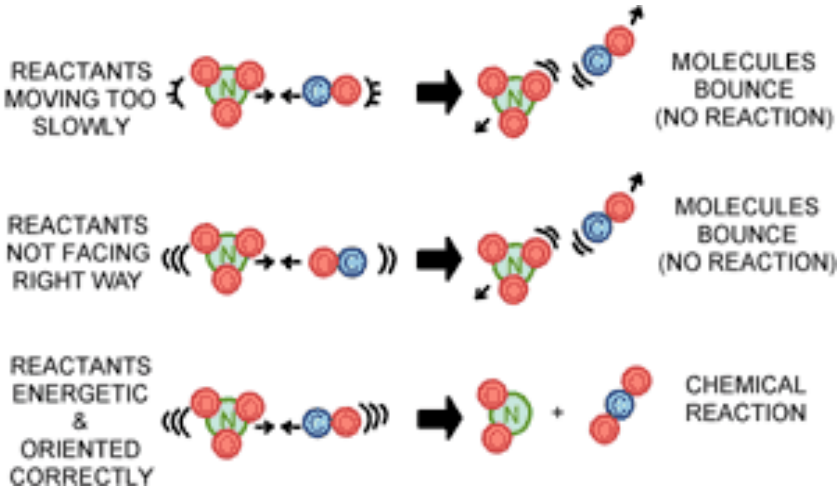
Reaction Rates

The collision model: the rate of reaction is affected by the number and type of collisions of reactant molecules.



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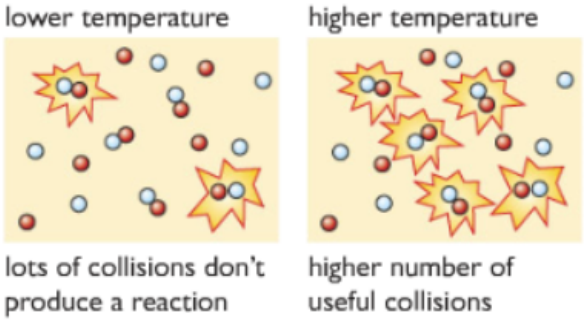
1. Temperature: higher temperature causes particles to move faster and collide more frequently and with higher force, so reaction rate increases.



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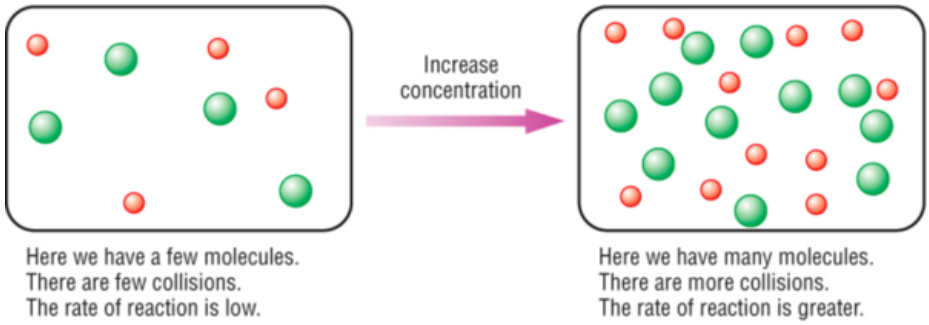
2. <u>Concentration:</u> Higher concentration means more particles to collide with each other, so reaction rate increases



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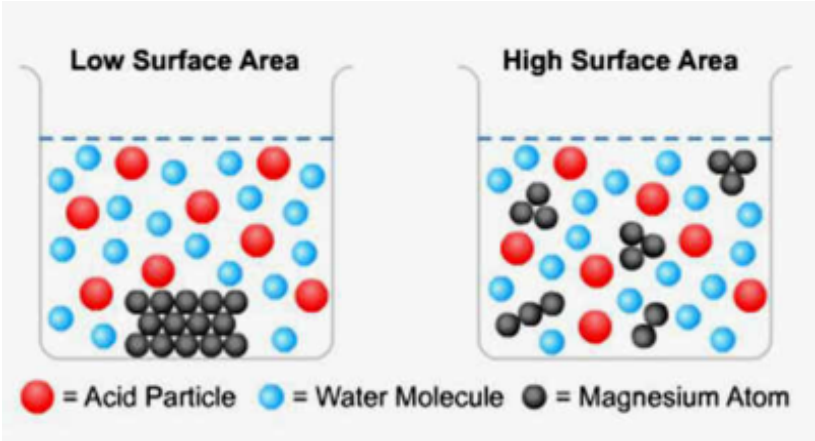
3. <u>Surface area</u>: larger surface area means more exposed particles to react.



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4. Catalyst: A substance that increases a chemical reaction rate but does not get consumed (used up) by the reaction. It works by reducing the amount of energy needed for the reaction to take place.

Ex: $2H_2O_2 \xrightarrow{MnO_2} 2H_2O + O_2$

MnO_2 is a catalyst and doesn't get used up.

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1. Explain how you would use your knowledge of factors that affect the rate of reaction to cook a steak as quickly as possible.

2. What would happen to the rate of reaction of a metal with 20 ml of acid at room temperature if:

A) the acid was cooled to 10^0C? ↓

B) 2 ml of concentrated acid was added? ↑

C) the metal was ground into powder before addition to the acid? ↑

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