

## Type 1

List the charges the following elements would have as ions. Tell whether they are anions or cations, and name them:

- |       |           |               |                    |        |       |       |       |
|-------|-----------|---------------|--------------------|--------|-------|-------|-------|
| 1. Li | <u>1+</u> | <u>cation</u> | <u>lithium ion</u> | 6. Al  | _____ | _____ | _____ |
| 2. Cl | _____     | _____         | _____              | 7. K   | _____ | _____ | _____ |
| 3. Mg | _____     | _____         | _____              | 8. O   | _____ | _____ | _____ |
| 4. Na | _____     | _____         | _____              | 9. F   | _____ | _____ | _____ |
| 5. I  | _____     | _____         | _____              | 10. Be | _____ | _____ | _____ |

How many electrons does the neutral atom gain or lose when each ion forms?

- |                      |                              |                      |       |
|----------------------|------------------------------|----------------------|-------|
| 11. $\text{Cr}^{3+}$ | <u>loses 3 e<sup>-</sup></u> | 14. $\text{Ca}^{2+}$ | _____ |
| 12. $\text{P}^{3-}$  | _____                        | 15. $\text{Cl}^-$    | _____ |
| 13. $\text{Li}^{1+}$ | _____                        | 16. $\text{O}^{2-}$  | _____ |

Solve the equations:

- |                              |   |
|------------------------------|---|
| 17. $(1+) + (1-) =$ _____    | 22. $(3+) + 3(\text{____}) = 0$             |
| 18. $(2+) + (1-) =$ _____    | 23. $(4+) + \text{____} = 0$                |
| 19. $(2+) + 2(1-) =$ _____   | 24. $(4+) + 2(\text{____}) = 0$             |
| 20. $(2+) + 3(1-) =$ _____   | 25. $\text{____}(3+) + \text{____}(2-) = 0$ |
| 21. $(3+) + \text{____} = 0$ | 26. $\text{____}(2+) + \text{____}(3-) = 0$ |

For each combination of ions, fill in the chart below:

	cation symbol	anion symbol	# cations needed to make a neutral compound	# anions needed to make a neutral compound	formula	compound name
magnesium ion + sulfide	$\text{Mg}^{2+}$	$\text{S}^{2-}$	1	1	$\text{MgS}$	magnesium sulfide
lithium ion + iodide						
potassium ion + bromide						
calcium ion + fluoride						
beryllium ion + oxide						
strontium ion + sulfide						
sodium ion + bromide						
aluminum ion + chloride						
gallium ion + iodide						
aluminum ion + sulfide						
gallium ion + fluoride						

**Type 2: (use chart on p 99 for charges)**

For each cation, list all the possible charges, and write the symbol and systematic name for each charge.

iron  $Fe^{3+}$  iron(III)  $Fe^{2+}$  iron(II) tin \_\_\_\_\_  
 copper \_\_\_\_\_ lead \_\_\_\_\_  
 cobalt \_\_\_\_\_ mercury \_\_\_\_\_

**For each combination of ions, fill in the chart below:**

	cation symbol	anion symbol	# cations needed	# anions needed	formula	compound name
mercury(II) + sulfide						
copper(I) + iodide						
tin(II) + bromide						
lead(IV) + fluoride						
iron(III) + oxide						
copper(II) + sulfide						
cobalt(III) + bromide						
gold(I) + chloride						
lead(II) + iodide						
tin(IV) + sulfide						
cobalt(II) + fluoride						

**Name the following binary ionic compounds:**

$CuCl_2$  copper(II) chloride

$CoF_3$  \_\_\_\_\_

$SnCl_4$  \_\_\_\_\_

$PbO$  \_\_\_\_\_

$FeCl_3$  \_\_\_\_\_

$Co_2S_3$  \_\_\_\_\_

$CoF_2$  \_\_\_\_\_

$Fe_2O_3$  \_\_\_\_\_