Molecular compounds worksheet

Continue

WRITING FORMULAS FROM NAMES

Name Key

Write the formulas of the following compounds.

1. ammonium phosphate $(NH_4)_3PO_4$
2. iron (II) oxide FeO
3. iron (III) oxide Fe_2O_3
4. carbon monoxide CO
5. calcium chloride $CaCl_2$
6. potassium nitrate KNO_3
7. magnesium hydroxide $Mg(OH)_2$
8. aluminum sulfate $Al_2(SO_4)_3$
9. copper (II) sulfate $CuSO_4$
10. lead (IV) chromate $Pb_2(CrO_4)_4 \Rightarrow Pb(CrO_4)_2$
11. diphosphorus pentoxide P_2O_5
12. potassium permanganate $KMnO_4$
13. sodium hydrogen carbonate $NaHCO_3$
14. zinc nitrate $Zn(NO_3)_2$
15. aluminum sulfite $Al_2(SO_3)_3$

Naming Molecular Compounds

How are the chemical formula and name of a molecular compound related?

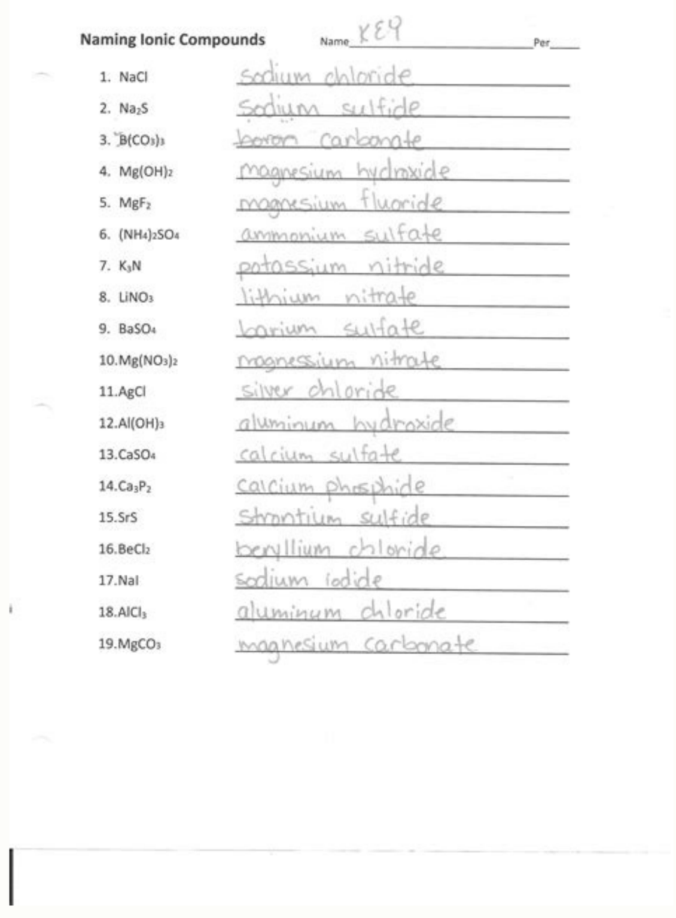
Why?

When you began chemistry class this year, you probably already knew that the chemical formula for carbon dioxide was CO_2. Today you will find out why CO_2 is named that way. Naming chemical compounds correctly is of paramount importance. The slight difference between the names carbon monoxide (CO, a poisonous, deadly gas) and carbon dioxide (CO_2, a greenhouse gas that we exhale when we breathe out) can be the difference between life and death! In this activity you will learn the naming system for molecular compounds.

Model 1 – Molecular Compounds

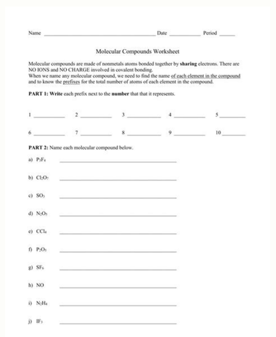
Molecular Formula	Number of Atoms of First Element	Number of Atoms of Second Element	Name of Compound
ClF	1	1	Chlorine monofluoride
ClF_5	1	5	Chlorine pentafluoride
CO	1	1	Carbon monoxide
CO_2	1	2	Carbon dioxide
Cl_2O	2	1	Dichlorine monoxide
PCl_5	1	5	Phosphorus pentachloride
N_2O_5	2	5	Dinitrogen pentoxide

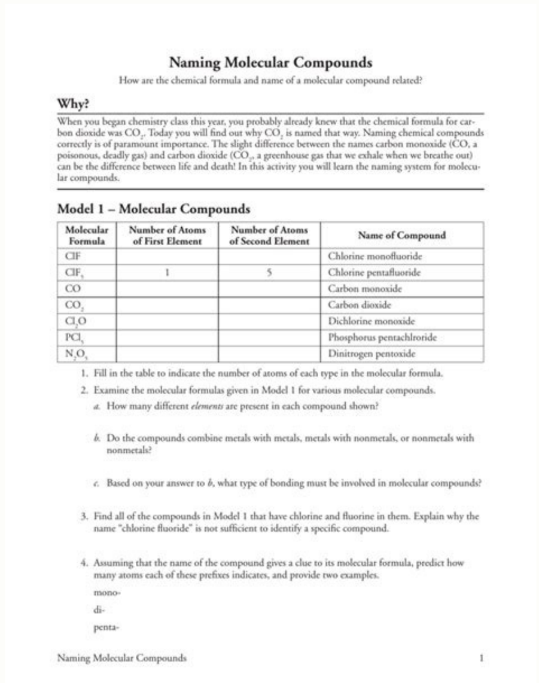
1. Fill in the table to indicate the number of atoms of each type in the molecular formula.
2. Examine the molecular formulas given in Model 1 for various molecular compounds.
   a. How many different *elements* are present in each compound shown?
   Each compound has two elements.
   b. Do the compounds combine metals with metals, metals with nonmetals, or nonmetals with nonmetals?
   The compounds have nonmetals with nonmetals.
   c. Based on your answer to *b*, what type of bonding must be involved in molecular compounds?
   A covalent bond must be involved.
3. Find all of the compounds in Model 1 that have chlorine and fluorine in them. Explain why the name "chlorine fluoride" is not sufficient to identify a specific compound.
   ClF and ClF_5: Chlorine fluoride does not specify that the two compounds have different ratios of chlorine and fluorine.
4. Assuming that the name of the compound gives a clue to its molecular formula, predict how many atoms each of these prefixes indicates, and provide two examples.
   mono – one - CO (carbon monoxide) and Cl_2O (dichlorine monoxide)
   di – two - CO_2 (carbon dioxide) and Cl_2O (dichlorine monoxide)
   penta – five - ClF_5 (chlorine pentafluoride) and PCl_5 (phosphorus pentachloride)



Naming Ionic Compounds Name KEY Per____

1. NaCl sodium chloride
2. Na_2S sodium sulfide
3. $B(CO_3)_3$ boron carbonate
4. $Mg(OH)_2$ magnesium hydroxide
5. MgF_2 magnesium fluoride
6. $(NH_4)_2SO_4$ ammonium sulfate
7. K_3N potassium nitride
8. $LiNO_3$ lithium nitrate
9. $BaSO_4$ barium sulfate
10. $Mg(NO_3)_2$ magnesium nitrate
11. AgCl silver chloride
12. $Al(OH)_3$ aluminum hydroxide
13. $CaSO_4$ calcium sulfate
14. Ca_3P_2 calcium phosphide
15. SrS strontium sulfide
16. $BeCl_2$ beryllium chloride
17. NaI sodium iodide
18. $AlCl_3$ aluminum chloride
19. $MgCO_3$ magnesium carbonate





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mono-

di-

penta-

Naming Molecular Compounds 1

Molecular compounds worksheet #9. 8.1 molecular compounds worksheet answers. Molecular compounds worksheet answer key. Molecular compounds worksheet #9 answers. Molecular compounds worksheet answers. Naming ionic and molecular compounds worksheet. Naming binary molecular compounds worksheet. Naming molecular compounds worksheet pdf.

Compounds A compound is a substance that has two or more chemical elements whose atoms are bonded together. These atoms are chemically bonded in specific ways and in detailed proportions, and the substances cannot be readily separated through simple physical means. There are several different types of compounds, including binary, ionic, molecular, acids, cations, and anions. These types of compounds have different properties and different chemical makeups, but they are the categories that describe the potentially millions of different chemical compounds. Examples of Compounds: 1. Water - Formula: H2O = Hydrogen2 + Oxygen Two atoms of the element Hydrogen combine with one atom of Oxygen through a covalent bond to form water. Hydrogen has a slightly positive charge and oxygen has a negative charge, and therefore it forms a polar molecule. Water can be split back into hydrogen and oxygen through electrolysis. 2. Hydrogen Peroxide - Formula: H2O2 = Hydrogen2 + Oxygen2 Hydrogen peroxide is formed when two atoms of hydrogen form a bond with two atoms of oxygen that have bonded to each other. Although it has only one more oxygen atom than is present in a molecule of water (H2O), its properties are very different. 3. Salt - Formula: NaCl = Sodium + Chlorine In salt, one atom of sodium bonds to one atom of chlorine to produce the resulting ionic compound sodium chloride. Salt is quite easily produced for commercial uses by simply evaporating seawater, although it can be mined from the ground as well. Sodium chloride can be separated into its different atoms through electrolysis. 4. Baking Soda - Formula: NaHCO3 = Sodium + Hydrogen + Carbon + Oxygen3 Sodium bicarbonate (baking soda) can be produced from the reaction of carbon dioxide with an aqueous solution of sodium hydroxide, which creates sodium carbonate; it is then combined with carbon dioxide molecules to produce sodium bicarbonate. It is found naturally in hot springs and other places on earth, but is commercially produced for industrial uses. 5. Octane - Formula: C8H18 = Carbon8 + Hydrogen18 Octane is a hydrocarbon whose actual formula is CH3(CH2)6CH3. It's a low-molecular weight compound, which means its highly volatile and flammable, making it ideally suited for the production of gasoline. Compounds Examples In order to continue enjoying our site, we ask that you confirm your identity as a human. Thank you very much for your cooperation. Atoms and Molecules | Chart With concise-yet-telling definitions and easy-to-grasp examples, this printable atoms and molecules chart for grade 5 and grade 6 is a perfect prelude to the topic. The illustrations help ease into the concept. Difference between Key Terms How are atoms different from molecules? Take the hassle out of reviewing with this pdf to tell the difference between key terms like atoms and molecules, elements and compounds, homogeneous and heterogeneous mixtures, and more. Writing Chemical Formulas How good are your students in writing the chemical formulas? Identify each constituent element, write its chemical symbol, and indicate the proportionate number of atoms of each element in this chemical formulas worksheet pdf. Identify Elements, Compounds & Mixtures Is water an element, or is it a compound? Don't freak out! Identify substances as elements, compounds, and homogeneous mixtures with this worksheet for 5th grade and 6th grade learners. Molecules of Elements or Compounds? Molecules of most elements are made up of two or more atoms of the same element, while compounds are made of atoms of two or more different elements. Cut out the structures, sort, and glue them to distinguish between elements of molecules and elements of compounds. Atomic Structure | Chart It's high time we dug deep into an atom. In this printable, students broaden their horizons to know the structure of an atom that includes the nucleus, protons, neutrons, electrons, and electron shells. Labeling the Atomic Structure Continue to excite grade 6 and grade 7 students with the task in this printable worksheet to label various parts of an atom, including the nucleus, a proton, a neutron, an electron. Matching Structures and Formulas With two distinct formulas for each compound in action, the interest in this worksheet becomes twofold. 7th grade and 8th grade learners are expected to match the structural formula to the molecular formula. Calculating Atomicity Atomicity is the number of atoms in the molecules of an element. In this 2-part atomicity worksheet, students interpret the atomicity of compounds first from their structures and then from their formulas. Periodic Table The periodic table is an organized display of all the chemical elements. Go through these printable worksheets and activities that help comprehend the families, and groups of elements in the periodic table. Electronic Configuration | Chart Electron configurations are the summary of where the electrons are around a nucleus. A perfect practice resource, this chart defines electronic configuration and illustrates it using the Aufbau Principle. Identifying Electronic Configuration "SPDF" refers to the four different types of orbitals. In this grade 6 and grade 7 worksheet, children prove their mettle by correctly writing the electron configurations of elements using the SPDF notation. Hund's Rule | Orbital Filling Diagram Hund's Rule clearly defines the behavior of unpaired valence shell electrons. In this printable exercise with six elements, high school students are tasked with drawing the Hund's Rule orbital diagram for each element. Calculating Valency Electrons Both transferable and shareable, valence electrons are the electrons in the outermost shell of an atom. In this pdf, middle school students write the electron configuration and write the valence electrons of each element. Bohr Model Diagram Proposed by the Danish physicist Niels Bohr, the Bohr model is a household name in Chemistry. Children in grade 6, grade 7, and grade 8 draw a Bohr model for each element and identify the element represented by each Bohr Model. Lewis Dot Structure A Lewis structure is one where element symbols represent atoms, and dots represent their electrons. In this worksheet, students draw the Lewis dot structure for each element, molecule, and compound. Answer the Following The questions in this printable exercise include defining the laws of conversation of mass and constant proportions, explaining the two types of ions, and telling between isotopes and isobars. Elements are substances that cannot be broken down into simpler substances by chemical means. Compounds are substances that composed of two or more elements that are chemically combined. Compounds can be broken down into elements. These worksheets focus on making these concepts concrete for students. Elements and Compounds Related Teacher Resources Elements and Compounds Bulletin Boards and Writing Paper What are Elements and Compounds? Every physical object in the world is made up of matter. Matter is simply anything that occupies space and has mass. The matter is classified into pure substances and mixtures. Pure substances may be elements (cannot be separated into simpler substances) and compounds (can be separated into simpler substances and elements). Elements and compounds are two forms in which natural substances are found. Their difference is that elements comprise one type of atom, whereas a compound comprises different elements. The periodic table lists elements according to their atomic numbers, from the lowest atomic number to the highest. In a periodic table, the columns represent elements of similar properties and groups. Similarities Basic Unit The basic building block of matter is an atom. Two or more atoms combine to form molecules. Elements and compounds are both made up of atoms. An element has only one kind of atom, whereas compounds contain different atoms. An oxygen molecule has two oxygen atoms. Whereas the compound, carbon dioxide, has two carbon atoms and one oxygen atom. Pure Substances If an element comprises one atom, compounds are made up of only one kind of molecule. In a way, they both are pure since breaking them down would only result in similar types of sub-particles. But breaking a compound would result in the loss of its specific chemical properties. This property of having properties indicates that the substance is pure. Homogeneous substance Elements and compounds are pure substances, whereas mixtures are not. Pure substances are homogenous because all the molecules or atoms that combine to form them have the same chemical and physical properties. Water will remain pure with its composition of oxygen and hydrogen but put a spoonful of sugar in it and it turns impure. Both elements and compounds have an even appearance and composition as long as they retain their particular atomic or molecular composition. Bonds link atoms Elements and compounds are composed of atoms that stay together through bonds. Atoms form bonds to stabilize their outer electron shells. They do so by sharing electrons. In the same way, atoms in elements and compounds bond together to make a particular substance. Differences Elements Compounds Definition Elements is a pure substance that is composed of only one type of atom. Compounds are formed by two or more types of elements that are in fixed proportions and chemically united. Classification Elements are classified as metals, nonmetals, or metalloids. Compounds are classified as ionic, molecular, or metallic according to their bonds. Representation Symbols represent elements. For example, sodium is represented by Na. The compound is represented by the chemical formula that represents symbols of its elements. Properties by composition The single type of atom that makes up the element represents its properties. The same type of molecules makes up the compound in the case of compounds. Breakdown ability Chemical reactions cannot break down elements into simpler substances. Compounds can be separated into their simpler substances by chemical methods. Examples Sodium Na, Chlorine Cl, Gold Au Water H2O, Sodium bicarbonate NaHCO3, Sodium chloride NaCl Elements Elements, as previously described, have the same type of atoms in their structure. One element gets a single entry in the periodic table. They have fixed atomic numbers and cannot be broken down into simpler parts. However, atoms of an element might give rise to different atomic mass due to the difference in neutrons of the atoms that make it up. This difference in neutrons gives rise to families of elements called isotopes. Isotopes are two or more atoms that make up an element, with different neutron numbers. Isotopes may be radioactive as well. Elements are represented by a symbol: O for Oxygen, Ag for silver, and Na for Sodium. Currently, 118 elements are known.Classification of elements: Elements are classified as metals, nonmetals, and metalloids. In a periodic table, elements are arranged in vertical columns called groups. Groups are numbered from 1 to 8. The properties of elements in a group are similar. There are 7 horizontal rows called periods. While moving from left to right, properties change from metallic to non-metallic in a period. Examples of elements Elements can exist in the following forms: Atom: Elements can consist of just one atom, like Helium (He) Ion: For example, copper ion (Cu++), Sodium ion (Na+) Isotope: Carbon has 3 isotopes, Carbon 12, Carbon 13, and Carbon 14 Molecule: When atoms chemically bond together, they form molecules. E.g., Oxygen molecule (O2), Hydrogen molecule (H2). Compounds A compound is a substance that has two or more elements combined chemically in fixed proportions. A molecule is the smallest part of a compound. Compounds may be classified according to the nature of the chemical bond present in their atoms. Classification Ionic compounds have oppositely charged ions attracted and bound together by ionic bonds. The most common example is sodium chloride, which has a positively charged sodium ion and a negatively charged chloride ion. Molecular compounds contain molecules that are held together by covalent bonds, e.g., the water molecule has 2 hydrogen atoms bonded to one oxygen atom by sharing electrons. Compounds are also classified as organic compounds (which contain carbon atoms bound with hydrogen) and inorganic compounds (which do not contain carbon). Examples of compounds: Sugar(C12H2O11) is a compound. It has carbon, hydrogen, and oxygen in its composition. Sodium bicarbonate has the formula NaHCO3. It has a sodium cation and a bicarbonate anion. Quick review Elements are pure substances that are composed of only one type of atom, e.g., Cl, Na. Compounds are formed by two or more types of elements that are in fixed proportions and chemically united, e.g., NaCl, H2O. Elements are classified as metals, nonmetals, and metalloids. Elements can exist in the following forms: atom, ion, isotope, and molecule. Compounds can be classified as ionic, molecular, organic, inorganic, etc. Examples of compounds include sugar(C12H2O11), sodium bicarbonate (NaHCO3), etc.

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