

Ionic Bonding

Read from **Lesson 1: Ionic Bonding** in the **Chemistry Tutorial Section, Chapter 6** of **The Physics Classroom:**

Part a: [Types of Bonds](#)

Part b: [Ions and Ionic Bonds](#)

Part c: [Ionic Compounds](#)

Part 1: Ionic compounds are neutral compounds containing **cations** and **anions** bonded together by electrostatic forces.

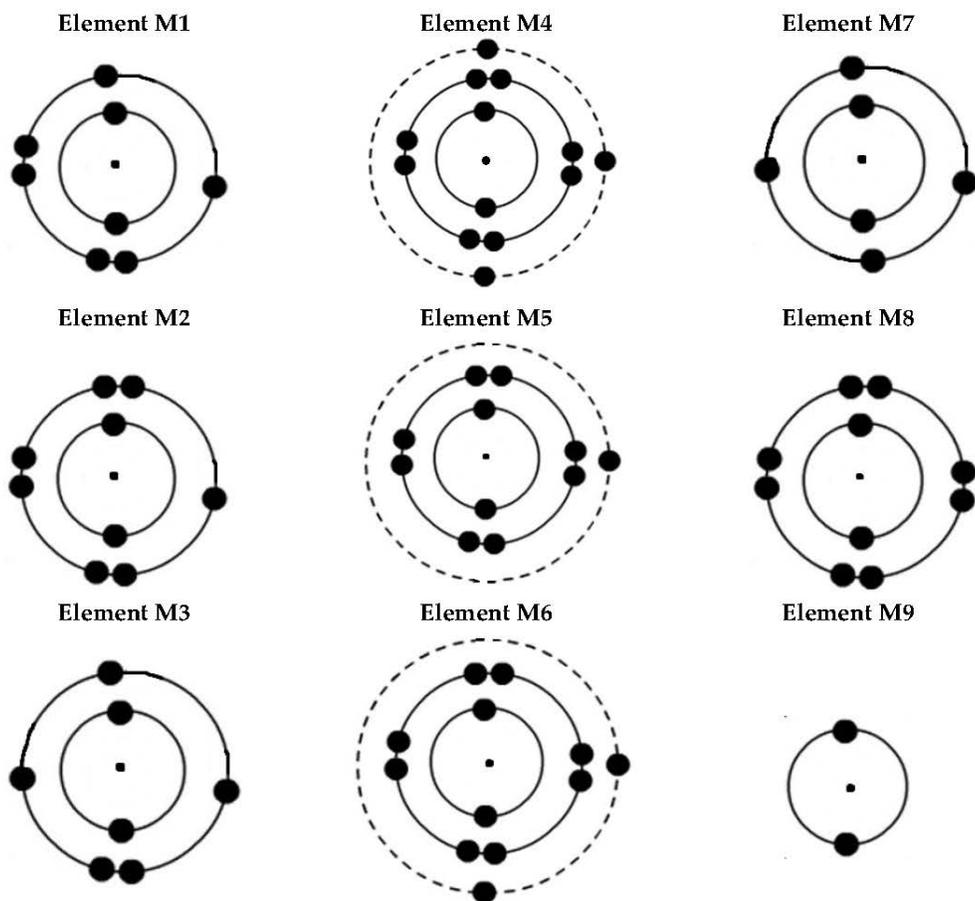
- Ionic compounds have which of the following properties? Circle each correct answer.

a. high melting point	b. low boiling point	c. conducts electricity in solution
d. malleable	e. brittle	f. usually solid at room temperature
g. usually a liquid or gas at room temperature	h. conducts electricity in its solid state	

- Ionic compounds form between two elements whose electronegativity difference is significantly different. Which of the following is a good definition for electronegativity?

a. the average distance between atoms in a bond.	b. the ability to attract electrons from another atom.
c. the equal sharing of electrons in a bond.	d. the energy required to remove electrons from atoms.

Part 2: Meteorite Elements. Lab analysis by NASA scientists revealed the following types of elements found on a meteorite from outer space. Atoms of these elements were labelled M1, M2, etc. Their electron shell diagrams are shown below. Answer the following questions about Elements M1, M2, M3, M4, M5, M6, M7, M8, and M9.



- Which of these elements would have smaller electronegativities? _____
 Would these be metals or nonmetals? _____
- Which of these elements would have larger electronegativities? _____
 Would these be metals or nonmetals? _____

Names and Formulas

3. Which elements would most likely lose electrons when forming ionic bonds? _____
Which elements would most likely gain electrons when forming ionic bonds? _____
4. Predict the cation-to-anion ratio when Element M5 and Element M1 form an ionic compound. How many electrons would be transferred? Use electron dot diagrams to show the electron transfer between the atoms of Element M5 and Element M1 when forming an ionic bond.
5. Predict the cation-to-anion ratio when Element M6 and Element M3 form an ionic compound. How many electrons would be transferred? Use electron dot diagrams to show the electron transfer between the atoms of Element M6 and Element M3 when forming an ionic bond.
6. Using your knowledge of the periodic table, identify which element is
- | | |
|-----------|-----------|
| M1? _____ | M6? _____ |
| M2? _____ | M7? _____ |
| M3? _____ | M8? _____ |
| M4? _____ | M9? _____ |
| M5? _____ | |
7. What is the name of the ionic compound formed in Question 4? _____
What is the name of the ionic compound formed in Question 5? _____