What is the rate of a reaction?

What are the three methods of monitoring the rate of reaction when a gas is given off?

When is upward delivery not a suitable method for monitoring the rate of reaction?

When is mass change using a mass balance not a suitable method for monitoring rate of reaction?

How would you use a graph to determine the rate of reaction?

What is activation energy?

How does increasing the concentration of a solution affect the rate of reaction?

How does increasing the pressure of a gas affect the rate of reaction?

Gas syringe, upward delivery over water or mass change using a balance

A measure of how quickly reactants are made into products

For low density gases such as hydrogen

When the gas is soluble in water e.g. oxygen or carbon dioxide

The minimum amount of energy that particles need to have when they collide in order for them to react

Plot volume of gas(y) against time (x). Draw a tangent and work out the gradient.

There are more particles of gas in the same volume. This gives more frequent collisions so the rate of reaction increases

There are more particles of solute in the same volume. This gives more frequent collisions so the rate of reaction increases

How does increasing the surface area of a solid affect the rate of reaction?	How does adding a catalyst affect the rate of reaction?
What is a catalyst?	What is an enzyme?
How does increasing the temperature affect the rate of reaction?	What is collision theory?
In terms of the amount of reactants, how is the rate of a reaction calculated?	In terms of the amount of products, how is the rate of a reaction calculated?

Lowers the activation energy of the reaction so that there are more successful collisions. This increases the rate of reaction Smaller pieces of solid mean that the solid has a higher surface area. This means that more of the reactant particles are exposed so there are more frequent collisions. This increases the rate of reaction.

A biological catalyst

A chemical which speeds up the rate of a reaction without being used up itself

In order to react
particles need to collide
with a minimum
amount of energy.

Particles have more
energy so will move
faster. This leads to more
frequent and more
successful collisions

Amount of reactants products made / time taken

Amount of reactants used / time taken