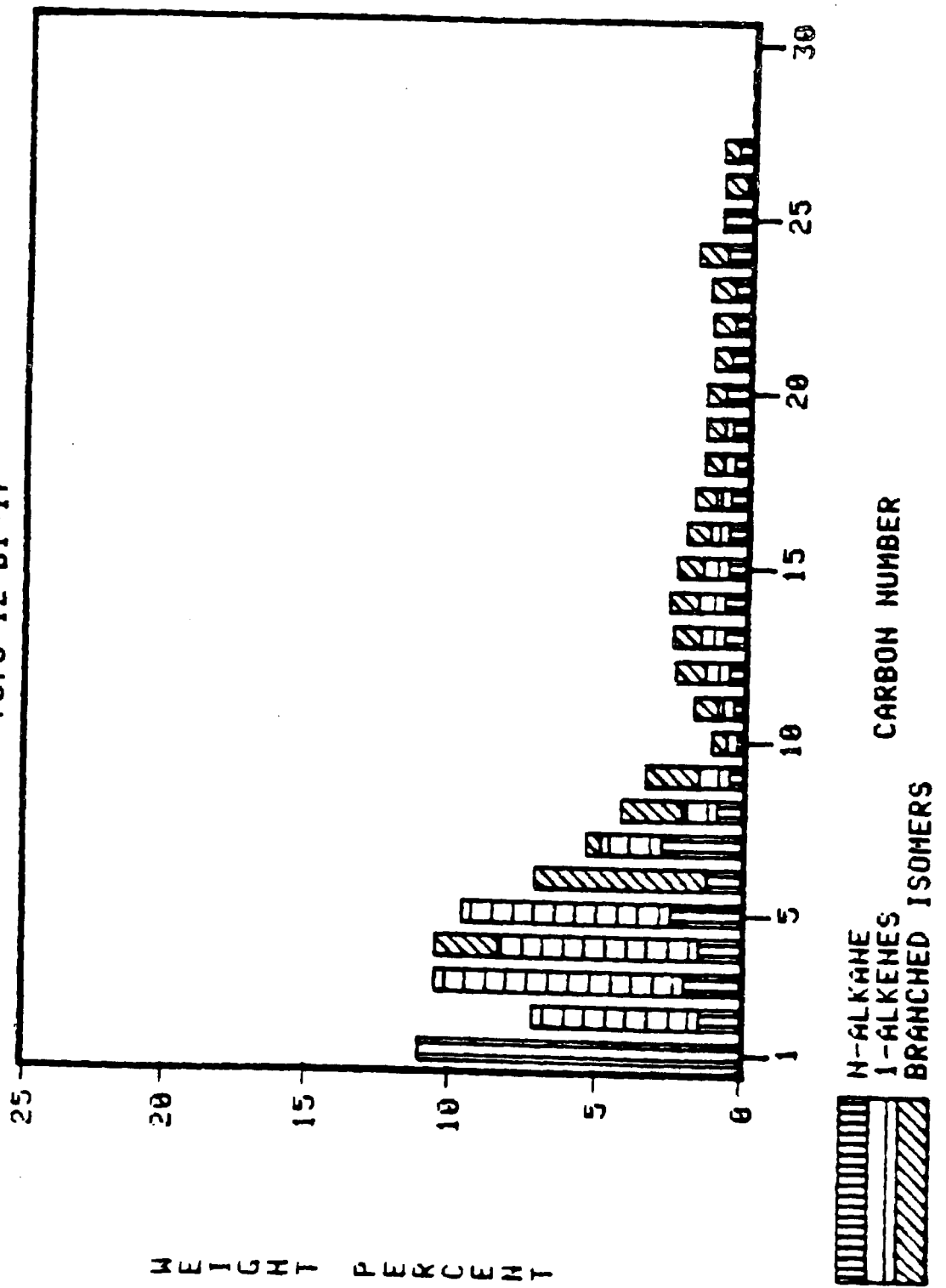


FIGURE 2
HYDROCARBON SCHULZ-FLORY DISTRIBUTION
7075-12-B1-17

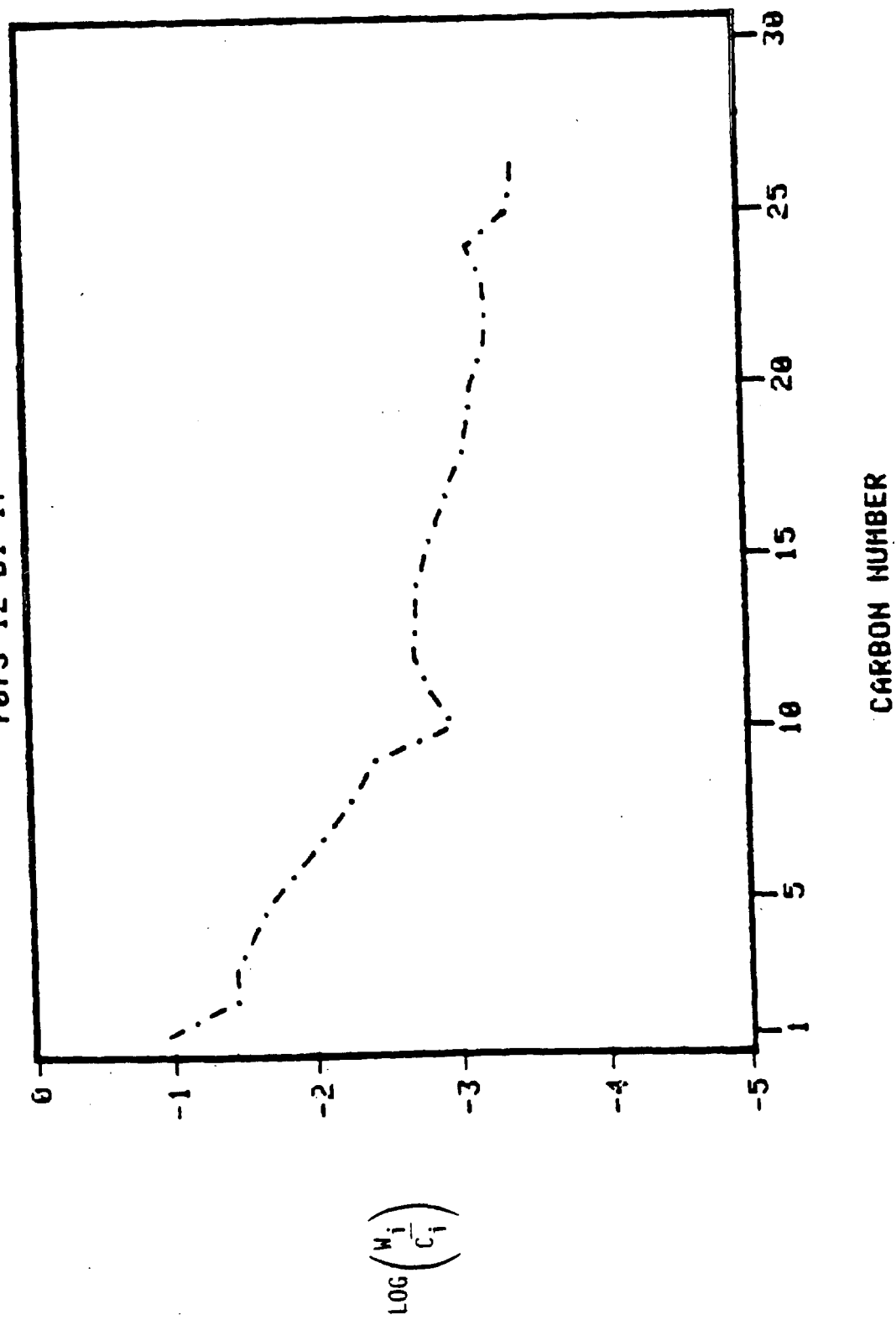


FIGURE 3
HYDROCARBON WEIGHT DISTRIBUTION
7075-12-B1-23

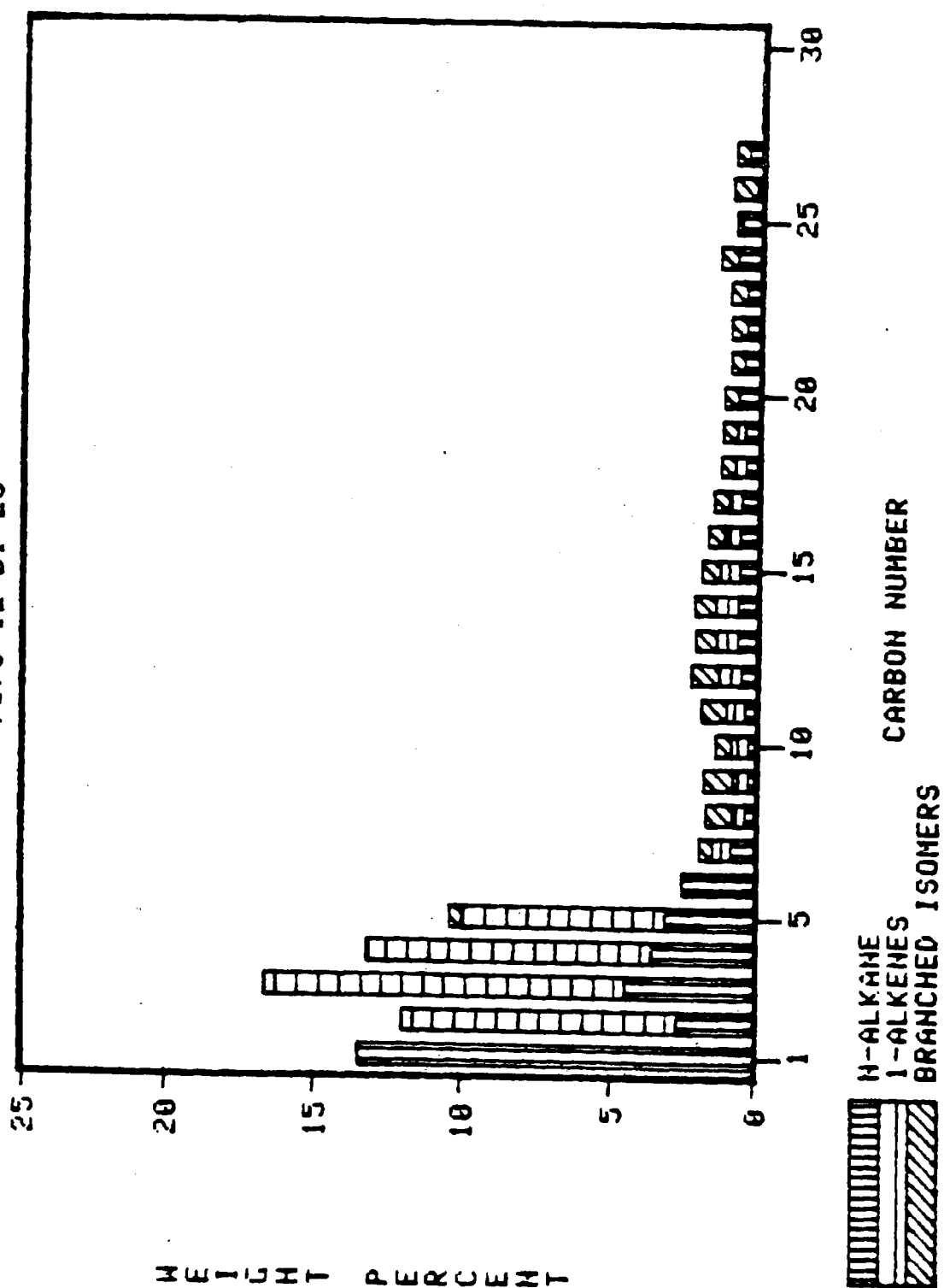


FIGURE 4
 HYDROCARBON SCHULZ-FLORY DISTRIBUTION
 7075-12-B1-23

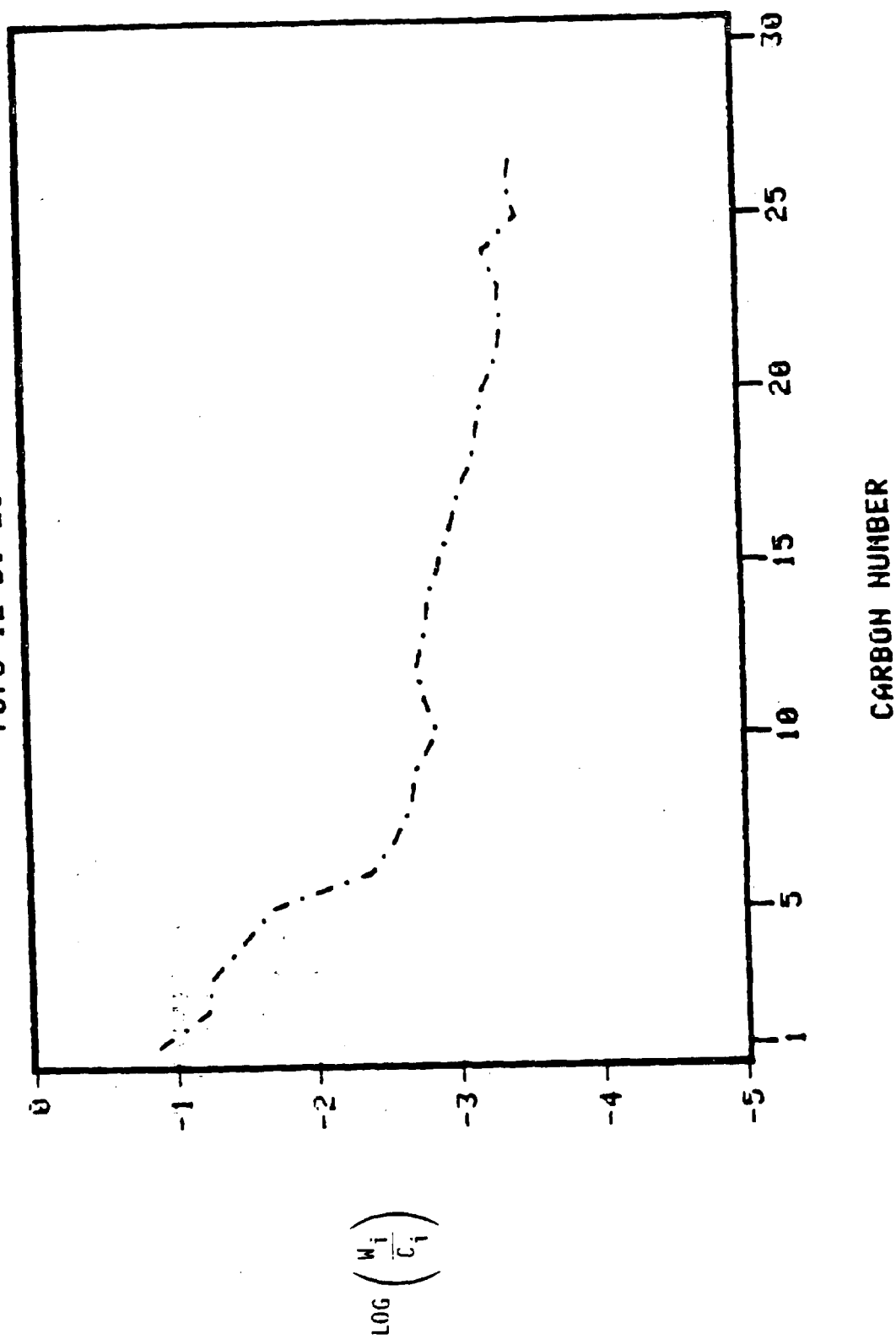


FIGURE 5
HYDROCARBON WEIGHT DISTRIBUTION
7075-12-81-27

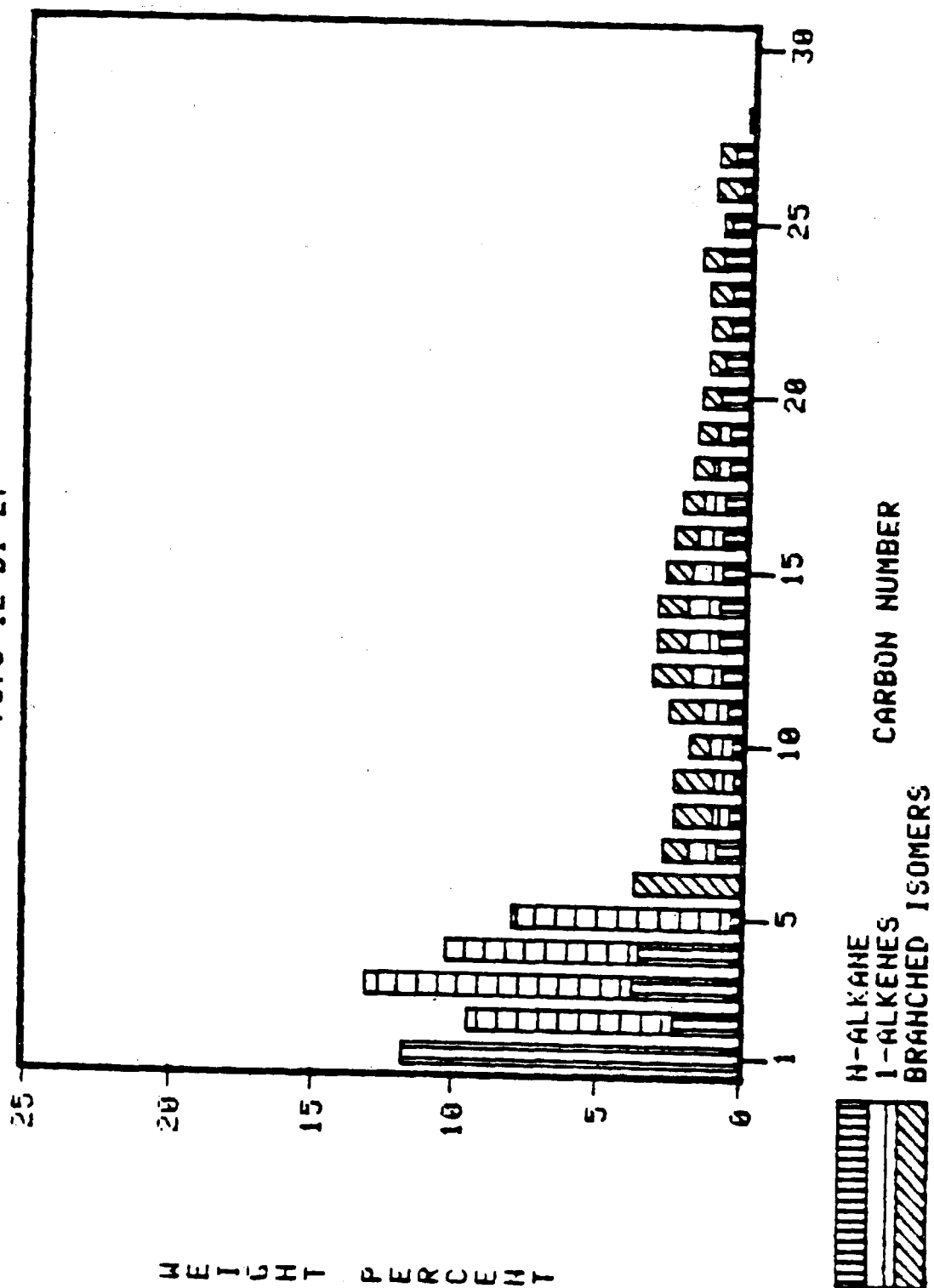


FIGURE 6
 HYDROCARBON SCHULZ-FLORY DISTRIBUTION
 7075-12-B1-27

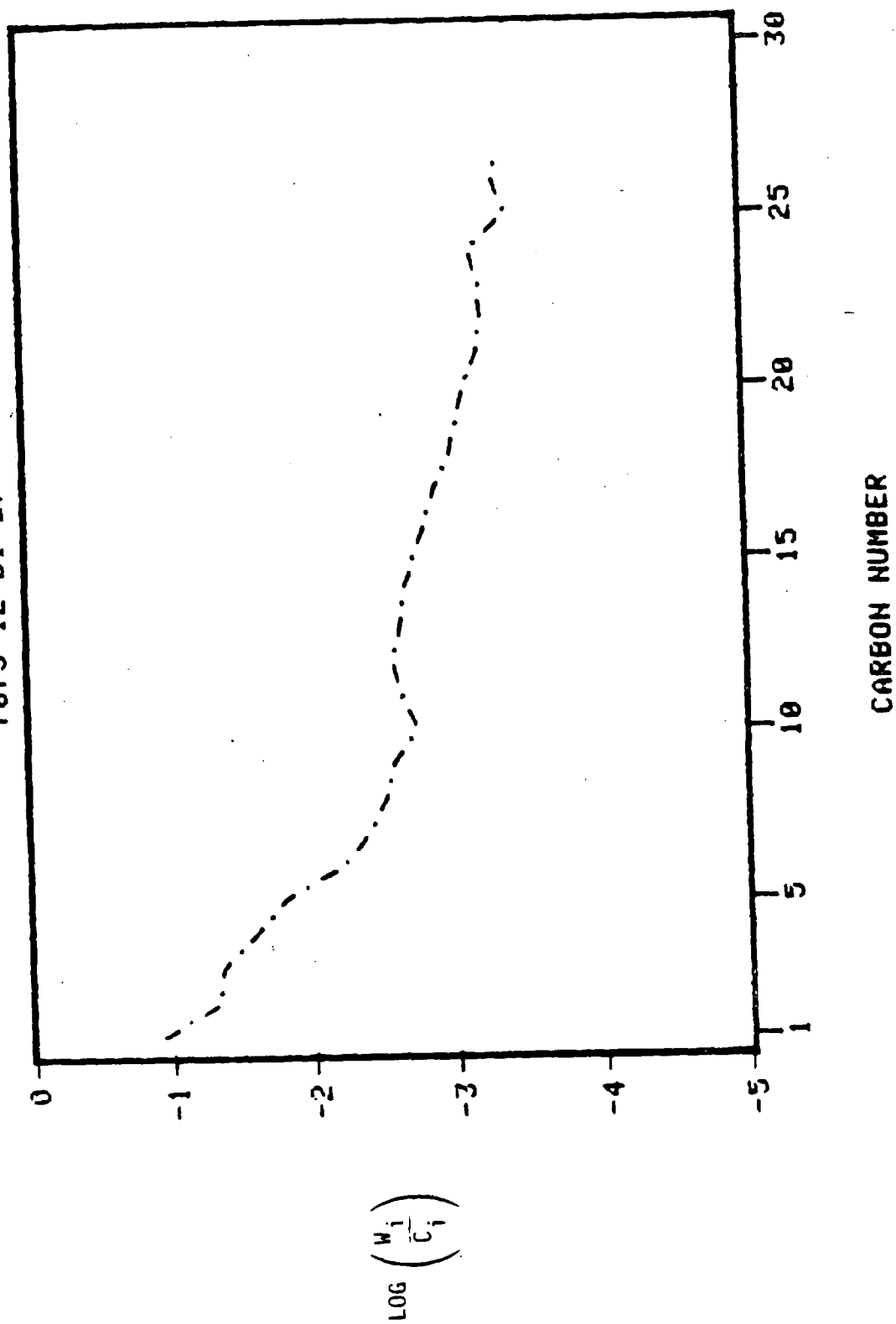


FIGURE 7
HYDROCARBON WEIGHT DISTRIBUTION
7075-12-81-31

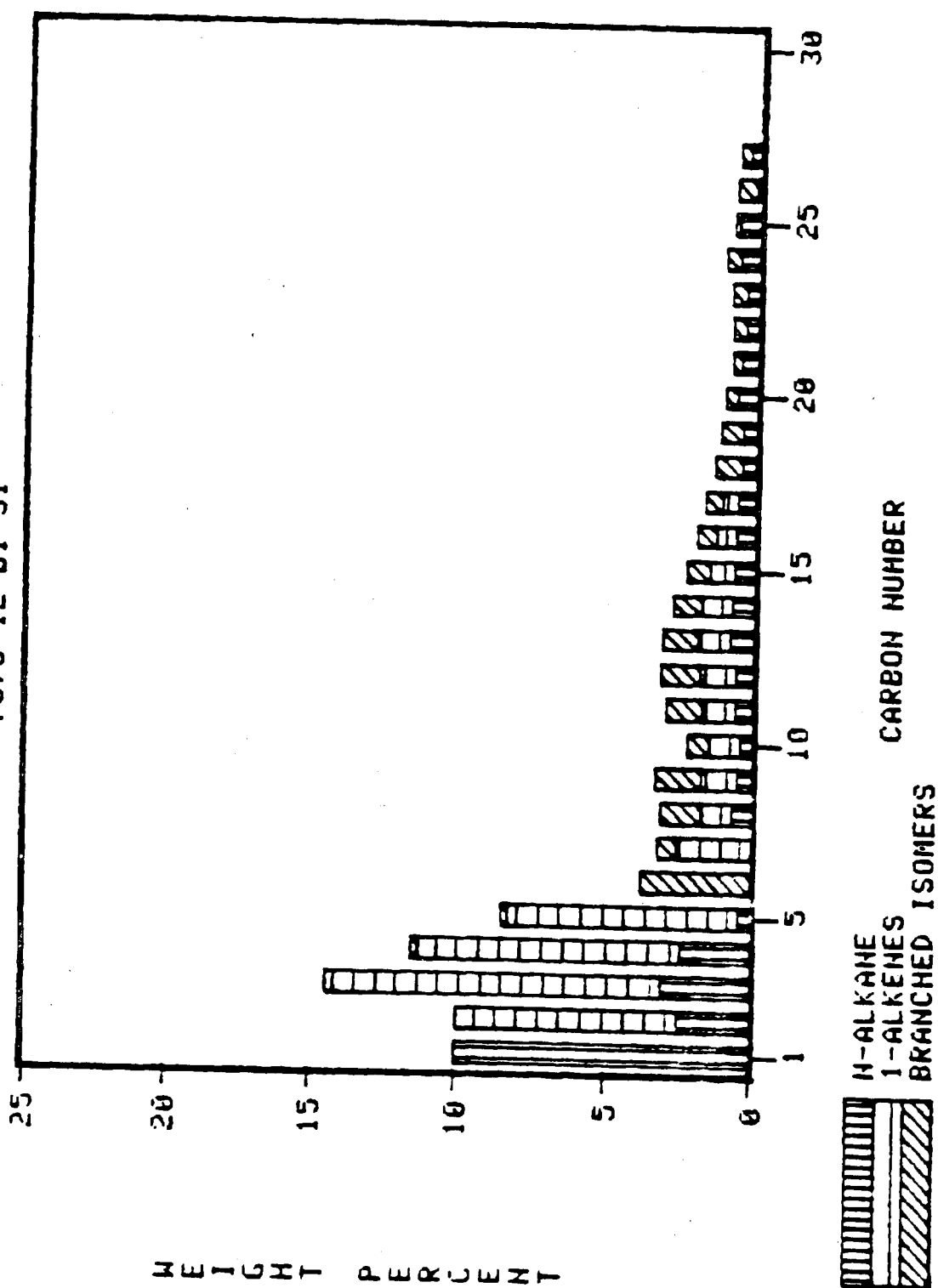


FIGURE 8

HYDROCARBON SCHULZ-FLÖRY DISTRIBUTION

7075-12-B1-31

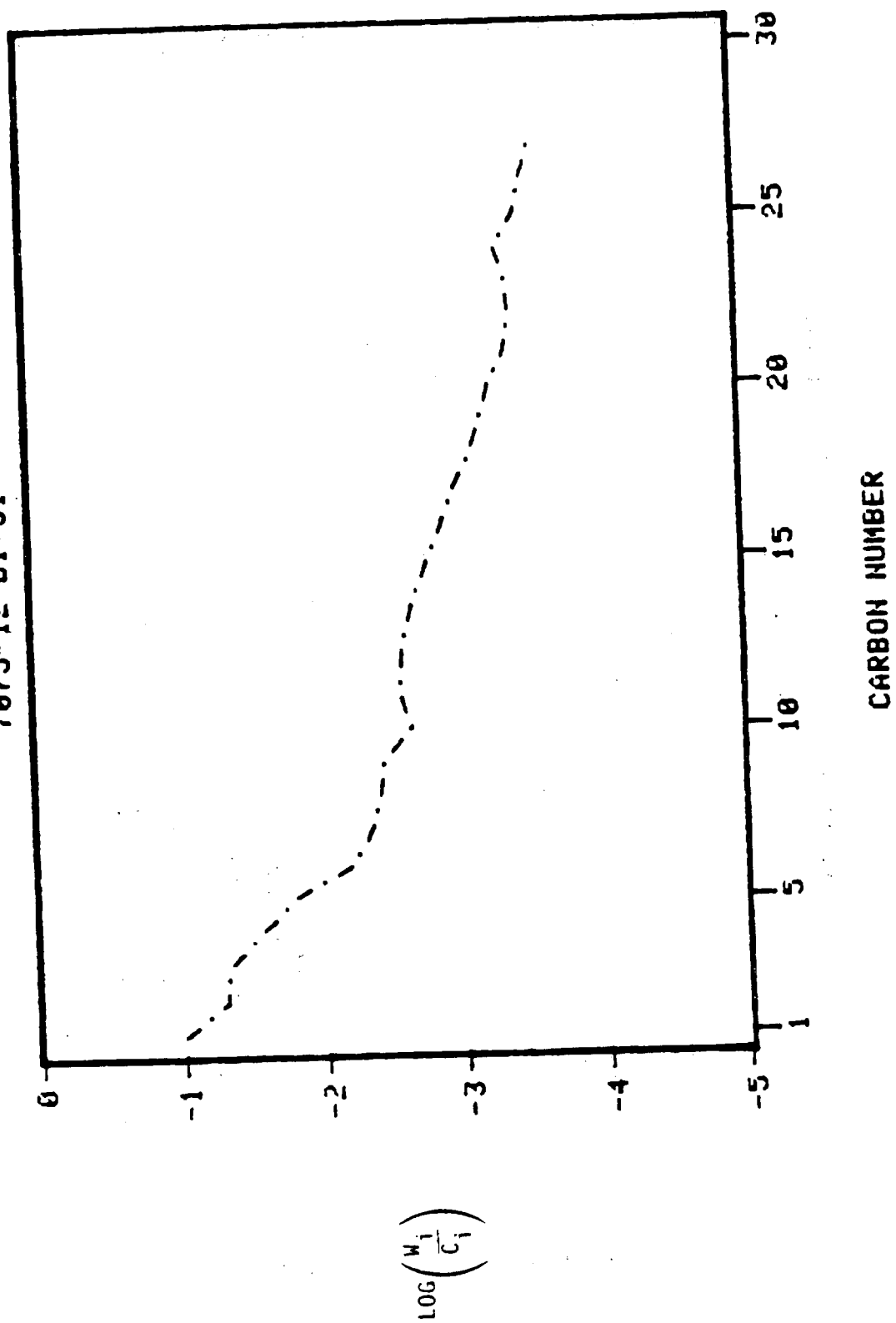


FIGURE 9
HYDROCARBON WEIGHT DISTRIBUTION
7075-12-B1-35

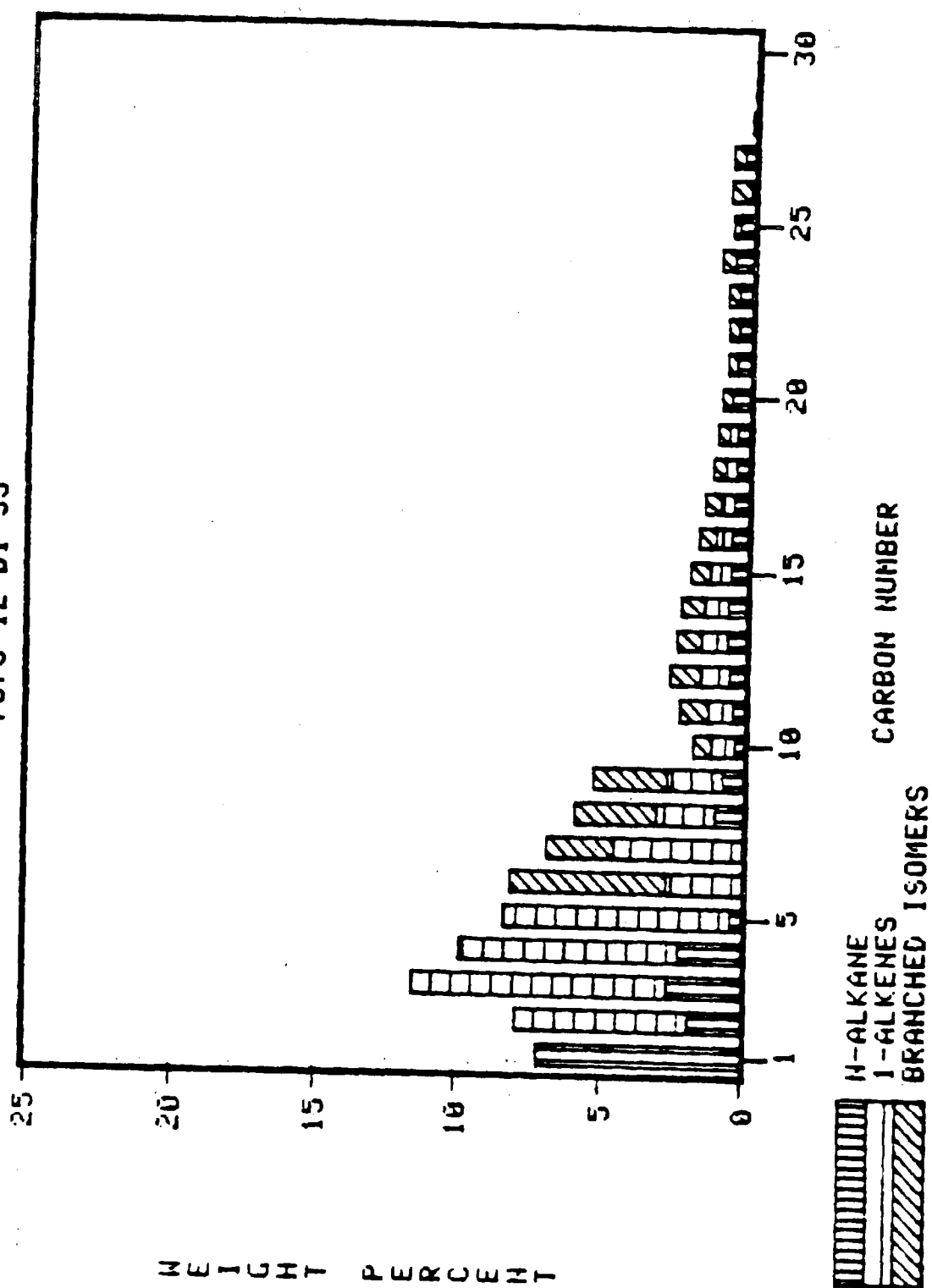


FIGURE 10

HYDROCARBON SCHULZ-FLORY DISTRIBUTION

7075-12-B1-35

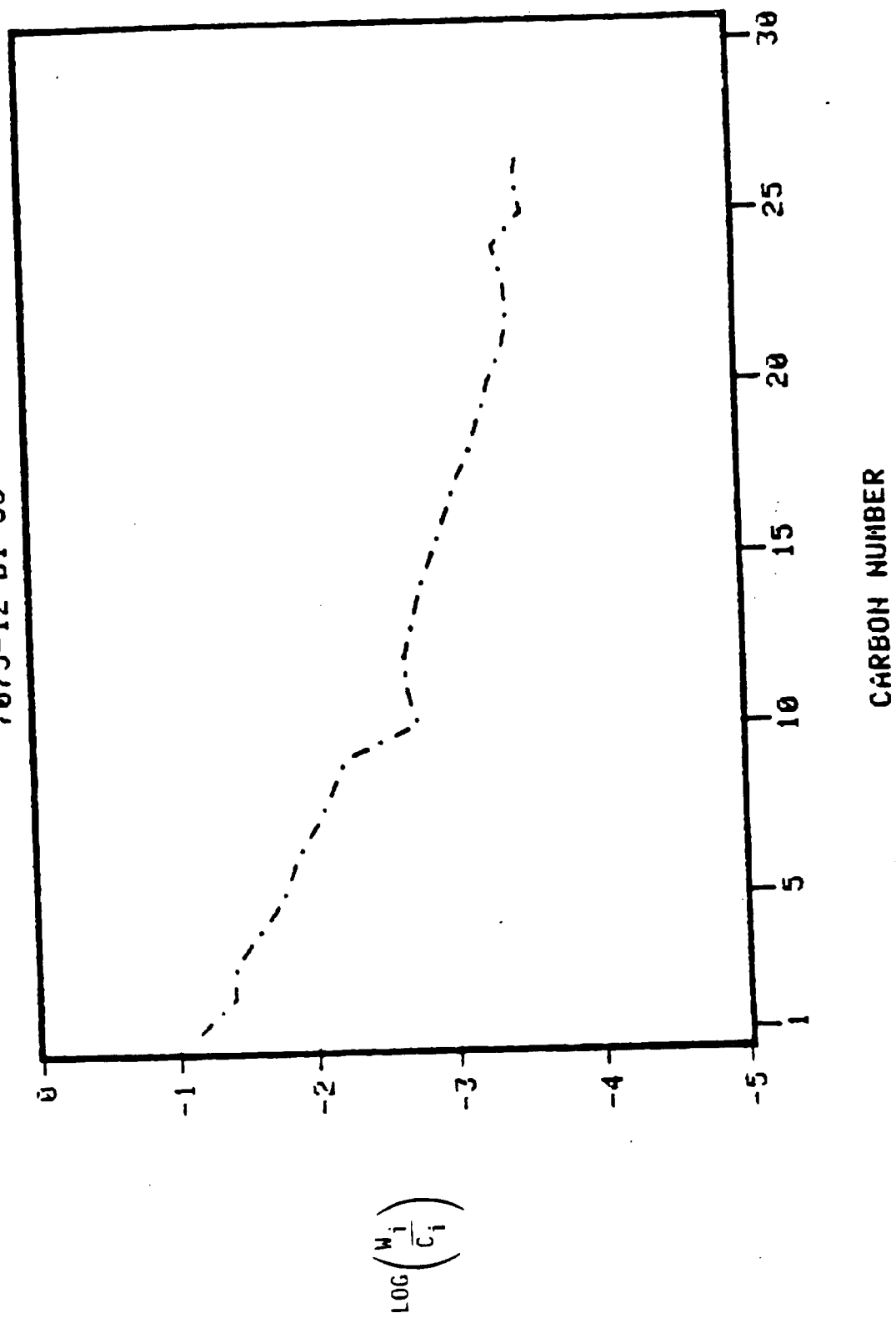


FIGURE 11

HYDROCARBON WEIGHT DISTRIBUTION

7075-12-B1-47

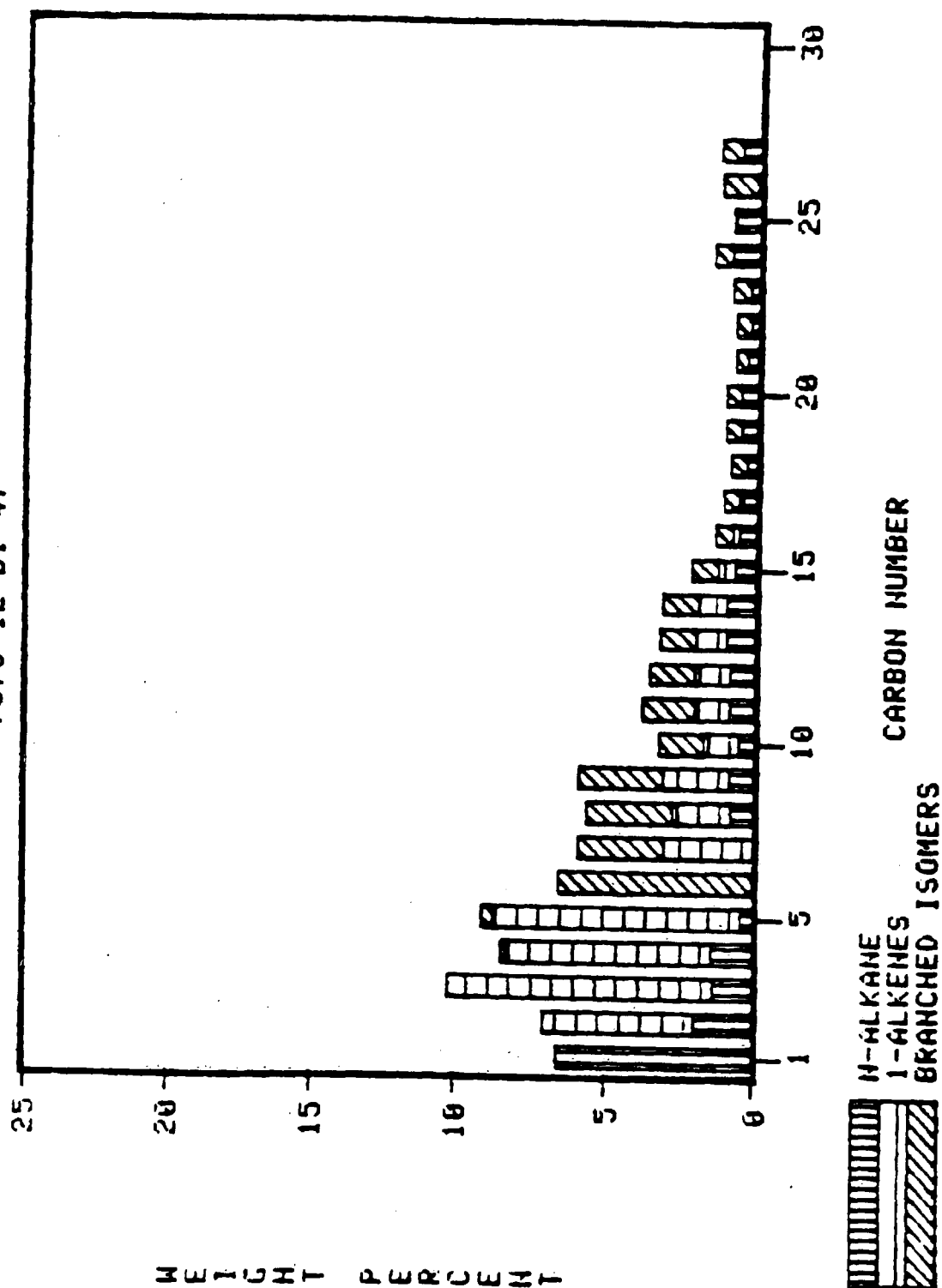


FIGURE 12
HYDROCARBON SCHULZ-FLORY DISTRIBUTION
7075-12-B1-47

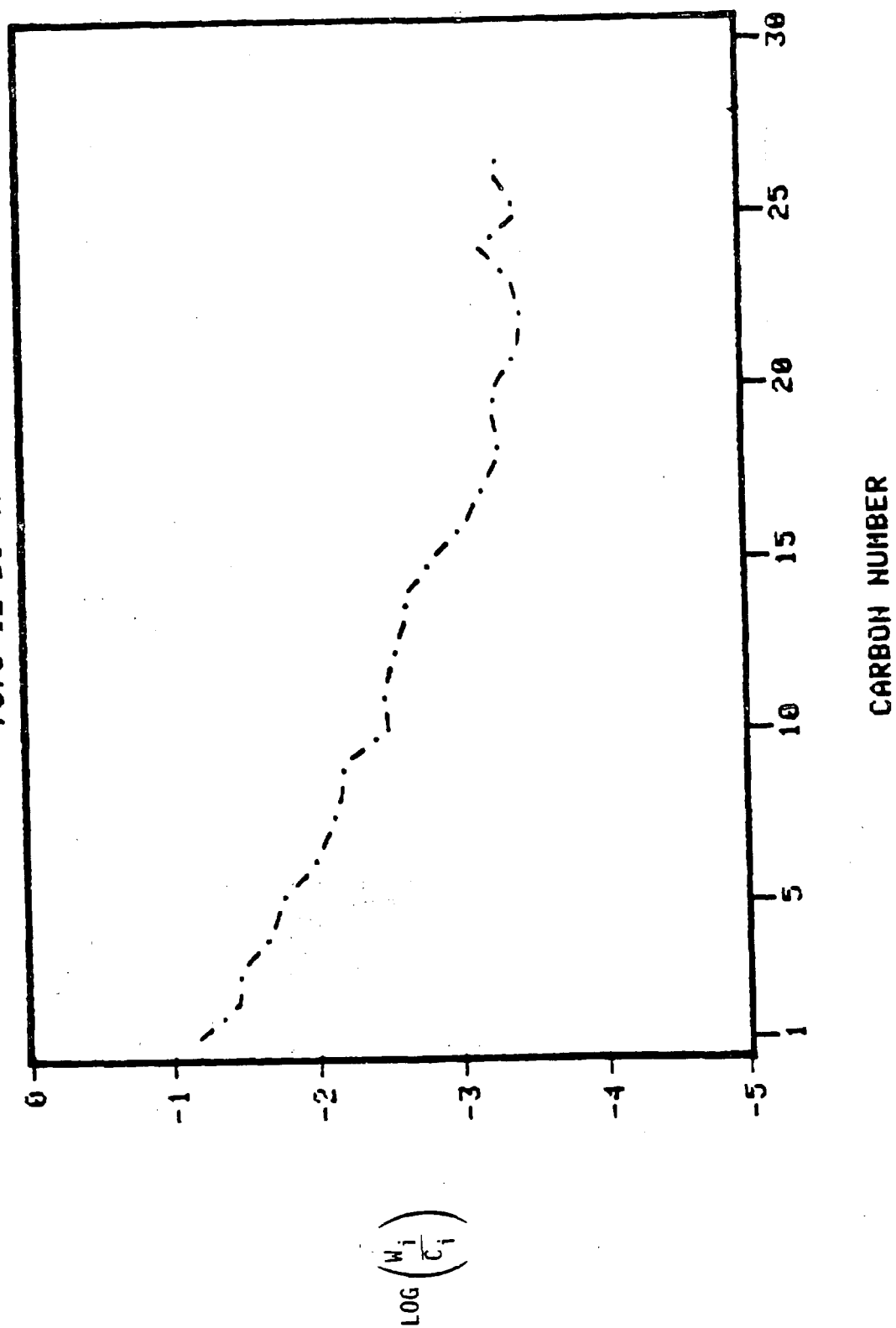


FIGURE 13
HYDROCARBON WEIGHT DISTRIBUTION
7075-12-B1-51

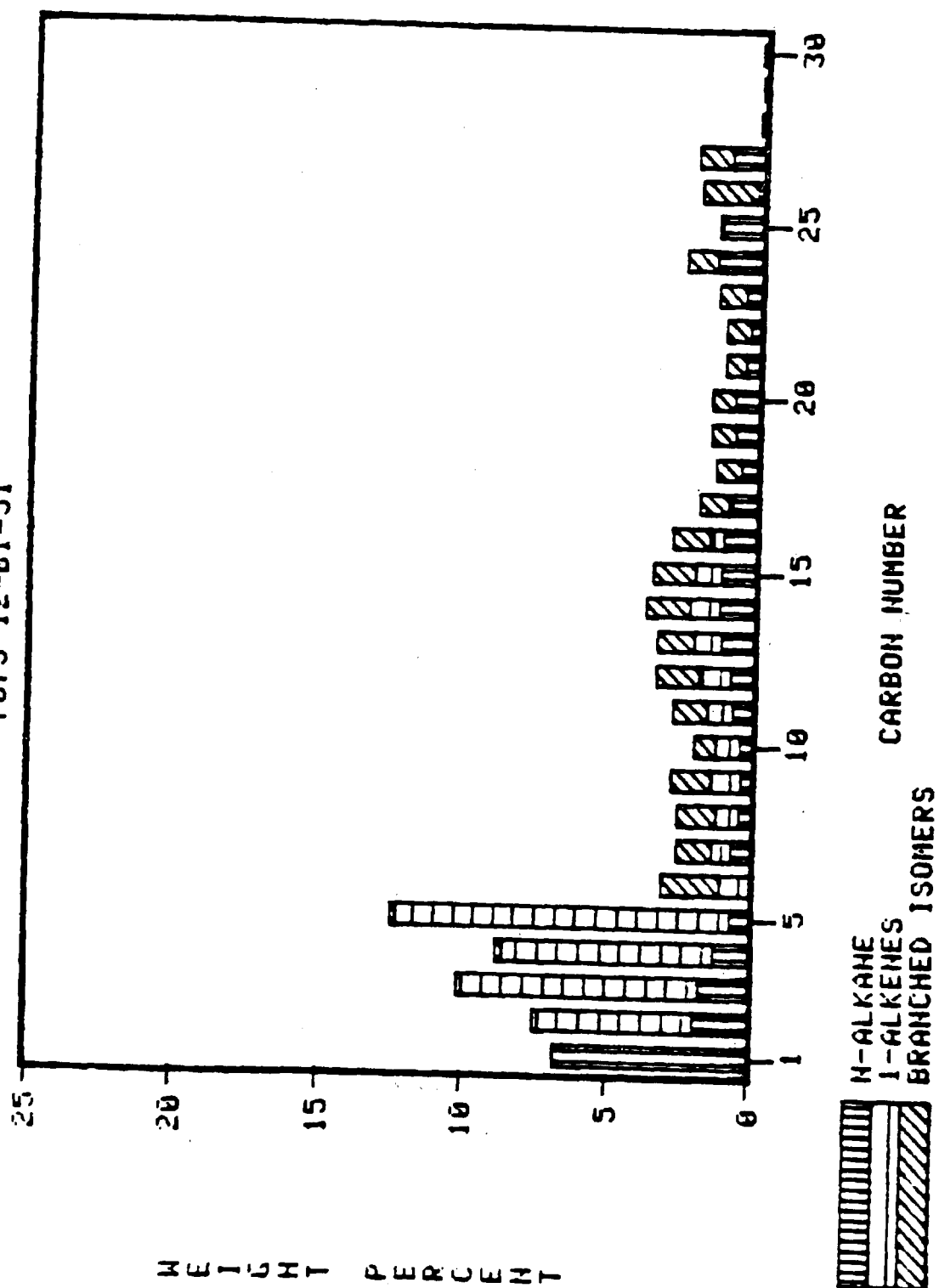


FIGURE 14
HYDROCARBON SCHULZ-FLORY DISTRIBUTION
7075-12-81-51

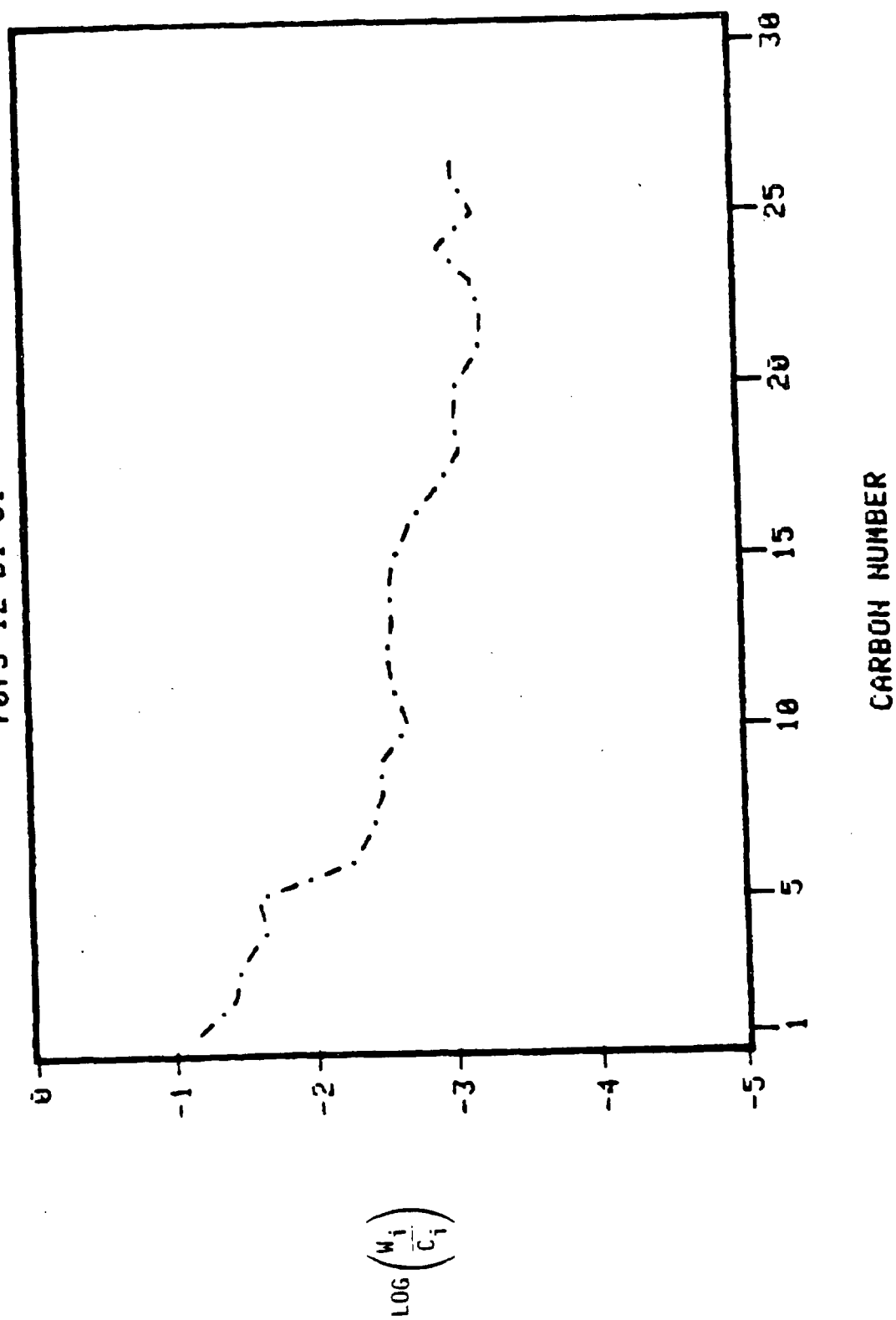


FIGURE 15
HYDROCARBON WEIGHT DISTRIBUTION
7075-12-B1-55

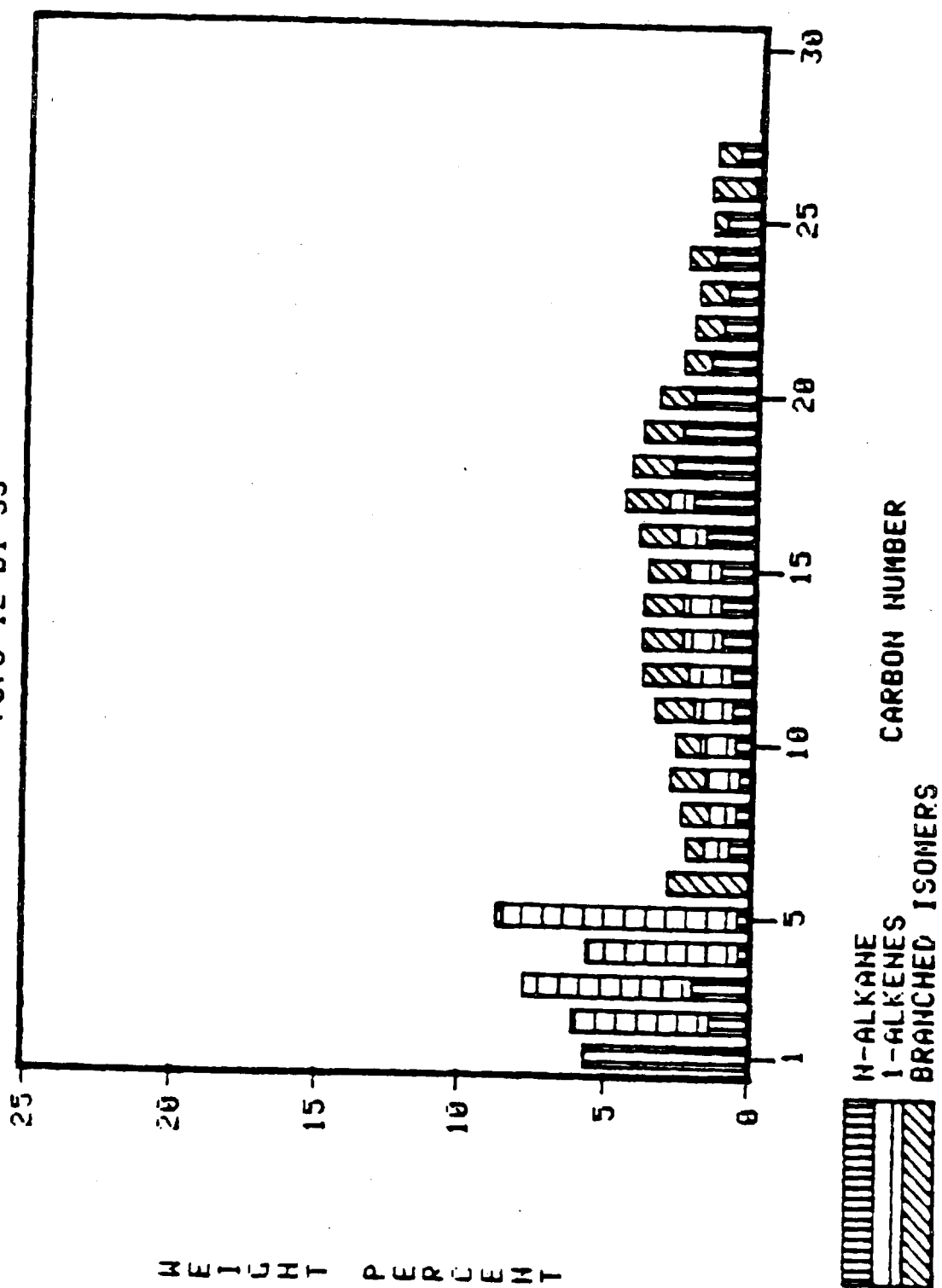


FIGURE 16

HYDROCARBON SCHULZ-FLORY DISTRIBUTION

7075-12-B1-55

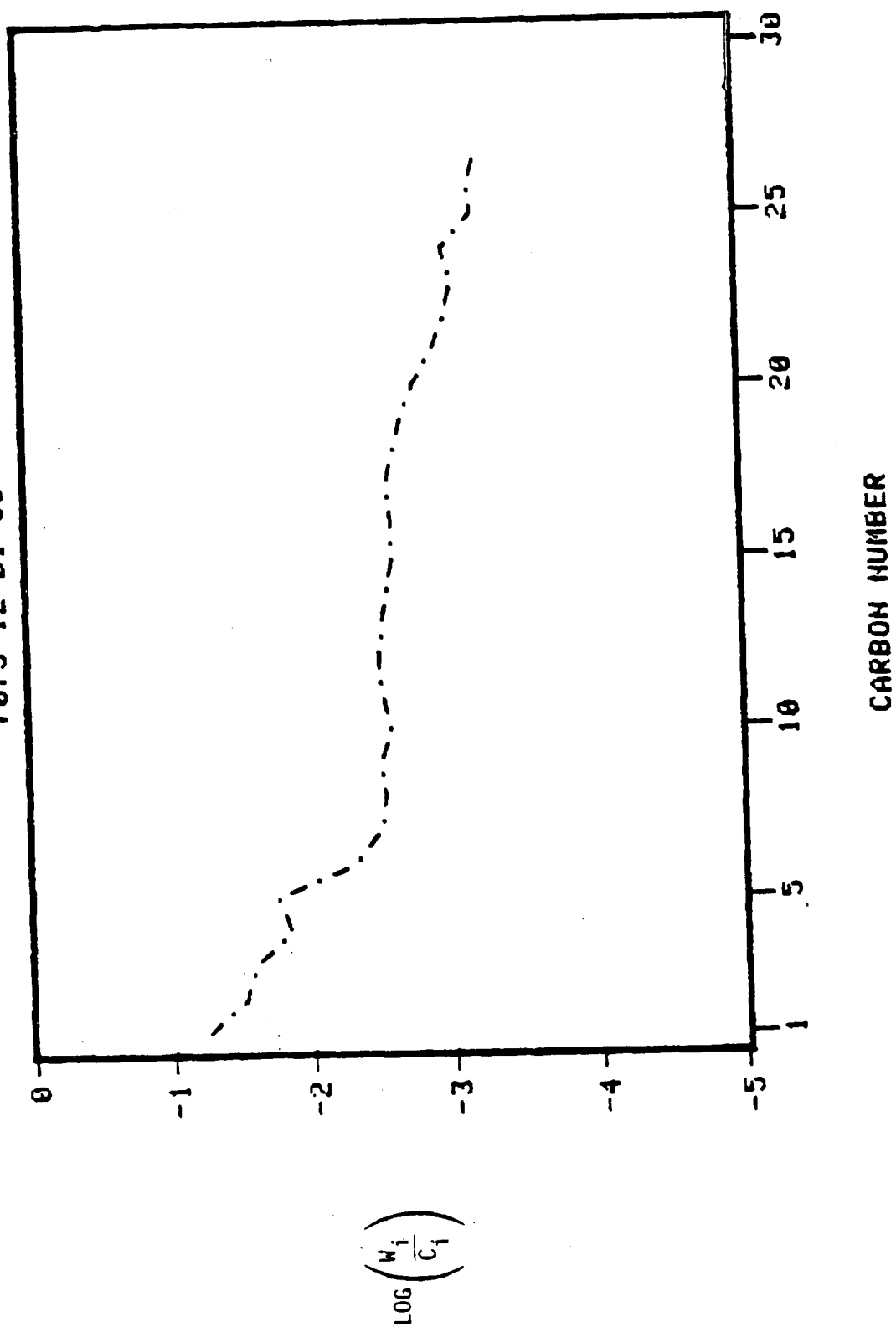


FIGURE 17
HYDROCARBON WEIGHT DISTRIBUTION
7075-12-B1-59

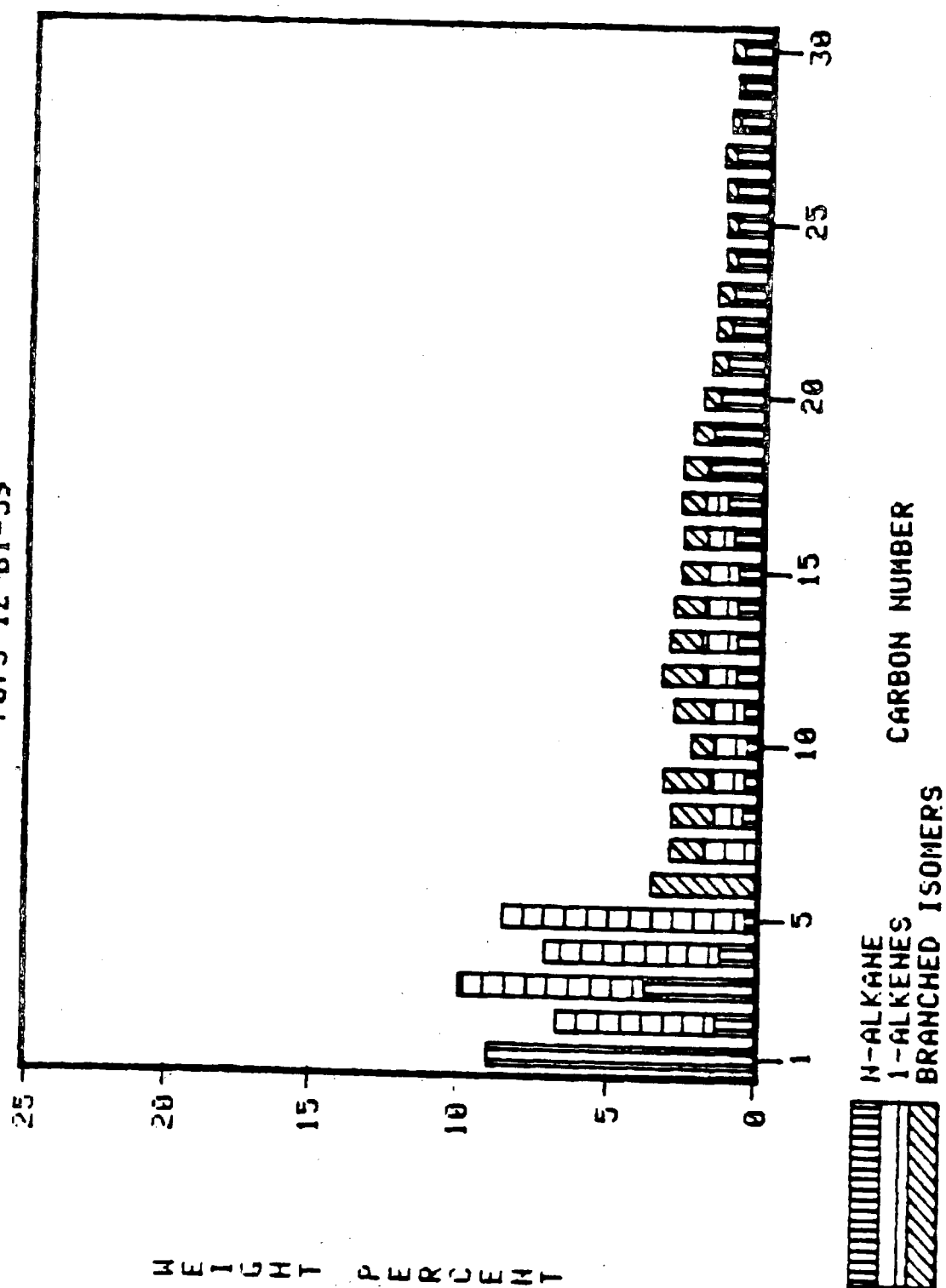


FIGURE 18
HYDROCARBON SCHULZ-FLORY DISTRIBUTION
7075-12-01-59

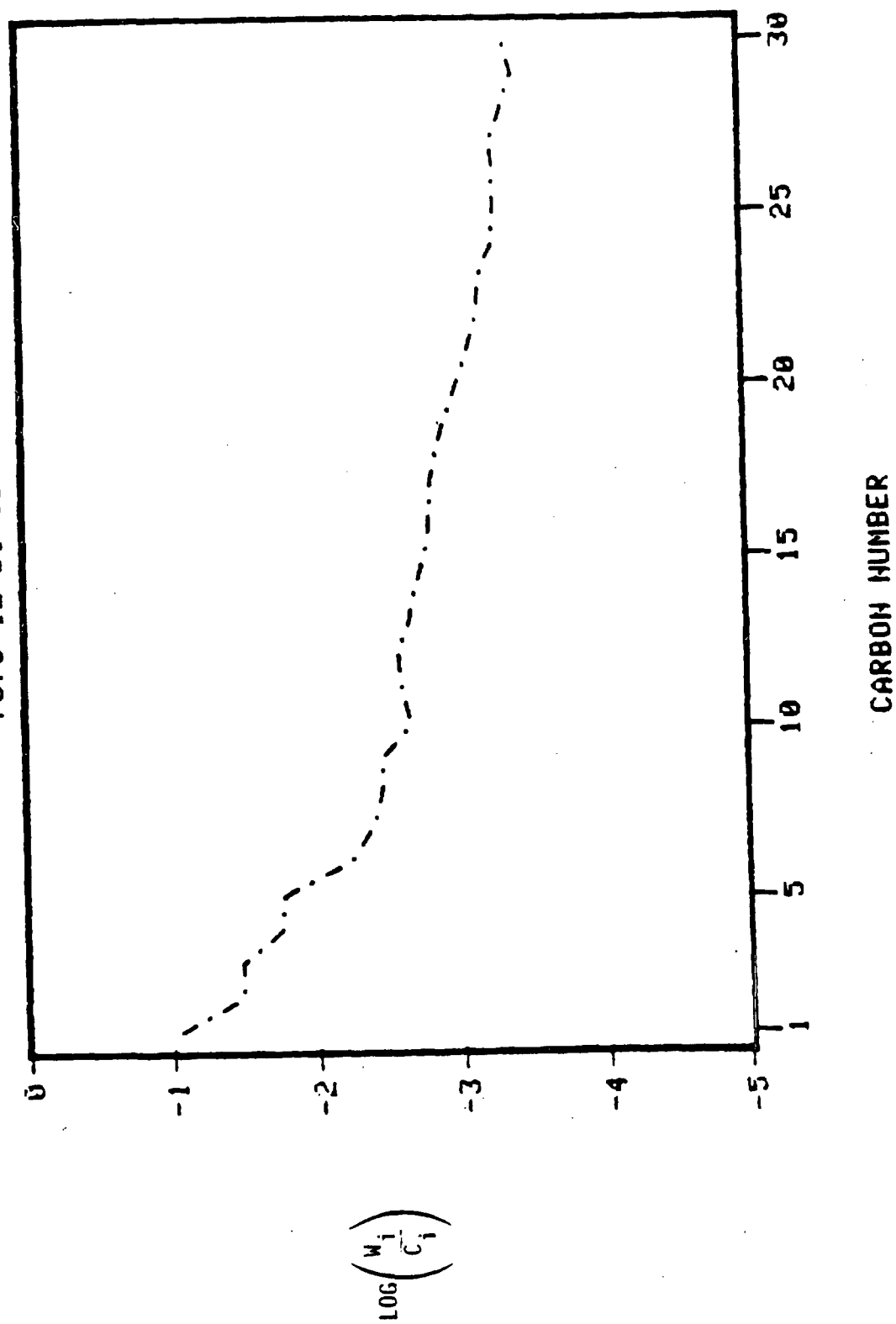


FIGURE 19

HYDROCARBON WEIGHT DISTRIBUTION
7075-12-81-62

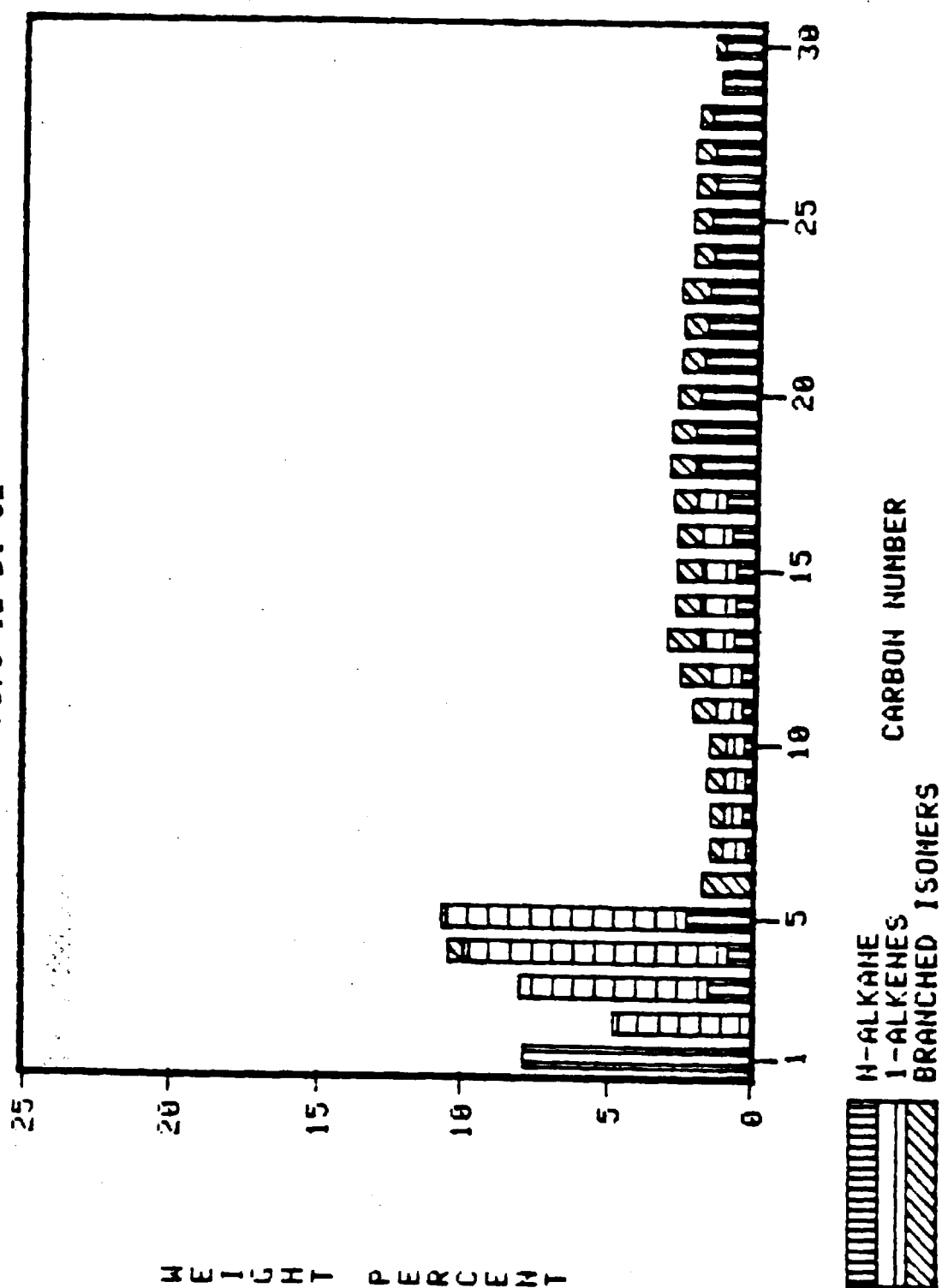


FIGURE 20

HYDROCARBON SCHULZ-FLORY DISTRIBUTION

7075-12-B1-62

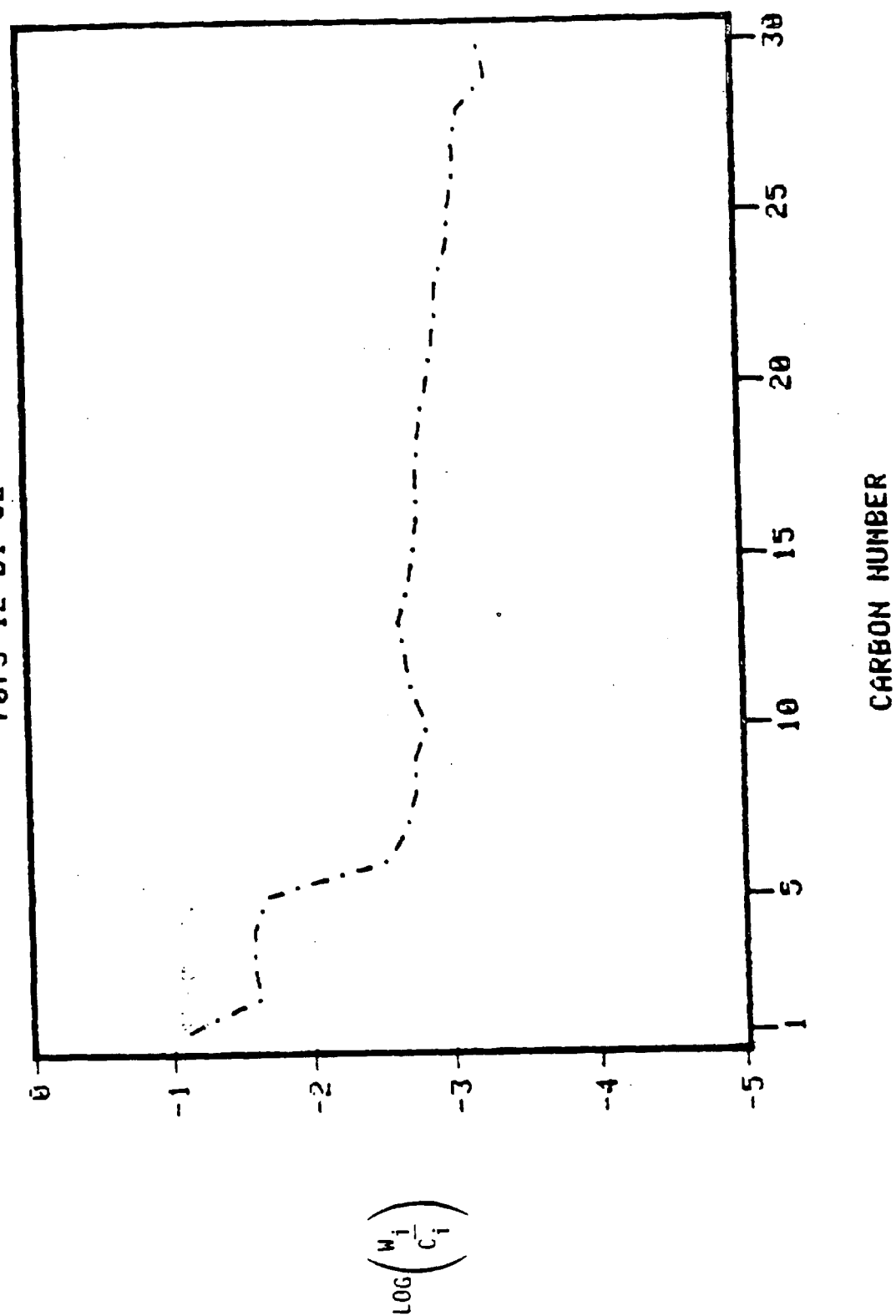


FIGURE 21
HYDROCARBON WEIGHT DISTRIBUTION
7075-12-81-65

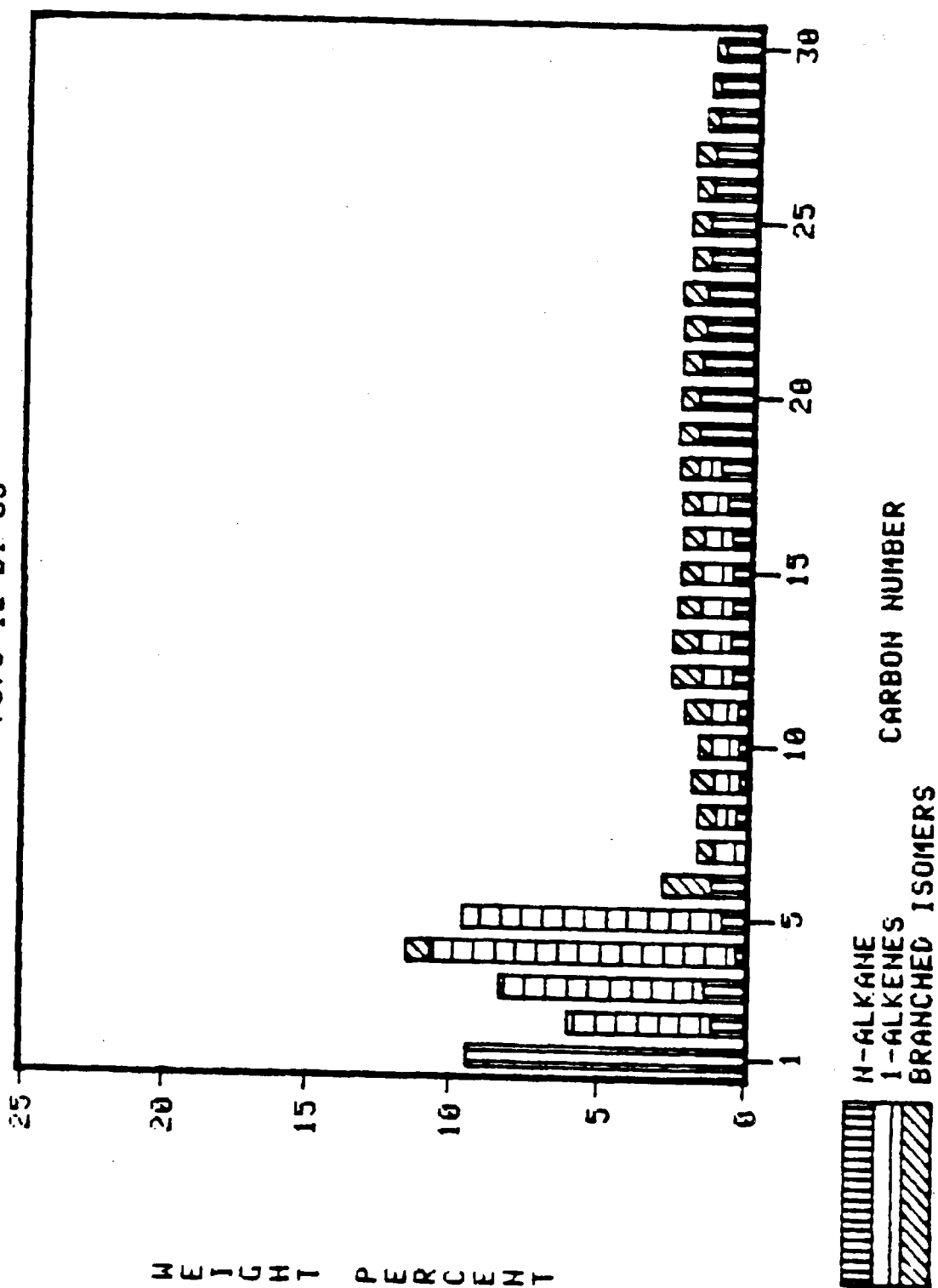


FIGURE 22
 HYDROCARBON SCHULZ-FLORY DISTRIBUTION
 7075-12-B1-65

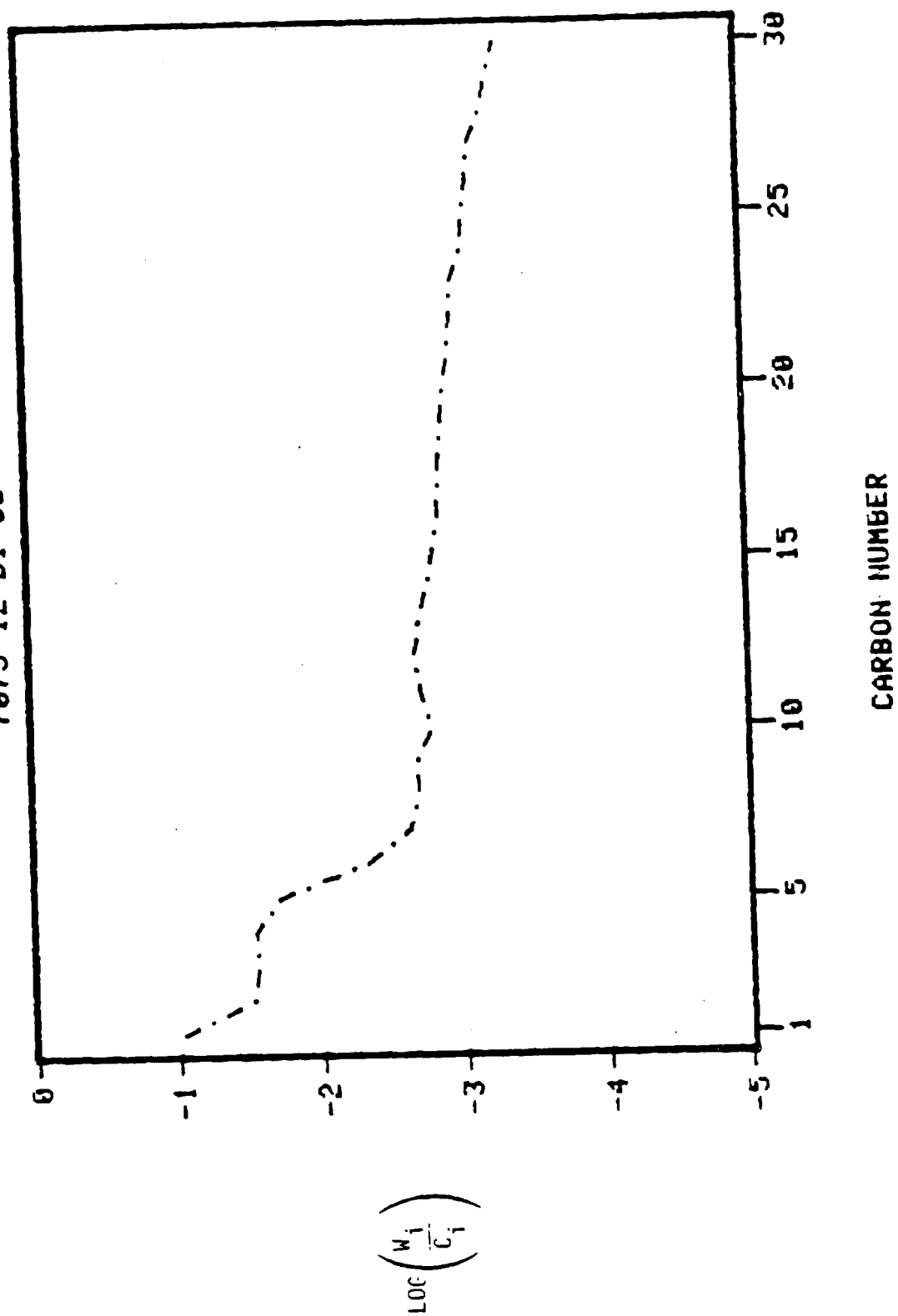


FIGURE 23

HYDROCARBON WEIGHT DISTRIBUTION
7075-12-81-68

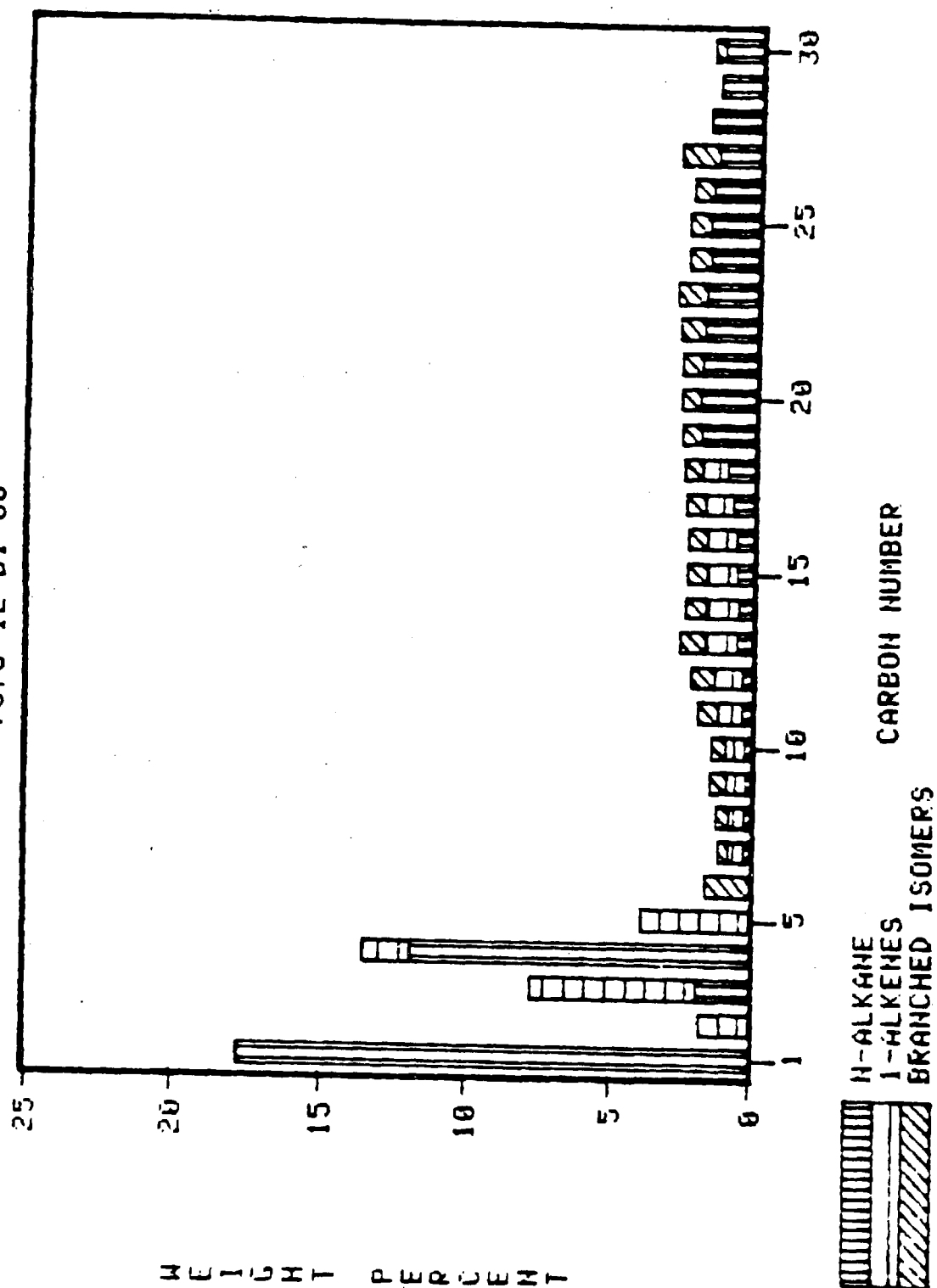


FIGURE 24

HYDROCARBON SCHULZ-FLORY DISTRIBUTION

7075-12-B1-68

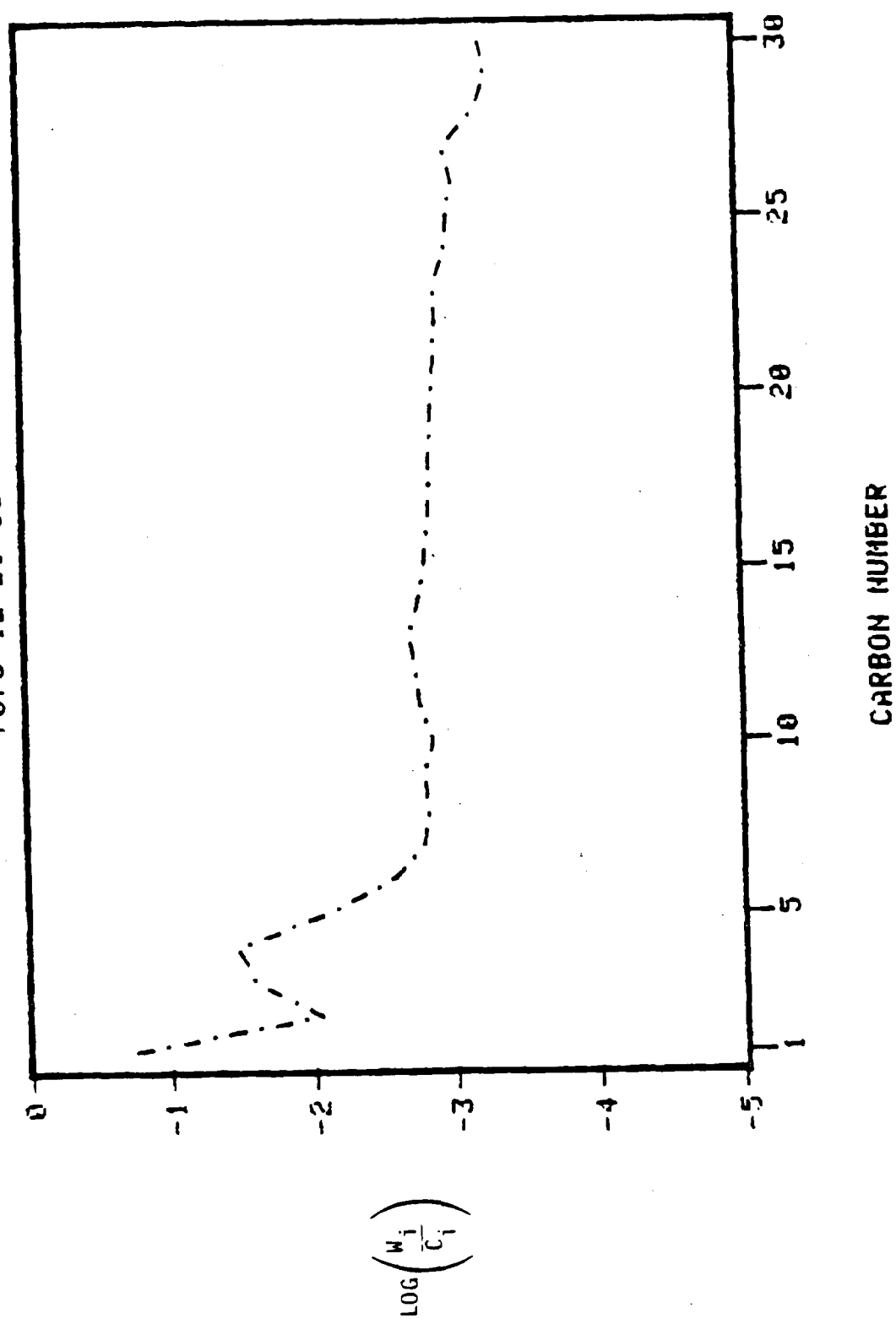


FIGURE 25

HYDROCARBON WEIGHT DISTRIBUTION

7075-12-B1-71

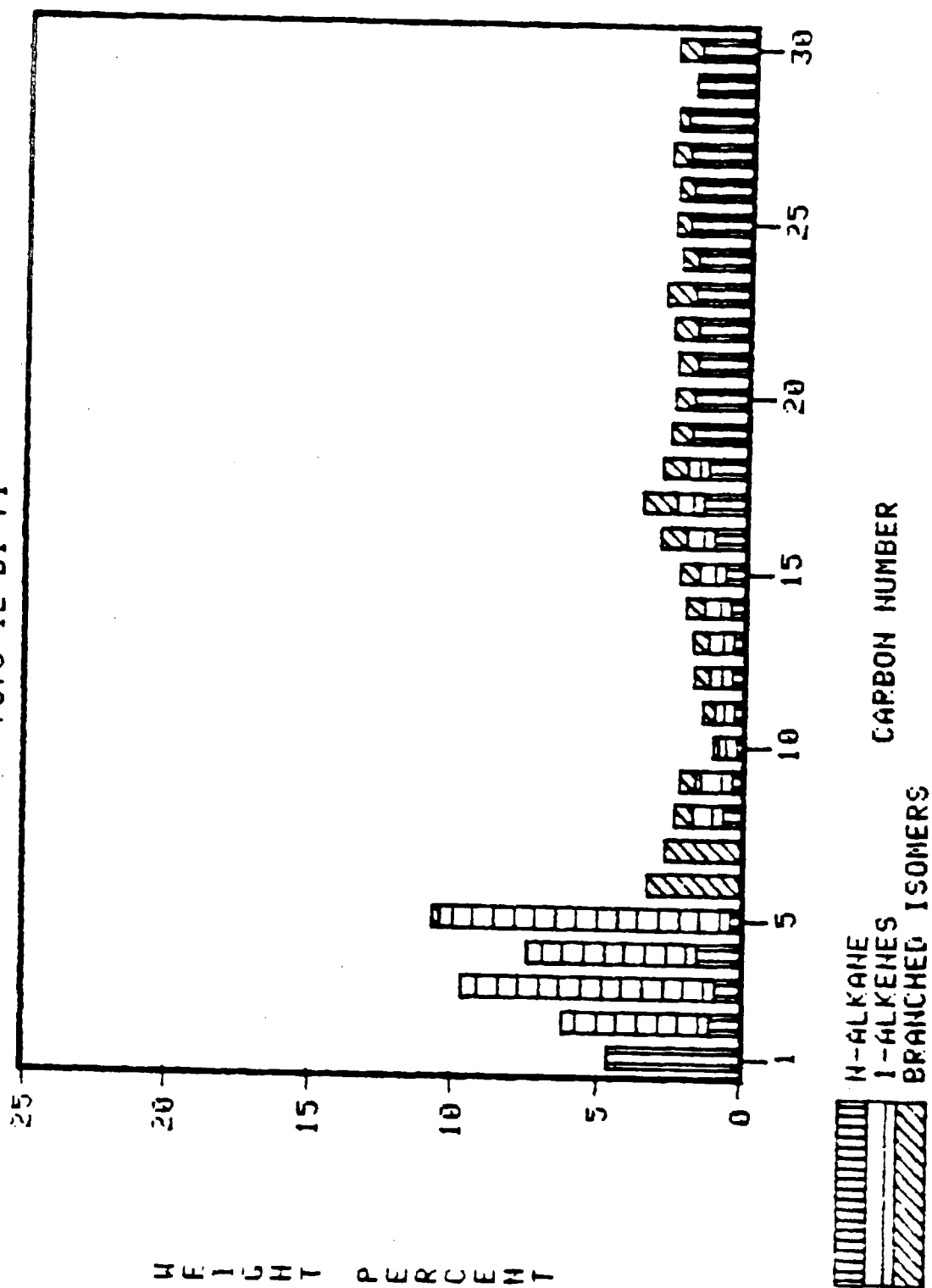


FIGURE 26

HYDROCARBON SCHULZ-FLORY DISTRIBUTION

7075-12-B1-71

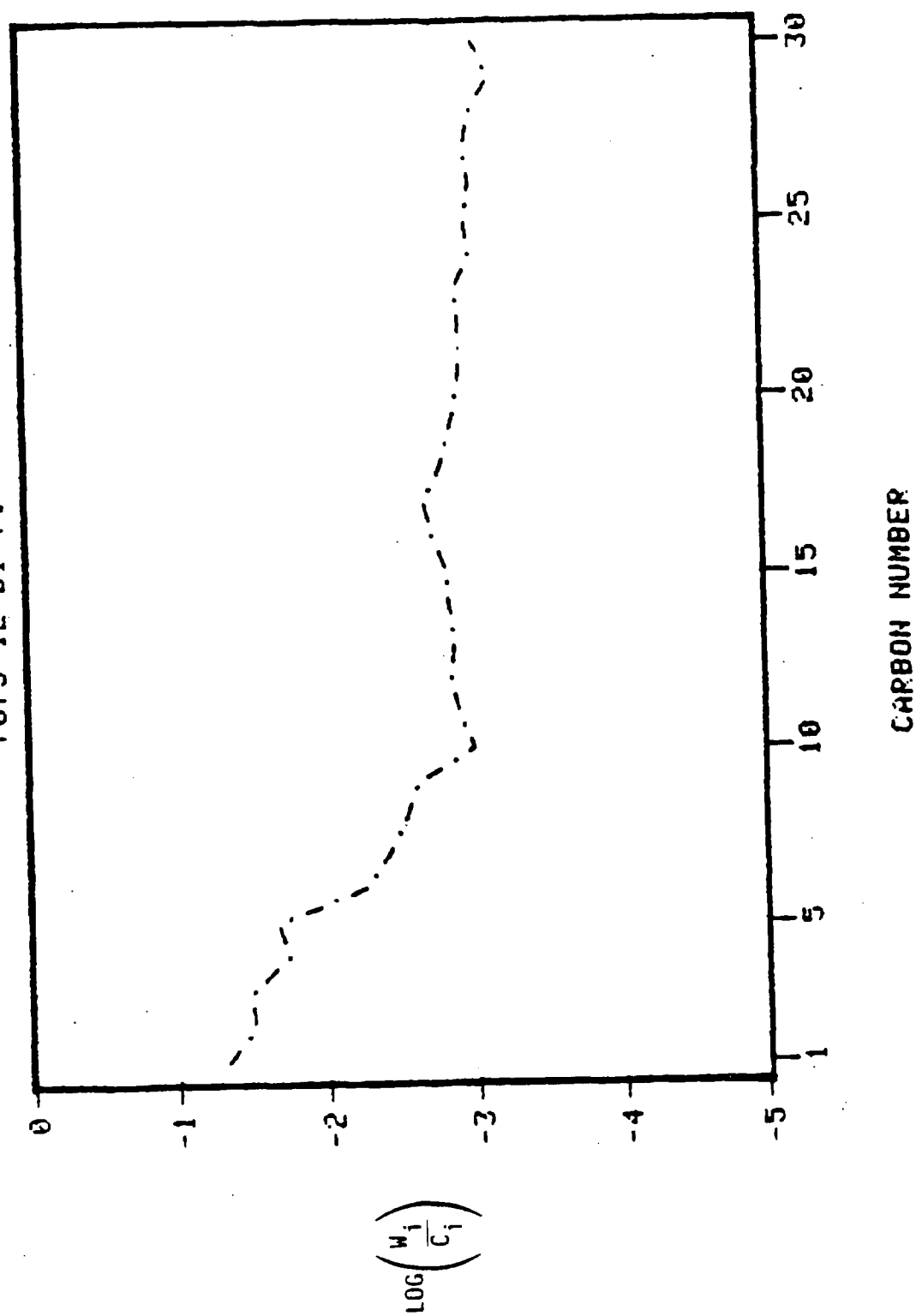


FIGURE 27

HYDROCARBON WEIGHT DISTRIBUTION

7075-12-B1-74

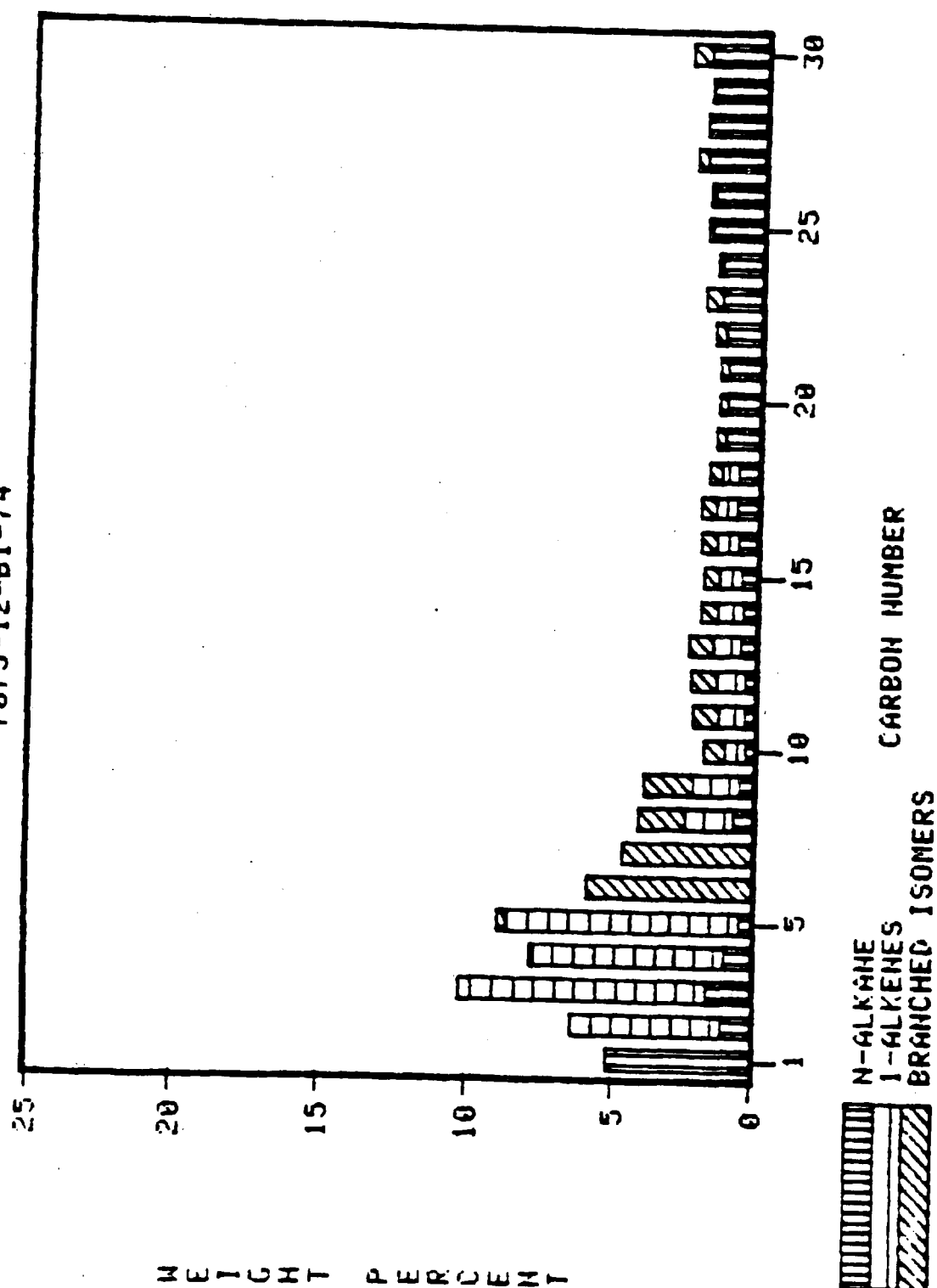


FIGURE 28

HYDROCARBON SCHULZ-FLORY DISTRIBUTION

7075-12-01-74

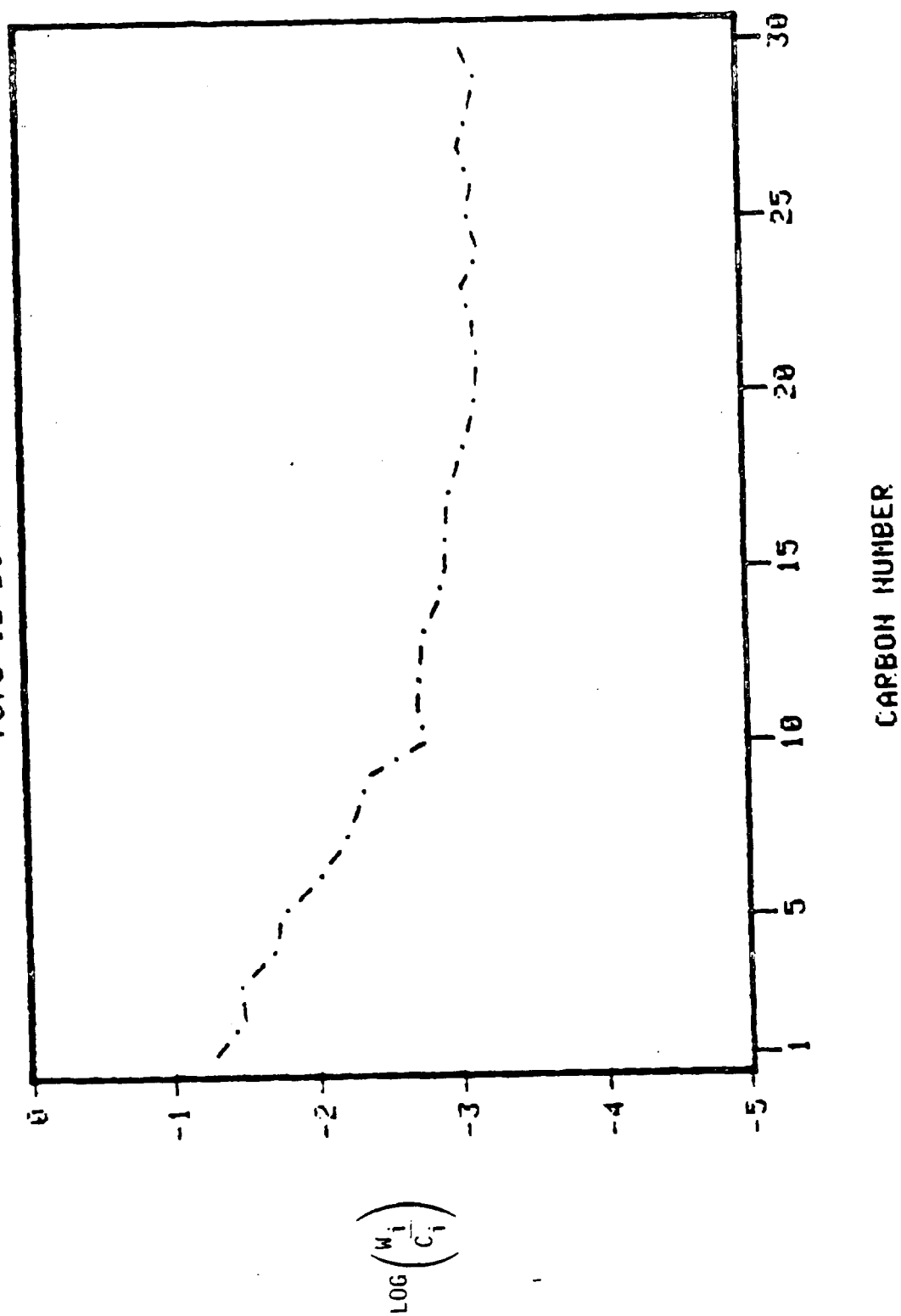


FIGURE 29

HYDROCARBON WEIGHT DISTRIBUTION
7075-12-B1-82

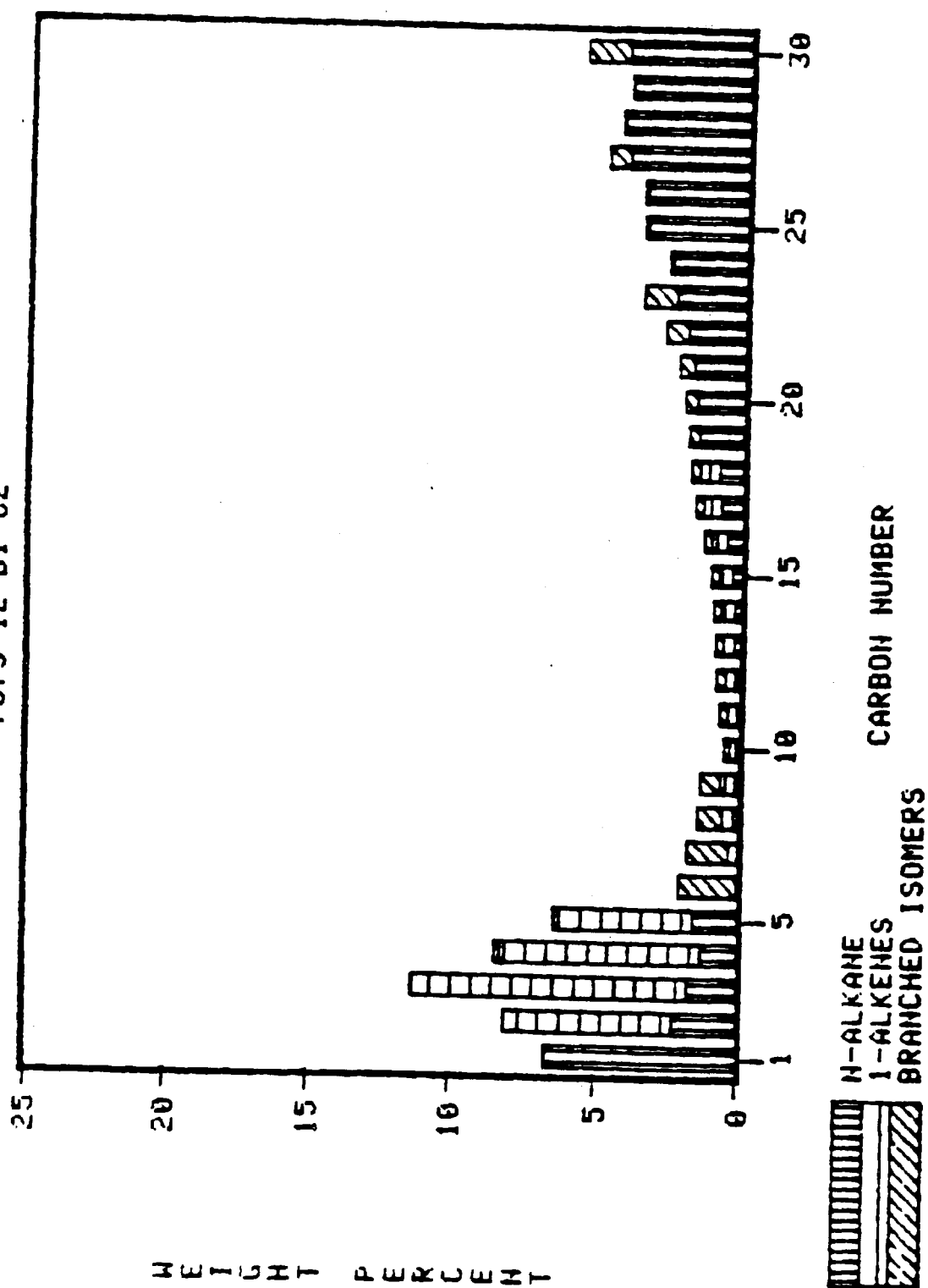
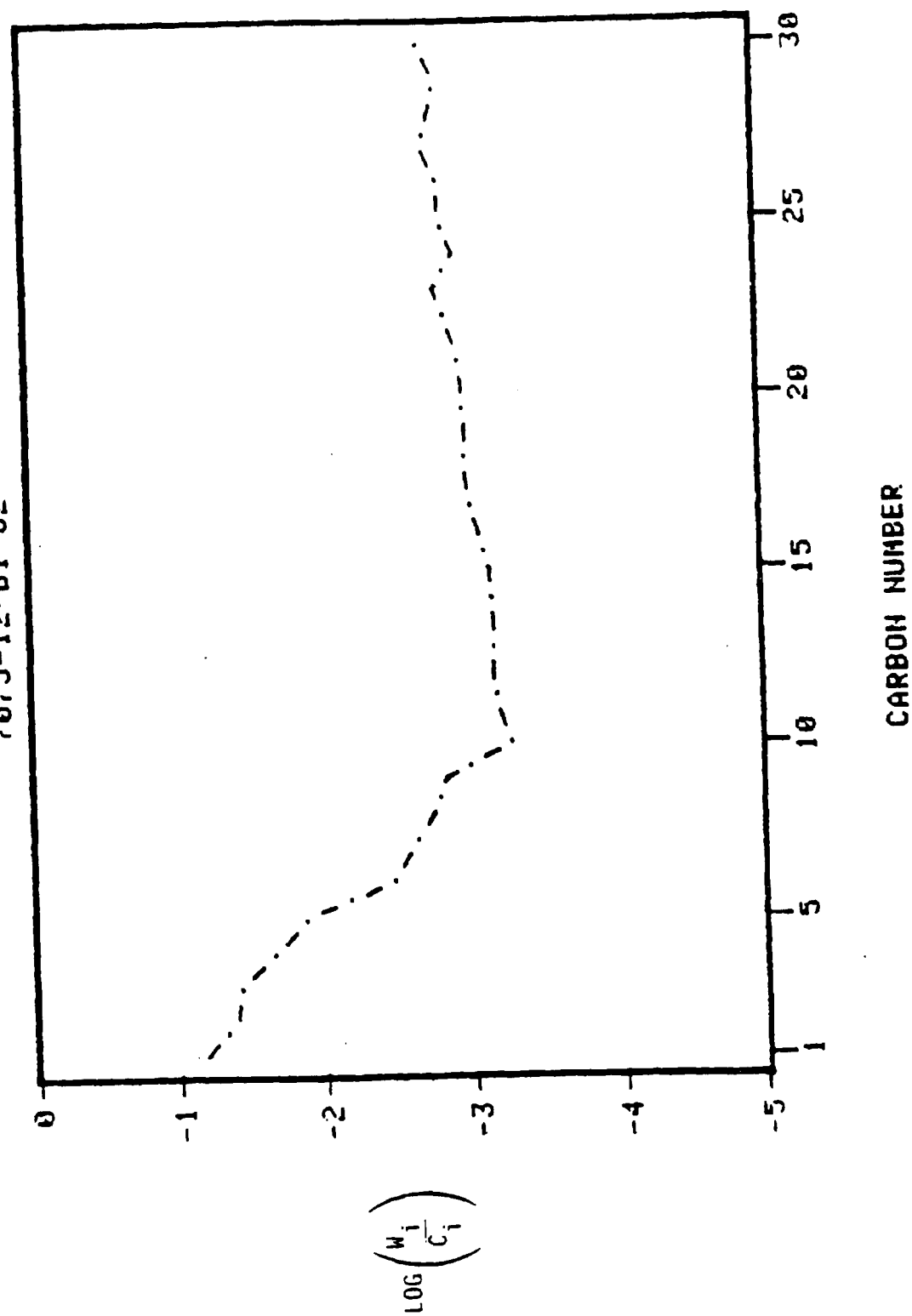


FIGURE 30

HYDROCARBON SCHULZ-FLORY DISTRIBUTION

7075-12-B1-82



7075-12-B1
slurry oil
ex-reactor

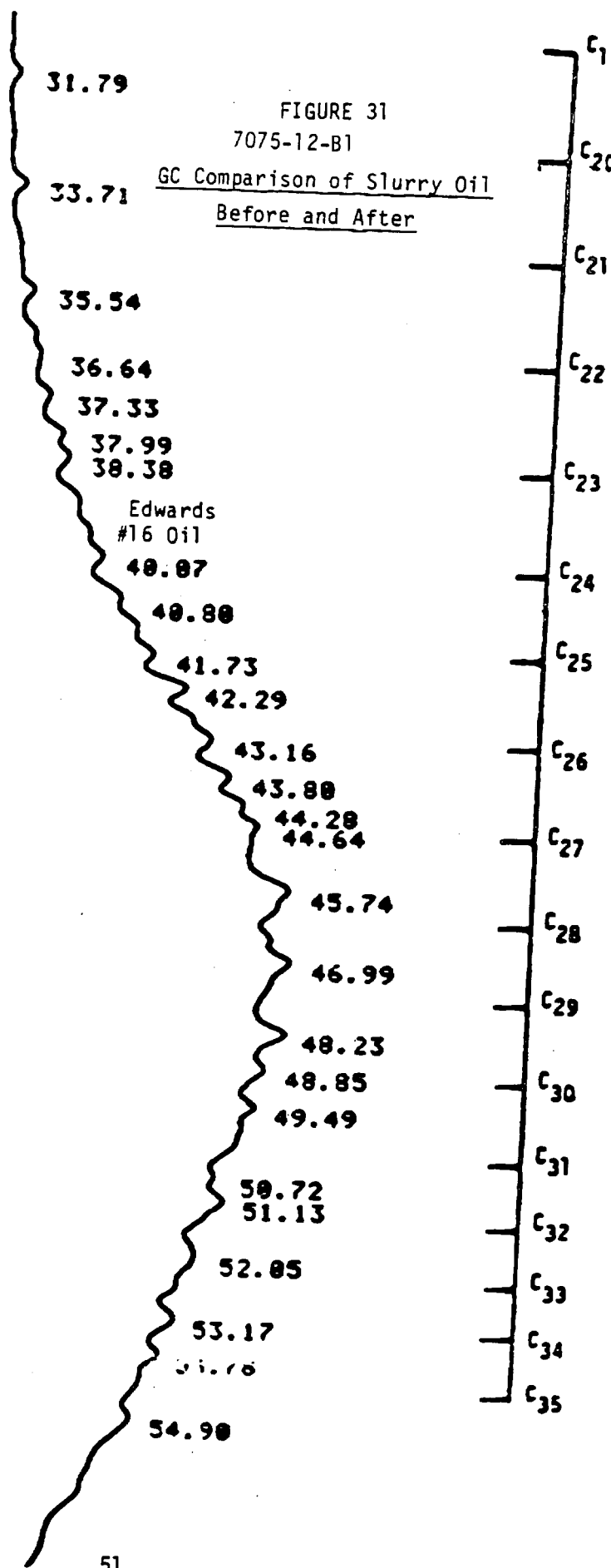
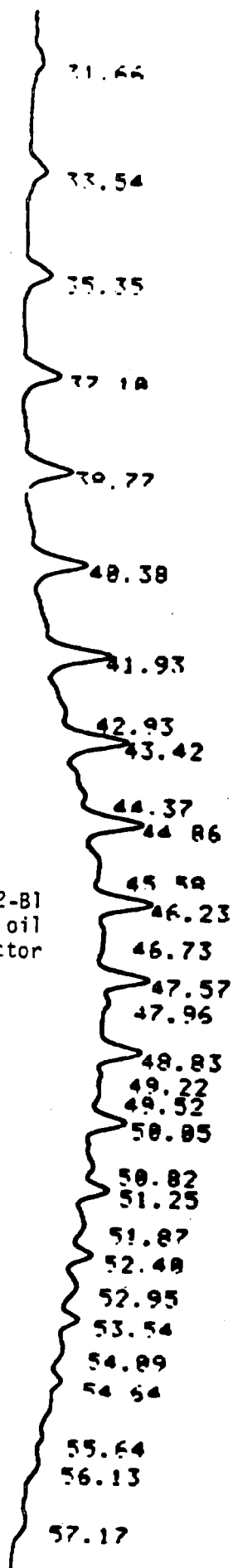


FIGURE 31
7075-12-B1
GC Comparison of Slurry Oil
Before and After

FIGURE 32

5 INCH COLD FLOW SIMULATOR

ISOPARAFFIN, 45-63 μ M SILICA, N2

GAS HOLDUP: AVERAGE VS MANOMETER METHOD

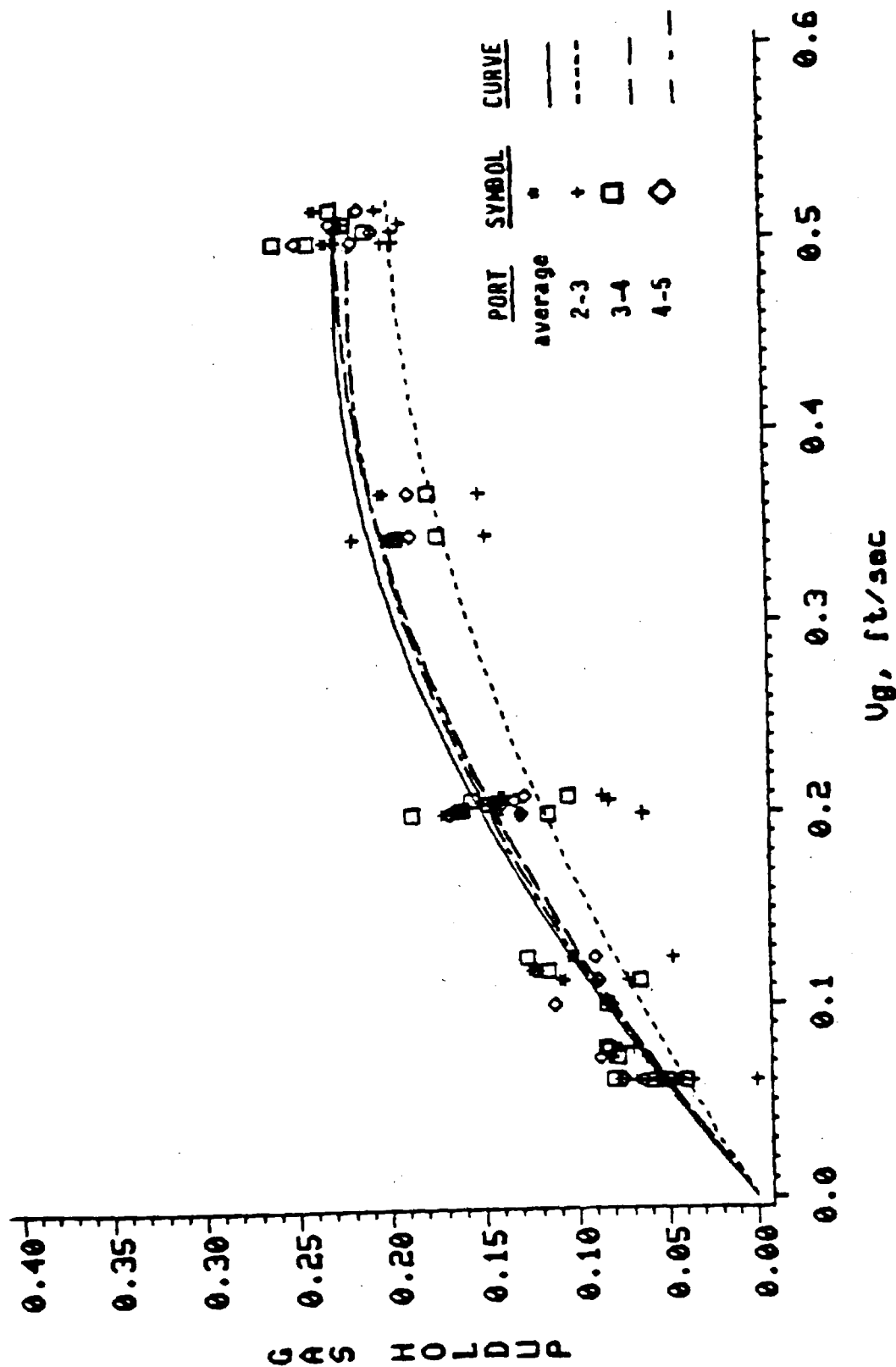


FIGURE 33

5 INCH COLD FLOW SIMULATOR

WATER, AIR

GAS HOLDUP: AVERAGE VS MANOMETER METHOD

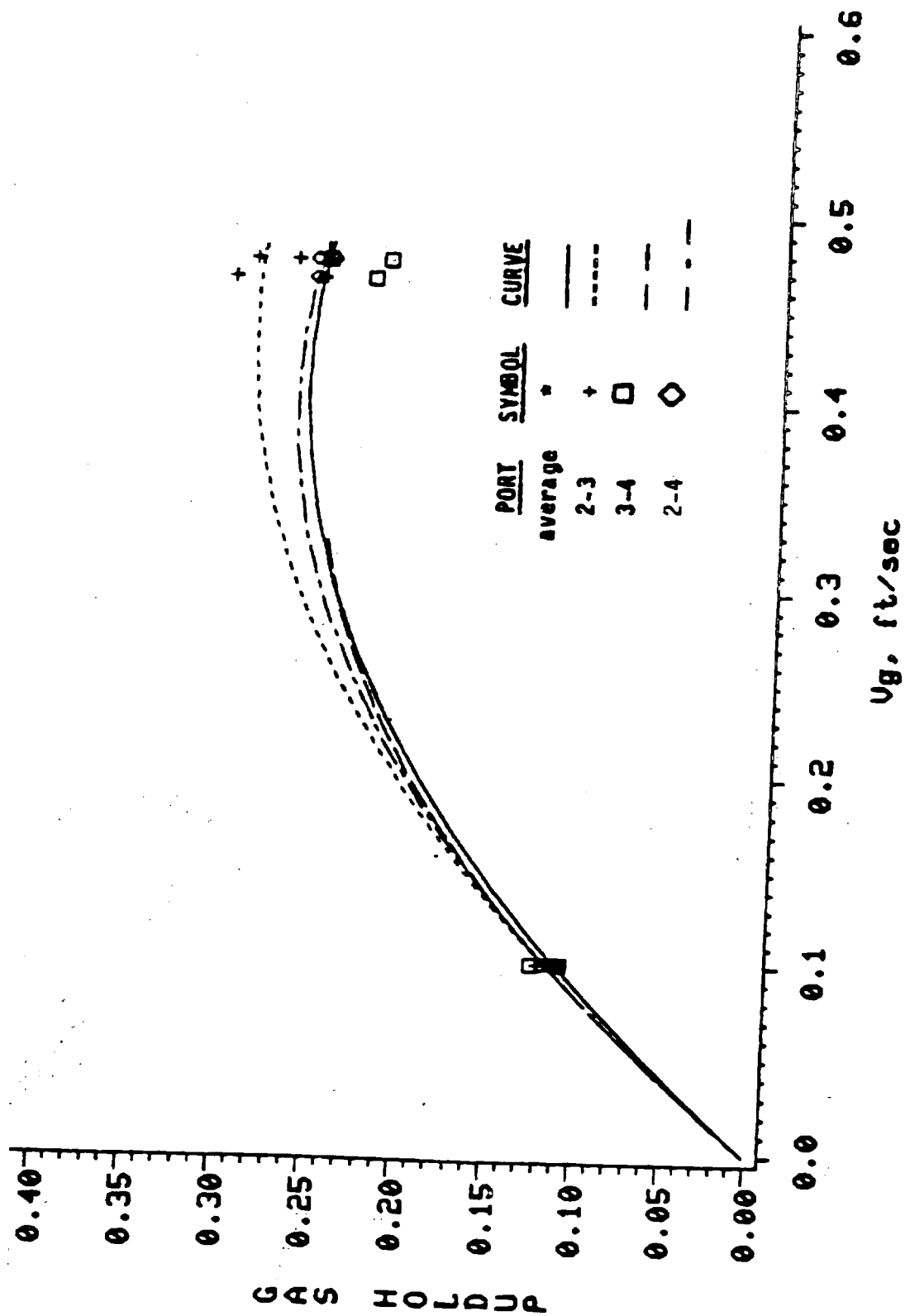


FIGURE 34

5 INCH COLD FLOW SIMULATOR

WATER, 0-5 μ M SILICA, AIR

GAS HOLDUP: AVERAGE VS MANOMETER METHOD

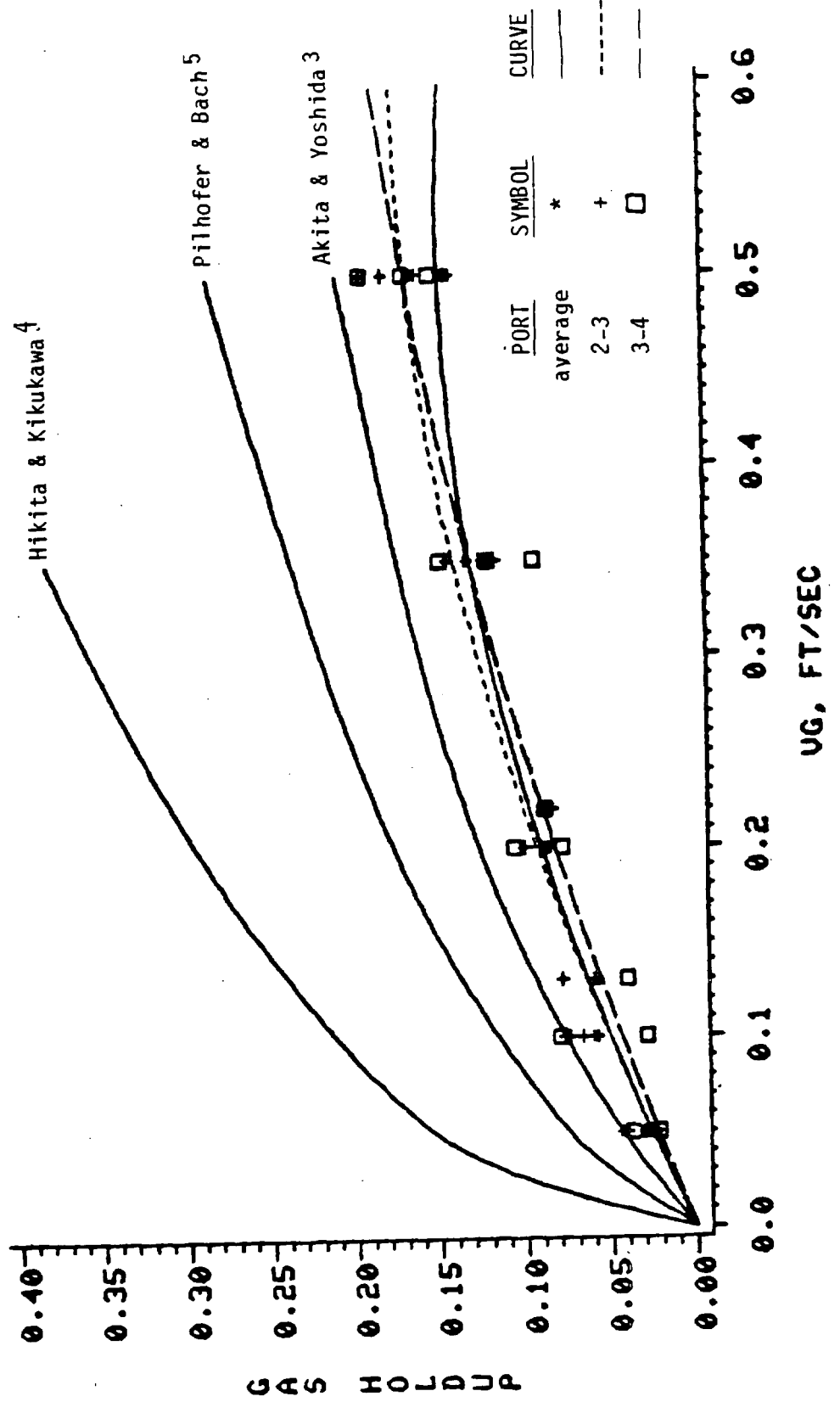


FIGURE 35

5 INCH COLD FLOW SIMULATOR WATER, 90-116 μ M SILICA, AIR

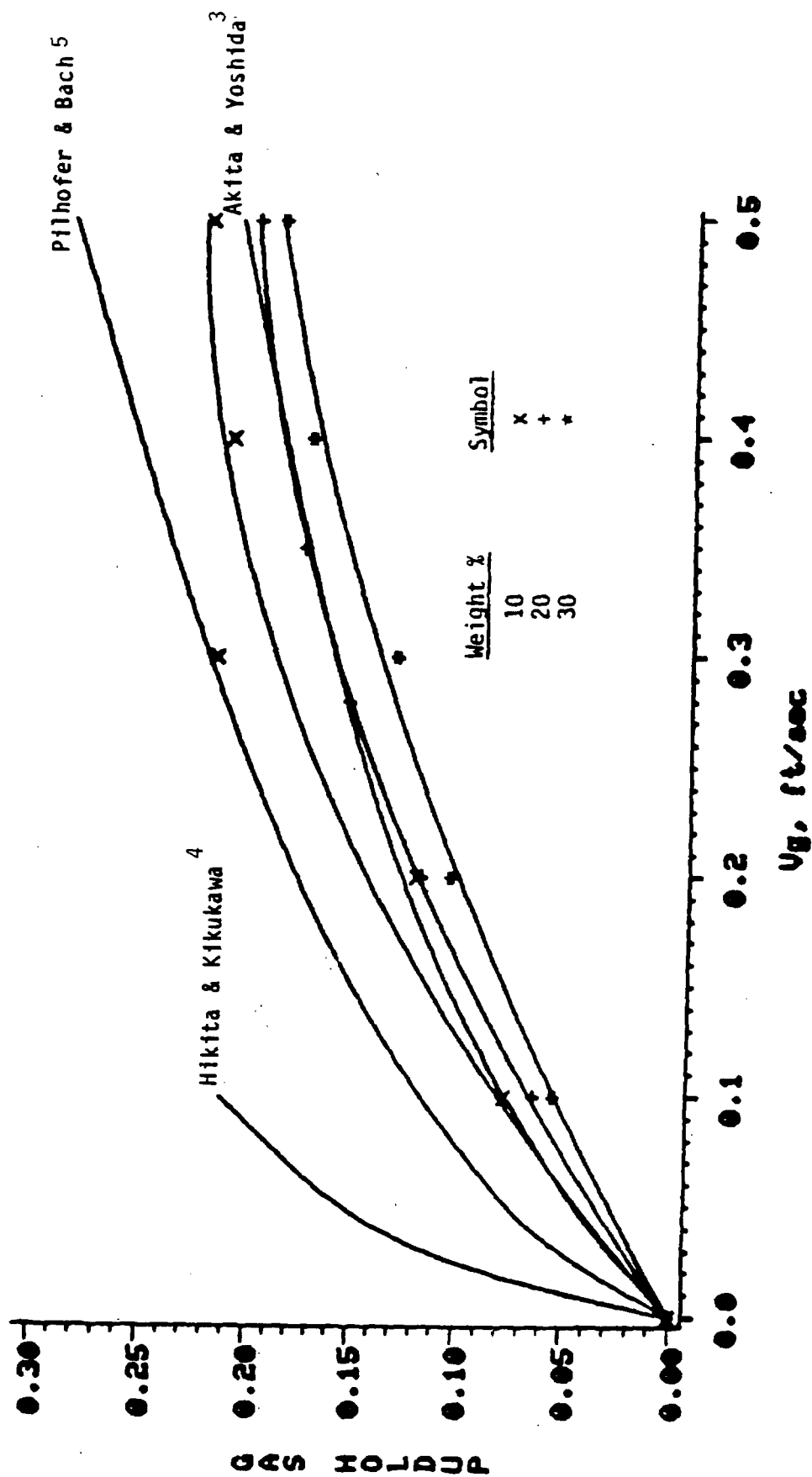


FIGURE 36

5 INCH COLD FLOW SIMULATOR

WATER, 10 WTX 90-115 μ M SILICA, AIR
LIQUID VELOCITY = 0.0 FT/SEC

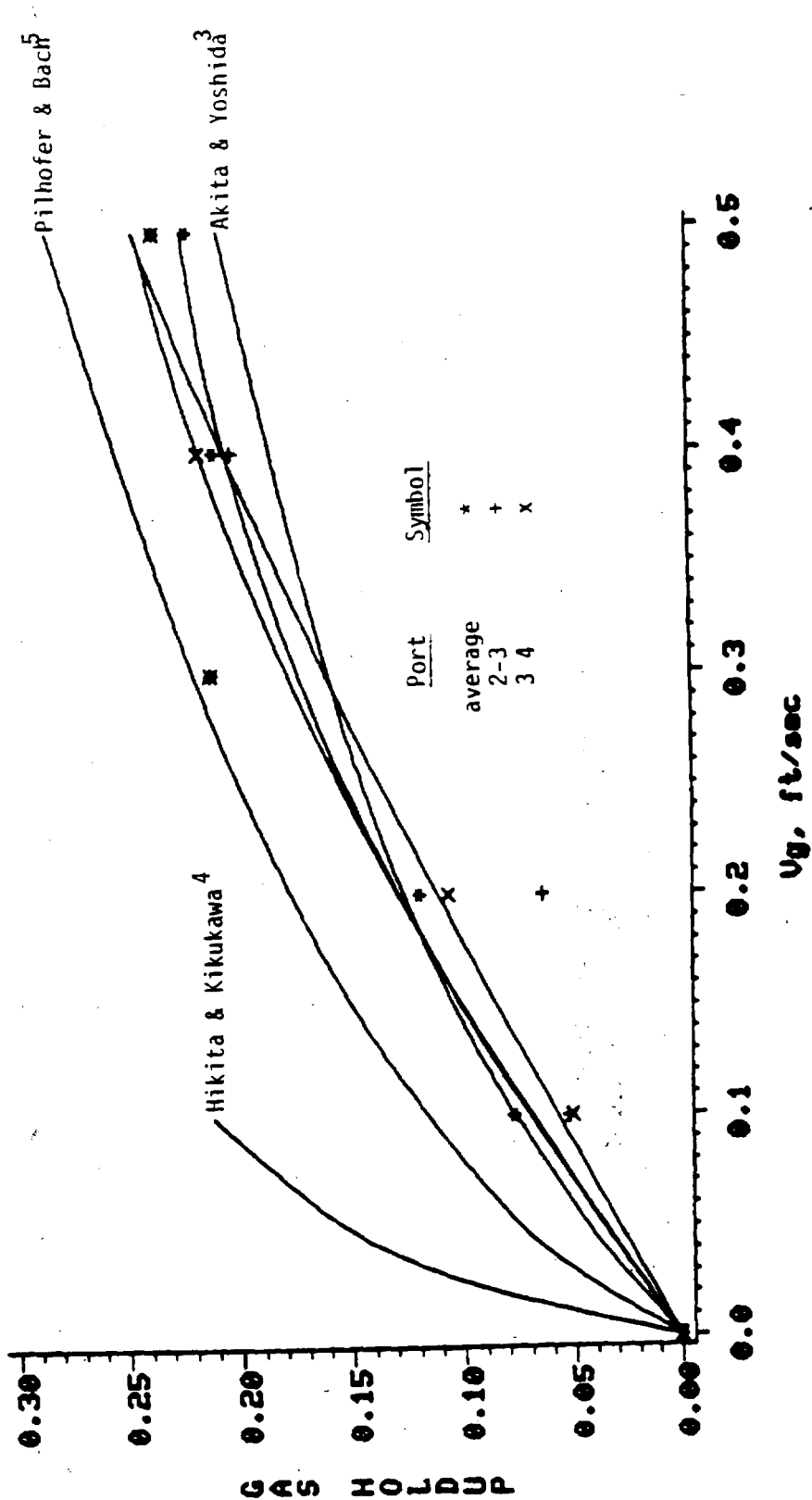


FIGURE 37

5 INCH COLD FLOW SIMULATOR

WATER, 20 WT% 90-16 μ M SILICA, AIR
LIQUID VELOCITY = 0.0 FT/SEC

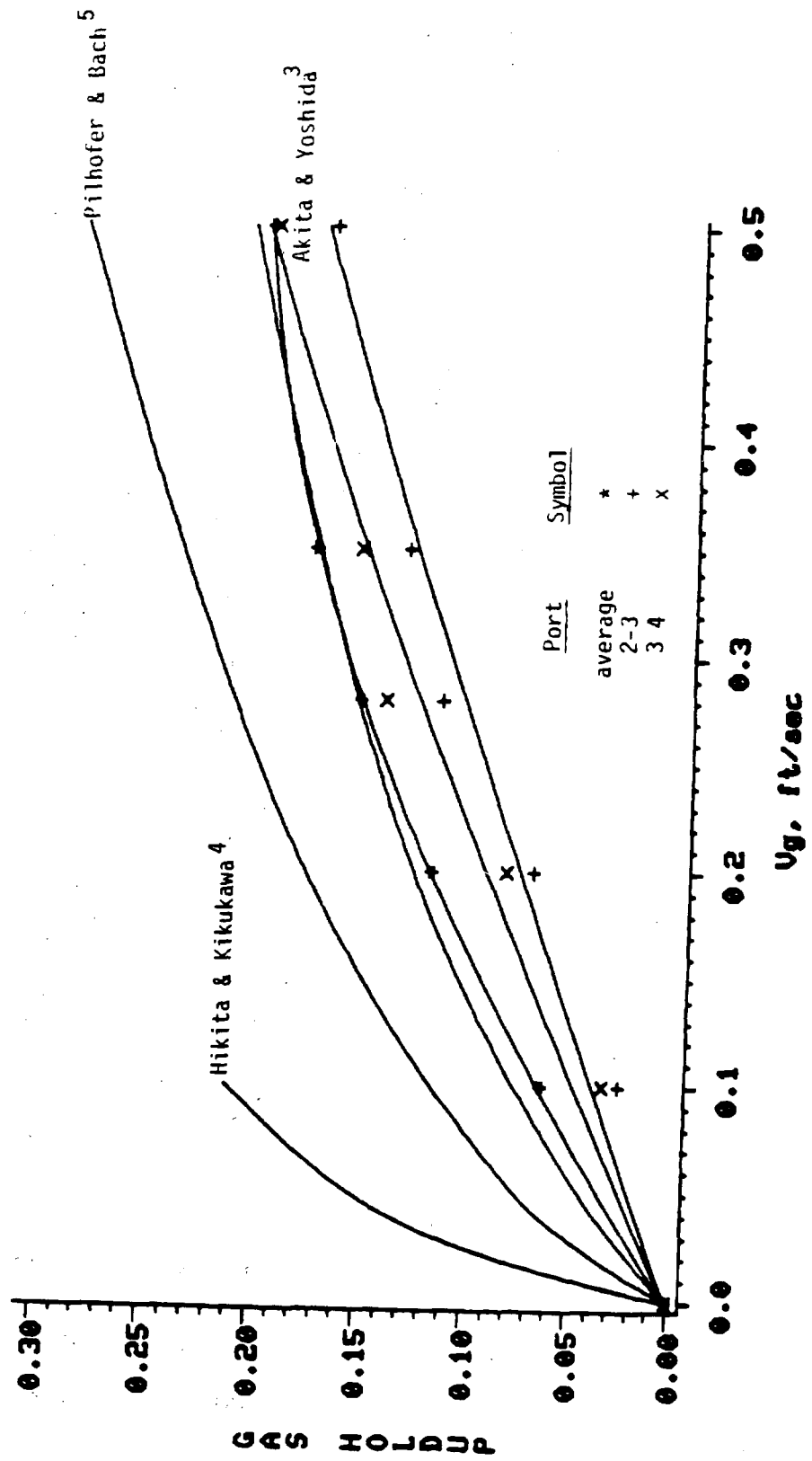


FIGURE 38

5 INCH COLD FLOW SIMULATOR

WATER, 30 WT% 90-116 μ M SILICA, AIR
LIQUID VELOCITY = 0.0 FT/SEC

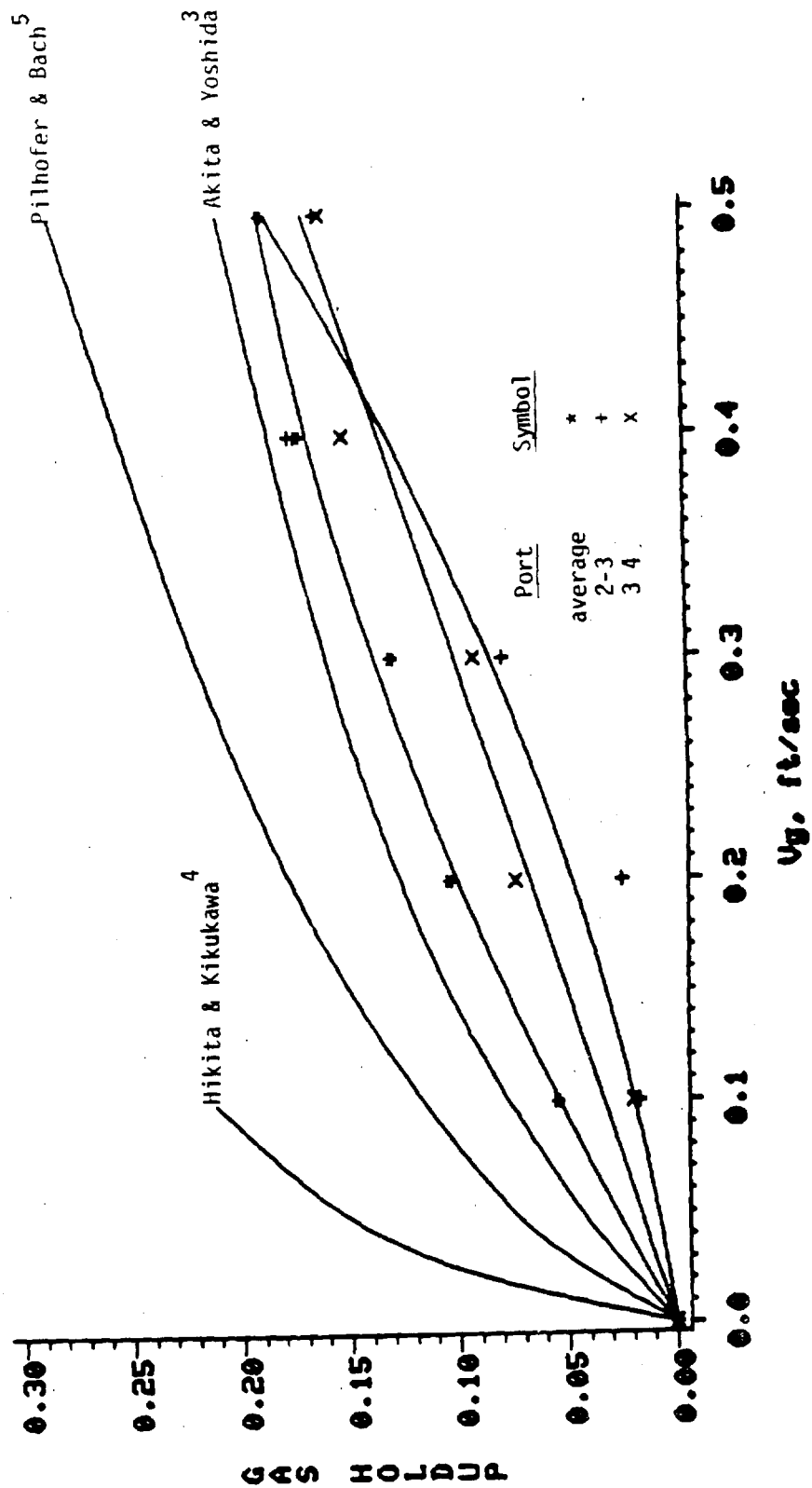


FIGURE 39

5 INCH COLD FLOW SIMULATOR

SOLID CONCENTRATION PROFILES

WATER, 0-3 μ M SILICA, AIR

LIQUID FLOW = 0.0 FT/SEC

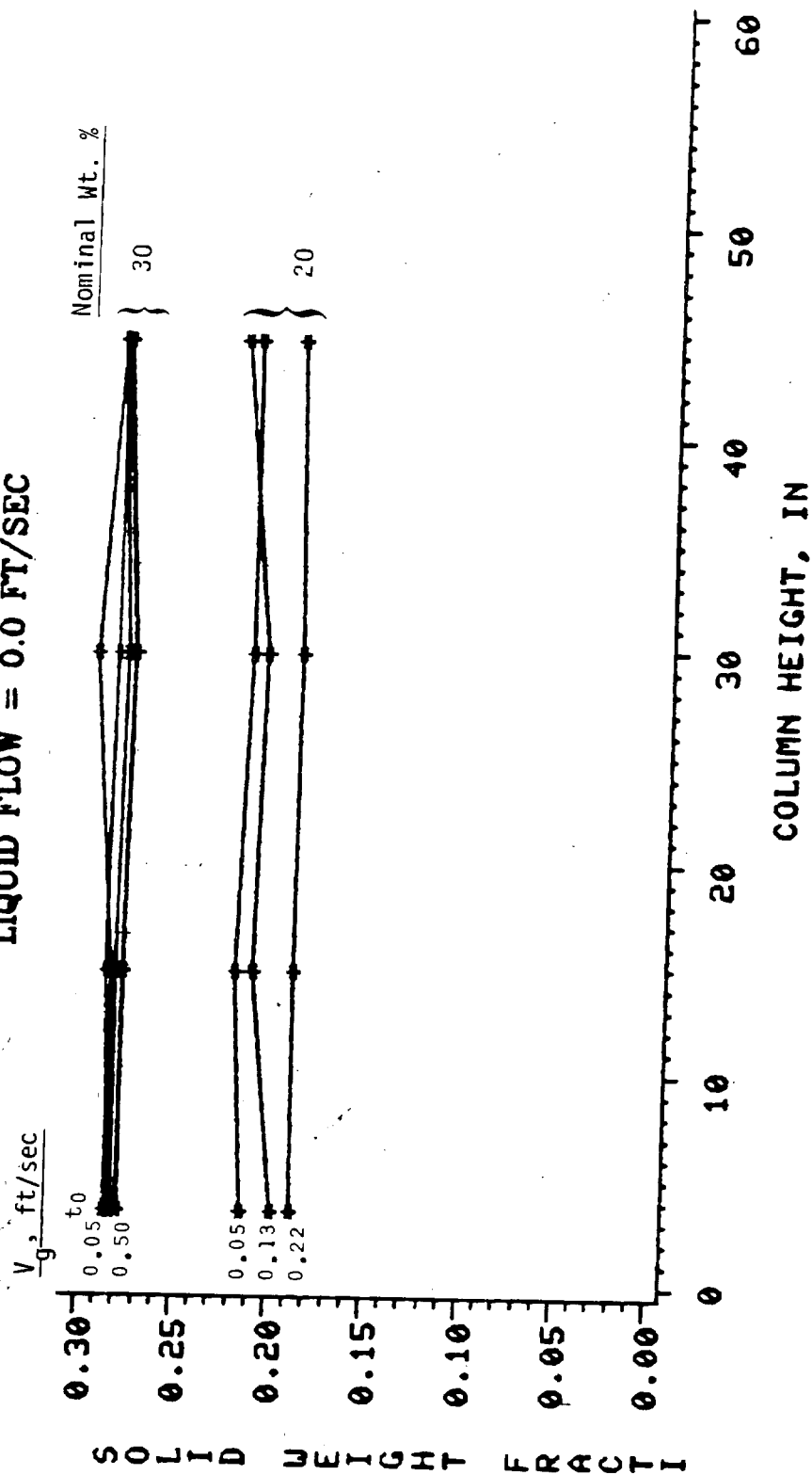


FIGURE 40

5 INCH COLD FLOW SIMULATOR

SOLID CONCENTRATION PROFILES

WATER, 0-5 μ M SILICA, AIR

LIQUID FLOW = 0.0 FT/SEC

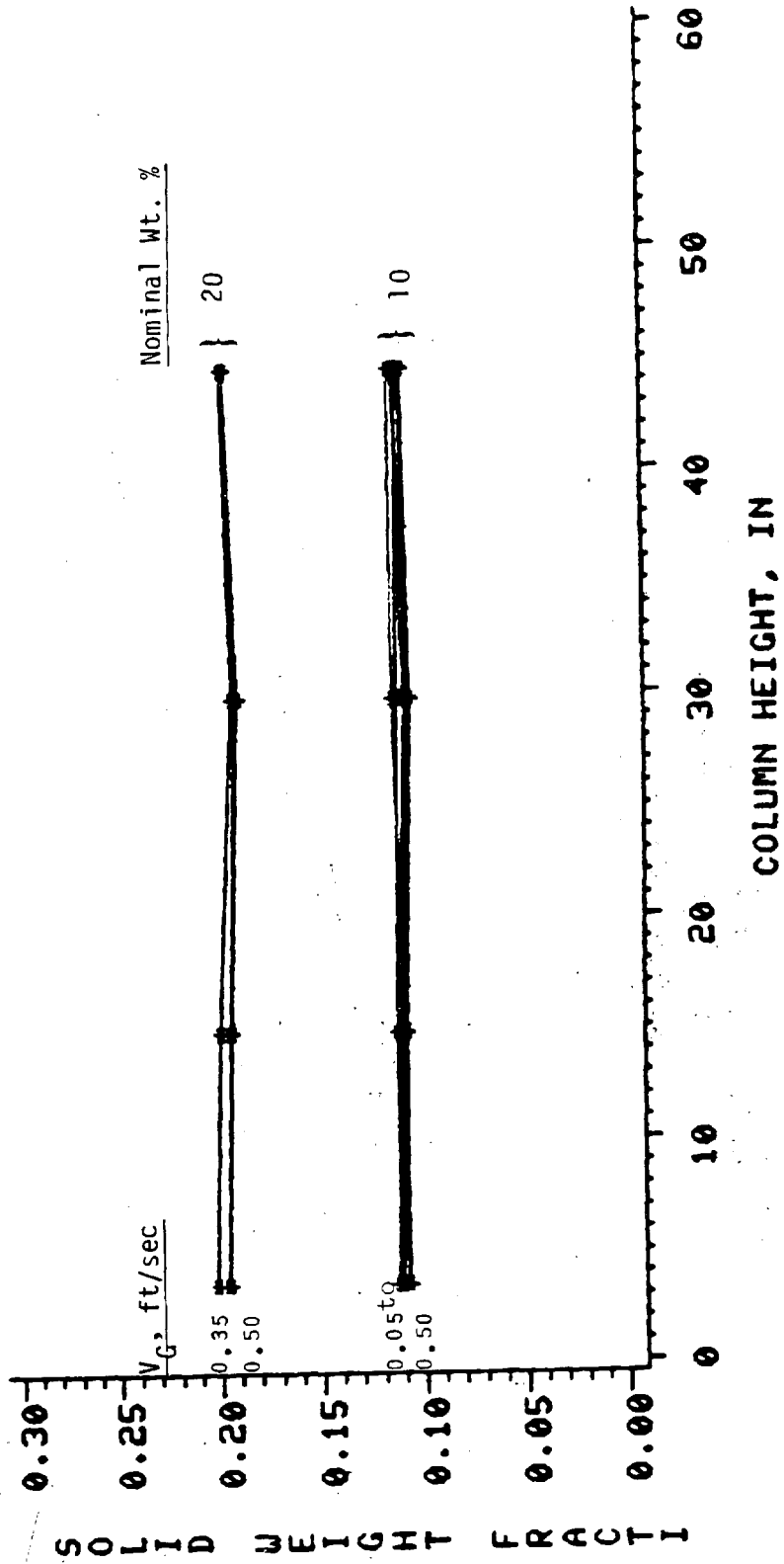


FIGURE 41

5 INCH COLD FLOW SIMULATOR

SOLID CONCENTRATION PROFILES

WATER, 90-115 μ M SILICA, AIR

LIQUID FLOW = 0.0 FT/SEC

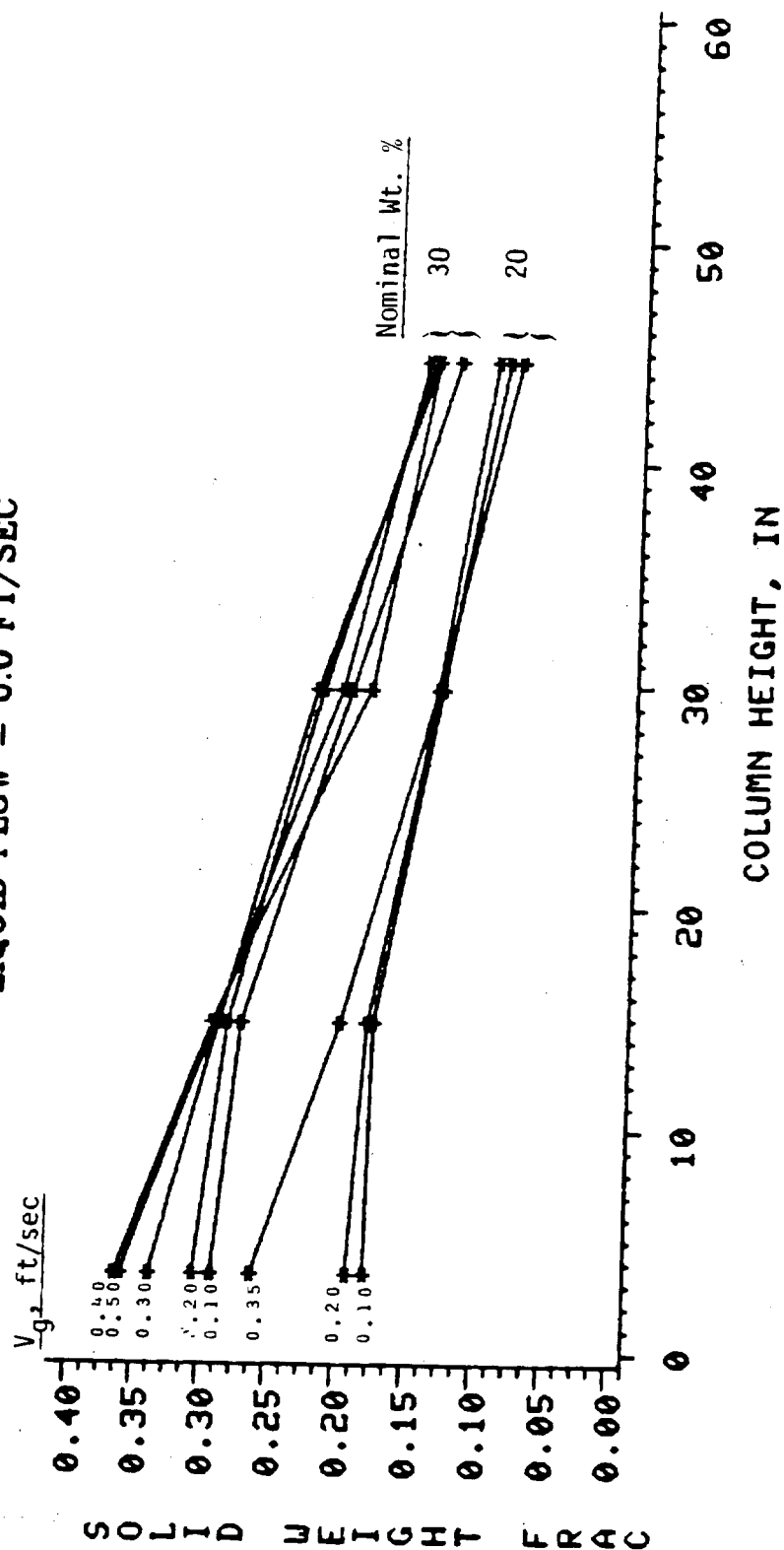


FIGURE 42

5 INCH COLD FLOW SIMULATOR

SOLID CONCENTRATION PROFILES

WATER, 90-115 μ M SILICA, AIR

LIQUID FLOW = 0.0 FT/SEC

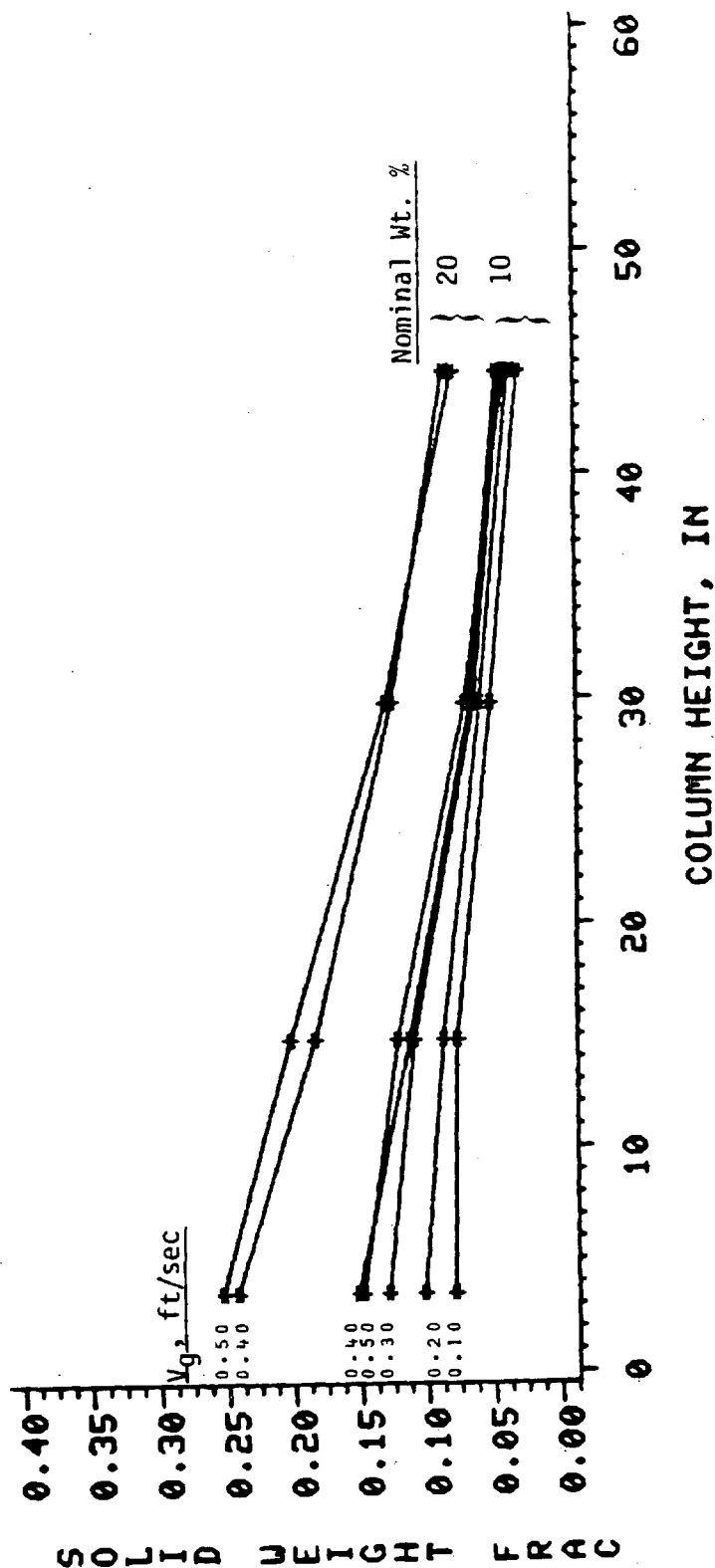


FIGURE 43

5 INCH COLD FLOW SIMULATOR
MASS TRANSFER DATA PLOT

NOTEBOOK # : 6962-77
LIQUID PHASE : WATER
SOLID PHASE : SILICA
SOLID CONC. : 30wt%
SOLID SIZE : 0-5um
GAS VELOCITY : .482 ft/sec
LIQUID VELOCITY : 0 ft/sec

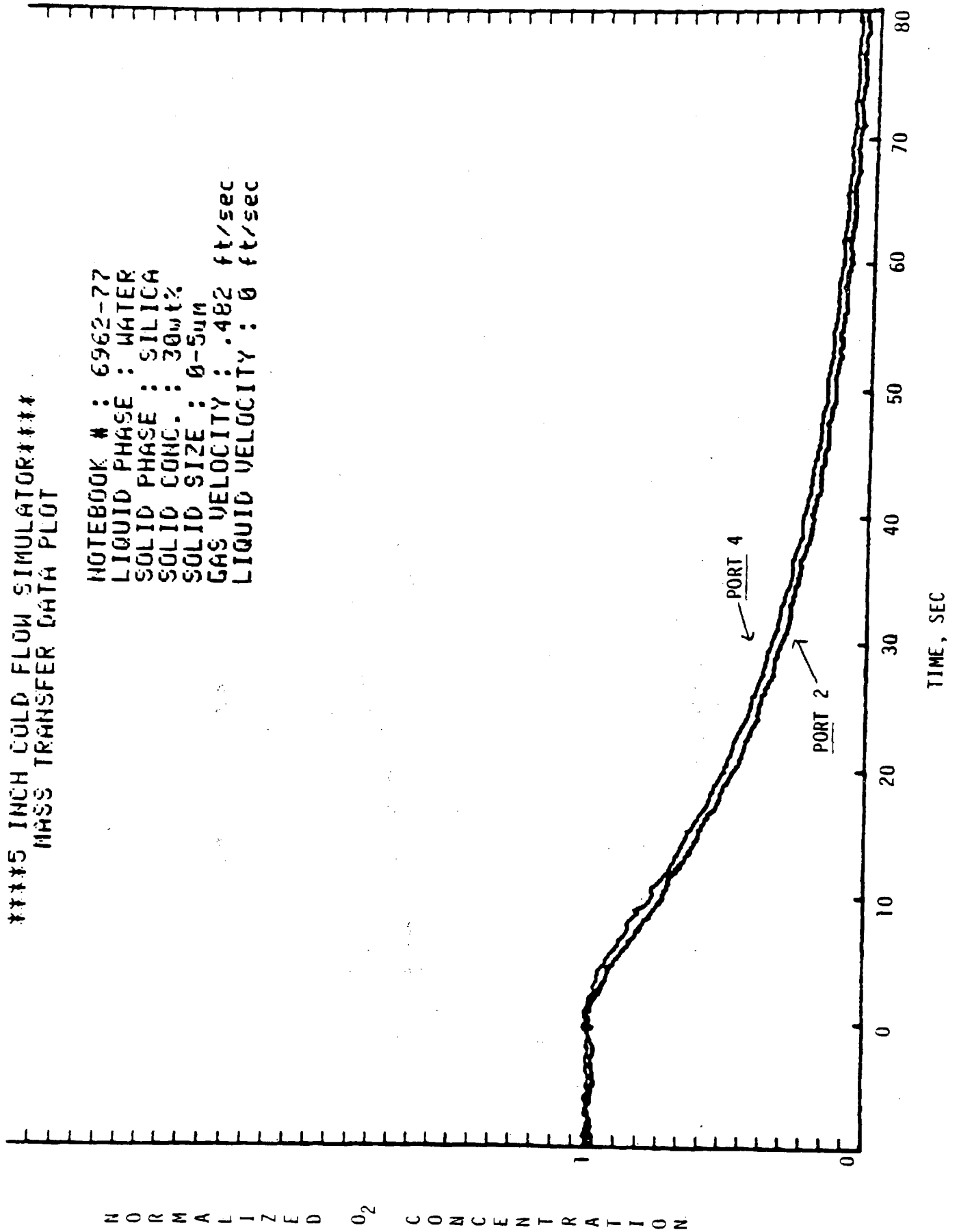
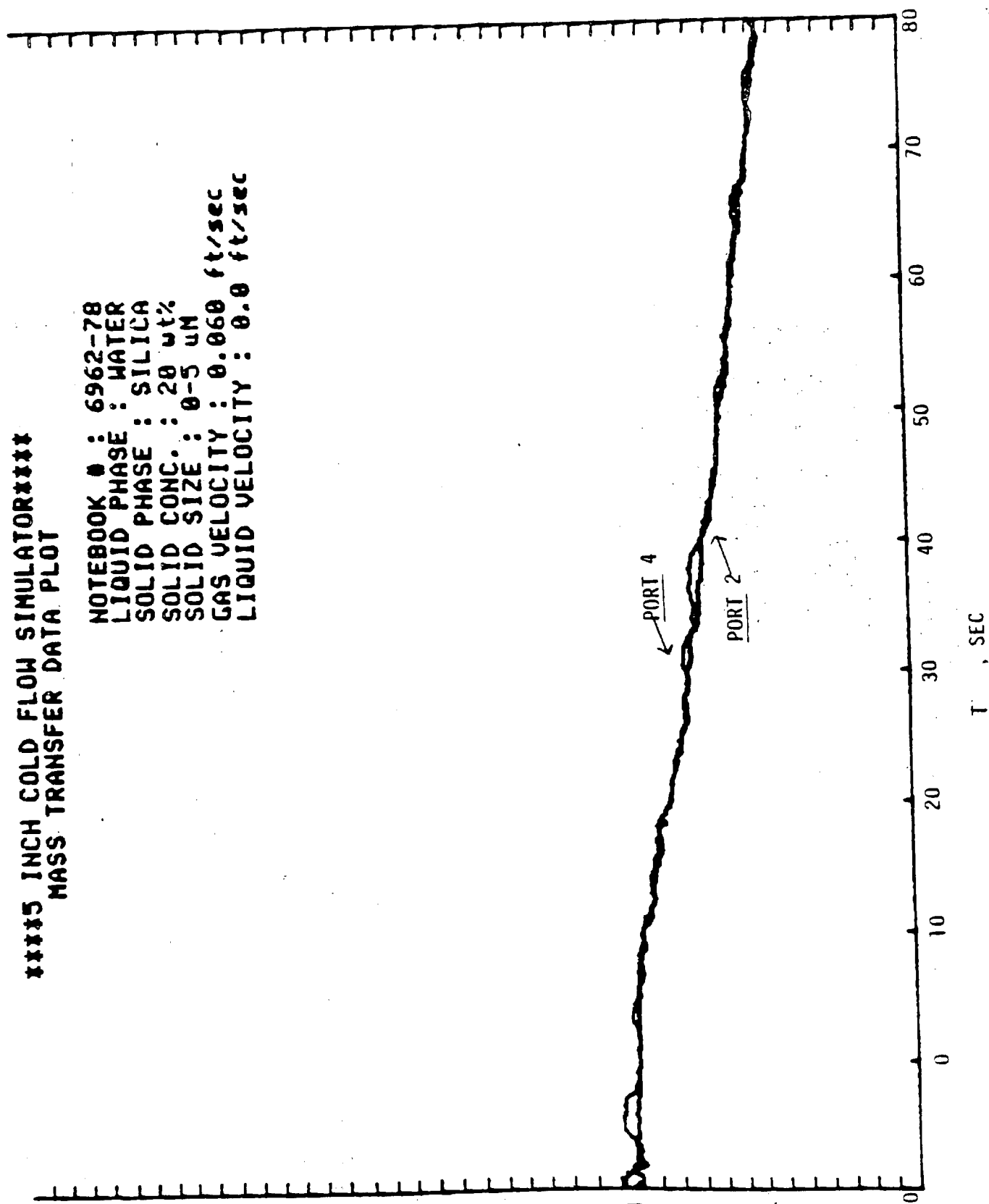


FIGURE 44

15 INCH COLD FLOW SIMULATOR
MASS TRANSFER DATA PLOT

NOTEBOOK # : 6962-78
LIQUID PHASE : WATER
SOLID PHASE : SILICA
SOLID CONC. : 20 wt%
SOLID SIZE : 0-5 μ m
GAS VELOCITY : 0.060 ft/sec
LIQUID VELOCITY : 0.0 ft/sec



NORMALIZED CONCENTRATION

FIGURE 45
 ****5 INCH COLD FLOW SIMULATOR****
 MASS TRANSFER DATA PLOT

NOTEBOOK # : 6962-79
 LIQUID PHASE : WATER
 SOLID PHASE : SILICA
 SOLID CONC. : 20 wt%
 SOLID SIZE : 0-5 μ M
 GAS VELOCITY : 0.135 ft/sec
 LIQUID VELOCITY : 0.0 ft/sec

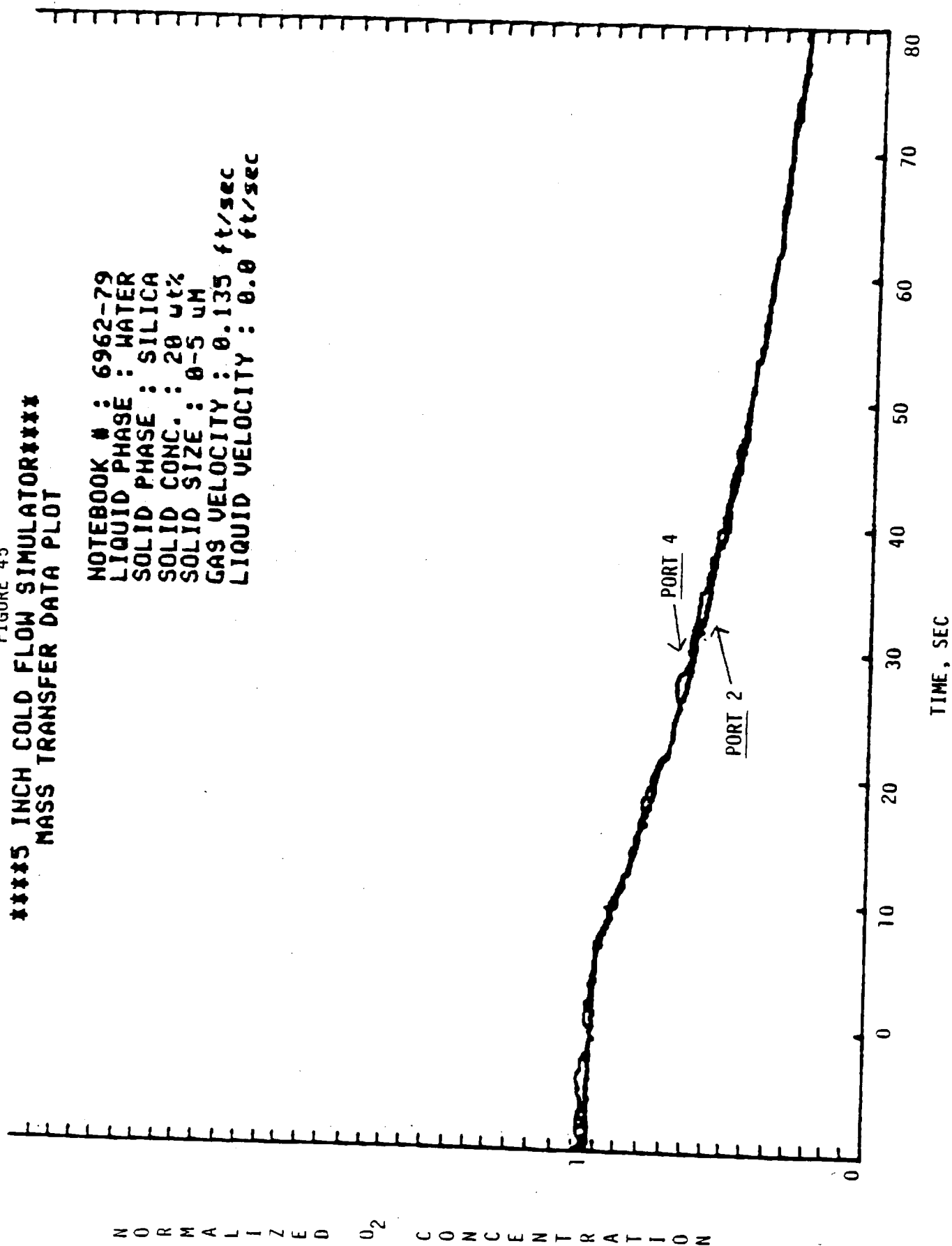
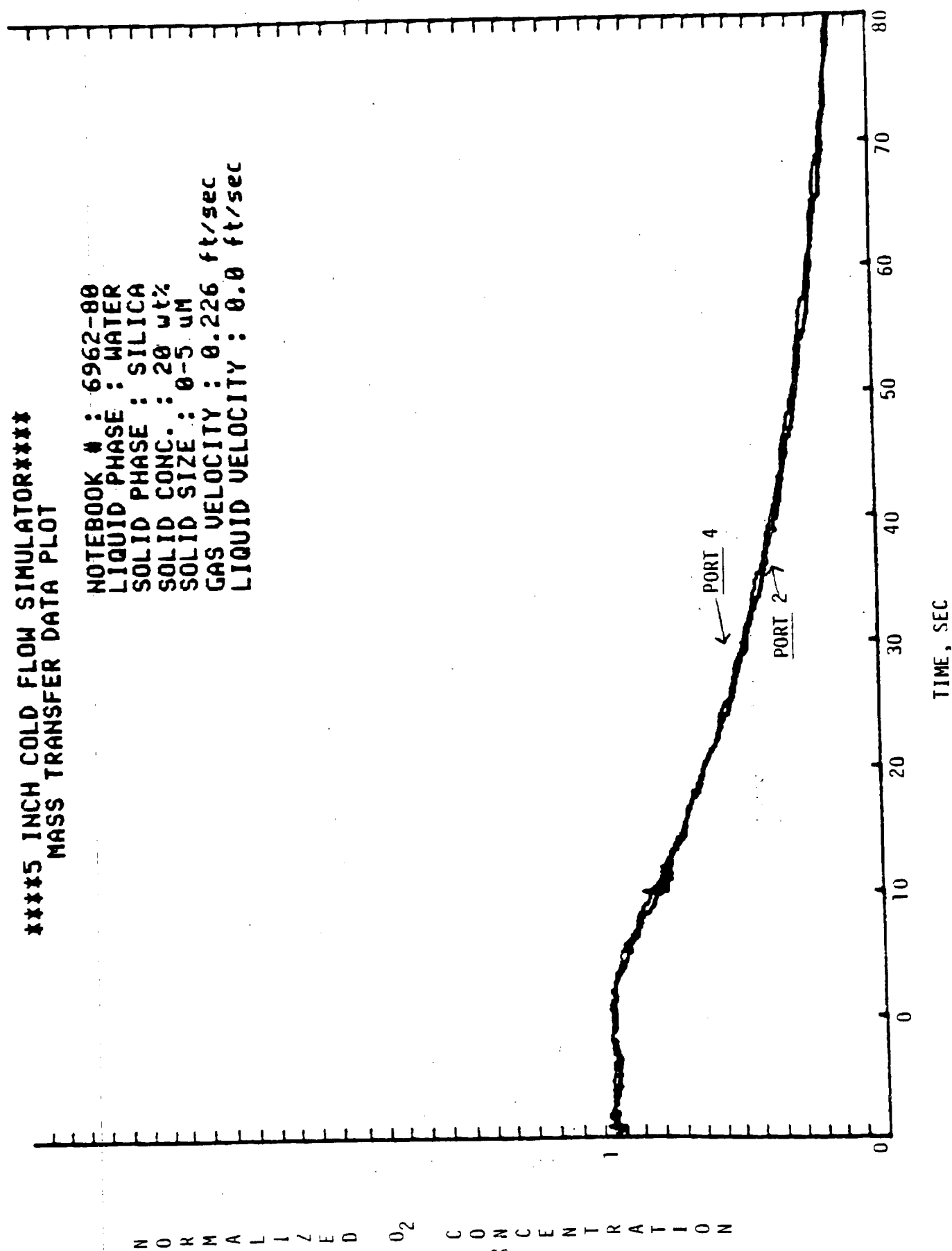


FIGURE 46

5 INCH COLD FLOW SIMULATOR
MASS TRANSFER DATA PLOT

NOTEBOOK # : 6962-80
LIQUID PHASE : WATER
SOLID PHASE : SILICA
SOLID CONC. : 20 wt%
SOLID SIZE : 0-5 μ m
GAS VELOCITY : 0.226 ft/sec
LIQUID VELOCITY : 0.0 ft/sec



N O R M A L I Z E D O_2 C O N C E N T R A T I O N

FIGURE 47

5 INCH COLD FLOW SIMULATOR

WATER, 0-5 μ M SILICA, AIR
MASS TRANSFER COEFFICIENT VS GAS VELOCITY
LIQUID VELOCITY = 0.0 FT/SEC

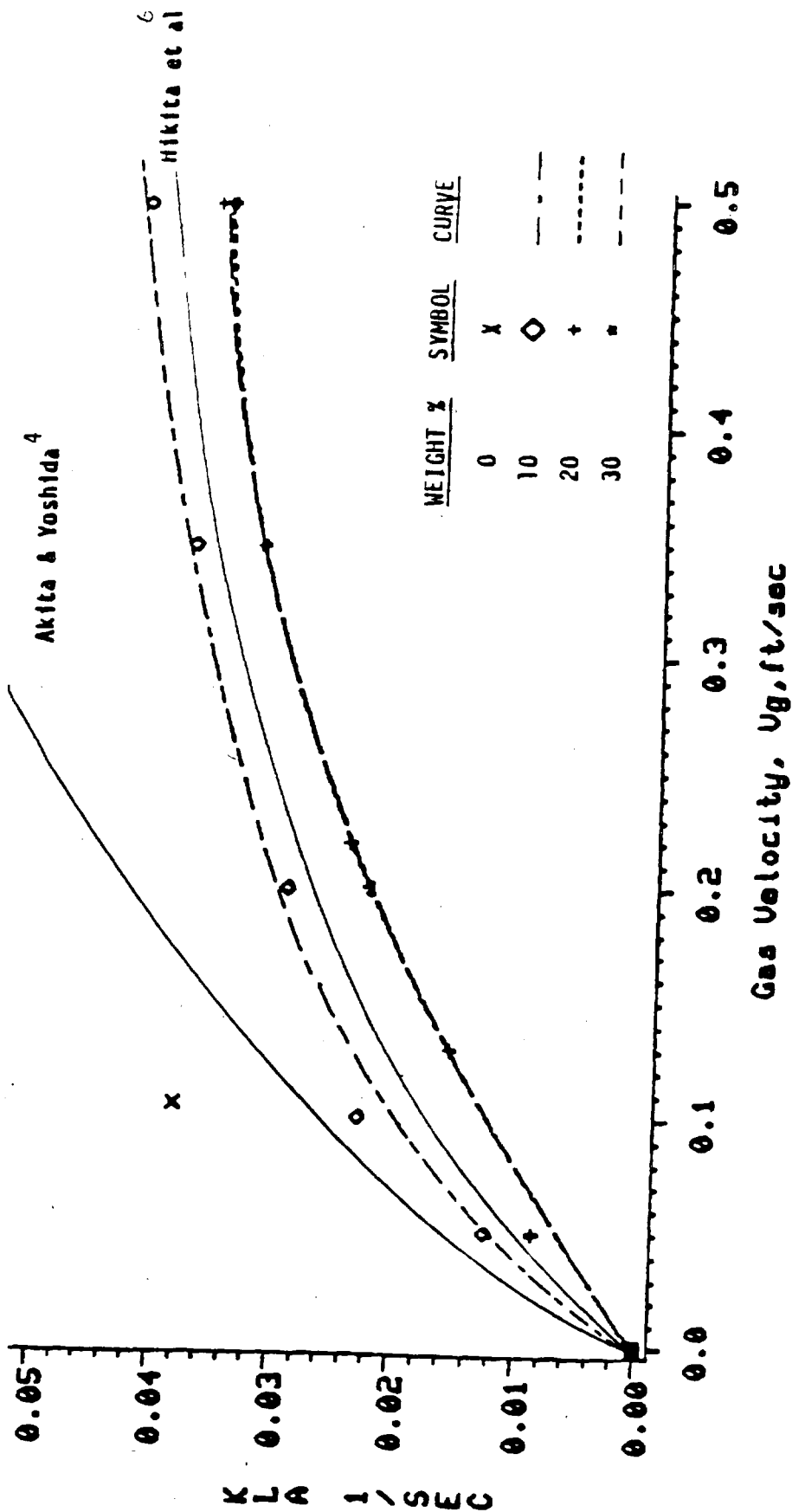


FIGURE 48

5 INCH COLD FLOW SIMULATOR

Mass Transfer Coefficient vs Gas Velocity

WATER, 90-115 μ M SILICA, AIR

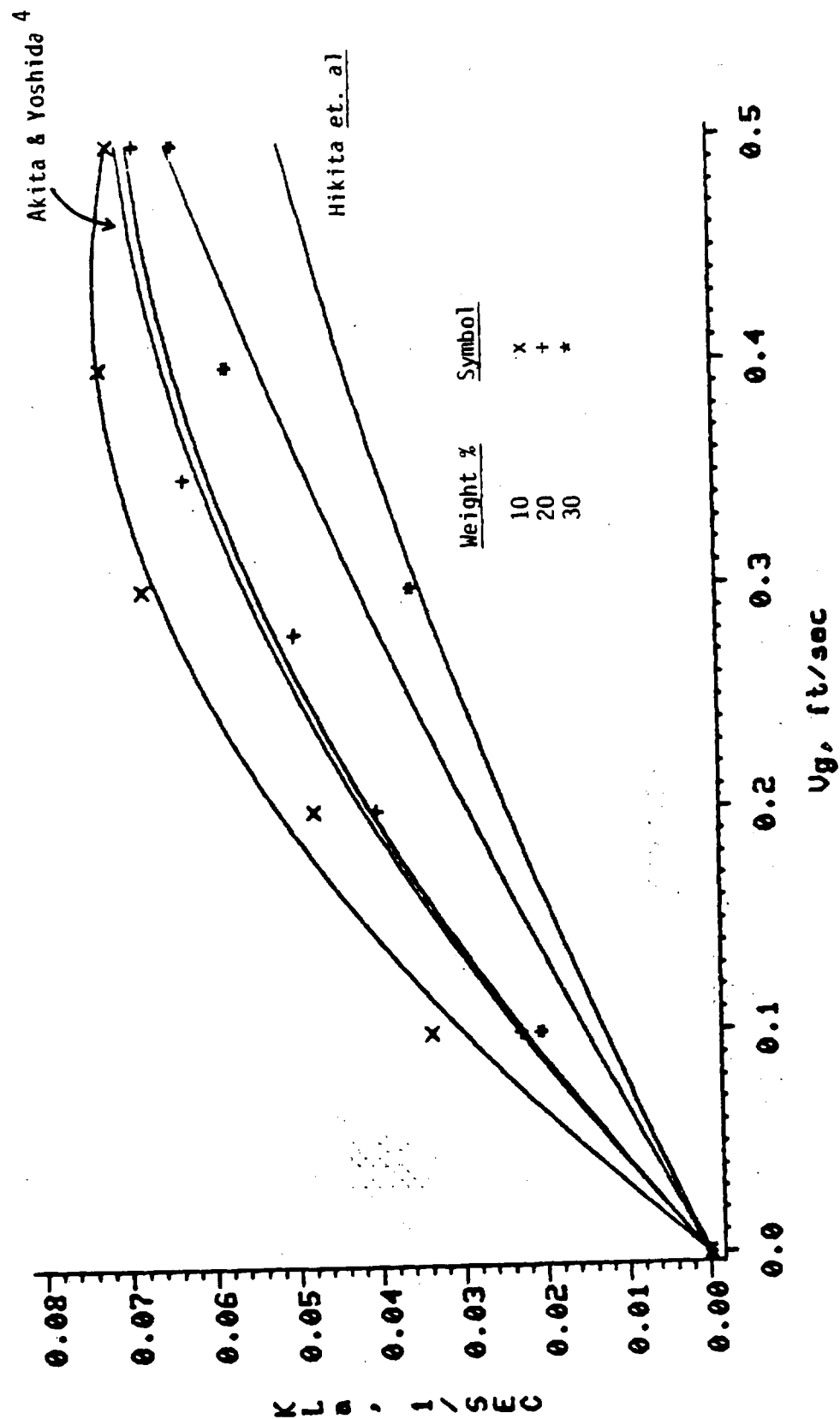


FIGURE 49

5 INCH COLD FLOW SIMULATOR NORMALIZED CONCENTRATION VS TIME CURVES AT 3.5 INCHES FOR 48 INCH BED ANALYTICAL SOLUTION

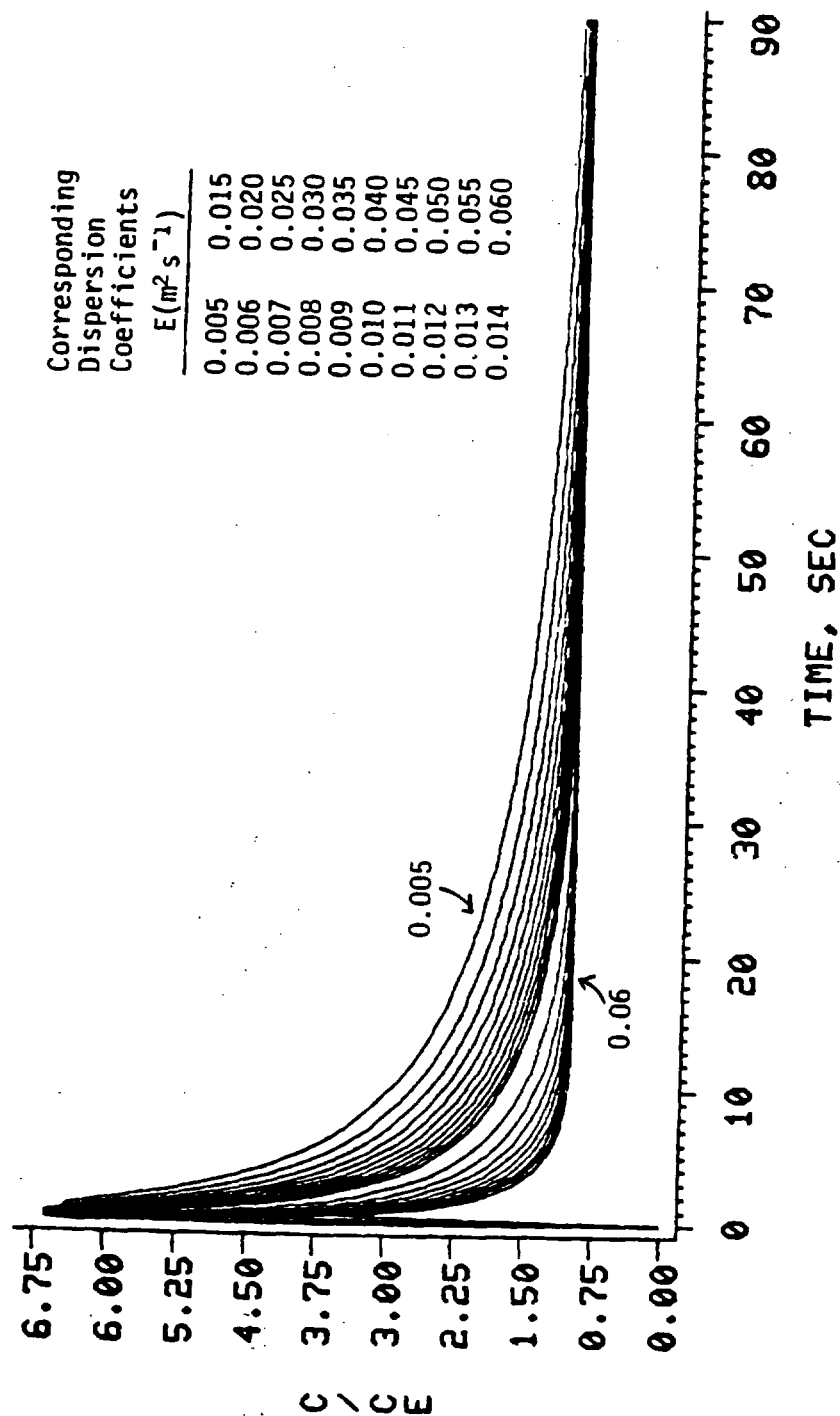


FIGURE 50

5 INCH COLD FLOW SIMULATOR NORMALIZED CONCENTRATION VS TIME CURVES AT 14.75 INCHES FOR 48 INCH BED ANALYTICAL SOLUTION

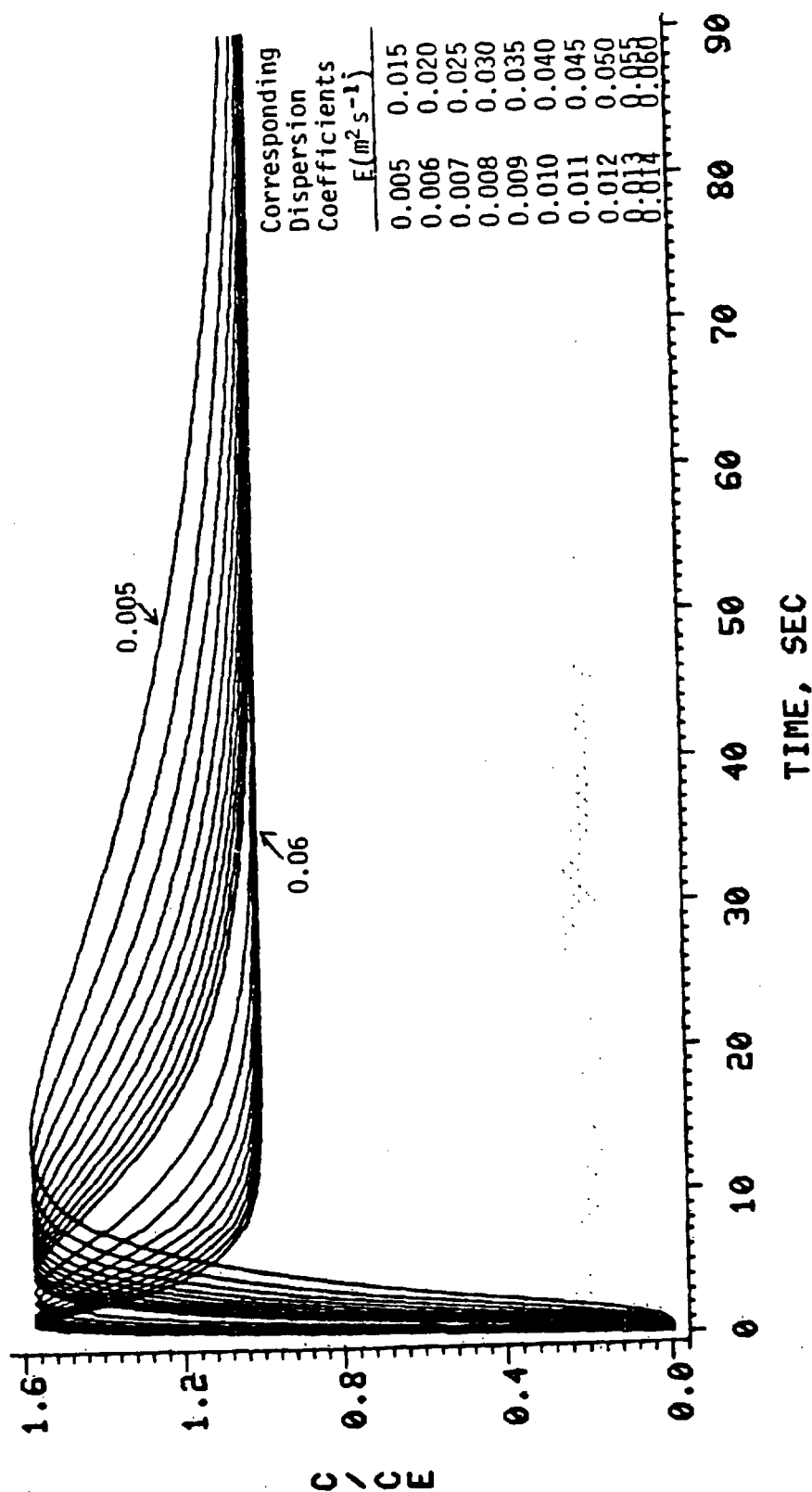


FIGURE 51

5 INCH COLD FLOW SIMULATOR NORMALIZED CONCENTRATION VS TIME CURVES AT 29.75 INCHES FOR 48 INCH BED ANALYTICAL SOLUTION

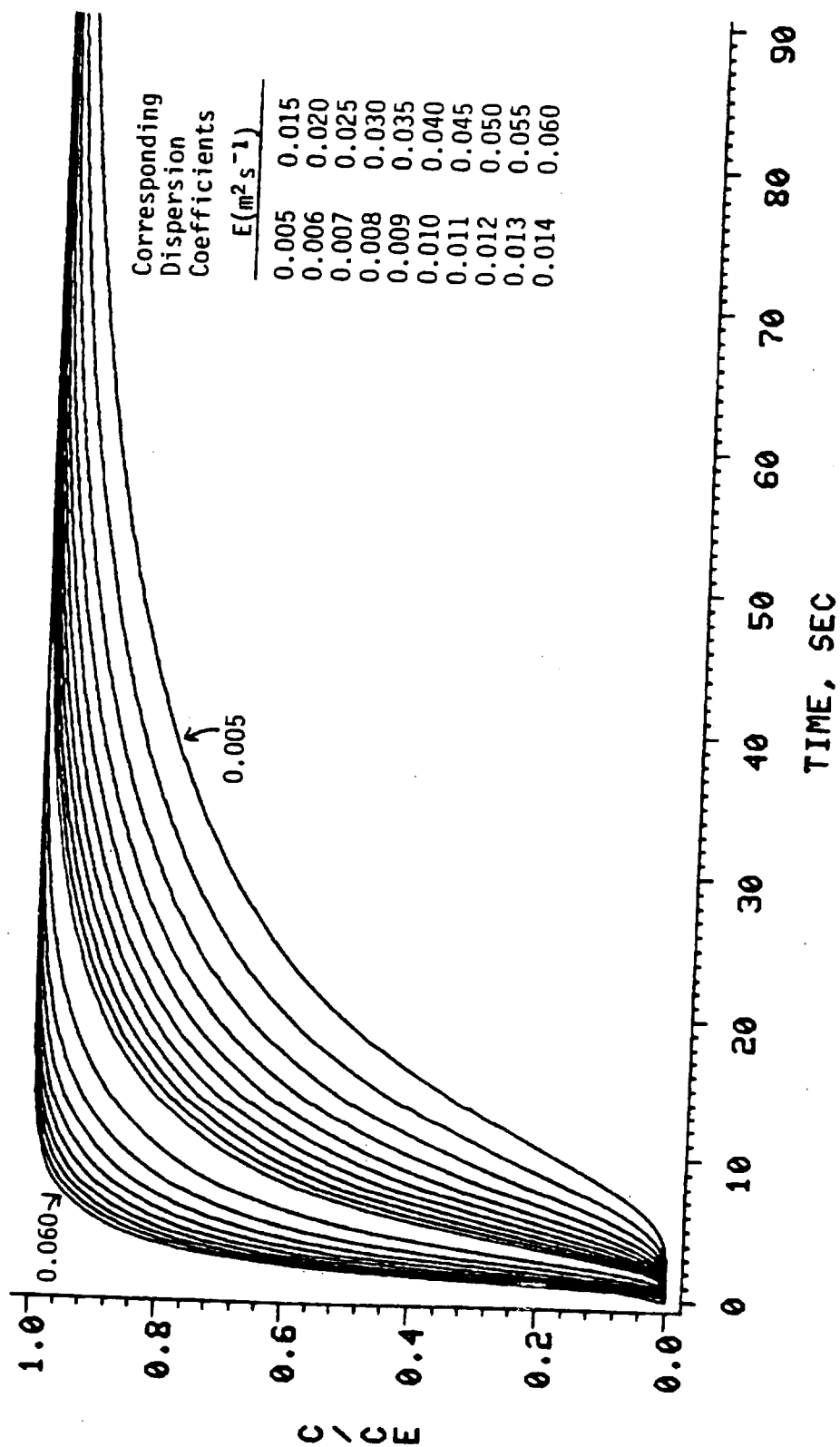


FIGURE 52

5 INCH COLD FLOW SIMULATOR NORMALIZED CONCENTRATION VS TIME CURVES AT 44.58 INCHES FOR 48 INCH BED ANALYTICAL SOLUTION

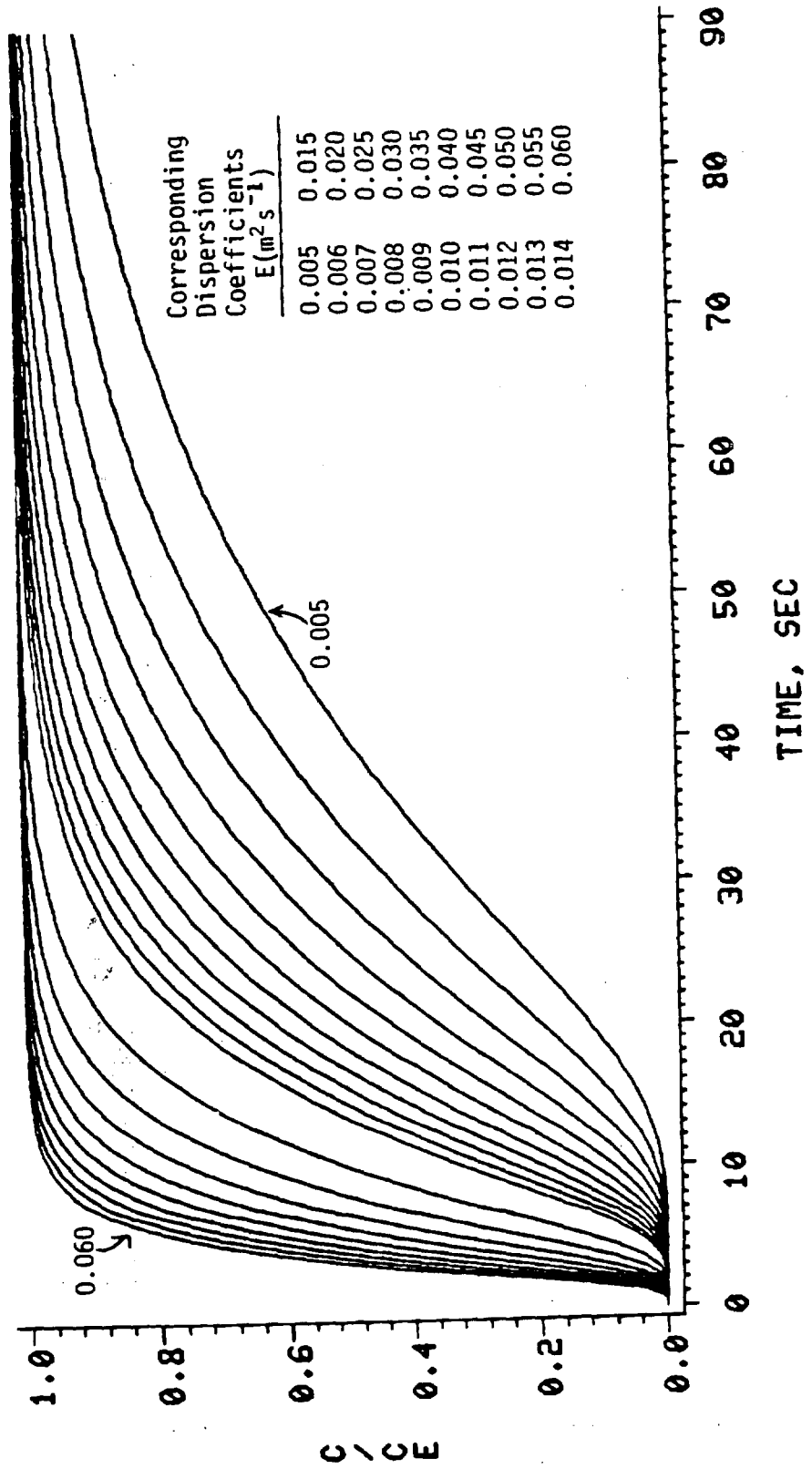


FIGURE 53

****5 INCH COLD FLOW SIMULATOR****
LIQUID DISPERSION PLOT

NOTEBOOK # : 6962-79
LIQUID PHASE : WATER
SOLID PHASE : SILICA
SOLID CONC. : 20 wt%
SOLID SIZE : 0-5 μ m
GAS VELOCITY : 0.135 ft/sec
LIQUID VELOCITY : 0.0 ft/sec

V O L T A G E

PORT #	DISTANCE ABOVE DISTRIBUTOR (IN)
2	3.5
3	14.75
4	29.75
5	44.58

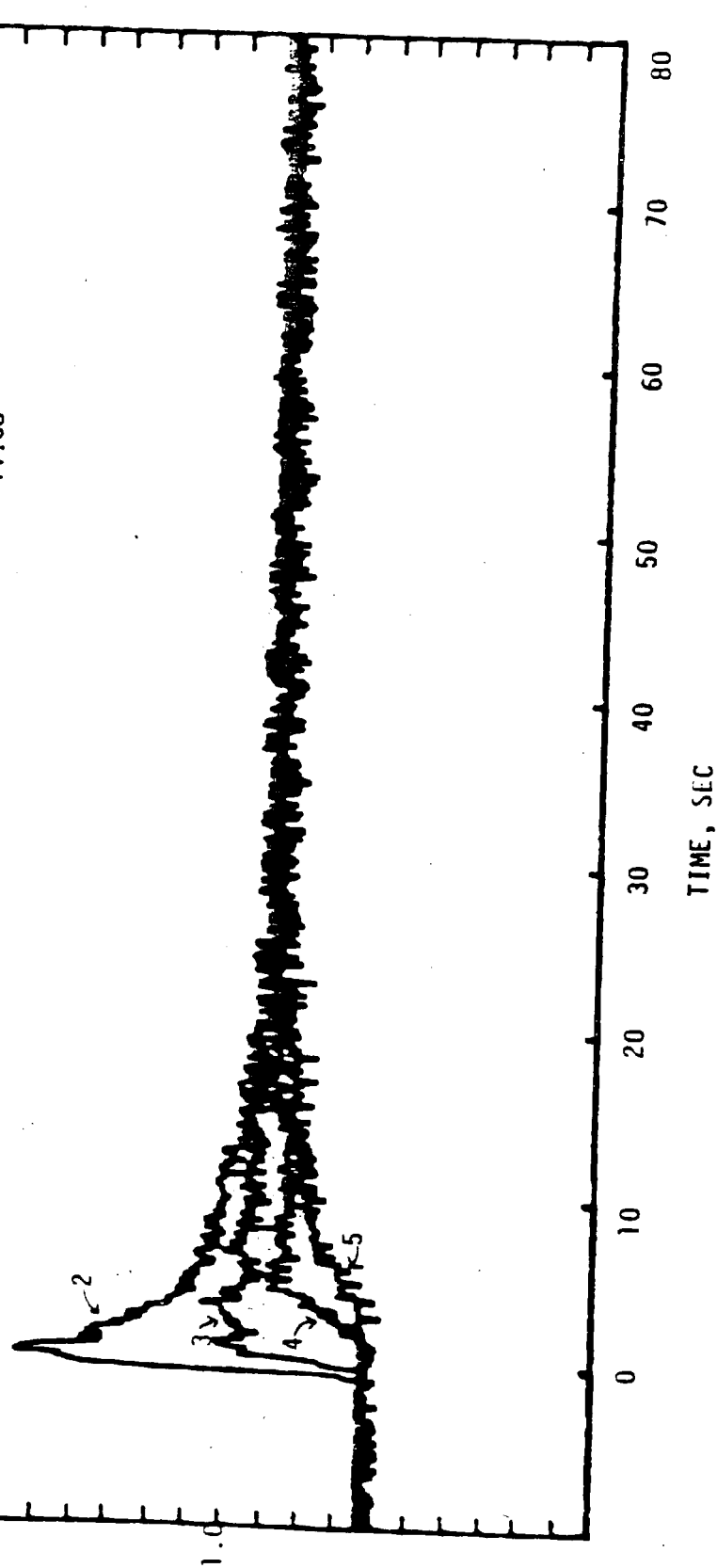


FIGURE 54

5 INCH COLD FLOW SIMULATOR
LIQUID DISPERSION PLOT

NOTEBOOK # : 6962-88
LIQUID PHASE : WATER
SOLID PHASE : SILICA
SOLID CONC. : 20 wt%
SOLID SIZE : 0-5 μ m
GAS VELOCITY : 0.226 ft/sec
LIQUID VELOCITY : 0.0 ft/sec

PORT #	DISTANCE ABOVE DISTRIBUTOR (IN)
2	3.5
3	14.75
4	29.75
5	44.58

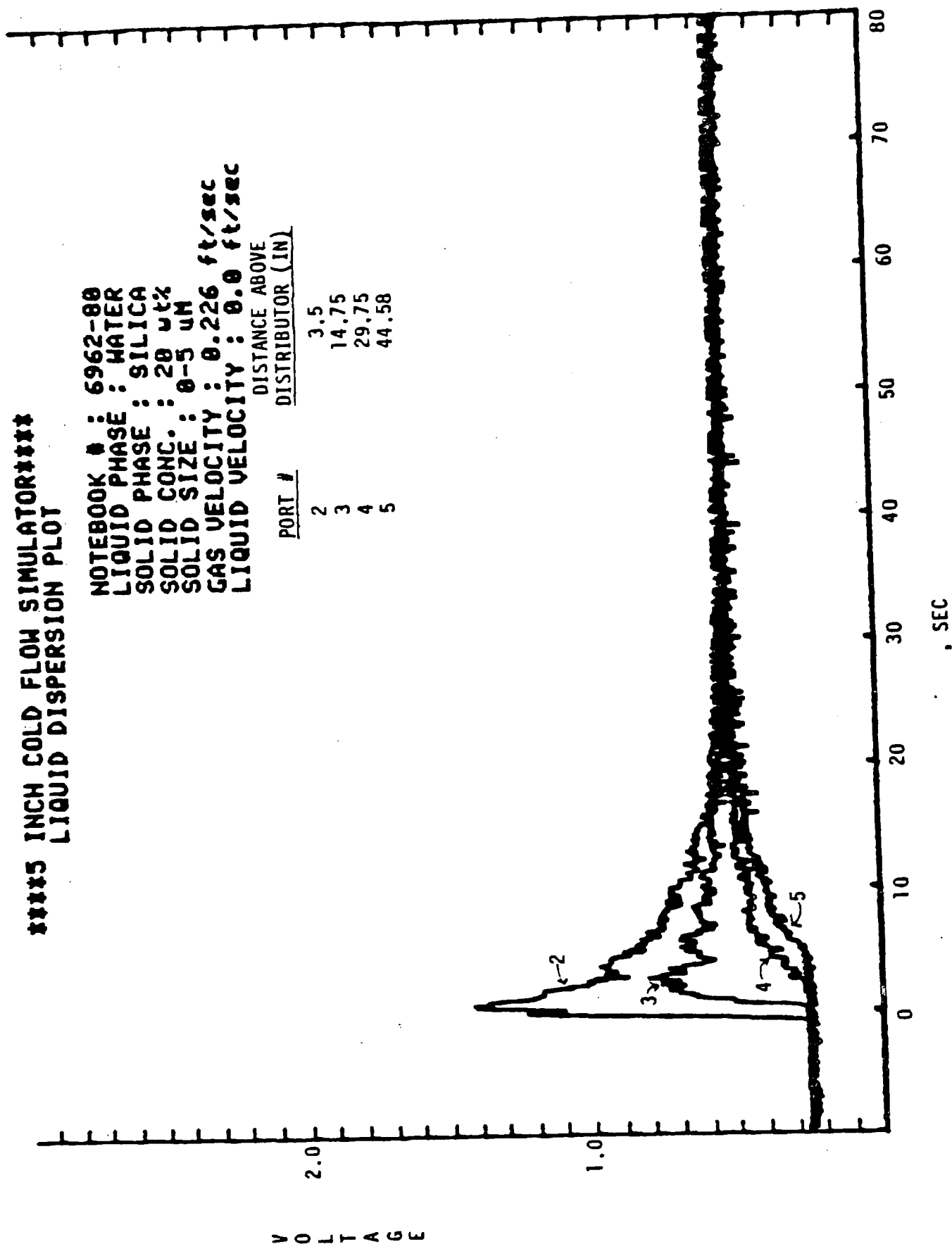


FIGURE 55

****5 INCH COLD FLOW SIMULATOR****
LIQUID DISPERSION PLOT

NOTEBOOK # : 6962-81
LIQUID PHASE : WATER
SOLID PHASE : SILICA
SOLID CONC. : 20 wt%
SOLID SIZE : 0-5 μ m
GAS VELOCITY : 0.326 ft/sec
LIQUID VELOCITY : 0.0 ft/sec

PORT #	DISTANCE ABOVE DISTRIBUTOR (IN)
2	3.5
3	14.75
4	29.75
5	44.58

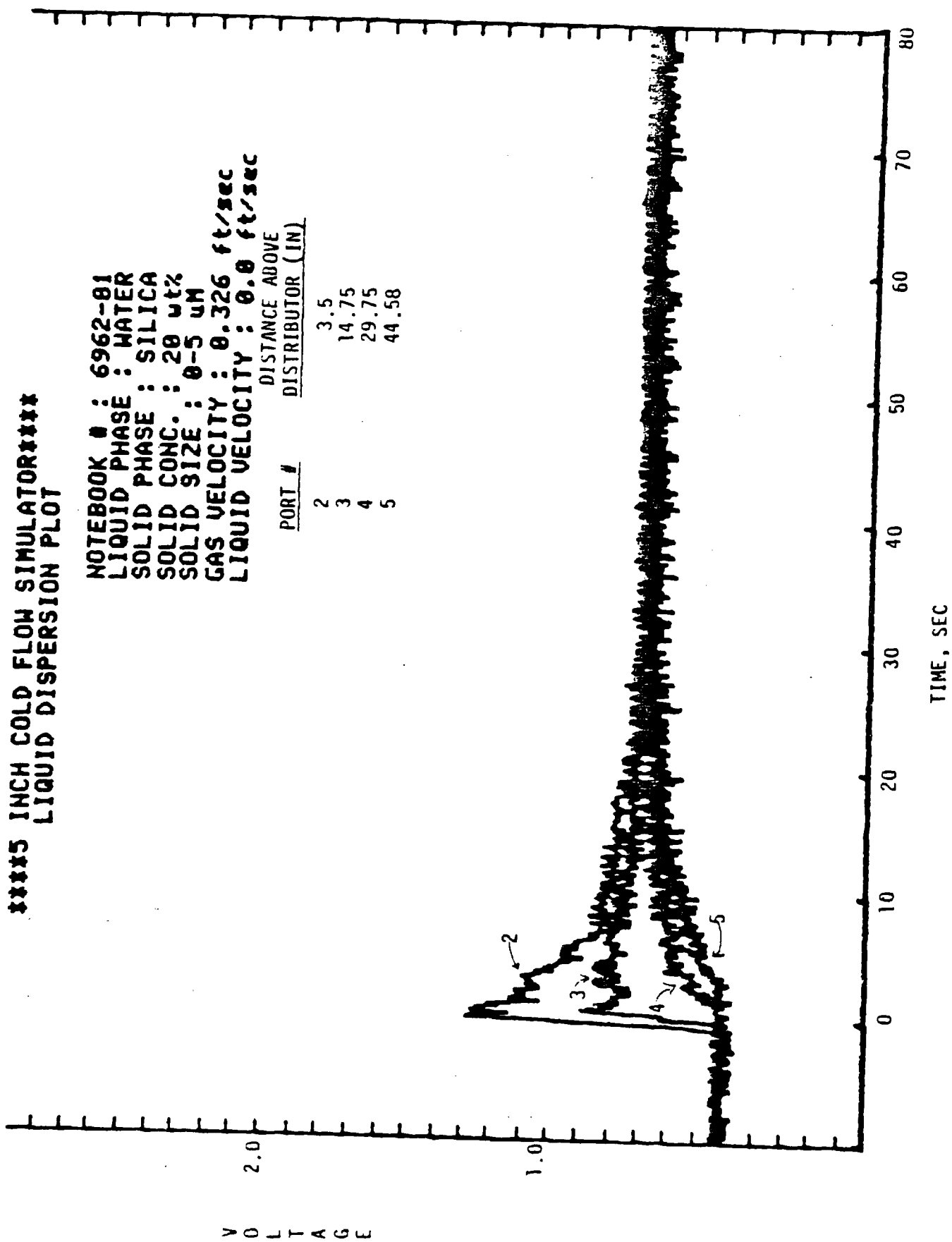


FIGURE 56

5 INCH COLD FLOW SIMULATOR
LIQUID DISPERSION PLOT

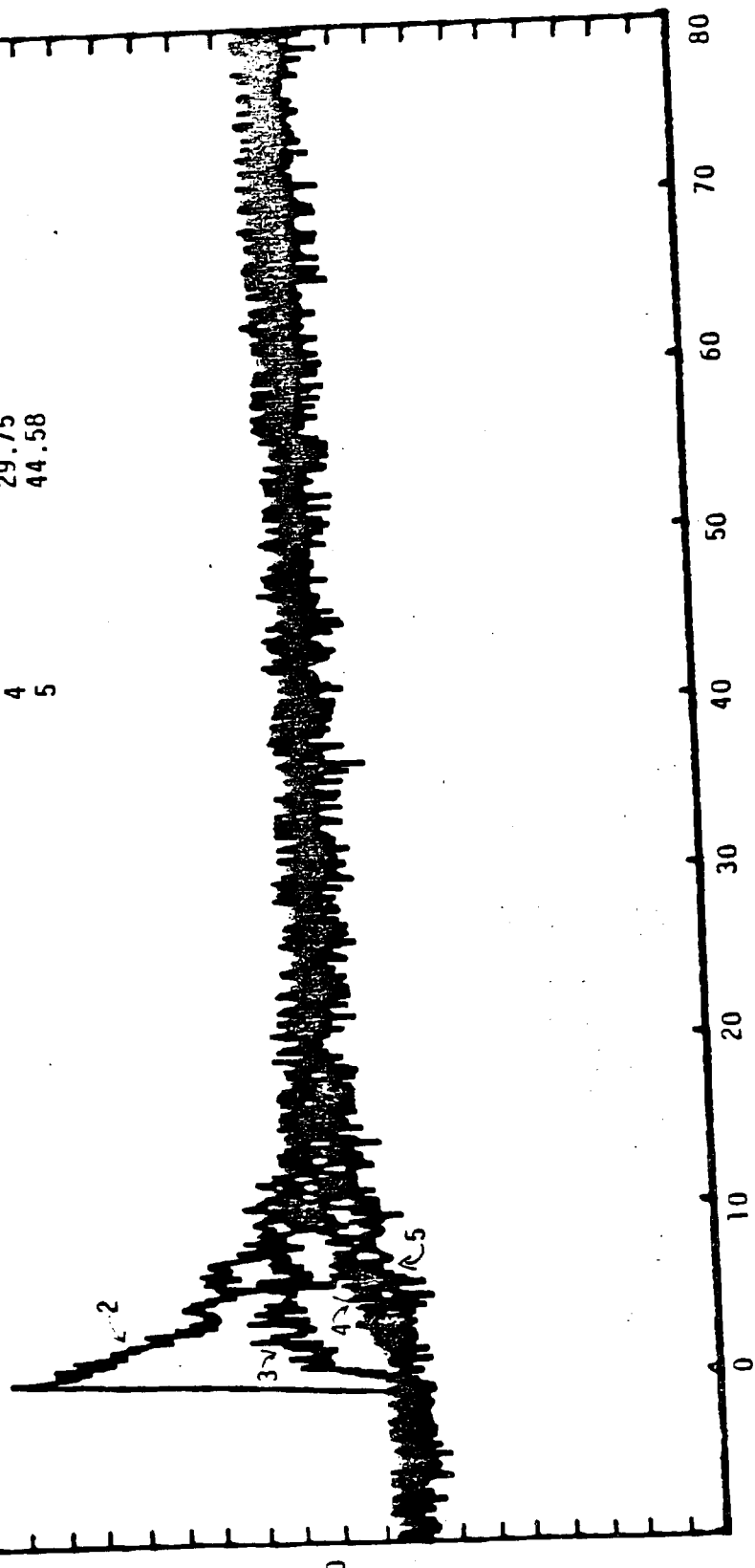
NOTEBOOK # : 6962-82
LIQUID PHASE : WATER
SOLID PHASE : SILICA
SOLID CONC. : 20 wt%
SOLID SIZE : 0-5 μ m
GAS VELOCITY : 0.486 ft/sec
LIQUID VELOCITY : 0.0 ft/sec

PORT #	DISTANCE ABOVE DISTRIBUTOR (IN)
2	3.5
3	14.75
4	29.75
5	44.58

V O L T A G E

2.0

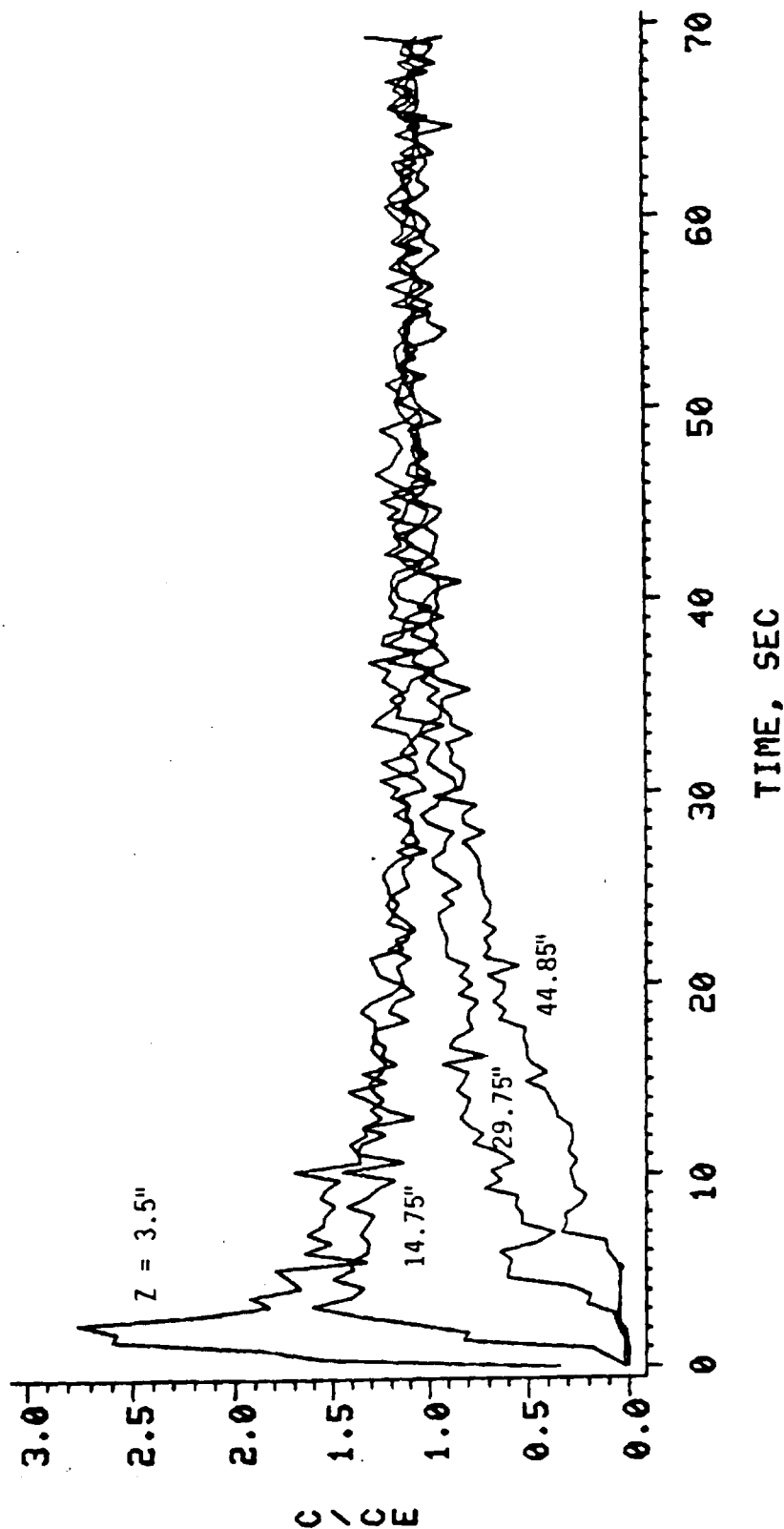
1.0

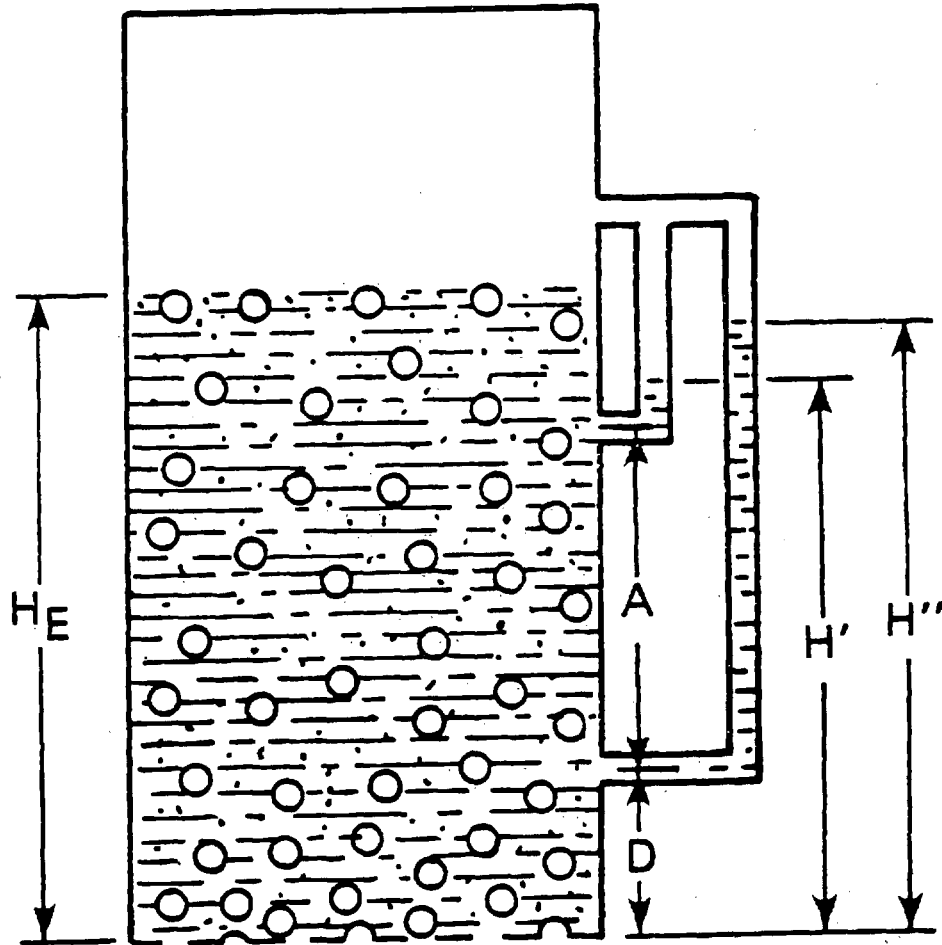


TIME, SEC

FIGURE 57

5 INCH COLD FLOW SIMULATOR CONCENTRATION VS TIME FOR WATER-AIR SYSTEM SMOOTHED DATA



GAS HOLD-UP ANALYSIS

METHOD 1

$$\epsilon_G = 1 - H_S/H_E$$

METHOD 2

$$\epsilon_G = 1 - H_S(H'' - H' + A)/[H''(D + A) - H'D]$$