

KEY

26. A system has reached equilibrium when:
- maximum entropy has been achieved
  - minimum enthalpy has been achieved
  - the rate of the forward reaction and reverse reaction is zero
  - the concentrations of reactants and products have stopped changing

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Your answer is d. Explain why Again, conc. is a macroscopic property - stops changing once equilibrium is reached

1

27. Equilibrium is achieved when reactant and product concentrations are (equal/constant/zero)

constant

1

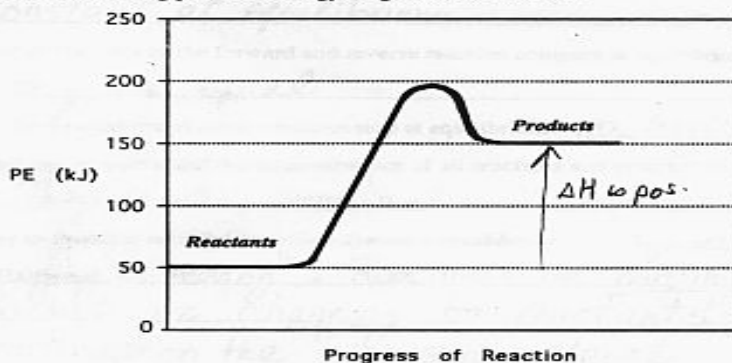
28. In a particular chemical reaction,  $\Delta H = +100$  kJ. When equilibrium has been established; it is found that a significant amount of product has formed, even though there is still some reactants left.

What has happened to entropy as this reaction was taking place? increased

1

Explain how you arrived at your answer rx. is endothermic ( $\Delta H$  pos.) so tendency to min enthalpy favors reactants. In order for this rx. to occur at all, the tend. to max. entropy must favor products (products have greater entropy)

29. Given the following potential energy diagram for a reaction:



1

Explain in terms of enthalpy and entropy, how you could end up with a fairly high ratio of products to reactants. endo. ( $\Delta H$  pos.) tend to min. enthalpy favors reactants. If  $\frac{\text{prod.}}{\text{reactants}}$  ratio is high, tend to max entropy must favor products. (products must have higher entropy)

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