Kinetics

AP Chemistry · Vocabulary in context

Word	Example
Kinetics /kɪ'netɪks/	**Kinetics** studies how fast reactions happen.
reaction rate /rɪ'ækʃn reɪt/	The **reaction rate** is how fast reactants are used up.
concentration /ˌkɒnsən'treɪʃn/	The **concentration** of the acid is 2 mol/dm^3. 2 mol/dm^3
temperature /'temprɪtʃə/	The thermometer shows the water's **temperature**.
surface area /'sɜːfɪs 'eərɪə/	Smaller solid pieces provide more **surface area** for reaction.
rate law /reɪt lɔː/	The **rate law** shows how rate depends on concentration.
rate constant /reɪt 'kɒnstənt/	The **rate constant** k gets larger at higher temperature. k
orders /'ɔːdəz/	The **orders** tell you how each concentration affects the rate.
second order	If doubling [B] quadruples the rate, the reaction is **second order** in B. [B] B
zero order	If the rate does not change with [A], the reaction is **zero order** in A. [A] A
overall order /ˌəʊvə'rɔːl 'ɔːdə/	The **overall order** is the sum of the orders.
integrated rate law	An **integrated rate law** links concentration to time.

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first order	If doubling [A] doubles the rate, the reaction is **first order** in A. [A] A
half-life /hɑːf laɪf/	After one **half-life**, half the nuclei have decayed.
radioactive decay /ˌreɪdɪəʊˈæktɪv dɪˈkeɪ/	**Radioactive decay** changes one element into another.
reaction mechanism /rɪˈækʃn ˈmekənɪzəm/	The **reaction mechanism** shows each step of the reaction.
elementary steps /ˌelɪˈmentəri steps/	A mechanism is made of **elementary steps**.
molecularity	**Molecularity** counts the particles in one step.
intermediates /ˌɪntəˈmiːdɪəts/	**Intermediates** are made in one step and used in the next.
Collision theory /kəˈlɪʒn ˈθɪəri/	**Collision theory** says particles must hit each other to react.
activation energy /ˌæktɪˈveɪʃn ˈenədʒi/	A match gives the **activation energy** to start the fire.
orientation /ˌɔːrɪənˈteɪʃn/	Particles must hit with the right **orientation** to react.
Maxwell-Boltzmann distribution	The **Maxwell-Boltzmann distribution** shows the spread of particle energies.
energy profile /ˈenədʒi ˈprəʊfaɪl/	An **energy profile** shows the energy barrier of a reaction.

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transition state /træn'sɪʃn steɪt/	The **transition state** is at the top of the energy curve.
enthalpy change /en'θælpi tʃeɪndʒ/	The **enthalpy change** of this reaction is -50 kJ/mol. -50 kJ/mol
exothermic /egzə'θɜ:mɪk/	Burning is **exothermic**: it gives out heat.
rate-determining step /reɪt dɪ'tɜ:mɪnɪŋ step/	The slowest step is the **rate-determining step**.
bimolecular	A **bimolecular** step involves two particles colliding.
fast pre-equilibrium	A **fast pre-equilibrium** comes before the slow step.
catalyst /'kætəlɪst/	A **catalyst** speeds up a reaction without being used up.
equilibrium position	Adding more reactant moves the **equilibrium position** to the right.

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