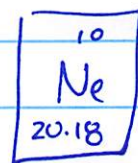


9/6/2019

Don't forget...

Mastering HW: Due Mon @ noon!
pre-labs : noon of lab day

How many p^+ does Neon have? 10.



ex: Ne, $Z=10$, $10p^+$

Z

90.48%	$10n^0$, $10p^+$ ($10e^-$)	} isotopes - atoms w/ same $\#p^+$, but diff't $\#n^0$ (same chem. props)
0.27%	$11n^0$, $10p^+$ "	
9.25%	$12n^0$, $10p^+$ "	

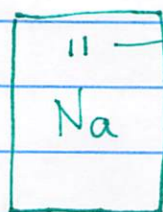
natural abundances

Mass Number: $A = \#p^+ + \#n^0$

$10p^+$, $10n^0$, $10e^-$	$Z=10$, $A=20$	neon-20
$10p^+$, $11n^0$, $10e^-$	$Z=10$, $A=21$	neon-21
$10p^+$, $12n^0$, $10e^-$	" , $A=22$	neon-22

Names of isotopes: Element name - mass #

Q: how p^+ , n^0 , and e^- are in an atom of sodium-27?



$Z = \#p^+$

$A=27$

$11p^+$
 $11e^-$
 $16n^0$

\uparrow
mass #
 $27 = \#n^0 + \#p^+$
 $\uparrow \quad \uparrow$
 $27-11 \quad 11$
 $= 16$

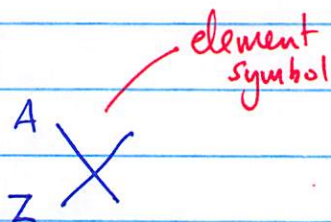
element name - mass #

ex: Neon-20

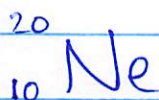
" - 21

" - 22

nuclide symbol:

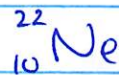


Neon-20:

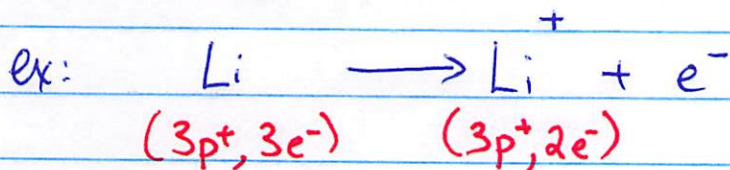


Ne-21

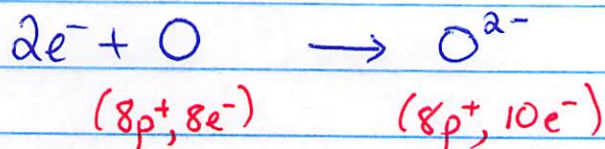
Ne-22



If ^{atoms} ~~atoms~~ gain/lose e^- : we call them IONS



+ve ions
cations
+



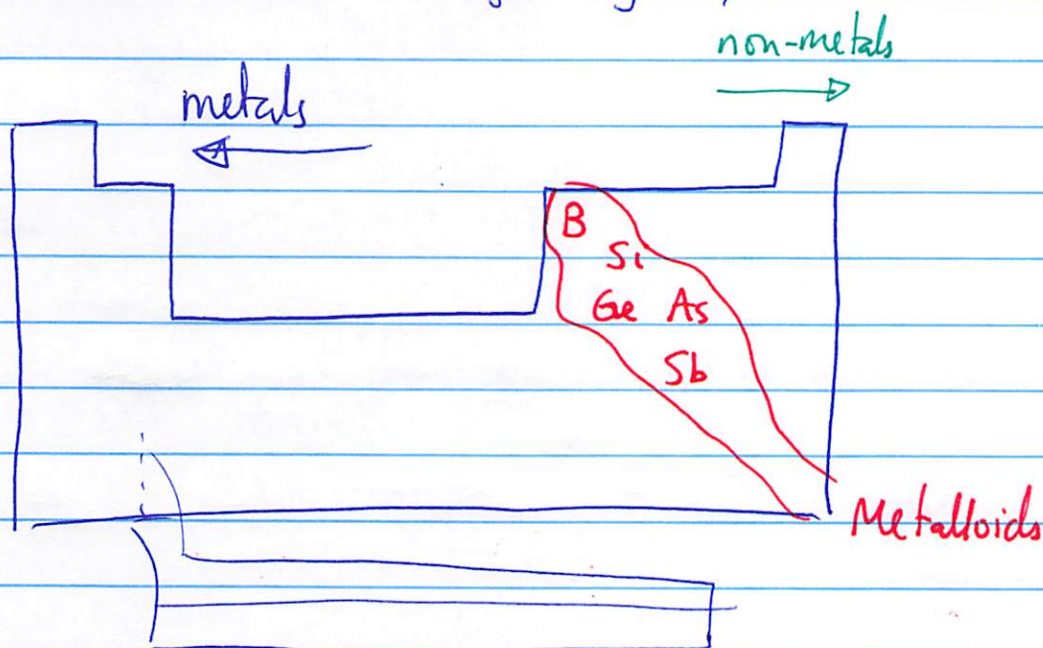
-ve ions
anions
!

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, good conductors
(wires) 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 $\begin{cases} \text{shiny} \\ \text{brittle} \\ \text{mediocre cond.} \end{cases}$

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
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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

Time of Discovery

Before 1800	1800–1849	1850–1899	1900–1949	1950–2012
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H hydrogen																	He helium
Li lithium	Be beryllium																Ne neon
Na sodium	Mg magnesium																Ar argon
K potassium	Ca calcium	Sc scandium	Ti titanium	V vanadium	Cr chromium	Mn manganese	Fe iron	Co cobalt	Ni nickel	Cu copper	Zn zinc	?	?	As arsenic	Se selenium	Br bromine	Kr krypton
Rb rubidium	Sr strontium	Y yttrium	Zr zirconium	Nb niobium	Mo molybdenum	Tc technetium	Ru ruthenium	Rh rhodium	Pd palladium	Ag silver	Cd cadmium	In indium	Sn tin	Sb antimony	Te tellurium	I iodine	Xe xenon
Cs cesium	Ba barium	La lanthanum	Hf hafnium	Ta tantalum	W tungsten	Re rhenium	Os osmium	Ir iridium	Pt platinum	Au gold	Hg mercury	Tl thallium	Pb lead	Bi bismuth	Po polonium	At astatine	Rn radon
Fr francium	Ra radium	Ac actinium	Rf rutherfordium	Db dubnium	Sg seaborgium	Bh bohrium	Hs hassium	Mt meitnerium	Ds darmstadtium	Rg roentgenium	Cn copernicium	Nh nihonium	Fl flerovium	Mc moscovium	Lv livermorium	Tn tennessine	Og oganeson

eka-aluminum

eka-silicon

Ce cerium	Pr praseodymium	Nd neodymium	Pm promethium	Sm samarium	Eu europium	Gd gadolinium	Tb terbium	Dy dysprosium	Ho holmium	Er erbium	Tm thulium	Yb ytterbium	Lu lutetium
Th thorium	Pa protactinium	U uranium	Np neptunium	Pu plutonium	Am americium	Cm curium	Bk berkelium	Cf californium	Es einsteinium	Fm fermium	Md mendelevium	No nobelium	Lr lawrencium

