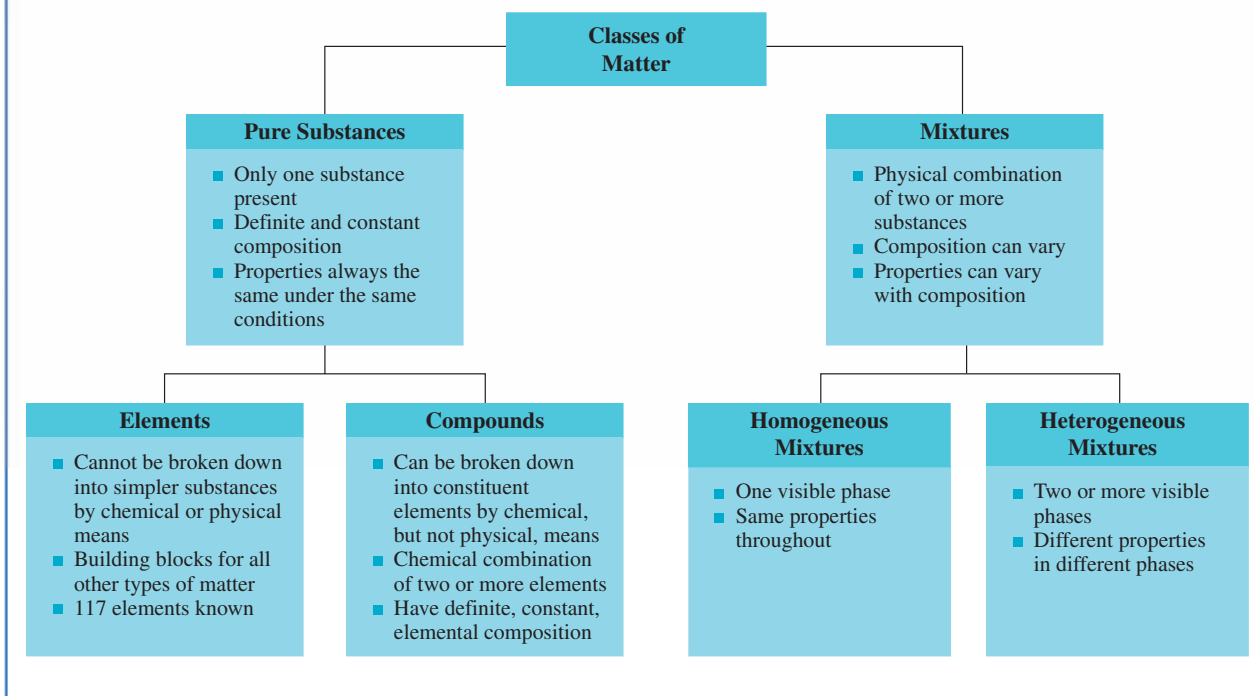


CHEMISTRY AT A GLANCE

Classes of Matter



Every known compound is made up of some combination of two or more of the 117 known elements. In any given compound, the elements are combined chemically in fixed proportions by mass.

Even though two or more elements are obtained from decomposition of compounds, compounds are not mixtures. Why is this so? Remember, substances can be combined either physically or chemically. Physical combination of substances produces a mixture. Chemical combination of substances produces a compound, a substance in which combining entities are *bound* together. No such binding occurs during physical combination. Example 1.3, which involves two comparisons involving locks and their keys, nicely illustrates the difference between compounds and mixtures.

The Chemistry at a Glance feature above summarizes what we have learned thus far about the subdivisions of matter called pure substances, elements, compounds, and mixtures.

EXAMPLE 1.3

The "Composition" Difference Between a Mixture and a Compound

Consider two boxes with the following contents: the first contains 10 locks and 10 keys that fit the locks; the second contains 10 locks with each lock's key inserted into the cylinder. Which box has contents that would be an analogy for a mixture and which box has contents that would be an analogy for a compound?

Solution

The box containing the locks with their keys inserted in the cylinder represents the compound. Two objects withdrawn from this box will always be the same; each will be a lock with its associated key. Each item in the box has the same "composition."

The box containing separated locks and keys represents the mixture. Two objects withdrawn from this box need not be the same; results could be two locks, two keys, or a lock and a key. All items in the box do not have the same "composition."