Acid/Base Chemistry and Titration

Chemistry Name

1 a) Write the chemical equation and draw the process for the auto-ionization of water.

Write all names, formulas, and Lewis structures.

b) Why does water undergo autoionization? That is, what causes this to happen?

2 Name the following.

a) HCl f) NaOH

b) HNO3 g) KOH

c) H2SO4 h) Ca(OH)2

d) H2S i) NaHCO3

e) H3PO4 j) NH3

3 a) Define the following acids and bases.

b) How is it possible that water can function as both an acid and a base?

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|  | ***Acid*** | ***Base*** |
| ***Arrhenius*** |  |  |
| ***Bronsted-Lowry*** |  |  |
| ***Lewis*** |  |  |

4 What is a titration? What are two common indicators for a titration in chemistry?

5 Calculate the pH for each solution, and determine if it is acidic, basic, or neutral.

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| a) Orange juice, [H+] = 3.7 x 10-4 | c) limewater, [H+] = 3.4 x 10-11 |
| b) Vinegar [H+] = 2.8 x 10-3 | d) blood, [H+] = 3.98 x 10-8 |

6 Calculate the [H+] for each solution, and determine if it is acidic, basic, or neutral.

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| (a) black coffee, with a pH of 5.0 | (b) a solution with a pH of 8.5 | (c) a solution with a pH of 1.2 |

7 Use the formula M1V1 = M2V2 to answer the following questions.

a) What volume of 0.253M HCl is required to titrate 17.1mL of 0.437M NaOH?

b) What is the molarity of a 25.0mL unknown NaOH solution that requires 29.6mL of 0.112MHCl for titration?

8 Given the data for the following separate titrations, calculate the molarity of the missing acid or base using the formula **M1V1 = M2V2**. *Use the space to the right for calculations if necessary.*



