

WJEC (Eduqas) Chemistry A-level

PI3 - Chemical Kinetics

Definitions and Concepts

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Definitions and Concepts for WJEC (Eduqas) Chemistry A-level PI3 - Chemical Kinetics

Activation energy: The minimum energy required for a reaction to occur between two colliding particles.

Arrhenius equation: $k = Ae^{-E_a/RT}$, where k is the rate constant, A is the pre-exponential factor, E_a is the activation energy, R is the gas constant and T is the temperature.

First order reactant: A substance in the reactant mixture where the rate of reaction is directly proportional to the concentration of this substance.

Order of reaction: Tells you how the reactant's concentration will affect the rate of reaction. In the rate equation, it is the power to which the concentration of the reagent is raised.
e.g. rate = $k[A]^2[B]$.

Rate constant: Relates the rate of a chemical reaction at a given temperature to concentration of substances in the reaction mixture.

Rate determining step: The slowest step in a multi-step reaction. The overall rate is decided by this step. Species present in the rate determining step will also be in the rate equation.

Rate equation: Describes the relationship between the rate of chemical reaction and the concentrations/pressures of reagents.

$$\text{Rate} = k[A]^m[B]^n,$$

where k is the rate constant and where m and n are the orders of reaction with respect to reactants A and B .

Rate of reaction: The measure of the amount of product formed or reactant used over time. The units of rate of reaction may be given as g/s, cm^3/s or mol/s.

Second order reactant: A substance in the reactant mixture where the rate of reaction is directly proportional to the square of the concentration of this reactant.

Total order of a reaction: Sum of all the individual orders of all the reactants in a chemical reaction.

Zero order reactant: A substance in the reactant mixture where the rate of reaction is independent of the concentration of this reacting substance.

