VALENCE ELECTRONS AND ELECTRON DOT DIAGRAMS

The valence electrons are the electrons in the outermost principal energy level. They are always "s", "p", or "s and p" electrons. Since the total number of electrons possible in s and p sublevels is eight, there can be no more than eight valence electrons. Electron dot structures are a way to visually indicate the number of valence electrons around an atom. Provide the number of valence electrons and an Electron Dot structure for each atom listed below.

EXAMPLE: Beryllium
Electron configuration: $1s^2\mathbf{2s^2}$
Beryllium has **2** valence electrons.

1. Calcium

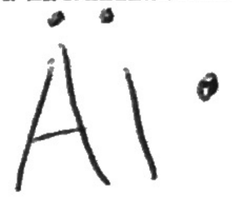
2. Potassium

3. Helium

4. Mercury

5. Oxygen

6. Aluminum



7. Phosphorus

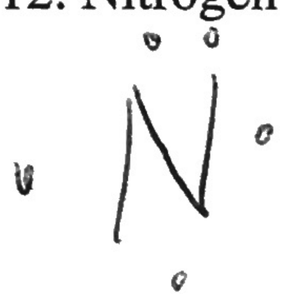
8. Bromine

9. Hydrogen

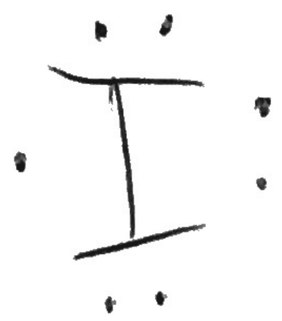
10. Barium

11. Sulfur

12. Nitrogen



13. Iodine



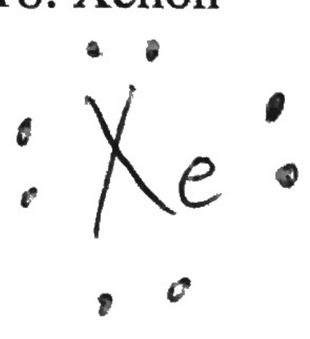
14. Magnesium

15. Lithium

16. Copper(I)

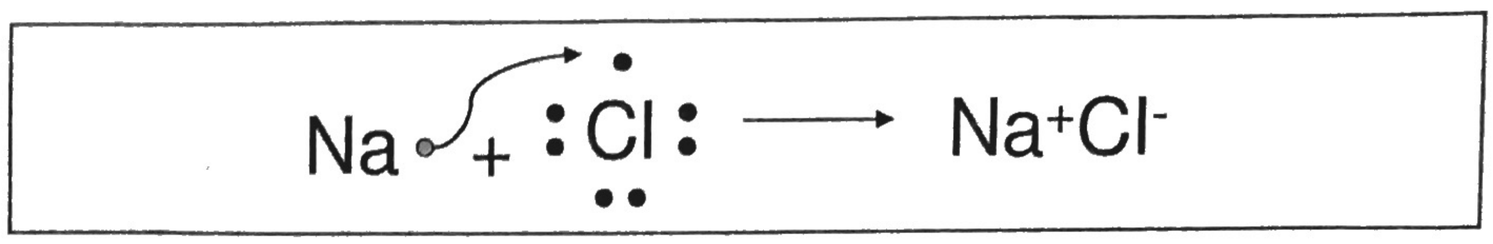
17. Sodium

18. Xenon

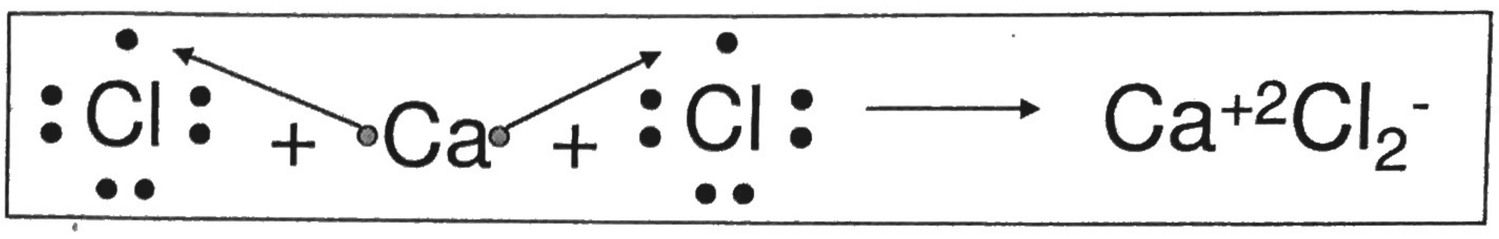


IONIC BONDING

Ionic bonding occurs when a metallic atom transfers one or more electrons to a nonmetallic atom in an effort to achieve a stable octet of electrons (noble gas configuration). This can be depicted in an Electron Dot Diagram, as shown below.

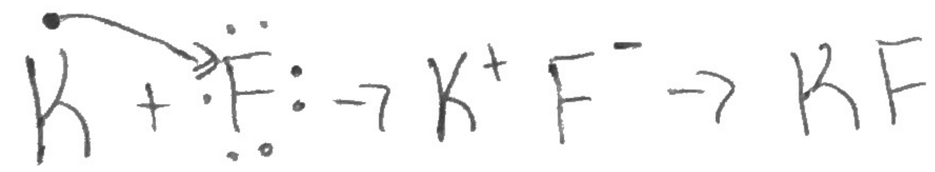


Multiple electron transfers may require more than one of an atom, as shown below.

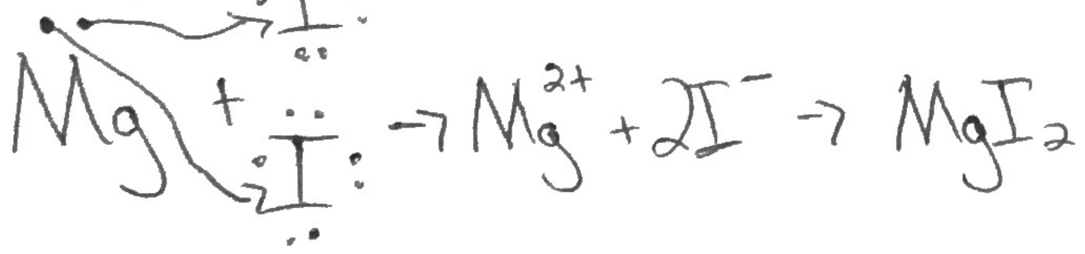


Show the electron transfers and give the formula unit for the following combinations. A partner (1-5), B Partner (6-10).

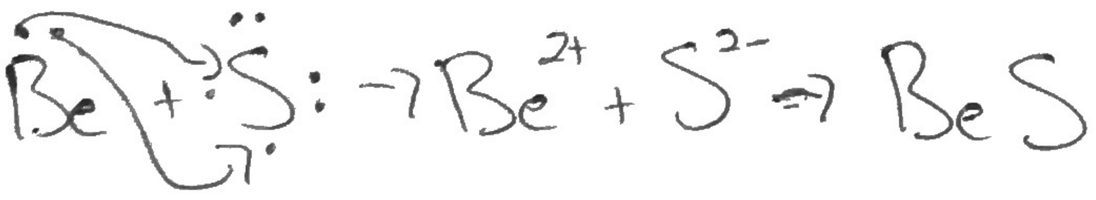
1. K + F



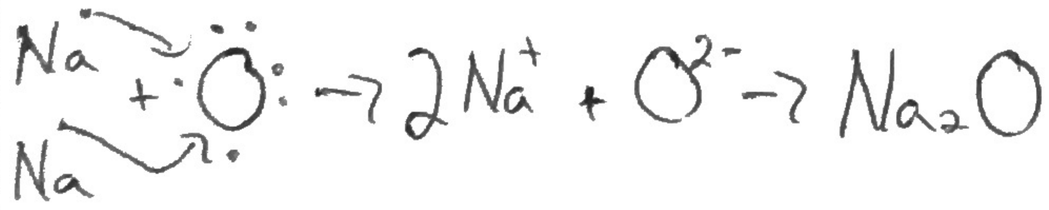
2. Mg + I



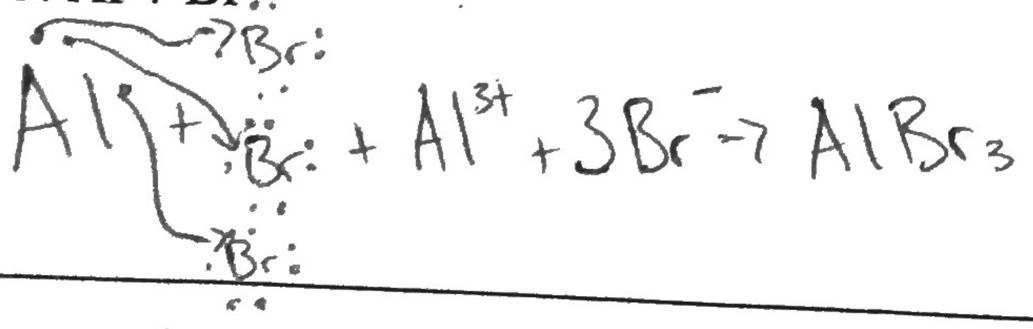
3. Be + S



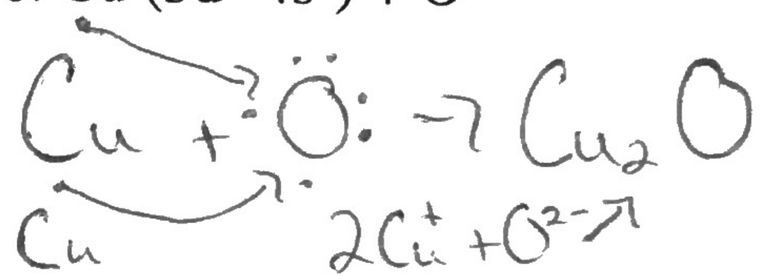
4. Na + O



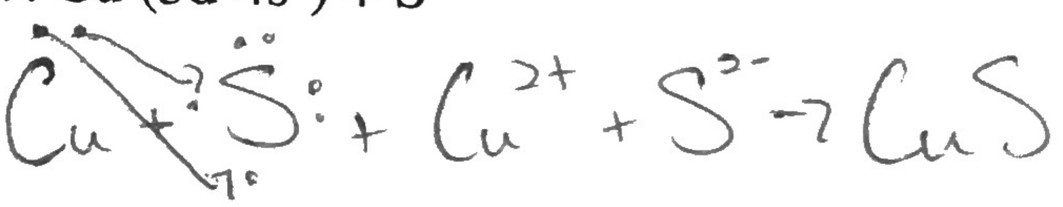
5. Al + Br



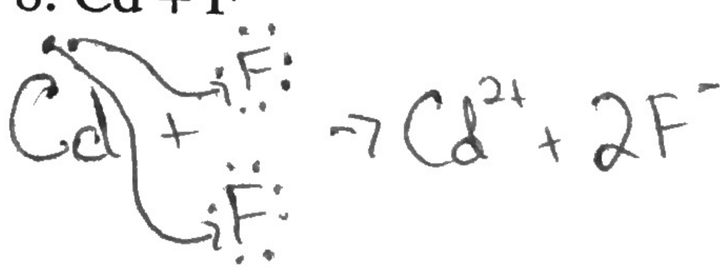
6. Cu ($3d^{10}4s^1$) + O



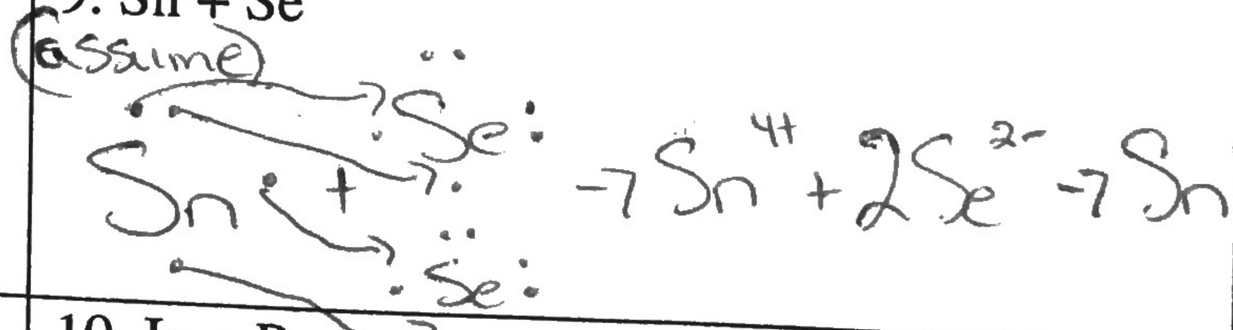
7. Cu ($3d^9 4s^2$) + S



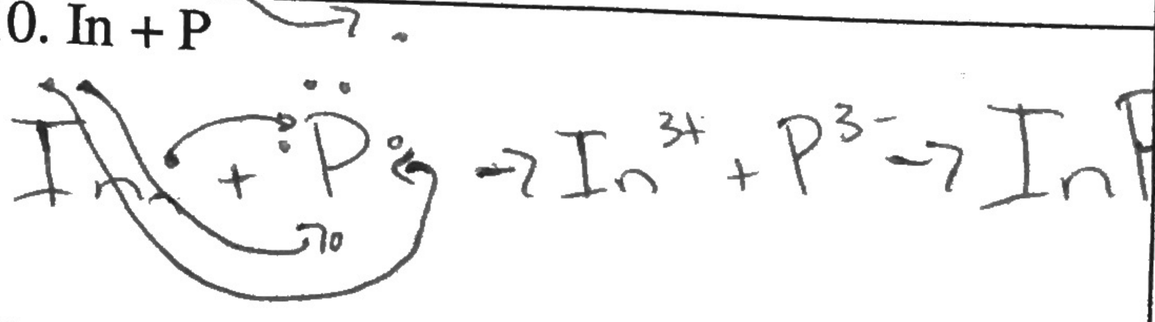
8. Cd + F



9. Sn + Se



10. In + P



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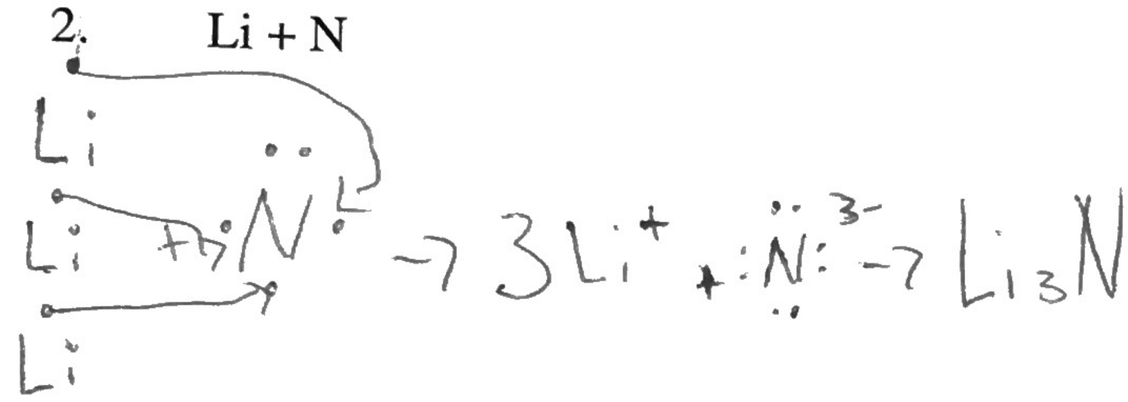
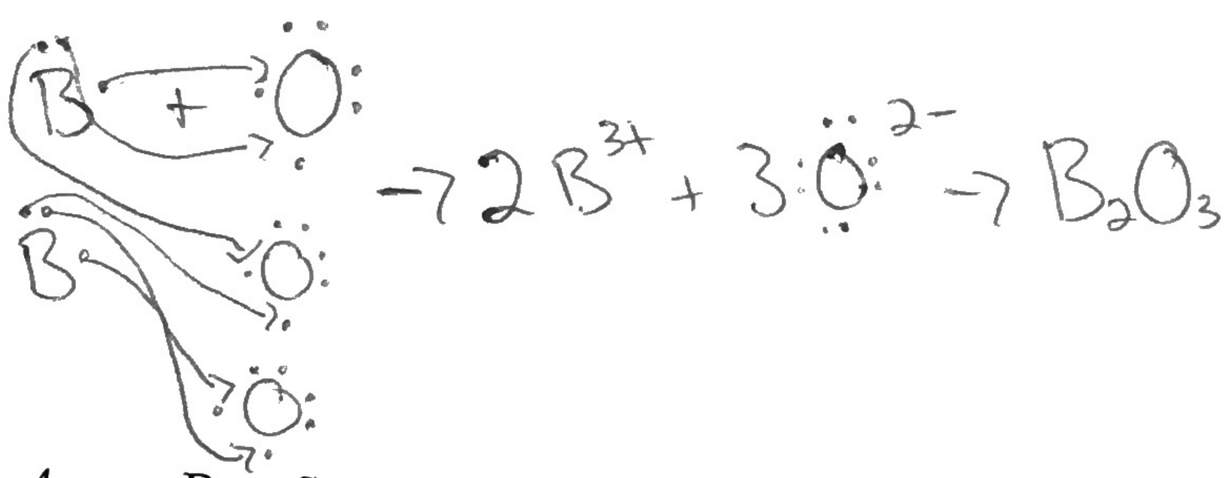
Show the transfer of electrons for the following pairs using electron dot structures. A partner (1-5), B partner (6-10).

1. Mg + F

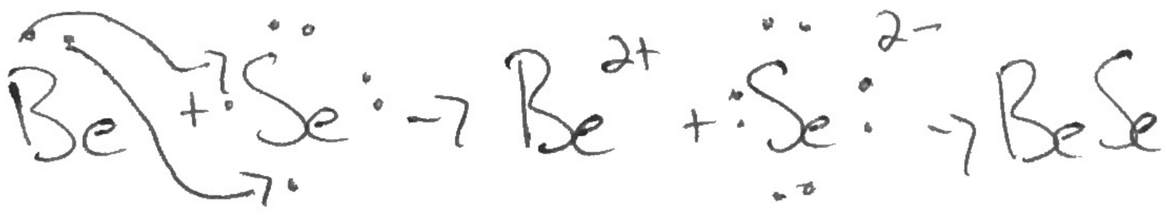
2. Li + N



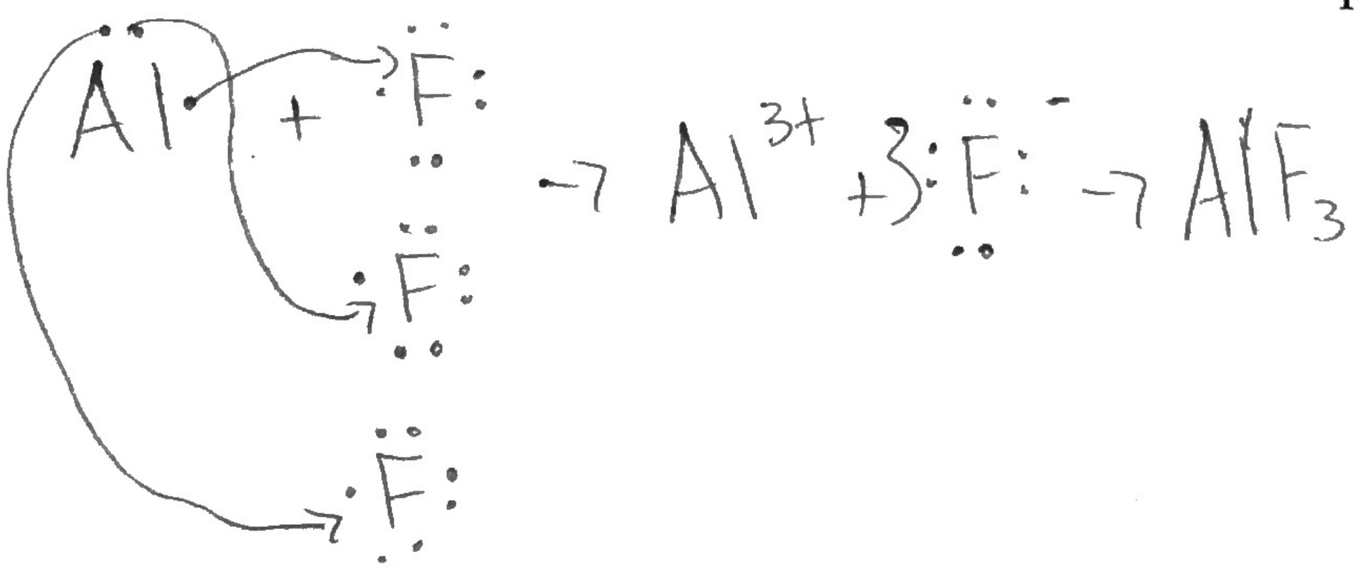
3. B + O



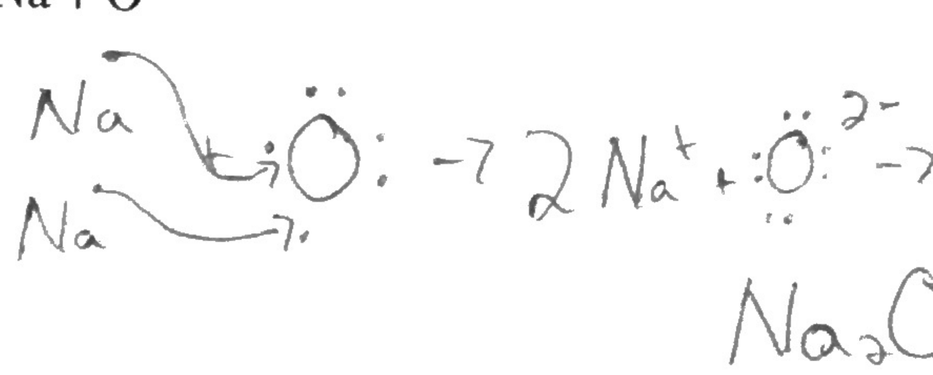
4. Be + Se



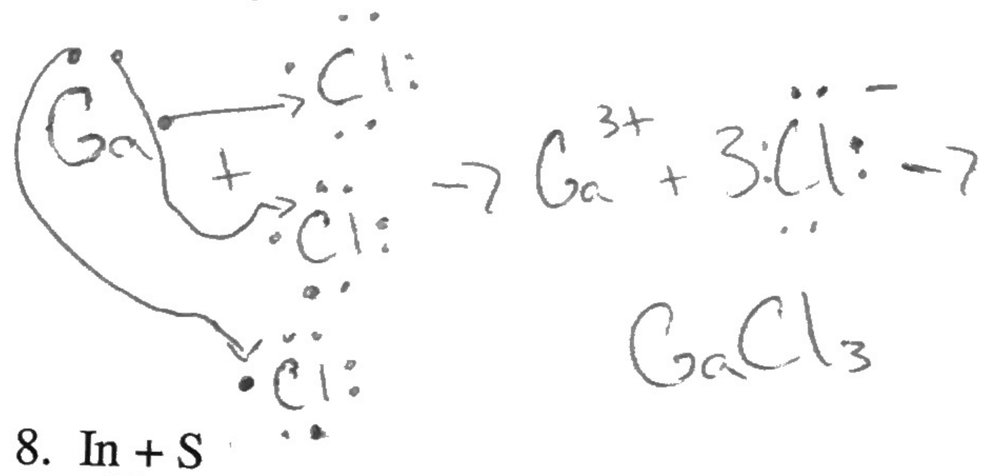
5. Al + F



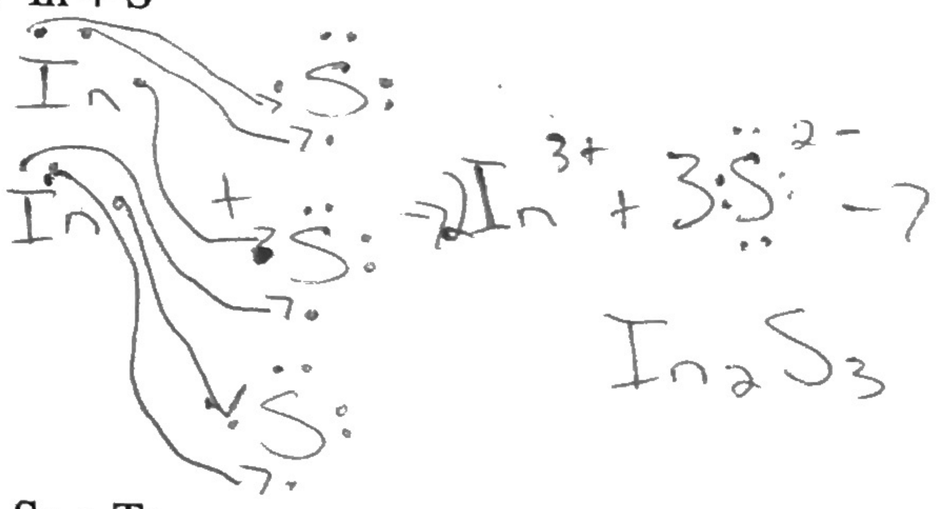
6. Na + O



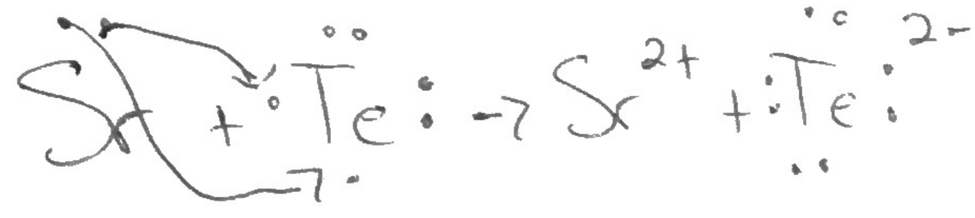
7. Ga + Cl



8. In + S



9. Sr + Te



10. K + As