



Section 4.1

Atomic Theory and Bonding

Study Notes

By the end of section 4.1 you should be able to understand the following:

- There are common structural patterns of protons, neutrons and electrons in all atoms
- Ionic compounds are composed of atoms gaining and losing electrons
- Covalent compounds are composed of atoms sharing electrons
- There are methods to illustrate and explain the structures of atoms and compounds

NOTES

What are the two types of pure substances?

- 1.
- 2.

What are the three types of subatomic particles, where are they found in an atom, and what is their charge in an atom?

- 1.
- 2.
- 3.

What are the relative masses of the three subatomic particles?

- 1.
- 2.
- 3.

Do the Reading Check on page 171

NOTES

What are five pieces of information revealed by the location of an element on the periodic table?

- 1.
- 2.
- 3.
- 4.
- 5.

What are the four families of elements you may have studied in earlier science courses?

- 1.
- 2.
- 3.
- 4.

What is an ion?

- 1.

What is the difference between how metals and non-metals form ions?

- 1.
- 2.

Do the Reading Check on page 174

NOTES

What is a Bohr diagram?
Draw a Bohr diagram of silicon.

1.

2.

How can the period and group reveal the location of electrons in the Bohr diagram of an atom?

1.

2.

What are the three ways groups of atoms may form compounds?

1.

2.

3.

NOTES

What is an ionic bond? Why is NaCl an ionic compound? Draw a Bohr diagram of the ionic compound NaCl.

1.

2.

3.

What is a covalent bond? Why is CO₂ a covalent compound? Draw a Bohr diagram of the covalent compound CO₂.

1.

2.

3.

What is a Lewis diagram? How is a Lewis diagram more simple than a Bohr diagram

1.

2.

Do the Reading Check on page 178

NOTES

Draw Lewis diagrams of Ca and F ions. Draw a Lewis diagram of a calcium fluoride molecule.

1.

2.

3.

Draw Lewis diagrams of C and O atoms. Draw a Lewis diagram of the covalent molecule carbon monoxide (CO).

1.

2.

3.

What is a diatomic molecule? Draw a Lewis diagram of the diatomic molecule O₂.

1.

2.