

CHEMISTRY

THE MOLE

Total Marks: 25

Duration: 0 hours, 20 minutes

Instructions to test takers

1. Answer all the questions in this paper
2. All the answers for the questions in this paper will be found on **Study Star** (www.studystar.me)
3. Using the answers on the website, mark yourself truthfully and carefully.

Turn this page, time yourself and begin the test

Section A [10 marks]

1. Calculate the relative molecular mass of Sulphuric acid (H_2SO_4).
 - a. 49
 - b. 98
 - c. 50
2. Calculate the number of moles of 6.23g of nitric acid. (HNO_3)
 - a. 0.099
 - b. 0.098
 - c. 0.9
3. Calculate the mass of 7.1 mols of water.
 - a. 120.7
 - b. 125.6
 - c. 127.8
4. Calculate the concentration of a solution with 0.2mol and dissolved in 0.25dm^3 .
 - a. 0.8M
 - b. 0.008M
 - c. 0.8M
5. What would be the concentration of 2.3g of lithium chloride (LiCl) dissolved in 250cm^3 ?
 - a. 0.21M
 - b. 0.22M
 - c. 0.23M
6. 48g of aluminium chlorate decomposes to potassium chloride and oxygen gas. Calculate the mass of potassium chloride formed.
 - a. 29.1g
 - b. 29.2g
 - c. 36.2g
7. Calculate the volume of oxygen from at RTP from question 6 above.
 - a. 4.8cm^3
 - b. 4800dm^3
 - c. 4.8dm^3
8. 20g of chlorine reacts with 0.1g of hydrogen gas.
$$\text{H}_2 + \text{Cl}_2 \rightarrow \text{HCl}$$
Calculate the number of moles of hydrogen gas.
 - a. 0.05mols

- b. 0.28mols
 - c. 0.5mols
9. 25cm^3 of barium chloride reacted with 20cm^3 of a solution of 0.05 mol/dm^3 of Sulphuric acid to form barium sulphate, find the concentration of BaCl_2 used.
- a. 0.4M
 - b. 0.04M
 - c. 0.004M
10. Find the relative molecular mass calcium phosphate, $\text{Ca}(\text{PO}_4)_2$.
- a. 199
 - b. 230
 - c. 270

Section B [5 marks]

11. The number of particles of atoms present in 1 mol of an element compared to $\frac{1}{12}$ of carbon-12 is called _____
12. The amount of products expected to be produced in a closed reaction is called _____
13. The ratio of actual yield to theoretical yield expressed as a percentage is called _____
14. What do we call the ratio of a pure substance to the whole compound expressed as a percentage?
15. A reactant that is up first and is used to determine the mass and quantity of products is called _____

Section C [10 marks]

16. 25cm^3 of hydrochloric acid of concentration of 0.12 mol/dm^3 reacts with 28.8cm^3 of sodium hydroxide to form water and sodium chloride. What is the concentration of sodium hydroxide? [2]
17. In a process 637.2g of ammonia is treated with 1142g of carbon dioxide.
 $\text{NH}_3 + \text{CO}_2 \rightarrow (\text{NH}_2)_2\text{CO} + \text{H}_2\text{O}$
Which reactant is limiting? [2]
18. What mass of urea was produced in question 17 above? [2]
19. In an experiment, 7.62g of iron reacted with 8.67g of sulphur
 $\text{Fe} + \text{S} \rightarrow \text{FeS}$
State the reactant which is limiting [2]
20. Calculate the excess reagent left over once the reaction is complete in question 19 above. [2]



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