

# ***Chemical Formulas and Chemical Compounds***

## **Section 7:2 Review - Oxidation Numbers**

**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  $\text{H}_2\text{SO}_3$   
\_\_\_\_\_ b. S in  $\text{MgSO}_4$   
\_\_\_\_\_ c. S in  $\text{K}_2\text{S}$   
\_\_\_\_\_ d. Cu in  $\text{Cu}_2\text{S}$   
\_\_\_\_\_ e. Cr in  $\text{Na}_2\text{CrO}_4$   
\_\_\_\_\_ f. N in  $\text{HNO}_3$   
\_\_\_\_\_ g. C in  $(\text{HCO}_3)^{-1}$   
\_\_\_\_\_ h. N in  $(\text{NH}_4)^{+1}$

2. \_\_\_\_\_ a. What is the formula for the compound sulfur(II) chloride?

- \_\_\_\_\_ b. What is the Stock system name for  $\text{NO}_2$ ?

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  $\text{SnO}_2$ .

- \_\_\_\_\_ a. Give the Stock system name for  $\text{SnO}_2$ .

- \_\_\_\_\_ b. Give the formula for the other oxide of tin.

5. Scientists think that two separate reactions contribute to the depletion of the ozone,  $\text{O}_3$ , 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) +  $\text{O}_3$  (ozone)  $\rightarrow$  \_\_\_\_\_ (nitrogen dioxide) +  $\text{O}_2$

- b.  $\text{Cl} + \text{O}_3 \rightarrow$  \_\_\_\_\_ (chlorine monoxide) +  $\text{O}_2$

**SECTION 7:2 continued**

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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.

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\_\_\_\_\_ 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:

a.  $\text{CO}_2$

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b.  $\text{CH}_4$  (methane)

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

a. Rust,  $\text{Fe}_2\text{O}_3$ , forms on an old nail.

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b. Nitrogen dioxide,  $\text{NO}_2$ , pollutes the air as a component of smog.

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c. Chromium dioxide,  $\text{CrO}_2$ , is used to make recording tapes.

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