CONCEPT: SUBATOMIC PARTICLES (SIMPLIFIED)

- The 3 **subatomic particles** share key differences and similarities in their masses and charges.
  - □ **Amu**: Shorthand for *atomic mass unit* and is used to calculate the relative mass of an atom or subatomic particle.
    - 1 AMU = one-twelfth the mass of a carbon-12 atom.
    - 1 AMU = 1 _____ (Da) named after John Dalton, a "Father of Chemistry".
    - 1 AMU = _____ kg.

Subatomic Particle	Actual Mass (kg)	Relative Mass (amu)	Relative Charge
Neutron	1.67493×10^{-27}		0
Proton	1.67262×10^{-27}		+1
Electron	0.00091×10^{-27}		−1

EXAMPLE: Osmium, one of the densest elements on earth, has an actual mass of 190.23 grams. According to the table above, what is its value in terms of atomic mass units?

a) 1.15×10^{26} Da b) 3.16×10^{-28} Da c) 1.15×10^{-28} Da d) 3.16×10^{26} Da

PRACTICE: According to the table above, how many electrons are needed to have a combined mass of 1.0465×10^{-25} kg?

a) 2.1028×10^{13} b) 1.1500×10^{5} c) 8.8192×10^{25} d) 3.2235×10^{22}

PRACTICE: How many atoms are contained in 0.230 g of sodium, Na? The mass of one sodium atom is 23.99 amu.

a) 7.197×10^{11} b) 4.182×10^{3} c) 5.775×10^{21} d) 9.181×10^{41}