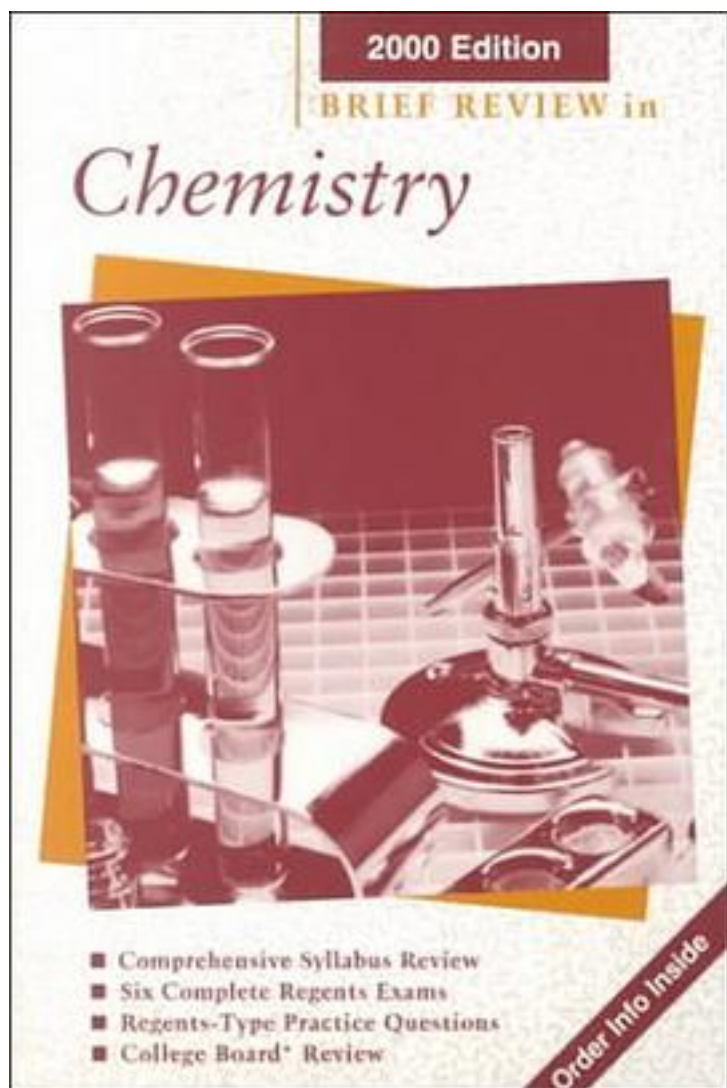


Brief Review in Chemistry



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UNIT 1 MATTER AND ENERGY
MATTER
SUBSTANCES. The term substance is used to refer to any particular variety of matter that always has the same properties and composition regardless of how and where a specimen of it is obtained. For example water is a substance; under given conditions any sample of water has the same properties and the same composition. These properties and composition can be used to identify water. On the other hand, wood is not a substance; its properties and composition can vary widely. A sample of any substance is homogeneous; that is the properties and composition are the same throughout the sample. There are two major kinds of substances: 1. Elements. A substance that cannot be decomposed into two or more other substances by means of a chemical change is called an element. An element consists entirely of atoms with the same atomic number. One hundred and six different elements are known to exist. Most of the elements are metals; typical examples are aluminum, iron, copper, silver and mercury. Some familiar nonmetallic elements are carbon, sulfur, iodine, oxygen and neon. 2. Compounds. A substance that can be decomposed into other substances by a chemical change is called a compound. Every compound consists of two or more elements chemically combined in definite proportions by weight. For example the compound water always consists of the two elements hydrogen and oxygen in a weight ratio of 1:8. That is if 9 grams of water is decomposed 1 gram of hydrogen and 8 grams of oxygen are always obtained. The properties of compounds are usually quite different from those of their component elements. MIXTURES. Like compounds mixtures are always composed of two or more substances but mixtures differ from compounds in the following ways: 1. The components of a mixture can be either elements or compounds. 2. The weight ratios of components in a mixture are not fixed. 3. The properties of the mixture are always intermediate between those of its components. 4. Some mixtures such as solutions of salt in water or mixtures of gases are homogeneous but others such as concrete (a mixture of sand, water and cement) are heterogeneous (that is samples are not uniform in composition throughout).

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