

## Elements, Compounds, and Mixtures

IN ALL your experiments in chemistry, you will be dealing with "matter."

Matter is anything that takes up room and has weight (or "mass"). An iron bar is matter — it takes up room and is heavy, as you very well know. Water is matter — it takes up room when you fill a pail with it, and a full pail weighs plenty. The air around you is matter — it takes up lots of room; it may not seem very heavy, yet the earth's atmosphere presses down on every square inch of your body with a weight of almost fifteen pounds.

Matter has three distinct forms. Iron, for instance, is a SOLID. Water is a LIQUID. Air has the form of a GAS.

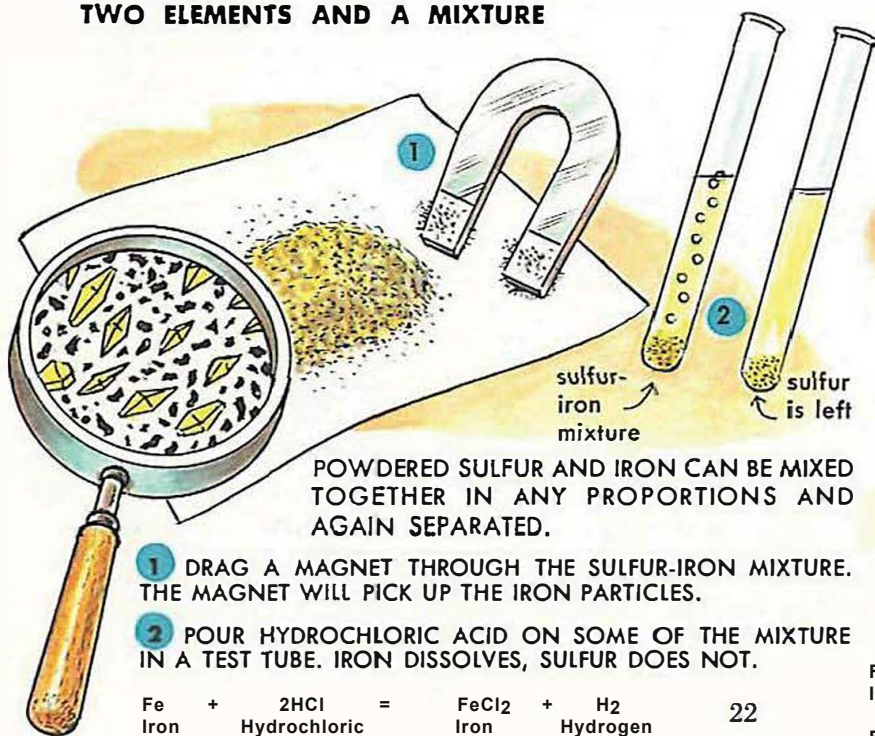
If you should take iron and divide it again and

again until you couldn't divide it any further, every tiny particle would still be iron. A thing that consists of one kind of matter only is called an ELEMENT.

Take water, on the other hand. You will learn to break water up into two kinds of matter — each of them an element. A thing in which two or more elements are combined chemically is called a COMPOUND. In a compound the proportions of the different elements that make it up are always exactly the same.

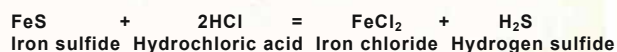
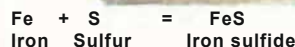
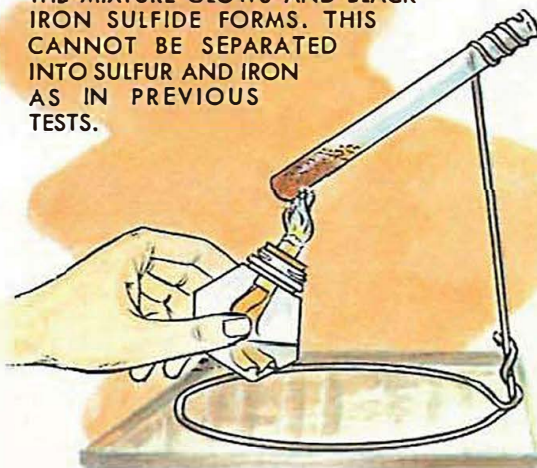
Air also consists of different kinds of matter, but they are not combined chemically — they are simply mixed together. When you make a MIXTURE, you can mix the ingredients together in any proportions that suit you.

### TWO ELEMENTS AND A MIXTURE



### MAKING A COMPOUND

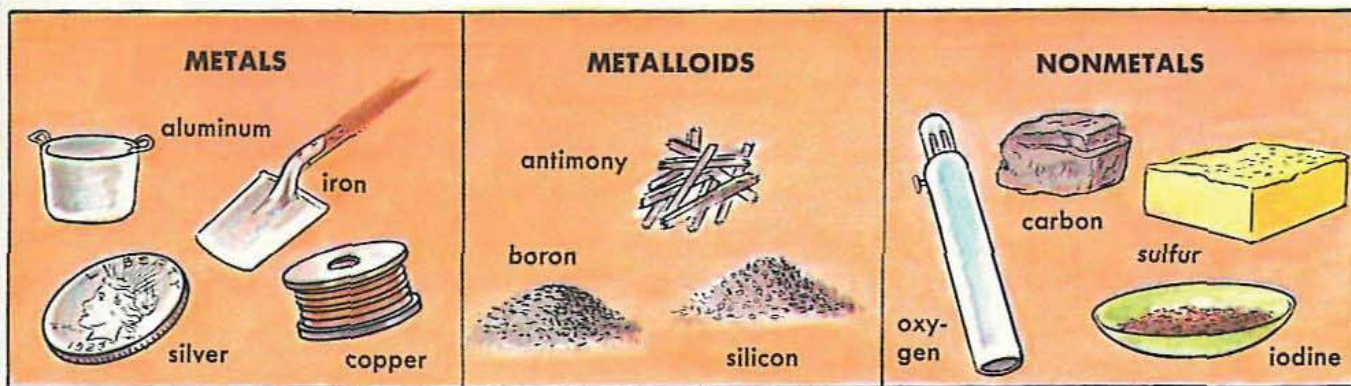
MIX TOGETHER 2 g OF FLOWERS OF SULFUR AND 3.5 g OF IRON FILINGS. PLACE MIXTURE IN A DAMAGED TEST TUBE. HEAT. SHORTLY A CHEMICAL REACTION TAKES PLACE. THE MIXTURE GLOWS AND BLACK IRON SULFIDE FORMS. THIS CANNOT BE SEPARATED INTO SULFUR AND IRON AS IN PREVIOUS TESTS.





**ELEMENTS** ARE SUBSTANCES THAT CONSIST OF ONE KIND OF MATTER ONLY. THEY CAN BE DIVIDED INTO

METALS, METALLOIDS (METAL-LIKE), NONMETALS. SEVERAL OF THE NONMETALS ARE GASES.



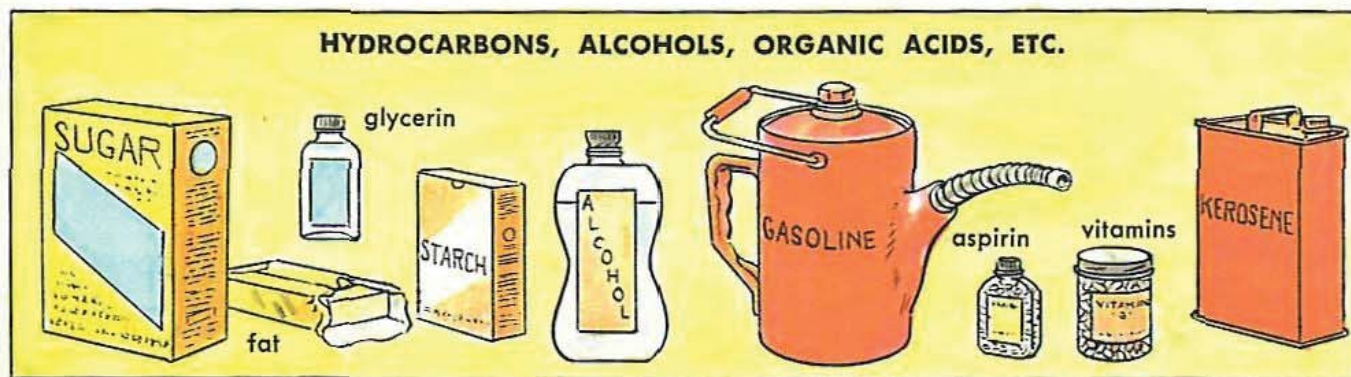
**COMPOUNDS—INORGANIC.** ALL COMPOUNDS CONSIST OF TWO OR MORE ELEMENTS. INORGANIC

COMPOUNDS (WITH A FEW EXCEPTIONS) ARE THOSE THAT DO NOT CONTAIN THE ELEMENT CARBON.



**CARBON COMPOUNDS—ORGANIC.** ORIGINALLY, COMPOUNDS MADE BY LIVING THINGS (PLANTS AND

ANIMALS) WERE CALLED "ORGANIC." TODAY ORGANIC CHEMISTRY COVERS THE CARBON COMPOUNDS.



**MIXTURES** CAN CONSIST OF ELEMENTS OR COMPOUNDS. SOME MIXTURES ARE COARSE. SOME (COL-

LOIDS) CONTAIN TINY PARTICLES. STILL OTHERS (SOLUTIONS) ARE OF SAME STRUCTURE THROUGHOUT.

