

1. The best electrolytes are molecules assembled with _____.

- (A) give-and-take ionic bonds
- (B) equal-sharing covalent bonds
- (C) unequal-sharing polar covalent bonds
- (D) metallic bonds

2. What is the oxidation number of sulfur in H_2SO_4 ?

- (A) 2
- (B) 4
- (C) 6
- (D) 8

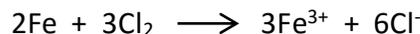
3. What is the oxidation state for tin sulfide, SnS_2 ?

- (A) 2
- (B) 4
- (C) 6
- (D) 8

4. What do oxidizing agents do to another atom?

- (A) They remove electrons and raise the oxidation state.
- (B) They remove electrons and lower the oxidation state.
- (C) They give electrons and raise the oxidation state.
- (D) They give electrons and lower the oxidation state.

5. In the chemical equation, which atom undergoes oxidation?



- (A) Fe
- (B) Cl in Cl_2
- (C) Fe^{2+}
- (D) Cl^-

6. In which of the following molecules does chlorine have the largest oxidation number?

- (A) NaClO_4
- (B) NaClO_3
- (C) NaClO_2
- (D) NaClO

7. In electrolysis, reduction takes place at the _____.

- (A) anode
- (B) cathode
- (C) battery
- (D) ionizing electrode

8. In the electrolysis of zinc and copper, electrons leave neutral zinc atoms at the anode and travel to copper at the cathode. What do the electrons combine with?

- (A) zinc ions in solution
- (B) copper ions in solution
- (C) neutral copper atoms at the cathode
- (D) neutral zinc atoms at the cathode

9. Without a salt bridge, electrolysis of zinc and copper stops because _____.

- (A) positive electrical charges build up around the anode and negative electrical charges build up around the cathode
- (B) positive electrical charges build up around the cathode and negative electrical charges build up around the anode
- (C) neutral copper atoms build up at the anode
- (D) the anode runs out of zinc

10. What is the opposite of ionization energy?

- (A) ionization potential
- (B) electronegativity
- (C) electron affinity
- (D) reduction potential

11. From which atom is it easiest to remove an electron from its outer shell?

- (A) magnesium
- (B) nitrogen
- (C) chlorine
- (D) boron

12. In calculating the voltage generated by the electrolysis of two atoms, the voltage of each atom is added after comparing the atom's electron affinity to what atom?

- (A) hydrogen
- (B) helium
- (C) sodium
- (D) oxygen

13. 1 coulomb's worth of electrical charges passing by a point each second is a measure of electrical current, called _____.

- (A) amps
- (B) Faradays
- (C) voltage
- (D) Faraday-moles

14. Watts are units of power, measured as _____.

- (A) Newtons per second
- (B) joules
- (C) joules per second
- (D) joules per amp

15. Most of the aluminum in the earth is in the form of aluminum oxide (Al_2O_3). In order to make aluminum oxide into pure aluminum metal, the aluminum oxide has to be _____.

- (A) electroplated
- (B) ionized
- (C) oxidized
- (D) reduced

16. In a hydrogen fuel cell, _____.

- (A) electrons are removed from hydrogen atoms
- (B) electrons are removed from oxygen atoms
- (C) electrons are passed through a polymer semipermeable membrane
- (D) the electrons are paired up to make water molecule