What is the Mole Concept?

Worksheet

A mole is 6.022 10 particles. The mole equation n = m/M converts mass (m) to moles (n) using molar mass (M).

$$n = \frac{m}{M}$$

Questions

1. How many moles in 44.01 g of CO?

A) 0.5 mol
B) 1.0 mol
C) 2.0 mol
D) 44.01 mol

2. Mass of 2.5 mol of HO (M = 18.02 g/mol)?

A) 7.21 g
B) 45.05 g
C) 36.04 g
D) 72.08 g

3. Avogadro's number is

A) 6.022 10
B) 6.022 10
C) 6.022 10
D) 6.022 10

4. What links mass to particle count?

A) Atomic number
B) Molar mass and Avogadro's number
C) Electron configuration
D) Neutron count

5. How many moles are in 36.04 g of HO?

6. What is the mass of 0.5 mol of CO?

7. How many molecules in 1 mol of O?

8. Define: What is a mole?

9. Define: What is the mole equation?

10. Define: How many grams is one mole of HO?

Answer Key

1. B) 1.0 mol - n = 44.01 / 44.01 = 1.0 mol.

2. D) 72.08 g - m = n M = 2.5 18.02 = 45.05 g.

3. B) 6.022 10 - Avogadro's number is 6.022 10 particles per mole.

4. B) Molar mass and Avogadro's number - Molar mass converts g to mol; Avogadro's number converts mol to particles.

5. Given: mass = 36.04 g, molar mass of HO = 18.02 g/mol n = m / M = 36.04 / 18.02 = 2.00 mol

6. Rearrange: m = n M Molar mass of CO = 44.01 g/mol m = 0.5 44.01 = 22.01 g

7. n = 1 mol Number of molecules = n Avogadro's number = 1 6.022 10 = 6.022 10 molecules

8. 6.022 10 particles (atoms, molecules, or ions) - Avogadro's number.

9. n = m / M, where n is moles, m is mass, M is molar mass.

10. The molar mass of HO = 18.02 g, so 1 mol = 18.02 g.