CHIWALE SECONDARY SCHOOL

CHEMISTRY PRACTICE QUESTIONS

Instructions; **DUE DATE: 11TH OCTOBER, 2019**

1. This paper contains 4 pages
2. Write your group name on top of each page of your answer sheet
3. Answer all questions within the specified time
4. Every member must participate
5. Write down names of all those that participated in your group
6. Give yourself time to study before attempting these questions.
7. **No books** should be used at the time of answering, everyone should try to recall.

TOPIC: 1. RATES OF REACTIONS

1. Define
    a. Rate of reaction **(1 mark)**
    b. Activation energy **(1 mark)**
    c. Fruitful collision **(1 mark)**
    d. Surface area **(1 mark)**
2. Explain how the following factors affect rate of chemical reactions;
    a. Concentration **(3 marks)**
    b. Temperature **(3 marks)**
    c. Catalyst **(3 marks)**

3. In an experiment to determine rate of reaction, dilute hydrochloric was reacted with magnesium ribbon and the results were collected and recorded in the table below. Use it to answer questions that follow.

TIME (MINUTES)	**VOLUME OF GAS EVOLVED**
5	16.5
10	33.5
15	45
20	51
25	54
30	55.5
35	56
40	56
45	56
50	56
55	56

a. plot a graph of volume of gas collected against time **(1 mark)**
b. After how many minutes did the reaction come to an end? **(1 mark)**
c. What volume of the gas had been collected by the end of the experiment **(1 mark)**
d. How many minutes did it take to collect 45cm3 of the gas and how many minutes did it take to collect the 10cm3 (after the 45cm3 had been collected). Explain the observation. **(4 marks)**
e. Use your graph to determine rate of the reaction. **show all calculations** **(5 marks)**

a. Explain what happens to the rate at which the hydrogen is produced as the time increases. **(4 marks)**
b. Write down a balanced chemical equation for the reaction above. **(4 marks)**

c. On the same graph you have plotted, sketch another graph that would be produced if the experiment was later done at

i. 50^{0}C. **(2 marks)**

ii. 10^{0}C. **(2 marks)**

4. Define

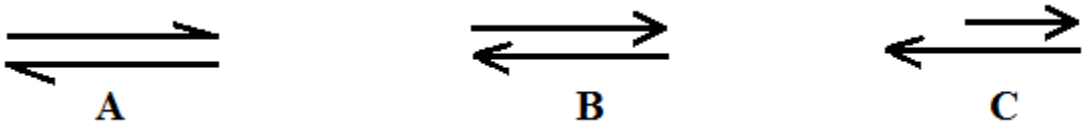
   a. Reversible reaction **(1 mark)**

   b. Chemical equilibrium **(1 mark)**

   c. Physical equilibrium **(1 mark)**

   d. Dynamic equilibrium **(1 mark)**

5. Give meaning for each of the arrows labeled **A, B** and **C** below when used in reversible reaction equations.



6. State the **Le Châtelier's** principle **(1 mark)**
7. Explain two factors which may disturb a chemical equilibrium **(2 marks)**
8. Explain the effect of adding catalyst on the direction of a reaction which is at equilibrium **(4 marks)**
9. Below is an equation for reaction at equilibrium, use it to answer questions that follow

$$Cr\,O_4^{2-}(aq) + H^+(aq) \rightleftharpoons Cr_2\,O_7^{2-}(aq) + H_2O\,(\ell)$$

   a. Balance the equation **(2 marks)**

   b. Briefly explain the effect of adding aqueous sodium hydroxide on the equilibrium of the reaction above. **(3 marks)**

   c. What would happen if a few drops of sulphuric acid are added to the mixture at equilibrium? [***include all the colour changes in your answers]*** **(3 marks)**

12. Methanol (CH3OH) is manufacture by the reaction of carbon (II) oxide and hydrogen at a temperature of 300^0C and a pressure of 300 atmospheres.

$$CO\ (g) + 2H_2\ (g) \rightleftharpoons CH_3OH\ (g) \quad \Delta H = -90KJmol^{-1}$$

Explain how the following conditions can affect position of equilibrium

a.

i.increasing temperature above to 300^0C **(2 marks)**

ii.decreasing temperature to below 300^0C **(2 marks)**

b.

i. Increasing pressure above to 300 atm **(2 marks)**

ii. Decreasing pressure to below to 300atm **(2 marks)**

c. Adding a catalyst to the reaction mixture **(2 marks)**

13. Design an experiment that you would carry out to investigate how concentration affects rate of reaction. **(10 marks)**

14. Design an experiment that you would carry out to investigate the effect of light on the rate of a reaction. **(10 marks)**

END OF PRACTICE QUESTION PAPER

Look for more questions and practice solving them

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