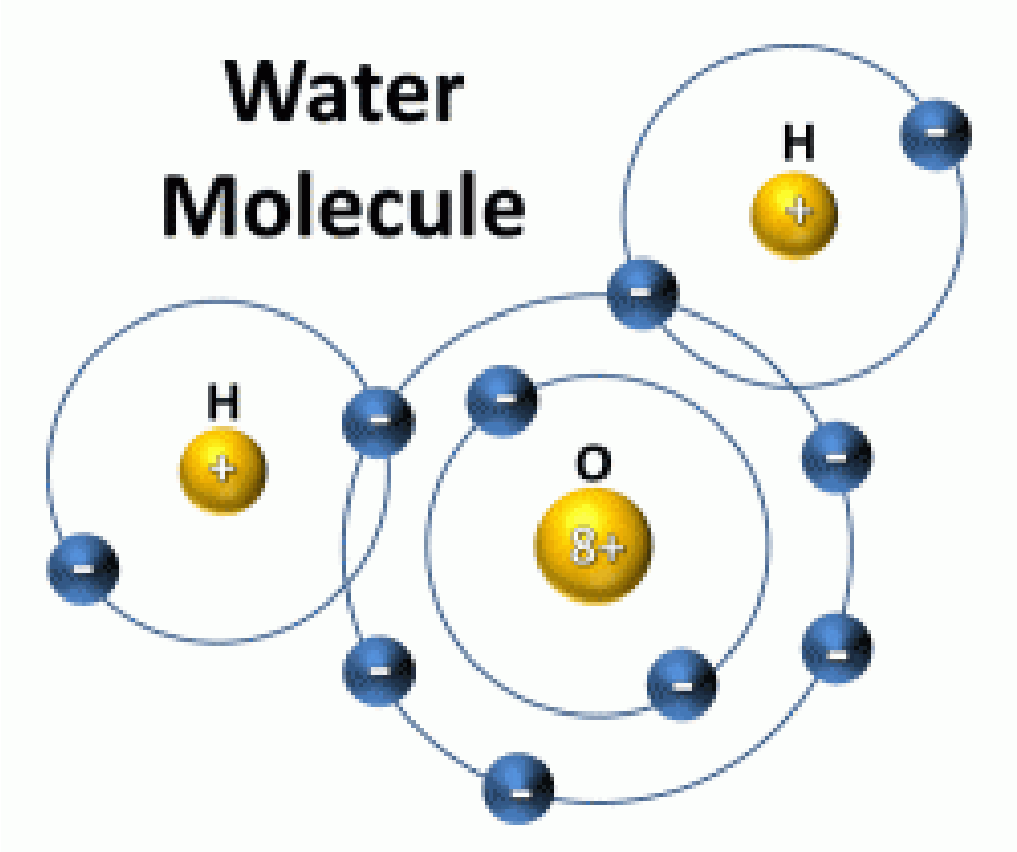
Lesson 4: Covalent Compounds

Learning outcomes

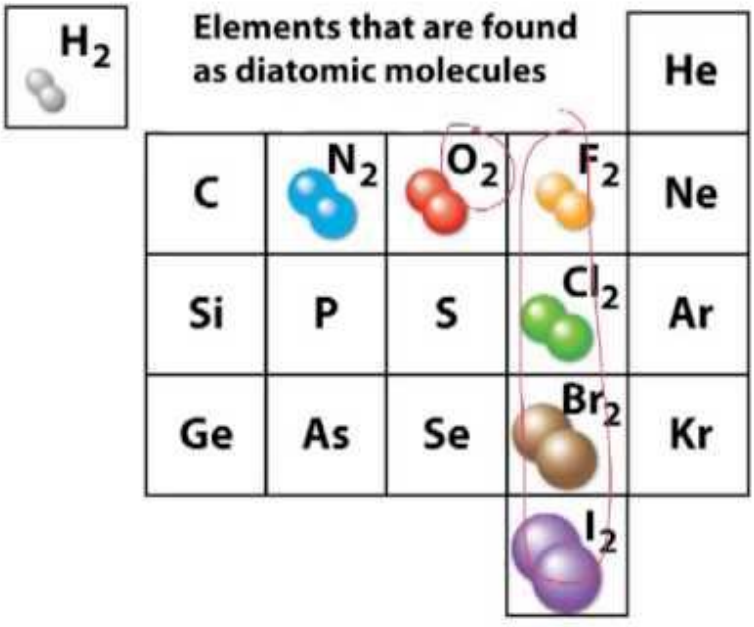
- **Covalent compounds are made of molecules**
- **Covalent bonding also occurs in elements and network solids**

- **Molecule**: a particle made up of two or more atoms bonded by covalent bonds.
- **Covalent bond**: a strong **attraction** between atoms that forms when atoms **share** valence electrons.
- **Covalent compound**: a compound that results when atoms of two or more (**non-metal**) elements bond covalently.
- Formation of a **covalent compound** is also based on the stability associated with a **full valence shell (outer shell).**
- A covalent bond is the result of a **single pair of shared electrons**



- **Have low melting points**
- Covalent bonds are relatively **weak**
- Only need to supply enough energy to overcome the attraction between the molecules
- Because this attraction is weak, most covalent compounds boil and melt at **relatively low temperatures.**

- **Are relatively soft**
- Compared to ionic compounds, it is easier for molecules to shift and move relative to one another
- **Are poor conductors**
- Covalent compounds do not have free electrons or ions and are relatively poor conductors of electric current and heat
- Covalent Bonding in elements
- Some elements in their natural form are made up of molecules held together with **covalent bonds**
- These are called **diatomic molecules**

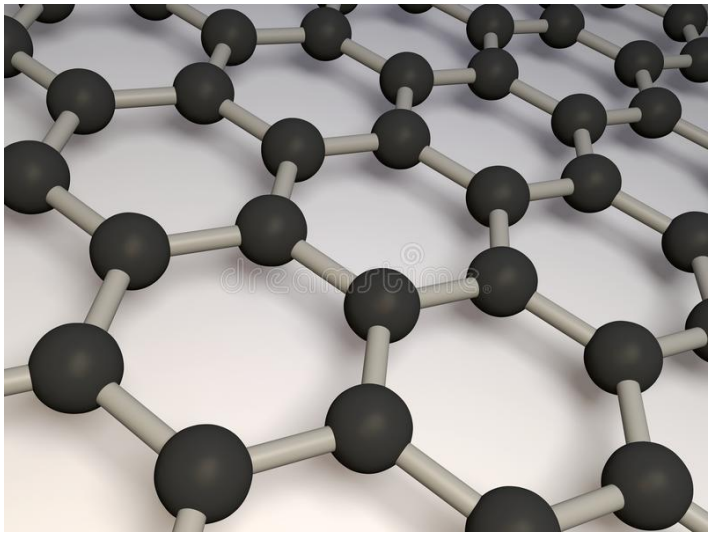


- Network solids

Compounds and non-metal elements that contain covalent bonds that connect their atoms in **one large network** – essentially they are **one giant molecule**

- **Carbon** in the form of **diamond** is an example of a network solid

- Graphene (one layer of graphite)



Assignment: Worksheet for Lesson 4