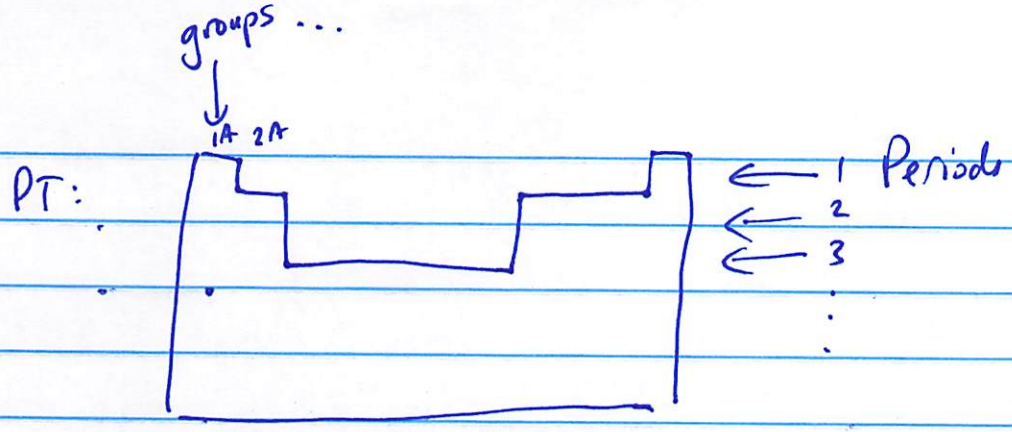
9/12/2018



group IA ~ Alkali metals ~ react violently w/ water
ex: Na, K, Li

2A ~ Alkaline earth metals ~ react moderately w/ water
ex: Mg, Ca

7A ~ Halogens : very reactive + form salts
ex: F, Cl

8A ~ Noble gases : unreactive!
(Inert gases) ex: He, Ne

Ions and the periodic table

Metals ~ lose e^-s ~ Cations X^+
Non-Metals ~ gain e^-s ~ Anions Y^-

~ for main-group elements, they tend to gain/lose e^-s as nearest noble gas.

1A	2A	...	3A	4A	5A	6A	7A	8A
H^+							H^-	He ($2e^-$)
Li^+					N^{3-}	O^{2-}	F^-	Ne ($10e^-$)
Na^+	Mg^{2+}		Al^{3+}			S^{2-}	Cl^-	Ar ($18e^-$)
K^+	Ca^{2+}					Se^{2-}	Br^-	Kr ($36e^-$)

Metals

Non-Metals

$_{19}K \rightarrow {}_{19}K^+ + e^-$

$19p^+$ $19p^+$

$19e^-$ $18e^-$

like Ar

$_{34}Se + 2e^- \rightarrow Se^{2-}$

$34p^+$ $34p^+$

$34e^-$ $36e^-$

like Kr

Q: Predict the charge on ions formed from: Rb^+, P^{3-}

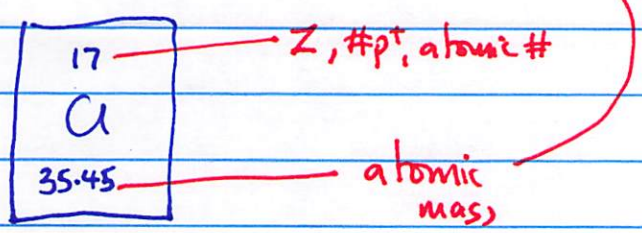
Atomic Mass: The average mass of an element's atoms

Dalton ⇝ all atoms of element are same (X) !!
why? Different #n° (~~is~~ isotopes)
- Different masses

Atomic mass = average mass of element
~ weighted average!

ex: Cl : 75.77% $^{35}_{17}Cl$ 34.97u 24.23% $^{37}_{17}Cl$ 36.97u

Atomic mass = $\frac{75.77}{100} \times 34.97u + \frac{24.23}{100} \times 36.97u$
= 35.45u



In general, Atomic mass = $\sum_n$ (fraction of isotope n) × (mass of isotope n)

ex: Mg → ^{24}Mg, 78.99%, 23.99u
→ ^{25}Mg, 10.00%, 24.99u
→ ^{26}Mg, 11.01%, 25.98u
} → atomic mass = ??

$\frac{78.99}{100} \times 23.99u \oplus \frac{10.00}{100} \times 24.99u \oplus \frac{11.01}{100} \times 25.98u =$ **24.31 u**

Molar Mass: Counting atoms by weighing

penny rolls @ bank → weigh
- same w/ atoms