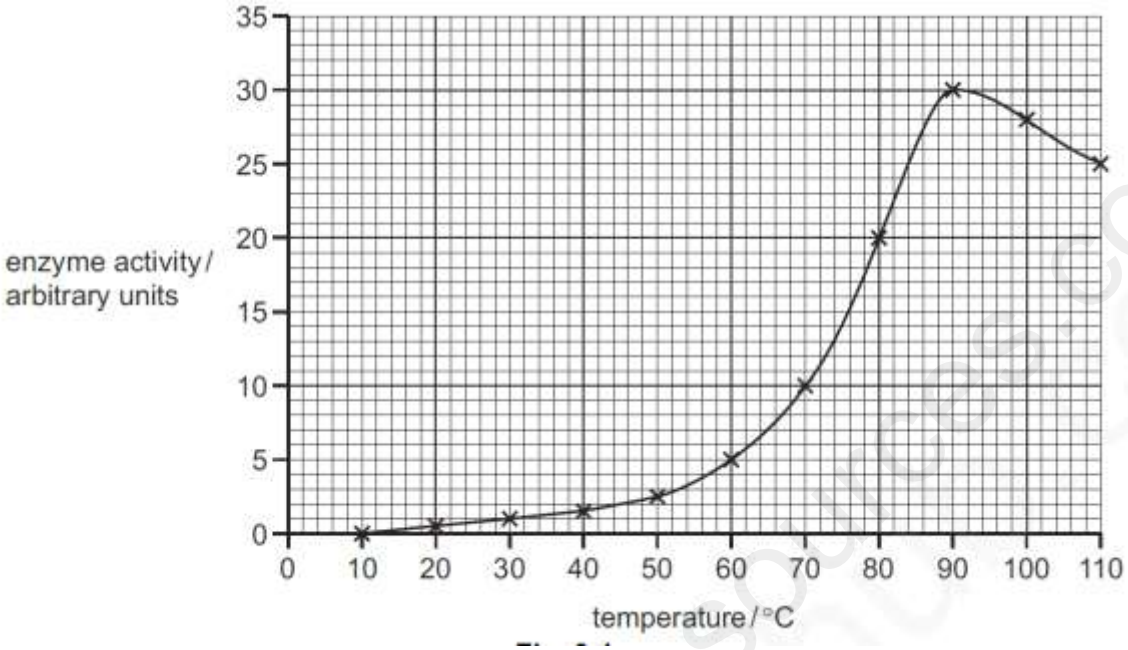
Effect of temperature on enzyme activity

Following graph shows the activity of an enzyme produced by bacteria that live in very hot water.



It can be seen that:

- There is no activity at 10^0C.
- The activity increases between (10 and 90)^{0}C.
- There is an exponential increase between 50^0C and 90^0C.
- Optimum activity is at 90^0C.
- Activity decreases above 90^0C.

In general:

- ✓ As the temperature and therefore kinetic energy of the molecules increases, the enzymes and substrates will collide more often which results in an increased chance of a successful collision between the enzymes active site and the substrate. This will result in more enzyme/substrate complexes forming in a given time and the rate of the reaction is increased.
- ✓ Very high temperatures disrupt the shape of the active site, which will reduce its activity by preventing the formation of enzyme/substrate complexes. The enzyme will have been denatured.

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