

Chemistry Review Take-Home Quiz

Instructions: Complete the quiz from memory (with periodic table of elements), on a separate sheet of paper. Then, review the “Comprehensive Chemical Compounds” powerpoint (on Ms. Au’s website → Unit 2) and try to fill in any questions you missed. Finally, check the answer key for this quiz and correct any mistakes you made. Circle any questions you had major issues with and want help with.

1. What is an element? List 3 examples of elements.

An element is a pure substance that cannot be broken down into simpler substances. Examples: magnesium, aluminum, hydrogen. (Really anything on the periodic table.)

2. What is a compound? List 3 examples of compounds.

A compound is a pure substance that is made of more than one element. Compounds can be ionic or covalent depending on the types of bonds that make them up. Examples of compounds: NaCl, CaCO₃, H₂O

3. How do you find the number of protons in an atom or ion?

The number of protons is equal to the atomic number. (e.g. protons in Hydrogen is 1; protons in Magnesium is 12)

4. How do you find the number of neutrons in an atom or ion?

The number of neutrons is equal to the atomic mass (rounded to the nearest whole number) minus the atomic number.

5. How do you find the number of electrons in an atom?

The number of electrons is equal to the atomic number.

6. How do you find the number of electrons in an ion?

The number of electrons is equal to the atomic number minus the ionic charge.

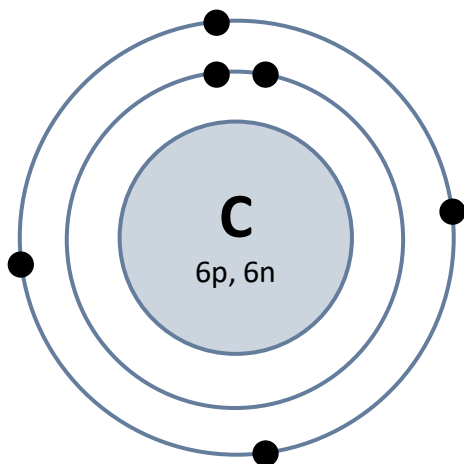
7. In a Bohr model, how many electrons can the first shell hold? Second shell? Third shell? Fourth shell?

The first shell holds 2; the second shell holds 8; the third shell holds 8; the fourth shell holds 16.

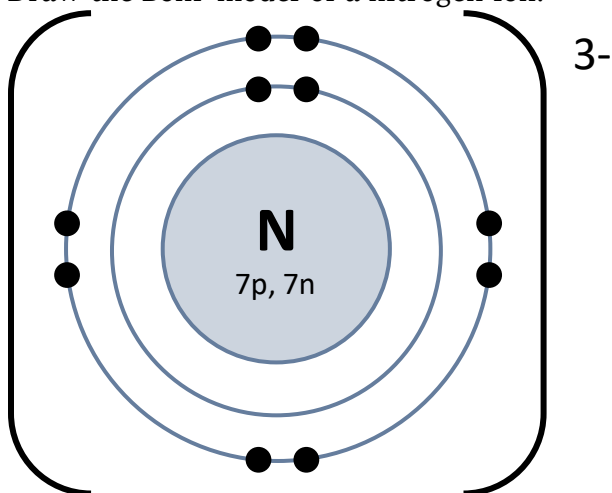
8. What is a valence shell?

The valence shell is the outermost shell of an atom or ion that contains electrons.

9. Draw the Bohr model of a neutral carbon atom.



10. Draw the Bohr model of a nitrogen ion.



11. Why do compounds form?

Compounds form so that the atoms forming the compound can obtain a full valence shell, either by gaining/losing or sharing valence electrons.

12. Compare and contrast ionic and covalent compounds.

Ionic compounds are between ions, which are atoms (or covalently bonded atoms) that have gained or lost valence electrons to attain an ionic charge. They are most often between a metal and non-metal, though ionic compounds can also involve polyatomic ions (which are groups of covalently bonded atoms that also have a charge).

Covalent compounds are between non-metals. They involve sharing of valence electrons.

13. Classify these as elements, ionic compounds, and covalent compounds. Then, name them.

a. NaBr	Ionic	sodium bromide
b. Br ₂	Element	bromine
c. K	Element	potassium
d. N ₂ O ₄	Covalent	dinitrogen tetraoxide
e. S ₂	Element	sulfur
f. Li ₂ S	Ionic	lithium sulfide
g. NO	Covalent	nitrogen monoxide
h. Ag ₂ SO ₄	Ionic	silver sulfate
i. K ₃ PO ₄	Ionic	potassium phosphate
j. P ₄	Element	potassium
k. Rb ₃ P	Ionic	rubidium phosphide
l. H ₂ O	Covalent	dihydrogen monoxide (water)

14. Classify these as elements, ionic compounds, and covalent compounds. Then, write their chemical formulas.

a. hexafluorine trioxide	Covalent	F ₆ O ₃
b. magnesium	Element	Mg
c. manganese(III) fluoride	Ionic	MnF ₃
d. iron(II) dichromate	Ionic	FeCr ₂ O ₇
e. magnesium chloride	Ionic	MgCl ₂
f. dicarbon hexachloride	Covalent	C ₂ Cl ₆
g. oxygen	Element	O ₂
h. nickel(II) oxide	Ionic	NiO
i. diphosphorus pentoxide	Covalent	P ₂ O ₅
j. copper(I) phosphate	Ionic	Cu ₃ PO ₄