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Review

NaCl

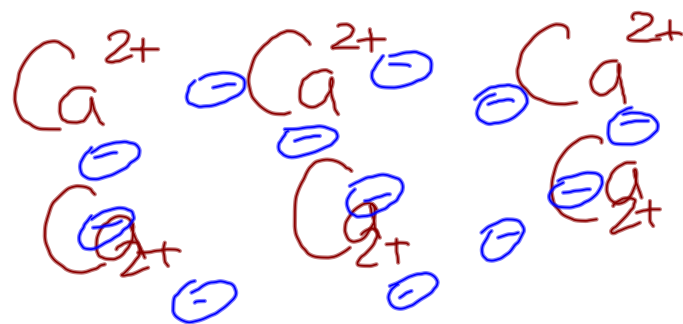
Ionic Crystals - packing

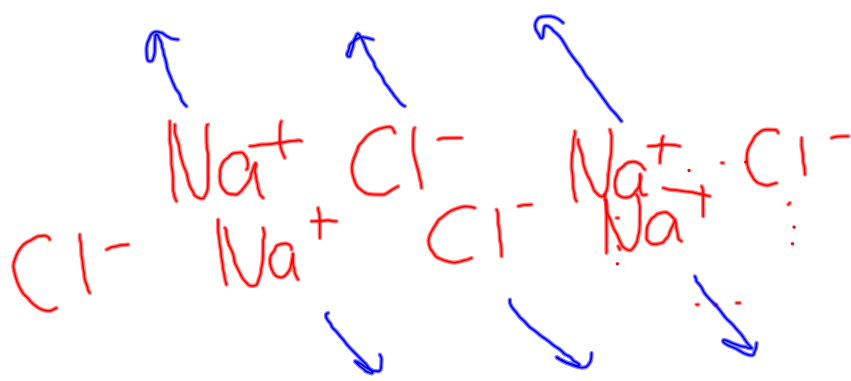
Metallic bonding - cations

'sea of electrons'

Packing arrangements

- Body-Centered Cubic
- Face-Centered Cubic
- Hexagonal Close-Packed





Alloys

Alloys

Mixtures of two or more elements, at least one of which is a metal.

Table 7.3

Name	Composition (by mass)
Sterling silver	Ag 92.5%
	Cu 7.5%
Cast iron	Fe 96%
	C 4%
Stainless steel	Fe 80.6%
	Cr 18.0%
	C 0.4%
	Ni 1.0%
Spring steel	Fe 98.6%
	Cr 1.0%
	C 0.4%
Surgical steel	Fe 67%
	Cr 18%
	Ni 12%
	Mo 3%

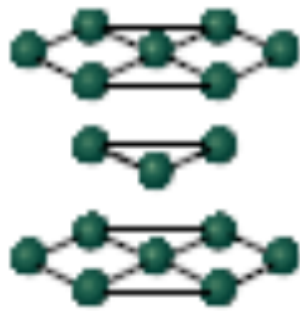
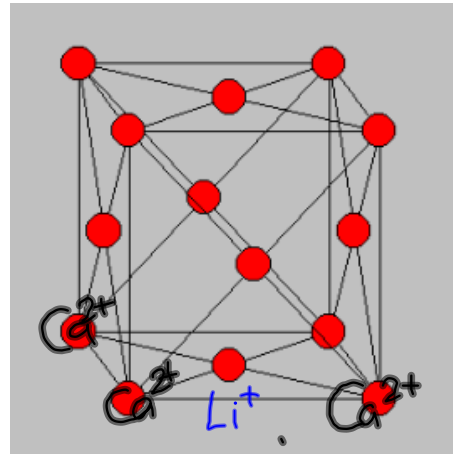
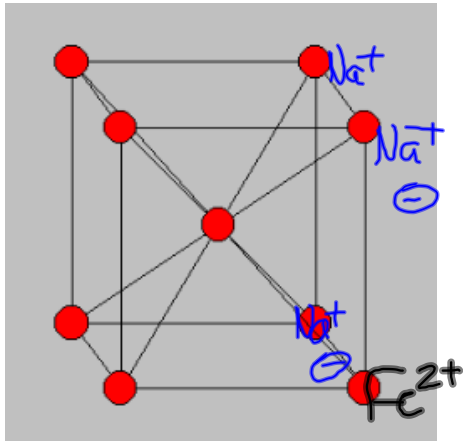
Form in one of two ways:

1) Substitutional Alloys

If atoms of the alloy are about the same size, they can replace each other in the crystal.

2) Interstitial Alloys

If atomic sizes are quite different, smaller atoms can fit into the spaces between the larger atoms.



Hexagonal close-packed

Electronegativity

weak Strong
0 - 4.0

Electronegativity

The ability of an atom in a compound to attract electrons

F

Trends

- Within a group, electronegativity decreases from top to bottom
- Within a period, electronegativity increases from left to right

Ex. F

F Cl

F : Cl

4.0 3.0

F : Cl

Cl : H
3.0 2.1

Table 6.2**Electronegativity Values for Selected Elements**

H 2.1						
Li 1.0	Be 1.5	B 2.0	C 2.5	N 3.0	O 3.5	F 4.0
Na 0.9	Mg 1.2	Al 1.5	Si 1.8	P 2.1	S 2.5	Cl 3.0
K 0.8	Ca 1.0	Ga 1.6	Ge 1.8	As 2.0	Se 2.4	Br 2.8
Rb 0.8	Sr 1.0	In 1.7	Sn 1.8	Sb 1.9	Te 2.1	I 2.5
Cs 0.7	Ba 0.9	Tl 1.8	Pb 1.9	Bi 1.9		

Covalent Bond

Recall that a **covalent bond** is a shared pair of electrons between two nonmetal atoms.

- Electrons are attracted to the positive nuclei
- Each atom wants to reach the electron configuration of a noble gas (ns^2np^6 - Octet Rule)



Single Covalent Bond

Two atoms held together by sharing a pair of electrons

Molecular Formula

Electron Dot Structure

Structural Formula

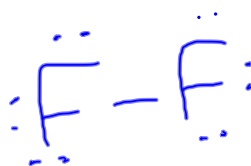
Molecular Formula



Electron Dot Structure



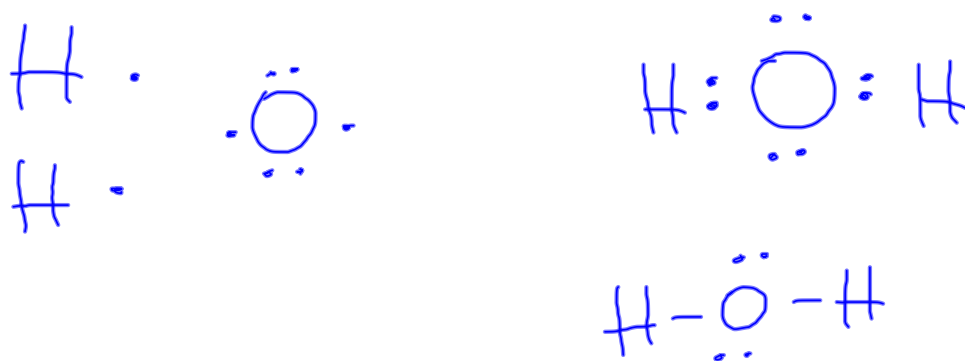
Structural Formula



Lone pair (unshared pair)

A pair of valence electrons not shared between atoms

H₂O



CH₄

- one of carbon's 2s electrons is promoted to the 2p orbital:

