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Elements and their symbols worksheet answers

Back Home Next Elements Elements are pure substances. The atoms of each element are chemically different and different from the atoms of other elements. About 110 items are currently known. By 1980, 106 of them had been definitively characterized and accepted by the International Association for Pure and Applied Chemistry (IUPAC). Since then, elements 107 and 109 have been identified among the products of the nuclear reaction. The search for new elements continues in many of the world's labs; new elements can be announced at any time. A. Names and Symbols of Elements Each element has a name. Many of these names are already familiar to you - gold, silver, copper, chlorine, platinum, carbon, oxygen and nitrogen. The names are interesting. See a property of most items. The golden Latin name aurum, meaning shining dawn. Latin mercury means hydrargyrum, mercury silver. After one of the properties of an element, the naming application continues. Cesium was discovered in 1860 by German chemist Bunsen (inventor of bunsen burner). Because this element gave a blue color for a flame, Bunsen named it cesium, which means celestial blue in Latin. Other items are named for humans. Curium Marie Curie (1867-1934) was a pioneer in radioactivity studies. Marie Curie, a French scientist on Polish birth, was awarded the Nobel Prize in Physics in 1903 for her work on radioactivity. He was also awarded the Nobel Prize in Chemistry in 1911 for discovering the elements polonium (named after Poland) and radium (Latin, radius Ray). Some items are named for places. The small Swedish town of Ytterby has four elements: terbium, yttrium, erbium and ytterbium. Californium is another example of an element named for where it was first observed. This element does not occur in nature. It was first produced in 1950 by a team of scientists headed by Glenn Seaborg at the Radiation Laboratory at the University of California, Berkeley. Seaborg was also the first company to identify curium in the metallurgical laboratory at the University of Chicago (now Argonne National Laboratory) in 1944. Seaborg himself was named nobel laureate in 1951 in honor of his pioneering work in the preparation of other unknown elements. Each item has a symbol, one or two letters that represent as many items as your initials represent you. The symbol of an element has an atom of that element. For 14 of the elements, the symbol consists of a letter. Yttrium (Y) and vanadium (V) are familiar with the names of all elements with possibly single-letter symbols, with possible exceptions. These items are listed in Table 3.1. For 12 of these elements, the symbol is the first letter of the name. Potassium was discovered in 1807 and selected for potassium, potassium is the first substance to be isolated. Potassium symbol, K, comes from calyum, latin word for potassium. Tungsten, discovered in 1783, has the symbol W, the mineral to which tungsten was first isolated, for wolframite. TABLE 3.1 Elements B boron c carbon F fluorine H hydrogen I iodine N nitrogen O oxygen Symbol Element P phosphorus K potassium S sulfur W tungsten U uranium V vanadium Y yttrium Most of the other elements have two-letter symbols. In these two-letter symbols, the first letter is always capitalized, and the second is always lowercase. The names (and symbols) of eleven items begin with the letter C. One of them has carbon, a single-letter symbol, C. Other ten-letter symbols (see Table 3.2). TABLE 3.2 Name C Symbol Element Cd cadmium Ca calcium Cf californium C carbon Ce cerium Cs sescoium Symbol Element Cl chlorine Cr chromium Cobalt Cu copper Cm curium B. Lists of elements begin with letters that need a list of elements. Click here to see a list of items. The list symbol contains the atomic number and the atomic weight of the element. The importance of atomic numbers and weights will be discussed in Chapter 4. For now, it is enough to know that each element has a number between 1 and 110, called an atomic number. This number is as unique as the name or symbol of . The second list, called the periodic table, organizes the elements in order to increase the number of atoms in rows of varying length. The importance of row length and the relationship between items in the same row or column will be discussed in Chapter 5. The periodic table appears by clicking on the inner part of the front cover of this text. We will refer to the periodic table throughout the text, because it contains an incredible amount of information. For now, you need to know that only elements in the same column have similar characteristics, and that the heavy stair stepline that crosses the table through boron (B) (Horse) astatine (Horse) separates it from non-metallic elements. The periodic table is also shown in figure 3.3. Scanned fields mark the items you'll encounter most often in this text. 1. Metals and metals Metals appear below and to the left of the heavy diagonal line in the periodic table. Characteristic features of a metal are: Bright and shiny. It transmits heat and electricity. Ductible and shapeable; that is, it can be drawn into a wire and beaten into a thin sheet. It is a solid at 20°C. Mercury is the only exception to this rule; is a liquid at room temperature. The other two metals, gallium and cesium, have melting points close to room temperature (19.8°C and 28.4°C). Ametaller properties vary more than metals; Some even the metallic properties listed have one or more. Some ametaller gas home; chlorine and nitrogen are gase gasetals. An ametal at 20°C, bromine, a liquid, and others solid - for example, carbon, sulfur and phosphorus. Bromine Carbon Sulfur Red Phosphorus C. Distribution of Elements Known elements are not evenly distributed all over the world. There are only 91 people in the earth's bubble, oceans or atmosphere; others are manufactured in laboratories. Traces of some of these elements have been found on Earth or in stars. The search for the others is ongoing. When reviewing this text, you can read its success or isolation of new elements. TABLE 3.3 Distribution of elements in the earth's pumpkin, oceans, Total mass oxygen percentage of atmosphere Element 49.2 silicon 25.7 aluminum 7.50 iron 4.71 calcium 3.39 sodium 2.63 potassium 2.40 magnesium 1.93 hydrogen 0.87 titanium 0.58 Element Total mass chlorine percentage 0.. 19 phosphorus 0.11 manganese 0.11 manganese09 carbon 0.08 sulfur 0.06 barium 0.04 nitrogen 0.04 fluorine 0.03 others 0.49 Table 3.3 lists the 18 most abundant elements in the earth's box , oceans and atmosphere, along with relative percentages of the earth's total mass. One of the most striking points about this list is the highly irregular distribution of elements (see Figure 3.4). Oxygen is by way the most abundant element. It's 21% of the volume of the atmosphere and 89% of the body of water. Oxygen in the air, water and elsewhere makes up 49.2% of the mass of the earth's nightmare, oceans and atmosphere. Silicon is the second most abundant element in the world (25.7% by mass). Silicon is not free in nature but is formed along with oxygen, mostly such as silicon dioxide (SiO_2), sand, quartz, rock crystal, amethyst, agate, flint, jasper, and opal, as well as various silicate minerals such as granite, asbestos, clay, and mica. Aluminum is the most abundant metal in the groundabab (7.5%). It is always found in nature combined. Most of the aluminum used today is obtained by processing bauxite, an aluminum oxide-rich ore. These three elements (oxygen, silicon and aluminum) plus iron, calcium, sodium, potassium and magnesium make up more than 97% of the mass of the earth's nightmare, oceans and atmosphere. Another surprising feature of the distribution of elements is that the most important metals for our civilization are among the rarest; These metals include lead, kiyon, copper, gold, mercury, silver and zinc. FIGURE 3.4 Relative percentages of the earth's pumpkin relative to the masses of elements in the oceans and atmosphere. The distribution of elements in the universe is quite different from that on Earth. According to today's information, hydrogen is the most abundant element in the universe. mass. Together, helium and hydrogen make up almost 100% of the mass of the universe. Table 3.4 lists biologically important elements - those found in a normal, healthy body. The first four of these elements -- oxygen, carbon, hydrogen and nitrogen -- make up about 96% of the total body weight (see Figure 3.5). Other elements listed are still necessary for good health, although they are available in much smaller quantities. TABLE 3.4 Biologically important elements (quantities given per body weight of 70 kg) The main elements approximately amount (kg) oxygen 45.5 carbon 12.6 hydrogen 7.0 nitrogen 2.1 calcium 1.0 phosphorus 0.70 magnesium 0.35 potassium 0.24 sulfur 0.24 18 sodium 0.10 chlorine 0.10 iron 0.003 zinc 0.002 Elements present in quantities of less than 1 mg (listed alphabetically) arsenic chromium cobalt copper fluorine iodine manganese molybdenum nickel selenium silicon vanadium FIGURE 3.5 The distribution of elements (according to mass) in the human body. How D.Elements Form in Nature Elements are formed as single atoms or chemically interconnected atomic groups. The nature of these chemical bonds will be discussed in Section 7. Chemically interconnected atomic groups are called molecule or formula units. Molecules can contain atoms of a single element or atoms of different elements (in this case the molecule is a composition.) Just as an atom is the smallest unit of an element, a molecule is the smallest unit of a composition. Let's think about how elements can be categorized based on the way they're found in the universe. 1. Geneagree gases Only a few elements are found as single, unigree atoms; Table 3.5 lists these items. Under normal circumstances, all of these elements are gas; Collectively, they are known as pedigree gases. They are also called monatomic gases, meaning they are a single atom (meaning mono). The formula for each of the pedigree gases is just his symbol. When the helium formula is required, the O symbol is used. Subtitle 1 is understood. TABLE 3.5 Pedigree gases Symbol Element Helium Ne neon Ar argon Kr krypton Xe xenon Rn radon 2. Metals Pure metals are treated as if they were single, uniunited atoms, although an example of pure metal is the sum of billions of atoms. Thus, when the copper formula is required, the symbol, Cu, is used to mean a copper atom. Copper Metal 3. Some ametallers have temperature and pressure under normal conditions, as molecules containing two, four or eight atoms. Ametals that emerge as diatomic (two-atom) molecules are listed in Table 3.6. Thus, use O_2 as oxygen formula, N_2 for nitrogen, and so on. Ametals include sulfur S_8 and phosphorus P_4. For other ametals (not in Table 3.5, or When it comes to arsenic and Se for selenium, for example - a monatomic formula is used. TABLE 3.6 Diatomic elements Formula Name Normal state H_2 hydrogen colorless gas N_2 nitrogen colorless gas O_2 oxygen colorless gas F_2 fluorinated pale yellow gas Cl_2 chlorine greenish yellow gas Br_2 bromine dark red liquid I_2 iodine purple black solid 4. Although many elements are formed in the Combined state, all elements except some geneagree gases are combined with other elements in the compounds. In Chapter 3.1, we identified a ingredient as a substance that can be decomposed by ordinary chemical means. A compound can also be defined as a pure substance that contains two or more elements. The composition of a compound is expressed by a formula that uses symbols of all elements in the compound. Each symbol is followed by a subtitle, a number that shows how many atoms of the element occur in a riddled molecule (simple unit); subtitle 1 is not shown. Water is a compound with the formula H_2O, meaning that a molecule of water (or unit of formula) contains two hydrogen atoms and one oxygen atom. The compound has the sodium hydrogen carbonate formula $NaHCO_3$, a single formula unit of this compound contains a sodium atom, a hydrogen atom, a carbon atom and three oxygen atoms. Note that the symbols of metals in sodium hydrogen carbonate are written first, followed by the oxygen of ametals and metals last written. This order is customary. Sometimes a formula contains a group of symbols in the paratheses, such as $Cu(NO_3)_2$. The paratheses imply that the atom group they are in is acting as a single unit. Subtitles following the enumerte mean that the group is taken twice for each copper atom. Copper Nitrate The properties of a composition are quite different from the properties of the elements in which it is formed. This fact is evident when we compare carbon dioxide, CO_2 (a colorless gas used in fire extinguishers) properties with carbon (black, flammable solid) and oxygen (a colorless gas required for combustion). The properties of the compounds are discussed in more detail in Chapter 6. Go Home Next