

Name: _____

Blk: _____ Date: _____

Chemistry 12
ACID BASE PART II Lesson # 15
Mixing STRONG acids and Bases

Recall the NET IONIC EQUATION for the NEUTRALIZATION reaction of a strong acid with a strong base:

When you MIX A STRONG ACID WITH A STRONG BASE there are THREE POSSIBLE OUTCOMES:

- 1.
- 2.
- 3.

TO SOLVE THESE PROBLEMS THE FOLLOWING EQUATIONS ARE USED:

A. IF THE SOLUTION IS BASIC (pH > 7)

B. IF THE SOLUTION IS ACIDIC (pH < 7)

Example 1. If 10.0 mL of 0.100 M HCl is mixed with 90.0 mL of 0.100 M NaOH, What is the pH of the resulting mixture?

1. HCl is a strong acid , $[HCl] = [H_3O^+]$ NaOH is a strong base; $[NaOH] = [OH^-]$

2. Dilution calculations for $[H_3O^+]$ and $[OH^-]$:

3. Which ion has the larger concentration? $[H_3O^+]$ or $[OH^-]$?

4. Solve for the XS of _____.

5. Solve for the pH

Example 2. Calculate the pH that results when 50.0 mL of 0.150 M LiOH is mixed with 50.0 mL of 0.200 M HNO₃.

1. HNO₃ is a strong acid; [HNO₃] = [H₃O⁺] LiOH is a strong base; [LiOH] = [OH⁻]

2. Dilution calculations for [H₃O⁺] and [OH⁻]:

3. Which ion has the larger concentration? [H₃O⁺] or [OH⁻]?

4. Solve for the XS of _____.

5. Solve for the pH

Example 3. How many grams of NaOH must be added to 40.0 mL of 0.180 M HCl to produce a solution having a pH of 12.500. Assume NO CHANGE in volume when the NaOH is added.

1. pH of 12.500 means the solution is _____. There is an excess of _____!

2. Use pH to solve for the excess concentration of _____.

3. Rearrange the XS equation to solve for _____

4. Now convert concentration into grams!