No. of Molecules

At T = 100°C

At T = 110°C

Activation energy — Ea

Molecular energy

⇒ Increasing temperature increases average Kinetic energy (E_K) of the reactant molecules.

⇒ The rate of reaction increases because of two factors
First factor has a greater impact than second factor.

1) Primarily because greater "proportion" of the molecules have Kinetic energy equal to or greater than activation energy. [Refer Fig 1]

2) Secondarily number of collisions per second increases.
Now, there are more effective collisions. [i.e freq of effective collision increases]

⇒ Time taken to complete the reaction decreases. A 10°C rise temperature can approximately DOUBLE the rate of reaction.

⇒ Total area under curve remains constant since total number of molecules are constant.

⇒ However, area of shaded region increases because more molecules now have $E \geqslant E_A$.

CHEMISTRY with HAMZA