

TABLE 6 Common Oxidation Numbers of Some Nonmetals That Have Variable Oxidation States*

Group 14	carbon	-4, +2, +4
Group 15	nitrogen	-3, +1, +2, +3, +4, +5
	phosphorus	-3, +3, +5
Group 16	sulfur	-2, +4, +6
Group 17	chlorine	-1, +1, +3, +5, +7
	bromine	-1, +1, +3, +5, +7
	iodine	-1, +1, +3, +5, +7

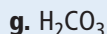
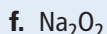
*In addition to the values shown, atoms of each element in its pure state are assigned an oxidation number of zero.

In Section 1 we introduced the use of Roman numerals to denote ionic charges in the Stock system of naming ionic compounds. The Stock system is actually based on oxidation numbers, and it can be used as an alternative to the prefix system for naming binary molecular compounds. In the prefix system, for example, SO_2 and SO_3 are named sulfur dioxide and sulfur trioxide, respectively. Their names according to the Stock system are sulfur(IV) oxide and sulfur(VI) oxide. The international body that governs nomenclature has endorsed the Stock system, which is more practical for complicated compounds. Prefix-based names and Stock-system names are still used interchangeably for many simple compounds, however. A few additional examples of names in both systems are given below.

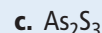
	Prefix system	Stock system
PCl_3	phosphorus trichloride	phosphorus(III) chloride
PCl_5	phosphorus pentachloride	phosphorus(V) chloride
N_2O	dinitrogen monoxide	nitrogen(I) oxide
NO	nitrogen monoxide	nitrogen(II) oxide
PbO_2	lead dioxide	lead(IV) oxide
Mo_2O_3	dimolybdenum trioxide	molybdenum(III) oxide

SECTION REVIEW

1. Assign oxidation numbers to each atom in the following compounds or ions:



2. Name each of the following binary molecular compounds according to the Stock system:



Critical Thinking

3. **DRAWING CONCLUSIONS** Determine the oxidation numbers for iron oxide, Fe_3O_4 . (Recall that oxidation numbers are integers.)