NS B2 (pg 1 of 2) **Pure Substance or Mixture: Atoms, Molecules, Elements & Compounds** Name_____

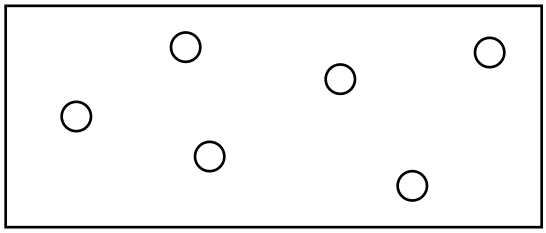
In chemistry it is important to be able to communicate about substances and the smallest whole particles that make up that substance. Thus we need to learn to use the following words appropriately.

- Pure Substance
  - ✓ A **pure substance** is a material that contains only one kind of particle (either atoms or molecules).
- Mixture
  - ✓ **Mixtures** occur when a material has more than one type of particle in it (more than one kind of substance present).
- Atom
  - ✓ **Atoms** are the simplest particles of any particular element.
- Molecule
  - ✓ **Molecules** are particles made of more than one atom bonded together.
- Element
  - ✓ **Elements** are the simplest form of matter. **Elements** cannot be separated into any other elements. In the models on the back, the **elements** are made of all the same color ball, although the particles of elements might be atoms or molecules.
  - ✓ Remember the seven diatomic elements: H_2, N_2, O_2, F_2, Cl_2, Br_2, I_2
- Compound
  - ✓ A **compound** is a substance made of two or more different elements bonded together. **Compounds** can always be chemically separated into two or more different elements. In the models on the back, **compounds** will always be made of at least two different colored balls bonded together (slghtly overlapping), and the particles that **compounds** are made of are always molecules.
- Clarification: All compounds are made of molecules, however, not all molecules are compounds. This is because the particles of an element may also be made of molecules, like O_2 and N_2.

Turn to the back for examples →

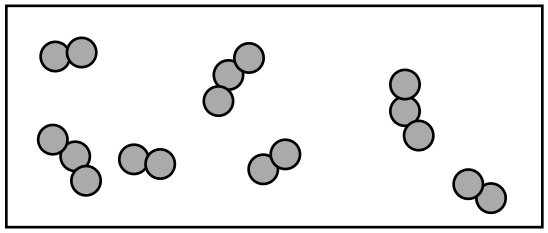
NS B2 (pg 2 of 2) **Pure Substance or Mixture:**
Atoms, Molecules, Elements & Compounds

A



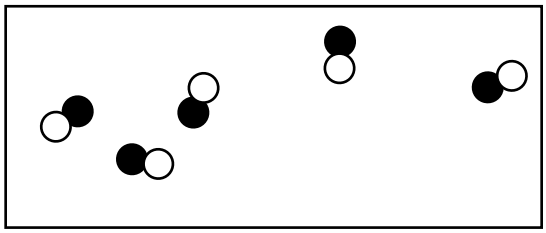
This box contains a **pure substance**: an **element** whose particles are made of **atoms**.

B



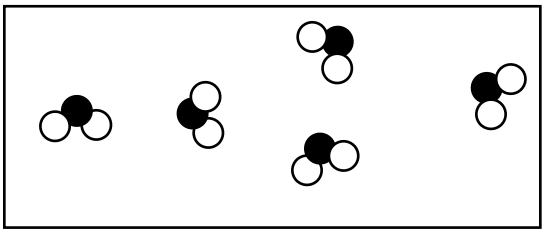
This box contains a **mixture**: two different **molecules**, both of which are made out of the same **element**. (Different atom arangements made from the same element are called allotropes.)

C



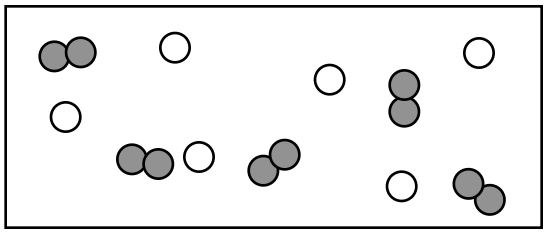
This box contains a pure substance: a **compound**. All **compounds** are always composed of **molecules**.

D



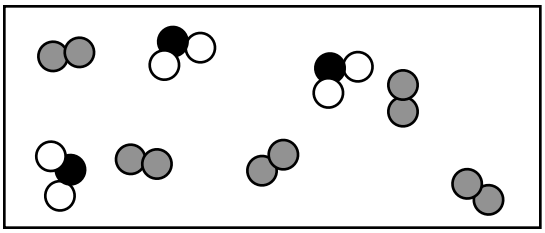
This box contains a **pure substance**: a **compound** whose particles are made of **molecules**.

E



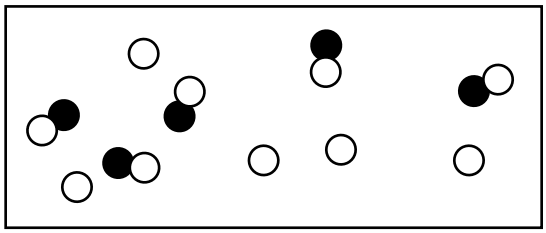
This box contains **mixture** of **elements**. There are both **atoms** and **molecules** in the **mixture**.

F



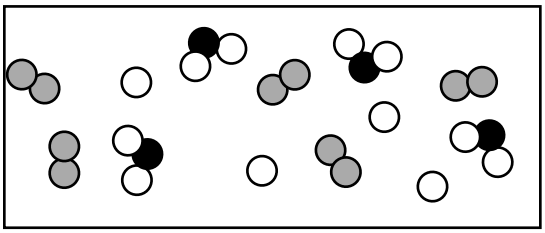
This box contains a **mixture** of an **element** and a **compound**. All the **particles** are **molecules**

G



This box contains a **mixture** of an **element** and a **compound**. All **compounds** are always composed of **molecules**. The particles that the **element** in this box is made of are **atoms**. (But the particles of some elements may be molecules.)

H



This box contains a **mixture** of both **elements** and **compounds**. One **element** is made of **atoms** and the other **element** is made of **molecules**. The particles that the **compound** is made of are only **molecules**.