

FINAL EXAM REVIEW

1. Calculate the mass percent (m/m) of a solution containing 25 g of KCl in 125 g H₂O.
2. Calculate the mass of solute needed to prepare each 350 mL of 1.8 M NaOH solution.
3. What volume (mL) of a 4.0 M solution of HCl contains 12 g of solute?
4. For each reaction shown below, determine the Brønsted-Lowry acid and base and their conjugates:





5. Identify the Brønsted-Lowry acid for each base shown below:



6. Identify the Brønsted-Lowry base for each acid shown below:



7. Complete the missing information in the table below:

$[\text{H}_3\text{O}^+]$	$[\text{OH}^-]$	Acidic/Basic
	1.0×10^{-12}	
	4.2×10^{-4}	
6.5×10^{-8}		

8. Identify each of the substances below as **strong electrolyte**, **weak electrolyte** or **non-electrolyte**:



9. What are the $[\text{H}_3\text{O}^+]$ and $[\text{OH}^-]$ for a solution with a pH of 4.10.

10. Match each of the solutions below with an expected pH value (assume the same concentration for all solutions):

_____ pH = 5.8

A) HCl

_____ pH = 12.8

B) HF

_____ pH = 3.1

C) NaOH

_____ pH = 8.4

D) NH₃

11. A gas sample with a volume of 730 mL and pressure of 830 mmHg is at a temperature of 30.0°C. How many moles of gas does this sample contain?

12. 7.6 moles of a gas in a container with a movable piston is heated from 100.0 °C to 175.0 °C. If the pressure remains constant, what is the new volume of the gas if it initially occupied 2.5 L?

13. How many grams of nitrogen gas has the same volume as 120 g of Ar gas at the same temperature and pressure?

ANSWERS:

- 1) 17%
- 2) 25 g
- 3) 82 mL
- 4) For answers see instructor or tutors
- 5) For answers see instructor or tutors
- 6) For answers see instructor or tutors
- 7)

[H₃O⁺]	[OH⁻]	Acidic/Basic
1.0 x 10⁻²	1.0 x 10 ⁻¹²	Acidic
2.4 x 10⁻¹¹	4.2 x 10 ⁻⁴	Basic
6.5 x 10 ⁻⁸	1.5 x 10⁻⁷	Basic

- 8) For answers see instructor or tutors
- 9) [H₃O⁺] = 7.9 x 10⁻⁵ M
[OH⁻] = 1.3x10⁻¹⁰ M
- 10) A = 3.1; B = 5.8; C = 12.8; D = 8.4
- 11) 0.032 mol
- 12) 3.0 L
- 13) 84 g