

- Which event must *always* occur for a chemical reaction to take place?
 - formation of a precipitate
 - formation of a gas
 - effective collisions between reacting particles
 - addition of a catalyst to the reaction system
- Increasing the temperature increases the rate of a reaction by
 - lowering the activation energy
 - increasing the activation energy
 - lowering the frequency of effective collisions between reacting molecules
 - increasing the frequency of effective collisions between reacting molecules
- After being ignited in a Bunsen burner flame, a piece of magnesium ribbon burns brightly, giving off heat and light. In this situation, the Bunsen burner flame provides
 - ionization energy
 - activation energy
 - heat of reaction
 - heat of vaporization
- As the number of effective collisions between reacting particles increases, the rate of reaction
 - decreases
 - increases
 - remains the same
- In most aqueous reactions as temperature increases, the effectiveness of collisions between reacting particles
 - decreases
 - increases
 - remains the same
- Given the reaction: $\text{Mg} + 2 \text{H}_2\text{O} \rightarrow \text{Mg}(\text{OH})_2 + \text{H}_2$
At which temperature will the reaction occur at the greatest rate?
 - 25°C
 - 50°C
 - 75°C
 - 100°C
- A 5.0-gram sample of zinc and a 50.-milliliter sample of hydrochloric acid are used in a chemical reaction. Which combination of these samples has the fastest reaction rate?
 - a zinc strip and 1.0 M HCl(aq)
 - a zinc strip and 3.0 M HCl(aq)
 - zinc powder and 1.0 M HCl(aq)
 - zinc powder and 3.0 M HCl(aq)
- Based on the nature of the reactants, which reaction will occur at the fastest rate?
 - $\text{C} + \text{O}_2 \rightarrow \text{CO}_2$
 - $\text{NaI} + \text{KCl} \rightarrow \text{NaCl} + \text{KI}$
 - $2 \text{H}_2 + \text{O}_2 \rightarrow 2 \text{H}_2\text{O}$
 - $\text{H}_2\text{CO}_3 \rightarrow \text{H}_2\text{O} + \text{CO}_2$
- At STP, which 4.0-gram zinc sample will react fastest with dilute hydrochloric acid?
 - lump
 - powdered
 - bar
 - sheet metal
- Given the reaction:
 $\text{Fe}(\text{s}) + 2 \text{HCl}(\text{aq}) \rightarrow \text{FeCl}_2(\text{aq}) + \text{H}_2(\text{g})$
In this reaction, 5 grams of powdered iron will react faster than a 1-gram piece of solid iron because the powdered iron
 - has less surface area
 - has more surface area
 - is less dense
 - is more dense
- Which change would most likely increase the rate of a chemical reaction?
 - decreasing a reactant's concentration
 - decreasing a reactant's surface area
 - cooling the reaction mixture
 - adding a catalyst to the reaction mixture
- A catalyst lowers the activation energy of a reaction by
 - providing an alternate pathway
 - decreasing the heat of reaction
 - increasing the mass of the reactants
 - changing the mole ratio of the reactants

