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## Which of the following statement is true for pure substance

Learning Objectives Explain the difference between a pure substance and a mixture. Explain the difference between an element and a compound. Explain the difference between a homogeneous mixture and a heterogeneous mixture. One useful way of organizing our understanding of matter is to think of a hierarchy that extends down from the most general and complex to the simplest and most fundamental (Figure 1). Matter can be classified into two broad categories: pure substances and mixtures. A pure substance is a form of matter that has a constant composition (meaning that it is the same everywhere) and properties that are constant throughout the sample (meaning that there is only one set of properties such as melting point, color, boiling point, etc. throughout the matter). A material composed of two or more substances is a mixture. Elements and compounds are both examples of pure substances. A substance that cannot be broken down into chemically simpler components is an element. Aluminum, which is used in soda cans, is an element. A substance that can be broken down into chemically simpler components (because it has more than one element) is a compound. For example, water is a compound composed of the elements hydrogen and oxygen. Today, there are about 118 elements in the known universe. In contrast, scientists have identified tens of millions of different compounds to date. Figure 1): Relationships between the Types of Matter and the Methods Used to Separate Mixtures Ordinary table salt is called sodium chloride. It is considered a substance because it has a uniform and definite composition. All samples of sodium chloride are chemically identical. Water is also a pure substance. Salt easily dissolves in water, but salt water cannot be classified as a substance because its composition can vary. You may dissolve a small amount of salt or a large amount into a given amount of water. A mixture is a physical blend of two or more components, each of which retains its own identity and properties in the mixture. Only the form of the salt is changed when it is dissolved into water. It retains its composition and properties. A homogeneous mixture is a mixture in which the composition is uniform throughout the mixture. The salt water described above is homogeneous because the dissolved salt is evenly distributed throughout the entire salt water sample. Often it is easy to confuse a homogeneous mixture with a pure substance because they are both uniform. The difference is that the composition of the substance is always the same. The amount of salt in the salt water can vary from one sample to another. All solutions are considered homogeneous because the dissolved material is present in the same amount throughout the solution. A heterogeneous mixture is a mixture in which the composition is not uniform throughout the mixture. Vegetable soup is a heterogeneous mixture. Any given spoonful of soup will contain varying amounts of the different vegetables and other components of the soup. Phase A phase is any part of a sample that has a uniform composition and properties. By definition, a pure substance or a homogeneous mixture consists of a single phase. A heterogeneous mixture consists of two or more phases. When oil and water are combined, they do not mix evenly, but instead form two separate layers. Each of the layers is called a phase. Example 1) Identify each substance as a compound, an element, a heterogeneous mixture, or a homogeneous mixture (solution). filtered tea freshly squeezed orange juice a compact disc aluminum oxide, a white powder that contains a 2:3 ratio of aluminum and oxygen atoms selenium Given: a chemical substance Asked for: its classification Strategy: Decide whether a substance is chemically pure. If it is pure, the substance is either an element or a compound. If a substance can be separated into its elements, it is a compound. If a substance is not chemically pure, it is either a heterogeneous mixture or a homogeneous mixture. If its composition is uniform throughout, it is a homogeneous mixture. Solution A) Tea is a solution of compounds in water, so it is not chemically pure. It is usually separated from tea leaves by filtration. B) Because the composition of the solution is uniform throughout, it is a homogeneous mixture. A) Orange juice contains particles of solid (pulp) as well as liquid; it is not chemically pure. B) Because its composition is not uniform throughout, orange juice is a heterogeneous mixture. A) A compact disc is a solid material that contains more than one element, with regions of different compositions visible along its edge. Hence, a compact disc is not chemically pure. B) The regions of different composition indicate that a compact disc is a heterogeneous mixture. A) Aluminum oxide is a single, chemically pure compound. A) Selenium is one of the known elements. Exercise 1) Identify each substance as a compound, an element, a heterogeneous mixture, or a homogeneous mixture (solution). white wine mercury ranch-style salad dressing table sugar (sucrose) Answer a: homogeneous mixture (solution) Answer b: element Answer c: heterogeneous mixture Answer d: compound Example 2) How would a chemist categorize each example of matter? saltwater soil water oxygen Solution Saltwater acts as if it were a single substance even though it contains two substances—salt and water. Saltwater is a homogeneous mixture, or a solution. Soil is composed of small pieces of a variety of materials, so it is a heterogeneous mixture. Water is a substance. More specifically, because water is composed of hydrogen and oxygen, it is a compound. Oxygen, a substance, is an element. Exercise 2) How would a chemist categorize each example of matter? Answer a: a homogeneous mixture (solution), assuming it is filtered coffee Answer b: element Answer c: heterogeneous mixture Matter can be classified into two broad categories: pure substances and mixtures. A pure substance is a form of matter that has a constant composition and properties that are constant throughout the sample. Mixtures are physical combinations of two or more elements and/or compounds. Mixtures can be classified as homogeneous or heterogeneous. Elements and compounds are both examples of pure substances. Compounds are substances that are made up of more than one type of atom. Elements are the simplest substances made up of only one type of atom. Vocabulary Element: a substance that is made up of only one type of atom. Compound: a substance that is made up of more than one type of atom bonded together. Mixture: a combination of two or more elements or compounds which have not reacted to bond together; each part in the mixture retains its own properties. In order to continue enjoying our site, we ask that you confirm your identity as a human. Thank you very much for your cooperation. Question: 1. Which of the following statements are true for pure substances? Pure substances contain only one kind of particles Pure substances may be compounds or mixtures Pure substances have the same composition throughout Pure substances can be exemplified by all elements other than nickel (i) and (ii) (i) and (ii) (ii) (iii) and (iv) (i) and (ii) and (iii) Answer: (b) (i) and (ii) Question: 2. Rusting of an article made up of iron is called corrosion and it is a physical as well as chemical change dissolution and it is a physical change corrosion and it is a chemical change dissolution and it is a chemical change Answer: (c) Corrosion and it is a chemical change Question: 3. A mixture of sulphur and carbon disulphide is heterogeneous and shows Tyndall effect homogeneous and shows Tyndall effect heterogeneous and does not show Tyndall effect homogeneous and does not show Tyndall effect Answer: (a) Heterogeneous and shows Tyndall effect Question: 4. Tincture of iodine has antiseptic properties. This solution is made by dissolving iodine in potassium iodide iodine in vaseline iodine in water iodine in alcohol Answer: (c) Iodine in water Question: 5. Which of the following are homogeneous in nature? (i) and (ii) (ii) and (iv) (i) and (iv) (ii) and (iv) Answer: (c) (i) and (iv) Question: 6. Which of the following are physical changes? Melting of iron metal Rusting of iron Bending of an iron rod Drawing a wire of iron metal (i), (ii) and (iii) (i), (ii) and (iv) (i), (iii) and (iv) (ii), (iii) and (iv) Answer: (c) (i), (iii) and (iv) Question: 7. Which of the following are chemical changes? Decaying of wood Burning of wood Sawing of wood Hammering of a nail into a piece of wood (i) and (ii) (ii) and (iv) (i) and (iv) Answer: (a) (i) and (ii) Question: 8. Two substances, A and B were made to react to form a third substance, A2B according to the following reaction:  $2A + B \rightarrow A_2B$  Which of the following statements concerning this reaction are incorrect? The product A2 shows the properties of substances A and B The product will always have a fixed composition The product so formed cannot be classified as a compound The product so formed is an element (i), (ii) and (iii) (ii), (iii) and (iv) (i), (iii) and (iv) Answer: (c) (i), (iii) and (iv) Question: 9. Two chemical species X and Y combine together to form a product P which contains both X and Y  $X + Y \rightarrow P$  X and Y cannot be broken down into simpler substances by simple chemical reactions. Which of the following concerning the species X, Y and P are correct? P is a compound X and Y are compounds X and Y are elements P has a fixed composition (i), (ii) and (iii) (i), (ii) and (iv) (ii), (iii) and (iv) (i), (iii) and (iv) Answer: (d) (i), (iii) and (iv) Copyright © excellup 2014 practice Which of the following statements are true for pure substances?(i) Pure substances contain only one kind of particle.(ii) Pure substances may be compound or mixture.(iii) Pure substances have the same composition throughout.(iv) Pure substances can be exemplified by all elements other than nickel. A(i) and (ii) B(i) and (iii) C(iii) and (iv) D(ii) and (iii) Characteristics of pure substance:-A pure substance contains only one type of particles which can either be atoms or molecules or elements or compounds.A pure substance cannot be separated into other kinds of matter by any physical process but a mixture can as they are impure substances because they contain more than one particles. Ex: salt solutions.A pure substance has fixed composition as well as fixed melting and boiling points. Ex: salt.Pure substances cannot be exemplified by all elements other than nickel because pure nickel is an element containing only one kind of particles.Hence, the correct ans is (1) and (3). Distribute the referral code to your friends and ask them to register with Tutorix using this referral code. Once we get 15 subscriptions with your referral code, we will activate your 1 year subscription absolutely free. Your subscribed friend will also get 1 month subscription absolutely free.

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