9/6/2019

Don't forget... Mastering HW: Due Mon @ noon!
pre-labs : noon of lab day

How many p^+ does Neon have? 10.

10
Ne
20.18

ex: Ne, Z = 10, $10p^+$ ← Z

90.48%	$10n^\circ$, $10p^+$ ($10e^-$)	isotopes
0.27%	$11n^\circ$, $10p^+$ "	-atoms w/
9.25%	$12n^\circ$, $10p^+$ "	same $\#p^+$, but diff't $\#n^\circ$

natural abundances

(same chem. props)

Mass Number: $A = \#p^+ + \#n^\circ$

$10p^+$, $10n^\circ$, $10e^-$	Z = 10, A = 20	neon-20
$10p^+$, $11n^\circ$, $10e^-$	Z = 10, A = 21	neon-21
$10p^+$, $12n^\circ$, $10e^-$	" , A = 22	neon-22

Names of isotopes: Element name - mass #

Q: how p^+, n°, and e^- are in an atom of sodium-27?

11
Na

Z = $\#p^+$

A = 27 < $11p^+$, $11e^-$, $16n^\circ$

mass #

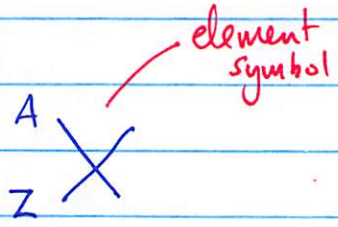
$27 = \#n^\circ + \#p^+$

$27 - 11 = 16$

11

element name - mass # ex: Neon-20
" - 21
" - 22

nuclide symbol:



Neon-20: $^{20}_{10}Ne$ Ne-21: $^{21}_{10}Ne$ Ne-22: $^{22}_{10}Ne$

If atoms gain/lose e^-s: we call them IONS

ex: $Li \longrightarrow Li^+ + e^-$
$(3p^+, 3e^-)$ $(3p^+, 2e^-)$

+ve ions
cations
+

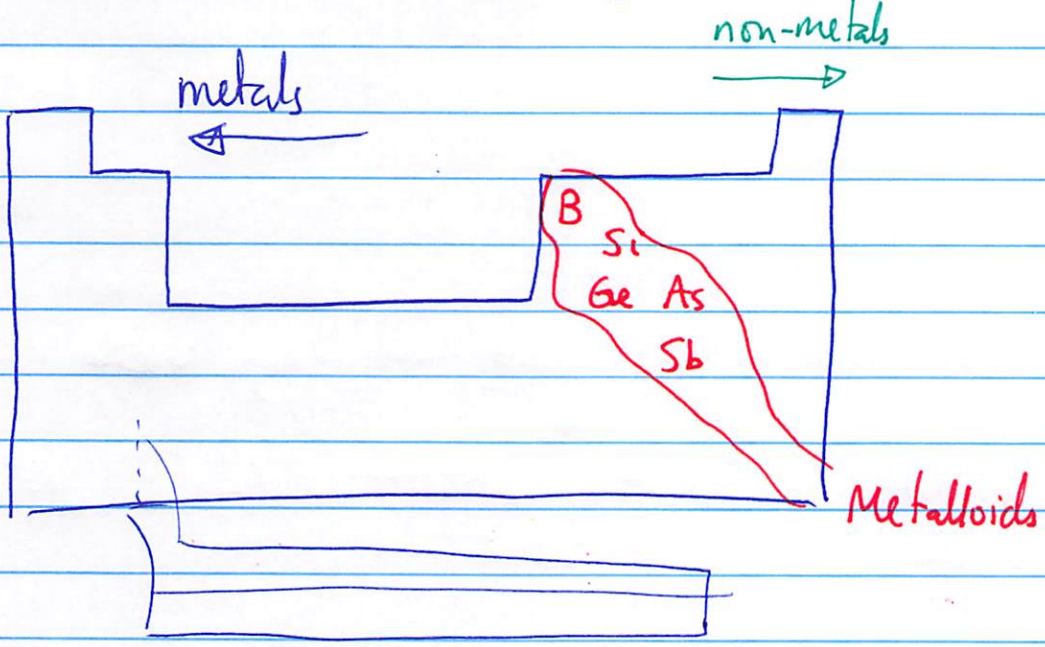
$2e^- + O \longrightarrow O^{2-}$
$(8p^+, 8e^-)$ $(8p^+, 10e^-)$

-ve ions
anions
!

The Periodic Table (PT)

Dmitri Mendeleev, 1869
- organized elements by mass (later Z)
- repeating patterns!
  - left gaps predicting new elements that were later discovered!

Modern table is arranged by Z, not mass!



Metals: shiny, malleable, ductile (wires), good conductors of heat + elec
- often lose e^- and form cations.

Non-metals: dull, brittle, poor conductors
- often gain e^-, and form anions.

Metalloids: some M, some NM props: Si < shiny, brittle, mediocre cond.

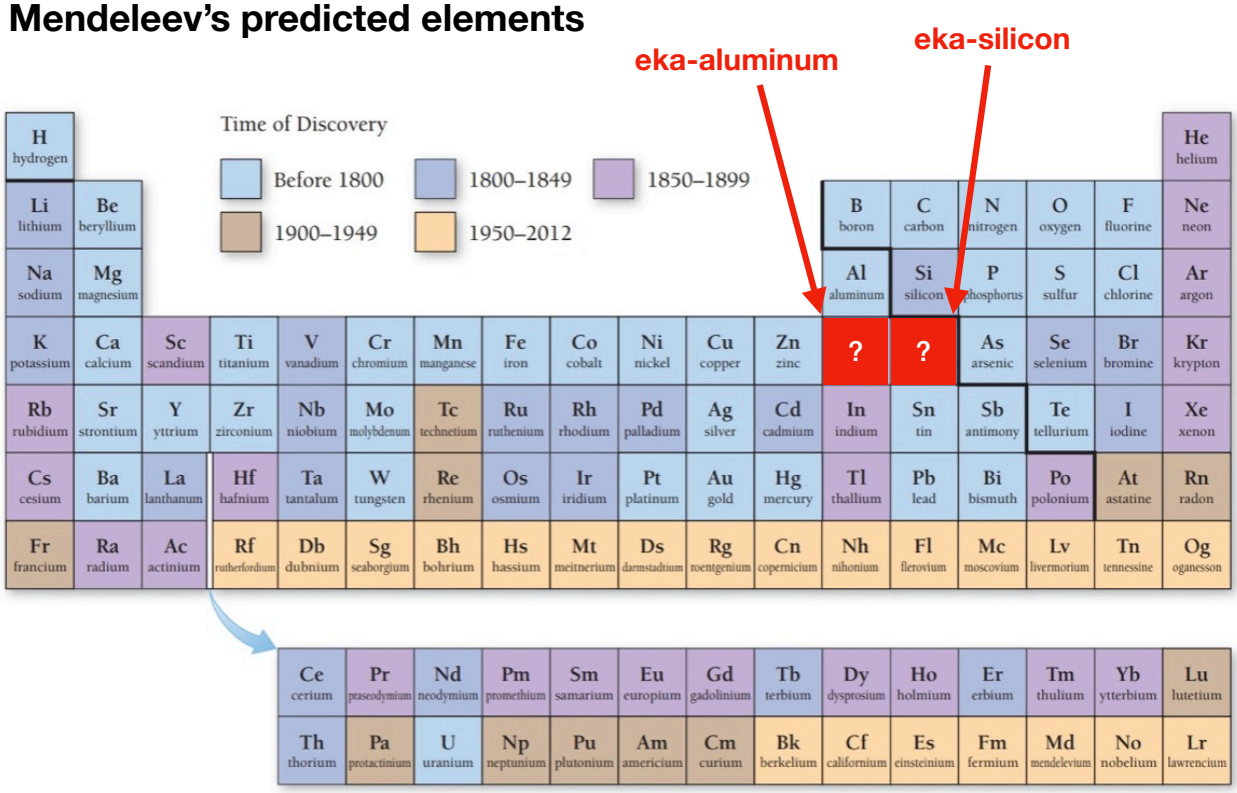
The Periodic Law

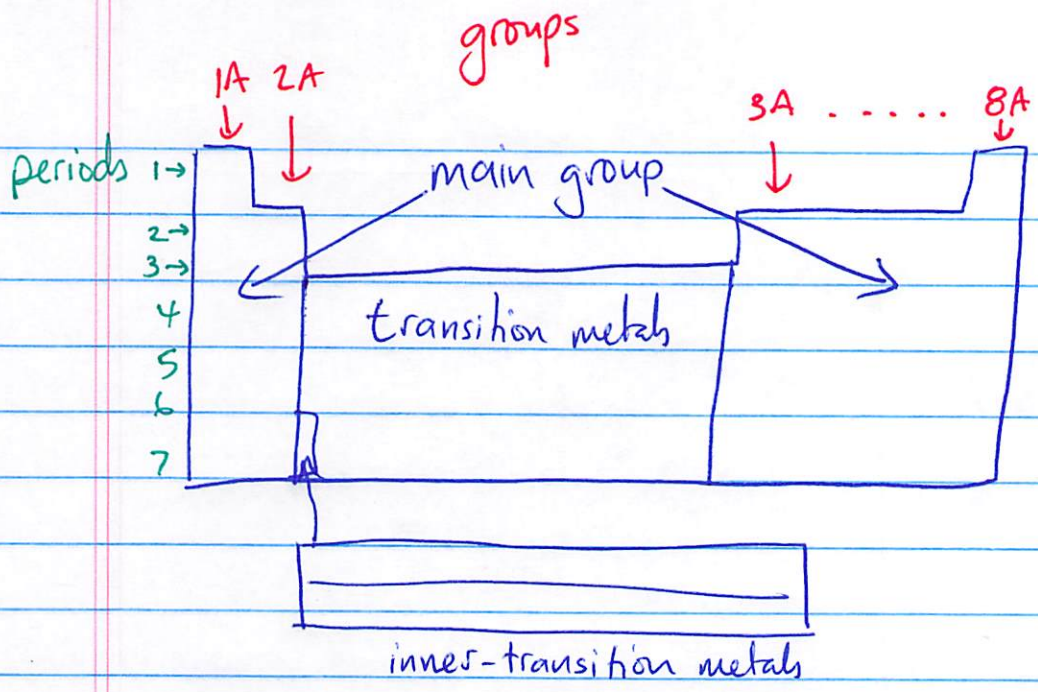
1 H	2 He	3 Li	4 Be	5 B	6 C	7 N	8 O	9 F	10 Ne	11 Na	12 Mg	13 Al	14 Si	15 P	16 S	17 Cl	18 Ar	19 K	20 Ca

Elements with similar properties recur in a regular pattern.

1 H									2 He
3 Li	4 Be	5 B	6 C	7 N	8 O	9 F	10 Ne		
11 Na	12 Mg	13 Al	14 Si	15 P	16 S	17 Cl	18 Ar		
19 K	20 Ca								

Mendeleev's predicted elements




groups
1A
2A
3A
8A
periods
1
2
3
4
5
6
7
main group
transition metals
inner-transition metals