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APPENDIX

Program I

```
10 REM GRAN'S PLOT
20 CLS:PRINT "PUT PAPER ON PRINTER"
30 DIM V(40),PH(40),G(40),GH(40)
40 INPUT "Ente file name ";C$
60 OPEN "i",1,C$
70 INPUT#1,D$,PKW,VO,N
80 X=1
90 INPUT#1,V,PH
100 V(X)=V : PH(X)=PH
110 IF EOF(1) THEN 130
120 X=X+1: GOTO 90
130 LPRINT"Compound name is ";D$; :LPRINT TAB(40)"No. of data point = ";X
140 LPRINT "pKw = ";PKW;:LPRINT TAB(15)"Initial volumn = "; VO;
150 LPRINT TAB(40) "Normality of titrant =";N
160 FOR I =1 TO X
170 OH = 10^(PH(I)-PKW)
180 H=10^-PH(I)
190 G(I) = V(I)*N+(H-OH)*(VO+V(I))
200 GH(I) = H*G(I)
210 NEXT I
220 LPRINT C$:LPRINT
230 LPRINT TAB(3) "Vol"; : LPRINT  TAB(12) "pH";
240 LPRINT TAB(30) "G(I)"; : LPRINT TAB(48) "GH(I)"
250 FOR I = 1 TO X
260 LPRINT TAB(2) USING "#.##";V(I); : LPRINT TAB(11) USING "##.##";PH(I);
270 LPRINT TAB(26) USING "+#.#####^^^^";G(I);
280 LPRINT TAB(44) USING "+#.#####^^^^";GH(I);
290 NEXT I
300 LPRINT:LPRINT
310 CLS:LPRINT"LINEAR CORRELATION COEFFICIENT AND REGRESSION"
320 PRINT:PRINT
330 DIM X(X),Y(X)
340 FOR I=1 TO X
350 X(I)=G(I):Y(I)=GH(I)
360 NEXT I
370 REM*  FIND XSUM,YSUM,XYSUM,X2SUM,Y2SUM
380 INPUT "HOW MANY TERM YOU WANT TO SOURCE ";P
390 LPRINT "No. OF USED DATA";P
400 LPRINT
410 LPRINT "Exper.";
420 LPRINT TAB(13) "Correlation";:LPRINT TAB(30) "Slope";
430 LPRINT TAB(43) "Y intercept";:LPRINT TAB(60) "X intercept"
440 LPRINT
450 FOR J=0 TO X-P
460 XBAR=0 : YBAR=0 : XYSUM=0 : NUM=0 : DEN=0
470 XSUM=0 : YSUM=0 : X2SUM=0 : Y2SUM=0
480 FOR K=1 TO P
490 I=J+K
500    XSUM=XSUM+X(I)
510    YSUM=YSUM+Y(I)
520    U=X(I)*Y(I) : XYSUM=XYSUM+U
530    U=X(I)*X(I) : X2SUM=X2SUM+U
540    U=Y(I)*Y(I) : Y2SUM=Y2SUM+U
550 NEXT K
560 XBAR=XSUM/P : YBAR=YSUM/P
570 CLS
580 REM*CALCULATE NUMERATOR
590 NUM=XYSUM-((XSUM*YSUM)/P)
600 REM*CALCULATE DENOMINATOR
610 DEN=(SQR(X2SUM-((XSUM^2/P))))*(SQR(Y2SUM-((YSUM^2/P))))
620 REM*CALCULATE CORRELATION
630 R=NUM/DEN
640 REM*CALCULATE SLOPE OF REGRESSION LINE
650 B=(XYSUM-((XSUM*YSUM)/P))/(X2SUM-(XSUM^2/P))
660 REM*CALCULATE Y INTERCEPT
670 A= YBAR-(B*XBAR)
680 REM*CALCULATE X INTERCEPT
690 AX=-A/B
700 LPRINT ;J+1;"-";J+P;
710 LPRINT TAB(11) USING "+#.#####";R;: LPRINT TAB(27) USING "+#.#####^^^^";B;
720 LPRINT TAB(42) USING "+#.#####^^^^";A;
730 LPRINT TAB(59) USING "+#.#####^^^^";AX;
740 LPRINT :
750 NEXT J
760 INPUT "Enter 1 for more range OR 2 to quit ";C
770 IF C=2 THEN END
780 GOTO 380
```

Program II

```
10 INPUT "Enter file name ";C$
20 INPUT "Enter compound name ";D$
30 INPUT "pKw ";PKW
40 INPUT "Initial volume ";VO
50 INPUT "Normality of titrant ";N
60 INPUT "No. of data point ";X
70 DIM V(X), PH(X)
80 FOR I=1 TO X
90 PRINT "Volume (";I;") = ";
100 INPUT V(I)
110 NEXT I
120 INPUT "Enter 1 if all volume is correct OR 2 if there is error";D
130 IF D=1 GOTO 180
140 INPUT "What No. ";E
150 PRINT."Volume (";E;") = ";
160 INPUT V(E)
170 GOTO 120
180 FOR I=1 TO X
190 PRINT "pH (";I;") = ";
200 INPUT PH(I)
210 NEXT I
220 INPUT "Enter 1 for all pH is true OR 2 to correct ";D
230 IF D=1 GOTO 280
240 INPUT "What No. ";E
250 PRINT "pH (";E;") = ";
260 INPUT PH(E)
270 GOTO 220
280 OPEN "O",1,C$
290 PRINT#1,D$
300 PRINT#1,PKW
310 PRINT#1,VO
320 PRINT#1,N
330 FOR I=1 TO X
340 V=V(I) : PH=PH(I)
350 PRINT#1,V,PH
360 NEXT I
370 CLOSE 1
380 CLS: PRINT : PRINT :PRINT : PRINT TAB(37) "THE END"
```

Note :

    a. Program I was employed for executation the end point volumes of a Gran function which accounted for autoprotolysis of water. The program was also utilized for other Gran function by changing arithmatic functions in line number 170-200 with respect to those Gran functions.

    b. Profram II was exploited for collecting data which would be input in Program I for calculation.

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