AP Chemistry
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Name_____

AP MULTIPLE CHOICE QUESTIONS
CH. 19, SET 1

1989

41. Which of the following reactions has the largest value of ΔS per mole of Cl_2?

(A) $H_2\,(g) + Cl_2\,(g) \rightarrow 2HCl\,(g)$
(B) $Cl_2\,(g) + \frac{1}{2}\,O_2\,(g) \rightarrow Cl_2O\,(g)$
(C) $Mg\,(s) + Cl_2\,(g) \rightarrow MgCl_2\,(s)$
(D) $2NH_4Cl\,(s) \rightarrow 4H_2\,(g) + Cl_2\,(g)$
(E) $Cl_2\,(g) \rightarrow 2Cl\,(g)$

66. $MnS\,(s) + 2\,H^+ \rightleftharpoons Mn^{2+} + H_2S\,(g)$

At 25°C the solubility product constant, K_{sp}, for MnS is 5×10^{-15} and the acid dissociation constants For H_2S are 1×10^{-7} and 1×10^{-13} , respectively. What is the equilibrium constant for the reaction represented by the equation above at 25°C?

(A) $(1 \times 10^{-13})/(5 \times 10^{-15})$
(B) $(5 \times 10^{-15})/(1 \times 10^{-7})$
(C) $(1 \times 10^{-7})/(5 \times 10^{-20})$
(D) $(5 \times 10^{-15})/(1 \times 10^{-20})$
(E) $(1 \times 10^{-20})/(5 \times 10^{-15})$

70. $H_2O\,(s) \rightarrow H_2O\,(l)$

When ice melts at its normal melting point, 273.16 K and 1 atm, which of the following is true for the process shown above?

(A) $\Delta H<0,\ \Delta S>0,\ \Delta V>0$
(B) $\Delta H<0,\ \Delta S<0,\ \Delta V>0$
(C) $\Delta H>0,\ \Delta S<0,\ \Delta V<0$
(D) $\Delta H>0,\ \Delta S>0,\ \Delta V>0$
(E) $\Delta H>0,\ \Delta S>0,\ \Delta V<0$

1984

56. A cube of ice is added to some hot water in a rigid, insulated container, which is then sealed. There is no heat exchange with the surroundings. What has happened to the total energy and the total entropy when the system reaches equilibrium?

	Energy	Entropy
(A)	remains constant	remains constant
(B)	remains constant	decreases
(C)	remains constant	increases
(D)	decreases	increases
(E)	increases	decreases

35. When phenolphthalein is used as the indicator in a titration of an HCl solution with a solution of NaOH, the indicator undergoes a color change from clear to red at the endpoint of the titration. This color change occurs abruptly because

(A) phenolphthalein is a very strong acid that is capable of rapid dissociation.
(B) the solution undergoing titration undergoes a large pH change near the endpoint of the titration.
(C) phenolphthalein undergoes an irreversible reaction in basic solution.
(D) OH^- acts as a catalyst for the decomposition of phenolphthalein.
(E) phenolphthalein is involved in the rate-determining step of the reaction between H_3O^+ and OH^-.