

Atoms vs. Ions

${}^3\text{Li}$ Lithium	Atomic Number = 3
6.9	Aug. Atomic Mass = 6.9 7.0

Electrons = 3^-

Protons = 3^+

Neutrons = $7.0 - 3.0 = 4$

Aug. Mass Atomic Number

LITHIUM ATOM

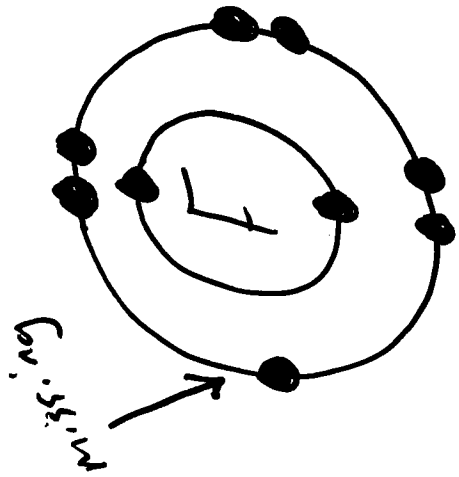


LITHIUM ION



CHARGE Electrons = 3^- CHARGE
= NEUTRAL Protons = 3^+ = $+1$
Neutrons = ~~3~~ 4

Electrons = ~~2~~ 2^-
Protons = 3^+
Neutrons = ~~3~~ 4

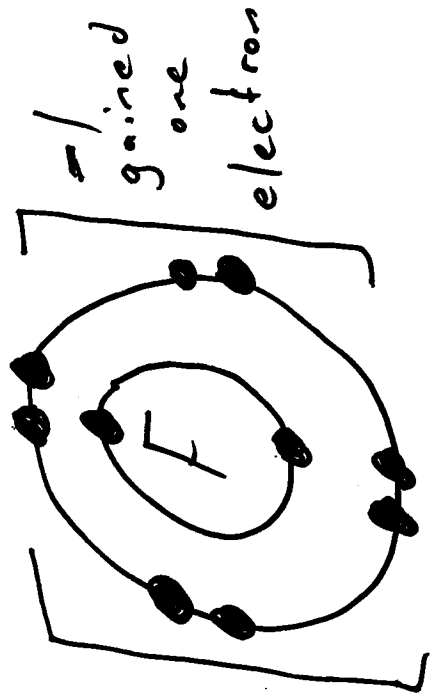


$$e^- = 9^- \text{ CHARGE}$$

$$p^+ = 9^+ = \text{NEUTRAL}$$

$$n = 10 \text{ NO CHARGE}$$

Fluorine
ATOM

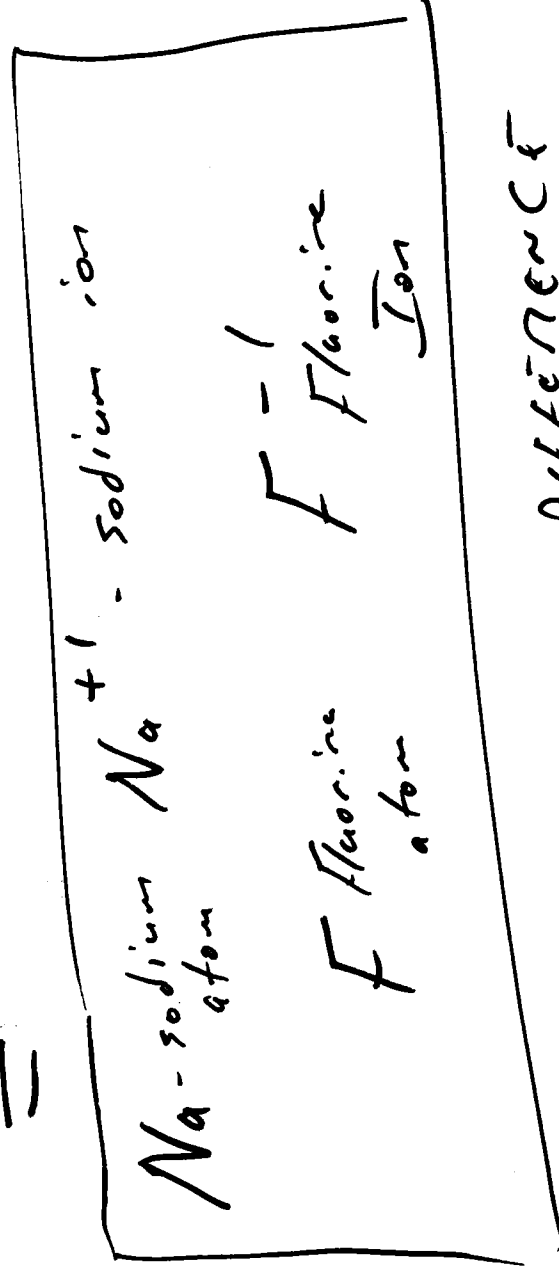


$$e^- = 10^- \text{ CHARGE}$$

$$p^+ = 9^+ = -1$$

$$n = 10$$

Fluorine
ION



WHAT IS THE DIFFERENCE
BETWEEN AN
AND ION?

Atom - neutral, not charged

Ion - charged particle
- last ring is complete
- stable

lost / or
GAINED or
NEUTRAL

ELEMENT

Na⁺¹ lost 1e⁻

F⁻¹ GAINED 1e⁻

O⁻² ↙ GAINED 2e⁻

N⁻³ GAINED 3e⁻

Ca²⁺ lost 2e⁻

Al³⁺ lost 3e⁻

Mg²⁺ lost 2e⁻

Cl⁻¹ GAINED 1e⁻

P⁻³ GAINED 3e⁻

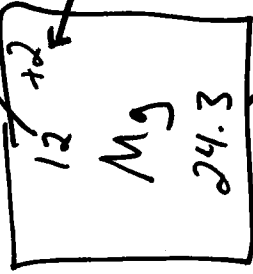
Be²⁺ lost 2e⁻

K⁺¹ lost 1e⁻

e⁻ # p⁺ n

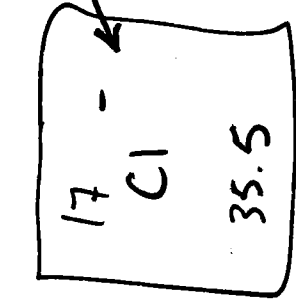
Mg atom	12	12	12
Mg ²⁺ (ion)	10	12	12
Cl atom	17	17	36 - 17 (35.5) = 19
Cl ⁻¹ (ion)	18	17	19
Al atom	13	13	27 - 13 = 14
Al ⁺³ (ion)	10	13	14

Atomic #

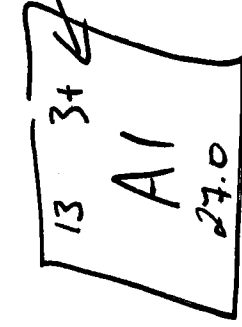


loses two e⁻ when it's an Ion

Atomic Mass



gains one electron when it's an Ion



loses three electrons when it's an Ion

21/9

Transformation of

DATA

or



Dependent Variable

Independent Variable