1. Using the mass/volume graph determine the following:

   a) the slope of the graph

   b) the mass of 25.0 cm³ of the substance

2. A silver metal piece weighing 194.3 g is placed in a graduated cylinder containing 242.0 mL of water. The volume of water now reads 260.5 mL. From these data calculate the density of silver. \((Answer: 10.5 \text{ g/cm}^3)\)

3. Name the given compounds:

   a) \(\text{Ni(MnO}_4\text{)}_2\)

   b) \(\text{H}_2\text{SO}_4(aq)\)

   c) \(\text{PCl}_5\)
4. Write the formulas of the following compounds:
   
a) barium arsenate
   
b) cobalt(II) phosphide
   
c) hydroselenic acid

5. Balance the following equations. Determine the type of reaction each one represents.
   
a) \( \text{Fe}_3\text{O}_4 + \_\text{Al} \rightarrow \_\text{Al}_2\text{O}_3 + \_\text{Fe} \)
   
b) \( \_\text{K}_3\text{PO}_4 + \_\text{Ba(NO}_3)_2 \rightarrow \_\text{Ba}_3(\text{PO}_4)_2 + \_\text{KNO}_3 \)
   
c) \( \_\text{C}_2\text{H}_6 + \_\text{O}_2 \rightarrow \_\text{CO}_2 + \_\text{H}_2\text{O} \)

6. Complete and balance the given equation. Write the total ionic and net ionic equation.
   
a) a) \( \text{HNO}_3(aq) + \text{Ba(OH)}_2(aq) \rightarrow \)

7. Using the provided information, order the iron, zinc, and lead by decrease in activity in single-replacement reactions:
   
1) When iron metal was reacted with Zn(NO_3)_2 solution there was no reaction.
2) When zinc metal was reacted with a solution of Pb(NO_3)_2 plating on the metal piece was observed.
3) When lead metal was reacted with a Fe(NO_3)_2 solution there was no reaction.

8. Identify the oxidizing and the reducing agent in the given reaction:
   
a) \( \text{I}_2(s) + 2\text{NaBr}(aq) \rightarrow 2\text{NaI}(aq) + \text{Br}_2(l) \)
9. Report the answers of the following calculations with the appropriate number of significant figures:

\[
\frac{13.602 \times 1.90 \times 3.06}{4.2 \times 1.4097} =
\]

a) 

b) 

10. Calculate the percent by mass of carbon in morphine, C_{17}H_{19}NO_{3}. \((\text{Answer: 71.60\%})\)

11. A 170.0-g sample of metal at 78.0°C is added to 170.0 g of H_{2}O(\ell) at 15.0°C in an insulated container. The temperature rises to 17.9°C. Calculate the specific heat of the metal? The specific heat of H_{2}O(\ell) is 4.18 \text{ J/(g \cdot °C)}. \((\text{Answer: 0.206 \text{ J/(g°C)}})\)

12. Water is added to 25.0 mL of 0.866 \text{ M} KNO_{3} solution until the volume of the solution is exactly 500. mL. What is the molarity of the final solution? \((0.0433 \text{ M})\)

13. Calculate the molarity of a solution prepared by dissolving 6.57 g of CH_{3}OH in 1.50 \times 10^{2} \text{ mL of solution.} \((\text{Answer: 1.37 M})\)

14. The reaction of H_{2}SO_{4} with NaOH is represented by the equation

\[
\text{H}_{2}\text{SO}_{4}(\text{aq}) + 2\text{NaOH}(\text{aq}) \rightarrow \text{Na}_{2}\text{SO}_{4}(\text{aq}) + \text{H}_{2}\text{O}(\ell)
\]

What is the molarity if the H_{2}SO_{4} solution if 10.0 mL of it are neutralized by using 45.10 mL of 0.432 \text{ M} NaOH solution? \((\text{Answer: 0.974 M})\)