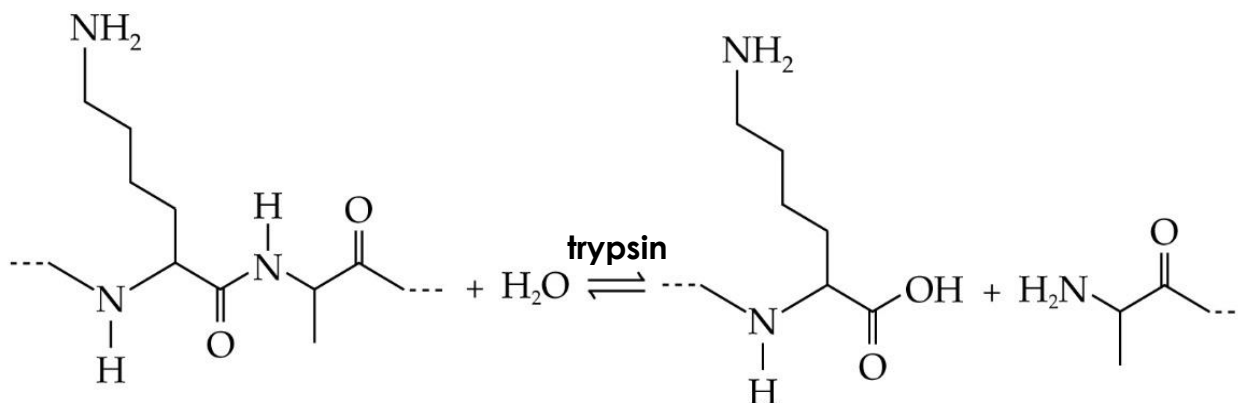


## Quiz (Catalyst and Catalysis)

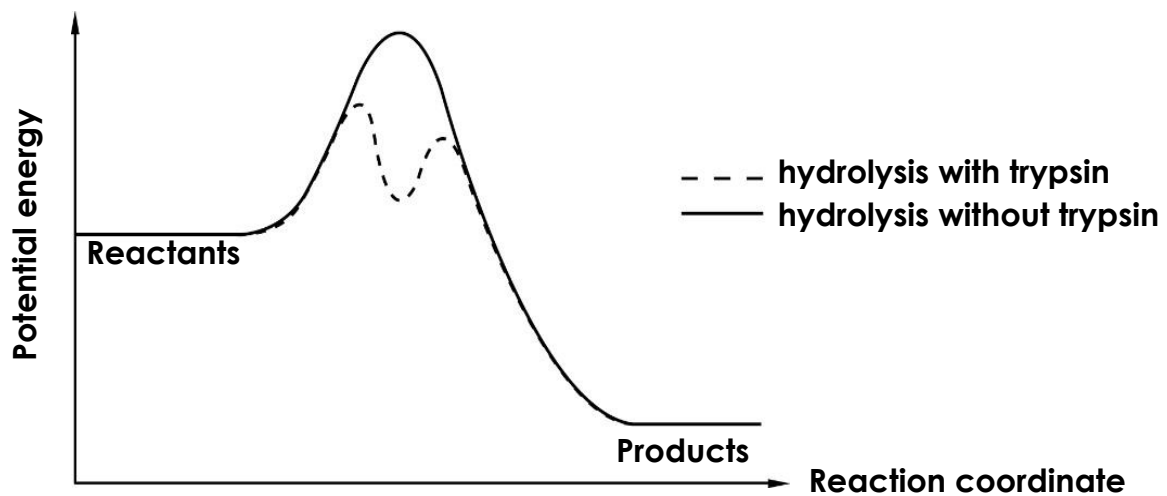
Enzymes can be employed in contact lens cleaners. For example, trypsin can be used as a catalyst for removing proteins on contact lens by hydrolysis. It helps break proteins into smaller molecules. The following equation shows the action of trypsin.



- Sketch the energy profiles for the hydrolysis of protein, with and without trypsin, in one diagram. (Assume the hydrolysis is an exothermic reaction and the first step is the rate-determining step.)
- Is the equilibrium constant of the hydrolysis affected by the action of trypsin? Explain.
- A student claimed that the contact lens cleaners can be reused. Do you agree? Explain.
- Suggest ONE advantage of using enzymes rather than chemicals for removing proteins on contact lens.

## Suggested Answer

(a)



- (b) No. The enzyme can only shorten the time for the reaction to reach equilibrium / equilibrium constant depends on temperature only.
- (c) Any ONE:
- Agree. The enzyme remains chemically unchanged at the end of the reaction and it can be reused.
  - Disagree. The used cleaning solution contains a lot of dirt.  
(Accept other reasonable answers)
- (d) Enzymes can be degraded by the environment easily / only a small amount of enzyme is required for the reaction. (Accept other reasonable answers)