

CSCA 样题-化学

原子量：O: 16 Na: 23 Cu: 64

选择题（每小题共有 4 个选项，其中只有 1 个选项是正确的。）

1. 下列物质加入水中，所得溶液 pH 可能为 4 的是()。

A. NaOH

B. 乙酸

C. 蔗糖

D. 食盐

2. 实验室制备下列气体时，所用方法正确的是()。

A. 使用电石 CaC_2 与水反应制备乙炔气体

B. 加热 MnO_2 反应制备氧气

C. 使用锌与浓硫酸反应制备氢气

D. 制二氧化碳时，用排水法或向上排空气法收集气体

3. 已知 KNO_3 的溶解度随着温度升高而变大，下列方法可以使 KNO_3 饱和溶液变成不饱和溶液的是()。

A. 蒸发溶剂

B. 降温

C. 加水

D. 加硝酸钾

4. 10%的 KCl 溶液 90 克，加入 10 克 KCl 完全溶解后得到的溶液中溶质的质量分数是()。

- A. 10%
- B. 20%
- C. 19%
- D. 21.1%
5. 下列是 C_2H_4 的同系物的是() .
- A. C_2H_6
- B. C_2H_2
- C. C_3H_6
- D. C_3H_8
6. 使用 CO 与氧化铜反应，得到 6.4 克铜，生成气体的体积在标准状况下为() .
- A. 22.4L
- B. 1L
- C. 11.2L
- D. 2.24L
7. 下列各组中，互为同素异形体的是() .
- A. CH_4 与 C_3H_8
- B. 金刚石与石墨
- C. CO 与 CO_2
- D. ^{12}C 与 ^{14}C
8. Y^{2-} 的核外有 x 个电子，相对原子质量是 m，那么 A 元素原子核外的中子数是() .

A. $m-x+2$

B. $m-x-2$

C. $m+x+2$

D. $m+x-2$

9. 常温下，100mL $0.05\text{mol}\cdot\text{L}^{-1}$ 的 H_2SO_4 溶液 pH 是()。

A. 3

B. 1

C. 0.1

D. 0.05

10. 对于吸热反应 $\text{C}(\text{s}) + \text{H}_2\text{O}(\text{g}) \rightleftharpoons \text{CO}(\text{g}) + \text{H}_2(\text{g})$ ，能使平衡逆向移动的是()。

A. 升温 降压

B. 升温 增压

C. 降温 降压

D. 降温 增压

11. 6.9g 金属钠在空气中充分燃烧，将燃烧产物投入足量的水中，反应后放出的气体的质量是()。

A. 23.4g

B. 11.7g

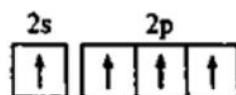
C. 2.4g

D. 4.8g

12. 下列反应属于加成反应的是()。

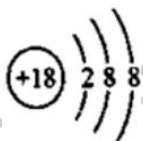
- A. 乙烯使溴水褪色
- B. 乙炔使酸性高锰酸钾褪色
- C. 苯酚与溴水反应
- D. 苯和浓硫酸加热条件下反应

13. 下列说法正确的是().

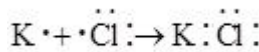


A. 基态 ${}_6\text{C}$ 原子价电子排布图:

B. ${}_{17}\text{Cl}^-$ 结构示意图:



C. KCl 形成过程:



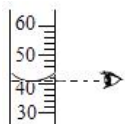
D. 基态 ${}_{11}\text{Na}$ 原子的核外电子排布式: $1s^2 2s^2 2p^6 3s^1$

14. 在无色透明的酸性溶液中,下列离子能大量共存的是().

- A. K^+ 、 Cu^{2+} 、 NO_3^- 、 SO_4^{2-}
- B. CO_3^{2-} 、 Na^+ 、 Cl^- 、 SO_4^{2-}
- C. K^+ 、 Cl^- 、 NO_3^- 、 Mg^{2+}
- D. Na^+ 、 Ba^{2+} 、 NO_3^- 、 SO_4^{2-}

15. 下列有关操作**错误**的是().

A. 读



B. 闻



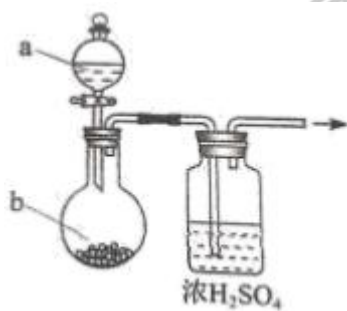
C. 拿



D. 滴



16. 用如图装置制取干燥的气体(a、b表示加入的试剂)，能实现的是()。

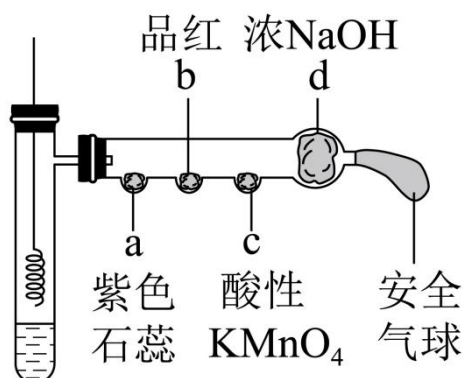


- A. 气体: H_2S ; a: 稀 H_2SO_4 ; b: FeS
- B. 气体: O_2 ; a: H_2O_2 溶液; b: MnO_2
- C. 气体: NO_2 ; a: 浓 HNO_3 ; b: 铁片
- D. 气体: Cl_2 ; a: 稀盐酸; b: MnO_2

17. 实验室进行粗盐提纯时，需除去 Ca^{2+} 、 Mg^{2+} 和 SO_4^{2-} ，所用试剂及添加顺序为()。

- A. BaCl_2 , Na_2CO_3 , NaOH , HCl
- B. Na_2CO_3 , BaCl_2 , HCl , NaOH ,
- C. NaOH , Na_2CO_3 , HCl
- D. Na_2CO_3 , NaOH , HCl

18. 若将铜丝插入热浓硫酸中进行如图所示的探究实验(a-d 均为浸有相应试液的棉花), 下列分析正确的是().



A. a 处变红, 说明 SO_2 是酸性氧化物

B. b 处褪色, 均说明 SO_2 具有氧化性

C. c 褪色, 均说明 SO_2 具有漂白性

D. Cu 与浓硫酸反应, 只体现 H_2SO_4 的酸性

19. 以氯化锌溶液为电解液, 以含 Cu 的粗锌废料做为电极进行电解, 得到纯度高的锌。该过程中正确的是().

A. 阴极发生的反应为 $\text{Zn} - 2\text{e}^- = \text{Zn}^{2+}$

B. 阳极上氯离子被氧化

C. 粗锌作为阴极

D. 氯化锌的浓度不变

20. W、X、Y、Z 为四种短周期主族元素, 原子序数依次增大。XY 是一种无色的气体, 与 Y_2 在常温下反应可以得到棕色气体 XY_2 。Z 原子在同周期中原子半径最大, Z 的单质与 W_2Y 反应可得气体 W_2 。下列说法错误的是().

A. XY_2 与 W_2Y 反应可得到 XY

- B. Z 的焰色反应是紫色
- C. Y_3 和 Y_2 是同素异形体
- D. XW_3 可使湿润的红色石蕊试纸变蓝



参考答案

1	2	3	4	5	6	7	8	9	10
B	A	C	C	C	D	B	A	B	D
11	12	13	14	15	16	17	18	19	20
C	A	D	C	C	B	A	A	D	B



CSCA Sample Questions - Chemistry

Atomic mass: O: 16 Na: 23 Cu: 64

Multiple-Choice Questions (Each question has four options among which only one of them is correct.)

1. Which of the following substances, when added to water, may result in a solution with a pH of 4? ().

- A. NaOH
- B. Acetic acid
- C. Sucrose
- D. Salt

2. What is the correct method used for preparing the following gases in the laboratory?().

- A. Preparation of acetylene gas by reacting calcium carbide CaC_2 with water
- B. Preparation of Oxygen by Heating MnO_2 Reaction
- C. Preparation of hydrogen gas by reacting zinc with concentrated sulfuric acid
- D. When producing carbon dioxide, gas is collected using drainage or upward air discharge methods

3. It is known that the solubility of KNO_3 increases with temperature.

Which of the following methods can make a saturated solution of KNO_3 become an unsaturated solution? ().

- A. Evaporative solvent
- B. Cooling down
- C. Adding water
- D. Adding potassium nitrate
4. What is the mass fraction of solute in the solution obtained by adding 90 grams of 10% KCl solution and completely dissolving 10 grams of KCl? ().
- A. 10%
- B. 20%
- C. 19%
- D. 21.1%
5. Which of the following are homologues of C_2H_4 ? ().
- A. C_2H_6
- B. C_2H_2
- C. C_3H_6
- D. C_3H_8
6. Using CO to react with copper oxide, 6.4 grams of copper were obtained, and the volume of gas generated under standard conditions is ().
- A. 22.4L
- B. 1L
- C. 11.2L

D. 2.24L

7. Which of the following groups consists of allotropes of the same element? ().

A. CH_4 and C_3H_8

B. Diamond and graphite

C. CO and CO_2

D. ^{12}C and ^{14}C

8. There are x electrons outside the nucleus of Y^{2-} , with a relative atomic mass of m , so the number of neutrons in the nucleus of element A is ().

A. $m-x+2$

B. $m-x-2$

C. $m+x+2$

D. $m+x-2$

9. At room temperature, the pH of a 100mL $0.05\text{mol}\cdot\text{L}^{-1}$ H_2SO_4 solution is ().

A. 3

B. 1

C. 0.1

D. 0.05

10. For the endothermic reaction $\text{C(s)} + \text{H}_2\text{O(g)} \rightleftharpoons \text{CO(g)} + \text{H}_2\text{(g)}$, what can cause the equilibrium to shift in the opposite direction?().

A. Increase temperature, decrease pressure

B. Increase temperature, increase pressure

C. Decrease temperature, decrease pressure

D. Decrease temperature, increase pressure

11. 6.9g of metallic sodium is fully burned in air, and the combustion product is added to sufficient water. The mass of the gas released after the reaction is ().

A. 23.4g

B. 11.7g

C. 2.4g

D. 4.8g

12. Which of the following reactions belongs to addition reactions? ().

A. Ethylene causes fading of bromine water

B. Acetylene causes the fading of acidic potassium permanganate

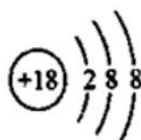
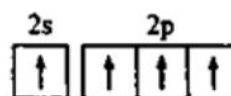
C. Phenol reacts with bromine water

D. Reaction between benzene and concentrated sulfuric acid under heating conditions

13. Which of the following statements is correct? ().

A. Ground state ${}^6\text{C}$ atomic valence electron arrangement

diagram:



B. Structure diagram of $_{17}\text{Cl}^-$:

C. The formation of KCl : $\text{K} \cdot + \cdot \ddot{\text{Cl}} : \rightarrow \text{K} : \ddot{\text{Cl}} :$

D. The arrangement of extranuclear electrons in the ground state $_{11}\text{Na}$ atom: $1s^2 2s^2 2p^6 3s^1$

14. In a colorless and transparent acidic solution, which of the following ions can coexist in large quantities? ().

A. K^+ 、 Cu^{2+} 、 NO_3^- 、 SO_4^{2-}

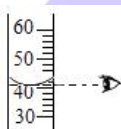
B. CO_3^{2-} 、 Na^+ 、 Cl^- 、 SO_4^{2-}

C. K^+ 、 Cl^- 、 NO_3^- 、 Mg^{2+}

D. Na^+ 、 Ba^{2+} 、 NO_3^- 、 SO_4^{2-}

15. Which of the following operations is wrong?().

A. Read



B. Smell



C. Take

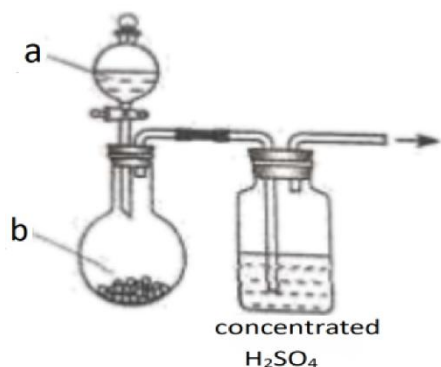


D. Drip



16. Using the device shown in the figure, which of the following dry

gases can be produced?(). (a and b represent the added reagents)



A. Gas: H_2S ; a: dilute H_2SO_4 ; b: FeS

B. Gas: O_2 ; a: H_2O_2 solution; b: MnO_2

C. Gas: NO_2 ; a: concentrated HNO_3 ; b: iron sheets

D. Gas: Cl_2 ; a: dilute hydrochloric acid; b: MnO_2

17. When performing crude salt purification in the laboratory, it is necessary to remove Ca^{2+} , Mg^{2+} , and SO_4^{2-} . The reagents used and the order of addition are ().

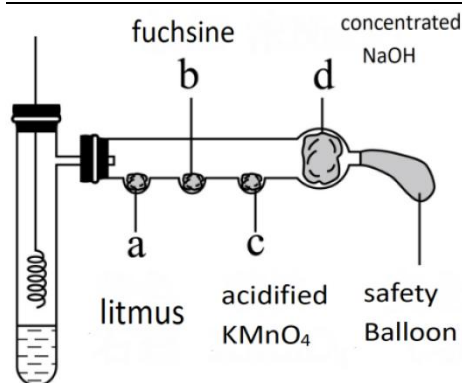
A. BaCl_2 , Na_2CO_3 , NaOH , HCl

B. Na_2CO_3 , BaCl_2 , HCl , NaOH ,

C. NaOH , Na_2CO_3 , HCl

D. Na_2CO_3 , NaOH , HCl

18. If a copper wire is inserted into hot concentrated sulfuric acid for the exploration experiment shown in the figure (a-d are cotton soaked in the corresponding test solution), which of the following analyses is correct?
().



- A. Turning red at point a indicates that SO_2 is an acidic oxide
- B. Fading at point b indicates that SO_2 has oxidizing properties
- C. c fading indicates that SO_2 has bleaching properties
- D. The reaction between Cu and concentrated sulfuric acid only reflects the acidity of H_2SO_4

19. Using zinc chloride solution as electrolyte and crude zinc waste containing Cu as electrode for electrolysis, high-purity zinc is obtained.

What is correct in this process? ().

- A. The reaction that occurs at the cathode is $\text{Zn} - 2\text{e}^- = \text{Zn}^{2+}$
- B. Chlorine ions on the anode are oxidized
- C. Coarse zinc as cathode
- D. The concentration of zinc chloride remains unchanged

20. W, X, Y, and Z are four short period main group elements, with increasing atomic numbers in sequence. XY is a colorless gas that can react with Y_2 at room temperature to obtain brown gas XY_2 . Z atom has the largest atomic radius in the same period, and the reaction of Z's elemental with W_2Y yields gas W_2 . Which of the following statements is

incorrect? ().

- A. XY_2 reacts with W_2Y to obtain XY
- B. The flame color reaction of Z is purple
- C. Y_3 and Y_2 are allotropes
- D. XW_3 can turn wet red litmus test paper blue



参考答案

1	2	3	4	5	6	7	8	9	10
B	A	C	C	C	D	B	A	B	D
11	12	13	14	15	16	17	18	19	20
C	A	D	C	C	B	A	A	D	B

