Substrate concentration

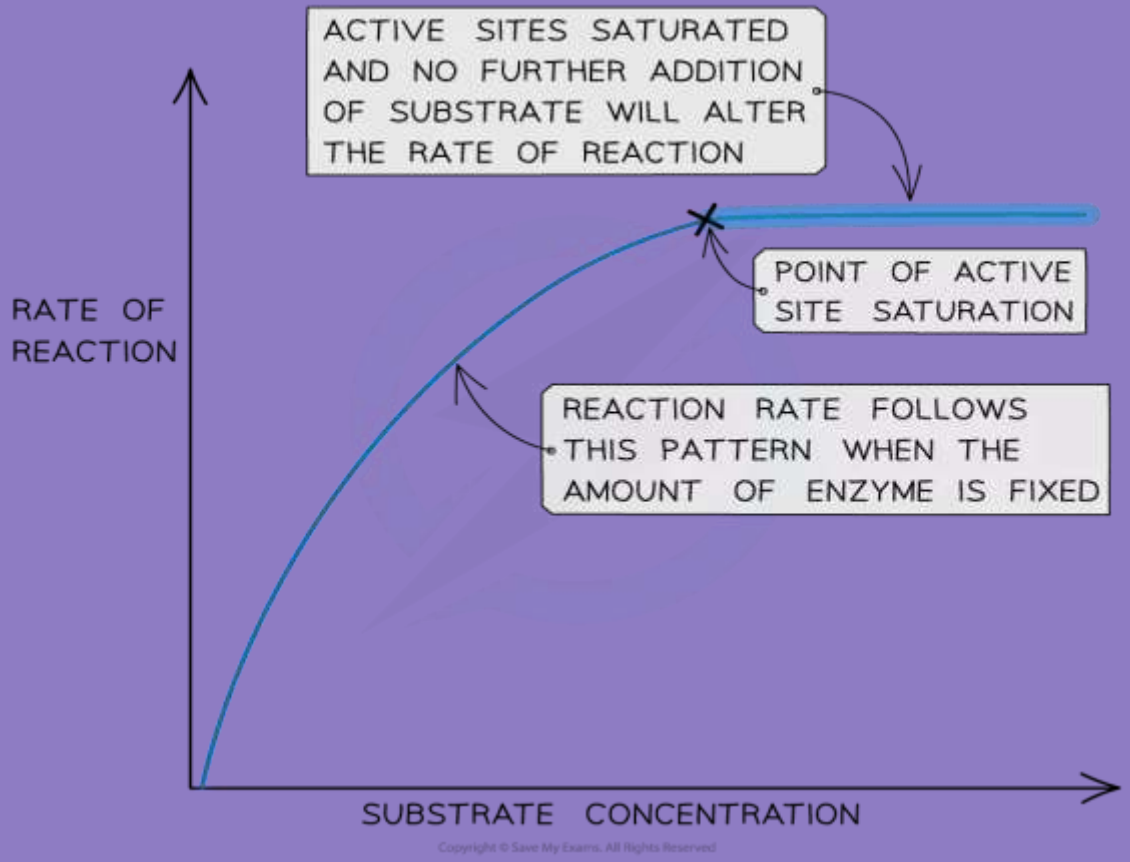
What is substrate concentration?

The greater the substrate concentration, the higher the rate of reaction: As the number of substrate molecules increases, the likelihood of enzyme-substrate complex formation increases.

If the enzyme concentration remains fixed but the amount of substrate is increased past a certain point, however, all available active sites eventually become saturated and any further increase in substrate concentration will not increase the reaction rate.

When the active sites of the enzymes are all full, any substrate molecules that are added have nowhere to bind in order to form an enzyme-substrate complex

The effect of substrate concentration on the rate of an enzyme-catalysed reaction



Maximum possible rate

- If substrate concentration is continually increased but enzyme concentration is kept constant, there eventually comes a point where every enzyme active site is working continuously. At this point, the substrate molecules are effectively ‘queuing up’ for an active site to become available.

- At this stage, the enzyme is working at its maximum possible rate, known as Vmax (V stands for velocity).