Formation of Compounds

The Variety of Compounds

Start With Something Simple

- Salt is a fairly simple compound.
- Called: sodium chloride…
- NaCl.
- Properties: solid at room temp.
- Crystals.
- Brittle.
- Unreactive.

Individually, the Elements Are Different…(duh)

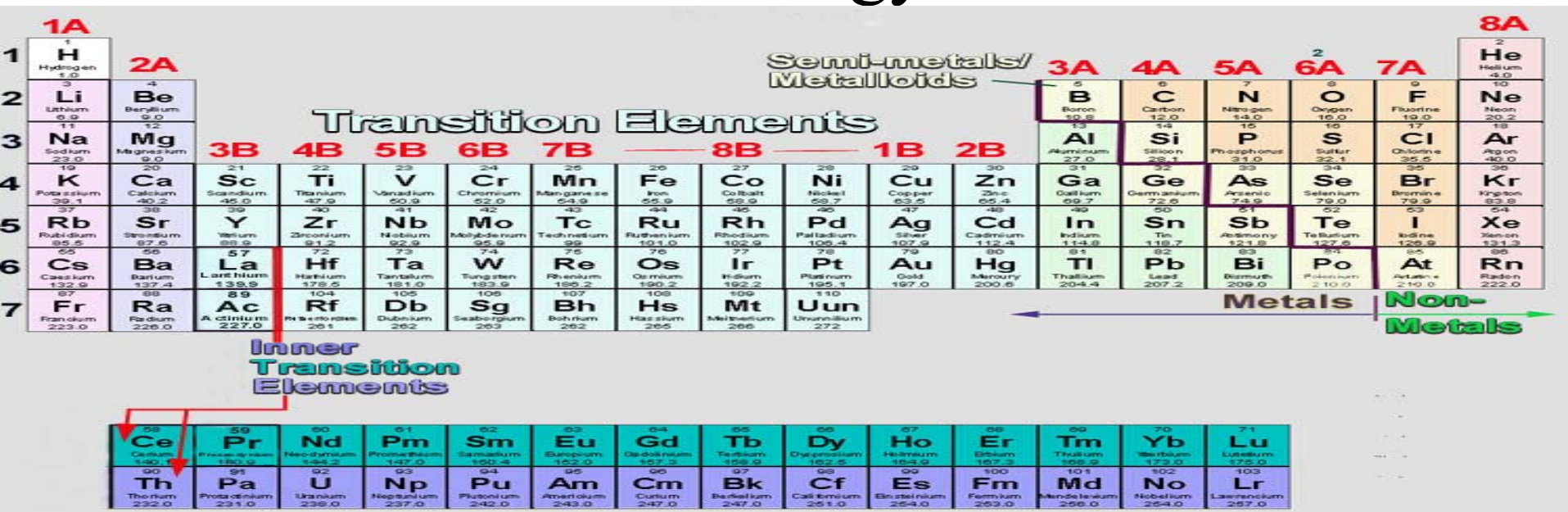
- Sodium is very reactive…
- It must be stored in oil so that it does not explode.
- In nature it is always found bonded with something else.

Chlorine

- Very toxic and violent gas.
- Also a very reactive, and must be handled with extreme care…
- But when paired with sodium it is harmless.

How Do Elements Form Into Compounds?

- First: notice the noble gases.
- None of them are reactive…why?
- Their outermost energy level is full.



The Octet Rule!

- A full outermost shell, means that the element is Unreactive…
- So, that must mean that valence e- are important in reactivity.
- Atoms with fewer electrons can be combined with other atoms, to fill up that outer shell.

Na Cl

- Sodium has 1 valence e-
- Chlorine has 7 valence e-

Na Cl

Ionic Compound

Sodium gives it's valence electron to chlorine, Cl now has a full outer shell…and so does sodium?

Then Why Do They Still Bond?

Na before it bonds has:	Cl before it bonds has:
•11 electrons (-)	•17 electrons (-)
•11 protons (+)	•17 protons (+)
Na after it bonds has:	Cl after it bonds has:
•10 electrons (-)	•18 electrons (-)
•11 protons (+)	•17 protons (+)

So What?

Sodium now is positively charged.

Chlorine is now negatively charged.

And since opposites attract,
$Na^{+}Cl^{-}$ is formed as a compound.

Ionic Compound