**Quiz 11A**

# Directions: Answer each of the following questions. Be sure to use complete sentences where appropriate. For full credit be sure to show all of your work. Where appropriate answers should be boxed for clarity, written to the correct number of significant figures, and, include the proper units.

1. An aqueous solution of iron(III) bromide reacts with an aqueous solution of potassium hydroxide (20 points).
   1. Write the balanced conventional, total ionic, and net ionic equation.

FeBr3 (aq) + 3 KOH (aq) → 3 KBr (aq) + Fe(OH)3 (s)

Fe3+ (aq) + 3 Br- (aq) + 3 K+ (aq) + 3 OH- (aq) → 3 K+ (aq) + 3 Br- (aq) + Fe(OH)3 (s)

Fe3+ (aq) + 3 OH- (aq) → Fe(OH)3 (s)

* 1. How many grams of precipitate are produced when 27.9 mL of 2.12 M iron(III) bromide react with 15.00 mL of 2.50 M potassium hydroxide?

First calculate the moles of each ion that undergoes reaction:

Second, using the net ionic equation, complete the ICE table, and determine the limiting reagent by comparing ratios.

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| --- | --- | --- | --- |
|  | Fe3+ (aq) + | 3 OH- (aq) → | Fe(OH)3 (s) |
| I | **59.1**48 mmol | **37.5** mmol | 0 mol |
| C | -x | -3x | +x |
| E | **59.1**48 mmol –x =  **59.1**48 mmol – **12.5** mmol = **46.6**48 mmol | 37.5 mmol -6x =  37.5 mmol – 3(**12.5** mmol) =  0 mmol | x = 12.5 mmol = |

To determine the limiting reagent compare ratios

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Therefore, the limiting reagent is hydroxide, OH-. So, now x can be found:

Lastly, calculate the grams of iron(III) hydoxide produced:

* 1. What is the molarity of the ions that are left?

First calculate the millimoles of each ion remaining

The total volume of the resulting solution is VT = 27.9 mL + 15.00 mL = 42.9 mL

Then calculate the molarity of the ions remaining in the solution