

## CHE1010 Tutorial Sheet 1 Stoichiometry

Answer questions 7, 8, 12 and 14 in an A4 size book.

Indicate your names as registered in the system, also TG and lecture group

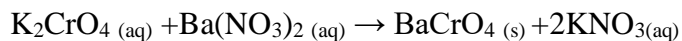
Class reps should submit all the books in tutors' offices by 20<sup>th</sup> Monday, 16 hrs

- Which data set has the best combination of accuracy and precision if the true value is 6.72g.  
(a) 6.71, 6.75, 6.70  
(b) 6.50, 6.48, 6.52  
(c) 6.41, 6.72, 6.55  
(d) 6.56, 6.76, 6.84
- How many significant figures are there in the value  $8. \times 10^8$   
(A) 3 (B) 2 (C) 1 (D) 4
- Correct formula of Fe(III)oxide is  
(A)  $\text{Fe}_3\text{O}_4$  (B)  $\text{Fe}_2\text{O}_3$  (C)  $\text{FeO}$  (D)  $\text{Fe}_3\text{O}_2$
- Reagent that can be weighed easily and its mass truly represents the number of moles of substance contained is called  
(A) Standard solution (B) Limiting reagent (C) primary standard (D) oxidising agent
- Find the oxidation state of I in iodic acid,  $\text{HIO}_3$   
(A)  $+3$  (B)  $-3$  (C)  $+5$  (D)  $-1$
- Convert 9.3 m to  $\mu\text{m}$   
(A)  $9.3 \times 10^{-6}$  (B)  $9.3 \times 10^3$  (C)  $9.3 \times 10^6$  (D)  $9.3 \times 10^{-3}$
- The manufacture of sulphuric acid by the contact process can be represented as follows:  
 $\text{S} \rightarrow \text{SO}_2 \rightarrow \text{SO}_3 \rightarrow \text{H}_2\text{SO}_4$   
Correct sequence of oxidation number of sulphur at each stage is:  
(A) 0, +4, +6, +6 (B) -2, +4, +3, +2 (C) -2, +4, +6, +6 (D) 0, +2, +4, +6
- In which of the following changes is the nitrogen reduced?  
(A)  $\text{NH}_3$  to  $\text{NO}$   
(B)  $\text{NH}_3$  to  $\text{NO}_3^-$

(C)  $\text{N}_2$  to  $\text{NH}_3$

(D)  $\text{N}^{3-}$  to  $\text{N}_2$

9. Name the reaction given below



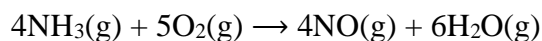
(A) precipitation reaction (B) decomposition reaction (C) neutralisation reaction (D) displacement reaction

10. On complete combustion, 0.246 g of an organic compound gave 0.198 g of  $\text{CO}_2$  and 0.1014 g of  $\text{H}_2\text{O}$ . What is the ratio of carbon and hydrogen atoms in the compound?

11. A 35.3 g of element M is reacted with nitrogen to produce 43.5 g of compound  $\text{M}_3\text{N}_2$ .

What is (i) the molar mass of the element and (ii) name of the element?

12. In an experiment, 1.90 g of  $\text{NH}_3$  reacts with 4.96 g of  $\text{O}_2$ .



(i) Which is a limiting reactant? Show your working.

(ii) How many grams of excess reactant remain? Show your working.

(iii) How many grams of  $\text{NO}$  is formed? Show your working

13. The isotopic mass of  ${}_{17}\text{Cl}^{35}$  and  ${}_{17}\text{Cl}^{37}$  are 34.968852 u and 36.965902 u respectively. The atomic mass of  $\text{Cl}$  is 35.453 u. What is the isotopic percent composition of two isotopes?

14. Calculate the % yield of a reaction in which 41.5 g of tungsten (VI) oxide [ $\text{WO}_3$ ] reacts with excess hydrogen to produce metallic tungsten and 9.50 mL water ( $\rho = 1.00 \text{ g/mL}$ )