

Year 12 Chemistry HSC

Sample Questions

This is NOT a complete sample examination paper.

This document shows the layout of the 2019 Year 12 Chemistry HSC Diagnostic Topic Tests and provides some sample questions from the tests.

TEST 11 SAMPLE QUESTIONS

Question 1

A student carefully adds some acid to a solid and observes the formation of a gas.

Which one of the rows in the following table contains the correct tests to identify the gases listed?

	Oxygen	Hydrogen	Carbon dioxide
A.	pop test	limewater test	glowing splint test
B.	limewater test	pop test	glowing splint test
C.	glowing splint test	pop test	limewater test
D.	glowing splint test	limewater test	pop test

Question 2

A scientist wants to use pH to compare the strength of two acids.

Which one of the following pairs provides a valid comparison?

- A. $0.1 \text{ mol L}^{-1} \text{ HNO}_3$ and $0.1 \text{ mol L}^{-1} \text{ CH}_3\text{COOH}$
- B. $0.1 \text{ mol L}^{-1} \text{ HNO}_3$ and $1.0 \text{ mol L}^{-1} \text{ HNO}_3$
- C. $0.1 \text{ mol L}^{-1} \text{ HNO}_3$ and $0.1 \text{ mol L}^{-1} \text{ NH}_3$
- D. $0.1 \text{ mol L}^{-1} \text{ HNO}_3$ and $1.0 \text{ mol L}^{-1} \text{ CH}_3\text{COOH}$

Question 3 (5 marks)

In an experiment to determine the enthalpy of neutralisation, the following experimental data was collected:

- volume of 1.0 mol L^{-1} HCl used: 25.0 mL
- mass of NaOH added: 1.00 g
- initial temperature of the solution: 19.5°C
- final temperature of the solution: 30.3°C

a. Write a net ionic equation for the reaction that occurs. 1 mark

b. Calculate the enthalpy of neutralisation. 3 marks

c. The value for the enthalpy of the solution recorded in the textbook is approximately -56 kJ mol^{-1} .

Suggest a reason why the value obtained in the school laboratory is different. 1 mark

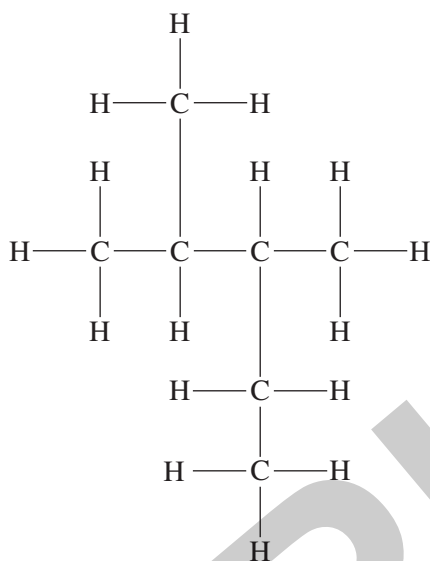
TEST 13 SAMPLE QUESTIONS**Question 1**

Which row of the table below correctly matches the reaction type with its correct reactants, catalyst and products?

	Reaction Type	Reactants	Catalyst	Products
A.	hydration	$\text{H}_2\text{C} = \text{CH}_2 + \text{H}_2\text{O}$	H_2SO_4	$\text{HOCH}_2\text{CH}_2\text{OSO}_3\text{H}$
B.	hydration	$\text{H}_2\text{C} = \text{CH}_2$	concentrated H_2SO_4	$\text{CH}_3\text{CH}_2\text{OH}$
C.	addition	$\text{H}_2\text{C} = \text{CH}_2 + \text{H}_2\text{O} + \text{Br}_2$	no catalyst needed	$\text{BrCH}_2\text{CH}_2\text{Br}$
D.	addition	$\text{H}_2\text{C} = \text{CH}_2 + \text{H}_2$	Ni	CH_3CH_3

Question 2

Consider the organic compound shown below.



What is the correct IUPAC systematic name for the organic compound shown above?

- A. 2,3-dimethylheptane
- B. 2-ethyl-3-methylbutane
- C. heptane
- D. 2,3-dimethylpentane

Question 3 (3 marks)

Explain, with reference to the intermolecular forces involved, why pent-1-ene is not soluble in water but is very soluble in pentane.

TEST 15 SAMPLE QUESTIONS**Question 1**

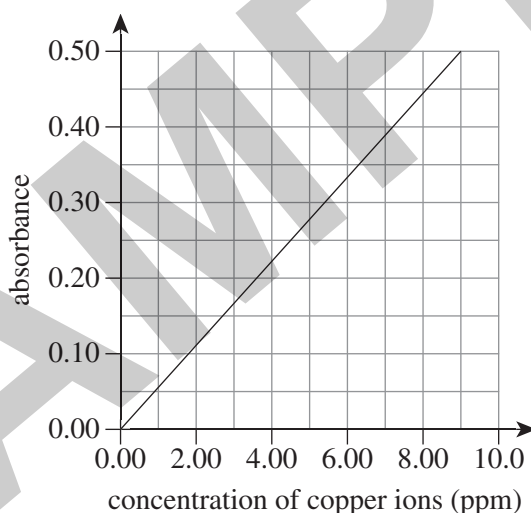
A student calculated the amount of chloride ions in a sample. The student weighed exactly 1.00 g of the sample and dissolved it in water. Excess AgNO_3 solution was added, forming a precipitate of AgCl . The precipitate was collected by filtration. The precipitate of AgCl weighed 2.45 g after drying.

What was the percentage of chloride ions in the sample?

- A. 24.8%
- B. 40.8%
- C. 60.6%
- D. 100%

Question 2 (3 marks)

A series of standard solutions were prepared by dissolving pure $\text{Cu}(\text{NO}_3)_2$ in distilled water. The absorbance of these standard solutions was measured at 625 nm and the standard curve shown below was obtained.



Determine the absorbance of a solution prepared by dissolving 15.0 mg of $\text{Cu}(\text{NO}_3)_2$ in sufficient water to give 2.00 L of solution.

END OF SAMPLE QUESTIONS