

CHAPTER 7 REVIEW

Chemical Formulas and Chemical Compounds

SECTION 2

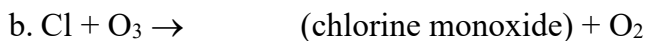
SHORT ANSWER Answer the following questions in the space provided.

1. Assign the oxidation number to the specified element in each of the following examples:

- _____ a. S in H_2SO_3
_____ b. S in MgSO_4
_____ c. S in K_2S
_____ d. Cu in Cu_2S
_____ e. Cr in Na_2CrO_4
_____ f. N in HNO_3
_____ g. C in $(\text{HCO}_3)^-$
_____ h. N in $(\text{NH}_4)^+$

2. _____ a. What is the formula for the compound sulfur(II) chloride?
_____ b. What is the Stock system name for NO_2 ?
3. _____ a. Use electronegativity values to determine the one element that always has a negative oxidation number when it appears in any binary compound.
_____ b. What is the oxidation number and formula for the element described in part a when it exists as a pure element?
4. Tin has possible oxidation numbers of +2 and +4 and forms two known oxides. One of them has the formula SnO_2 .
_____ a. Give the Stock system name for SnO_2 .
_____ b. Give the formula for the other oxide of tin.
5. Scientists think that two separate reactions contribute to the depletion of the ozone, O_3 , layer. The first reaction involves oxides of nitrogen. The second involves free chlorine atoms. The equations that represent the reactions follow. When a compound is not stated as a formula, write the correct formula in the blank beside its name.
- a. _____ (nitrogen monoxide) + $\text{O}_3 \rightarrow$ _____ (nitrogen dioxide) + O_2

SECTION 2 *continued*



6. Consider the covalent compound dinitrogen trioxide when answering the following:

_____ a. What is the formula for dinitrogen trioxide?

_____ b. What is the oxidation number assigned to each nitrogen atom in this compound? Explain your answer.

_____ c. Give the Stock name for dinitrogen trioxide.

7. The oxidation numbers assigned to the atoms in some organic compounds have unexpected values. Assign oxidation numbers to each atom in the following compounds: (Note: Some oxidation numbers may not be whole numbers.)

a. CO_2

b. CH_4 (methane)

c. $\text{C}_6\text{H}_{12}\text{O}_6$ (glucose)

d. C_3H_8 (propane gas)

8. Assign oxidation numbers to each element in the compounds found in the following situations:

a. Rust, Fe_2O_3 , forms on an old nail.

b. Nitrogen dioxide, NO_2 , pollutes the air as a component of smog.

c. Chromium dioxide, CrO_2 , is used to make recording tapes.

Assessment

Chemical Formulas and Chemical Compounds

Section Quiz: Oxidation Numbers

In the space provided, write the letter of the term or phrase that best completes each statement or best answers each question.

- _____ 1. An oxidation number
- is always negative.
 - is always positive.
 - has no exact physical meaning.
 - is the same in each compound that an element forms.
- _____ 2. Which element has the same oxidation number in all of its compounds?
- oxygen
 - fluorine
 - hydrogen
 - chlorine
- _____ 3. What is the oxidation number of an atom of nitrogen in the compound N_2 ?
- 0
 - +3
 - 3
 - 6
- _____ 4. What is the oxidation number of phosphorus in H_3PO_4 ?
- +1
 - +4
 - +5
 - +8
- _____ 5. What is the oxidation number of As in AsO_4^{3-} ?
- +8
 - +5
 - 5
 - 8

Section Quiz, *continued*

- _____ 6. What is the correct Stock name for $\text{Cr}(\text{CH}_3\text{COO})_3$
- chromium acetate
 - chromium triacetate
 - trichromium acetate
 - chromium(III) acetate
- _____ 7. What is the correct prefix-based name for selenium(II) fluoride?
- selenium fluoride
 - diselenium fluoride
 - diselenium difluoride
 - selenium difluoride
- _____ 8. What is the formula for copper(I) oxide?
- CuO
 - Cu_2O
 - CuO_2
 - Cu_2O_2
- _____ 9. A monatomic ion has an oxidation number
- of zero.
 - indicated by the ion's prefix.
 - equal to the charge of the ion.
 - equal to its subscript.
- _____ 10. What is the correct Stock name for SnBr_4 ?
- tin(IV) bromide
 - tin bromide
 - tin tetrabromide
 - tin(IV) tetrabromide.