

Chemistry, 2014 EC, natural science, entrance exam

Grade 12 · Chemistry · 2014 E.C.

Time allowed: 120 minutes

Questions: 30

Total marks: 30

Name _____ Grade _____ ID No. _____ Date _____

1. What is the purpose of synthetic Cryolite in the extraction of aluminum by the Hall's process? (1)
 - A. Cryolite reduces the melting point of alumina
 - B. Cryolite increases the purity of the extraction of aluminum.
 - C. Cryolite is used as a catalyst in the extraction of aluminum.
 - D. Cryolite increases the melting point of alumina
2. Which of the following is a chemical property of aluminum? (1)
 - A. Aluminum is a grey metal in color.
 - B. Aluminum liberates hydrogen gas from dilute acids like HCl and H₂SO₄
 - C. Aluminum has a lower density than any other commercial metal.
 - D. Aluminum is a good conductor of heat and electricity.
3. How is tanning carried out? In tanning the hides or skins are (1)
 - A. soaked in lime and water for several days.
 - B. soaked in water for several days.
 - C. treated with dilute hydrochloric acid to remove the line.
 - D. treated with chromium salts.
4. How can a project of establishing an industry that consumes coal affect the environment? (1)
 - A. Rise in global temperature
 - B. Increment in concentration of nitric oxide
 - C. By changing the PH of water
 - D. Production of high level of lead in the atmosphere
5. Which of the following is a fundamental quantity SI unit? (1)

A. Force	B. Speed
C. Length	D. Pressure
6. What is enthalpy change? It is (1)
 - A. the amount of heat given out or absorbed in a reaction at constant pressure.
 - B. the amount of heat given out in a reaction.
 - C. the amount of heat absorbed in a reaction.
 - D. the amount of heat given out or absorbed in a reaction at constant pressure and volume.
7. What is oxidation? Oxidation is (1)
 - A. the loss Of electrons by a species, accompanied by an increase in oxidation number.
 - B. the addition of hydrogen to a substance and the removal of oxygen from a substance.
 - C. the reduction of the oxidation state of the oxidizing agent.
 - D. the addition of electron (s) to the oxidizing agent.

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8. What is meant by preferential discharge, if a number in a solution? It means that last at given electrode. (1)
- A. least energy will be liberated first a given electrode.
 - B. least energy will be liberated last at a given electrode.
 - C. highest energy will be liberated first at a given electrode.
 - D. highest energy will be liberated fist at
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9. Faraday' s Second Law states: (1)
- A. passing the same quantity of electricity through solutions ofdifferent electrolytes produces masses of substances that are directlyproportional to their equivalent masses.
 - B. passing the same quantity of electricity through solutions ofdifferent electrolytes produces masses of substances that are directlyproportional to their molecular masses.
 - C. the amount of substance consumed or produced at an electrode isinversely proportional to the quantity of electricity passing throughthe solution.
 - D. the amount of a substance consumed or produced at an electrode isdirectly proportional to the quantity of electricity passing through thesolution.
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10. Which of the following is true about Zn - Cu voltaic cell? (1)
- A. After the cell runs for several hours, the Zn electrode weights less.
 - B. The anode half - cell consists of Cu electrode dipped into a $\text{Cu}^{(2+)}$ solution.
 - C. As the cell operates, electrons are continuously generated at thecathode and consumed at the anode.
 - D. The electrons flow from right to left through the external circuit.
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11. Which of the following postulates of Dalton' s atomic theory was modified by the modern atomic theory? (1)
- A. Atoms are indivisible and indestructible.
 - B. Atoms are the smallest particles of all elements.
 - C. Compounds are formed when atoms of more than one element combine.
 - D. Atoms are neither created nor destroyed in chemical reactions.
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12. Which of the following includes all of the known atomic models? (1)
- A. Bohr Model, the Quantum Mechanical Model, Thomson Model, Rutherford Model
 - B. Bohr Model, Quantum Mechanical Model, Dalton's Atomic Model, Valence Bond Model
 - C. Bohr Model, Thomson Model, Rutherford Model, Dalton's Atomic Model, de Broglie Model
 - D. Bohr Model, the Quantum Mechanical Model, Rutherford Model, Thomson Model, Dalton's Atomic Model
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13. What does Mendeleev' s Periodic Law state? Properties of elements are periodic functions of their (1)
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|-------------------|----------------------------|
| A. atomic masses | B. atomic radius |
| C. atomic numbers | D. electron configurations |
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14. Which of the following statements is correct regrading alkenes and alkynes? (1)
- A. Alkenes are soluble in polar solvents, while alkymes are not solublein polar solvents.
 - B. Alkenes and alkynes are soluble in polar solvents.
 - C. The molecule of alkenes and alkynes are held together by weakinter-molecular force.
 - D. Alkynes have longer bond length and less surface area than alkenes.
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15. Which functional group containing compound is named using the suffix "-ol"? (1)
- | | |
|-----------|-------------|
| A. Aryl | B. Carboxyl |
| C. Phenyl | D. Hydroxyl |

16. What is a Lewis acid? It is _____ (1)

- A. an electron pair acceptor
B. a proton acceptor
C. a proton donor
D. an electron pair donor

17. Which Of the following statements is NOT correct about minerals and ores? (1)

- A. All ores are minerals
- B. All minerals are ores
- C. Ores are usually used to extract metals economically
- D. Minerals are the natural forms in which various metals exist.

18. Which of the following is NOT a major step in metallurgical processes? (1)

- A. Concentrating the ore B. Mining the ore
C. Extracting the metal and refining D. Pretreatment

19. Which monomers are used for the synthesis of Teflon? (1)

- A. Propylene
B. Tetrafluoroethylene
C. Isoprene
D. Styrene and Phenol

20. What is the significance of electron probability distribution? It tells us about (1)

- A. finding the electron in its orbit at a particular time.
- B. the uncertainty to assign fixed path for electrons.
- C. the probability of finding an electron is very far away from the nucleus.
- D. finding the electron very close to the nucleus at all times.

21. Which Of the following is a property Of covalent compounds? Covalent compound (1)

- A. has high melting and boiling points
- B. is non-volatile
- C. is crystalline solids at room temperature
- D. is generally insoluble in water

22. Which of the following is a covalent molecule? (1)

- A. NaCl
B. PCl_3
C. $(\text{CO}_3)^{2-}$
D. $[\text{NH}_4]^+$

23. Which Of the following carboxylic acids is a solid substance at room temperature? (1)

- A. Octanoic acid
B. Decanoic acid
C. Heptanoic acid
D. Nonanoic acid

24. What is the IUPAC name of an ester having the molecular formula $C_6H_{12}O_2$ (1)

- A. Methyl butyrate
B. Pentyl butyrate
C. Ethyl butanoate
D. Ethyl butyrate

25. What is the rate of dissolution? It is (1)

- A. the speed at which a solid substrate goes into solution.
- B. the rate at which a solid turns to liquid
- C. the speed at which a solid sublimates.
- D. the rate at which a solid dissociates.

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- 26.** Which one of the following is correctly stated regarding solubility as an equilibrium process? (1)
- A. Saturated solution is a solution in which more of the solute can be dissolved.
 - B. Unsaturated solution is a solution to a given dissolved substance.
 - C. Supersaturated solution is more stable than saturated solution.
 - D. Supersaturated solution is a solution that contains more than the equilibrium amount of dissolved solute.
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- 27.** Which of the following assumptions of the kinetic molecular theory of gases explains the high compressibility of gases? (1)
- A. There is no force of attraction between gas molecules.
 - B. The actual volume of gas molecules is negligible.
 - C. Different particles have different speeds.
 - D. Particles are always in random motion.
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- 28.** Consider a bottle containing water, water vapor and air in equilibrium. If the temperature decreases slightly, the amount of water vapors; (1)
- A. will increase and the vapor pressure will decrease.
 - B. and vapor pressure will increase.
 - C. and vapor pressure will decrease.
 - D. will decrease and the vapor pressure will increase.
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- 29.** Why do water droplets collect on the outside of a glass of water on a hot day? (1)
- A. Water from the glass starts to vaporize.
 - B. There is heat exchange between the water in the glass and the surrounding.
 - C. There will be a sublimation of water vapor on the outside of a glass.
 - D. There will be a condensation of water vapor on the glass.
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- 30.** What are hydrocarbons? Compounds that contain (1)
- A. hydrogen and carbon only.
 - B. hydrogen and carbon with no benzene rings.
 - C. benzene and its derivatives only.
 - D. benzene rings only
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