

N5 Chemistry
Unit 3: Chemistry in Society
Homework 3.8

Name _____

Teacher _____

1. Which of the following would quickly decolourise bromine solution?

- A C₂H₄
- B C₃H₈
- C C₄H₁₀
- D C₅H₁₂

Answer _____

2. The course of a chemical reaction was followed measuring the volume of gas produced over time. 40 cm³ of gas was collected after 100s. What was the average rate of reaction, in cm³s⁻¹, over 100 seconds?

- A 0.04
- B 0.4
- C 2.5
- D 4

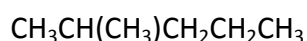
Answer _____

3. The correct formula for calcium sulfite is

- A CaS
- B CaSO₃
- C CaSO₄
- D CaS₂O₃.

Answer _____

4. What is the correct systematic name for the following compound?



- A Hexane
- B Pentane
- C 2-methylpentane
- D 3-methylpentane

Answer _____

5. Which of the following has a covalent network structure?

- A Neon
- B Silicon dioxide
- C Calcium chloride
- D Carbon dioxide

Answer _____

6. What is the charge on the copper ion in CuO?

- A 1+
- B 2+
- C 1-
- D 2-

Answer _____

7. Metallic bonds are due to

- A a shared pair of electrons
- B an attraction between positive ions and negative ions
- C an attraction between positive ions and delocalised electrons
- D an attraction between negative ions and delocalised electrons.

Answer _____

8. Which of the following contains metallic bonding?

- A Calcium
- B Carbon
- C Oxygen
- D Fluorine

Answer _____

9. Which of the following is **not** an isomer of pent-1-ene?

- A but-1-ene
- B pent-2-ene
- C cyclopentane
- D 2-methylbut-1-ene

Answer _____

10. In a neutralisation reaction between an acid and an alkali, the pH

- A of the acid increases
- B of the acid decreases
- C of the alkali increases
- D of the alkali is unchanged.

Answer _____

11. Which of the following substances will not produce a gas when added to dilute hydrochloric acid?

- A Copper
- B Zinc
- C Copper carbonate
- D Zinc carbonate

Answer _____

12. Which of the following compounds is a salt?

- A Ammonium chloride
- B Calcium oxide
- C Hydrogen chloride
- D Sodium hydroxide

Answer _____

13. Which of the following metals can be obtained from its ore by heating with carbon monoxide?

(You may wish to use the data booklet.)

- A Aluminium
- B Calcium
- C Magnesium
- D Nickel

Answer _____

14. When a metal element reacts to form a compound the metal is

- A displaced
- B oxidised
- C precipitated
- D reduced.

Answer _____

15.

Metal	Reaction with	
	Dilute acid	Water
X	reacts	no reaction
Y	no reaction	no reaction
Z	reacts	reacts

Which of the following shows the metals in order of **increasing** reactivity?

- A X Y Z
- B Y X Z
- C Z X Y
- D Z Y X

Answer _____

16. Which of the following substances dissolves in water to give a solution of pH greater than 7?

- A Ammonia
- B Carbon dioxide
- C Sulfur dioxide
- D Sodium chloride

Answer _____

17. What mass of ammonium sulfate, $(\text{NH}_4)_2\text{SO}_4$, is required to produce 0.5 litres of 1 mol l^{-1} solution?

- A 32 g
- B 64 g
- C 66 g
- D 132 g

Answer _____

18. Which metal will displace zinc from a solution of zinc sulfate?

- A Iron
- B Magnesium
- C Silver
- D Tin

Answer _____

19. Read the passage below and answer the questions that follow.

Scientists Investigate Release of Bromine in Polar Regions

Ozone plays a key role not only in the atmosphere, but also on the ground. While at ground level it is not particularly relevant for the protection from UV radiation, it is for the self-cleaning of the atmosphere and removal of contaminants.

In the 1990s researches discovered that the extensive ozone depletion in the atmosphere close to the ground in the Arctic and Antarctic was due to a reaction of bromine with ozone (O_3), producing bromine oxide (Br_2O) and oxygen. This bromine is released in autocatalytic processes.

During the polar spring, the resulting bromine oxide clouds can be spread over several thousand square kilometres. "It is by far the largest release of bromine on our planet," says Prof. Platt of the Institute of Environmental Physics at Heidelberg University. The precise processes involved are quite complex and are still a topic of current research.

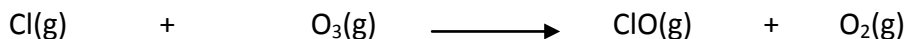
a) What role does ozone play in our atmosphere?

1

b) Write the formula equation for the reaction between bromine with ozone.
There is no need to balance the equation.

1

c) CFC's such as dichlorofluoromethane are also broken down by UV radiation to produce very reactive free radicals such as chlorine atoms. These chlorine atoms react with ozone as shown in the equation.



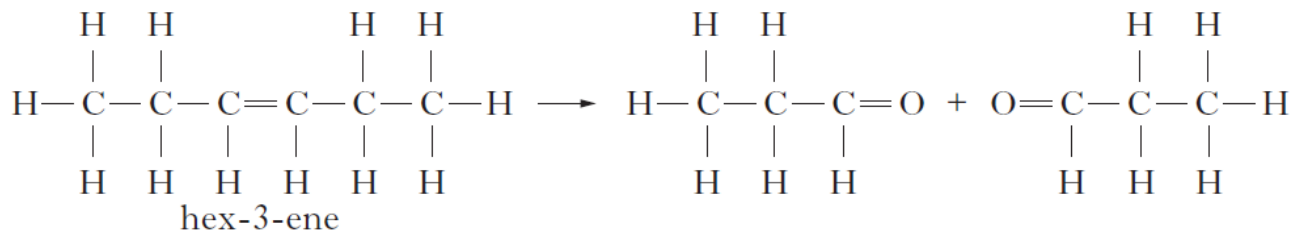
What mass of ozone would react with 71 g of chlorine free radicals?

_____ g

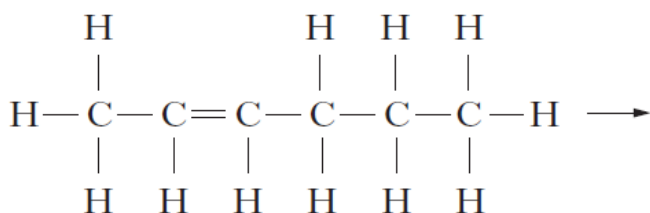
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20. Alkenes can undergo different reactions.

- a) In ozonolysis an alkene reacts with ozone forming two molecules. The ozonolysis of hex-3-ene is shown.



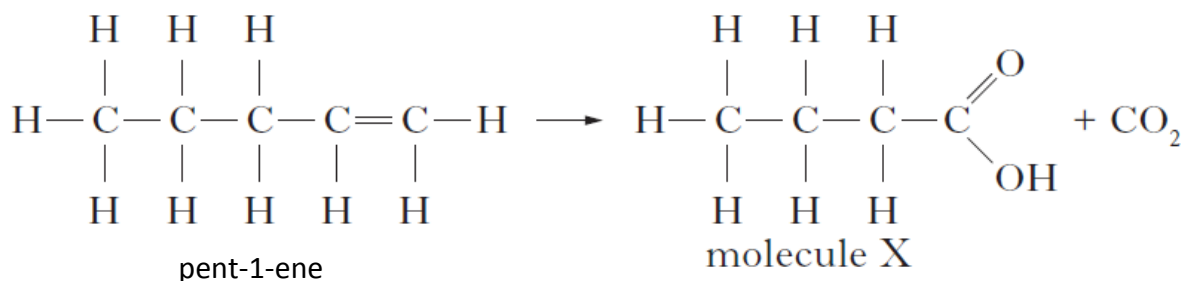
Draw the products formed by the ozonolysis of hex-2-ene.



1

- b) Potassium permanganate can be used to convert alkenes into two molecules.

The conversion of pent-1-ene is shown.



- i) Name molecule X

1

- ii) State the test for carbon dioxide.

1

- iii) Draw the structure for an isomer of pent-1-ene.

1

21. The table shows information about some useful compounds.

Compound	Formula
Y	Na_3PO_4
ammonia	NH_3
ammonium nitrate	NH_4NO_3

a) i) Name compound Y.

_____ 1

ii) Compound Y can be used as a fertiliser.

Why are fertilisers added to soil?

_____ 1

iii) Calculate the percentage by mass of nitrogen in ammonium nitrate.

Space for working and answer.

_____ % 3

b) Name the catalyst used in the industrial manufacture of ammonia.

_____ 1

c) What is present in the root nodules of some plants which convert nitrogen from the atmosphere into nitrogen compounds?

_____ 1

d) Ammonium nitrate is produced when ammonia gas reacts with nitric acid.

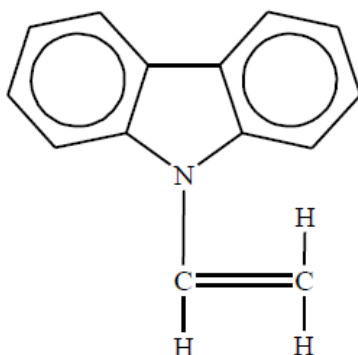
i) Name the industrial process used to produce nitric acid.

_____ 1

ii) State the catalyst used in this process.

_____ 1

22. Poly(vinyl carbazole) is a useful polymer. The monomer used to produce this polymer is shown.



Vinyl carbazole monomer

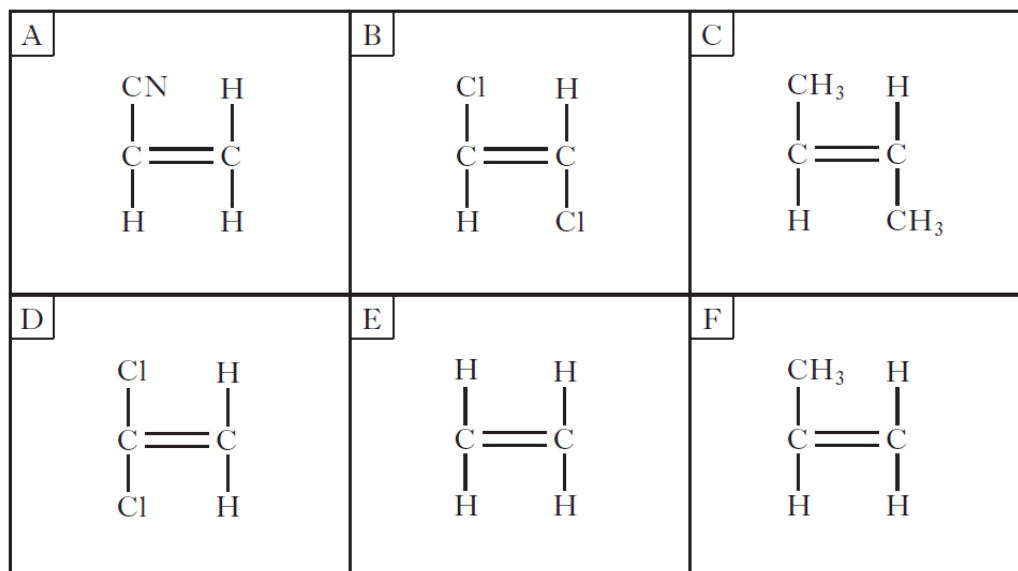
a) Draw a section of the polymer molecule consisting of **three** vinyl carbazole monomers.

1

b) Name the type of polymerisation reaction which takes place when poly (vinyl carbazole) is formed.

1

23. The grid shows the structural formulae of some monomers.



a) Identify the monomer which would form poly(propene). Answer _____

1

b) Identify the monomer which reacts with hydrogen to form ethane. Answer _____

1

c) Identify the two isomers. Answers _____ & _____

1

Total Marks 41