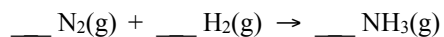
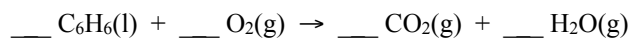
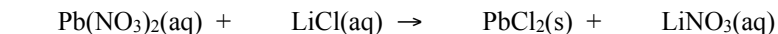


Be sure to show all work, use the correct number of significant figures, circle final answers and use correct units in all problems.

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1. Fill in the missing stoichiometric coefficients. **Blank entries** will be **considered** to be **zero**. All stoichiometric coefficients must be whole numbers. (6 points)



2. Consider a 0.0180 M  $(\text{NH}_4)_2\text{SO}_4$  (ammonium sulfate) aqueous solution. (6 points)

- What is the concentration (M) of ammonium in the solution?
- How many mL of the ammonium sulfate solution are needed to deliver  $6.30 \times 10^{-4}$  mol of ammonium sulfate?
- If you add 400. mL of water to 0.0500 L of 0.0180 M  $(\text{NH}_4)_2\text{SO}_4$ , what will be the diluted solution concentration?

3. Consider ethanol,  $\text{C}_2\text{H}_6\text{O}$  (drinking alcohol): (4 points)

- What is the molar mass (g/mol) of ethanol to 0.01 g/mol?
- Determine the %C, %H and %O in ethanol.

4. For the species HCl, NaOH, HClO,  $\text{NH}_3$  and water: (4 points)

- Which of the above are acids? List them here:
- Which of the above are bases? List them here:

**Answers**

Be sure to show all work, use the correct number of significant figures, circle final answers and use correct units in all problems.

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1. **1, 2, 1, 2**  
**2, 15, 12, 6**  
**1. 3. 2**
  
2. **0.0360 M**  
**35.0 mL**  
**0.00200 M**
  
3. **46.08 g/mol**  
**52.13% C, 34.72% O, 13.2% H**
  
4. **HCl, HClO**  
**NaOH, NH<sub>3</sub>**