

Controlling the Rate

- How can we control the rate of a chemical reaction?
- Why does changing concentration, temperature, pressure and adding a catalyst change the rate of a chemical reaction?
- How can we calculate the rate and/or “relative” rate of a chemical reaction?
- How can we show the progress of the potential energy of a chemical reaction?
- What is “Activation Energy”?
- What is an “Activated Complex”?
- How can we calculate activation energies and reaction enthalpies from Potential Energy diagrams?
- What effect does adding a catalyst have on the shape of a Potential Energy diagram?
- How can we show the kinetic energies of particles in a sample?
- What is the relationship between kinetic energy and temperature?
- What effect does adding a catalyst, changing concentration, and changing temperature have on a Kinetic Energy diagram?



Periodicity

- **What structures and bonding types are involved in the first 20 elements of the Periodic Table?**
- **What is “covalent radius”?**
- **Why does covalent radius increase down a group and decrease across a Period in the Periodic Table?**
- **What is “ionisation energy”?**
- **Why does ionisation energy decrease down a group and increase across a Period in the Periodic Table?**
- **Why is the 2nd, 3rd etc. ionisation energy of a particle always greater than the first?**
- **What is “electronegativity”?**
- **Why does electronegativity decrease down a group and increase across a Period in the Periodic Table?**

Structure and Bonding

- **What is a covalent bond?**
- **Why are some covalent bonds considered “polar”?**
- **What effect does the relative electronegativities of the atoms have on the polarity of the bond between them?**
- **What is meant by the “bonding continuum”?**
- **How do we know that there are Van der Waals forces between covalent molecules?**
- **What is a “London Dispersion Force”?**
- **How do London Dispersion Forces occur?**
- **How does the number of electrons in an atom or molecule affect the size of the London Dispersion Force?**
- **Why do some molecules have “permanent dipoles”?**
- **What is a permanent dipole- permanent dipole interaction?**
- **What is a “hydrogen Bond”?**
- **What effect does the type and size of the intermolecular bond have on the physical properties of a substance?**
- **What are the relative solubilities of ionic compounds, polar molecules and non-polar molecules.**

