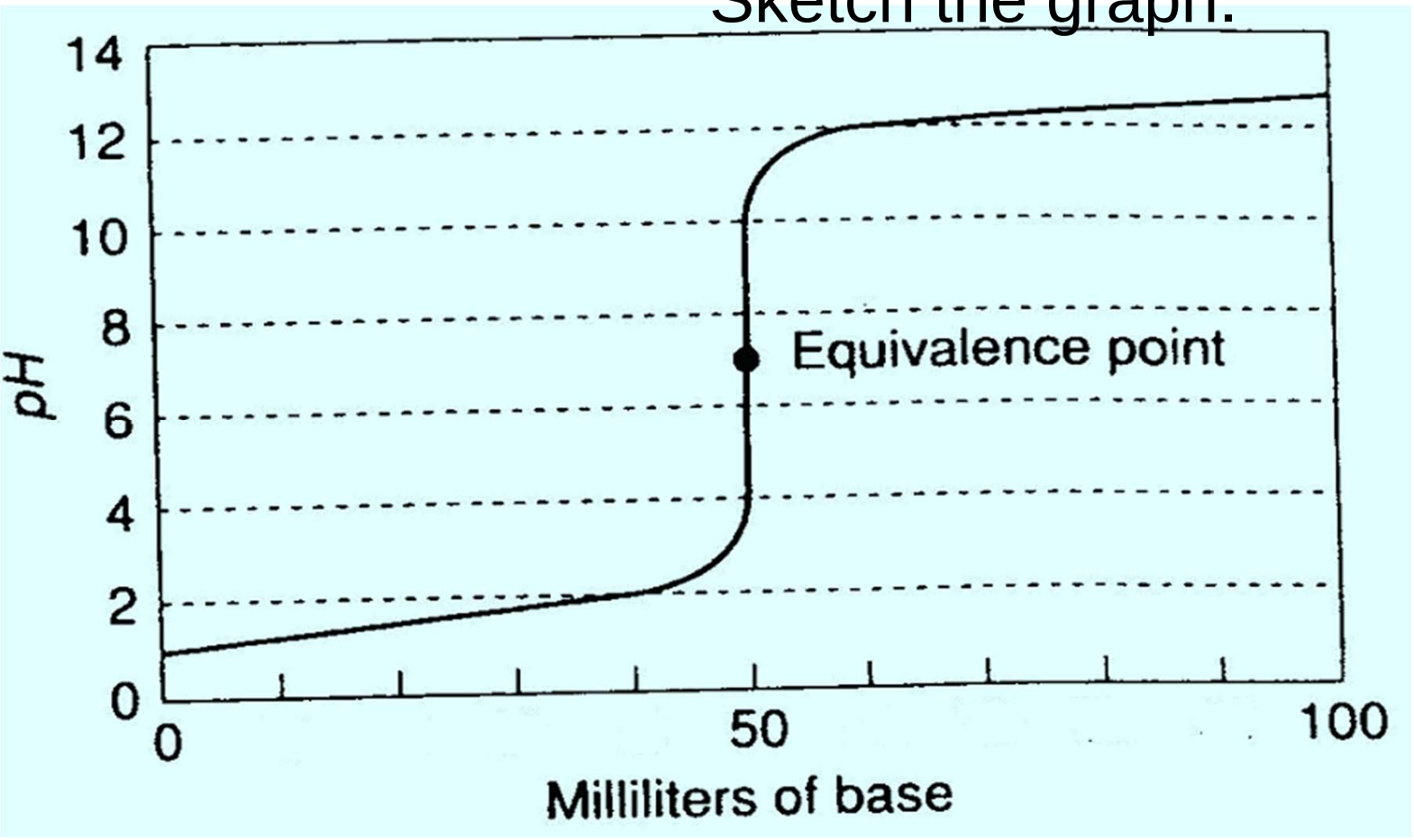
Bell Work, Oct 14 - 17, 2013

Energy & States, ACT Question

Bell Work, Monday, Oct 14, 2013 ACT Question

Sketch the graph.



Passage:

pH + pOH = 14

Acid: pH < 7

Base pH > 7

Water pH = 7

pH is a measure of hydrogen ion concentration,
pOH is a measure of hydroxide (OH^-) concentration.
Acid + Base → Water + a salt

Bell Work, Monday, Oct 14, 2013

1. A beaker contains 50 milliliters (mL) of a strong acid solution. A researcher adds 100 mL of a strong base, 10 mL at a time, and measures the pH of the solution after each addition of the base. The graph at right shows the results of this experiment. The equivalence point on the graph is where there are exactly 50 mL of base and 50 mL of acid. Which of the following conclusions can the researcher draw from the graph?

a. The pH of a solution is 7 when the solution contains 50 mL of a strong acid.

b. The solution is a base below the equivalence point on the graph.

c. The pOH of the solution is 14 after 100 mL of the base is added.

d. Most of the pH change is accounted for near the equivalence point.

pH + pOH = 14, pH + 14 = 14

pH = 0

Bell Work, Tuesday, Oct 15, 2013

1. **What is an experimental value? Give an example.**

   An experimental value is a value you determined from measurements.

   Example: you massed a sample of metal with a balance and found its volume using a graduated cylinder. You calculated the density. The mass, the volume and the density of the metal were all experimentally determined.

2. **Explain how to calculate the deviation.**

   The experimental value minus the mean value.

   The formula is d = x – $\bar{x}$

where x = the experimental value & $\bar{x}$ is the average value.

Bell Work, Tuesday, Oct 15, 2013

3. **Calculate the deviation if your experimental value of density for the silver metal is 1.55 g/mL and the class average for the density of the silver metal is 2.87 g/ cm^3.**

d = |1.55 – 2.87| = 1.32

4. **Explain how to calculate the percent deviation**

$$\% \text{ deviation} = \frac{d}{\overline{x}} \cdot 100$$

where d = the deviation, $\overline{x}$ = the average value

5. **Calculate the percent deviation using the values in question 3.**

$$\% \text{ Deviation} = \frac{1.32}{2.87} \times 100 = 46\%$$

This means your experimental value is 46% different than the average value.

Bell Work, Wednesday, Oct 16, 2013

1. **What is the density of the CO_2 gas from Mr. B's demo?**

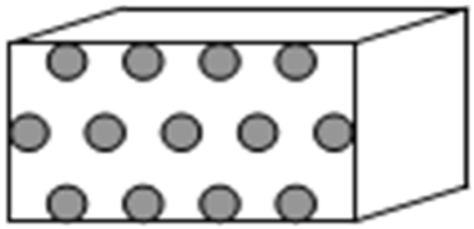
2. **Most liquids have densities between 0.6 g/ mL and 1.5 g/ mL. How does the density of the gas compare to the liquids?**

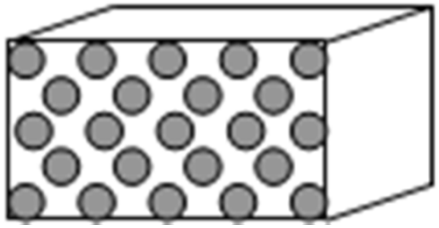
   Bigger? Smaller? A lot bigger? A lot smaller? By how much?

3. **How does the density of the gas compare to the solids, like aluminum (density = 2.70 g/mL)?**

   Bigger? Smaller? A lot bigger? A lot smaller? By how much?

4. **Using what you know about density, draw a picture of a solid, a liquid, and a gas using particle drawings in a box.**





Bell Work, Wednesday, Oct 16, 2013

5. What do we know about how our particles arrange themselves in solids, liquids & gasses ?

What is this property called?

Bell Work, Thursday, Oct 17, 2013

1. Use the data below to answer Wednesday's questions

Substance	*Density (g/cm^3)*
Gas - CO_2	0.0021
liquid - water	1.00
Solid - Aluminum	2.70

2. How does the density of the liquid compare to the solid?

Bigger? Smaller? A lot bigger? A lot smaller? By how much?

3. Using particle diagrams, represent samples of a cold gas and a hot gas. Speed is shown by the length of the whooshies.