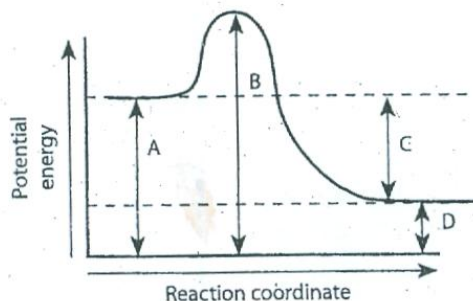


## PEDiag4 HW

- In order for a chemical reaction to occur, there must always be
  - (1) an effective collision between reacting particles
  - (2) a bond that breaks in a reactant particle
  - (3) reacting particles with a high charge
  - (4) reacting particles with high kinetic energy
- As the number of effective collisions between reacting particles increases, the rate of reaction
  - (1) decreases
  - (2) increases
  - (3) remains the same
- Activation energy is required to initiate
  - (1) exothermic reactions only
  - (2) endothermic reactions only
  - (3) both endothermic and exothermic reactions
  - (4) neither endothermic nor exothermic reactions
- In a chemical reaction, as the concentrations of the reacting particles increase, the rate of reactions generally
  - (1) decreases
  - (2) increases
  - (3) remains the same
  - (4) reaches equilibrium
- Which conditions will increase the rate of a chemical reaction?
  - (1) decreased temperature and decreased concentration of reactants
  - (2) decreased temperature and increased concentration of reactants
  - (3) increased temperature and decreased concentration of reactants
  - (4) increased temperature and increased concentration of reactants
- Adding a catalyst to a chemical reaction will
  - (1) lower the activation energy needed
  - (2) lower the potential energy of the reactants
  - (3) increase the activation energy
  - (4) increase the potential energy of the reactants
- Given the potential energy diagram below, which lettered interval represents the potential energy of the activated complex?

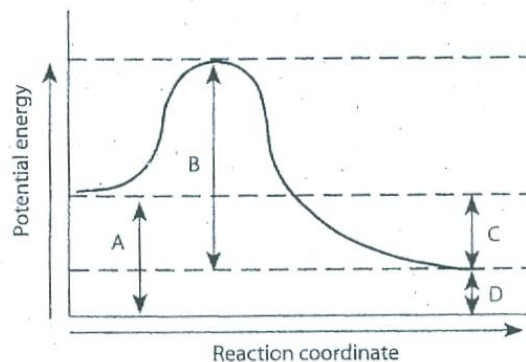


- (1) A
- (2) B
- (3) C
- (4) D

- The graph above is a potential energy diagram of a compound that is formed from its elements. Which interval represents the heat of reaction?

- What will change when a catalyst is added to a chemical reaction?
  - (1) activation energy
  - (2) heat of reaction
  - (3) potential energy of the reactants
  - (4) potential energy of the products
- The energy needed to start a chemical reaction is called
  - (1) potential energy
  - (2) kinetic energy
  - (3) activation energy
  - (4) ionization energy

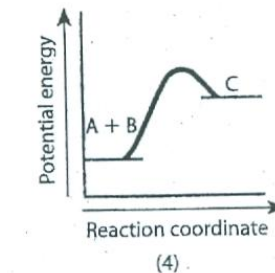
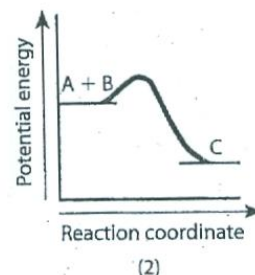
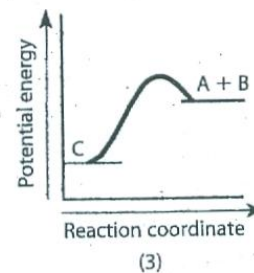
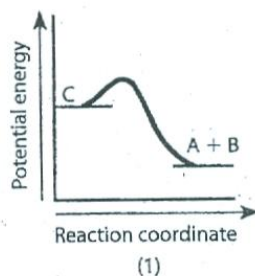
Use the potential energy diagram of a chemical reaction shown below to answer questions 8 and 9.



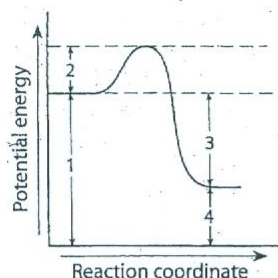
- Which arrow represents the part of the reaction most likely to be changed by the addition of a catalyst?
  - (1) A
  - (2) B
  - (3) C
  - (4) D
- Which letter represents the activation energy for the reverse reaction?
  - (1) A
  - (2) B
  - (3) C
  - (4) D
- As the temperature of a system increases, the entropy of the system
 

entropy = disorder, randomness

  - (1) decreases
  - (2) increases
  - (3) remains the same
- Which potential energy diagram represents the reaction  $A + B \rightarrow C + \text{energy}$ ?



Base your answers to Questions 11 and 12 on the diagram below, which represents the reaction:



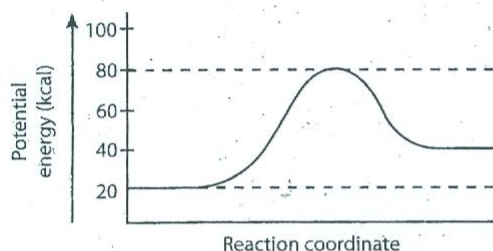
11. Which statement correctly describes this reaction?

- (1) It is endothermic and energy is absorbed.
- (2) It is endothermic and energy is released.
- (3) It is exothermic and energy is absorbed.
- (4) It is exothermic and energy is released.

12. Which numbered interval will change with the addition of a catalyst to the system?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

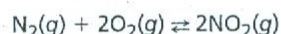
13. A potential energy diagram of a chemical system is shown below.



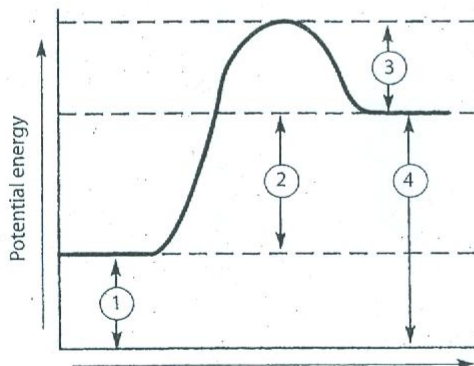
What is the difference between the potential energy of the reactants and the potential energy of the products?

- (1) 20. kcal
- (2) 40. kcal
- (3) 60. kcal
- (4) 80. kcal

14. Consider the reaction for which  $\Delta H = +33 \text{ kJ/mol}$ .



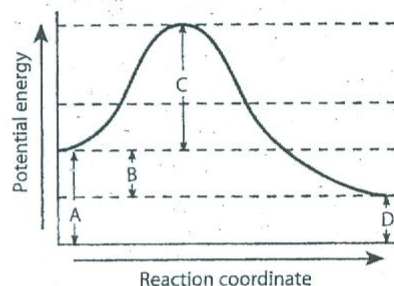
The potential energy diagram of the reaction is shown below.



Which arrow represents the heat of reaction for the reverse reaction?

- (1) 1
- (2) 2
- (3) 3
- (4) 4

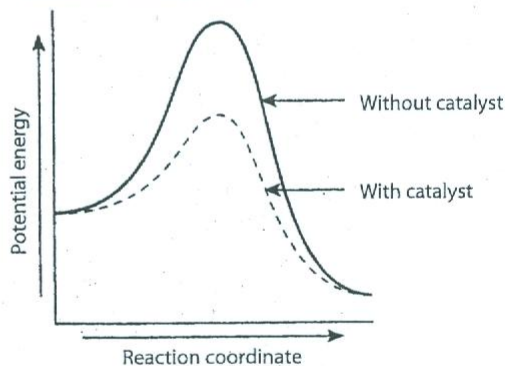
15. The potential energy diagram of a chemical reaction is shown below.



Which letter in the diagram represents the heat of reaction?

- (1) A
- (2) B
- (3) C
- (4) D

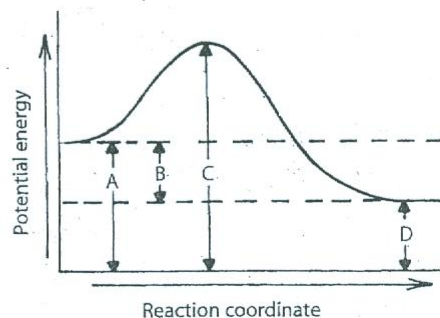
16. A potential energy diagram is shown below.



Which reaction would have the lowest activation energy?

- (1) the forward catalyzed reaction
- (2) the forward uncatalyzed reaction
- (3) the reverse catalyzed reaction
- (4) the reverse uncatalyzed reaction

17. In the potential energy diagram below, which arrow represents the potential energy of the activated complex?



- (1) A
- (2) B
- (3) C
- (4) D