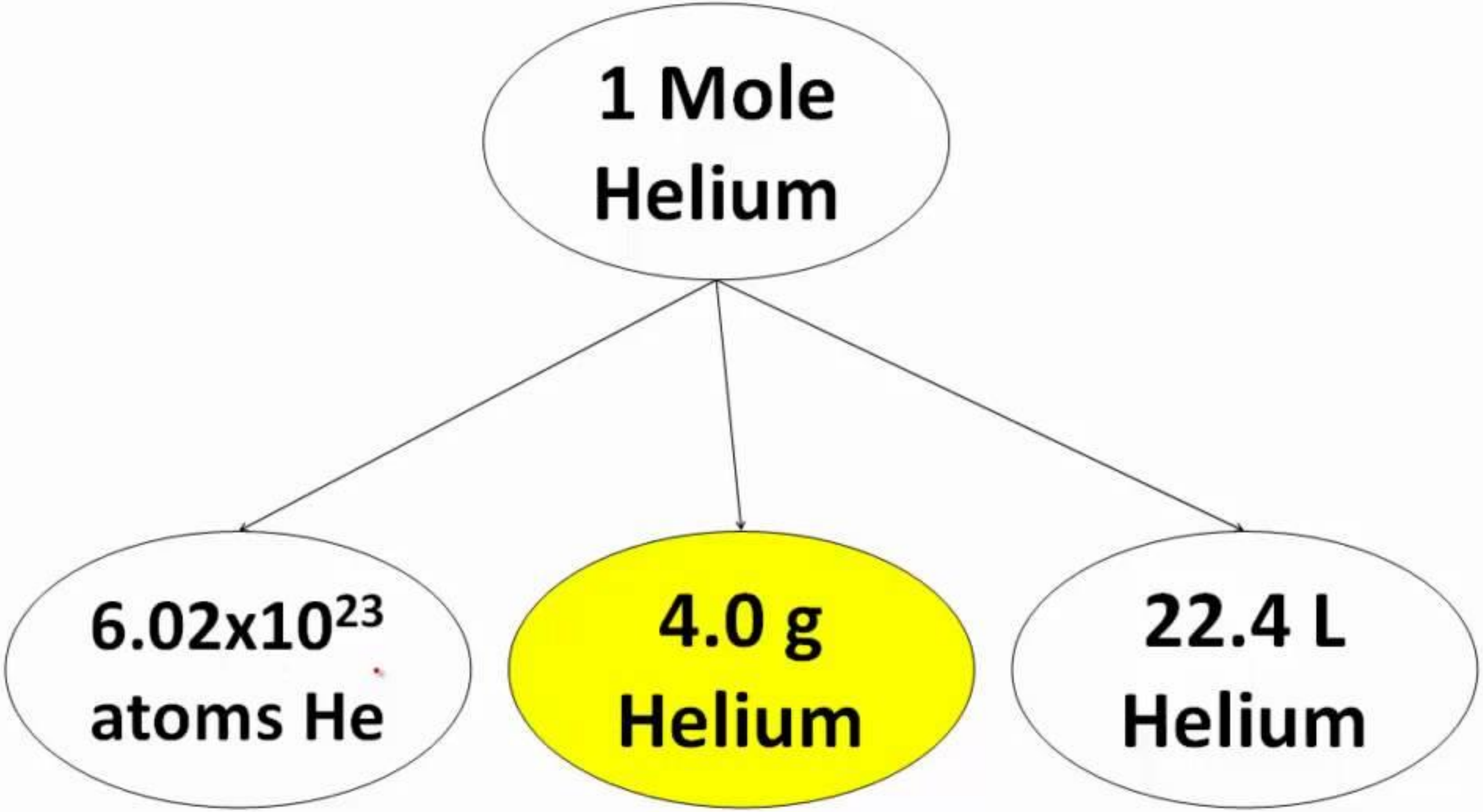
EST

The concept of mole

Molar mass

- A mole is a quantity equal to the number of atoms in exactly 12 g of carbon-12. It's symbol is mol.
- The molar mass of a substance is the mass of one mole of that substance.
- One mole of He has a mass of 4.00 g (because He has a mass of 4.00 u)
-


1 Mole Helium
6.02x10^23 atoms He
4.0 g Helium
22.4 L Helium

Examples of molar mass

Substance	Relative atomic mass (u)	Molar mass (g/mol)
Carbon (C)	12.01	12.01
Calcium (Ca)	40.08	40.08
Water (H20)	H = 1.01 O = 16.00	(2 x 1.01) + 16.00 = 18.02
Table salt (NaCl)	Na = 22.99 Cl = 35.45	22.99 + 35.45 = 58.44
Glucose (C6H12O6)	C = 12.01 H = 1.01 O = 16.00	(6 x 12.01) + (12 x 1.01) + (6 x 16.00) = 180.18
Carbon dioxide (CO2)	C = 12.01 O = 16.00	12.01 + (2 x 16.00) = 44.01

How to calculate Molar Mass

- $M = m \div n$

- M = molar mass (g/mol)
- m = mass (in g)
- n = number of moles (in mol)

To determine the number of moles

- $n = m \div M$

- **i.e. Determine the number of moles in 100 g of carbon.**

- **$n = m \div M$**

- **$= 100\ g \div 12.01\ g/mol$**
- **$= 8.33\ mol$**

Avogadro’s number

- Avagadro’s number represents the number of entities in a mole. It equates to 6.022140857 × 10 ^{23}

  of those entities (could be electrons, atoms, ions or molecules)