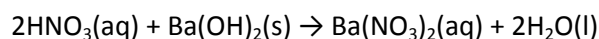
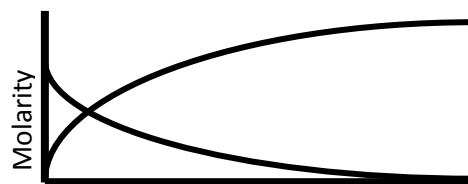


- 1) A grapefruit tastes sour. You would expect this to be a(n) _____.
- 2) Ammonium hydroxide feels slippery. It is a(n) _____.
- 3) Barium chloride conducts electricity but doesn't change the color of Litmus paper. It is a(n) _____.
- 4) Sodium hydroxide turns red Litmus paper blue. It is a(n) _____.
- 5) Zinc is placed in an unknown solution and bubbles form. This solution must be a(n) _____.
- 6) HCl gives its hydrogen ion when it reacts with a metal. It must be a(n) _____.
- 7) Potassium hydroxide takes hydrogen ions when it reacts with H_2SO_4 . It is a(n) _____.
- 8) NaOH completely separates into Na^+ and OH^- ions in water. It is a _____ base.
- 9) Hydrofluoric acid (HF) is a weak acid. An aqueous solution of hydrofluoric acid contains which molecules/ions?
- 10) Identify the acid and base present in this neutralization reaction:



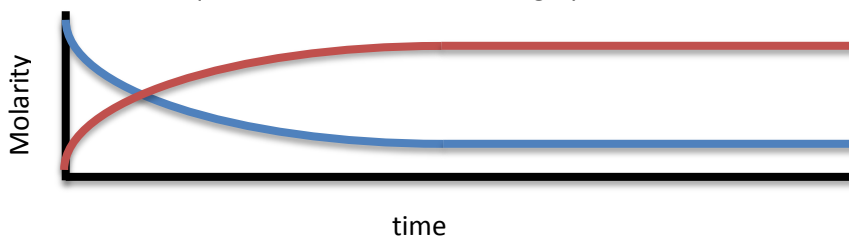
- 11) Barium hydroxide ($\text{Ba}(\text{OH})_2$) is a strong base. What ions are present in a solution of barium hydroxide?
- 12) A solution of HBr has a very low pH. It is a(n) _____.
- 13) A sample of vinegar has a pH of about 2.4. It is a(n) _____.
- 14) An ammonia cleaning solution has a pH of 12.0. It is a(n) _____.
- 15) When 50 mL of a 1.00 M NaOH solution reacts with 50 mL of a 1.00 M HCl solution, NaCl and H_2O are formed and the final solution has a pH of 7.00. This salt water solution is _____.
- 16) The HCl concentration is reduced in a neutralization reaction. It must be a reactant/product.
- 17) When hydrogen gas burns according to this reaction: $\text{H}_2(\text{g}) + \text{O}_2(\text{g}) \rightarrow \text{H}_2\text{O}(\text{g})$, describe the concentration changes for each molecule in the reaction.

- 18) Label the products and reactants on the following reaction diagram



- 19) If more successful collisions happen in the same period of time, this results in a(n) _____ in the reaction rate.
- 20) To speed up a reaction, we could _____ the temperature.
- 21) To slow down a reaction, we could _____ the pressure.
- 22) How does a catalyst affect the energy of collisions?
- 23) A catalyst will _____ the rate of reaction because of the _____ activation energy.

- 24) Adding more reactants to a reaction chamber will cause a(n) _____ in the reaction rate.
- 25) Chemical equilibrium is when the forward and reverse reactions _____.
- 26) The forward rate of a reaction is 100 reactions per minute and the reverse rate of a reaction is 80 reactions per minute. Is this system at equilibrium?
- 27) A decomposition reaction has been taking place over the course of two days. The concentration of the reactant is 5.23 M, and the product concentration is 2.16 M. If these concentrations are unchanging, this system must be _____.
- 28) Draw a vertical line to indicate the point at which equilibrium is reached for the graph below.



- 29) Restate Le Châtelier's Principle.
- 30) Consider the equation, $\text{N}_2(\text{g}) + \text{O}_2(\text{g}) \rightleftharpoons 2 \text{NO}(\text{g}) \quad \Delta H = +180 \text{ kJ}$
- Adding $\text{N}_2(\text{g})$ would cause more _____ to be produced.
 - Removing $\text{O}_2(\text{g})$ would cause more _____ to be produced.
 - Heating the reaction vessel would cause a _____ shift.
 - Decreasing the volume of the container results in _____.
- 31) Consider: $\text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) \rightleftharpoons 2 \text{NH}_3(\text{g}) \quad \Delta H = -91.8 \text{ kJ}$
- What change in temperature causes more NH_3 to form?
 - What volume change causes more NH_3 to form?