

Ions & Their Charges Worksheet

Name KEY Per _____

Diagram of charges based on groups on the periodic table including transition metals and noble gases:

IA	IIA	Transition metals	IIIA	IVA	VA	VIA	VIIA	VIIIA
+1	+2	+1 or +2	+3	+4 or -4	-3	-2	-1	0

The charge on an ion will involve a number and a sign. The number will always be the number of electrons involved, e.g., loss of two electrons is +2. The sign will be positive if electrons, negatives, are lost and negative if electrons, negatives, are gained.

I. Determine the charges on the following using the diagram above as a guide:

- An atom having lost two electrons +2
- An atom having lost six electrons +6
- An atom having gained one electron -1
- An atom having gained three electrons -3
- An atom having lost five electrons +5
- An atom having gained two electrons -2
- An atom having lost one electron +1
- An atom having gained four electrons -4

II. Determine the charges on the following elements based on their locations on the periodic table:

- | | | | |
|----------------------|-----------|-------------------|-----------|
| 1. Fluorine, F #9 | <u>-1</u> | 6. Zinc, Zn #30 | <u>+2</u> |
| 2. Magnesium, Mg #12 | <u>+2</u> | 7. Hydrogen, H #1 | <u>+1</u> |
| 3. Aluminum, Al #13 | <u>+3</u> | 8. Argon, Ar #18 | <u>0</u> |
| 4. Sodium, Na #11 | <u>+1</u> | 9. Barium, Ba #56 | <u>+2</u> |
| 5. Nitrogen, N #7 | <u>-3</u> | 10. Sulfur, S #16 | <u>-2</u> |

III. Answer the following questions based on knowledge from previous units:

- Will metals lose or gain electrons? Answer lose
- Considering your answer for #1, what type of ion will metals form, positive or negative? Answer positive
- What is the name of a positive ion? Answer cation
- What is the name of a negative ion? Answer anion
- How many electrons are contained in a completed outer shell for period 1? Answer 2
- How many electrons are contained in completed outer shells for all periods above period 1? Answer 8
- What are the charges on ions that are common to all elements of the transition block, transition metals? Answer +2 (or +1)
- What is the charge on ions that is common to all elements of the rare earth metals? Answer +1
- What is the only charge common to group IA elements? Answer +1
- What is the only charge common to group IIA elements? Answer +2