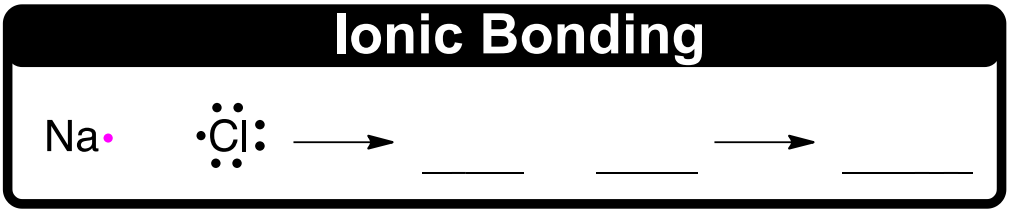
CONCEPT: CHEMICAL BONDS

- The attractive force that holds atoms or ions together in a chemical compound.
  - □ When elements bond they _____, _____, or _____ electrons to attain a filled outer shell like the noble gases.

Ionic Bonding

- The attractive force between the opposing charges of a cation and an anion.
  - □ Recall, _____ tend to lose their *valence electrons* and _____ tend to gain electrons.
  - □ Ionic bond formation helps to lower the _____ energies (exothermic) of the cation and anion.



EXAMPLE: Which of the following species has bonds with the most ionic character?

a) SO_3 b) NBr_3 c) SnO_2 d) P_2O_5 e) $AsCl_5$

PRACTICE: The strength of an ionic bond comes principally from:

a) The converting of atoms into compounds.

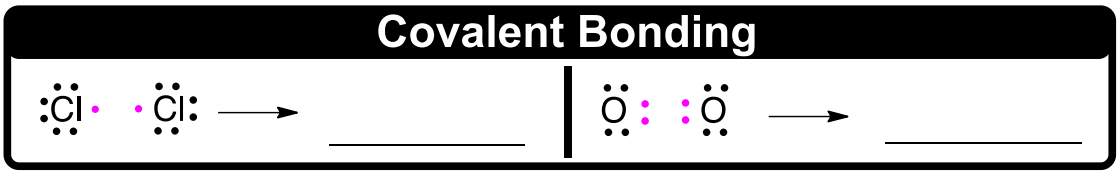
b) The movement of electrons from cations to anions.

c) The mutual attraction of opposite electrical charges.

d) The sharing of electrons.

Covalent Bonding

- Molecular Bonds involving the sharing of valence electrons between non-metals.



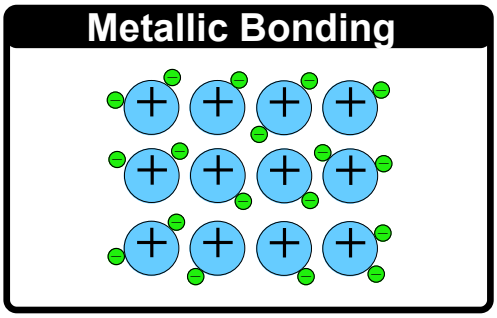
EXAMPLE: Which of these elements is unlikely to form covalent bonds?

a) S b) H c) K d) Ar e) Si

CONCEPT: CHEMICAL BONDS

Metallic Bonding

- The attractive force between free flowing _____ electrons and positively charged ions on a metal's surface.
  - □ Metallic bonding is responsible for unique _____ properties of metals.



EXAMPLE: Which of the following is best description of the free flowing electrons in metallic bonding?

a) Core electrons that can move freely between metal ions.

b) Core and valence electrons that can move freely between metal ions.

c) Valence electrons that can move freely between metal ions.

d) Valence electrons that are bound to metal ions.

e) Core electrons that are bound to metal ions.

PRACTICE: Which of the following is not a physical property attributed to metallic bonding?

a) Ductility b) Luster c) Brittleness d) Malleability e) Conductivity

PRACTICE: Which of the following statements is true?

a) O_2 is characterized by metallic bonding.

b) BaO is characterized by covalent bonding.

c) H_2O is characterized by ionic bonding.

d) Zn is characterized by metallic bonding.

e) BeF_2 is characterized by metallic bonding.