1. For the following equilibrium 2KClO3(s) ⇌ 2KCl(s) + 3O2(g)

 When KClO3 is added to the reaction mixture, the reaction will

1. Shift to right (B) Shift to left

(C) Remain unaffected (D) none

1. For the following equilibrium C(s) ⇌ 2H2(g) + CH4(g)

When CH4 is added to the reaction mixture, the reaction will

(A) Shift to right (B) Shift to left

(C) remain unaffected (D) none

1. The following reaction is endothermic C(s) + CO2(g) ⇌ 2CO(g)

When the reaction temperature is increased, the reaction will

(A) Shift to right (B) Shift to left

(C) remain unaffected (D) none

1. Which of the following is a heterogeneous equilibrium?

(A) NH3(aq) + H2O (l) ⇌ NH4+ (aq) + OH-(aq)

(B) HF(aq) + H2O (l) ⇌ H3O+ (aq) + F-(aq)

(C) 2KClO3(s) ⇌ 2KCl(s) + 3O2(g)

(D) CO32-(aq) + H2O (l) ⇌ HCO3- (aq) + OH-(aq)

1. Which of the following is a weak acid?

(A) HCl (B) HNO3

(C) HBr (D) H2SO3

1. Which of the following is a weak base?

(A) NaOH (B) NH3

(C) HC2H3O2 (D) HN4 Cl

1. Hydrofluoric acid is:

(A)Strong acid (B) strong base

(C) weak acid (D) weak base

1. Which of the following is a Lewis acid?

(A) HCl (B) NH3

(C) HNO3  (D) BF3

1. For the following equilibrium reaction A ⇌ 3C K1

The overall equilibrium constant K1 in terms of the given two equilibria

A ⇌ 2B K2

2B ⇌ 3C K3

(A) K1=K2+K3 (B) K1=K2. K3

(C) K1=K2/K3 (D) K1=K3/K3

1. The household ammonia has a ………….

(A) pH =7 (B) pH <7

(C) pH >7 (D) pH ≤ 7

1. The equilibrium constant K, for the reaction

2KClO3(s) ⇌ 2KCl(s) + 3O2(g) is given by

(A) K = [KCl]**2** [O2]**3**/ [KClO3(s)]**2**

(B) K = [O2]**3**

(C) K = [KClO3(s)]**2** / [KCl]**2** [O2]**3**

(D) K = 1/ [O2]**3**

1. The following reaction: N2O4(g) ⇌ 2 NO2(g) represents

(A) irreversible (B) reversible

(C) acidic (D) neutral

1. The soft drinks (e.g. Pepsi) has a ………….

(A) pH =7 (B) pH <7

(C) pH >7 (D) pH ≤ 7

1. The [H3O**+**] in a solution is 1.8 x 10-4, this solution is:

(A) Acidic (B) basic

(C) neutral (D) amphoteric

1. The hydronium ion concentration of a solution of pH 7.8 is ……….

(A) 1.6 ×108 (B) 6.2

(C) 1.6 ×10-8 (D) 6.3×107

1. Which of the following is a heterogeneous equilibrium?

(A) NH3(aq) + H2O (l) ⇌ NH4**+** (aq) + OH**-**(aq)

(B) HF(aq) + H2O (l) ⇌ H3O+ (aq) + F**-**(aq)

(C) C(s) + 2H2(g) ⇌ CH4(g)

(D) CO3**2-**(aq) + H2O (l) ⇌ HCO3**-** (aq) + OH**-**(aq)

1. Which of the following is a weak acid?

(A) HCl (B) HNO3

(C) HF (D) HI

1. Which of the following is the conjugate base of NH4+?

(A) NH4Cl (B) NH3

(C) CHO2**-** (D) NH2 **–**

1. For the following equilibrium N2(g)+ 3H2(g) ⇌ 2NH3(g) When excess ammonia NH3 is added to the reaction mixture, the reaction will

(A) Shift to right (B) Shift to left

(C) remain unaffected (D) none

1. For the following equilibrium C(s) + CO2(g) ⇌ 2CO(g)

When CO2 is added to the reaction mixture, the reaction will

(A) Shift to right (B) Shift to left

(C) remain unaffected (D) none

1. The following reaction is exothermic N2(g)+ 3H2(g) ⇌ 2NH3(g)

When the reaction temperature is increased, the reaction will

(A) Shift to right (B) Shift to left

(C) remain unaffected (D) none

1. What is the hydronium ion concentration equals to A SOLUTION WITH of pH 7.8 is ……….(A) 1.6 ×10-8  (B) 6.2

(C) 7.8 (D) 6.3×107

1. The equilibrium constant K, for the reaction

CaCO3(s) ⇌ CaO(s) + O2(g) is given by

(A) K = [CaO] [O2] / [CaCO3]

(B) K = [O2]

(C) K = [CaCO3] / [CaO] [O2]

(D) K = 1/ [O2]

1. The following reaction: PCl5 (g) ⇌ PCl3(g) + Cl2(g) represents

(A) irreversible (B) reversible

(C) acidic (D) neutral

1. Consider the following reaction at equilibrium.

CaCO3(s) ⇌ CaO(s) + CO2(g)

Adding additional CO2 will shift the reaction mixture towards:

(A) The reactants (B) products

(C) both reactants and products (D) none

1. The [H3O+] in a solution is 1.8 x 10-4, this solution is:

(A) Acidic (B) basic

(C) neutral (D) amphoteric

1. When the following reaction reaches to equilibrium:

A(g) + B(g) 2C(g) Kc=1.4 x 10-5

The concentration of the products …………..the concentration of reactants

(A) is greater than (B) is lower than

(C) equal (D) non

1. Acetic acid is a weaker acid than sulphuric acid because:

(A) it has low molecular weight.

(B) sulphuric acid is weakly ionised.

(C) it does not dissociates completely.

1. Consider the reaction at equilibrium:

2KClO3(s) 2 KCl(s) + 3O2(g)

Addition of KCl to the reaction mixture will:

(A) shift the reaction left

(B)shift the reaction right

(C) remain the reaction unchanged

1. This reaction is endothermic

C(s) + CO2(g) 2CO(g)

Increasing the reaction temperature will:

(A) shift the reaction left

(B) shift the reaction right

(C) remain the reaction Unchanged

1. A reaction is said to be reversible that can proceed in……………….

(A) forward (B) reverse

(C) forward and reverse (D) very fast

1. The equilibrium constant for the following reaction is ……………..

2 N2O4 (g) 4NO2 (g) + O2 (g)

1. k= [NO2]4[O2]

 [N2O4]2

 ( B) k= [N2O4]2

 [NO2]4 [O2]

 (C) k= [NO2]4[O2]

 [N2O4]

(D) k= [NO2]4[O2]2

 [N2O4]

1. NH3 is a base because it …………………………………..

a- donors a proton water b- accepts a proton from water

c- produces H+ in aqueous solution d- produces OH- in aqueous solution

1. The formula of Citric acid is……**………..**(A) HC2 H3O2 (B) H3C6 H5O7

(C) HC2H3O2 (D) H2CO3

1. For the reaction:

 The type of equilibrium considered

A-Homogeneous b- Heterogeneous

c- precipitation reaction d- Acid –base reaction



1. For the reaction,

The increase of concentration of (A) will shift the equilibrium to

a- a right b- a left

c- none d- down

1. For the reactions: , 

K1 and , K2 will be

a- K2 = 1/ K1 b- K2= 0

c- K1= 0 d- K2= K1

1. Which of the following considered lewis acid:

a- BF3 b- NH3

c- NaOH d- NH4Cl

1. If Kc = 4 at 100°C for the reaction, 2A (g) + B (g) 2 2C (g), then what is the value of Kc for the reaction, A (g) + 1/2B (g) C (g)?

a- 0.06 b- 0.25 c- 2.00 d- 16.00

1. The solution of pH more than 7 is

a- Neutral b- Acidic c- Basic d- Buffer

1. The pH of 0.1M HCl is

a- 1 b- 2 c- 3 d- 4