

Practice Quiz Ch 2

Student: _____

Radioactive Isotope	Half-life	Energy of Particles Emitted
^{131}I ("iodine-131")	8.1 days	0.8 MeV
^{32}P ("phosphorus-32")	14.3 days	1.7 MeV
^{33}P ("phosphorus-33")	25.5 days	0.25 MeV
^{35}S ("sulfur-35")	87.5 days	0.2 MeV
^3H ("tritium")	12.4 years	0.02 MeV
^{14}C ("carbon-14")	5730 years	0.2 MeV

- From the above table of radioisotopes and their properties, it is obvious that
 - the longer the half-life, the more energy emitted by the particles.
 - the longer the half-life, the less energy emitted by the particles.
 - radioisotopes of the same element must emit the same amount of energy in their emissions and decay at the same rate.
 - adjusted for time, radioisotopes emit the same amount of energy in their emissions.
 - energy and half-life are not directly related.
- Which statement is NOT true about subatomic particles?
 - Protons are found in the nucleus.
 - Neutrons have no electrical charge.
 - Electrons contain much less mass than neutrons.
 - Electrons are found in orbitals around the nucleus.
 - All electrons in an atom contain the same amount of energy.
- Which is NOT true about the electrical charges in chemistry?
 - Protons carry a positive charge.
 - In an atom, the number of protons and neutrons must be equal.
 - An atom is neutral when the positive and negative charges balance.
 - An ion contains one or more positive or negative charges.
- In a water molecule,
 - the oxygen atom is more electronegative than the hydrogen atoms.
 - the oxygen atom has an overall negative charge with the hydrogen atoms having an overall positive charge.
 - unequal sharing of electrons results in a polar molecule.
 - All of the choices are correct.

5. To determine the age of fairly recent fossils and organic artifacts, it is possible to analyze the amounts of the isotopes ^{14}C and ^{14}N , because over time the ^{14}C -which originated in the atmosphere-breaks down into ^{14}N . What net change occurred for this to happen?
- The ^{14}C lost an electron.
 - The ^{14}C gained an electron.
 - The ^{14}C lost a proton.
 - The ^{14}C gained a proton.
 - The ^{14}C gained a neutron.
6. Which of the following statements is NOT true about electron configurations?
- If an atom has only one shell, it is complete with two electrons.
 - If an atom has two or more shells, the octet rule applies.
 - If an atom has two or more shells, the outer shell is complete with eight electrons.
 - Atoms with more than eight electrons in the outer shell react by gaining electrons.
 - Atoms with eight electrons in the outer shell are not reactive at all.
7. An orbital is best described as
- the electron shell closest to the nucleus.
 - the outermost electron shell of an atom.
 - the volume of space in which electrons are most often found.
 - the original energy level of electrons in photosynthesis.
8. Which statement is NOT true about ionic bonds?
- One atom acts as an electron donor and another atom acts as an electron acceptor.
 - Electrons are completely lost or gained in ion formation.
 - An ion has the same number of electrons as a nonionic atom of the same element.
 - An ionic bond occurs between positive ions and negative ions.
 - A salt such as NaCl is formed by an ionic reaction.
9. Which statement is NOT true about polar covalent bonds?
- Most covalent bonds are nonpolar, with electrons shared fairly equally between the atoms.
 - Polar covalent bonds are important in the characteristics of water.
 - Electrons are shared unequally in a polar covalent bond.
 - The larger atom in a polar bond attracts the electron more strongly than the smaller atom.
 - The oxygen of a water molecule is electropositive relative to the hydrogen.
10. The blood buffer reactions described by $\text{H}_2\text{CO}_3 \rightleftharpoons \text{H}^+ + \text{HCO}_3^-$ indicates that
- scientists are uncertain which direction the equation flows.
 - the reaction can flow either direction depending on whether there is an excess of hydrogen or hydroxide ions.
 - any reaction in one direction causes an immediate reverse reaction.
 - chemicals can swing wildly from acid to basic.
 - there is really no difference in chemistry whether a molecule is formed or dissociated.

Bond	Energy (kcal/mol)	Bond	Energy (kcal/mol)
H—H	104	P—O	100
H—O	110	N—O	53
C—H	99	S—H	81
C—O	84	C=C	146
C—C	83	C=N	147
C—N	70	P=O	120
C—S	62	C=O	170
S—S	51	C≡C	195

11. From the above table, it is apparent that:
- triple bonds are stronger than double bonds; double bonds are stronger than single bonds.
 - triple bonds are weaker than double bonds; double bonds are weaker than single bonds.
 - carbon bonds are stronger than other bonds; hydrogen bonds are always weakest.
 - carbon forms only single bonds
12. The characteristic way in which atoms of an element react is most related to the
- number of electrons in the outermost shell.
 - number of electrons in the innermost shell.
 - number of neutrons in the nucleus.
 - size of the nucleus.
13. As a solid, water floats. This means that
- solid water is less dense than liquid water.
 - organisms in ponds, lakes, and reservoirs can survive under the ice cover.
 - this is due to hydrogen bonding changes.
 - All of the choices are correct.
14. When two atoms share a pair of electrons, this type of chemical bond is
- Ionic
 - Covalent
 - Hydrogen
 - Negative-positive
15. An atom that has lost electrons is a(n)
- Cation ion
 - Neutral atom
 - Molecule
 - Anion ion