

Date: 30/10/2011

Time: 60 min.

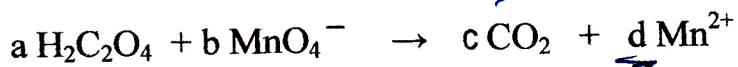
Student Name: ..... Reg. No.: .....

Instructor's Name: ..... Section: ...44..... Seat No.: ...25....

Answer Sheet1- a b c  9- a  c  d e2- a  c  d e10-  b c  d e3- a b c   e11- a b  c  d e4- a b   d e12- a b c  5-  b c  d e13- a  b  c  d e6- a b c   e14- a b c   e7- a b   d e15- a b c   d e8- a b c  d 16-  b c  d e

~~Redox Reactions~~

14. Balance the following redox reaction in acidic solution:



The ratio of coefficients  $d/a$  in the balanced equation is:

- a) 10/2      b) 7/3      c) 2/10      d) 2/5      e) 5/2

15. What is the volume of 0.810 M  $\text{Ba}(\text{OH})_2$  solution needed to titrate 25.0 mL of 1.500M  $\text{H}_3\text{PO}_4$  to produce  $\text{Ba}_3(\text{PO}_4)_2$ ?

- a) 79.2 mL      b) 92.2 mL      c) 52.0 mL      d) 61.8 mL      e) 69.4 mL

$$\frac{(V)(0.810)}{2} = \frac{(25)(1.500)}{1.62}$$

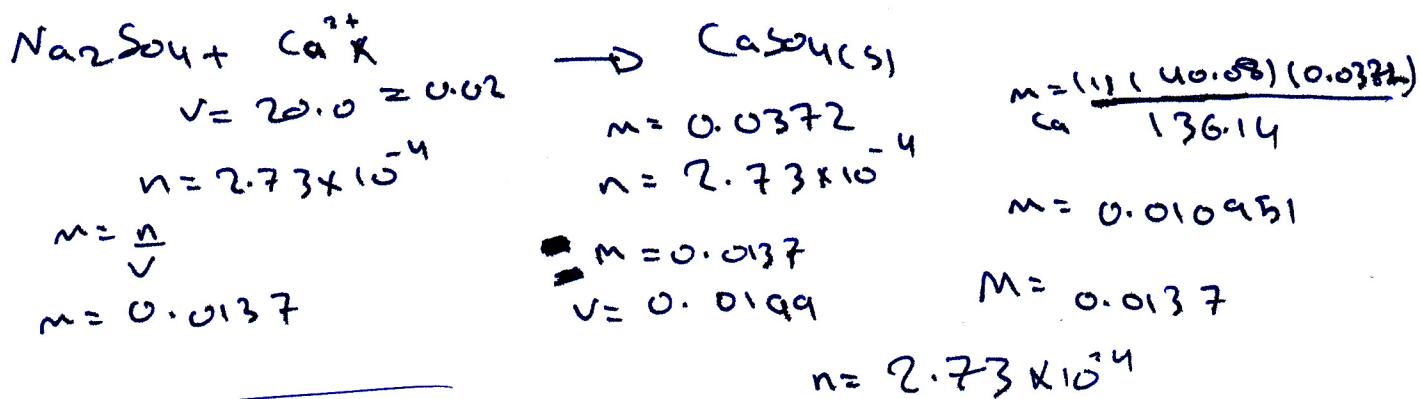
$$V = 69.4$$

$$0.021 \\ \cancel{g}$$

16. When excess  $\text{Na}_2\text{SO}_4$  solution was added to 20.0 mL of an unknown solution containing  $\text{Ca}^{2+}$  ion, 0.0372 g of  $\text{CaSO}_4$  precipitated. What is the molar concentration of  $\text{Ca}^{2+}$  in the unknown solution?

(Molar mass of  $\text{CaSO}_4$  = 136.14 g/mol)  $\text{Ca} = 0.08$

- a)  $1.36 \times 10^{-2}$       b)  $1.73 \times 10^{-2}$       c)  $2.10 \times 10^{-2}$       d)  $2.47 \times 10^{-2}$       e)  $3.83 \times 10^{-2}$



$$M = \frac{n}{V} = \frac{?}{0.02}$$

$$\cancel{M} \cancel{V} \cancel{n} \cancel{\cancel{V}}$$

$$n_{\text{CaSO}_4} = \frac{m}{M} = \frac{0.0372}{136.14} = 2.73 \times 10^{-4} \text{ mol}$$

$$\therefore M = \frac{2.73 \times 10^{-4}}{0.02} = 1.36 \times 10^{-2}$$

- ~~QUESTION PAPER~~
6. The correct name of the compound  $N_2O_5$  is:
- Nitrogen(V) oxide.
  - Dinitrogen(V) pentoxide.
  - Nitrogen pentoxide.
  - Dinitrogen pentoxide.
  - Nitrogen(V) pentoxide.

$$m = m_m \left( \frac{n_0}{Av} \right) = \frac{(32.06)(1)}{6.022 \times 10^{23}} = 5.324$$

7. What is the mass of one sulfur atom?
- (Atomic mass of sulfur = 32.06, Avogadro's number =  $6.022 \times 10^{23}$ )
- $9.274 \times 10^{-23}$  g
  - $6.656 \times 10^{-23}$  g
  - $5.324 \times 10^{-23}$  g
  - $4.037 \times 10^{-23}$  g
  - $3.346 \times 10^{-22}$  g

$$m = \frac{(n_0)(M_m)}{(m_n)} \quad (m) = (2) \frac{(35.45)(16.6)}{110.98} \\ = 10.6 \text{ g}$$

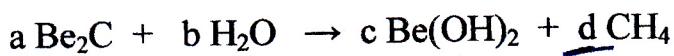
8. What is the mass of chlorine in  $16.6 \text{ g } CaCl_2$ ?
- (atomic masses: Cl = 35.45 and Ca = 40.08)
- 9.33 g
  - 6.77 g
  - 4.24 g
  - 8.05 g
  - 10.6 g

9. What is the empirical formula of a compound with the following composition by mass: C: 52.2% ; H: 13.0% and O: 34.8%?
- Atomic masses : C = 12.01 ; H = 1.008 and O = 16.00.
- $C_2H_3O$
  - $C_2H_6O$
  - $C_3H_5O_2$
  - $C_2H_4O$
  - $C_2H_5O$

$$C = 52.2 \quad H = 13.0 \quad O = 34.8 \\ n = 4.35 \quad n = 12.9 \quad n = 2.18$$



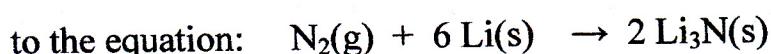
10. Balance the following equation:



The ratio of coefficients  $b/d$  in the balanced equation is:

- a) 4/1      b) 2/1      c) 1/4      d) 1/2      e) 3/1

11. 14.8 g of Li(s) was reacted with 16.2 g of N<sub>2</sub>(g) according



If the actual yield is 16.4 g, what is the percent yield of this reaction?

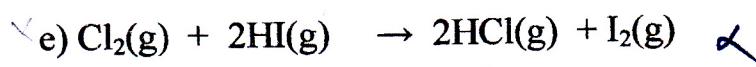
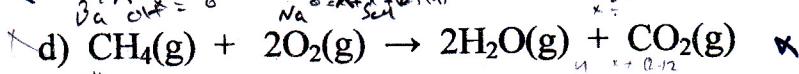
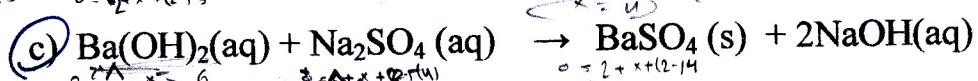
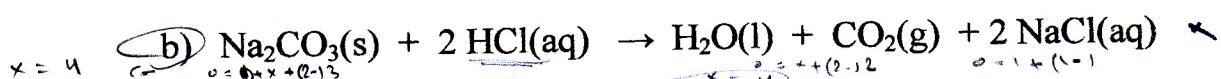
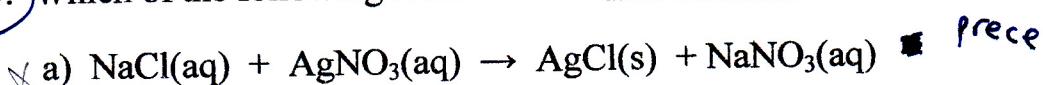
Atomic masses: Li = 6.942 and N = 14.01.

- a) 51.4      b) 28.6      c) 66.3      d) 41.8      e) 70.2

12. Which of the following compounds is insoluble in water?

- a) Na<sub>3</sub>PO<sub>4</sub>      b) NH<sub>4</sub>ClO<sub>4</sub>      c) K<sub>2</sub>CO<sub>3</sub>      d) AgNO<sub>3</sub>      e) Al<sub>2</sub>(CO<sub>3</sub>)<sub>3</sub>

13. Which of the following reactions is an acid-base reaction?



~~QUESTION~~  
Answer each of the following questions and put "X" on the correct choice on front page.

- 1- Which of the following is an intensive property?
- a) energy    b) weight    c) volume    d) length    e) density

2. Carry out the following operation and report the result to the correct number of significant figures:

$$\frac{2.5}{15.0} = 0.17 \quad [(1.00 - 0.01) \times 2.500] \div 15.0$$

- a) 0.165    b) 0.17    c) 0.1650    d) 0.16500    e) 0.2

$$46.0 \frac{\text{miles}}{\text{hr}} \times \frac{\text{hr}}{3600 \text{s}} \times \frac{1609 \text{ m}}{\text{miles}} = 20.6$$

$1 = 1609 \text{ m}$   
 $46 \text{ miles} = *$

3. The speed of a car is 46.0 mile/hr. What is its speed in m/s?

(given: 1 mile = 1609 m)

- a) 14.3    b) 16.1    c) 18.8    d) 20.6    e) 103



4. The formula of manganese(III) phosphate is:

- a)  $\text{Mn}_2(\text{PO}_4)_3$     b)  $\text{Mn}_2\text{PO}_4$     c)  $\text{MnPO}_4$     d)  $\text{MnPO}_3$     e)  $\text{Mn}_3(\text{PO}_4)_3$

5. For the isotope  $^{93}_{41}\text{X}$ . The number of protons and neutrons in that isotope are:

- a) 41 and 52    b) 41 and 93    c) 93 and 41    d) 93 and 52    e) 52 and 41

1	2	3	4	5
a	b	c	d	a