
Loading and running instructions

IMPORTANT: The programs in this suite are large, using all the available memory space and any peripherals must be disconnected.

Normal microdrives and printers need not be disconnected but, with microdrives fitted, you must inform the computer you are using tapes; see your Spectrum manual.

All programs are loaded as follows:

LOAD " " **ENTER**

The computer will display the words

'program: program name'.

You must leave the tape running until asked to stop the tape. Pressing any key will then start the program running.

Loading from tape is slow but it can be made easier if the counter numbers are marked in this booklet – a space is provided.

Both sides of Tapes 1 and 2 contain a number of programs which can be accessed sequentially as on the introductory tape provided with your computer. Alternatively you may access each program out of sequence by 'loading' it by name.

Further running instructions are given in this booklet, and the programs contain information on how to use them. If you experience loading problems, consult your manual.

Pressing **BREAK** will stop all programs; to run them again you must re-load.

There are two types of user input required for the execution of these programs. If you are requested to 'ENTER' a response you must press the **ENTER** key after your entry. You can change your mind before pressing the **ENTER** by using the **DELETE** key.

If you are requested to 'PRESS' a key, do not use the **ENTER** key.

The program continues as soon as you have pressed a key so you cannot change your mind.

How to use the programs in a revision scheme

The programs on these cassette tapes have been devised to make your revision more approachable and enjoyable. Organization is the key to making the most of your revision time. For each subject follow these simple rules.

- 1 Know your syllabus. A quick reference to the relevant syllabus analysis table to be found at the front of Letts Study Aids *Revise* series is advised.
- 2 Devise a timetable, as soon as the Mocks are over, which will allow you to go through the syllabus at least twice (more for problem areas).
- 3 For each topic, read all your available material – class notes and textbooks. Make summary notes as you go, then test yourself. Key Facts *Multiple Choice* or Letts Study Aids *Objective Questions* will give invaluable practice and help. Finally, run the relevant computer program which will both test your knowledge and give you another perspective.
- 4 Just before the examination, use all your summary notes to jog your memory and the whole subject program suite to reinforce your understanding.

Success in chemistry lies partly in a knowledge of basic facts but also in the level of understanding of the underlying principles. This suite of programs has been designed to encourage you to test your knowledge and to develop your deductive faculty. You may be wrong sometimes but will gain in confidence as you become more practised. Be selective in your choice of subject area. Don't try to cram too much into a single session.

Most programs have a 'help' facility. Do not over-use it – use only when you cannot arrive at correct responses by your own efforts. In some cases the computer automatically helps you after 2 or 3 wrong attempts. In other cases you must request help by pressing a key (usually 'x' or '?' as indicated on screen).

When entering chemical names use terminology of the form 'iron (III) chloride' and *not* 'ferric chloride'. The use of the graphics keys for formulae is explained in this booklet for relevant programs.

The Programs *(Program loading names in brackets)*

Tape 1

Side A

Atomic structure and bonding ("atom")
Periodic table ("pertab")

Side B

Formulae and equations ("form")
Chemical deductions ("deduce")

Tape 2

Side A

Electrolysis ("elect")
Apparatus ("app")

Side B

Acids bases and salts ("abs")
Organic chemistry 1 ("orgchem")
Organic chemistry 2 ("org")

The Programs

1 Atomic structure and bonding ("atom")

Counter number:

This program is designed to develop your understanding of the atomic structure of elements and the relationships between atomic structure and different types of chemical bonds. This is achieved by the gradual completion of descriptive paragraphs about: atomic structure; ionic and metallic bonds; covalent and dative bonds; valency. You may select one of five levels of difficulty. The easiest requires you to enter only a few missing words whereas in the hardest you are given no words to help you. If you find any of the paragraphs too difficult you may use a built-in help facility. By entering 'x' you instruct the computer to complete the passage for you.



2 Periodic table ("pertab")

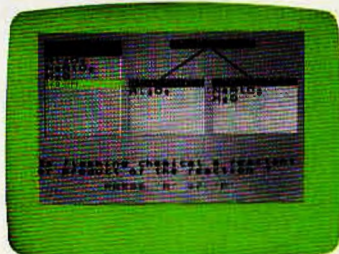
Counter number:

This program enables you to test your knowledge of the location in the periodic table of the more familiar elements. Alternatively you may select options which require you to apply your understanding of the electronic configuration of atoms. You may select how many elements you wish to predict and also choose between options of different levels of difficulty. The less difficult option is confined to those elements with which you should be familiar whereas the more difficult option extends your understanding to less familiar elements. You will need to know the sequence in which electrons are added to successive elements for both main group and transition elements.

3 Formulae and equations ("form")

Counter number:

Chemistry is primarily concerned with the interaction of materials. Reactions are normally represented by balanced equations in which the reactants and products are represented by chemical formulae. You may select between completing equations in which both sides are incomplete or organizing a selection of chemicals to produce a valid balanced equation. Both selections have built-in help facilities. The entry of correct formulae requires the correct use of upper and lower case letters. Additionally you will need to use subscript numbers. These have been located on graphics keys. When it is required a prompt is available on screen.



The **CAPS SHIFT** key must be used for capital letters as with a typewriter.

For example for Na_2SO_4 use the keys as follows:

SHIFT N a GRAPH a GRAPH SHIFT S SHIFT O GRAPH d
GRAPH

The **GRAPH** key is used to switch the graphics mode both on and off. Some of the function keys (e.g. **DELETE**) only operate correctly if the graphics mode is OFF.

4 Chemical deductions ("deduce")

Counter number:

This will test your overall knowledge of chemistry. The computer selects a chemical substance randomly from a databank. For each substance you will be provided with five clues, one at a time, from which you are asked to identify the selected substance. Some clues are numerical. For these you will need a calculator and a table of atomic masses. At any stage, you may enter your answer. If it is incorrect, the next clue will automatically appear. When each substance has been identified, or revealed by the computer, you will be asked for its chemical formula. Use the keyboard graphics keys as demonstrated in the previous program. A help facility is provided.

5 Electrolysis ("elect")

Counter number:

A random combination of electrolytes, molten or in dilute aqueous solution, is selected by the computer. You are required to identify the ions present, to which electrode they migrate (using the + or - key) and to identify the preferred ion reaction at each electrode. Finally you are requested to compile the ionic equation for each electrode reaction. Only inert electrode systems are considered.

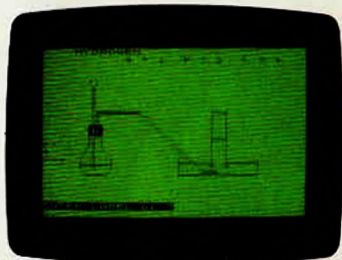
You will need to use subscript and superscript numerals for chemical formulae and ions. The graphics keys are programmed for this and on-screen information tells you which keys to use. A help facility is provided for the construction of ionic equations.

6 Apparatus ("app")

Counter number:

This program enables you to select pieces of standard equipment and assemble the most usual apparatus for the laboratory preparation of each of thirteen gases. At each stage you are offered a choice between two or three options and the computer remembers your selections. When all choices have been made, the computer identifies

which of your selections are correct and displays them on screen. The correct full apparatus is then drawn and you are invited to fill in the labels. These are indicated by a series of dashes, one for each character. Finally, the same technique is used for the completion of the correct balanced equation for the



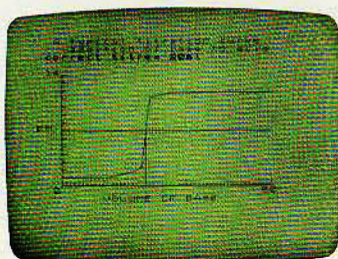
preparation. The final two stages of the program require the use of graphics characters for subscript numbers, as in previous programs. A help facility is also available by pressing '?',

7 Acids bases and salts ("abs")

Counter number:

This program is in three parts. In the first you are required to complete descriptive passages about acids, bases, salts, and pH. In the second part you are asked to comment on the proposed reactions, represented by equations. All are related to the various methods of preparing salts and their properties.

The third part demonstrates how pH changes in acid-base titrations and identifies the pH end-point. You may enter your own data and compare your result with that calculated by the computer.



8 Organic chemistry 1 ("orgchem")

Counter number:

This consists of four descriptive passages about the structure of organic molecules. You are required to complete them, with different levels of difficulty as in some previous programs. When each passage is completed, diagrams are produced which illustrate the substance of the passage.



9 Organic chemistry 2 ("org")

Counter number:

The program requires you to identify isomers, homologues and compounds with similar reactivity from a selection of twelve formulae displayed on screen. This tests your powers of observation rather than any detailed knowledge of the properties of organic molecules. If you press '?' the computer will solve the problem for you.

