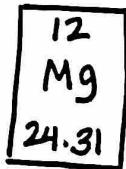


① Atomic #'s


 atomic # = # protons
 average mass → round to a whole # then
 $= \# p + \# n$

normally

$$\# p = \# e^-$$

Potassium:

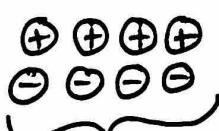

 $\# p = 19$
 $\# e^- = 19$ ← rounded first!
 $\# n = 39 - 19 = 20$
 $= \text{mass\#} - \# p$

* The name of the atom is based on the # of protons

③ Ions

* same # p, same # n
 ↳ different # e⁻

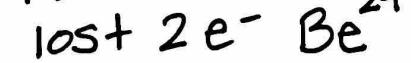
ion symbol:  cations Anions
 lost e⁻ gain e⁻
 + charge - charge



neutral
 \emptyset charge



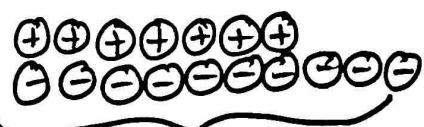
+2 charge
 lost $2e^-$



$N: 7p^+ 7e^-$



neutral, \emptyset charge

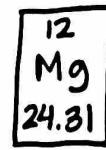


-3 charge,
 gained $3e^-$



② Isotopes

* Same # p, same # e⁻
 ↳ different # of n
 (same element, but a different "version")



Average mass of all isotopes in the universe!

- guess the most common isotope by rounding to the whole #
- isotope name - "mass #"
- magnesium-26

Isotope Symbol
 $^{26}_{12} \text{Mg}$ ← mass # } $\# p = 12$
 ← atomic # } $\# e^- = 12$
 } $\# n = 14$
 $(26 - 12)$

④ Orbitals

* area an e⁻ is most likely to be found
 ↳ "probability cloud"

shapes: s, p, d, f
 ↓ ↓ weird!



In an energy level:
 x, y, or z orientation

s - 1 orbital - $2e^-$

p - 3 orbital - $6e^-$

d - 5 orbital - $10e^-$

f - 7 orbital - $14e^-$

up to 7 energy levels

⑤ Orbital rules

① Aufbau

- fill orbitals from lowest energy to highest energy
- fill diagram from bottom to top

② Pauli Exclusion

- every e⁻ needs a unique "address"
- one e⁻ in an orb. spin up ↑
- one e⁻ in an orb. spin down ↓

"e⁻ are lazy!"

"only fit
2e⁻ per
orbital!"

↑↑

③ Hund's

- If you have multiple orbitals @ same energy level - spread them out before pairing them up!

"don't
share
a room!"

Practice Problems

⑥ Orbital diagrams

