

Concept Review

Section: Compounds and Molecules

1. **Explain** what holds compounds together.

2. **Describe** the difference between a ball-and-stick model and a space-filling model of a compound.

3. **Explain** why adding flexible springs to the ball-and-stick model would make the model more accurate.

4. **Explain** why a substance with a network structure has a high melting point.

5. **Contrast** the structure of table salt and table sugar.

6. **Predict** whether a compound with a boiling point of 68°C is likely to be a network solid or in the form of individual molecules.

Concept Review

Section: Ionic and Covalent Bonding

1. **Explain** why atoms will often join together to form bonds.

2. **Contrast** ionic and covalent bonds.

3. **Explain** why a triple bond between two nitrogen atoms is stronger than a double bond between two oxygen atoms.

4. **Explain** how it is possible for a compound to have both ionic and covalent bonds.

5. **Predict** whether a gold ring would be a good conductor of electricity. What kind of bonds does gold have? How do these bonds explain gold's properties?

Concept Review

Section: Compound Names and Formulas

1. **Explain** the difference between iron(II) nitrate and iron(III) nitrate. What is the significance of the Roman numerals?

2. **Name** the following ionic compounds, keeping in mind that a transition metal cation must include its charge.

- _____ a. TiO_2
_____ b. BaCl_2
_____ c. CuCl_3
_____ d. KI
_____ e. SrCl_2
_____ f. CuBr_2

3. **Describe** how covalent compounds are named.

4. **Write** the chemical formulas for the following compounds:

- _____ a. lithium oxide (ionic)
_____ b. carbon monoxide (covalent)
_____ c. carbon tetrachloride (covalent)
_____ d. nitrogen trifluoride (covalent)
_____ e. calcium chloride (ionic)

5. **Contrast** molecular formulas and empirical formulas.

Concept Review

Section: Organic and Biochemical Compounds

1. **Identify** the following compounds as alkanes, alkenes, or alcohols based on their names.

- _____ a. 1-propanol
_____ b. cyclopentene
_____ c. cyclopentanol
_____ d. methylcyclopropane
_____ e. 2-butene
_____ f. 2-ethylhexane

2. **Contrast** alkanes and alkenes, and give an example of each.

3. **Explain** the similarities between alcohol molecules and water molecules.

4. **Explain** how glucose and starch are related.

5. **Explain** why carbon can never form more than a total of four bonds.

6. **Explain** how the bases that form DNA make pairs.

