



## Classification of Matter

### EXERCISES

A. Indicate whether the following statements are true or false:

- 1) Elements are composed of one type of atom.
- 2) Heterogeneous mixtures exhibit two or more phases.
- 3) Sugar is a mixture.
- 4) Beer is a mixture.
- 5) Onion soup is a mixture.
- 6) Homogeneous mixtures are called solutions.
- 7) A mixture of oil and water is a homogeneous mixture.
- 8) In a mixture, the components cannot be separated by physical means.
- 9) Mixtures have a definite composition by weight.
- 10) All solutions are mixtures.
- 11) Pure substances are heterogeneous.
- 12) A pure substance is homogeneous but does not have a fixed composition.
- 13) A system with more than one phase is heterogeneous.
- 14) Homogeneous and heterogeneous mixtures are pure substances.

B. Classify each of the following as being an element, a mixture or a compound.

- |          |                       |
|----------|-----------------------|
| 1) lead  | 3) table salt         |
| 2) vodka | 4) potassium chlorate |



C. Classify the following as being a physical change or a chemical change:

- |                                    |                                       |
|------------------------------------|---------------------------------------|
| 1) Food is digested.               | 5) Sulphur is burned.                 |
| 2) Gasoline evaporates.            | 6) A nail rusts.                      |
| 3) Steam is generated in a boiler. | 7) Ice melts.                         |
| 4) Glass shatters.                 | 8) Drink powder is poured into water. |

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## SOLUTIONS

- A. (1) True. This is the definition of “element”.  
(2) True. This is the definition of “heterogeneous”.  
(3) False. Sugar is a single compound, made up of only one type of molecule.  
(4) True. It is a homogeneous mixture, or solution.  
(5) True. It is a heterogeneous mixture: broth with onions in it.  
(6) True. These terms are equivalent.  
(7) False. There are two clearly visible parts to it, so it is heterogeneous.  
(8) False. Some mixtures can be separated by physical means. A mixture of iron and copper filings could be separated with a magnet, for example.  
(9) False. They can have any composition. Only compounds (and elements) have fixed compositions.  
(10) True. They are all homogeneous mixtures.  
(11) False. Pure substances consist of only one material, so they can't have more than one phase.  
(12) False. Pure substances must have fixed composition.  
(13) True. This is the definition of “heterogeneous”.  
(14) False. Mixtures cannot be pure; they are a mix of several things.
- B. (1) element (2) mixture (3) compound (4) compound
- C. (1) chemical (2) physical (3) physical (4) physical (5) chemical (6) chemical  
(7) physical (8) chemical

