

Skill Practice 1

Composition of Air

Name: _____

Date: _____

1. The air we breathe is mostly made up of two gases. It is approximately 20% oxygen and 80% nitrogen.
2. Let's say you have a friend who thinks the air is all one element. You decide to convince him using what you know about Lavoisier's mercury experiment. Summarize the experiment in a persuasive way to convince your friend:

Students should summarize the experiment as presented in ChemQuest 1. Students should include diagrams as appropriate.

3. Sodium metal and chlorine gas combine to make sodium chloride, which is table salt. Is salt an element? Why or why not?

It is not an element because it can be made from other things.

4. Throughout history, people known as alchemists have attempted to make gold out of other metals. No one has ever succeeded. Do you think gold is an element? Why or why not?

Gold is an element because it cannot be made from other things.

Skill Practice 2

Matter Practice

Name: _____

Date: _____

1. Explain why compounds are always homogeneous, but mixtures can be either homogeneous or heterogeneous.

With a compound (such as salt or sugar), one microscopic portion has the same composition as another microscopic portion. With a mixture (such as sand+salt), however, one part may not have exactly the same composition.

2. A white powder is in a beaker. Which statement(s) can be said for sure about the powder?

- I. It is homogeneous
- II. It is heterogeneous
- III. It is a mixture.
- IV. It is a compound.

A) I only B) I and IV only C) I and III only D) III only **E) none of these**

3. Classify the following as chemical changes (C) or physical changes (P). Place a C or P in the blanks as appropriate.

C a) a dead fish rotting

P d) melting steel

P b) dissolving salt in water

P e) bending steel

P c) boiling salt water until just salt remains

P f) cracking ice

4. Identify the following as an element (E), compound (C), or mixture (M).

E a) calcium

C d) water

M b) calcium and oxygen in the same container

E e) sodium

C c) calcium and oxygen atoms bonded

M f) sand

5. How many phases and how many states are in a mixture made out of sand, saltwater, oil and ice.

4 phases and 2 states

Skill Practice 3

Experiments With Water

Name: _____

Date: _____

1. Is water an element? How do you know?

No, because it can be made from other things. And it can be broken down into other things.

2. Your friend believes you that water is formed of hydrogen and oxygen since he has heard of the formula, H_2O . However, he doesn't know how scientists proved it. Describe Lavoisier's rifle barrel experiment for your friend:

Student answers will vary, but should agree with descriptions presented in ChemQuest 3.

3. Is water a mixture or a compound? Explain.

It is a compound because it is always made in the same proportion of hydrogen and oxygen.

4. Which are easier to separate, in your opinion—mixtures or compounds? Why?

Mixtures are generally easier. Some mixtures are able to be separated through simple sorting (like Chex Mix).

5. Label each of the following as an element (E), mixture (M), or compound (C).

 M a) salad C b) sugar M c) soda E d) copper