Ag. & Soil Chemistry

A Matter of Fact (notes)

15 October 2017 / 10:48 PM / ROOM 504

# **Mixtures, elements & Compounds**

Scientists like to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ things.

One way that scientists classify matter is by its \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Ultimately, all matter can be classified as \_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_,

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

# **Why isn’t it a good idea to classify matter by its phases?**

Because one kind of substance can exist in more than one phase – such as

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. And matter changes phases rather easily.

Why isn’t matter classified according to its physical characteristics, such as color?

Scientists wouldn’t find it very useful to group gold, sunflowers, and the sun together.

# **Scientists ask themselves these questions?**

Is the matter \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ throughout?

Can it be separated by\_\_\_\_\_\_\_\_\_\_\_\_ means?

Can it be separated by\_\_\_\_\_\_\_\_\_\_\_\_\_means?

# **By asking these questions scientists can classify matter into:**

Mixtures – two or more substances that are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

with each other and can be separated by physical means.

The substances in a mixture retain their individual properties.

Solutions –a special kind of mixture where one substance \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Elements – simplest form of pure substance. They cannot be broken into anything else by physical or chemical means.

Compounds –pure substances that are the

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

They can be broken into simpler substances by chemical means.

Is it uniform throughout?

If the answer is no, the matter is a heterogeneous mixture.

Considered the “\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.”

Does not appear to be the same throughout.

Particles are large enough to be seen and to be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ from the mixture.

Examples of heterogeneous mixtures

Sand and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Oil and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Powdered iron and powdered sulfur

Is it uniform throughout?

If the answer is yes, the matter is homogeneous (looks the same throughout).

That leads us to another question.

Can it be separated by physical means?

If the answer is yes, the matter is a homogeneous mixture or solution.

Homogeneous Mixtures

A mixture that appears to be the same throughout.

It is “well mixed.”

The particles that make up the mixture are very small and not easily recognizable.

Examples of homogeneous mixtures

Colloids

In a colloid the particles are mixed together but \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

The particles are relatively large and are kept permanently suspended.

Colloids

A colloid will not separate upon standing.

The particles are constantly colliding, and this allows a colloid to scatter light – thus colloids often seem\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Solutions

A solution is a type of homogeneous mixture formed when one substance \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

It is the best mixed of all mixtures.

A solution always has a substance that is dissolved and a substance that does the dissolving.

The substance that is dissolved is the solute and the substance that does the dissolving is the solvent.

Water as a solvent

Many liquid solutions contain water as the solvent.

Ocean water is basically a water solution that contains many salts.

Body fluids are also water solutions.

Types of solutions

Air is a solution of oxygen and other gases dissolved in nitrogen

Alloys

Can it be separated by physical means?

If the answer is no, the matter is a pure substance.

An element Or a compound

Elements

Elements are the simplest pure substance.

An element can not be changed into a simpler substance by heating or any chemical process.

The smallest particle of an element that has the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is called an atom.

An atom is the basic building block of matter.

There are more than one hundred known elements in the universe listed on the periodic table of elements.

These elements combine in such a way to create millions of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Elements

All elements are made of\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Atoms of the same element are alike.

Atoms of different\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are different.

Elements

In 1813, a system of representing elements with symbols was introduced.

Each symbol consists of one or two letters.

Two letters are needed for a chemical symbol when the first letter of that element’s name has already been used.

Common Elements

Compounds

Compounds are also \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

But compounds are made from more than one element.

Water is a compound.

Water can be broken down into simpler substances – \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.