Answers to Further Questions
in GCSE Chemistry for You (5th Edition)

On the following pages we show the Answers and Mark Schemes for the Further Questions on Synthesis and Analysis.

The answers have been prepared by an Examiner using the mark schemes published by each Examination Board.

For the Student:

- It is very important that you are able to answer the questions on your own, using your own knowledge of Chemistry.
  So it is important that you have a go at the questions first, and then afterwards you can check your answers using these pages.
  If you get a question wrong, try to work out where you have made an error. Discuss it with your teacher if you are not sure.

- Be aware that in some answers the mark is for the idea in your own words (not necessarily the exact words shown), whereas in other answers the number and unit must be exactly correct.

For the Teacher:

- You will find these sheets useful when marking the students’ homework, or when going over the Further Questions in class.
  The Answer Sheet will also enable you to assess how much work is involved in answering the questions when planning how much homework to set.

- The PDFs are available for you to hand out to the students if you wish (perhaps as part of a Revision Programme).
  As with all mark schemes there may be alternative credit-worthy statements for qualitative answers (for the idea) and this may need to be explained to your students. Quantitative answers, however, are generally more prescriptive and your students may need to be encouraged to show the exact numerical value and the appropriate unit.

Lawrie Ryan
Making new materials

1. (a) 1 mark for formulation.
   (b) pure substances are salt, limestone, ethanol; mixtures are paint, alloys, fertilisers.
   3 marks; subtract 1 mark for each error
   (c) 1 mark for the idea that cement is the matrix or binder;
   1 mark for the idea that the gravel is the reinforcement.
   (d) 1 mark for any other composite such as wood, fibre glass.

Total 7 marks

2. (a) 1 mark for C
   1 mark for E
   (b) (i) 1 mark each for any two of:
       • polythene requires least energy;
       • polythene uses less fossil fuel;
       • polythene produces least solid waste;
       • polythene gives least greenhouse gases;
       • polythene uses least water.
   (ii) 1 mark for each of any two (for or against the ban) of:
       • bags may be discarded and litter the environment/harm wildlife/they take up space in landfill;
       • polythene will not rot/takes a long time to degrade;
       • incineration of polythene bags causes pollution;
       • polythene is made from crude oil which is finite;
       • polythene can be recycled and used to make something else;
       • bags could be reused.

Total 6 marks

3. (a) 1 mark for D.
   (b) 1 mark for the idea that less material is needed;
   1 mark for the idea that therefore this will save costs.
   (c) 1 mark for smaller particles may get through the pores in the skin;
   1 mark for the idea of potential damage to cells.

Total 5 marks

Analysis

4. (a) 1 mark for each of the following correct matches:
   Sodium ion – 3;
   Calcium ion – 7;
   Copper ion – 5;
   Ammonium ion – 2;
   Chloride ion – 6;
   Sulfate ion – 4;
   Carbonate ion – 1.
   Total 7 marks

5. (a) 1 mark for each of the following ideas:
   sodium;
   carbonate or hydrogen carbonate.
   (b) 1 mark for each of the following:
   calcium;
   chloride.
   (c) 1 mark for Fe^{2+} (or Fe(II) ion).
   Total 5 marks

6. (a) (i) 1 mark for carbon dioxide;
   (ii) 1 mark for each of the following ideas:
       potassium;
       carbonate;
   (iii) 1 mark for chloride ion;
   (iv) 1 mark for hydrochloric acid;
   (v) 1 mark for silver chloride.
   (b) 1 mark for each of the following ideas:
       dip wire into hydrochloric acid and heat in Bunsen flame to clean;
       add few drops of hydrochloric acid to sample A;
       dip wire into sample and put into flame to observe colour.
   Total 9 marks

7. (a) 1 mark for each of the following ideas:
   solid A is copper(II) carbonate;
   solution B is copper(II) sulfate;
   gas C is carbon dioxide.
   (b) 1 mark for each of the following ideas:
       formulae correct on left of equation;
       formulae correct on right of equation;
       equation balanced.
   (complete equation is CuSO_{4} + 2NaOH \rightarrow Cu(OH)_{2} + Na_{2}SO_{4})
   Total 6 marks