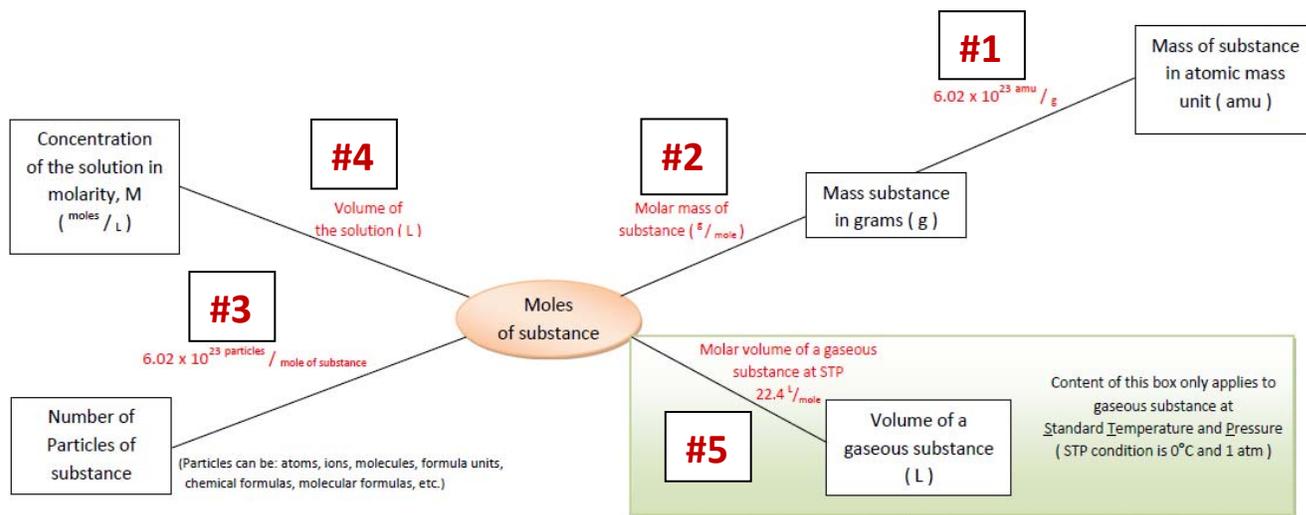


Mole - Mass - Particles Problems

Expanded Road Map for "Mole - Mass - Volume - Particles" Calculations



Your plan of action:

1. One mole of aluminum, Al, is equivalent to

- (a) 26.9815 amu.
- (b) 6.02E23 grams.
- (c) 6.02E23 atoms.
- (d) 26.9815 atoms.

2. How many Al^{3+} ions are in 47.2 g of aluminum sulfate, $\text{Al}_2(\text{SO}_4)_3$?

- (a) 7.25 Al^{3+} ions
- (b) 1.94E28 Al^{3+} ions
- (c) 5.68E25 Al^{3+} ions
- (d) 1.66E23 Al^{3+} ions

3. Calculate the mass of 3.00E20 cobalt, Co, atoms.

- (a) 1.77E22 g
- (b) 0.0294 amu
- (c) 0.0294 g
- (d) 5.09E18 amu

4. DDT is a pesticide that is banned in most of the world. The chemical formula is $C_{14}H_9Cl_5$. The number of atoms in 27 molecules of DDT is

- (a) $4.6E26$ atoms
- (b) $1.3E-21$ atoms
- (c) 28 atoms
- (d) 756 atoms
- (e) $2.1E26$ atoms

5. The chemical formula of an anti-malarial drug, quinine, is $C_{20}H_{24}N_2O_2$. How many hydrogen atoms are in 9.28 moles of quinine?

- (a) $5.59E24$ hydrogen atoms
- (b) 223 hydrogen atoms
- (c) 9.28 hydrogen atoms
- (d) $1.34E26$ hydrogen atoms

6. DDT is a pesticide that is banned in most of the world. The chemical formula is $C_{14}H_9Cl_5$. Calculate the mass, in kilograms, of $1.7E20$ molecules of DDT.

- (a) $6.0E25$ kg
- (b) $6.0E19$ kg
- (c) $10.0E-5$ kg
- (d) $1.0E2$ kg

7. How many grams of tin, Sn, are in 2.50 moles tin, Sn?

- (a) $4.93E-22$ g
- (b) 297 g
- (c) $4.93E-22$ g
- (d) 0.0211 g

8. How many grams of phosphorus are in 1.50 mole of phosphorus atoms?

- (a) $7.49E-23$ g
- (b) 46.5 g
- (c) $2.88E25$ g
- (d) 0.0484 g

9. Borax, $Na_2B_4O_7 \cdot 10H_2O$, is an industrially important mineral and a boron source. How many moles are there in 1.30 kg of borax?

- (a) $3.41E-6$ moles borax
- (b) 3.41 moles borax
- (c) $2.98E23$ moles borax
- (d) $2.05E24$ moles borax

10. The common chemical name for aspirin is acetylsalicylic acid. The chemical formula of aspirin is $C_9H_8O_4$. How many moles of hydrogen atoms are in 4.48 moles of acetylsalicylic acid?

- (a) $2.16E25$ moles of hydrogen
- (b) $4.86E26$ moles of hydrogen
- (c) 807 moles of hydrogen
- (d) 35.8 moles of hydrogen

