Chemistry 12

Lab Simulation: Strengths of Acids & Bases

Name:

Block:

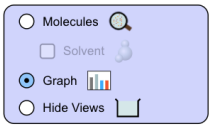
1. Go to: https://phet.colorado.edu/en/simulations/acid-base-solutions
2. Click the arrow to launch the simulation.
3. Select "Introduction". 

4. On the bottom right, select the light bulb tool. 
5. Complete the following table:

Solution	**Reaction**	**Light Bulb** **(select one of the following)**
Water (H_2O)		Dim // Bright // Very Bright
Strong Acid (HA)		Dim // Bright // Very Bright
Weak Acid (HA)		Dim // Bright // Very Bright
Strong Base (MOH)		Dim // Bright // Very Bright
Weak Base (B)		Dim // Bright // Very Bright

6. Provide an explanation of the differences in light bulb brightness:

7. At the very bottom of your screen, select "My Solution". 

8. Under "Views" select "Graph". 

9. Your reaction is:
10. Your K_a expression is:

11. Ensure that the "Initial Concentration is 0.010 M and that you haven't moved the parameters on "Strength". (If you did, you can simply hit the refresh button.) 

12. Given these parameters, calculate the value of K_a and identify the acid based on your Acids-Bases table.

    Calculation:

    Acid: _____

13. Fill out the following table by adjusting "Initial Concentration (mol/L)":
    ****do not adjust the "strength" parameters***

Initial Concentration (mol/L)	**[HA]**	**[A-]**	**[H_3O^+]**	**K_a (calculation)**	**Identify the Acid**	**pH**
0.001M						
	7.97×10^{-3} M					
						3.81
		2.00×10^{-4} M				
0.701M						

14. Complete the following with "increases", "decreases" or "stays the same".

    a. If pH increases, [H_3O^+] _____.

    b. If pH decreases, [H_3O^+] _____.

    c. If pH increases, [OH^-] _____.

    d. If pH decreases, [OH^-] _____.

    e. As initial concentration of an acid increases, pH _____.

    f. As initial concentration of an acid increases, K_a _____.

    g. As strength of the acid increases, K_a _____.