## **Equilibrium Constant**

Apprentice Difficulty Level: Question Groups 1-4
Master Difficulty Level: Question Groups 1-8
Wizard Difficulty Level: Question Groups 5-12

# **Question Group 1**

### Question 1

Identify the equlibirum constant equation that is consistent with the given reaction.

$$N_{2(g)} + O_{2(g)} \leftarrow \rightarrow 2 NO(g)$$

### **Question 2**

Identify the equlibirum constant equation that is consistent with the given reaction.

$$2 HI_{(g)} \longleftrightarrow H_{2(g)} + I_{2(s)}$$

# **Question Group 2**

#### Question 3

Identify the equlibirum constant equation that is consistent with the given reaction.

$$Ba(OH)_{2 (s)} \leftarrow \rightarrow Ba^{2+}_{(aq)} + 2 OH^{-}_{(aq)}$$

### **Question 4**

Identify the equlibirum constant equation that is consistent with the given reaction.

$$Ca(OH)_{2 (s)} \leftarrow \rightarrow Ca^{2+}_{(aq)} + 2 OH^{-}_{(aq)}$$

# **Question Group 3**

### Question 5

### **Question 6**

Identify the equlibirum constant equation that is consistent with the given reaction.

$$2 SO_{2(g)} + O_{2(g)} \leftarrow \rightarrow 2 SO_{3(g)}$$

## **Question Group 4**

### **Question 7**

Identify the equlibirum constant equation that is consistent with the given reaction.

$$HF_{(aq)} + H_2O_{(l)} + F_{(aq)} + F_{(aq)}$$

### **Question 8**

Identify the equlibirum constant equation that is consistent with the given reaction.

$$2 H_2 O_{(1)} \longleftrightarrow 2 H_{2(g)} + O_{2(g)}$$

# **Question Group 5**

### **Question 9**

Identify the equlibirum constant equation that is consistent with the given reaction.

### **Question 10**

Identify the equlibirum constant equation that is consistent with the given reaction.

$$C_{(s)}$$
 +  $CO_{2(g)}$   $\leftarrow \rightarrow$  2  $CO_{(g)}$ 

## **Question Group 6**

### **Question 11**

Identify the equlibirum constant equation that is consistent with the given reaction.

$$2 \text{ HgO}_{(s)} \leftarrow \rightarrow 2 \text{ Hg}_{(l)} + O_{2(g)}$$

### **Question 12**

$$2 |C|_{(g)} \leftarrow \rightarrow |_{2(s)} + C|_{2(g)}$$

# Question Group 7

### **Question 13**

Identify the equlibirum constant equation that is consistent with the given reaction.

$$CO_{(g)} + 3 H_{2(g)} \leftarrow \rightarrow CH_{4(g)} + H_{2}O_{(g)}$$

### **Question 14**

Identify the equlibirum constant equation that is consistent with the given reaction.

$$CO_{(g)} + 3H_{2(g)} \leftarrow \rightarrow CH_{4(g)} + H_{2}O_{(f)}$$

# **Question Group 8**

### Question 15

Identify the equlibirum constant equation that is consistent with the given reaction.

$$Ca_3(PO_4)_{2 (s)}$$
  $\longleftrightarrow$  3  $Ca^{2+}_{(aq)}$  + 2  $PO_4^{3-}_{(aq)}$ 

#### Question 16

Identify the equlibirum constant equation that is consistent with the given reaction.

$$Al_2(SO_4)_{3 (s)} \leftarrow \rightarrow 2 Al^{3+}_{(aq)} + 3 SO_4^{2-}_{(aq)}$$

## **Question Group 9**

### **Question 17**

Identify the equlibirum constant equation that is consistent with the given reaction.

$$Cl_{2(g)} + 2Br^{-}(aq) \leftarrow \rightarrow Br_{2(l)} + 2Cl^{-}(aq)$$

### **Question 18**

$$2 H_2 S_{(g)} + 3 O_2_{(g)} \leftarrow \rightarrow 2 SO_2_{(g)} + 2 H_2 O_{(h)}$$

## Question Group 10 Question 19

Identify the equlibirum constant equation that is consistent with the given reaction.

$$4 \text{ NH}_{3 (g)} + 5 \text{ O}_{2 (g)} \longleftrightarrow 4 \text{ NO }_{(g)} + 6 \text{ H}_{2} \text{O}_{(g)}$$

### **Question 20**

Identify the equlibirum constant equation that is consistent with the given reaction.

$$4 \text{ NH}_{3 \text{ (q)}} + 3 \text{ O}_{2 \text{ (q)}} \longleftrightarrow 2 \text{ N}_{2 \text{ (q)}} + 6 \text{ H}_{2} \text{O}_{\text{ (q)}}$$

## **Question Group 11**

### **Question 21**

Identify the equlibirum constant equation that is consistent with the given reaction.

$$N_{2 (g)}$$
 +  $3 H_{2 (g)}$   $\longleftrightarrow$   $2 NH_{3 (g)}$ 

### **Question 22**

Identify the equlibirum constant equation that is consistent with the given reaction.

$$2 \text{ NH}_{3 \text{ (g)}} \quad \longleftrightarrow \quad \text{N}_{2 \text{ (g)}} \quad + \quad 3 \text{ H}_{2 \text{ (g)}}$$

# **Question Group 12**

### **Question 23**

Identify the equlibirum constant equation that is consistent with the given reaction.

### **Question 24**

$$2 SO_{2 (g)}$$
 +  $O_{2 (g)}$   $\longleftrightarrow$   $2 SO_{3 (g)}$