Inorganic chemistry worksheet 01

A. Select most appropriate answer.

1. Compound x on flame test gave green colour. When the flame was observed through cobalt glass plate purple colour was observed. X can be,

    1)$BaCl_2$ 2)$CuSO_4$ 3)KNO_3 4)$Na_2[Cu(CN)_3]$ 5)$K_2[Cu(CN)_3]$

2. Which of the following would not give a precipitate wit $BaCl_{2(aq)}$.

    1)K_2SO_4 2)$AgNO_3$ 3)K_2CO_3 4)$Pb(NO_3)$ 5)$Cs(NO_3)$

3. Which of the following would not give a precipitate with $AgNO_3$.

    1)$CdCl_3$ 2)K_2CrO_4 3)$CHCl_3$ 4) $NaOH$ 5)Na_2CO_3

4. Which of the following can be used to differentiate between H_2S and SO_2?

    1)$K_2Cr_2O_7/H^+$ 2)$Pb(CHCOOH)_2$ 3)$KMnO_4/H^+$ 4)Flower petals

    5) All of the above

5. Which of the following of the following gives CO2 as the only gaseous product on heating?

    1)$ZnCO_3$ 2)Ag_2CO_3 3)$(NH_4)_2CO_3$ 4)$Na_2CO_3.10H_2O$ 5)$KHCO_3$

6. An equal weight mixture of NH_4NO_3 & KNO_3 was heated until a constant weight is obtained. What percentage of original weight is lost on heating?

    1)57.92%   2)32.64%   3)47.70%   4)53.04%   5)66.49%

7. Colorimetric technique is used to determine concentration of coloured compounds by measuring their absorbance at specific wavelengths of light. The two solutions given below have the same colour and same absorbance.

A- 5cm^3 of well water + 3cm^3 of distilled water + 2cm^3 of 0.001M salicylic acid

B-2cm^3, 0.002M Fe^{2+} solution + 6cm^3 of distilled water + 2cm^3 of 0.001M salicylic acid

What is the Fe^{2+} concentration in well water?

    1)0.00008M   2)0.0008M   3)0.008M   4)0.08M   5) insufficient data for calculation

8. If 50.00cm^3 0f 0.12M $KMnO_4$ solution is mixed with 50.00cm^3 of 0.08M $Na_2C_2O_4$ solution and no volume change occurs, what if the concentration of Mn^{2+} in the final mixture?

    1)0.008M   2)0.0016M   3)0.016M   4)0.06M   5)0.015M

9. A primary standard is a compound with known composition, obtained with high purity and can be stored as solid or liquid (stable) and possess high molar mass. Which of the following can be used as a primary standard?

       1)$Mg(OH)_2$ 2)$MgCO_3$ 3)$NaOH$ 4)Na_2CO_3 5)KOH

10. Which of the given oxidising agent is needed in least no. of moles to oxidise a given amount of KI to I_2

       1)$K_2Cr_2O_7$ 2)$KMnO_4$ 3)$FeCl_3$ 4)K_2CrO_4 5)MnO_2

B. Solve the following.

1) 5g of a sand sample mixed with $KClO_3$ is heated until a constant weight is obtained. If the volume of O_2 collected was $672.4 cm^3$ at STP, calculate the mass percentage of $KClO_3$. (Molar volume of O_2 at STP – $22414 cm^3$)

2) When CaO reacts with H_2SO_4, $CaSO_4$ is produced with 100% efficiency. But during recrystallization process 20% of $CaSO_4$ is lost. From a sample of 2.8g of CaO how much $CaSO_4$ can be obtained?

3) SO_2 gas was bubbled through an acidic $KMnO_4$ solution prepared by dissolving 15.8g of $KMnO_4$ in $1 dm^3$, until colour changes. SO_2 for this process was obtained by burning iron pyrite FeS_2 ore. Calculate the mass of iron pyrite needed for this purpose with 25% (W/W) FeS_2 mass purity.

4) An impure sample of NH_4NO_3 (1.0g) is allowed to react with excess Al and NaOH. To neutralise the evolved NH_3 gas $50.00 cm^3$ of 0.2M H_2SO_4 was needed. Calculate (W/W) purity of NH_4NO_3 in sample.

Hint: $3NO_3^- + 8Al + 5OH^-\ 2H_2O \longrightarrow 8AlO_2^- + 3NH_3$ (test for nitrate)

5) Urea reacts with NaOH as follows,

$2NaOH + NH_2CONH_2 \longrightarrow Na_2CO_3 + 2NH_3$
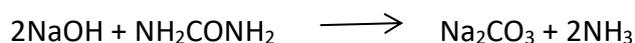
0.6g of urea is allowed react completely with $25.0\ cm^3$ of 1.0M NaOH. NH_3 produced is completely removed by boiling. Calculate the volume of 0.50M HCl needed to neutralise the resultant solution.