AP Chemistry
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Name_____

AP MULTIPLE CHOICE QUESTIONS
CH. 15, SET 1

1984

36. $CuO\ (s) + H_2\ (g) \rightleftharpoons Cu\ (s) + H_2O\ (g) \quad \Delta H = -2.0\ kJ$

When the substances in the equation above are at equilibrium, at pressure P and temperature T, the equilibrium can be shifted to favor products by

(A) increasing the pressure by means of a moving piston at constant T.
(B) increasing the pressure by adding an inert gas such as nitrogen.
(C) decreasing the temperature.
(D) allowing some gases to escape at constant P and T.
(E) adding a catalyst.

76. $HgO\ (s) + H_2O \rightleftharpoons HgI_4^{2-} + 2\ OH^-$

Consider the equilibrium above. Which of the following changes will increase the concentration of HgI_4^{2-}?

(A) increasing the concentration of OH^-
(B) adding 6M HNO_3
(C) increasing the mass of HgO present.
(D) increasing the temperature.
(E) adding a catalyst.

1989

29. In which of the following systems would the number of moles of the substances present at equilibrium NOT be shifted by a change in volume of the system at constant temperature?

(A) $CO\ (g) + NO\ (g) \rightleftharpoons CO_2\ (g) + \frac{1}{2}N_2\ (g)$
(B) $N_2\ (g) + 3H_2\ (g) \rightleftharpoons 2NH_3\ (g)$
(C) $N_2\ (g) + 2O_2\ (g) \rightleftharpoons 2NO_2\ (g)$
(D) $N_2O_4\ (g) \rightleftharpoons 2NO_2\ (g)$
(E) $NO\ (g) + O_3\ (g) \rightleftharpoons NO_2\ (g) + O_2\ (g)$

54. Which of the following is the correct equilibrium expression for the hydrolysis of CO_3^{2-}?

(A) $k = \dfrac{[HCO_3^-]}{[CO_3^{2-}][H_3O^+]}$
(B) $k = \dfrac{[CO_3^{2-}]}{[CO_2][OH^-]^2}$
(C) $k = \dfrac{[HCO_3^-][OH^-]}{[CO_3^{2-}]}$
(D) $k = \dfrac{[CO_3^{2-}][H_3O^+]}{[HCO_3^-]}$
(E) $k = \dfrac{[CO_3^{2-}][OH^-]}{[HCO_3^-]}$