

pH Review Problems

- 1) What is the molarity of a solution that has 450 grams of sodium chloride in 800 mL of water?
- 2) What is the molarity of a solution that contains 100 grams of iron (II) nitrate in 2.4 liters of water?
- 3) What is the pH of a solution that contains 2.4×10^{-5} moles of hydrobromic acid in 0.5 L of water?
- 4) What is the pH of a solution that contains 25 moles of nitric acid dissolved in 5000 liters of water?
- 5) What is the pH of a solution that contains 0.009 grams of hydrochloric acid in 100 mL of water?

pH Review Problems ANSWER KEY

- 1) What is the molarity of a solution that has 450 grams of sodium chloride in 800 mL of water? 9.61 M
- 2) What is the molarity of a solution that contains 100 grams of iron (II) nitrate in 2.4 liters of water? 0.23 M
- 3) What is the pH of a solution that contains 2.4×10^{-5} moles of hydrobromic acid in 0.5 L of water? 4.32
- 4) What is the pH of a solution that contains 25 moles of nitric acid dissolved in 5000 liters of water? 2.30
- 5) What is the pH of a solution that contains 0.009 grams of hydrochloric acid in 100 mL of water? 2.61
- 6) What is an acid/base indicator used for? **An acid base indicator is used to determine whether a solution is acidic or basic, and in titrations to tell when the equivalence point has been reached.**
- 7) Define "titration": **The process of finding the unknown concentration of an acid (or base) by neutralizing it with a base (or acid) with known concentration. The equation $M_1V_1 = M_2V_2$ allows you to do this.**
- 8) In a few steps, describe how you would titrate a base of unknown concentration with an acid with concentration 1 M.
 - 1) **Put a known amount of the base in a container**
 - 2) **Add a drop of indicator**
 - 3) **Add acid until the indicator changes color permanently**
 - 4) **Use $M_1V_1 = M_2V_2$ to find the concentration of the base**
- 9) I did a titration where it took 50 mL of 0.1 M hydrochloric acid to neutralize 500 mL of a base with unknown concentration. Using this titration information, what was the concentration of the base? 0.01 M
- 10) I did a titration where it took 25 mL of 5 M NaOH to neutralize 1000 mL of an acid with unknown concentration. Using this information, what was the concentration of the acid? 0.125 M