Asian Journal of Chemistry Vol. 6, No. 1 (1994), 154–158

NOTES

A Simple Program for Estimation of Elements

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The aim of this note is to bring out a simple BASIC program for the quicker estimation of certain elements such as carbon, hydrogen, oxygen, nitrogen, sulphur and phosphorus. This program is considered very necessary for the benefit of the undergraduate students in particular and others in general for undertaking analytical works in the chemistry laboratories.

The estimation of elements in organic compounds has been considered an essential part of the work for the undergraduate students in different chemistry laboratories. The estimation of elements is carried out, based on the identification of the elements present in the given organic compound and for such a compound the percentage composition of each element could precisely be determined. This estimation becomes useful in determining the molecular formulae of the organic compound.

A simple computer program has been developed in BASIC in order to estimate the elements of the organic compounds. The user has now been given an option to specify the element of his interest for an analysis.

The written program contains a series of steps that enables the user to enter his data for obtaining the expected results. To execute this program, the following feedings are to be made available to the computer by the user:

(i) which element to estimate,
(ii) weight of element
(iii) weight of organic compound.

As a result of the above inputs, we will now get the output with the percentage of the element in the given organic compound.

On executing this program (Table 1) there would be a response on the computer monitor as follows:

WHICH ELEMENT DO YOU WANT TO ESTIMATE? C

For example 'C' is to be typed for carbon; then the computer makes a search for the molecular weight of the compound known as carbon dioxide, and the quantity of element C in this specific case. Yet the computer does require two additional informations as detailed below:

WEIGHT OF CARBON DIOXIDE?

WEIGHT OF ORGANIC COMPOUND?

On feeding the data approximately, the computer prints out the percentage of the element required. The results thus obtained would be found to compare well with the values obtained by means of the general procedures.

This program certainly saves a lot of time for the user to complete his estimation on certain elements more correctly in the given organic compounds.

TABLE 1

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10 REM THIS PROGRAM FOR ESTIMATION OF ELEMENTS
20 PRINT
30 PRINT "THIS PROGRAM FOR THE ESTIMATION OF ELEMENTS"
40 PRINT
50 PRINT "WHICH ELEMENT DO YOU WANT TO ESTIMATE?"
60 PRINT
70 PRINT "GIVE C FOR CARBON  H FOR HYDROGEN"
80 PRINT
90 PRINT "GIVE O FOR OXYGEN  N FOR NITROGEN"
100 PRINT
110 PRINT "GIVE L FOR HALOGENS  S FOR SULPHUR"
120 PRINT
130 PRINT "GIVE P FOR PHOSPHORUS"
140 PRINT
150 INPUT A$
160 IF A$ = "C" THEN 250
170 IF A$ = "H" THEN 300
180 IF A$ = "O" THEN 680
190 IF A$ = "N" THEN 500
200 IF A$ = "L" THEN 350
210 IF A$ = "S" THEN 400
220 IF A$ = "P" THEN 450
230 PRINT "THIS TYPE OF ELEMENT CANNOT FIND FOR THIS PROGRAM"
240 GOTO 1020
250 LET B$ = "CARBON DIOXIDE"
260 LET G1 = 12
270 LET MW1 = 44
280 LET C$ = "CARBON"
290 GOTO 920
300 LET B$ = "WATER"
310 LET MW1 = 18
320 LET G1 = 2
330 LET C$ = "HYDROGEN"
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340 GOTO 920
350 LET B$ = "SILVER IODIDE"
360 LET MW1 = 235
370 LET G1= 127
380 LET C$ = "IODINE"
390 GOTO 920
400 LET B$ = "BARIUM SULPHATE"
410 LET MW1 = 233.34
420 LET G1 = 32
430 LET C$ ="SULPHUR"
440 GO TO 920
450 LET B$ = "MAGNESIUM PYROPHOSPHATE"
460 LET MW1 = 222
470 LET G1= 62
480 LET C$ = "PHOSPHOROUS"
490 GO TO 920
500 REM TO CALCULATE FOR NITROGEN
510 PRINT "GIVE PRESSURE P1 VALUE"
520 INPUT P1
530 PRINT "GIVE VOLUME V1 VALUE"
540 INPUT V1
550 PRINT "GIVE TEMPERATURE T1 VALUE"
560 INPUT T1
570 LET C$ = "NITROGEN"
580 LET P2 = 760
590 LET T2 = 273
600 LET TT1 = 273 + T1
610 LET V2 = (P1 * VI * T2)
620 LET V3 = P2 * TT1
630 LET V4 = V2/V3
640 LET MW1 = 22400
650 LET G1= 28
660 LET W2 = V4
670 GOTO 950
680 LET B$ = "CARBON DIOXIDE"
690 LET G1 = 12
700 LET MW1 = 44
710 LET C$ = "CARBON"
720 GOTO 920
730 LET TT1 = T2
```

```
740 LET B$ = "WATER"
750 LET MW1 = 18
760 LET G1 = 2
770 LET C$ = "HYDROGEN"
780 PRINT "WEIGHT OF" ; B$
790 PRINT
800 INPUT W2
810 PRINT "WEIGHT OF ORGANIC COMPOUND"
820 PRINT
830 INPUT W1
840 LET T1 = (G1 * W2)/MW1
850 LET T2 = (100 * T1)/W1
860 LET TT3 = TT1 + T2
870 LET TT4 = 100 - TT3
880 PRINT "PRECENTAGE OF"; C$; "="; T2
890 PRINT
900 PRINT "PERCENTAGE OF OXYGEN ="; TT4
910 GOTO 1020
920 PRINT "WEIGHT OF"; B$
930 INPUT W2
940 PRINT
950 PRINT "WEIGHT OF ORGANIC COMPOUND"
960 INPUT W1
970 LET T1 = (G1 * W2)/MW1
980 LET T2 = (100 * T1)/W1
990 PRINT
1000 PRINT "PERCENTAGE OF"; C$; "="; T2
1010 IF A$ = "O" THEN 730
1020 PRINT
1030 PRINT
1040 PRINT "ANY MORE Y(ES) OR N(O) ?"
1050 INPUT D$
1060 IF D$ <> "N" THEN 50
1070 END
```

```
THIS PROGRAM FOR THE ESTIMATION OF ELEMENTS
WHICH ELEMENT DO YOU WANT TO ESTIMATE?
GIVE C FOR CARBON   H FOR HYDROGEN
GIVE O FOR OXYGEN   N FOR NITROGEN
GIVE L FOR HALOGENS   S FOR SULPHUR
```

GIVE P FOR PHOSPHRUS
? C
WEIGHT OF CARBON DIOXIDE
? 0.88
WEIGHT OF ORGANIC COMPOUND
? 0.30
PERCENTAGE OF CARBON = 80
ANY MORE Y(ES) OR N(O) ?
? N

(*Received*: 15 April 1992; *Accepted*: 15 May 1993) AJC-617