

University of Bahrain
Department of Chemistry
CHEMY 101 (2nd Hour Exam)

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Name:----- I.D. #----- Section #-----

$K = t(^{\circ}\text{C}) + 273.15; \quad 760 \text{ mm Hg} = 1 \text{ atm}$ $R = 0.0821 \frac{\text{L.atm}}{\text{Mol.K}}$

Q.1. The **net ionic equation** between $\text{Ba}(\text{OH})_2$ and HBr is

- a) $\text{OH}^-_{(\text{aq})} + \text{H}^+_{(\text{aq})} \rightarrow \text{H}_2\text{O}_{(\text{l})}$
- b) $\text{Ba}(\text{OH})_{2(\text{aq})} + 2\text{HBr}_{(\text{aq})} \rightarrow \text{BaBr}_{2(\text{aq})} + 2\text{H}_2\text{O}_{(\text{l})}$
- c) $\text{OH}^-_{(\text{aq})} + \text{HBr}_{(\text{aq})} \rightarrow \text{Br}^-_{(\text{aq})} + \text{H}_2\text{O}_{(\text{l})}$
- d) $\text{Ba}(\text{OH})_2 + 2\text{H}^+_{(\text{aq})} \rightarrow \text{Ba}^{++}_{(\text{aq})} + 2\text{H}_2\text{O}_{(\text{l})}$
- e) $\text{Ba}^{++}_{(\text{aq})} + 2\text{Br}^-_{(\text{aq})} \rightarrow \text{BaBr}_{2(\text{aq})}$

Q.2. The **net ionic equation** of precipitation reaction between $\text{Pb}(\text{NO}_3)_{2(\text{aq})}$ and $\text{HCl}_{(\text{aq})}$ is

- a) $\text{Pb}(\text{NO}_3)_{2(\text{aq})} + 2\text{HCl}_{(\text{aq})} \rightarrow \text{PbCl}_{2(\text{s})} + 2\text{HNO}_{3(\text{aq})}$
- b) $\text{Pb}^{++}_{(\text{aq})} + 2\text{HCl}_{(\text{aq})} \rightarrow \text{PbCl}_{2(\text{s})} + 2\text{H}^+_{(\text{aq})}$
- c) $\text{Pb}^{++}_{(\text{aq})} + 2\text{Cl}^-_{(\text{aq})} \rightarrow \text{PbCl}_{2(\text{s})}$
- d) $\text{Pb}(\text{NO}_3)_{2(\text{aq})} + 2\text{Cl}^-_{(\text{aq})} \rightarrow \text{PbCl}_{2(\text{s})} + 2\text{NO}^-_{3(\text{aq})}$
- e) $\text{Pb}(\text{NO}_3)_{2(\text{aq})} + 2\text{H}^+_{(\text{aq})} \rightarrow \text{PbH}_{2(\text{s})} + 2\text{NO}^-_{3(\text{aq})}$

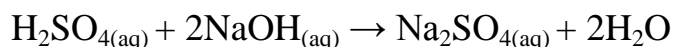
Q.3. Which **list** contains only strong acids?

- a) HCl, HNO₃, HF, HClO₄
- b) H₂SO₄, H₃PO₄, HClO₄, NH₃
- c) HCl, HNO₃, H₃PO₄, HClO₄
- d) HCl, H₂SO₄, HClO₄, HI
- e) HNO₃, H₂SO₄, NaOH, H₃PO₄

Q.4. 5 g of unknown compound contains sulfate (SO₄)²⁻ is treated with excess of Ba(NO₃)₂ gives 1.32 g of BaSO₄ precipitate. What is the **% of Oxygen (O)** in the compound?

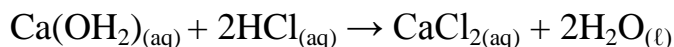
- a) 7.25%
- b) 3.62%
- c) 12.3%
- d) 16.6%
- e) 25.3%

Q.5. What **volume** of 0.1 M of H₂SO₄ is needed to neutralize 25 ml of 0.05 M of NaOH



- a) 12.0 ml
- b) 6.25 ml
- c) 14.3 ml
- d) 15.6 ml
- e) 24.8 ml

Q.6. 15 ml of 0.1 M of HCl_(aq) neutralize 20 ml of an aqueous solution of Ca(OH)_{2(aq)}



What is the **Molarity of Ca(OH)₂**

- a) 0.25 M
- b) 0.012 M
- c) 0.0375 M
- d) 0.062 M
- e) 0.085 M

Q.7. 5.60 g of glucose $C_6H_{12}O_6$ was dissolved in 600 ml of H_2O
(density of $H_2O = 1 \text{ g/ml}$)
(density of solution = 1.1 g/ml)
What is the **Molarity of the solution**?

- a) 0.0563 M b) 0.324 M c) 0.684 M d) 0.123 M e) 0.784 M

Q.8. What is the **molality** of 0.5 M of Na_2CO_3 solution (density of solution = 1.2 g/ml)

- a) 0.12 m b) 1.26 m c) 0.88 m d) 0.44 m e) 1.65 m

Q.9. What is the **mole fraction** of NaOH in a 36.6 % by mass of NaOH solution?

- a) 0.102 b) 0.612 c) 0.206 d) 0.052 e) 0.036

Q.10. What is the **% by mass** of $NaNO_3$ in a 0.94 m solution?

- a) 17.9% b) 16.9% c) 26.3% d) 35.4% e) 7.4%

Q.11. The volume of a gas is 841 ml at $62^\circ C$. What is **its volume** if it is heated to $84^\circ C$? (Suppose the pressure and no. of moles remains constant).

- a) 896 ml b) 377 ml c) 958 ml d) 1020 ml e) 1103 ml

Q.12. The density of a gas is 1.6 g/L at 640 mm Hg and 35°C. What is its **density** at 1.1 atm and 28°C.

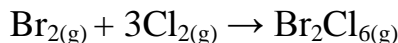
- a) 4.2 g/L b) 2.14 g/L c) 6.4 g/L d) 3.6 g/L e) 8.9 g/L

Q.13. Given $2\text{KClO}_{3(s)} \xrightarrow{\Delta} 2\text{KCl}_{(s)} + 3\text{O}_{2(g)}$

What **volume of O₂** was obtained at 540 mm Hg and 30°C if 2.6 g of KClO₃ was used up?

- a) 1.12 L b) 3.62 L c) 2.45 L d) 6.35 L e) 9.96 L

Q.14. Given



What volume of Br₂Cl_{6(g)} was obtained from 6L of Br₂ and 6L of Cl₂ if the two gas reacted at the same temperature and pressure?

- a) 6L b) 2L c) 8L d) 10L e) 12L

Q.15. Given



Suppose that 280 ml of CO₂ was obtained over water at 980 mm Hg. At **what temperature** the gas CO₂ exists if 0.012 mole of NaHCO₃ was dissolved. (Vapour pressure of H₂O at 28°C = 23.1 mm Hg)

- a) 62.6°C b) 52.6°C c) 73.4°C d) 84.8°C e) 43.4°C