

Record your multiple choice answers here.

Question	Answer	Question	Answer	Question	Answer
1		8		15	
2		9		16	
3		10		17	
4		11			
5		12			
6		13			
7		14			

To be the multiple choice questions

1. Determine the pH of the following:

A. 0.25 M HBr =

$$\underline{.60}$$

B. 0.003 M HCl =

$$\underline{2.52}$$

C. 0.00125 M NaOH =

$$\underline{11.1}$$

2. A basic solution is prepared by dissolving 7.55 g of sodium hydroxide in 850.0 mL of water. What is the pH of the solution?

$$7.55 \text{ g} \left/ \begin{array}{l} 1 \text{ mol} \\ 40 \text{ g} \end{array} \right. = .188 \text{ mol} \\ \frac{.188 \text{ mol}}{.850 \text{ L}} = .21 \text{ M NaOH} \rightarrow \text{pOH} = .67 \\ \boxed{\text{pH} = 13.33}$$

3. A 35.0 mL volume of Ca(OH)₂ is titrated with 38.0 mL of 0.10 M HCl. What is the molarity of the calcium hydroxide in this solution?

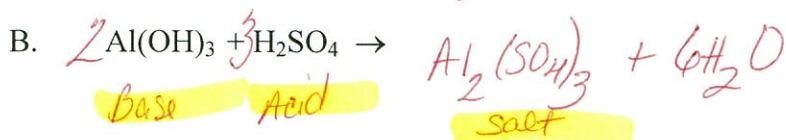
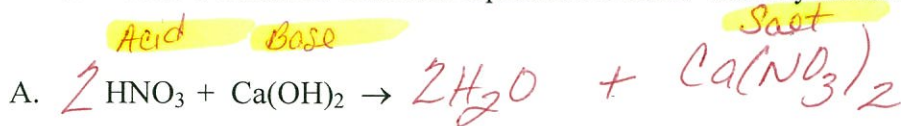
4. If 72.1 mL of a 0.543 M H₂SO₄ solution completely titrates 45.0 mL of KOH solution, what is the molarity of the KOH?

$$\text{H}_2\text{SO}_4 + 2\text{KOH} \rightarrow 2\text{H}_2\text{O} + \text{K}_2\text{SO}_4 \\ M = \frac{\text{mol}}{L} \quad \frac{\text{mol}}{.0721} = .543 \rightarrow .039 \text{ mol H}_2\text{SO}_4 \left/ \begin{array}{l} 2 \text{ mol KOH} \\ 1 \text{ mol H}_2\text{SO}_4 \end{array} \right. = \frac{.078 \text{ mol}}{.045 \text{ L}} = \boxed{1.73 \text{ M KOH}}$$

5. Complete the following chart.

Salt	Parent Acid	Acid Strength	Parent Base	Base Strength	Type of Salt
Na ₂ CO ₃	H ₂ CO ₃	W	NaOH	S	B
NH ₄ Br	HBr	S	NH ₄ OH	W	A
Al(NO ₃) ₃	HNO ₃	S	Al(OH) ₃	W	A

6. Write a balanced chemical equation for each. Identify the acid, base, and salt for each equation.



7. A solution of NaOH is prepared with 9.2 g of NaOH in 600 mL of water. Calculate the molarity of the solution and determine the pH

M = .38 pH = 13.58

$$\frac{9.2 \text{ g}}{40 \text{ g}} \times 1 \text{ mol} = .23 \text{ mol NaOH} \quad \rightarrow \quad M = \frac{\text{mol}}{\text{L}} = \frac{.23 \text{ mol}}{.6 \text{ L}} = .38 \text{ M}$$

8. Complete the table.

[H ⁺]	pH	pOH
6.54×10^{-5}	4.18	9.82
1×10^{-7}	7	7
9.5×10^{-3}	2.02	11.98

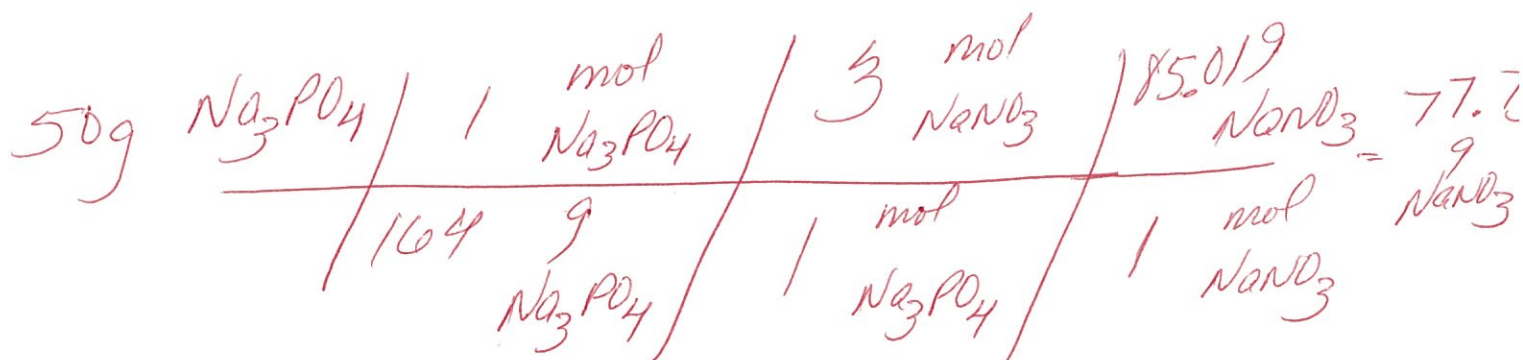
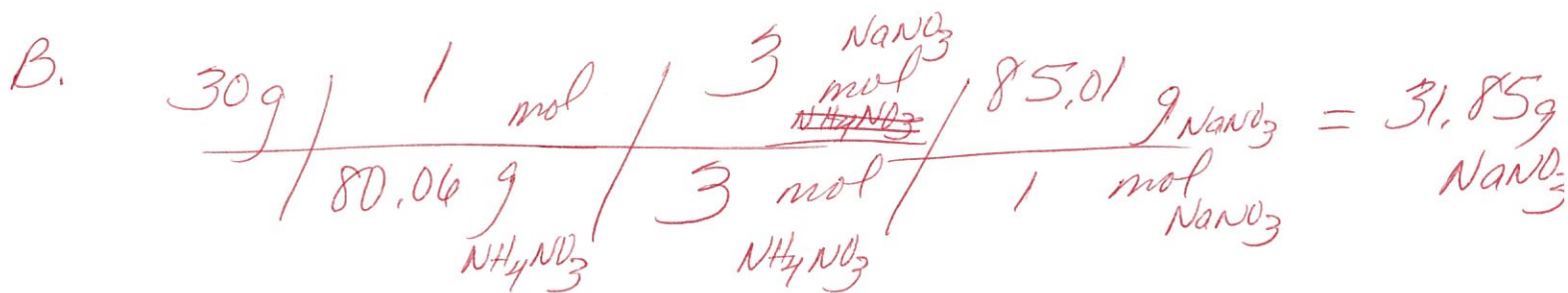
9. Complete the table.

[H ⁺]	[OH ⁻]
6.4×10^{-3}	1.56×10^{-12}
1.02×10^{-14}	9.8×10^{-1}

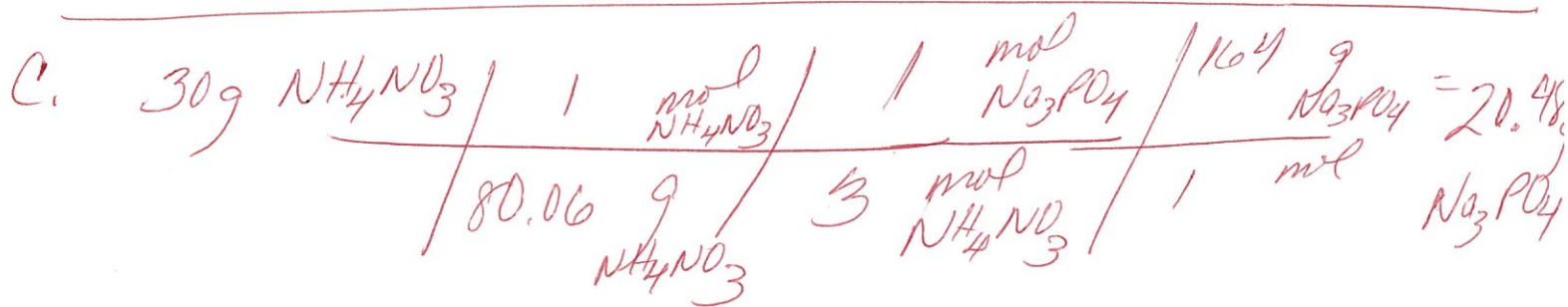
Extra Credit! Given that a reaction occurs using 30 g of NH₄NO₃ and 50 g of Na₃PO₄:

- Write a balanced equation (3)
- Determine the limiting reagent (5).
- Determine the amount of excess reagent left over (5).

Extra Credit:



Limiting = NH_4NO_3 excess = Na_3PO_4



$$50\text{g} - 20.48 = 29.52 \text{ left over}$$