

AIM | What is an element?

7

If there are six sextillion atoms in a drop of water, how many atoms are there in all matter? The number is so enormous it is impossible to describe. But even with the enormous number of atoms in the world, there are only 106 different *kinds* of atoms that are known. That means that everything we know—every kind of matter—has to be made up of one or more of these 106 kinds of atoms.

Most matter is made up of two or more kinds of atoms. But some matter is made up of only one kind of atom. Matter that is made up of only one kind of atom is called an *element*.

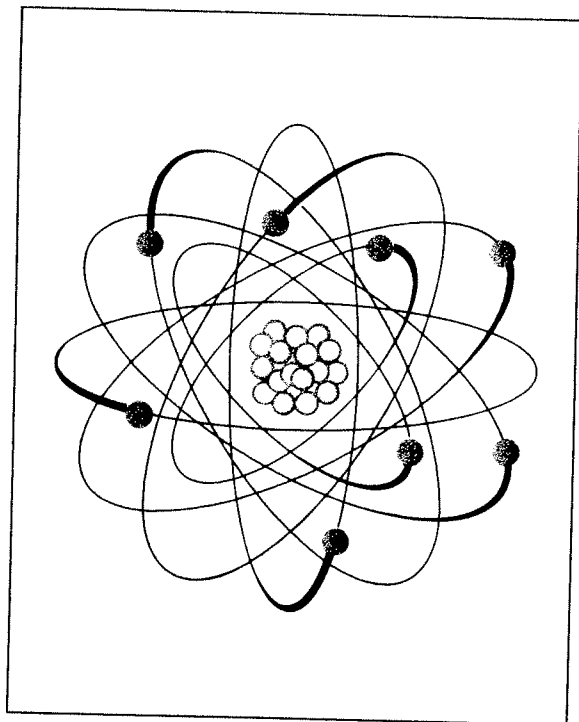
If there are 106 kinds of atoms, there have to be 106 elements. There is one element for each kind of atom. The atoms of any one element are exactly alike. But the atoms of any given element are different from the atoms of every other element.

You know some names of elements: gold, copper, oxygen, iodine, sulfur, and probably many more. There are 90 elements that are found in nature. The other 16 elements are made by scientists.

Most elements are found in the solid state. Some elements are found as gases. Only two elements are found as liquids at usual temperatures.

MORE ABOUT ATOMS

Look at each picture below. Read about the picture. Then try to answer the questions with each picture.



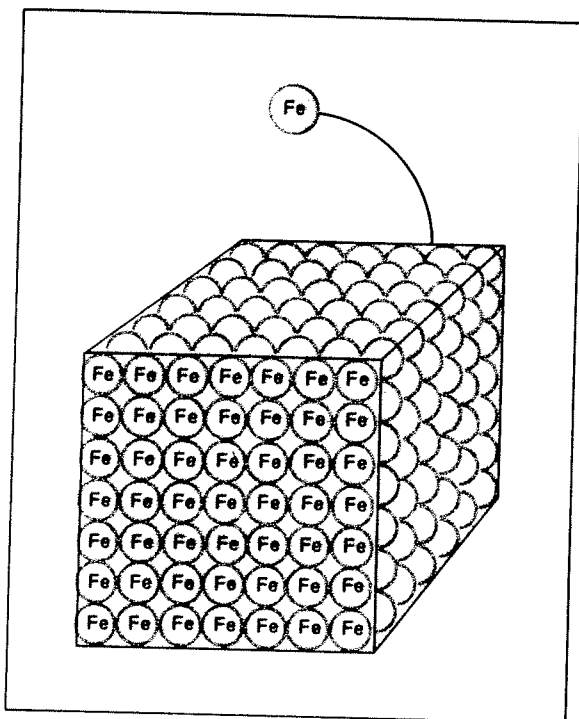
A.

This is what scientists think an atom looks like.

Different elements have different atoms.

Sometimes the differences are very slight.

1. How many different kinds of atoms are there? _____
2. What do we call matter that has only one kind of atom? _____



B.

The atoms of any one element are exactly alike.

Each of the circles in the picture stands for one atom of the element iron.

If we could study just one of these atoms, it would still have the properties of iron.

The smallest part of an element is just one atom of that element.

3. Is it possible to study just one atom?

4. Explain your answer. _____

COMPLETING SENTENCES

Complete the sentences with the choices below. One of these may be used twice.

different
element
16

one atom
90
atoms

106
alike
solid

1. All matter is made up of tiny parts called _____.
2. There are _____ different kinds of atoms.
3. Matter that is made of only one kind of atom is called an _____.
4. There are _____ different elements.
5. There are _____ natural elements.
6. There are _____ elements made by scientists.
7. The atoms of any one element are exactly _____.
8. Atoms of different elements are always _____.
9. The smallest part of an element is _____ of that element.
10. Most elements are in the _____ state.

TRUE OR FALSE Write T on the line next to the number if the sentence is true.
Write F if the sentence is false.

1. _____ Every atom in the world is exactly the same.
2. _____ There are only 106 different kinds of atoms.
3. _____ There are 90 different elements.
4. _____ An element has only one kind of atom.
5. _____ Atoms of different elements are the same.
6. _____ A piece of iron has only one atom.
7. _____ A piece of iron has only one kind of atom.
8. _____ An atom of iron is the same as an atom of oxygen.
9. _____ The smallest part of an element is one atom.
10. _____ Someday scientists may find new elements.