

Comparing Compounds and Mixtures

Aim

- describe the nature of compounds
- interpret chemical formulas
- describe the nature of mixtures

Notes

| Characteristics of Compounds | Characteristics of Mixtures |
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| <ul style="list-style-type: none"> ★ substance composed of two or more elements chemically combined | <ul style="list-style-type: none"> ★ consists of two or more kinds of matter |
| <ul style="list-style-type: none"> ★ can be broken down into simpler substances (elements) by chemical means <ul style="list-style-type: none"> ☆ water (H_2O) → hydrogen and oxygen ☆ rust (Fe_2O_3) → iron and oxygen ☆ ammonia (NH_3) → nitrogen and hydrogen ☆ table salt ($NaCl$) → sodium and chlorine | <ul style="list-style-type: none"> ★ can be separated by physical means <ul style="list-style-type: none"> ☆ iron and sand - can be separated with a magnet ☆ iron is attracted by a magnet ☆ sand is not attracted by a magnet ☆ water and sand - can be separated with filter paper ☆ water can pass through pores in filter paper ☆ sand cannot pass through filter paper |
| <ul style="list-style-type: none"> ★ properties of the elements that compose a compound are not retained <ul style="list-style-type: none"> ☆ water <ul style="list-style-type: none"> ☆ hydrogen is explosive ☆ oxygen supports combustion ☆ water puts out fires ☆ table salt <ul style="list-style-type: none"> ☆ sodium - extremely reactive, caustic ☆ chlorine - extremely reactive, corrosive, toxic ☆ salt - eaten with food | <ul style="list-style-type: none"> ★ each substance in a mixture retains its own properties <ul style="list-style-type: none"> ☆ sugar and water - sweet and wet ☆ brine (salt water) - salty liquid |
| <ul style="list-style-type: none"> ★ Constant composition - uniform throughout or homogeneous <ul style="list-style-type: none"> ☆ consist of more than one type of atom, but in a fixed ratio as shown by the formula | <ul style="list-style-type: none"> ★ the composition is variable (not constant) |

Answer the questions below by circling the number of the correct response

1. In the formula for water, H_2O , the number 2 refers to the number of (1) hydrogens and oxygens, (2) waters, (3) hydrogens only, (4) oxygens only.
2. The number of atoms in $Cu_3(PO_4)_2$ is (1) 13, (2) 9, (3) 10, (4) 24.
3. Every sample of a given material contains hydrogen and oxygen in a 1:8 mass ratio. This material must be a(n) (1) element, (2) compound, (3) mixture, (4) solution
4. The matter in a container is composed of hydrogen and oxygen. When the contents of the container are added to a fire, the fire goes out. This shows that the hydrogen and oxygen in the container are (1) mixed to form a solution, (2) mixed to form an emulsion, (3) chemically combined to form a compound, (4) separate elements.
5. A compound consists of (1) one element, (2) two or more elements *NOT* chemically combined, (3) two or more elements chemically combined, (4) two or more substances.
6. A bottle of green food coloring, which was left standing on a shelf for a long time, separated into distinct blue and yellow layers. The food coloring was most likely (1) an element, (2) a compound, (3) a mixture, (4) changing phase.
7. Which of the following is a mixture? (1) salt (2) silver (3) soup (4) sugar