

Exercise 5.43 – Catalysis

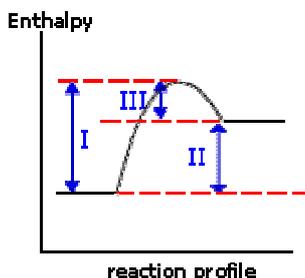
Q543-01 A catalyst that increases the rate of a reaction does so by:

- A. increasing the concentrations of the initial reactants
- B. increasing the temperature
- C. decreasing the temperature
- D. decreasing the activation energy for the process

Q543-02 The rate of reaction between two gases increases when the temperature is increased and a catalyst is added. Which statements are both correct for the effect of these changes on the reaction:

Increasing the temperature	Adding a catalyst
A. Collision frequency increases	Activation energy increases
B. Activation energy increases	Activation energy does not change
C. Activation energy does not change	Activation energy decreases
D. Activation energy increases	Collision frequency increases

Q543-03 Which of the quantities on the enthalpy level diagram shown below is (are) affected by the use of a catalyst?



- A. I only
- B. III only
- C. I and III
- D. II and III

Q543-04 What is the effect of adding a catalyst to a reaction mixture at equilibrium.

- A. It decreases the activation energy of the forward reaction and increases the activation energy of the reverse reaction
- B. It decreases both the activation energy and the enthalpy change of the forward reaction.
- C. It decreases the activation energy of both the forward and reverse reactions.
- D. It decreases the activation energies and enthalpy changes of both the forward and reverse reactions.

Q543-05 Some solids act as heterogeneous catalysts. State what is meant by the term heterogeneous and outline how such catalysts work.

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Q543-06 Which items correctly complete the following statement? A catalyst can act in a chemical reaction to:

- I - increase the equilibrium constant.
 - II - lower the activation energy.
 - III - decrease ΔE for the reaction.
 - IV - provide a new path for the reaction.
- A. only I & II
B. only II & III
C. only III & IV
D. only I & III
E. only II & IV
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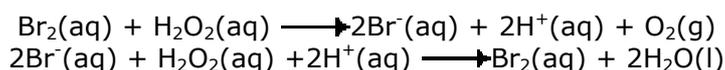
Q543-07 A catalyst:

- A. actually participates in the reaction.
B. changes the equilibrium concentration of the products.
C. always decreases the rate for a reaction.
D. always increases the activation energy for a reaction.
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Q543-08 Which one of the following statements is correct for catalysed and uncatalysed versions of the same reaction?

- A. ΔH catalysed reaction < ΔH uncatalysed reaction.
B. ΔH for both reactions is the same.
C. Eact catalysed reaction > Eact uncatalysed reaction.
D. Eact for both reactions is the same
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Q543-09 The following equations represent two stages in a reaction:



The sum of the two equations suggests strongly that:

- A. H_2O_2 is a catalyst.
B. Br_2 is a reactant in the overall reaction.
C. Br_2 is a catalyst.
D. Br_2 is a product in the overall reaction.
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Q543-10 The rate of a reversible reaction is altered by the addition of a heterogeneous catalyst. Which statement correctly describes the role of the catalyst?

- A. It alters the enthalpy change of the reaction
B. It decreases the activation energy of the forward reaction
C. It increases the activation energy of the reverse reaction
D. It increase both the rate of the forward reaction and reverse reactions.
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