

# N5 Chemistry

## Unit 3 Chemistry in Society Practice Questions

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## Key Area: Metals 1

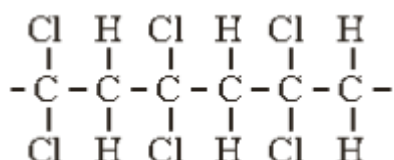
1. What is a metallic bond
2. Metals conduct electricity. Use your knowledge of metallic bonding to explain why.
3. Write a balanced formula equation for the reaction between copper and oxygen to form copper (II) oxide.
4. What type of reaction is 3.
5. Magnesium reacts with dilute hydrochloric acid to form a salt and hydrogen. Write a balanced formula equation for this reaction.
6. What type of reaction is 5.
7. Metals are extracted from their ores. What is an ore?
8. State the name of the ore from which iron is extracted.
9. Aluminium is extracted from bauxite ( $\text{Al}_2\text{O}_3$ ) by electrolysis. Write a balanced formula equation for this reaction.
10. What % by mass of  $\text{Pb}_2\text{O}_3$  is lead?

## Key Area: Metals 2 – Electrochemical cells

1. Zinc, zinc sulphate solution, copper and copper sulphate solution are set up in an experiment to create an electrochemical cell. Draw and label a diagram of the set up that could be used.
2. Mark on your diagram the direction of electron flow
3. Write the ion equation for the reaction occurring at the positive electrode. Label it as oxidation.
4. Write an ion equation for the reaction occurring at the negative electrode. Label it as reduction.
5. Combine the 2 ion equations from 3 and 4 to generate an overall redox equation.
6. Name a suitable material for making electrodes and give a reason why it is suitable.
7. What is a rechargeable cell?
8. Name 2 types of rechargeable cell and state a use for each one.
9. What is a hydrogen fuel cell?
10. State an advantage of hydrogen fuel cells over regular cells

## Key Area: Properties of Plastics

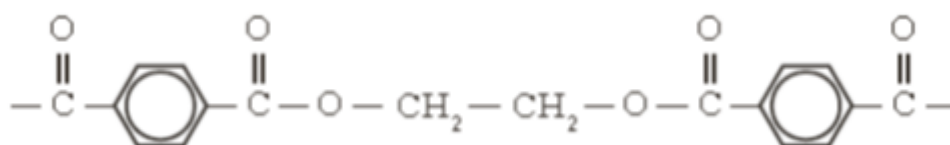
1. Draw a section of polythene made from joining 3 ethene molecules.
2. Identify the repeat unit in you diagram from 1
3. What type of polymer is polyethene.
4. The structure of part of a polymer is shown below. Name and draw the structure of the monomer used to produce it.



5. PET is a polymer used to make plastic bottles which can easily be recycled by heating and shaping. Which of the rows in the table below best describes PET

	Type of polymer	Property
A	addition	thermoplastic
B	condensation	thermosetting
C	addition	thermosetting
D	condensation	thermoplastic

6. The structure of a section of PET is shown

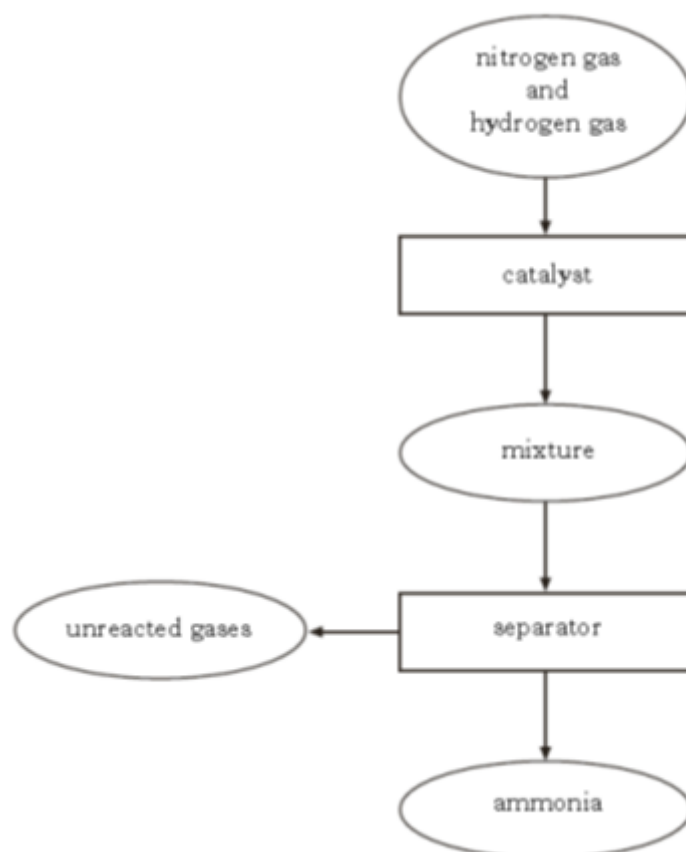


Draw the structures of the 2 monomers used to make it.

7. What is a smart material?
8. State the name of a smart material and an application of it.
9. Name 2 natural polymers
10. What is a biodegradable polymer?

## Key Area: Fertilisers

1. The flow diagram below shows the manufacture of ammonia in the Haber process



- Add an arrow to show how the process is made more economical.
2. Write a balanced formula equation for the production of ammonia
  3. Name the catalyst used in this process.
  4. Look at the table below. Write a general statement describing how the yield of ammonia is affected by the temperature.

Temperature/°C	Percentage yield of ammonia
200	88
300	67
400	49
500	18

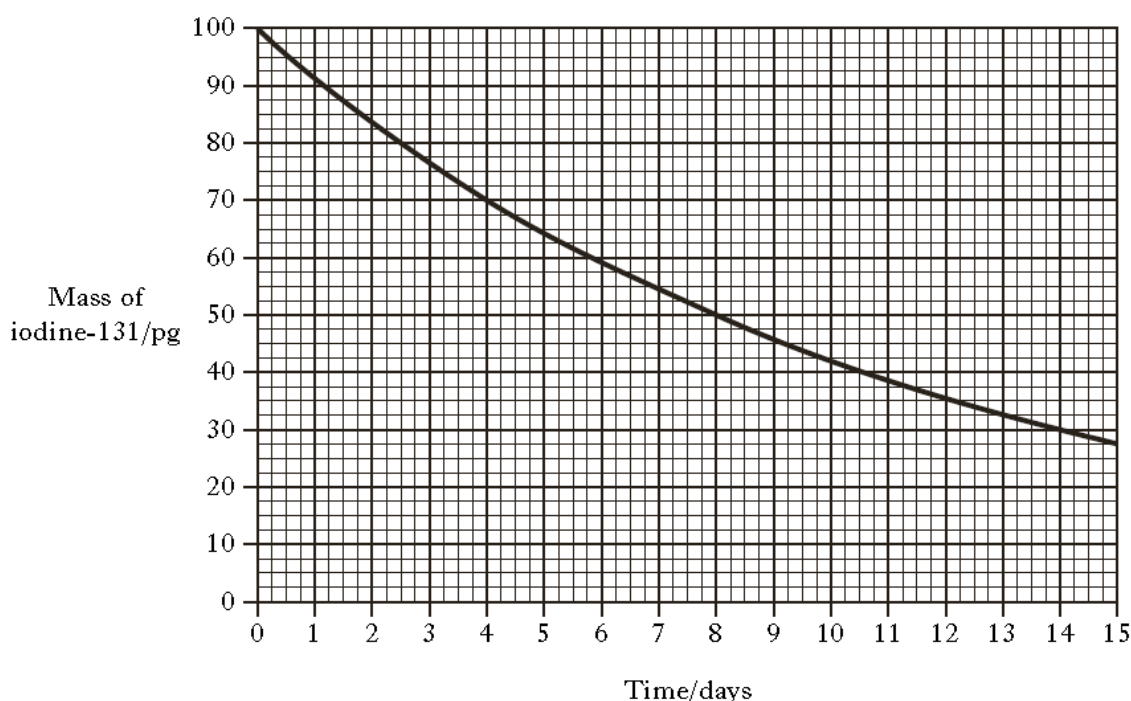
5. Suggest a reason why a plant operates at temperatures closer to 500°C rather than 200°C
6. Potassium hydroxide solution can react with dilute sulphuric acid to form a salt that can be used as a fertiliser. Name the salt produced.
7. Which essential nutrient does this contain that is needed by plants?
8. A student carried out a titration experiment to determine how much dilute sulphuric acid was needed to make potassium sulphate solution. Her results are shown below. Calculate the average volume of sulphuric acid she should use.

Titration	Initial burette reading (cm <sup>3</sup> )	Final burette reading (cm <sup>3</sup> )	Titre (cm <sup>3</sup> )
1	0.5	17.1	16.6
2	0.2	16.3	16.1
3	0.1	16.0	15.9

9. Write a balanced formula equation for the reaction between potassium hydroxide and sulphuric acid.
10. State an industrial use for ammonia and an industrial use for nitric acid.

## Key Area: Nuclear Chemistry

1. Strontium-89 decays by emission of a beta particle. Write a nuclear equation for this decay.
2. A mosquito fed on a solution containing phosphorus-32 is released. Phosphorus-32 has a half-life of 14 days. When the mosquito is recaptured 28 days later, what fraction of the phosphorus-32 will remain?
3. Name the 3 types of nuclear radiation and a use of each one.
4. The graph below shows how a sample of Iodine-131 decays over time. What is its half life?



5. The process of neutron capture can be used to generate radioisotopes. Write a nuclear equation for the neutron capture of Sulphur 32.
6. Americium-241 decays by the emission of alpha radiation. Write a nuclear equation for the decay.
7. What is nuclear fission?
8. Which element is used as a fuel in the nuclear fission process?
9. What is nuclear fusion?
10. Where does nuclear fusion naturally occur?

## Key Area: Chemical Analysis

1. Use your data book to identify the colour that would be seen if sodium chloride is put through a flame test.
2. A student tested sodium chloride solution with acidified silver nitrate solution. Which acid should be used ?
3. What would the student see? Write an equation to explain her observations.
4. Nitrate ions can pollute water supplies. State a source of nitrate pollution.
5. A mystery substance was dissolved in water. A sample of the solution reacted with dilute sodium hydroxide to form a pale blue precipitate. A second sample reacted with dilute barium chloride solution to form a white precipitate. Identify the mystery substance.
6. Write a balanced formula equation for the reaction between potassium iodide solution and acidified silver nitrate solution. Include state symbols.
7. A student was analysing soil samples to find the pH. Describe what they would do to find the pH.
8. The pH of the soil was found to be 3. Suggest a possible cause of this low pH.
9. Some students collected a sample of water from their local reiver and tested with universal indicator paper; the pH of the water was approximately 10. They titrated the sample in the laboratory against dilute acid because they wanted to find the concentration of hydroxide ions. Write an ion equation to show this reaction.
10. The results from her titration are shown in the table below. Fill in this missing values.

	Rough titre	1 <sup>st</sup> titre	2 <sup>nd</sup> titre
Initial burette reading (cm <sup>3</sup> )	0.0	15.3	29.8
Final burette reading (cm <sup>3</sup> )	15.3	29.8	44.4
Volume used (cm <sup>3</sup> )	15.3		