Calculation of Liq Density

Using Cva's data for ortho

$D = 1.18$

$D = 1.18 - .0009\,T$

where T in °C, 1.18 = density at 0°C

$A = 25$ °C

$\Delta d = -25 \times .0009 = -.0225$

TRICHLOR $\quad 1.375 - .0225 = 1.3525 = 1.352$ @ 0°C

TETRA $\quad 1.454 - .0225 = 1.4315 = 1.432$ @ 0°C

PENTA $\quad 1.52 - .0225 = 1.4975 = 1.498$ @ 0°C

DICHLO $\quad 1.5679 - .0775 = 1.4904$ @ 0°C

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Density

$$\rho = 0.9885 + \{ 0.0375 - 0.0004804ST - 0.0000009171 S T^2 \}$$

ITEM	d^{25}
TRICHLOR	1.375
TETRACHLORO	1.454
PENTACHLORO	1.52
O CHLORO	$1.1499^{32.5}$
P CHLORO	$1.1579^{25/4}$
DICHLORO (4,4')	$1.442^{0/4}$
BIPHENYL	$0.992^{75/4}$

CORRECTION ASSUMED LINEAR from 25°C to 75°C

75 - 100 : change in sp gr Biphenyl

.9885
.9695
.0190 x 2 = 0.038 ~ .020/25 = .0008/°C

100 - 150 .9695
.9294
.0401 ~ 0.40/50 = .0008/°C

ESTIMATED DENSITY AT 75°C

$\Delta = 50° \times .008/°C = -0.4$
$42.5 \times .008/°C = -0.352$

ITEM	d_{75}	$d_{75} + .0375$
TRICHLORO	0.975	1.0125
TETRACHLORO	1.054	1.0915
PENTACHLORO	1.12	1.1575
O CHLORO	0.8259	1.1809
P CHLORO	0.7579	1.1809
DICHLORO (4-4')	0.842	1.217

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Liquid Density Coefficients

Biphenyl

$$\rho = \rho_0 + \rho_1 T + \rho_2 T^2$$

Density of Liquid Diphenyl

°C	GRAMS/CC
75	0.9885
100	0.9695
150	0.9299
200	0.8885
250	0.8470
300	0.8010
350	0.7510
400	0.6918
450	0.6180

Calc equation using NONLIN

$\rho_0 = 1.0260$

$\rho_1 = -0.00048045$

$\rho_2 = -0.000,000,91715$

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$$\rho = 1.0260 + (-0.00048T) - 0.00000091 7T^2$$

$$\boxed{\rho = 1.0260 - 0.00048045\,T - 0.000000091715\,T^2}$$

$$\rho = 0.9885\{+0.0375 - 0.00048045T - 0.000000091715T^2\}$$

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R-262
REV.-7/63

TECHNICAL COMPUTER DEPARTMENT

DATE 6F 12.5

PROBLEM NO.	JOB NO.	
TITLE		
ANALYST K.E.B	PAGE 1 OF 1	DATE 6/17/71

```
//STEPA   EXEC STEPWISE
//STEP2.SYSIN DD*

1 LIQUID DENSITY COEFFICIENTS FOR BIPHENOL                                T
                                                  3    9    1
  1   1     3 9000          1     ₹
                  75.              0.9885
                 100.              0.9695
                 150.              0.9294
                 200.              0.8885
                 250.              0.8470
                 300.              0.8010
                 350.              0.7510
                 400.              0.6918
                 450.              0.6180
/*
```

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