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Be sure to mention the filename:  
Chemistry\_Questions\_0028

- 1 What is the quantum of light called?
  - a. the amplitude
  - b. the frequency
  - c. a photon
  - d. the wavelength
  
- 2 The first law of thermodynamics
  - a. defines chemical energy
  - b. defines entropy
  - c. is a statement of conservation of energy
  - d. provides a criterion for the spontaneity of a reaction
  
- 3 The normal boiling point occurs when the
  - a. intermolecular forces within the liquid phase are broken
  - b. temperature of the pure liquid equals the external temperature
  - c. vapor pressure of a pure liquid equals an external pressure of one atmosphere
  - d. vapor pressure of the liquid equals the external pressure
  
- 5 Which subatomic particle has the smallest mass?
  - a. a proton
  - b. a neutron
  - c. an electron
  - d. an alpha particle
  
- 6 How many lone pairs of electrons are on the P atom in PF<sub>3</sub>?
  - a. 0
  - b. 1
  - c. 2
  - d. 3
  
- 7 Which is not a solution?
  - a. brass
  - b. fog
  - c. hydrochloric acid
  - d. wine
  
- 9 Of the following, which element has the highest first ionization energy?
  - a. aluminum

- b. magnesium
- c. silicon
- d. sodium

10 The reaction of  $\text{Cu}(s) + 2 \text{AgNO}_3(aq) \rightarrow \text{Cu}(\text{NO}_3)_2(aq) + 2 \text{Ag}(s)$  is best classified as a(n)

- a. acid-base neutralization reaction
- b. double replacement reaction
- c. oxidation-reduction reaction
- d. precipitation reaction

11 Which two ions have the same electron configuration in the ground state?

- a.  $\text{Rb}^+$  and  $\text{Cs}^+$
- b.  $\text{Ba}^{2+}$  and  $\text{I}^-$
- c.  $\text{Se}^{2+}$  and  $\text{I}^-$
- d.  $\text{Fe}^{2+}$  and  $\text{Fe}^{3+}$

12 Which of the following mixtures have components which can be separated by filtration?

- a. colloids
- b. solutions
- c. suspensions
- d. all of the above

13 When 200. mL of 0.150 M of hydrochloric acid is added to 125 mL of 0.175 M  $\text{Mg}(\text{OH})_2$ , the resulting solution will be

- a. acidic
- b. basic
- c. neutral
- d. it is impossible to tell from the information given

14 The average osmotic pressure of blood is about 7 atm. Therefore,

- a. the average blood pressure is about 7 atm
- b. the average pressure inside the body is about 7 atm above the external pressure
- c. a pressure of about 7 atm would be required to prevent osmosis of blood is in contact with pure water across a semipermeable membrane
- d. all of the above are true

15 Which statement about elemental analysis by combustion is not correct?

- a. carbon is determined from the amount of  $\text{CO}_2$  formed
- b. hydrogen is determined from the amount of  $\text{H}_2\text{O}$  formed
- c. Oxygen is determined from the amount of  $\text{H}_2\text{O}$  formed

d. Only carbon and hydrogen can be determined directly from CO<sub>2</sub> and H<sub>2</sub>O

16 When K<sub>2</sub>SO<sub>4</sub>(aq) and Pb(NO<sub>3</sub>)<sub>2</sub>(aq) are mixed, a white colored precipitate forms which is

- a. KNO<sub>3</sub>
- b. K<sub>2</sub>SO<sub>3</sub>
- c. Pb
- d. PbSO<sub>4</sub>

17 Which of the following have the same number of valence electrons?

- a. K, As, Br
- b. B, Si, As
- c. N, As, Bi
- d. He, Ne, F

18 Gaseous elements characterized by low reactivity are found in group \_\_\_\_\_ of the periodic table.

- a. 5A
- b. 6A
- c. 7A
- d. 8A

19 Which element has the highest first electron affinity?

- a. B
- b. C
- c. Li
- d. N

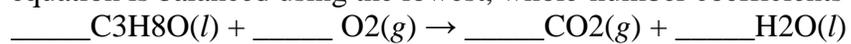
20 What geometric arrangement of charge clouds is expected for an atom that has five charge clouds?

- a. tetrahedral
- b. square planar
- c. trigonal bipyramidal
- d. octahedral

21 Two aqueous solutions, A and B, are separated by a semipermeable membrane. The osmotic pressure of solution A immediately begins to decrease. Which of the following statements is true?

- a. solvent molecules are moving from solution B into solution A
- b. the initial osmotic pressure of solution B is greater than that of solution A
- c. the solvent molecules are moving from the solution of higher osmotic pressure to that of lower osmotic pressure
- d. both B and C are true statements

22 What is the stoichiometric coefficient for oxygen when the following equation is balanced using the lowest, whole-number coefficients



- a. 3
- b. 5
- c. 7
- d. 9

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