

# Reaction Rates

The key areas of study in this topic are:

- Simple collision theory
- Catalysts
- The Boltzmann distribution

By the end of this topic I should be able to:

	Start	End
Explain the effect of concentration (and pressure of gases), on the rate of a reaction, in terms of frequency of collisions		
Calculate reaction rate from the gradients of graphs measuring how a physical quantity (e.g. concentration, gas volume, mass) changes with time		
Explain the role of a catalyst: <ul style="list-style-type: none"> <li>• in increasing reaction rate without being used up by the overall reaction</li> <li>• in allowing a reaction to proceed via a different route with lower activation energy, as shown by enthalpy profile diagrams</li> </ul>		
Explain the terms homogeneous and heterogeneous catalysts		
Explain that catalysts have great economic importance and benefits for increased sustainability (lowering temperatures, reducing energy demand from combustion of fossil fuels with resulting reduction in CO <sub>2</sub> emissions), but weighed against the fact that some catalysts are toxic.		
Describe the techniques and procedures used to investigate reaction rates including the measurement of mass, gas volumes and time		
Explain qualitatively, the Boltzmann distribution and its relationship with activation energy		
Explain, using Boltzmann distributions, the qualitative effect on the proportion of molecules exceeding the activation energy and hence the reaction rate, for: <ul style="list-style-type: none"> <li>• temperature changes</li> <li>• catalytic behaviour</li> </ul>		

In all topic areas you should be able to demonstrate and apply your knowledge and understanding.

