



مدونة المناهج السعودية

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الموقع التعليمي لجميع المراحل الدراسية

في المملكة العربية السعودية

Choose the correct answer

A-1 The correct formula of a compound consists of N and Ca :

- a) Ca_3N_3 b) Ca_2N_3 c) Ca_3N_2 d) CaN

A-2 In the process of dissolving 1 g of sodium chloride in 100 ml of ethanol, the ethanol is referred to as the:

- a) precipitate b) solution c) solute d) solvent

A-3 The systematic name for IF_5 is:

- a) Iodine (V) fluoride b) Iodine pentafluoride c) Iodine fluoride d) monoiodine fluoride

A-4 2.4×10^3 mm equal to 2.4 ___ ?

- a) μm b) Mm c) Tm d) pm

A-5 An example of monatomic ion is

- a) N_2 b) OH^{1-} c) O^{2-} d) C

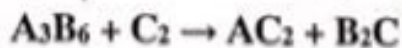
A-6 What is the percent of phosphorus (P) in $\text{Mg}_3(\text{PO}_4)_2$?

- a) 23.66 % b) 43.7 % c) 11.8 % d) 18.5 %

A-7 An analysis of unknown compound gives the following percentage: 13.5% C, 2.25% H, and 84.27% As, what is the empirical formula of the compound?

- a) C_3HAs_2 b) $\text{C}_2\text{H}_4\text{As}$ c) CH_2As d) $\text{C}_2\text{H}_6\text{As}$

A-8 After balancing the following hypothetical reaction, the coefficient of C_2 is

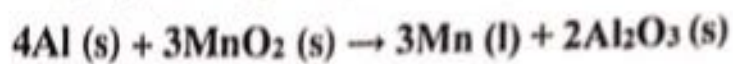


- a) 1 b) 9 c) 2 d) 6

A-9 The element (B) is classified as

- a) metalloid b) metal c) nonmetal d) transition metal

A-10 Manganese metal can be prepared by the thermite process:



If 130 g of Al reacted with excess amount of MnO_2 , calculate the amount of Mn produced?

- a) 198.6 g b) 202.3 g c) 220.2 g d) 163.2 g

A-11 Which one of the following is an allowable set of quantum numbers for an electron?

- a) $n=3, l=2, m_l=3, m_s=1/2$ b) $n=1, l=1, m_l=2, m_s=1/2$
c) $n=4, l=2, m_l=1, m_s=-1/2$ d) $n=2, l=1, m_l=0, m_s=1$

A-12 Where would the element with the following electron configuration located in the periodic table $[\text{Ar}]4s^23d^{10}4p^5$?

- a) group 7A, period 4 b) group 5A, period 4 c) group 4A, period 7 d) group 7A, period 5

A-13 Pick out the correct statement from the following:

- a) Alkali metals have the highest electron affinity
b) Alkali earth metals have the highest electron affinity
c) Halogens have the highest electron affinity
d) Inert gases have the highest electron affinity.

A-14 A gas sample containing 1.50 mol at 25°C exerts a pressure of 400 torr. Some gas is added to the same container and the temperature is increased to 50°C . If the pressure increases to 750 torr, how many moles of gas were added to the container? Assume a constant-volume container

- a) 4.1 mol b) 0.39 mol c) 2.6 mol d) 1.1 mol

A-15 Calculate the molar mass of unknown gaseous compound with a density of 0.8 g/L at 25°C and 862 mmHg?

- a) 0.02 g/mol b) 44.1 g/mol c) 17.2 g/mol d) 1.4 g/mol

A-16 An FM radio station broadcasts at 73.2 MHz. Calculate the wavelength of the corresponding radio waves?

- a) 0.24 m b) 4.1 m c) 2.2×10^{16} m d) 4.1×10^6 m

A-17 An example of polar covalent bond is

- a) Cl-Cl b) H-F c) Li-Br d) K-I

A-18 Which of the following when acting as central atom could not expand its octet?

- a) Br b) Cl c) B d) Si

A-19 Calculate the total valence electrons for CO_3^{2-} ?

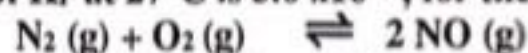
- a) 20 b) 10 c) 24 d) 22

A-20 The electron configuration of a ground-state P atom is
a) $[\text{Ne}]2s^2 2p^3$ b) $[\text{Ne}]3s^2 3p^3$ c) $[\text{Ar}]3s^2 3p^3$ d) $[\text{Ar}]4s^2 4p^3$

A-21 For the reaction at equilibrium; $\text{S}_2\text{O}_6\text{F}_2(\text{g}) \rightleftharpoons 2\text{SO}_3(\text{g}) + \text{F}_2(\text{g})$
If an equilibrium mixture contains 8.0 mol. of $\text{S}_2\text{O}_6\text{F}_2$, 4.0 mol. of SO_3 and 2.0 mol. of F_2 in 1.0 L flask. The equilibrium constant (K_c) is:

- a) 0.25 b) 1.0 c) 4.0 d) 0.50

A-22 The value of K_p at 27°C is 5.0×10^{-32} , for the reaction;



Find the partial pressure of NO at equilibrium if N_2 and O_2 have partial pressures at equilibrium of 25.0 atm and 5.0 atm respectively.

- a) 2.5×10^{-15} atm b) 6.25×10^{-30} atm c) 5.0×10^{16} atm d) 2.5×10^{33} atm

A-23 The value of K_c for the above question ;

- a) is more than the value of K_p b) is less than the value of K_p
c) is the same as the value of K_p d) cannot be calculated at this temperature

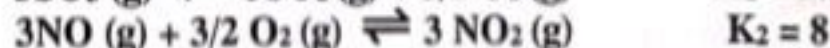
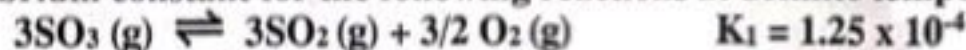
A-24 For the following equilibrium reaction;



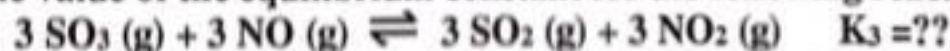
Predict the direction in which the reaction will proceed to reach the equilibrium in a mixture of 4.0 M N_2 , 4.0 M H_2 & 4.0 M NH_3

- a) the reaction will proceeds to left b) the reaction will stop
c) the system will still be at equilibrium d) the reaction will proceeds to right

A-25 The equilibrium constant for the following reactions at definite temperature is;



What is the value of the equilibrium constant for the following reaction?



- a) 1.0×10^3 b) 1.0×10^{-3} c) 1.0×10^{-1} d) 1.0×10^{-2}

A-26 Identify the conjugate base of HPO_4^{2-} in the reaction



- a) H_2O b) HCO_3^- c) H_2CO_3 d) PO_4^{3-}

A-27 Which one of the following combinations can function as a buffer solution?

- a) HCl (strong acid)/NaCl b) H_2SO_4 (strong acid)/ K_2SO_4
c) HBr (weak acid)/ CH_3COONa d) HF (weak acid)/NaF

A-28 Calculate the pH of a buffer solution that contains 0.25 M benzoic acid ($\text{C}_6\text{H}_5\text{CO}_2\text{H}$) and 0.15 M sodium benzoate ($\text{C}_6\text{H}_5\text{COONa}$). [$K_a = 6.5 \times 10^{-5}$ for benzoic acid]

- a) 1.36 b) 4.41 c) 3.97 d) 4.83

A-29 The reaction $\text{N}_2(\text{g}) + \text{O}_2(\text{g}) \rightleftharpoons 2\text{NO}(\text{g})$ is endothermic, $\Delta H^\circ = 180 \text{ kJ/mol}$. Which one of these statements is true?

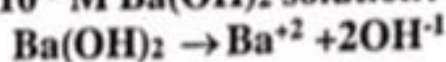
- a) K_p depends on total pressure as well as temperature.
- b) K_p at 1,000 K is larger than K_p at 2,000 K
- c) The K_p 's at 1000 K and 2000 K are the same.
- d) K_p at 1,000 K is less than K_p at 2,000 K

A-30 The following equilibrium constant expressing belong to which reaction?

$$K_c = \frac{[E][D]^2}{[B]^2}$$

- a) $2\text{A}(\text{s}) + 2\text{B}(\text{g}) \rightleftharpoons 2\text{C}(\text{l}) + 2\text{D}(\text{aq}) + \text{E}(\text{g})$
- b) $\text{A}(\text{aq}) + 2\text{B}(\text{g}) \rightleftharpoons 2\text{C}(\text{g}) + 2\text{D}(\text{g}) + \text{E}(\text{aq})$
- c) $\text{A}(\text{l}) + 2\text{B}(\text{g}) \rightleftharpoons 2\text{C}(\text{l}) + 2\text{D}(\text{g}) + 2\text{E}(\text{aq})$
- d) $\text{A}(\text{s}) + 2\text{B}(\text{g}) \rightarrow 2\text{C}(\text{l}) + 2\text{D}(\text{g}) + \text{E}(\text{aq})$.

A-31 What is the pOH of $2.0 \times 10^{-2} \text{ M}$ $\text{Ba}(\text{OH})_2$ solution?



- a) 12.7
- b) 3.5
- c) 0.6
- d) 1.4

A-32 Find the pH of a 0.5 M aqueous solution of periodic acid(HIO_4), for which $K_a = 2.3 \times 10^{-2}$



- a) 0.05
- b) 0.97
- c) 1.62
- d) 0.65

A-33 Calculate the $[\text{H}^+]$ concentration if you know that in an aqueous solution $[\text{OH}^-] = 3 \times 10^{-3} \text{ M}$?

- a) $3.3 \times 10^{-12} \text{ M}$
- b) $4.2 \times 10^{-13} \text{ M}$.
- c) $6.3 \times 10^{-14} \text{ M}$.
- d) $1.4 \times 10^{-12} \text{ M}$

A-34 Arrange the following acid in order of decreasing acid strength?

H_2CO_3 $K_a = 4.3 \times 10^{-7}$, $\text{C}_6\text{H}_5\text{COOH}$ $K_a = 6.46 \times 10^{-5}$, HF $K_a = 7.2 \times 10^{-4}$, H_2SO_3 $K_a = 1.54 \times 10^{-2}$

- a) $\text{H}_2\text{CO}_3 > \text{HF} > \text{C}_6\text{H}_5\text{COOH} > \text{H}_2\text{SO}_3$
- b) $\text{H}_2\text{CO}_3 > \text{C}_6\text{H}_5\text{COOH} > \text{HF} > \text{H}_2\text{SO}_3$
- c) $\text{H}_2\text{SO}_3 > \text{C}_6\text{H}_5\text{COOH} > \text{HF} > \text{H}_2\text{CO}_3$
- d) $\text{H}_2\text{SO}_3 > \text{HF} > \text{C}_6\text{H}_5\text{COOH} > \text{H}_2\text{CO}_3$

A-35 Consider the following: (1) $2\text{A}(\text{g}) + 3\text{B}(\text{g}) \rightleftharpoons 3\text{C}(\text{g}) + \text{D}(\text{g})$,

(2) $2\text{A}(\text{aq}) + 3\text{B}(\text{aq}) \rightarrow 3\text{C}(\text{aq}) + \text{D}(\text{aq})$, (3) $2\text{A}(\text{aq}) + 3\text{B}(\text{g}) \rightleftharpoons 3\text{C}(\text{g})$, (4) $2\text{A}(\text{aq}) + 3\text{B}(\text{g}) \rightarrow 3\text{C}(\text{s})$

_____ is an example of heterogeneous equilibrium and _____ is an example of homogenous equilibrium?

- a) 3, 1
- b) 1 and 2, 3 and 4
- c) 2, 4
- d) 1 and 3, 2 and 4

A-36 The equilibrium constant, K_p , for the reaction $2A_2(g) + 3B(s) \rightleftharpoons D(g)$, is 4.7×10^{-4} at 415°C . The value of K_p for the equilibrium $2D(g) \rightleftharpoons 4A_2(g) + 6B(s)$ at the same temperature is _____.

- a) 1.2×10^{-9} b) 4.53×10^6 c) 4.7×10^{-4} d) 1.4×10^{10}

A-37 A 0.040 M monoprotic acid solution is 3% ionized. Its K_a value is _____.

- a) 0.36 b) 1.5×10^{-2} c) 3.6×10^{-5} d) 2.4×10^{-4}

A-38 The solubility of the ionic compound M_2X , having a molar mass of 288 g/mol , is

$4.1 \times 10^{-6} \text{ g/L}$. Calculate the K_{sp} of the compound. $M_2X(s) \rightleftharpoons 2M^{+1}(aq) + X^{-2}(aq)$

- a) 1.15×10^{-23} b) 4.5×10^{-40} c) 2.1×10^{-38} d) 3.6×10^{-30}

A-39 The equilibrium constant K_p is not applicable for the reaction _____.

- a) $N_2(g) + 3H_2(g) \leftrightarrow 2NH_3(g)$ b) $C_6H_5COOH(aq) \leftrightarrow C_6H_5COO^-(aq) + H^+(aq)$
 c) $2CO_2(g) \leftrightarrow 2CO(g) + O_2(g)$ d) $H_2O(g) + C(s) \leftrightarrow CO(g) + H_2(g)$

A-40 The equilibrium $PCl_5(g) \leftrightarrow PCl_3(g) + Cl_2(g)$, can be shifted toward more product formation by _____. $\Delta H = 92.5 \text{ kJ}$

- a) decreasing the pressure b) decreasing the volume
 c) decreasing the temperature d) Adding PCl_3