

Expressing Reaction Rates

- Some chemical reactions are fast and others are slow, but chemists need to be more specific.
- What is a rate? speed at which a reaction takes place
hotdogs/min
- How do we use rates in everyday life? %/years
mi/hr beats/min
- How would we measure the rate of a reaction?

$$\frac{\Delta \text{quantity}}{\Delta \text{time}}$$

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Expressing Reaction Rates



- What happens to the amount of reactants over time? decrease
- What happens to the amount of products over time? increase
- Do you think you would observe the same changes for any reaction?

rate
temp.
amount
agitation
concentration

particle size
pressure
Volume
chemicals

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Reaction Rates

- Reaction Rate for chemistry is defined as the change in concentration of reactant or product in a period of time.
- What is concentration?
 - > amount of solute in a given amount of solvent
 - solute: what's being dissolved
 - solvent: doing the dissolving
 - ex: salt in water -- salt is solute, water is solvent
 - unit typically used in chemistry is molarity (M) -- moles/liter

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Reaction Rates

- Reaction Rates are determined experimentally by measuring the concentration of reactants and/or products in a chemical reaction.
- Reaction rates CANNOT be calculated from balanced chemical reactions.
- Reaction rates must always be positive.

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