Chemistry Revision

SOFT 959 (Cassette)
SOFT 1959 (Disc)

An aid for 'O' level, CSE and GCSE candidates

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For the Amstrad CPC464 and CPC664

Special features

* You can select which topics you wish to revise.
* You can choose to see the correct answer if you make a mistake.
* Colour graphics and animation are used to illustrate more difficult points.
* Suitable for 'O' level, CSE and GCSE syllabi.
* Helps you decide in which topics you are weakest.

Contents

1. Introduction

This cassette (or disc) contains eight programs to aid your chemistry revision. The first program tests your existing knowledge so that you can see where your strengths and weaknesses lie. The next six programs concentrate on topics which often cause difficulty. The programs also allow you to practise exam techniques such as multiple choice and multiple completion. The final program allows you to keep notes during your revision. The notes can be saved for future reference. The programs have been designed and tested by chemistry teachers working in schools with pupils taking both 'O' level and CSE examinations. The new GCSE syllabus has been taken into account in the design of these programs. The main topics covered include

> Separation techniques
> The atom and its structure
> Isotopes
> Structures of solids
> Bonding
> Elements in the periodic table
> Organic chemistry
> Electrochemistry and applications

These are described in detail under the heading for individual programs.

2. RUNning a Program

Before RUNning a program it is best to reset the computer by pressing the **[CTRL]** and **[SHIFT]** keys and whilst holding them down press and release the **[ESC]** key.

Cassette version: If you have a disc drive plugged into your computer be sure to type: | D I S C. The cassette should be placed in the Datacorder with side A upwards and the tape wound back to the beginning. To start RUNning the programs simply press and hold the **[CTRL]** key down and then press the small **[ENTER]** key. The cassette version of the programs are held in the following order

Side A

Program Title	*Program name*
Multiple Choice	multi
Introductory Topics	intro
The Element Game	element
The Separation Game	separate

Side B

Program Title	*Program name*
Organic Chemistry	organic
Electrochemistry	electro
Electrochemical Applications	applic
Electronic Notebook	notebook

Ii you wish to RUN a program out of order, reset the computer and type

```
RUN " <program>
```

followed by the program name. You can save time by winding the tape to a point just before the program that you wish to R UN. Make sure that you have the correct side of the cassette upwards in the Datacorder.

Disc version: The disc versions have the same program titles and names and are held on sides A and B as listed above. Having reset your computer and inserted the disc either way up, type

```
RUN "DISC"
```

followed by the **[ENTER]** key.

The 'DISC' program shows a list of the eight programs available. Simply choose which program you wish to use first (do not forget to press the **[ENTER]** key). You may be asked to turn the disc over. Press the **[SPACE BAR]** after you have turned over the disc.

3. General Instructions

These programs have been designed to be simple and straightforward to use. However it will help to understand a few general principles which apply to all of the programs.

*   All eight programs initially display a list of options, so that you can select what you want to do. Press **[ESC]** twice to return to the initial list of options. In some cases, however, you will see a presentation of your score and an analysis of your results before reaching the initial list of options.
*   When space appears at the bottom of the screen, press the **[SPACE BAR]**. This will move you on to the next screen.
*   When the computer asks you a question a flashing line appears on the screen. If you make a mistake when typing in your answer, use the **[DEL]** key to rub out the last character you typed. When you are happy with your answer press the **[ENTER]** key.
*   Several programs include a section where you fill in the missing words or phrases. If you do not know the answer just press the **[ENTER]** key straightaway. The correct answer is always the same length as the dashes shown. Sometimes there are two correct answers; the program will accept either. If the answer is a phrase, do not press the **[ENTER]** key until you have typed in the whole phrase. If you make a mistake you are given the option to see the correct answers immediately.
*   Cassette Versions: All but the last program have the option to move on to the next program on the cassette.
*   Disc Versions: All the programs except the Electronic Notebook have the option to RUN another program. This leads to the 'DISC' program that you used, at the beginning, to select the topic you wanted to revise.
*   All eight programs have the option to exit. This completely resets the computer.

4. Multiple Choice

The first program contains over 100 multiple choice questions covering the key subject areas. The program analyses your answers so that you can identify areas of weakness. This allows you to make the best use of your revision time; you can select the programs which cover these areas in more depth.

Three types of question are used

1) Multiple choice
2) Multiple completion
3) Assertion-reason

Questions of types 2 and 3, which are more common in 'O' Level papers, make up a quarter of the total questions. Instructions on how to choose the right answer to these questions are given at the end of this section or are available whilst using the program by pressing the **[COPY]** key.

You are invited to choose from a list of options the type of question that you wish to attempt.

The questions are presented one at a time in a random order. When you feel that you have spent enough time in a particular section, just press **[ESC]** twice. Your score will be displayed, followed by an analysis of how you performed in each topic. Similar information will be given to you if you have completed a section. This detail allows you to identify any areas of weakness and hence plan your revision strategy.

You can use the review option (option 4) to see the questions you answered and hence identify exactly which questions you answered correctly. The review option also gives the correct solution to those problems that you answered incorrectly.

Multiple completion and Assertion-reason questions

The program displays a list of instructions telling you how to answer these types of questions. However you might like to keep this copy by your side as a reminder.

Multiple Completion
Choose answers from A to E according to the following:-

Choose A if 1, 2 and 3 are correct.

Choose B if only 1 and 2 are correct.

Choose C if only 2 and 3 are correct.

Choose D if only 1 is correct.

Choose E if only 3 is correct.

Assertion-Reason

Choose from A to E depending on the following considerations:-

A if BOTH statements are TRUE and the second is a correct explanation of the first.

B if BOTH statements are TRUE but the second is NOT a correct explanation of the first.

C if the first statement is TRUE but the second is FALSE.

D if the first statement is FALSE but the second is TRUE.

E if BOTH statements are FALSE.

5. Introductory Topics

An introduction to some key areas of the syllabus covering the following areas:-

1) The atom and its structure
2) Electron arrangements
3) Isotopes
4) Bonding
5) Structure of solids

The atom and its structure:

Covers essential groundwork in understanding the structure of the atom, including a table to test knowledge of different particles, their charge, mass and position.

Electron arrangements: Covers the orbitals for 20 different atoms.

Enter the number of electrons on each ring starting nearest the nucleus – press **[ENTER]** when you have completed the configuration (the point separating each ring appears automatically). You will then find out how accurate you have been – and the configuration will be drawn out for you.

Isotopes: Tests your knowledge and reinforces the principle of the isotopes of elements according to their particle configuration. Enter the pairs of isotopes which are of the same elements (n-neutrons, p-protons, e-electrons).

Bonding: A challenging program to help you understand bonding – what happens when atoms gain or lose electrons, how it occurs and examples of it in practice. Shows the movement that takes place with the transfer of an electron from one atom to another. Tests your knowledge of the change on common ions and radicals, how compounds are formed, and covalent bonding.

Structure of solids: Choice of programs covering some common types of solids – metals, ionic solids and molecular solids. Lots of questions and diagrams to test and reinforce areas including the understanding of the part ions and electrons play in the conduction of electricity, cell structure and its influence on the formation of crystals, the characteristics of lattices etc.

6.   The Element Game

The element game helps you to understand some of the key facts about elements and their position in the periodic table.

The game is made all the more interesting by a fight against the clock! After setting the time limit (between 2 and 15 minutes) and your choice of level of assistance, you select an element by choosing a periodic number as it appears in the table. Please note that for reasons of screen space elements 21 to 30 are represented on a seperate line rather than between the bottom of the two blocks of elements. To give you a start a few have already been filled in.

Selecting a periodic number leads to questions about that element – and your score goes up or down from your initial allocation of 100 points according to the accuracy of your answers! Metals are shown in blue (dark on a monochrome screen) and non metals in brown (light on a monochrome screen). When you have completed the table (or run out of time or points!) you will be shown your score.

7.   The Separation Game

Can you separate and, salt and iodine? This facinating adventure into separation techniques tests your understanding of some of the basic principles of separation of solids and liquids – and shows you diagrammatically the experiment as it progresses. The program gives you lots of help in understanding the process and if you have made a poor choice, the

reasons why. At the end you will see how well you have found your way round the problem by your score.

8.   Organic Chemistry

Two programs cover chemical names, formulae and vocabulary with questions likely to be found in examinations. You can select whether you wish to be shown the answer in each case or have a further attempt later.

A futher program covers the following reaction processes:

1) Carbon dioxide
2) Crude oil
3) Ethanol
4) Ethene

The processes range from easy (carbon dioxide) to difficult (Ethene) – so you can make your choice accordingly! The processes are presented in the form of flow charts where in each case you can choose to attempt an answer to chemical formed in the process (press A followed by the letter corresponding to the chemical) or to choose help (press H). In the latter case after choosing the reaction process by entering the reaction process number you are given a clue to the reaction and the chemicals involved. You can then attempt to guess the chemical – or if still uncertain collect more clues! Finally you may have to let the program complete one or two of the chemicals to complete the flow chart.

9.   Electrochemistry

The electrochemical series program tests your skill in selecting the right order for reactivity of the elements, telling you in each case where you are right and wrong! To create your list press space when the required item is highlighted – to delete the last entry press the **[SPACE BAR]** when DELETE is highlighted. When you have completed the series you can see your score.

The program also covers other general aspects of reactivity and uses of elements.

The electrolysis program helps you understand the electrolysis process, including Faraday's laws and worked examples of typical exam questions.

The electrolysis of brine is shown in diagramatic form, with a multitude of questions to help you revise the topic.

10. Applications of Electrochemistry

Three key industrial applications are covered:

1) Extraction of Aluminium
2) Refining of Copper
3) Manufacture of Sodium Hydroxide

The programs test your existing knowledge, show diagramatically processes that take place in industrial situations. A tutorial explanation accompanies each diagram. Details of the processes include the types of electrodes used, the equations representing reactions at the electrodes, the products and by-products formed etc.

11. Electronic Notebook

This program allows you to make notes on your chemistry revision which you can keep for future reference. You can keep notes on up to 30 different topics in the computer's memory at the same time. The topics are automatically kept in alphabetical order for you so you can find them easily. When the program starts you are offered these options:

1) Create a note
2) Edit a note
3) Delete a note
4) Look at notes
5) Load notes
6) Save notes

1) Create a note

You must give the note a name which you have not used before (up to 15 characters). Then you may type in your note. If you make a mistake, just use the [DEL] key or the cursor keys to go back to the mistake, then just type over it.

2) Edit a note

You can use this option to alter a note that your created earlier.

3) Delete a note

If you run out of room you can use this option to make more space.

4) Look at notes

Use this option to browse through some or all of the notes. The cursor keys are used to go forwards and backwards between the notes.

5) Load notes

Please note that loading a new set of notes will automatically erase notes already in memory. If you want to retain the existing notes save these under an appropriate file name before loading in your new notes.

Disc version: Before you give the file name the computer gives you a list of all the files on the disc. When you have noted the name of the file that you want to load, press the space bar. Then type in the name of the file you wish to load.

Tape version: Place your data cassette in the Datacorder. This function operates similarly to the save option in that it first gives an opportunity to position the tape correctly before attempting to load. Use the **[PLAY]**, **[REW]** and **[F.F.]** keys to position the tape in front of the file you wish to load. Press **[ESC]** twice when it is positioned. Having done so, press **[PLAY]** then any key to load the file. The program will indicate when the file has been successfully loaded.

6) Save notes

If at any time you wish to break off a session but would like to continue to maintain these notes at some other point in time, then you will need to save the notes. If you are making a lot of notes then it may also be a wise precaution to occasionally save them, since if there was a power failure all would be lost. Saving your notes occasionally acts as an 'insurance policy'. Note that all the notes in memory will be saved during this operation.

Disc version: The note must be saved on a separate data disc since the program disc is 'write protected' – you cannot record on it. When you select this option you must type in the file name. The file type ' .ENB ' is added automatically to the end of the file name.

Tape version: The notes must be recorded on a separate data tape since the program tape is 'write protected' – you cannot record on it. When the save option is chosen the computer operates to catalogue the tape in the Datacorder when **[PLAY]** is pressed followed by any key. If a new cassette is being used, or if you are sure that the tape is correctly positioned press **[ESC]** twice. This takes you back into the save program. If you are using a

tape with existing files which you want to avoid overwriting, use the **[PLAY]** (followed by any key) together with, if necessary, the **[F.F.]** and **[REW]** buttons on the Datacorder. This gives you the ability to position the tape exactly where you want to record the file. Normally this would be after the end of the last recorded file. Beware of overwriting files if there is another recorded after it on the tape since if the notes are much larger, it will use up more tape and there is a risk of overwriting the beginning of the next file. Having found the correct position press **[ESC]** twice. A file name is requested. Spaces in file names should be avoided since it can be confusing, especially if the space is at the beginning or end. For this reason a file name with a space in it will be rejected. It is suggested that if two words are used then separate with a hyphen or slash. It is recommended that each time a file is recorded that its name is written on the cassette card together with the tape counter number for the start and finish – e.g. FILE 160 195. Having entered the file name by pressing the **[ENTER]** key the message `'press REC and PLAY then any key'` will appear. Press the **[REC]** and **[PLAY]** keys on the Datacorder – then press any other key. The notes will then be recorded onto the tape. NOTE: DO NOT PRESS **[ESC]** whilst saving the file to tape – if you do it will be necessary to reload the Electronic Notebook program. If you suspect there is a problem during the save operation, allow the program to continue until 'File saved' appears. After this message is seen the program can be used as normal and a further attempt made. The program then returns to the initial options screen. Should you want to check that the file has recorded properly then again use the procedure outlined at the beginning of this section to catalogue the tape. The file name should appear when **[PLAY]** is pressed followed by any key. Having checked, press **[ESC]** twice to return to the initial options screen.

12. Other Amsoft BES programs

Physics Revision

This companion series of 8 programs covers the 'O' level, CSE and GCSE syllabus in a similar manner to this chemistry revision package.

The contents are:

1 Multiple Choice: Exam questions to find your strengths and weaknesses, so that you can plan your revision strategy efficiently.

2 Optics and Waves: The optics section deals with mirrors and lenses both convex and concave. The waves section is in the form of a crossword.

3 Mechanics: This covers the laws of motion. The section on trajectories shows a man being fired from a cannon in to a net. You have to determine whether he will miss the net under various conditions.

4 Radioactivity: Explores the formation radioactive particles and isotopes. The section on radiation uses animated diagrams to show the depth of penetration of alpha, beta and gamma particles.

5 Electricity: This program takes you step by step through the analysis of a circuit containing cells, resistors, meters and lights. The program builds from basic principles so that you don't have to understand the whole circuit initially.

6 Electromagnetism: This program covers magnetic fields from the simple bar magnet through electromagnets to situations involving both. It also tests your knowledge of Fleming's left and right hand rules.

7 Heat: This program includes expansion, heat energy, transfer of heat and worked examples. Animated diagrams help you distinguish between the 3 different modes of transferring heat.

8 Electronic Notebook: Helps you keep tabs on your revision. You can save your notes and refer to them any time in the future.

Osprey! Developed in conjunction with the RSPB (and based on their site at Loch Garten in Scotland), 'Osprey!' is a highly original game intended to illustrate the complexity of wildlife conservation.

Given the responsibility of protecting the precariously small Scottish Osprey population, you have at your disposal a team of wardens. They will enable you to keep egg-stealers at bay, prevent huntsmen from shooting the birds, and control the ever-inquisitive tourists who can easily disturb the nests.

After allocating the wardens to their duties you can see how successful your strategy has been. And, as in real-life, certain factors (like the weather!) remain beyond your control. So the problems of ensuring the Osprey's survival are by no means straightforward – as the RSPB will tell you.

Colourful and fast-moving 3-D graphics screens show clearly how you have used your wardens, the arrival of the Osprey, and the hazards that befall them! Suitable for all ages of 8 years and up.

Timeman One The program helps children tell the time and set a clock. Attractive scoring with a man and a ladder keep children's interest. Choice of twelve progressive stages of difficulty, together with the usual attractive sound, colour and monitoring facilities. (Age 4-9 years).

Timeman Two Companion program covering minutes to the hour, half and quarter hours and the 24-hour clock. Same attractive features as Timeman One with progressive stages if difficulty, together with attractive sound, colour and monitoring facilities. (Age 4-10 years).

Happy Numbers A program to help children learn their numbers and count without need of reading skills. Attractive graphics and scoring make this a favourite with 3 to 5 year olds.

Happy Letters   The program to teach children to match small and capital letters both on the screen and the keyboard. They love trying to stop the crocodile eating the fish. Features attractive use of sound and colour as well as easy identification of problem letters for further practice. (Age 3-6 years).

World-Wise   Two programs to stimulate children to 'teach the computer' about geography. Encourages the use of atlases and reference books, helps exam studies and introduces the use of the computer to store information. Data can be readily saved and reloaded at any time. (Age range 7-15 years).

Map Rally   Try to find the hidden checkpoints in a race against your opponent or the clock! Map co-ordinates and directions are soon mastered as children learn to control the cars. After each rally they can watch the cars retrace their routes taken, showing how well each driver did. (Age 7-13 years).

Happy Writing   The program helps children form their letters and numbers correctly and encourages them to practise writing. A moving pencil point shows clearly where to start each figure. Tractors, attractive colour and sound all help to keep their interest. (Age 3-5 years).

Animal/Vegetable/Mineral   This program provides hours of fun enjoyment as the computer tries to guess the object a child has thought of. The computer's failure to guess correctly encourages children to help the computer to tell the difference between the various objects. The program stimulates discussion and the use of reference books. Suitable for all ages 7 years and upwards.

Wordhang   This version of the traditional 'Hangman' spelling game has been described as '... the Rolls-Royce of them all!' Features over 250 words plus the ability to enter your own words – either individually or as a group (ideal for that weekly spelling list!). Improves spelling at all ages of 5 years and upwards.